CUNDALL

Hayes Digital Park Data Centre Campus, Building LON6

Air Quality Appendix

Colt DCS

Job No:	1042145
Doc Ref:	LONUX-CDL-ZZ-XX-RP-Z-00001
Revision:	P01
Revision Date:	14 March 2025

Project title	Hayes Digital Park Data Centre Campus, Building LON6	**Job Number**
Report title	Air Quality Appendix	1042145

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
P01.01	28 February 2025	For Planning DRAFT
P01	14 March 2025	For Planning

Document Validation (latest issue)

14/03/2025

X A.Trevis

Principal author

Signed by: Annie Trevis

14/03/2025

X J.Carrington

Checked by

Signed by: Jenny Carrington

14/03/2025

X G.Hodgkiss

Verified by

Signed by: Glyn Hodgkiss

Contents

Figures

Tables

1.0

Legislation, Policy and Guidance

1.0 Legislation, Policy and Guidance

1.1 Key Legislation and Policy

This assessment considers key air quality legislation, which is summarised in Table 1-1.

Legislation	Description
EU Ambient Air Quality Directive 2008/50/EC[1]	Establishes the requirements of Member States in terms of improvements required to air quality. Sets standards for a variety of pollutants for human-health and the environment.
The Air Quality Standards Regulations 2010[2]	Transposes formalised EU Limit Values set out in directive 2008/50/EC to UK law. An Amendment was published in 2016[3]
Clean Air Strategy 2019[4]	Defra published a Clean Air Strategy in January 2019, setting out a wide range of actions for UK Government to reduce pollutant emissions and improve air quality. The actions are grouped into four main emission sources: Transport, Domestic, Farming and Industry The Clean Air Strategy sets out the case for action and demonstrates the government's determination to improve air quality. In some cases, the goals are even more ambitious than EU requirements to reduce people's exposure to toxic pollutants like nitrogen oxides, ammonia, particulate matter, non-methane volatile organic compounds and sulphur dioxide.
Environment Act 1995, Part IV[5], amended by the Environment Act 2021[8].	Defines the requirements for Local Air Quality Management (LAQM).
Environment Protection Act 1990, amended by the Pollution Prevention and Control Act 1999[6] and the Environment Act 2021[8].	Part III provides statutory nuisance provisions for nuisance dust. Nuisance complaints about dust would need to be investigated by the Local Authority. In practice, dust deposition is generally managed appropriately by suitable on-site practices and mitigation, avoiding the determination of statutory nuisance and/or prosecution or enforcement notices.
The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018[7]	Developers and contractors are required to meet compliance with the emission standards for Non-Road Mobile Machinery (NRMM). The Regulations exercise of the powers conferred by section 2(2) of, and paragraph 1A of Schedule 2 to, the European Communities Act 1972 in relation to the type, description, construction or equipment of vehicles.
Environment Act, 2021[8].	The Act makes provision about targets, plans and policies with the focus of improving the natural environment. This includes air quality, as well as water, nature and biodiversity, regulation of chemicals, waste and resource efficiency and recall of products failing to meet environmental standards. The Act introduces a duty on government to bring forward at least two air quality targets by October 2022 for consultation. These are to be to reduce the annual average level of fine particulate matter ($PM_{2.5}$) and to set a long-term (minimum of 15 year) target for its reduction. The 2021 Act amends the Environment Act 1995 Part IV by seeking to strength local air quality a management (LAQM) through greater cooperation at local level and broadening the range of organisations that play a role in improving air quality. Responsibility for tackling air pollution is to be shared between

[1] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
[2] HMSO (2010). Statutory Instrument 2010 No. 1001, The Air Quality Standards Regulations 2010, London: HMSO
[3] HMSO (2016). Statutory Instrument 2016 No. 1184, Environmental Protection, England, The Air Quality Standards (Amendment) Regulations 2016, London: HMSO, https://www.legislation.gov.uk/uksi/2016/1184/contents/made
[4] Department for Environment Food and Rural Affairs (Defra) (2019) Clean Air Strategy 2019, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
[5] Environment Act 1995, Chapter 25, Part IV Air Quality
[6] Environmental Protection Act 1990, Chapter 43, Part III Statutory Nuisances and Clean Air https://www.legislation.gov.uk/ukpga/1990/43/part/III
[7] HMSO (2018) The Non-Road Mobile Machinery Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018, UK Statutory Instruments, 2018 No. 764, https://www.legislation.gov.uk/uksi/2018/764/made
[8] HMSO (2021) Environment Act 2021, November 2021, https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

Legislation	Description
	designated local authorities, all tiers of local government and neighbouring authorities. The environment secretary will be required to review the Air Quality Strategy at least every five years and publish annual progress reports to parliament. The 2021 Act amends the Clean Air Act 1993 to give local authorities more power to reduce pollution in smoke control areas by replacing the criminal offence of emitting smoke from a chimney in a smoke control area with a civil penalty regime, seeking to enable simpler, quicker and more proportionate enforcement at local level. It also amends the Environmental Protection Act 1990 by extending the system of statutory nuisance to private dwellings in smoke control areas, which could result in abatement notice and issuing fines for criminal offence of breaches. The 2021 Act introduces new powers for the government to compel vehicle manufacturers to recall vehicles and non-road machinery that fails to meet legal binding standards.
Environmental Improvement Plan, 2023[9]	The Environmental Improvement Plan (EIP23) highlights that air quality continues to be the biggest environmental risk to human health and a source of harm to the natural environment. The document makes provision about targets and plans with the focus of improving the environmental quality. This includes reducing emissions in the home, driving effective local action through local authorities, maintaining and improving regulatory framework for industrial emissions, supporting farmers to cut the impact of agriculture on air quality and reducing emissions from cars and other forms of transport. Ten environmental goals were set in the 25 Year Environmental Plan. The second goal is clean air and the EIP23 seeks to address this further through the following targets and commitments: ▪ In 2040 reduce population exposure of fine particulate matter ($PM_{2.5}$) by 35% compared to 2018 levels (with an interim target of a 22% reduction by January 2028) ▪ Work towards meeting compliance with a 40 µg/m^3 limit for nitrogen dioxide (NO_2) ▪ Maximum annual mean 10 µg/m^3 for $PM_{2.5}$ (with an interim target of 12 µg/m^3 by January 2028) ▪ Legal emission reduction targets for five damaging pollutants by 2030 relative to 2005 levels: ○ Reduce emissions of nitrogen oxides by 73%. ○ Reduce emissions of sulphur dioxide by 88%. ○ Reduce emission of ($PM_{2.5}$) by 46%. ○ Reduce emissions of ammonia by 16%. ○ Reduce emissions of non-methane volatile organic compounds by 39%. Progress towards delivering the EIP23 will be monitored through Annual Progress Reports and the Outcome Indicator Framework. This framework contains 66 indicators, six which are relevant to clean air.

Table 1-1: Key Legislation

[9] HM Government (2023) Environmental Improvement Plan 2023, https://www.gov.uk/government/publications/environmental-improvement-plan

The UK Air Quality Objectives (AQOs)[10] which apply to this assessment[11] are shown in Table 1-2. Relevant Future Targets outlined in the Environmental Improvement Plan 2023[9] are also listed, as well as Mayor of London targets as set in the London Environment Strategy[12], which the London Borough of Hillingdon have committed to. Some pollutants have long-term (annual mean) objectives due to the chronic way they affect human health or the natural environment and others have short-term (1-hour, 24-hour mean) objectives due to the acute way they affect human health or the natural environment.

Pollutant	Averaging Period	Objective Threshold	Future Target (EIP23)	Mayor of London (London Environment Strategy)
For the protection of human health				
Nitrogen Dioxide (NO_2)	Annual mean	40 µg/m^3	-	
	1-hour mean	200 µg/m^3 Not to be exceeded more than 18 times per year (equivalent to the 99.79th percentile of 1-hour mean values)	-	
Particulate Matter (PM_{10})	Annual mean	40 µg/m^3	-	
	24-hour mean	50 µg/m^3 Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour mean values)	-	
Fine Particulate Matter ($PM_{2.5}$)	Annual mean	20 µg/m^3	10 µg/m^3 by end of 2040 46% reduced by 2030 based on 2005 levels 35% reduced by end of 2040 based on 2018 levels	10 µg/m^3 by end of 2030
For the protection of vegetation and ecosystems				
Nitrogen oxides (NOx)	Annual mean	30 µg/m^3	73% reduced by 2030 based on 2005 levels	

Table 1-2: UK Air Quality Objectives (AQO) and future targets from EIP23

Previous research carried out on behalf of Defra identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m^3. This assumption is still considered valid; therefore, Defra's Technical Guidance document, LAQM (TG22)[13] confirms that this figure can be referenced where 1-hour mean monitoring data are not available (typically if monitoring NO_2 using passive diffusion tubes).

Good practice design (e.g., Building Regulations) often consider WHO guidelines, which are usually more stringent (see Table 1-3below). Compliance with WHO recommended guidelines for residential and non-residential elements is considered 'best practice' but is non-mandatory at present, i.e., suitable control can be adopted on an 'as-required' basis. The WHO recommended guidelines were updated in September 2021[14]. The update includes Air Quality Guideline (AQG) levels for the pollutants of relevance to this assessment (NO_2, PM_{10} and $PM_{2.5}$) and a range of interim targets.

---

[10] Department for Environment Food & Rural Affairs (Defra) UK Air Information Resource (UK AIR), National air quality objectives, https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

[11] Other pollutants have been screened out of this assessment as exceedance of their respective objectives is not anticipated to be associated with the pollutant sources of relevance to this assessment.

[12] Mayor of London (2018) London Environment Strategy, May 2018 https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf

[13] Department for Environment Food & Rural Affairs (Defra) (2022) Local Air Quality Management Technical Guidance (TG22), August 2022 https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

[14] World Health Organisation (WHO) (2021) WHO global air quality guidelines, Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide, https://apps.who.int/iris/handle/10665/345329.

Pollutant	Averaging Period	Air Quality Objective (AQO) ($\mu g/m^3$)	WHO Guidelines ($\mu g/m^3$)	
			Interim Target	AQG Level
NO_2	Annual mean	40	40 to 20	10
NO_2	24-hour mean	N/A	120 to 50	25
PM_{10}	Annual mean	40	70 to 20	15
PM_{10}	24-hour mean	50	150 to 50	45
$PM_{2.5}$	Annual mean	20	35 to 10	5
$PM_{2.5}$	24-hour mean	N/A	75 to 25	15

Table 1-3: Comparison of WHO Guidelines with National Air Quality Objectives

1.2 Consultation with Hillingdon Council

Consultation with Environmental Health at Hillingdon Council was undertaken between November 2024 and February 2025 to discuss and agree the scope of the assessment. Further details are provided in Annex B.

An emerging significance impact matrix for $PM_{2.5}$ was provided by Hillingdon, as shown in Table 1-4 below. The results of this assessment have also been interpreted using this matrix, as an indication of the impact of the Proposed Development in line with emerging guidance.

Annual mean at receptor in assessment year	Change in concentration				
	(<0.2 $\mu g/m^3$)	(≥0.2 - <0.6 $\mu g/m^3$)	(≥0.6 - <2.2 $\mu g/m^3$)	(>2.2 - <3.8 $\mu g/m^3$)	(≥3.8 $\mu g/m^3$)
(< 5 $\mu g/m^3$)	Negligible	Negligible	Negligible	Slight	Moderate
(5 - 7 $\mu g/m^3$)	Negligible	Slight	Moderate	Substantial	Substantial
(8 - 10 $\mu g/m^3$)	Slight	Moderate	Substantial	Substantial	Substantial
(> 10 $\mu g/m^3$)	Moderate	Substantial	Substantial	Substantial	Substantial

Table 1-4: Significance of Impacts Matrix for $PM_{2.5}$

1.3 Planning Policy and Guidance

Consideration of the strategic location and design of new developments is of key important in the land-use planning process and can provide a means of improving air quality. Air quality considerations as part of development applications may become material in determining planning applications. Relevant planning policy and guidance at the National, Regional, and Local levels as summarised in Table 1-5.

Policy / Guidance	Description
National Policy and Guidance	
Ministry of Housing, Communities & Local Government – National Planning Policy Framework (NPPF) (2024)[15]	The National Planning Policy (NPPF) first published March 2012 and last updated in December 2024, with the purpose of planning and achieving sustainable development. Paragraph 199 of the NPPF states that: "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan*". In addition, paragraph 110 states that: *"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."* Paragraph 187 discusses how planning policies and decisions should contribute to and enhance the natural and local environment. Of relevance to air quality, NPPF notes that this can be achieved by: *"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans"*
Planning Policy Guidance - Air Quality (updated 2019)[16]	Planning Practice Guidance (PPG) documents have been published as part of the NPPF. PPG relating to air quality was last updated in November 2019. It provides guidance on the significance of air quality in determining the local impact of proposed developments and highlights the importance of local and neighbourhood plans with regard to air quality. A flowchart is provided to assist local authorities in determining how air quality considerations might fit into development management processes.
UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations. Detailed Plan. Defra / Department of Transport (DfT) (2017)[17]	This plan was produced in response to a UK Supreme Court Ruling and sets out how the UK will achieve compliance with EU Limit Values for nitrogen dioxide (NO_2) in the shortest possible time. The plan outlined infrastructure initiatives and grants and the requirements for Local Authorities to produce local action plans, with the aim of reducing NO_2 concentrations below the objective as soon as practically possible.

[15] Ministry of Housing, Communities & Local Government, National Planning Policy Framework, December 2024 National Planning Policy Framework

[16] Ministry of Housing, Communities and Local Government (2019) Planning Practice Guidance: Air Quality, updated 1 November 2019 https://www.gov.uk/guidance/air-quality--3

[17] Department for Environment, Food and Rural Affairs / Department for Transport (2017) UK plan for tackling roadside nitrogen dioxide concentrations, July 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633269/air-quality-plan-overview.pdf

Policy / Guidance	Description
Regional Planning Policies	
London Local Air Quality Management Framework (2022)[18]	The Major's London Local Air Quality Management (LLAQM) framework is the statutory process used by local authorities to review and improve air quality within their areas. The latest LLAQM was published in October 2019 and the updates was undertaken to ensure: ▪ Ensure boroughs are taking ambitious action, which is properly co-ordinated at the regional level, and which supports Mayoral objectives including those set out in the London Environment Strategy. ▪ Ensure that London boroughs continue to work towards achievement of World Health Organization safe limits for pollutants even when legal limits are met. ▪ Update information in the guidance documents to reflect new research, policies, and priorities. ▪ Update Cleaner Air Borough Status (a recognition scheme for boroughs that was introduced under the previous Mayor) so that it is transparent and fair, now promotes continual improvement, and clearly aligns with new LLAQM priorities. Related documents include the 2022 LLAQM Policy Guidance[19], 2022 LLAQM Technical Guidance[20].
London Plan (2021)[21]	The London Plan 2021 was published in March 2021 and is the Spatial Development Strategy for Greater London. It sets out how London will develop of the next 20-25 years and the Mayor's vision for good growth. Policy SI1 Improving air quality "A *Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality*. B *To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:* *1) Development proposals should not*: a) *lead to further deterioration of existing poor air quality* *b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits* *c) create unacceptable risk of high levels of exposure to poor air quality.* *2 In order to meet the requirements in Part 1, as a minimum:* *a) Development proposals must be at least air quality neutral* *b) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures* *c) Major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1* *d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.* *C Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:* *1) How proposals have considered ways to maximise benefits to local air quality, and* *2) What measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*

[18] Mayor of London, The London Local Air Quality Management Framework, https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-london-boroughs
[19] Mayor of London (2019) London Local Air Quality Management (LLAQM), Policy Guidance 2022 (LLAQM.PG (22)), https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-Policy-Guidance-2022.pdf
[20] Mayor of London (2019) London Local Air Quality Management (LLAQM), Technical Guidance 2022 (LLAQM.TG (22)), https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf
[21] Major of London (2021) The London Plan, The Spatial Development Strategy for Greater London, March 2021 https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf .

Policy / Guidance	Description
	D In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance. *E Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development".*
Mayor of London's Environment Strategy (2018)[12]	The London Environment Strategy was published in May 2018. The strategy aims to set out a joint approach to improve London's environment. In regard to air quality, it states the Mayor will: ▪ Clean up London's transport system and phase out fossil fuels including diesel, making the whole bus fleet zero emission by 2037 at the latest and introducing the Ultra-Low Emission Zone (ULEZ) by 2019 to deter the most polluting vehicles from entering London. ▪ Consider introducing a new Air Quality Positive standard so new building developments contribute to cleaning London's air. ▪ Use the planning system to help ensure that new schools and other buildings that will be used by people who are particularly vulnerable to pollutants are not located in areas of poor air quality. ▪ Fund the implementation of air quality plans that will help at least 50 schools in some of London's most polluted areas reduce their pupils' exposure to poor air. ▪ Provide more information to Londoners on when air pollution is bad, with guidance on monitors. ▪ Give people with fireplaces or wood burning stoves better information on which to use so they don't make air pollution worse. ▪ Set even tighter long-term air quality standards based on the best health evidence to make sure Londoners can breathe the cleanest air and start addressing the problem of indoor air quality.
The Mayor of London's Transport Strategy (2018)[22]	The Mayor's Transport Strategy (MTS) compliments London's policy documents by setting out policies and measures for the development of London's transport infrastructure. It aims to promote improvements in air quality, by "*improving public transport and assisted transport services for older and disabled people will help a wider range of people to become less car dependent, and improving streets to increase active travel levels, reduce road danger, improve air quality and reconnect communities will be vital in reducing unfair health inequalities*". Policy 6: *"The Mayor, through TfL and the boroughs, and working with stakeholders, will take action to reduce emissions – in particular diesel emissions – from vehicles on London's streets, to improve air quality and support London reaching compliance with UK and EU legal limits as soon as possible. Measures may include retrofitting vehicles with equipment to reduce emissions, promoting electrification, road charging, the imposition of parking charges/ levies, responsible procurement, the making of traffic restrictions/ regulations and local actions".* The transport Strategy recognises that air quality in London is the worst in the country and supports the policies included in the Mayor of London's Air Quality Strategy. The Strategy lists a number of proposals aimed at improving air quality, such as introduction of the central London Ultra Low Emission Zone (ULEZ) and improvements to bus and taxi fleets.
Mayor of London's Supplementary Planning Guidance (SPG) Sustainable Design and Construction (2014)[23]	Mayor's Priorities: ▪ Developers are to design their schemes so that they are at least 'air quality neutral'. ▪ Developments should be designed to minimise the generation of air pollution. ▪ Developments should be designed to minimise and mitigate against increased exposure to poor air quality. ▪ Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants set out within the document.

[22] Mayor of London, Mayor's Transport Strategy, March 2018 https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf
[23] Mayor of London (2014) Sustainable Design and Construction Supplementary Planning Guidance, London plan 2011 Implementation Framework, April 2014 https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Sustainable%20Design%20%26%20Construction%20SPG.pdf

Policy / Guidance	Description
	▪ Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during Construction and Demolition SPG when constructing their development. The document provides guidance on: ▪ Assessment requirements ▪ Construction and demolition ▪ Design and occupation ▪ Air quality neutral policy for buildings and transport ▪ Emissions standards for combustion plant
Mayor of London's London Plan Guidance. Air Quality Neutral Guidance (February 2023)[24]	This updated guidance document was published on 8th February 2023 and provides updated methodology for undertaking Air Quality Neutral Assessments. An Air Quality Neutral development is defined as one that meets or improves upon the Air Quality Neutral benchmarks that are set out in this guidance document. The benchmarks set out the maximum allowable emissions of nitrogen oxides (NOx) and particulate matters based on the size and use class of the proposed development. "*These benchmarks are based on research and evidence carried out by building and transport consultants and are designed to prevent the degradation of air quality from the combined emissions of individual developments*".
London Plan Guidance. Air Quality Positive (2021)[25]	The Air Quality Positive London Plan Guidance *"to maximise benefits to local air quality in and around a large-scale development sites and masterplan area while also minimising exposure to existing sources of poor air quality."* It is to be applied at the plan making stage to masterplans as well as development stages which include large-scale development sites that are likely to be subject to an Environmental Impact Assessment (EIA).
Mayor of London's Supplementary Planning Guidance (SPG) The Control of Dust and Emissions during Construction and Demolition (2014)[26]	The SPG seeks to reduce emissions of dust, PM_{10} and $PM_{2.5}$ from construction and demolition activities in London. It also aims to manage emissions of NOx from construction and demolition machinery by means of a new non-road mobile machinery ultra-low emissions zone (ULEZ). The SPG provides guidance on the implementation of all relevant polices in the London Plan and the Mayor's Air Quality Strategy to neighbourhoods, borough, developers, architects, consultants and any other parties involved in the construction phase; sets out methodology for air quality impact of construction in London; identifies good practice for mitigating and managing air quality impacts for construction phase.
The Mayor of London's Air Quality Strategy (2010)[27]	The Mayor of London's Air Quality Strategy was published in 2010. It includes policies to reduce emissions from transport, such as improvements to the London bus and taxi fleets, widening the application of Low Emission Zones, targeting air quality 'priority locations' and encouraging behavioural change to promote cycling, walking and the use of sustainable public transport. A package of non-transport policy measures is also proposed to reduce emissions to air from industry, commercial buildings and residential dwellings. These are intended to improve localised air pollution through a range of policies including reductions in construction dust and stricter control of emissions from power generation. The London Air Quality Strategy also sets out how regional and local planning processes will be used to enable future developments to be 'air quality neutral or better'.
London Councils' Air Quality and Planning Guidance (2007)[28]	The document provides guidance to developers and local authorities on how to deal with planning applications that could have an impact on air quality. It aims to reduce exposure to air pollution across the whole of London and ensure consistency in the approach to dealing with air quality and planning in London.

[24] Mayor of London (2023) Air Quality Neutral London Planning Guidance, 8th February 2023. https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance
[25] Mayor of London (2021) London Planning Guidance Air Quality Positive, Pre-consultation draft, March 2021 https://www.london.gov.uk/sites/default/files/air_quality_positive_lpg_pre-consultation_draft.pdf
[26] Mayor of London (2014) The Control of Dust and Emissions during Construction and Demolition, July 2014 https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance-and-spgs/control-dust-and
[27] Mayor of London (2010) Clearing the air, The Mayor's Air Quality Strategy, December 2010 https://www.london.gov.uk/sites/default/files/air_quality_strategy_v3.pdf
[28] London Councils (2007) Air Quality and Planning Guidance, January 2007 https://www.londoncouncils.gov.uk/node/25533

Policy / Guidance	Description
Local Planning Policies	
Air Quality Action Plan, 2019-2024 (2019)[29]	The 2019-2024 Air Quality Action Plan for London Hillingdon focuses on reducing emissions from road traffic, aviation, and other sources to meet legal air quality limits. It includes measures such as promoting cleaner vehicles, improving public transport, and encouraging cycling and walking. The plan also seeks to reduce pollution from Heathrow Airport by working with aviation stakeholders and advocating for cleaner aircraft technology. Additionally, it aims to raise awareness and engage the community in actions to improve local air quality.
Local Plan Part 1 Strategic Policies (2012)[30]	Hillingdon's Local Plan Part 1 outlines the long-term vision for development in the borough up to 2026, focusing on sustainable growth. It prioritizes housing, employment, and infrastructure improvements, aiming to enhance town centres while protecting green spaces and heritage sites. The plan promotes economic growth, with a focus on expanding Heathrow Airport's role and creating job opportunities. It also emphasises environmental protection and improving transport connectivity across the borough.
Local Plan Part 2 Development Management Policies (2020)[31]	Hillingdon's Local Plan Part 2 provides detailed policies and site-specific proposals to support the strategic objectives set in Part 1. It includes development management policies to guide planning decisions, focusing on housing, transport, heritage conservation, and environmental sustainability. The plan identifies specific sites for housing, employment, and infrastructure projects, ensuring development aligns with local needs. Additionally, it emphasizes protecting green spaces and ensuring new developments contribute to the borough's long-term sustainability and community well-being.
London Borough of Hillingdon Supplementary Planning Document Planning Obligations (2014)[32]	Hillingdon's Planning Obligations Supplementary Planning Document (SPD) outlines how developers contribute to infrastructure and community needs through Section 106 agreements. It specifies the types of contributions required for areas such as affordable housing, education, transport, healthcare, and public spaces. The document ensures that development projects mitigate their impact on local services and provide long-term benefits to the community. Contributions are calculated based on the scale and type of development, ensuring they are fair and proportionate. The SPD also provides clarity for developers on the obligations they need to meet to gain planning approval, supporting sustainable development in the borough.
Strategic Climate Action Plan (Adopted July 2021)[33]	Hillingdon's Strategic Climate Action Plan sets out a framework for achieving carbon neutrality in the borough by 2030. The plan focuses on reducing emissions through improved energy efficiency in buildings, promoting renewable energy, and encouraging sustainable transport options. It emphasizes protecting green spaces, enhancing biodiversity, and reducing waste through recycling and responsible consumption. The plan also highlights the importance of community engagement and collaboration with businesses to meet climate goals. By prioritizing both mitigation and adaptation strategies, Hillingdon aims to build resilience against the impacts of climate change while promoting sustainability.
Other Relevant Policy and Guidance	
Defra Local Air Quality Management (LAQM) Policy Guidance (2022)[34] and Technical Guidance (2022)[35]	The guidance issued under Part IV of the Environment Act 1995 is designed to help local authorities with their LAQM duties. The guidance sets out the general approach to use and detailed technical guidance to guide local authorities through the Review and Assessment process.

[29] Hillingdon Council (2019) Air Quality Action Plan, 2019-2024, May 2019 https://modgov.hillingdon.gov.uk/documents/s45069/Air%20Quality%20Action%20Plan%202019-2024.pdf

[30] Hillingdon Council (2012) Local Plan: Part 1 Strategic Policies (Adopted November 2012) https://modgov.hillingdon.gov.uk/documents/s14281/121108%20-%2007%20-%20local%20plan%20document.pdf

[31] Hillingdon Council (2020) Local Plan Part 2 Development Management Policies (Adopted Version 16 January 2020) https://www.hillingdon.gov.uk/media/3084/Hillingdon-Local-Plan-Part-2-Development-Management-Policies/pdf/pdLPP2_Development_Management_Policies_-_ADOPTED_VERSION_JAN_2020_1.pdf?m=1598370641570

[32] London Borough of Hillingdon (2014) Supplementary Planning Document Planning Obligations, July 2014 https://www.hillingdon.gov.uk/media/3291/Document-B---Planning-Obligations-SPD/pdf/rlDocument_B_-_Planning_Obligations_SPD.pdf?m=1598975715390

[33] London Borough of Hillingdon (2021) Strategic Climate Action Plan (Adopted July 2021) https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiK9unrj7iIAxVtQEEAHdHaDh0QFnoECB4QAQ&url=https%3A%2F%2Fwww.hillingdon.gov.uk%2Fmedia%2F7171%2FStrategic-climate-action-plan%2Fpdf%2FClimate_strategy_adopted_July_2021_1.pdf%3Fm%3D1632473850913&usg=AOvVaw3dhlI_6lZgE3sg6BV0lWp7&opi=89978449

[34] Defra (2022) Local Air Quality Management Policy Guidance PG(22) https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-Policy-Guidance-2022.pdf

[35] Defra (2022) Local Air Quality Management Technical Guidance (TG22) August 2022 https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

Policy / Guidance	Description
World Health Organisation (WHO) Global Air Quality Guidelines (2021)[36]	Since 1987, WHO has periodically issued health-based air quality guidelines to assist governments and civil society to reduce human exposure to air pollution and its adverse effects. The WHO air quality guidelines published in 2006 provided health-based guideline levels for the major health-damaging air pollutants, including particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), nitrogen dioxide (NO_2) and sulphur dioxide (SO_2). These guidelines had a significant impact on pollution abatement policies all over the world and led to the first universal frame of reference. Following extensive research which started in 2016 and has referred to numerous epidemiological studies, WHO have reassessed their guideline values and recently (September 2021) provided updated values.
IAQM Indoor Air Quality Guidance (2021)[37]	The IAQM have provided guidance on the assessment of indoor air quality. This was published in September 2021 and covers assessment, monitoring, modelling and mitigation relating to indoor air quality.
Covid-19: Supplementary Guidance, Local Air Quality Management Reporting in 2021[38]	The guidance had been informed by responses from an impact survey received following the release of the interim statement on Covid-19 impacts to the LAQM regime. The guidance is to be read in conjunction with LAQM (TG22)[35]
Environmental Protection (EPUK)/Institute of Air Quality Management (IAQM) Land Use Planning & Development Control (2017)[39]	This guidance has been produced to ensure that air quality is adequately considered in the land use planning and development control processes by relevant officers within local authorities, developers, and consultants involved in the preparation of development proposals and planning applications. This document is best practice guidance and has no formal or legal status.
IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024)[40]	The document provides guidance for developers, their consultants and environmental health practitioners on how to undertake a construction impact assessment (including demolition and earthworks). The guidance provides a method for assigning a magnitude of risk (high, medium or low) and identifies appropriate mitigation measures.
IAQM assessment of air quality impacts on designated nature conservation sites[41]	This guidance signposts the appropriate thresholds used by local authorities, the Environment Agency and other regulators to determine the potential for air quality damage on sensitive ecological sites. Should threshold be likely to be exceeded, a suitably qualified and experienced ecologist is required to determine whether there is likely to be a significant impact on the habitat.

Table 1-5: Key Policy and Guidance

[36] World Health Organisation (WHO) (2021) WHO global air quality guidelines, Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide, https://apps.who.int/iris/handle/10665/345329.
[37] Institute of Air Quality Management (IAQM) (2021), Indoor Air Quality Guidance: Assessment, Monitoring, Modelling and Mitigation, version 1.0, September 2021, https://iaqm.co.uk/wp-content/uploads/2013/02/iaqm_indoorairquality.pdf
[38] Department for Environment, Food and Rural Affairs (Defra) / Greater London Authority (2021). Covid-19: Supplementary Guidance, Local Air Quality Management Reporting in 2021, April 2021, Version 1.0, https://laqm.defra.gov.uk/supporting-guidance.html
[39] Environmental Protection UK (EPUK)/Institute of Air Quality Management (IAQM), (2017) Land-Use Planning & Development Control: Planning for Air Quality https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf
[40] Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2) https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf
[41] Institute of Air Quality Management (IAQM) (2020) A guide to the assessment of air quality impacts on designated nature conservation sites, version 1.1, May 2020, https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf

2.0

Screening Assessment

2.0 Screening Assessment

2.1 EPUK/IAQM Screening Criteria

EPUK/IAQM's guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' (updated in January 2017)[39] was issued to ensure that air quality is adequately considered in the land-use planning and developmental control process.

It provides a decision-making process which assists with the understanding of air quality impacts and implications because of development proposals. It provides a framework for air quality considerations within local development control processes, promoting a consistent approach to the treatment of air quality issues within development control decisions.

The guidance includes a method for screening the requirement for an air quality assessment, the undertaking of an air quality assessment, the determination of the air quality impact associated with a development proposal and whether this impact is significant.

The guidance also provides some clarification as to when air quality constitutes a material consideration and highlights the links to other relevant issues (for example traffic speed reduction measure and the use of alternative technology to provide energy) and the importance of the understanding of these with the input from other discipline specialists. The 'creeping baseline' is another issue raised about cumulative impacts.

The guidance note is widely accepted as the most appropriate reference method for this purpose. This guidance refers to the Town and Country Planning (Development Management Procedure) Order (England) 2010 [(Wales) 2012] definition of a 'major' development when scoping assessments required for the planning process.

A 'major' development includes developments where:

- The number of dwellings is 10 or above.
- The residential development is carried out of a site of more than 0.5ha where the number of dwellings is unknown.
- The provision of more than 1,000 m^2 commercial floor space; or,
- Development carried out on land of 1ha or more.

There are two types of air quality impacts to be considered:

- The impact of existing sources in the local area on the Proposed development (governed by background pollutant levels and proximity to sources of air pollution); and,
- The impacts of the Proposed development on the local area.

Regarding the changes in air quality or exposure to air pollution, the guidance indicates that each local authority will be likely to have their own view on the significance of this; these are to be described in relation to whether a National Air Quality Objective (NAQO) predicted to be met, or at risk of not being met. Exceedances of these objectives are considered as significant, if not mitigated.

As part of the impact of the Proposed development on the local area, a two-staged assessment is recommended as per current guidance.

Stage 1: Determines whether an air quality assessment is required. In order to proceed to Stage 2, it requires any of the criteria under (A) coupled with any of the criteria under (B) in Table 2-1to apply.

Stage 2: Where an assessment is deemed appropriate, this may take the form of a Simple Assessment or a Detailed Assessment, using suitable guidance provided in Table 2-2.

Criteria to Proceed to Stage 2
A. If any of the following apply: • 10 or more residential units of a site area of more than 0.5ha • More than 1,000m^2 of floor space for all other uses or a site area greater than 1ha
B. Coupled with any of the following: • The development has more than 10 parking spaces • The development will have a centralised energy facility or other centralised combustion process **Note:** Consideration should still be given to the potential impacts of neighbouring sources on the application site, even if an assessment of impacts of the development on the surrounding area is screened out.

Table 2-1:Stage 1 Criteria

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors. **(LDV = cars and small vans <3.5 t gross vehicle weight).**	A change of LDV flows of: • More than 100 AADT within or adjacent to an Air Quality Management Area (AQMA) • More than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. **(HDV = goods vehicles + buses >3.5 t gross vehicle weight).**	A change of HDV flows of: • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere.
3. Realign roads, i.e., changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g., Traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. **NB. This includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.**	Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing NO_2 concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Table 2-2: Indicative Criteria for Requiring an Air Quality Assessment

Impact Descriptors for Individual Receptors

The IAQM guidance contains a two Stage process for determining the likely significant effects of the impacts on air quality:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts.

A framework for describing the impacts is set out in IAQM guidance and summarised in Table 2-3 below.

Long-term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Table 2-3: Impact Descriptors for Individual Receptors

For air quality impacts arising from surrounding sources on new occupants of a development, then the impacts are best described in relation to whether an air quality objective will not be met or is at risk of not being met. Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provisions is made to reduce their exposure by some means.

Changes of less than 0.5%, will be described as Negligible.

2.2 Results of Screening Assessment – Construction Phase

2.2.1 Construction Dust

The site currently consists of retail units/industrial which will need to be demolished to enable redevelopment.

The development proposals comprise the following activities:

- Demolition activities (existing buildings).
- Construction of a data centre building (to be known as LON 6), two further data centre buildings (to be known as LON 7 and LON 8) and an Innovation Hub.

Machinery used during demolition and construction can generate new sources of emissions, as well as traffic movements to/from the site and the works themselves. When assessing the effect of dust emissions generated during construction works, receptors include those nearest to the construction boundary of the site in each direction. These receptors have the potential to experience effects of greater magnitude due to emissions of dust generated by the works, when compared with more distant receptors.

Without appropriate mitigation controls in place, there is the potential for adverse effects to occur during to the construction of the Proposed Development. The implementation of best practice mitigation controls can ensure any potential adverse effects would be not significant.

The construction works associated with the development have the potential to generate dust, giving rise to impacts on dust soiling and human-health, especially through the generation of PM_{10}. The generation of dust on-site has the potential to cause adverse air quality impacts where there are human receptors within 350m and ecological receptors within 50m of construction works. A Construction Dust Assessment has therefore been scoped in.

2.2.2 Construction Traffic

The Proposed Development has the potential to impact existing air quality as a result of pollutants from road traffic exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$, associated with construction traffic travelling to and from the development during the construction phase.

Construction traffic data predictions have been screened in accordance with Environmental Protection UK (EPUK)/ IAQM criteria[39]. As the application site is located within an AQMA, the EPUK/IAQM guidance[39] states the following criteria to establish where an air quality assessment is likely to be considered necessary:

- A change of Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) movements; and
- A change of Heavy-Duty Vehicle (HDV) flows of more than 25 AADT movements.

The Transport Consultants (Arup) have stated that due to the sequenced delivery of the Proposed Development, there are currently no contractors appointed to deliver any of the on-site utility infrastructure for the data centres to which this planning application relates. It is therefore proposed that it is proposed that the details of the impact of future construction traffic will come forward with each reserve matter submission in the form of a Construction Management Plan to include the proposed construction logistics.

It is assumed that the non-road mobile machinery (NRMM) used during construction will be selected to conform to the regulatory requirements outlined in the Department for Transport document[42] on reducing emissions from NRMM.

2.3 Results of Screening Assessment – Operational Phase

2.3.1 Operational Traffic

The Proposed development has the potential to impact existing air quality as a result of pollutants from road traffic exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$, associated with traffic travelling to and from the development during the operation phase.

The guidance includes a method for screening the requirement for an air quality assessment, the undertaking of an air quality assessment, the determination of the air quality impact associated with a development proposal and whether this impact is significant. Interpretation of this guidance was used to develop a methodology for the assessment of road impact emissions.

As the application site is located within an AQMA, the EPUK/IAQM guidance[39] states the following criteria to establish where an air quality assessment is likely to be considered necessary:

- A change of Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) movements; and
- A change of Heavy-Duty Vehicle (HDV) flows of more than 25 AADT movements.

6.2.33 The Transport Planners (Arup) have indicated that there are expected to be a net change of -3,922 AADT as a result of the Proposed Development. As the anticipated number of vehicle trips associated with the Proposed Development is unlikely to increase annual average daily traffic flows by greater than 100 vehicles on any road link close to the Proposed Development, assessment of traffic-related impacts was scoped out of the operation phase assessment.

2.3.2 On-site Combustion Plant

Any on-site combustion plant such as boilers, combined heat and power (CHP) and generators has the potential to impact air quality receptors both on and off-site. Emissions from combustion plant would include NO_2 and possibly also PM_{10} and $PM_{2.5}$ if diesel is used as a source.

[42] HMSO (2018) The Non-Road Mobile Machinery Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018, UK Statutory Instruments, 2018 No. 764, https://www.legislation.gov.uk/uksi/2018/764/made

Options for heating, cooling and hot water provision for the buildings within the development has been explored as part of the Energy and Sustainability Statement[43]. The statement concluded that cooling energy consumption represents the largest share of the regulated energy in the development, therefore implementing the water -source heat -pump based cooling system is the most feasible low carbon option. The following carbon emission saving measures are expected:

- The building's envelope will be designed to reduce thermal loads on the HVAC systems, performing better than the Building Regulation standards.
- Glazed areas for data hall are minimal so that solar gain is limited, minimising the cooling loads.
- The energy efficiency measures employed in the development include a highly efficient cooling system using chillers, which will meet the substantial cooling loads while consuming a fraction of the energy of conventional cooling systems. This is achieved by elevating the chilled water temperatures supplied by the chillers to reduce their energy consumption.
- Centralised heat recovered from data hall for space heating.
- High efficacy lighting coupled with occupancy sensing to reduce emissions associated with lighting.
- Electrical and mechanical systems will be tightly monitored, metered and controlled with a full Building Management System (BMS). This will enable energy use to be tracked and opportunities for efficiency improvements to be made.
- The PV system has been maximized within the available roof space, providing:
  – 300 m^2 of PV installation for LON 6.
  – For the Innovation Hub, LON 7 and LON 8, an allowance has been made for outline planning (70 m^2 of PV installation for the Innovation Hub and 300 m^2 each for LON 7 and LON 8). However, these will need to be reviewed once detailed planning is undertaken in the future.

Standby generators are required to provide back-up power. Indicative design information indicates that 74 generators will be required, divided equally between the buildings. Annual maintenance and testing of each of these units is required. Although the operating hours for these units are expected to be minimal, due to the significant number of units required, there is potential for their emissions to results in significant adverse impacts on local air quality. As such, detailed modelling of the life safety generator emissions has been scoped into the assessment.

The technical specifications for the proposed generators have been included in Annex A of this Appendix and have been used to inform the process conditions for the dispersion modelling assessment, as detailed in section 3.6.1.

The Proposed Development includes a total of 74 back-up/life-safety generators. Due to the quantity of generators proposed, detailed dispersion modelling was carried out. The methodology and results of the modelling assessment are presented in this Appendix

As the combined thermal input of the generators exceeds 50 MW, a permit application will need to be submitted to the Environment Agency. It is recommended that the Environment Agency is consulted to advise on specific permitting requirements.

[43] Cundall (2025) COLT 4a Masterplan and LON6, Energy and Sustainability Statement, Colt Data Centre Services, Ref: LONUX-CDL-ZZ-XX-RP-Z-00002, version P01, 27 February 2025

2.4 Summary of Screening Assessment

Where the Development will:	Indicative Criteria to Proceed to an Air Quality Assessment	Information Relevant to the Proposed Development
1. Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors.	IAQM Guidance states a change of LDV flows of: • More than 100 AADT within or adjacent to an Air Quality Management Area (AQMA) • More than 500 AADT elsewhere.	The development will generate less than 100 daily vehicle trips, therefore further assessment of increased operational phase transport emissions on nearby receptors was scoped out.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere.	Due to the sequenced delivery of the Proposed Development, there are currently no contractors appointed. The predictions for construction traffic are therefore expected to come forward with each reserve matter submission in the form of a Construction Management Plan to include the proposed construction logistics. Screening of construction traffic predictions is therefore not possible at this stage.
3. Realign roads, i.e., changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA	No realignment of >5m proposed.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g., Traffic lights, or roundabouts.	No new significant junctions proposed.
5. Introduce or change a bus station.	Where bus flows will change by: • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere.	No bus station proposed.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).	No underground car parking proposed.
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.	Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion.	The Proposed Development includes a total of 74 back-up/life-safety generators. Due to the quantity of generators proposed, detailed dispersion modelling was carried out. The methodology and results of the modelling assessment are presented in this report.

Table 2-4: Indicative Criteria for Requiring a Detailed Air Quality Assessment

3.0

Dispersion Modelling Methodology

3.0 Dispersion Modelling Methodology

3.1 Dispersion Model

Detailed dispersion modelling of NOx and particulate matter (PM) emissions from generator exhaust flues was used to undertake an assessment of human exposure at the existing receptors in the vicinity of the Proposed Development. This has been carried out using the latest version of ADMS 6 (version 6.0.2.1), which is an internationally recognised new generation dispersion model developed by CERC. ADMS uses advanced algorithms to describe the boundary layer structure, turbulence and stability.

The inputs for the modelling are outlined in the following sections.

3.2 Meteorological Data

Hourly sequential meteorological data is required as an input to the model. Data from Heathrow Airport meteorological station for 2021, 2022 and 2023 has been used for this assessment. Heathrow Airport is located approximately 4.5 km southwest of the Site. Due to its location and elevation, Heathrow Airport is considered to be the most representative meteorological station for the site. Both the location of the Site and Heathrow Airport are inland sites, without significant terrain influence.

Defra's LAQM (TG22)[35] guidance recommends that meteorological data should only be used if the percentage of usable hours is greater than 85%. Unusable hours include missing hours and calm hours[44]. The datasets have been checked for usability and are all above the 85% threshold. The data is therefore considered to be adequate for dispersion modelling, in accordance with LAQM (TG22) guidance[35].

The 2021, 2022 and 2023 windroses for Heathrow Airport are presented in Figure 3-1. It can be seen that the predominant wind direction is from the southwest.

Sensitivity testing was conducted to determine the impact of the choice of year of meteorological data used within the model for generator emissions. There was no meteorological year which demonstrated consistent worst-case results. Therefore, the worst-case predicted concentrations across all meteorological years for both discrete receptors and the grid extent has been reported and interpreted in Section 6.

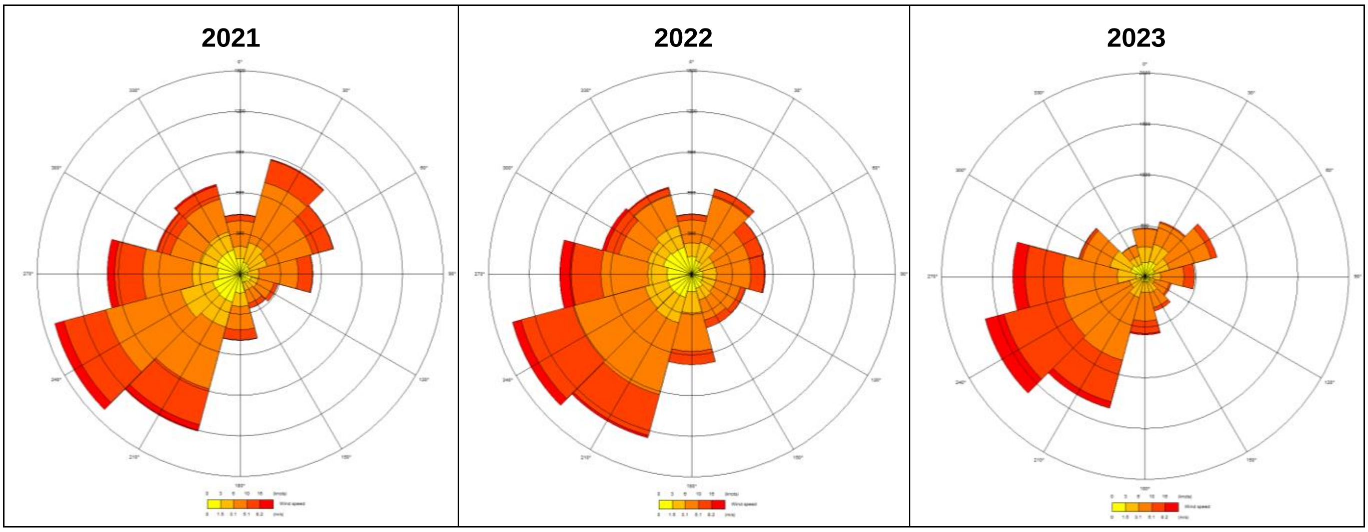

Figure 3-1: Windroses for London Heathrow Airport

[44] Wind speeds <0.75m/s would be classed as calm. ADMS Roads sets the speed to 0.75m/s for speeds <0.75m/s and uses the wind direction from the previous hour.

3.3 Topography and Terrain

Surface roughness is a component of surface texture. Air travelling over the surface is affected by the surface roughness, rough surface would result in higher roughness to smoother surfaces. Typical surface roughness values range from 1.5m (for cities, forests and industrial areas) to 0.0001m (for water or sandy deserts). The future setting of the Proposed Development has been considered in the modelling by setting the surface roughness length to 1.5 m. This is the value recommended by the model developers for 'large urban areas'. A lower surface roughness of 0.5 m has been selected for the meteorological station, which is described in the model as representative of 'parkland, open suburbia'.

The Monin-Obukhov length is used to describe the effects of buoyancy on turbulence kinetic energy, particular in the lowest atmospheric boundary layer. This relates to the urban heat island effect, and its effects on turbulence due to surface topology and the effects from heated and shaded building surfaces. Monin-Obukhov values typically range from 2m to 10m in rural settings but can be higher in urban area where buildings and traffic results in more heat generation. In this assessment, the minimum Monin-Obukhov Length Scale was set to 30 m for the Proposed Development and 10 m for the meteorological station.

Terrain topographical features such as hills can have a significant effect on the dispersion of pollutants, generally when the ground level within 1 km of the sources varies by more than 100 m (1 in 10). A review of the local area indicated a maximum difference in height of <30 m. The use of terrain data was therefore excluded from further consideration within the assessment.

3.4 Building Effects

Buildings can have a significant effect on the dispersion of pollutants from flues. The presence of tall buildings close to a flue can cause the plume to be entrained in the cavity zone downwind of the building. This could result in higher ground concentrations near the flue than would be expected in the absence of buildings and can affect the dispersion of pollutants in the atmosphere. The presence of the buildings may induce better pollutant mixing and dispersion with ambient air, thereby resulting in lower concentrations further downwind. The assessment of the generators has therefore considered the buildings in the vicinity of the proposed flues.

Figure 3-2 shows the buildings which have been included in the dispersion model. Buildings can only be added to the dispersion model as rectangular or circular shapes; therefore, some simplification has been made. As the selected buildings are broadly rectangular, simplification is likely to be minimal. Details of the building geometry included in the model are provided in Table 3-1.

Sensitivity testing for the selection of the main building within the model set up was carried out which concluded that setting the main building to "(Auto)" resulted in the worst-case overall results. With the "(Auto)" selection, the model automatically selects a main building for each particular source. The selection will be the closest building which is both tall enough and within the same region of influence of the source.

Figure 3-2: Modelled buildings

Building Name	Coordinates		Height (m)	Length (m)	Width (m)	Angle of Building (degrees)
	Easting	Northing				
LON8	511443.0	180355.9	40.1	31.4	113.1	104.7
Innovation Hub	511522.9	180649.2	27.9	34.1	12.5	104.3
LON6-1	511517.6	180610.0	41.5	59.8	30.1	104.2
LON6-3	511509.2	180554.9	41.5	60.4	31.2	104.2
LON7-1	511495.5	180501.3	46.5	65.6	32.5	104.6
Substation 2	511525.6	180352.9	10.0	31.8	40.8	104.8
Substation 1	511496.6	180256.2	10.0	23.4	35.9	195.5
LON5	511458.6	180195.8	36.9	81.0	61.0	15.0
LON4	511543.4	180181.9	36.9	88.0	64.0	105.0
LON7-3	511497.8	180445.4	55.9	104.0	31.6	284.6
LON7-2	511515.1	180468.7	46.5	44.8	21.2	283.9
LON6-2	511526.7	180579.3	34.5	49.6	24.8	104.3
Metro Bank	511594.1	180596.3	10.0	18.5	26.9	290.5
Unit 2	511510.8	180303.4	10.0	37.8	56.6	284.2
Fuel Store	511465.4	180268.9	10.0	16.8	28.6	285.4
Notes: * angle between north and the defined length.						

Table 3-1: Modelled buildings

3.5 Receptors

Nearby sensitive receptors have been modelled to determine the potential impacts associated with emissions from the generators.

The modelled receptors are listed in Table 3-2and shown in Figure 3-3. For the purposes of the assessment, all receptors are all considered to be of high sensitivity.

Sensitive residential receptor locations have been identified within the vicinity of the Site, which represent the worst-case exposure to generator emissions sources during the operation phase (which includes consideration of LON 4-LON 8 inclusive). These include existing receptors and proposed receptors associated with schemes under construction, such as the proposed residential towers covered by R14 and R15. For these receptors, heights of 1.5 m and 4.5 m have been modelled to represent the anticipated worst-case impact due to ground level road emissions. A height of 28.5 m has also been modelled (the maximum height of the development), to represent the potential worst-case impact due to the generator emissions (flue heights of >38.6 m).

In addition, receptors as reported in the Project Union at Bulls Bridge Air Quality Assessment report[45] have been included to allow for a cumulative assessment.

Receptor ID	Description	Location		Heights (m)
		X	Y	
C1	Commercial unit, 65A Delamere Rd, Hayes	511685.8	180635.2	1.5
C2	Commercial unit, 66A Delamere Rd, Hayes	511656.2	180646.5	1.5
C3	Residential Dwelling, 8 Uxbridge Rd	511589.4	180678.5	1.5
C4	Residential Dwelling, 64 Uxbridge Rd	511520.2	180728.7	1.5
C5	Residential Dwelling, 36 Uxbridge Rd	511552.2	180705.1	1.5
C6	Residential Dwelling with a commercial unit at ground floor, 136 Uxbridge Rd	511439.4	180775.8	1.5
C7	Residential Dwelling, 36 Uxbridge Rd	511381.3	180821	1.5
C8	Residential Dwelling, 32 Longford Gardens	511604.8	180816.4	1.5
C9	Residential Dwelling, 182 Uxbridge Rd	511306.5	180852.9	1.5
C10	Residential Dwelling, 20 The Broadway Rd	511917.5	180587.6	1.5
C11	Residential Dwelling, The Broadway Rd by the Stanley Rd	512117.8	180541.8	1.5
C12	Residential Dwelling, 47 Bankside Rd	511743.4	180302.7	1.5
C13	Residential Dwelling, 25 Bankside Rd	511765	180424.2	1.5
C14	Residential Dwelling, 2 Bankside Rd	511790.4	180528.3	1.5
C15	Residential Dwelling, 1 Tollgate Dr, Delamere Rd	511775	180765.8	1.5
C16	Residential Dwelling, 31 Livingstone Rd	511929.7	180719	1.5
C17	Residential Dwelling, 36 Abbotswood Way	510875.7	180560.8	1.5
R1	Blair Peach Primary School	511692.1	180106.4	1.5, 4.5
R2	Residential Dwelling, Cherry Avenue	511772	180177.8	1.5, 4.5
R3	Commercial use, NE of Application Site	511622.3	180293.5	1.5, 4.5

[45] Phlorum (2020) Project Union at Bulls Bridge, Air Quality Assessment, Project No. 9167, Rev. 4, June 2020.

Receptor ID	Description	Location		Heights (m)
		X	Y	
R4	Residential Dwelling, Cherry Avenue	511816.3	180269.7	1.5, 4.5
R5	Residential Dwelling, Ranleigh Road	511894.5	180307.1	1.5, 4.5
R6	Residential Dwelling, Beaconsfield Road	511858.8	180055.4	1.5, 4.5
R7	Allotments	511712.5	180247.2	1.5, 4.5
R8	Residential Dwelling, Beresford Road	511780.5	180332.2	1.5, 4.5
R9	Guru Nanak School 1	511374	180106.4	1.5, 4.5
R10	Guru Nanak School 2	511309.3	180111.5	1.5, 4.5
R11	Guru Nanak School 3	511396.1	179970.3	1.5, 4.5
R12	Goals, Football Club	511202.1	180285	1.5, 4.5
R13	Football Club	511498.1	180091.1	1.5, 4.5
R14	Residential Use under construction (PP/2015/4682)	511684.9	180038.7	1.5, 4.5, 28.5
R15	Residential Use under construction (PP/2015/4682)	511670	179960.8	1.5, 4.5, 28.5
B1	Proposed Commercial Unit: Nestle Site	510413.8	179294.5	1.5
B2	Proposed Commercial Unit: Nestle Site	510483.8	179295.8	1.5
B3	Proposed Residential Unit: Nestle Site	510553.1	179300.1	1.5
B4	Proposed Residential Unit: Nestle Site	510330.5	179199.8	1.5
B5	Guru Nanak School	510204.3	179266.7	1.5
B6	Commercial Unit	510144.9	179311.3	1.5
B7	Hillingdon Mosque	510093.2	179262.4	1.5
B8	Commercial Unit – Tarmac Site	511216.6	180007.6	1.5
B9	Commercial Unit	510346.9	179446.5	1.5
B10	Commercial Unit	510413	179445.5	1.5
B11	Residential Dwelling – Copperdale Rd	510256.3	179424.2	1.5
B12	Residential Dwelling – Chalfont Rd	510561.1	179467.9	1.5
B13	Proposed Commercial Unit: Nestle Site	510609.7	179173	1.5
B14	Residential Dwelling – Nestle Avenue	510684.1	179316.4	1.5
B15	Residential Dwelling – Nestle Avenue	510247.6	179528.3	1.5
B16	Residential Dwelling – Brent Road	510369.2	179593.2	1.5
B17	Residential Dwelling – Brent Road	510336.8	179714.7	1.5
B18	Proposed Residential Unit: Nestle Site	510263.8	179709.9	1.5
B19	Proposed Development – Reception	510594.5	179591.5	1.5
Notes: The description and locations for receptors B1-B19 may not match, due to inconsistencies within the Phlorum report[45]. Detail in the table for these receptors has been detailed as per the Phlorum report, as the correct information is not ascertainable in this case.				

Table 3-2: Modelled Receptors

Figure 3-3: Modelled Receptors

For the assessment of effects from the one-site generators a grid of regularly spaced receptors was created covering a domain of 2km x 2km area with a 20m grid spacing (in line with the resolution of the LAEI background data). This method ensures that potential impacts are assessed across the entire study area. The receptor grid has been modelled at a height of 1.5m to represent the breathing zone of the average adult. The modelled grid extent is shown in Figure 3-4.

Figure 3-4: Modelled Grid Extent

3.6 Generator Provision

3.6.1 Generator Process Conditions

Cundall provided technical specifications for the type of units they envisage to be installed at the Proposed Development. This included Kohler generators and MTU generators, both of which are emissions optimised. The technical specifications for these generators are included as Annex A of this Appendix. The MTU option has been used in this assessment as a worst case, as it has the highest NOx and PM emission rates.

The details of the proposed generators and estimated total thermal inputs (MWth) for LON 6, LON 7 and LON 8 are presented in Table 3-3. Details for LON 4 and LON 5 are also provided, where available, based on information provided within the Phlorum Air Quality Assessment[46].

Development	Generator Type	Generator Rating (MWe)	Number of Generators	Total (Mwe)	Efficiency %	MWh
LON 6	DH & Mech	3	19	57	35	162.9
	Life Safety	0.8	1	0.8	33	2.5
LON 7	DH & Mech	3	37	111	35	317.2
	Life Safety	0.8	1	0.8	33	2.5
LON 8	DH & Mech	3	14	42	35	120
	Life Safety	0.8	1	0.8	33	2.5
Totals:			**74**	**212.4**		**607.6**
LON 4 & LON 5	DH & Mech	2.4	34	81.6	0.35*	233.14
	DH & Mech	2.6	10	26	0.35*	74.29
	Life Safety	0.45	3	1.35	0.35*	3.86
Totals:			**47**	**108.95**		**311.286**
Notes: *assumed to have the same efficiency as generators at LON 6, 7 and 8.						

Table 3-3: Generator Details

Table 3-4presents the generator process conditions for both 100% and 50% loads, based on the use of diesel. The LON 4/LON 5 permission requires the use of HVO generator fuel, and it is anticipated that a similar condition would be attached to the hybrid planning permission. However, this assessment has assumed diesel would be the fuel as a worst-case approach.

Emissions from the diesel generators would include NO_2, PM_{10} and $PM_{2.5}$. Due to the limited availability of emissions data, all particulate matter (PM_{10} and $PM_{2.5}$) was assumed to be present as $PM_{2.5}$.

All generators will be installed with selective catalytic reduction (SCR), which are expected to will reduce the NOx emissions to ≤250 mg/Nm^3, which is a significant reduction in NOx emissions when compared to the generator without SCR. SCR becomes effective after the generator has reached temperature and this generally considered to be after the first 20 minutes of operation.

[46] Phlorum (2022) Air Quality Assessment, London 4, Hayes, V03, 18.02.2022 https://planning.hillingdon.gov.uk/OcellaWeb/viewDocument?file=dv_pl_files%5C38421_APP_2021_4045%5C10545%28AQ%29+v03.pdf&module=pl

Parameter	Unit	MTU 20V4000G94LF, 50 Hz Diesel Generator Set, 100% load, EN590 Diesel Fuel	MTU 20V4000G94LF, 50 Hz Diesel Generator Set, 50% load, EN590 Diesel Fuel	MTU 16V2000G76F, 50 Hz Diesel Generator Set, 100% load, EN590 Diesel Fuel	MTU 16V2000G76F, 50 Hz Diesel Generator Set, 50% load, EN590 Diesel Fuel
Engine power	MWe	3.0	3.0	0.8	0.8
Engine power	MWth	8.6	8.6	2.5	2.5
Stack diameter	m	0.7	0.7	0.3	0.3
Exhaust flow rate	m^3/s	11.9	11.9	3.35	3.35
Exhaust gas temperature	˚C	474.5	420.8	503	461
NOx emission rate	g/s	13.35	9.98	3.07	2.80
NOx emission rate (post-SCR)	g/s	0.53	0.40	0.12	0.11
PM emission rate	g/s	0.045	0.23	0.02	0.075
Notes: Emission rates are corrected for actual exhaust temperature.					

Table 3-4: Generator Process Conditions

3.6.2 Generator Flue Locations

A total of 74 back-up/life safety generators will be required. The proposed flue locations are presented in Figure 3-5.

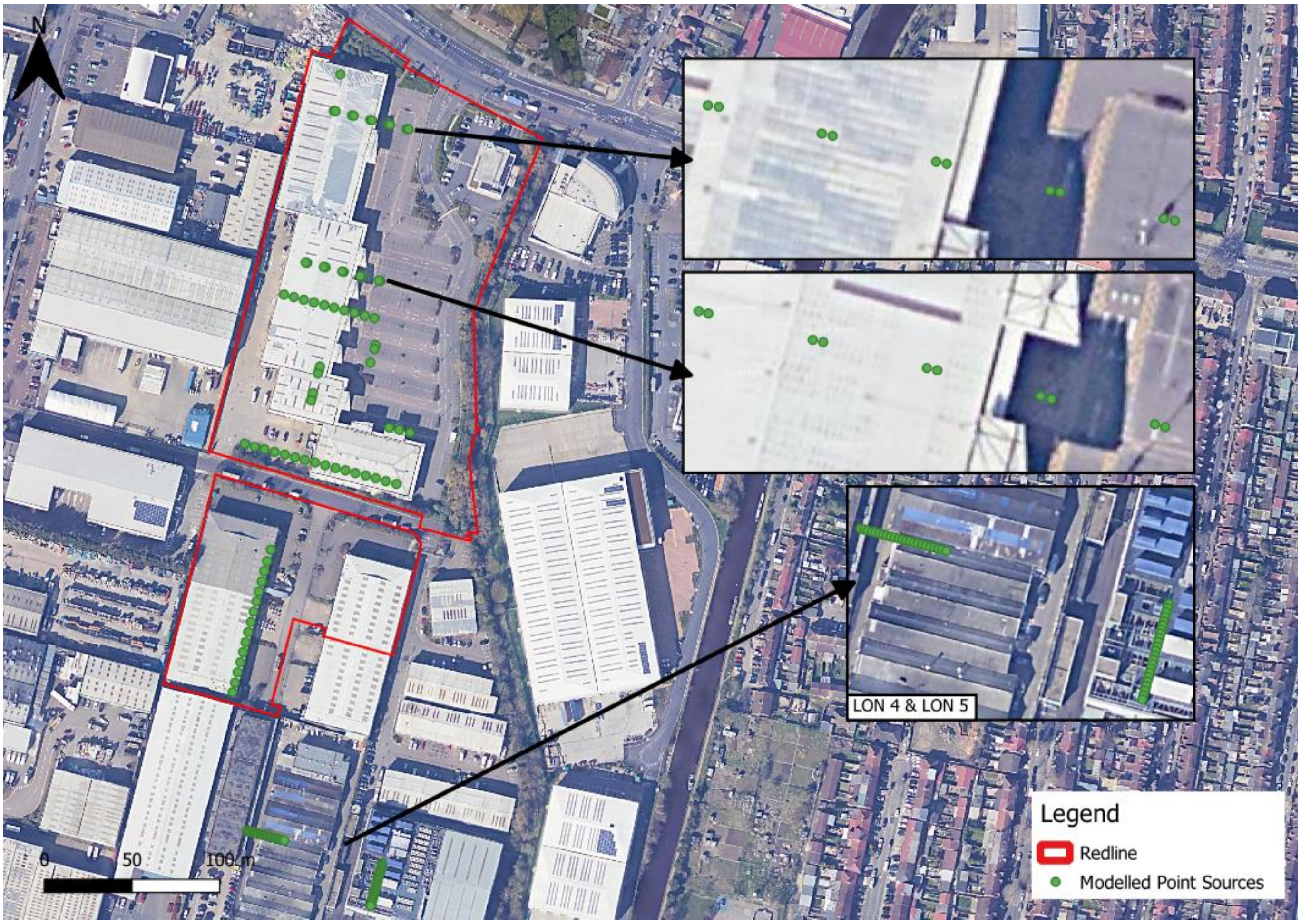

Figure 3-5: Modelled Point Sources

Flue	Building	X	Y	Z
1	Innovation Hub	511506.49	180651.02	28.0
2	LON 6	511502.64	180630.28	41.6
3		511503.63	180630.14	41.6
4		511513.04	180627.70	41.6
5		511514.04	180627.49	41.6
6		511523.50	180625.13	41.6
7		511524.47	180624.94	41.6
8		511533.91	180622.47	41.6
9		511534.85	180622.34	41.6
10		511544.31	180619.92	41.6
11		511545.31	180619.71	41.6
12		511529.23	180533.12	41.6
13		511528.28	180533.38	41.6
14		511518.82	180535.70	41.6
15		511517.83	180535.96	41.6
16		511508.39	180538.33	41.6
17		511507.44	180538.54	41.6
18		511497.96	180540.90	41.6
19		511497.01	180541.11	41.6
20		511487.47	180543.53	41.6
21		511486.58	180543.74	41.6
22	LON 7	511474.25	180525.35	46.6
23		511479.91	180523.91	46.6
24		511485.58	180522.34	46.6
25		511491.37	180520.89	46.6
26		511497.27	180519.33	46.6
27		511502.82	180517.88	46.6
28		511508.60	180516.43	46.6
29		511514.39	180514.87	46.6
30		511520.30	180513.18	46.6
31		511525.84	180511.85	46.6
32		511526.44	180496.54	46.6
33		511525.84	180494.25	46.6
34		511523.55	180486.54	46.6
35		511494.23	180482.17	46.6
36		511494.74	180484.25	46.6
37		511493.66	180480.27	46.6
38		511490.24	180466.91	46.6
39		511490.76	180469.09	46.6

Flue	Building	X	Y	Z
40		511489.73	180464.85	46.6
41		511534.29	180449.41	56.0
42		511540.02	180448.06	56.0
43		511546.19	180446.52	56.0
44		511451.85	180440.09	56.0
45		511457.51	180438.42	56.0
46		511463.17	180437.00	56.0
47		511468.96	180435.46	56.0
48		511474.74	180433.92	56.0
49		511480.53	180432.37	56.0
50		511486.19	180430.83	56.0
51		511491.98	180429.41	56.0
52		511497.77	180427.87	56.0
53		511503.68	180426.20	56.0
54		511509.34	180424.91	56.0
55		511515.00	180423.37	56.0
56		511520.92	180421.95	56.0
57		511526.58	180420.41	56.0
58		511532.36	180418.74	56.0
59		511538.41	180417.20	56.0
60		511466.77	180379.64	40.2
61		511464.71	180373.08	40.2
62		511463.04	180367.42	40.2
63		511461.63	180361.51	40.2
64		511459.95	180355.72	40.2
65		511458.54	180350.06	40.2
66		511457.00	180344.27	40.2
67	**LON 8**	511455.45	180338.36	40.2
68		511453.91	180332.57	40.2
69		511452.37	180326.78	40.2
70		511450.95	180321.12	40.2
71		511449.41	180315.33	40.2
72		511447.86	180309.55	40.2
73		511446.32	180303.63	40.2
74		511444.91	180298.23	40.2
75		511452.89	180219.15	38.6
76	**LON 4 & LON 5**	511453.85	180218.92	38.6
77		511454.74	180218.64	38.6
78		511455.70	180218.42	38.6

Flue	Building	X	Y	Z
79		511456.59	180218.20	38.6
80		511457.60	180217.92	38.6
81		511458.56	180217.64	38.6
82		511459.45	180217.41	38.6
83		511460.46	180217.13	38.6
84		511461.47	180216.91	38.6
85		511462.48	180216.68	38.6
86		511463.43	180216.40	38.6
87		511464.39	180216.12	38.6
88		511465.34	180215.95	38.6
89		511466.29	180215.62	38.6
90		511467.30	180215.39	38.6
91		511468.34	180215.11	38.6
92		511469.35	180214.83	38.6
93		511470.36	180214.55	38.6
94		511471.42	180214.38	38.6
95		511472.38	180214.10	38.6
96		511473.39	180213.88	38.6
97		511474.45	180213.54	38.6
98		511530.34	180200.20	38.6
99		511530.06	180199.19	38.6
100		511529.73	180198.07	38.6
101		511529.45	180196.95	38.6
102		511529.17	180195.83	38.6
103		511528.89	180194.82	38.6
104		511528.55	180193.75	38.6
105		511528.27	180192.74	38.6
106		511527.99	180191.68	38.6
107		511527.71	180190.61	38.6
108		511527.43	180189.49	38.6
109		511527.09	180188.37	38.6
110		511526.81	180187.25	38.6
111		511526.48	180186.13	38.6
112		511526.20	180185.06	38.6
113		511525.86	180183.94	38.6
114		511525.58	180182.88	38.6
115		511525.30	180181.81	38.6
116		511524.96	180180.69	38.6
117		511524.68	180179.51	38.6

Flue	Building	X	Y	Z
118		511524.35	180178.39	38.6
119		511524.01	180177.27	38.6
120		511523.73	180176.15	38.6

Table 3-5: Modelled Point Source

3.6.3 Generator Operating Hours

The generator testing regime for LON 6, LON 7 and LON 8 is presented in Table 3-6 and is applicable to all generators. Testing of each generator is expected to total 12 hours per year, with 11 hours at 50% load and 1 hour at 100% load. It should be noted that the generators may have additional run hours due to unplanned emergency operation where the utility supplies to site fail, however given the security and redundancy of supply to site this is expected to be minimal.

Testing Date	Duration	Load	Comment
Month 1	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 2	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 3	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 4	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 5	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 6	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 7	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 8	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 9	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 10	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 11	1 hour	50%	Generator start-up test / Single gen test against a load back
Month 12	1 hour	100%	Full Load test / Single gen test against a load back

Table 3-6: Testing Regime for LON 6, LON 7, and LON 8

The Phlorum Air Quality Assessment[46] assessed two conservative scenarios for LON 4 and LON 5, based on the use of diesel and selective catalytic reduction (SCR), as follows:

- Monthly testing of each of the generators individually for 2 hours + one annual testing of all generators for 2 hours+ a single five-hour grid failure event (36 generators in operation).
- Monthly testing of all generators at once for 2 hours + one annual testing of all generators for 2 hours + a single five-hour grid failure event (36 generators in operation).

3.6.4 Emergency Scenario

An emergency scenario has also been modelled, which assumes the generators would be operational for 33 hours continuously. It has been assumed that SCR would become operational after 20 minutes.

An emergency scenario of 33 hours is considered to be a conservative assumption, as in the unlikely event of a mains power outage, it is expected that any loss of mains power will be quickly resolved. It is therefore anticipated that the emergency operation of the generators would only be for a short duration.

It is considered to be very unlikely that power to both supplies for LON 6, 7 and 8 would be lost at the same time due to the security of supply requirements for the site. There would need to be a significant failure in the National Grid network. There have only been four events similar to this in its history (August 2019, Christmas 2013, May 2008 and August 2003).

On August 9, 2019, a major power outage occurred due to the simultaneous failure of two large generators meaning that demand exceeded the supply. This led to a significant drop in the frequency of the power grid, triggering an automatic protection system known as Low Frequency Demand Disconnection (LFDD) to stabilize the grid. The Distribution Network Operators (DNOs) began restoring power within 15 minutes, and all customers had their power back within 45 minutes. However, the knock-on effects, particularly on transportation services, lasted much longer, with some disruptions continuing into the following days. This was because those systems were not designed for a power outage of this kind. Colt data centres will allow for quick restoration of supply after a power outage. This is a requirement of Colt's service level agreement with the end users.

Such large-scale power outages are relatively rare. The 2019 incident was notable due to the scale and the impact on essential services. The energy sector has since taken steps to improve the resilience of the electricity network to prevent similar occurrences in the future.

Based on the above, a worst-case emergency scenario of 33 hours is considered to be provide a conservative robust assessment. Based on the 2019 experience, 45 minutes is considered to be more appropriate.

The emergency scenario of 33 hours has been run for each of the three meteorological years (2021, 2022 and 2023) and the maximum of the 100^{th} percentile results has been used in the results processing. This is to enable selection of results coinciding with the worst-case meteorological conditions.

3.6.5 Assumptions Relating to Generator Provision

The calculated emissions associated with the operation of the on-site standby generators are based on assumptions relating to the process contributions emitted from the MTU 20V4000G94LF, 50 Hz Diesel Generator Set and the MTU 16V2000G76F, 50 Hz Diesel Generator Set (Section 3.6.1) and their required testing and maintenance schedule (Section 3.6.3). Should an alternative generator model be selected as part of the final designs, and/or a modified testing and maintenance regime be required, an updated assessment will be required to assess potential air quality impacts.

As the combined thermal input of the generators exceeds 50 MW, a permit application will need to be submitted to the Environment Agency. It is recommended that the Environment Agency is consulted to advise on specific permitting requirements.

3.7 Results Processing

3.7.1 Atmospheric Chemistry

NO_2 is associated with effects on human health and therefore the air quality standards for the protection of human health are based on NO_2 rather than total NOx or NO. The model predicts NOx concentrations which comprise nitric oxide (NO) and nitrogen dioxide (NO_2). NOx is emitted from combustion processes primarily as NO with a small percentage (usually <5%) of NO_2. The emitted NO reacts with oxidants in the air (mainly ozone) to form secondary NO_2. Factors affecting the rate of this oxidation occurs include the concentration of oxidants in the air, wind speed and temperature.

Predicted NOx concentrations have been processed to determine annual mean nitrogen dioxide (NO_2) concentrations for comparison with the annual mean NO_2 objectives. A NOx:NO_2 conversion has been applied to the modelled NOx concentrations, in order to determine the impact of the NOx emissions on ambient concentrations of NO_2.

NO_2 is associated with effects on human health and therefore the air quality standards for the protection of human health are based on NO_2 rather than total NOx or NO. The model predicts NOx concentrations which comprise nitric oxide (NO) and nitrogen dioxide (NO_2). NOx is emitted from combustion processes primarily as NO with a small percentage (usually <5%) of NO_2. The emitted NO reacts with oxidants in the air (mainly ozone) to form secondary NO_2. Factors affecting the rate of this oxidation occurs include the concentration of oxidants in the air, wind speed and temperature.

For the on-site generators, Environment Agency guidance[47] has been followed, which states that 70% of long-term (annual mean) and 35% of short-term (all other averaging periods) NOx concentrations will convert to NO_2. Close to the emission point the above assumptions (70% and 35% NO_2) are likely to be overly pessimistic and reported concentrations will be an over-estimate.

3.7.2 Background Pollutant Concentrations

The background and modelled concentrations were added together to give total concentrations and enable a comparison to be made with the air quality objectives. LAEI predicted background concentrations for 2025 were used to process the NO_2, PM_{10} and $PM_{2.5}$ results. The background concentrations used in the results processing are discussed in Section 5.4.

3.7.3 Cumulative Assessment

In the cumulative impact scenario, the predicted NO_2 process contribution reported for the Union Park at Bulls Bridge development[45] receptor point closest to the Site (Guru Nanak School) has been included in the predicted environmental concentrations for all receptors C1-C7 and R1-R15. This has been carried out for NO_2 only, as the combustion plant for this development is gas fired and there are therefore no predicted PM emissions associated with this cumulative development.

3.7.4 Comparison with Air Quality Standards

The results of dispersion modelling at sensitive receptors have been compared to relevant air quality objectives for the protection of human health and the emerging Hillingdon Council matrix for $PM_{2.5}$, as, as listed in Table 1-2 and Table 1-4, respectively. Comparisons have also been made with the WHO guidelines, as listed in Table 1-3,

To quantify the potential for the operation of the Proposed Development to exceed the 1-hour mean NO_2 air quality objective (200 µg/m^3), results were determined for the 99.79th percentile (representing the 18th highest value predicted within the year). Environment Agency guidance[48] was followed, which states that 35% of short-term NOx concentrations will convert to NO_2, and that to determine the predicted environmental concentrations (PECs), two times the background concentration should be added. The following criteria outlined in paragraph 6.39 of EPUK/IAQM[39] guidance for assessing peak short-term concentrations from an elevated source was followed to determine the significance of the change (process contribution) in hourly NO_2 concentrations.

> "*Where such peak short-term concentrations from an elevated source are in the range 11-20% of the relevant AQAL, then their magnitude can be described as small, those in the range 21-50% medium and those above 51% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to reference background or baseline concentrations*".

The expected number of exceedances of the PM_{10} 24-hour mean objective (50 µg/m^3) was determined based on the relationship between the annual mean and 24-hour mean PM_{10} concentrations set out in LAQM (TG22) guidance[49], stated below.

No. 24-hour mean exceedances = -18.5 + 0.00145 × annual mean^3 + (206/annual mean)

[47] Environment Agency (2006), Air Quality Management and Assessment Unit- Conversion Ratios for NO_x and NO_2.
[48] Environment Agency (2006), Air Quality Management and Assessment Unit- Conversion Ratios for NO_x and NO_2.
[49] Defra (2022) Local Air Quality Management Technical Guidance (TG22) August 2022 https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

4.0

Site Description and Baseline Conditions

4.0 Site Description and Baseline Conditions

To assess the significance of any new development proposal (in terms of air quality), it is necessary to identify and understand the baseline air quality conditions in and around the study area. This provides a reference against which any potential changes in air quality can be assessed. Since air quality is predicted to change in the future (mainly because of changes to vehicle emissions), the baseline situation is extrapolated forward to the opening year. The future baseline scenario is the predicted baseline for the opening year.

To identify the existing air quality conditions, a review of publicly available information has been undertaken, including the latest local authority air quality reports, monitoring data, and background concentration maps. This section presents the results of the review.

4.1 Local Sources of Industrial Pollution

Industrial air pollution sources are regulated through operating permits or authorisations, which list stringent emission requirements. Regulated industrial process are classified as either Part A or Part B processes and are regulated through Environmental Permitting (England and Wales) Regulations 2016[50]. The larger, more polluting, Part A processes are regulated by the Environment Agency for emissions to air, water and land. The smaller, less polluting processes are regulated by the local authority for emission to air.

A review of the Environment Agency Pollutant Inventory for 2023[51] indicated that there is one Part A site within 2km of the Site which is the Amazon Data Services UK Ltd combustion site located 1.3km southwest of the proposed development, classified as an air polluter with respect of ammonia. The location of this Part A site is shown in Figure 4-1.

The Part B processes are regulated and reviewed by the Local Authorities and given the nature of these processes, are unlikely to significantly affect ambient air quality in the vicinity of the Proposed Development. Any emissions from these installations are assumed to be represented in the Defra background concentrations.

The most recent 2024 ASR[52] confirmed that there were various planning applications for data centres. Hillingdon Council are looking to secure a sustainable management of emissions considering these new sources of pollution to be introduced within the borough.

[50] HMSO (2016) The Environmental Permitting (England and Wales) Regulations 2016, UK Statutory Instrument 2016 No. 1154 https://www.legislation.gov.uk/uksi/2016/1154/contents/made
[51] Environment Agency, Pollution Inventory https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory
[52] The London Borough of Hillingdon (2024), Air Quality Annual Status Report, 2024, May 2024, The London Borough of Hillingdon

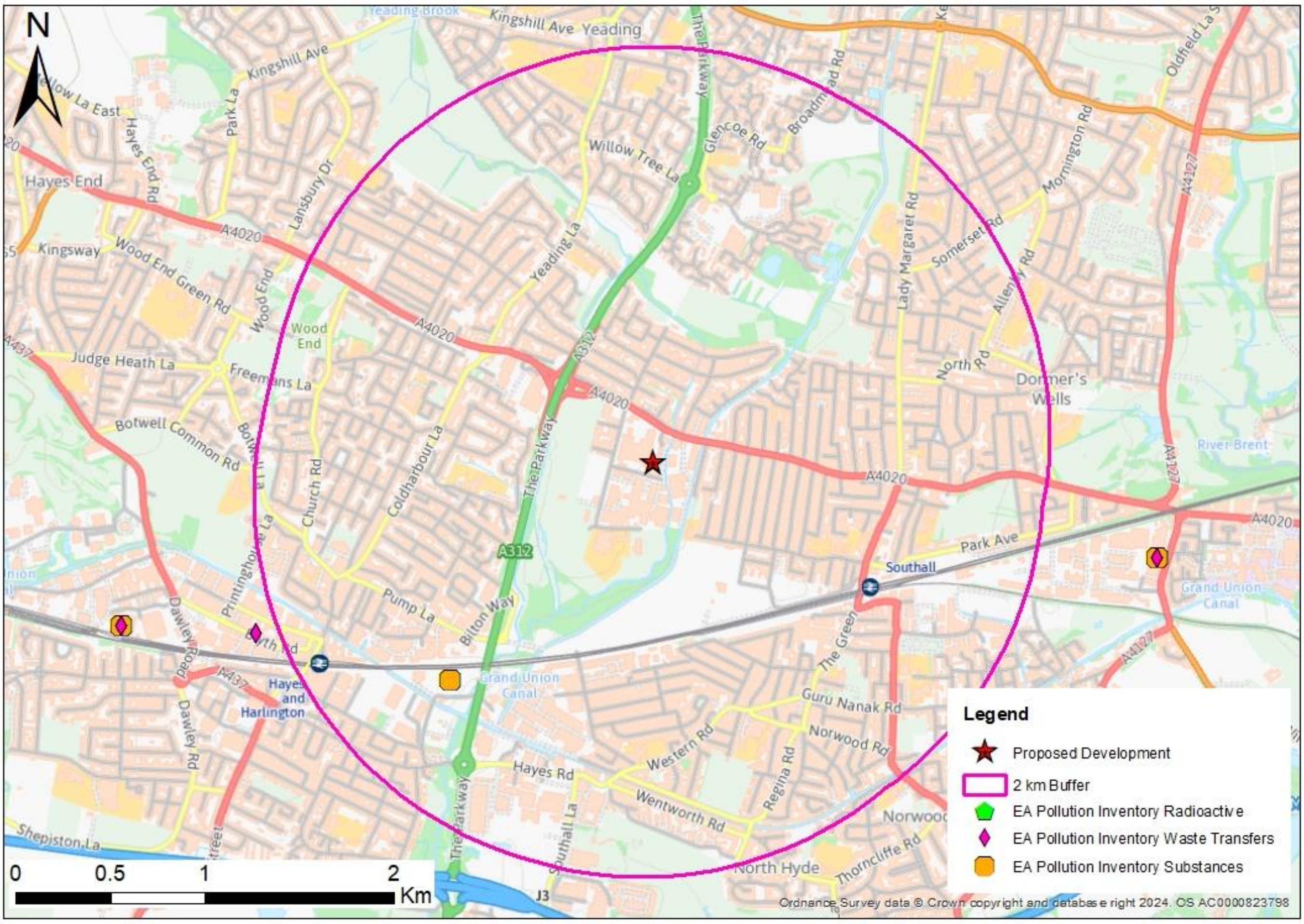

Figure 4-1: Part A Permit Sites

4.2 Local Air Quality Management

The Environment Act 1995[5] requires local authorities to review and assess air quality with respect to the objectives for seven pollutants specified in the National Air Quality Strategy. Local authorities are required to carry out an assessment and provide an Annual Status Report (ASR) of their area every year. If the ASR identifies any potential hotspot areas likely to exceed air quality objectives, a detailed assessment of those areas is required. If objectives are not predicted to be met, the local authority must declare the area as an Air Quality Management Area (AQMA). If an AQMA has been declared, the Local Authority will also need to produce an Air Quality Action Plan (AQAP), to includes measures to improve air quality in the AQMA.

The Proposed Development is in London Borough of Hillingdon (LBH), close to the boundary with London Borough of Ealing and the baseline assessment includes a brief review and summary of the Council's latest LAQM Annual Status Report (ASR). The 2024 ASR concluded that air quality issues in the borough are severe near Heathrow Airport and along the major road network that runs through the area. This reflects the primary sources of nitrogen oxide (NOx) emissions within the Air Quality Management Area (AQMA), which encompasses the southern half of the borough.

The Site is located within the Hillingdon AQMA which was declared in 2003 for exceedances of the annual mean NO_2 objective. Therefore, the area is identified as having potential for exceedances of this objective. The northern part of the Site is also located within an Air Quality Focus Area. The location of the Proposed Development in relation to the AQMA boundary is shown in Figure 4-2.

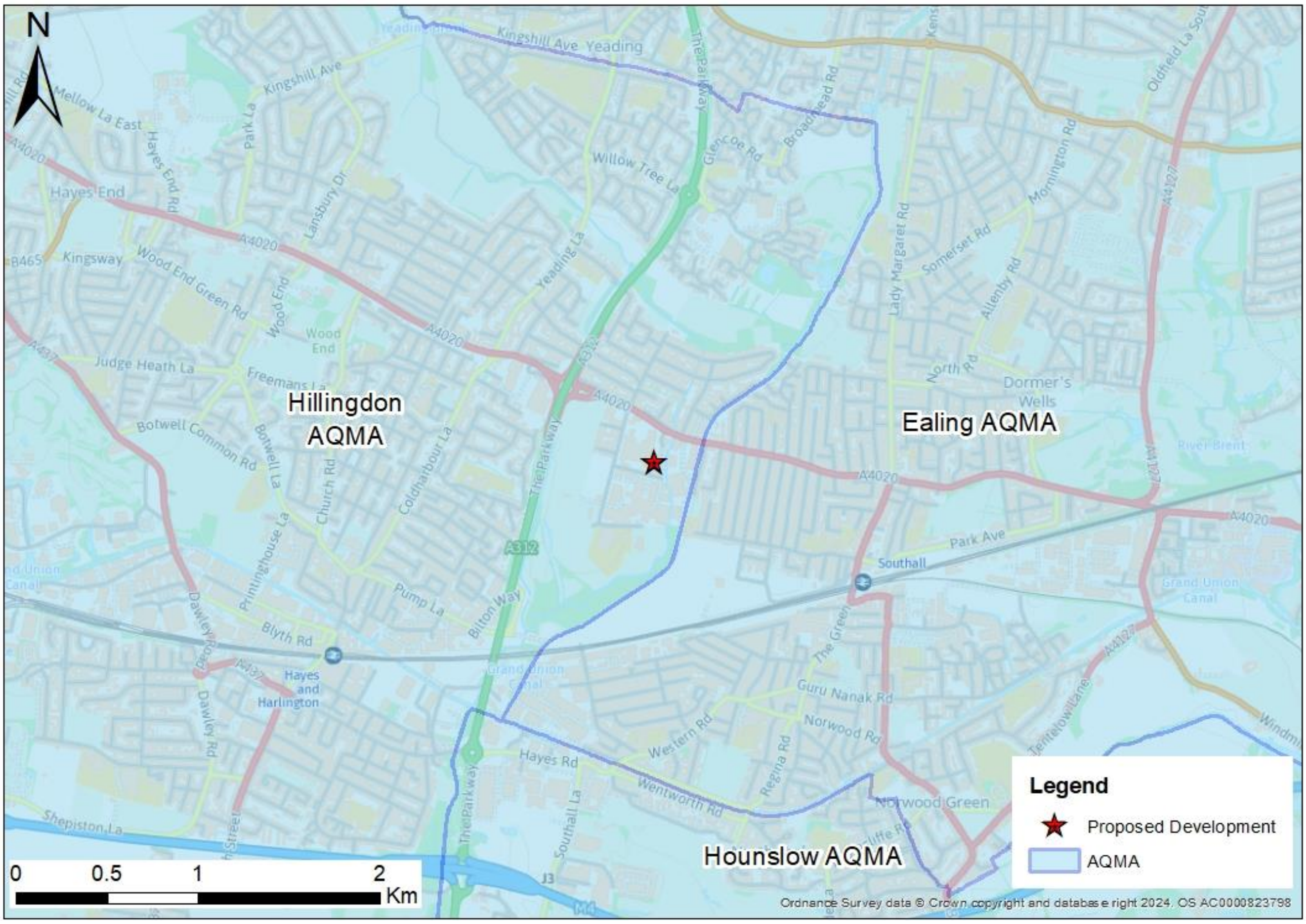

Figure 4-2: Air Quality Management Area (AQMA)

4.2.1 Local Air Quality Monitoring

A review of existing local air quality conditions in the vicinity of the Proposed Development has been undertaken. Automatic and diffusion tube monitors within 2 km of the proposed development have been evaluated as part of this assessment.

4.2.1.1 Automatic Monitoring

Automatic or continuous monitoring involves drawing air through an analyser continuously to obtain near real-time pollutant concentration data. A review of the most recent ASR from London Borough of Hillingdon shows that the Council currently operate twelve automatic monitoring stations, one of which is within 2 km of the Site. Also, one of the six automatic monitoring stations of the Ealing Council is within the 2 km buffer. The location of these automatic monitors in relation to the Proposed Development is shown in Figure 4-3 and details about the automatic monitoring site are provided in Table 4-1.

Site ID	Site Location	OS Grid Reference		Site Type	Pollutants Monitored	Distance to kerb of nearest road (m)
		x	y			
London Borough of Hillingdon						
HIL5	Hillingdon Hayes	510303	178882	Roadside	NO_2, PM_{10}	1
London Borough of Ealing						
EA010 Green Quarter	Green Quarter	511740	180048	Suburban Background	NO_2, PM_{10}, $PM_{2.5}$	40

Table 4-1: Details of Automatic Monitoring Sites within 2km

Recent NO_2 monitoring results from 2018 to 2023 are shown in Table 4-2, with numbers of hourly exceedances of 200 µg/m^3 indicated in brackets. An exceedance is defined as an annual mean greater than 40 µg/m^3 for NO_2, or when the hourly value exceeds 200 µg/m^3 more than 18 times within a calendar year. All exceedances of the objective thresholds are indicated in bold.

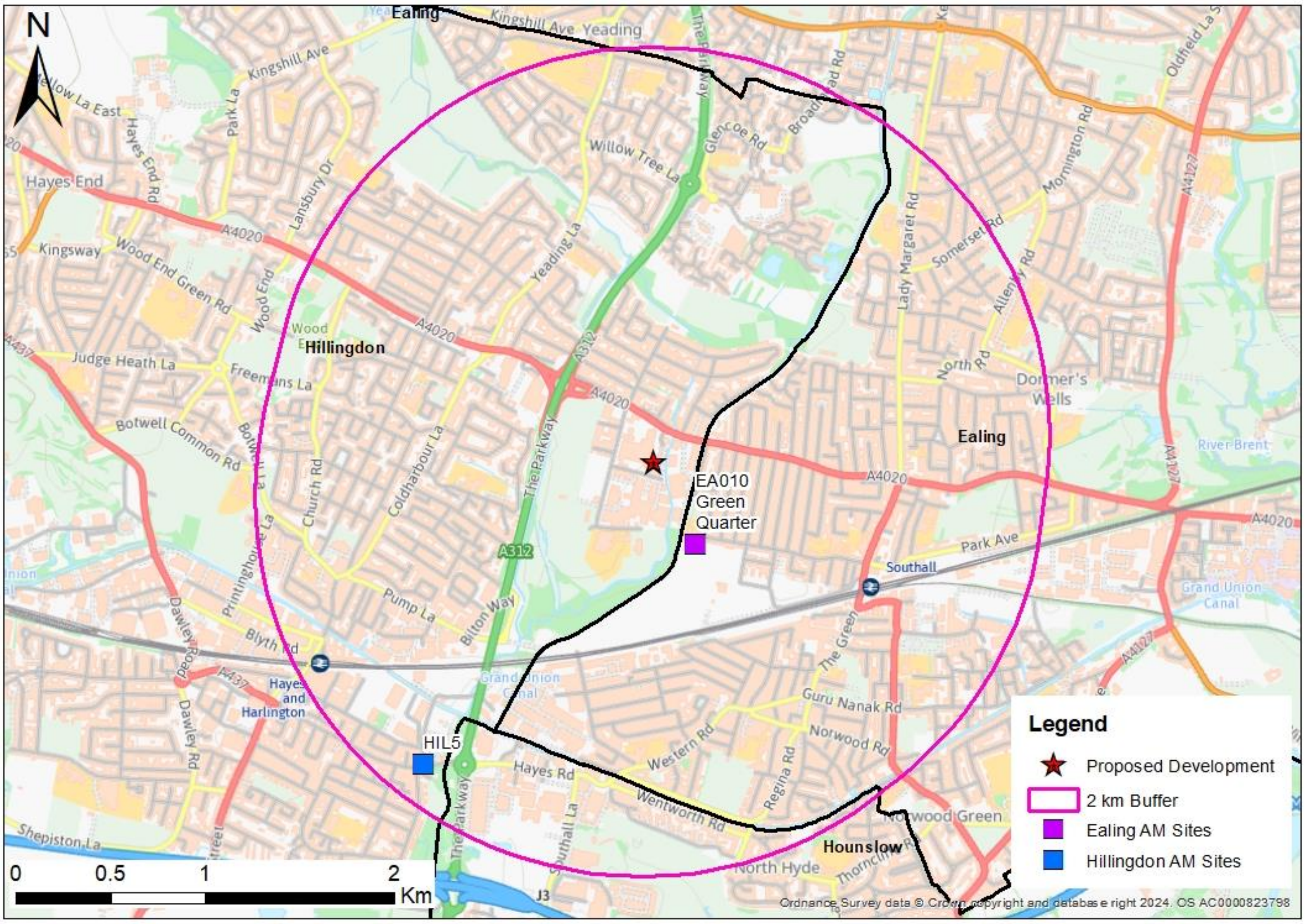

Figure 4-3: Automatic Monitoring Sites

Site ID	Site Type	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m^3)					
			2018	2019	2020	2021	2022	2023
London Borough of Hillingdon								
HIL5	Roadside	1.8 SW	**43** (12)	**41** (0)	31 (0)	34 (0)	34 (0)	34 (0)
London Borough of Ealing								
EA010 Green Quarter	Suburban Background	0.35 SE	-	-	-	-	16.7 (0)	21.0 (0)
Notes: Exceedances of the annual mean air quality objective are indicated in **bold.** - no data available								

Table 4-2: Results of Local Air Quality Monitoring at Automatic Sites - Nitrogen Dioxide

These results show that the NO_2 annual mean air quality objective was exceeded at one of these sites between 2018 and 2023. The maximum recorded annual mean of 43 µg/m^3 was in 2018 at the HIL5 roadside site. The NO_2 concentrations have been below the annual mean objective (40 µg/m^3) since 2020 at both sites.

The NO_2 concentrations did not exceed 60 µg/m^3 at either site between 2018 and 2023 (the concentration at which exceedances of the short-term objective may become likely). The number of hourly exceedances of 200 µg/m^3 recorded at both sites were well below the permissible 18 hours per year, with a maximum of 12 hours of exceedances in 2018 at HIL5 in 2018. Exceedances of the short-term objective for NO_2 are therefore considered to be unlikely.

Annual mean concentrations of PM_{10} recorded at the automatic monitoring sites within 2 km are shown in Table 4-3, with number of days of exceedance of 50 µg/m^3 shown in brackets. An exceedance is defined as an annual mean greater than 40 µg/m^3 for PM_{10}, or when the daily value exceeds 50 µg/m^3 more than 35 days within a calendar year.

Site ID	Site Type	Distance from Site (km)	Annual Mean PM_{10} Concentration (µg/m^3)					
			2018	2019	2020	2021	2022	2023
London Borough of Hillingdon								
HIL5	Roadside	1.8 SW	30 (22)	28 (25)	25 (16)	26 (25)	30 (23)	27 (16)
London Borough of Ealing								
EA010 Green Quarter	Suburban Background	0.35 SE	-	-	-	-	16.4 (6)	18.3 (3)
Notes: - no data available								

Table 4-3: Results of Local Air Quality Monitoring at Automatic Sites - PM_{10}

The monitoring results between 2018 and 2023 show that the recorded annual mean concentrations at both sites are below the PM_{10} air quality objective (40 µg/m^3). The number of daily exceedances of 50 µg/m^3 recorded between 2018 and 2023 are also below the permissible 35 days per year at both sites, with a maximum of 25 days recorded in 2019 and 2021 at HIL5.

Annual mean concentrations of $PM_{2.5}$ recorded at the monitoring sites within 2 km are shown in Table 4-4. An exceedance is defined as an annual mean greater than 20 µg/m^3 for $PM_{2.5}$.

Site ID	Site Type	Distance from Site	Annual Mean $PM_{2.5}$ Concentration (µg/m^3)					
			2018	2019	2020	2021	2022	2023
London Borough of Ealing								
EA010 Green Quarter	Suburban Background	0.35 SE	-	-	-	-	9.0	8.5
Notes: - no data available								

Table 4-4: Results of Local Air Quality Monitoring at Automatic Sites - $PM_{2.5}$

The available monitoring results for one site show that the recorded annual mean concentrations of $PM_{2.5}$ is well below the annual mean objective (20 µg/m^3), with a maximum of 9.0 µg/m^3 in 2022.

4.2.1.2 Non-Automatic Monitoring

The latest ASR indicates that Hillingdon has 44 and Ealing has 60 diffusion tubes monitoring NO_2 across the borough, 12 of which are within 2 km of the Site. These are classified as either “roadside” or “background” sites. The locations of these sites within 2 km are shown in Figure 4-4.

Details of the diffusion tubes within 2 km and recent monitoring results are given in Table 4-6 and Table 4-6. An exceedance is defined as an annual mean greater than 40 µg/m^3 for NO_2.

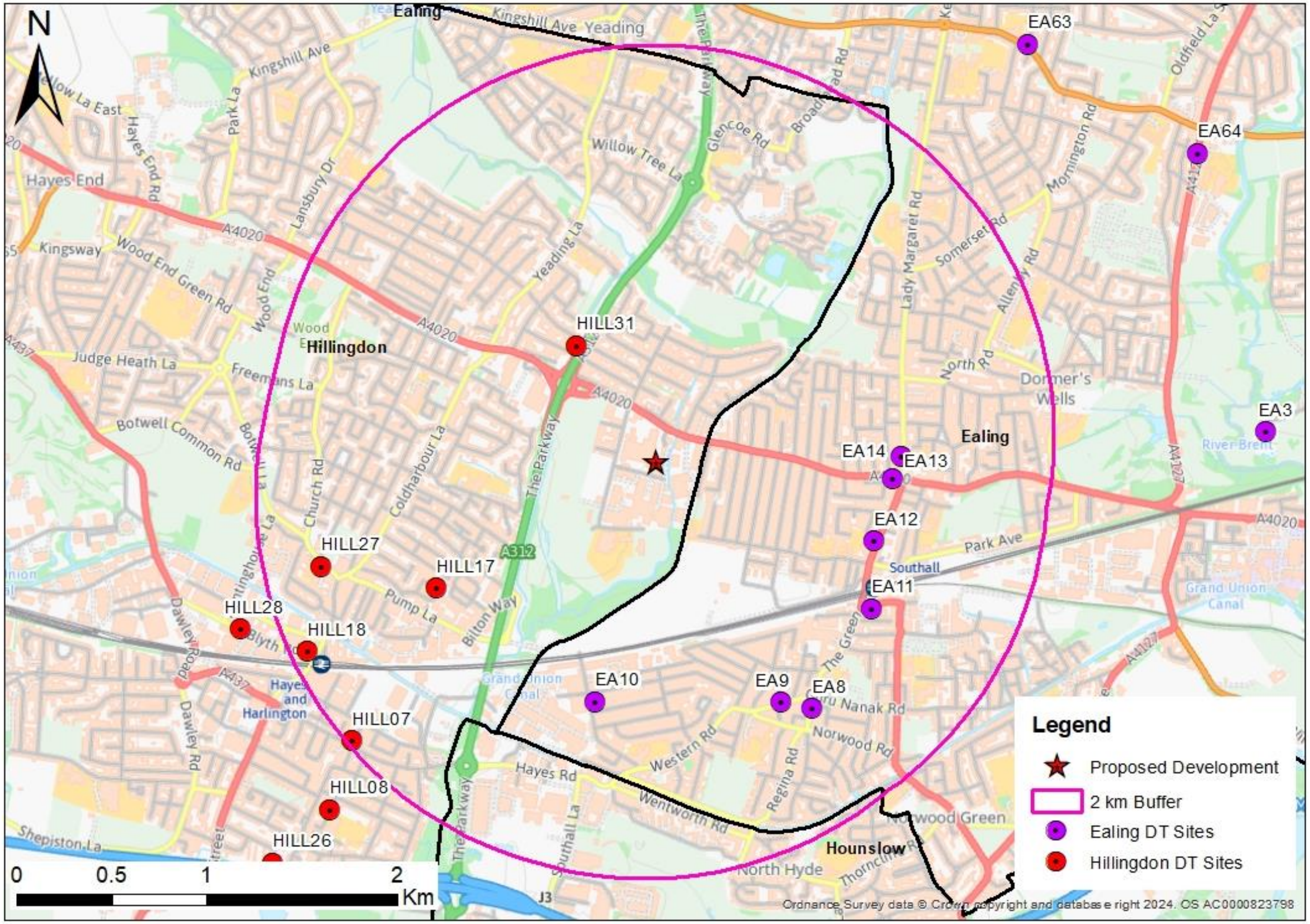

Figure 4-4: Local Diffusion Tube Sites

Site ID	Site Location	OS Grid Reference		Site Type	Distance to kerb of nearest road (m)
		x	y		
London Borough of Hillingdon					
HILL07	Harold Avenue (first lamp post on left)	509918	179015	Roadside	30
HILL17	49 Silverdale Gardens, Hayes Lamp Post (8)	510361	179820	Background	14
HILL18	Blyth Road, Hayes Lamp Post (4)	509683	179486	Roadside	2
HILL27	Botwell House RC Primary School (Sidefence)	509755	179934	Roadside	12
HILL31	On white lamp-post at end of Dorchester Waye that runs parallel with A312, side of houses	511103	181097	Background	10
London Borough of Ealing					
EA8	55 King Street, Southall, UB2 4DQ	512341	179186	Roadside	3.3
EA9	18 Western Road, Southall, UB2 5DU	512181	179219	Roadside	7.5
EA10	150 Brent Road, Southall, UB2 5LD	511196	179222	Roadside	0.5
EA11	2 Merrick Road, Southall, UB2 4AU	512657	179712	Roadside	12.0
EA12	Hambrough Primary School	512673	180069	Roadside	10.0
EA13	11 The Broadway, Southall, UB1 3PX	512768	180400	Roadside	4.0
EA14	25 Lady Margaret Road, Southall, UB1 2RA	512812	180516	Roadside	6.3

Table 4-5: Details of Diffusion Tube Monitoring Sites within 2km

Site ID	Site Type	Annual Mean NO_2 Concentration (µg/m^3)					
		2018	2019	2020	2021	2022	2023
London Borough of Hillingdon							
HILL07	Roadside	37.7	36.9	28.1	28.8	30.5	28.8
HILL17	Background	31.0	31.6	24.7	24.2	24.1	22.6
HILL18	Roadside	38.5	37.4	29.9	27.6	28.3	25.7
HILL27	Roadside	32.5	33.2	24.5	25.3	26.8	26.9
HILL31	Background	-	32.5	24.3	23.2	25.3	22.0
London Borough of Ealing							
EA8	Roadside	**41.1**	**40.5**	27.0	29.4	32.3	28.7
EA9	Roadside	30.9	31.5	22.4	22.9	23.4	21.7
EA10	Roadside	35.0	33.2	23.4	24.3	27.2	30.3
EA11	Roadside	28.6	27.5	17.6	20.8	19.3	20.3
EA12	Roadside	34.4	32.5	24.0	22.6	23.0	22.2
EA13	Roadside	**46.0**	**44.3**	35.2	32.9	36.2	34.2
EA14	Roadside	**40.2**	**41.2**	29.6	31.6	32.5	29.8
Notes: Exceedances of the annual mean air quality objective are indicated in bold. - no data available							

Table 4-6: Diffusion Tube Monitoring Results 2018 to 2023

Of the 12 diffusion tube monitoring locations within 2 km, three of the sites exceeded the NO_2 objective (40 µg/m^3) during the period between 2018 and 2023. The maximum recorded concentration was 46 µg/m^3, recorded at roadside site EA13 in 2018. More recent data for 2023 is available for all the monitoring sites within 2 km and indicates that annual mean concentrations were below the annual mean objective, with maximum of 34.2 µg/m³ recorded at the roadside site EA13 which is located near a junction and alongside an A Road (A4020).

As the northern boundary of the Site borders the A4020 but is away from any junction, it is anticipated that concentrations at the northern roadside of the Site boundary may be comparable to those recorded at the roadside sites further along the A9005 (EA12) which have shown NO_2 concentrations of below 25 µg/m³ since 2020. The annual mean NO_2 concentrations recorded at all the sites within 2 km between 2018 and 2023 are well below 60 µg/m³. Exceedances of the short-term objective are therefore considered to be unlikely.

4.3 Defra's Background Pollutant Concentration Mapping

Background concentrations refer to existing levels of pollution in the atmosphere, as a result of emission from a variety of sources, such as traffic, industrial and agricultural processes. Defra publishes background pollutant mapping[53] for every 1 km x 1 km OS grid square across the UK for NO_x, NO_2, PM_{10} and $PM_{2.5}$. Background pollutant mapping has been reviewed for the grid square in which the Proposed Development lies and surrounding grid squares. The 2025, 2026 and 2027 background concentrations (which are based on 2021 monitoring data) are presented in Table 4-7.

OS Grid Square		Annual Mean Concentration (µg/m³)											
		NO_x			NO_2			PM_{10}			$PM_{2.5}$		
x	y	2025	2026	2027	2025	2026	2027	2025	2026	2027	2025	2026	2027
511500	180500	22.5	21.6	20.8	16.2	15.6	15.1	14.0	14.0	13.9	8.2	8.1	8.0
511500	181500	21.1	20.2	19.4	15.4	14.8	14.2	14.1	14.0	14.0	8.2	8.1	8.0
512500	180500	22.3	21.4	20.7	16.1	15.5	15.1	14.3	14.2	14.1	8.3	8.2	8.1
511500	179500	23.0	22.3	21.6	16.5	16.0	15.6	13.5	13.4	13.4	8.0	8.0	7.9
510500	180500	22.4	21.5	20.7	16.1	15.6	15.0	14.1	14.0	14.0	8.2	8.2	8.1
	Average:	**22.3**	**21.4**	**20.6**	**16.1**	**15.5**	**15.0**	**14.0**	**13.9**	**13.9**	**8.2**	**8.1**	**8.0**

Table 4-7: Defra's 2025, 2026 and 2027 background concentrations of NOx, NO_2, PM_{10} and $PM_{2.5}$

Defra background concentrations are all below the air quality objectives for annual mean NO_2 and PM_{10} and $PM_{2.5}$.

4.4 London Atmospheric Emissions Inventory

The London Atmospheric Emissions Inventory (LAEI) is a database of geographically referenced datasets of pollutant emissions and sources in Greater London[53]. The concentration maps across the whole LAEI area, in a resolution of 20 m x 20 m, were produced by the LAEI dispersion modelling. The LAEI includes the key pollutants emissions such as NO_x and PM_{10} from line sources (e.g., road transport), area sources (e.g. aviation, domestic and commercial fuel) and point sources (e.g. Part A and Part B processes). The latest available base year is 2019, with the data most recently updated in 2023, including projections for 2025.

- The 2019 annual mean NO_2 concentration map shows that modelled concentrations at the Proposed Development are expected to range between 25 µg/m³ and 34 µg/m³ across the redline boundary, as shown in Figure 4-5, with higher concentrations at the northern boundary of the site. The 2025 annual mean NO_2 concentration map shows that modelled concentrations across the Proposed Development are expected to range between 19 µg/m³ and 25 µg/m³, as shown in Figure 4-6, with higher concentrations at the northern boundary of the site. Maximum modelled concentrations within the redline boundary are therefore below the objective (40 µg/m³).
- The 2019 annual mean PM_{10} concentration map shows that modelled concentrations at the Proposed Development are expected to range between <16 µg/m³ and 22 µg/m³, as shown in Figure 4 7. The 2025 annual mean PM_{10}

[53] https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html.

concentration map shows that modelled concentrations across the Proposed Development are expected to range between <16 µg/m^3 with higher levels of between 16 and 19 µg/m3 at the northern boundary of the site, as shown in Figure 4-8. Maximum modelled concentrations within the redline boundary are therefore below the objective (40 µg/m^3). The 2019 daily exceedances of the PM_{10} 24-hour mean objective (50 µg/m^3 not to be exceeded more than 35 times a year) map shows that modelled concentrations at the majority of the Proposed Development are expected to range between <5 to 10 days of exceedances per year, as shown in Figure 4-9, with maximum exceedance days at the northern boundary of the site. The 2025 daily exceedances of the PM_{10} 24-hour mean objective map shows that modelled concentrations at the majority of the Proposed Development are expected to range at <5 days of exceedances per year, as shown in Figure 4-10 and are therefore below the objective.

- The 2019 annual mean $PM_{2.5}$ concentration map shows that modelled concentrations at the Proposed Development are expected to range between 10 µg/m^3 and 12 µg/m^3, as shown in Figure 4-11. The 2025 annual mean $PM_{2.5}$ concentration map shows that modelled concentrations at the Proposed Development are expected to range between 8 µg/m^3 and 10 µg/m^3, as shown in Figure 4-12. The 2019 and 2025 modelled concentrations of $PM_{2.5}$ are therefore below the objective (20 µg/m^3).

The concentration maps from LAEI show that there are unlikely exceedances of the annual mean NO_2, $PM_{2.5}$ and PM_{10} objective limit values in 2019 or 2025 at the Site.

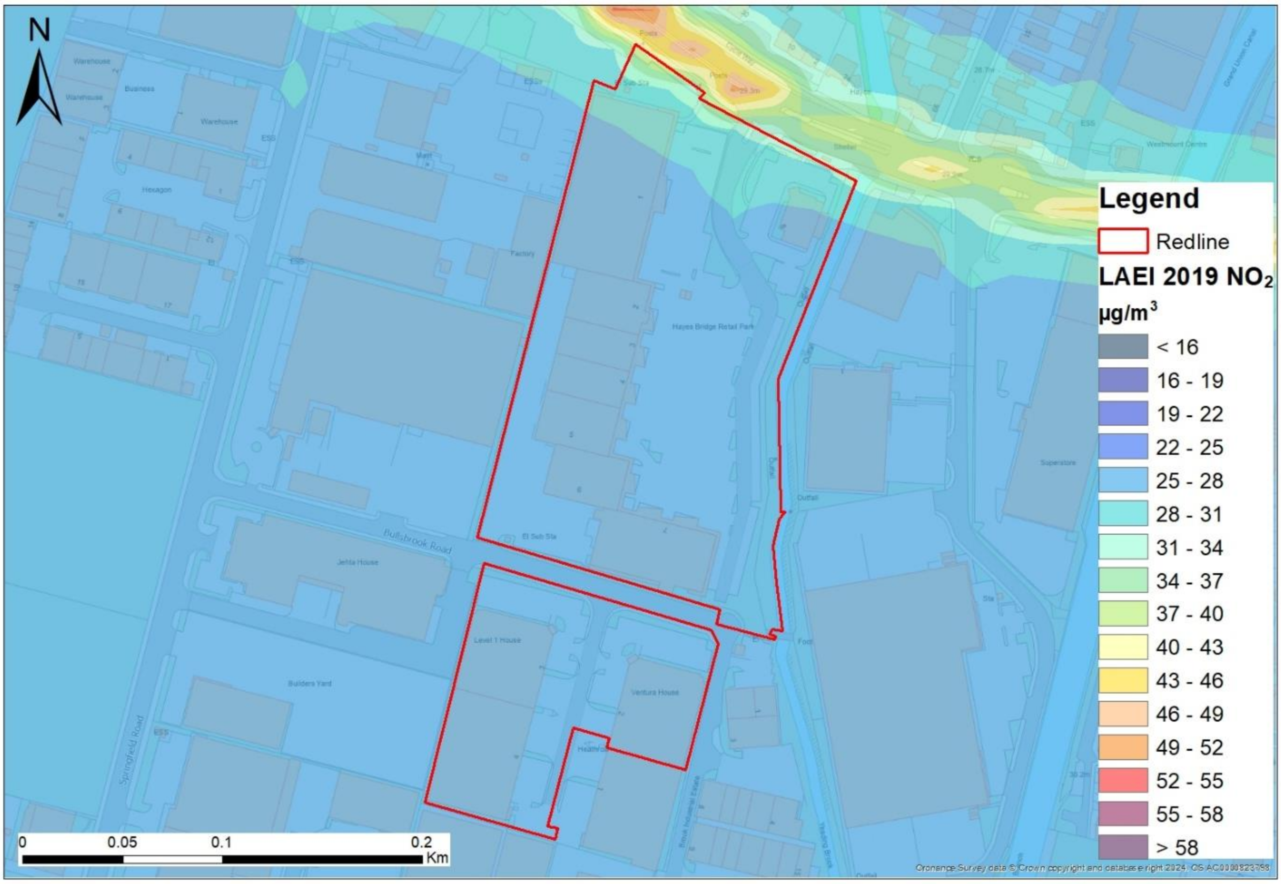

Figure 4-5: LAEI NO_2 concentration map for 2019

Figure 4-6: LAEI NO_2 concentration map for 2025

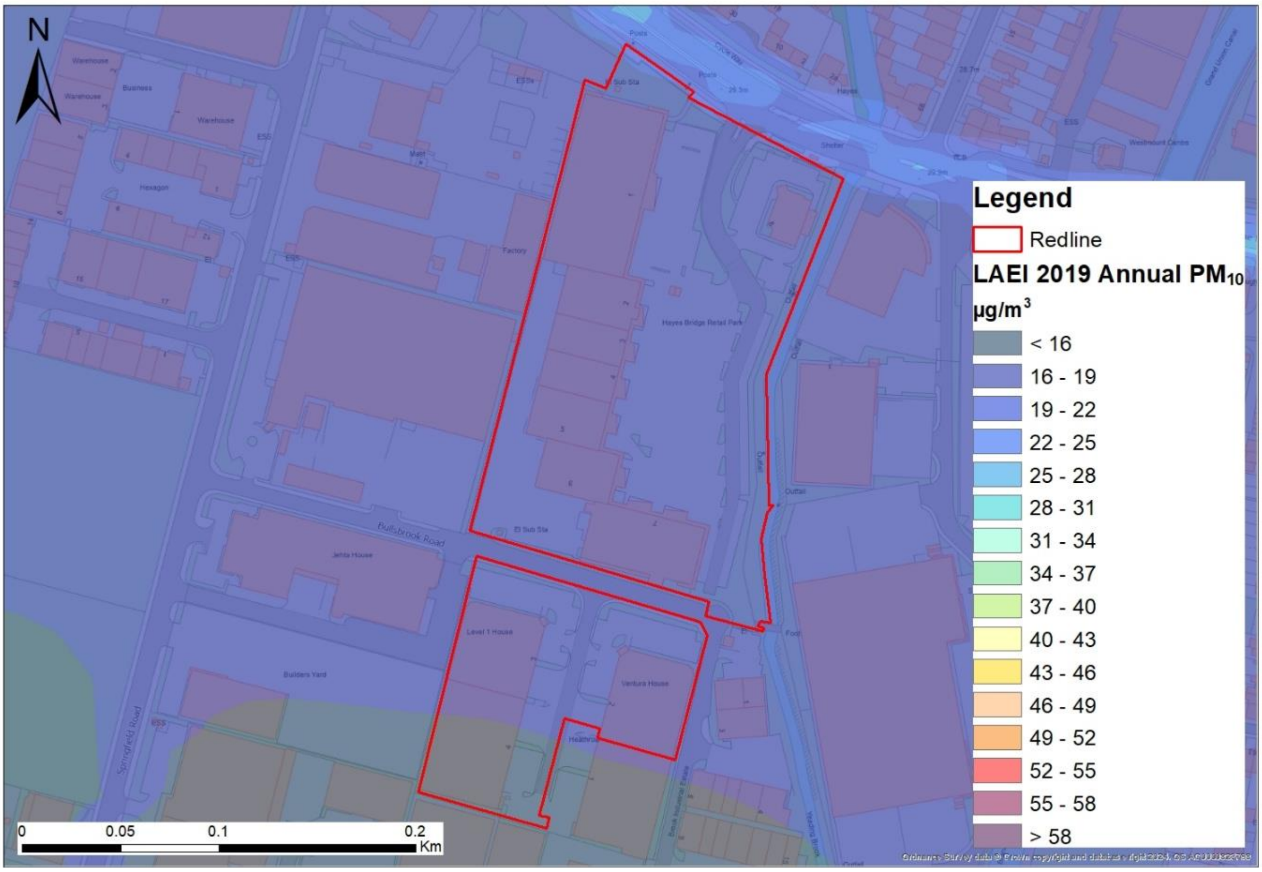

Figure 4-7: LAEI PM_{10} concentration map for 2019

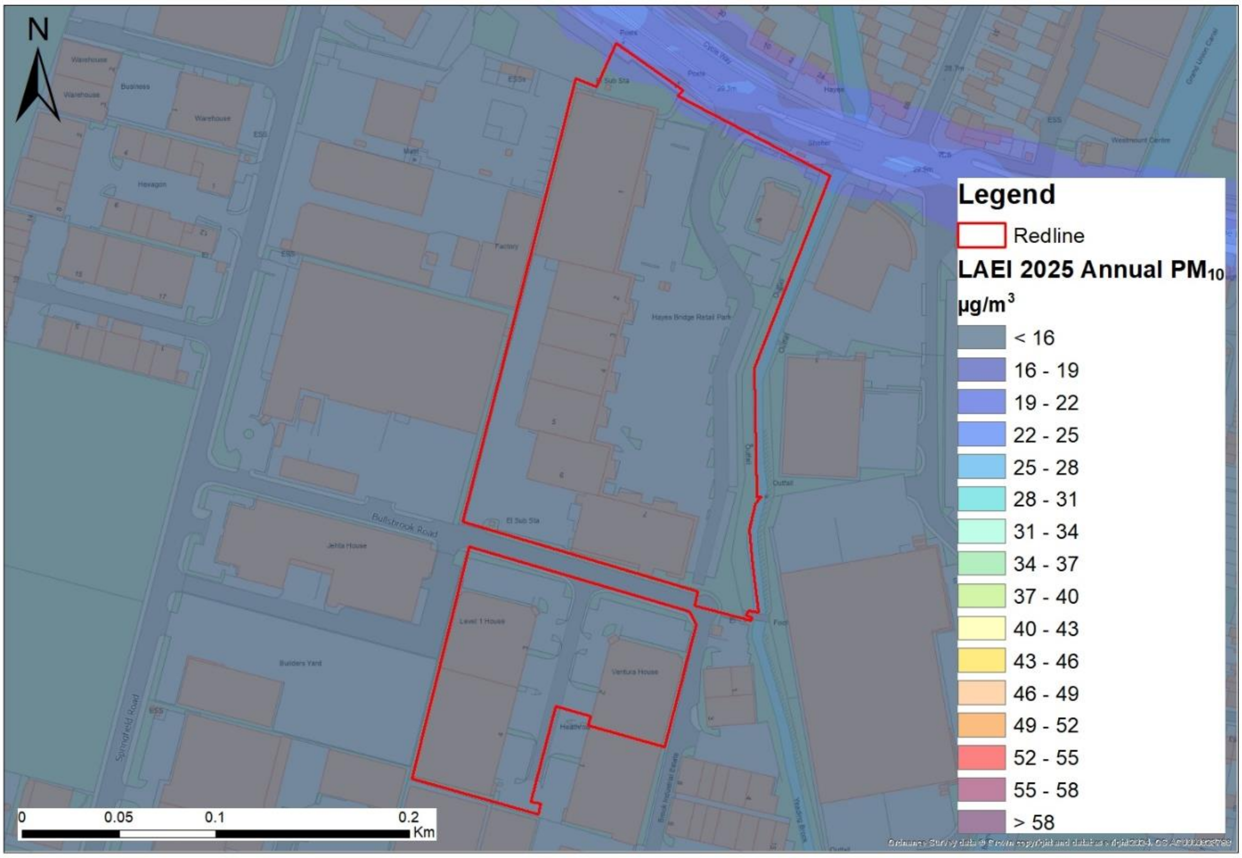

Figure 4-8: LAEI PM_{10} concentration map for 2025

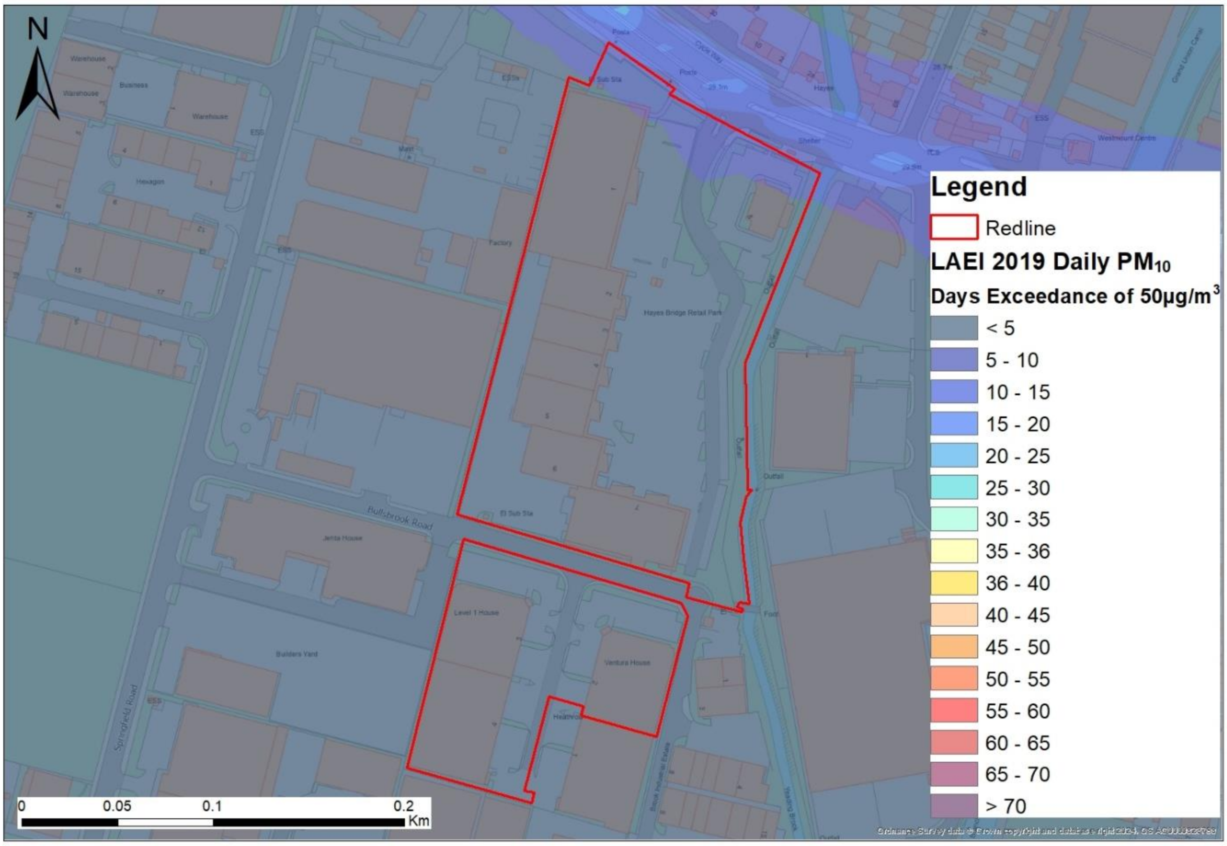

Figure 4-9: Daily PM_{10} concentration exceedance map for 2019

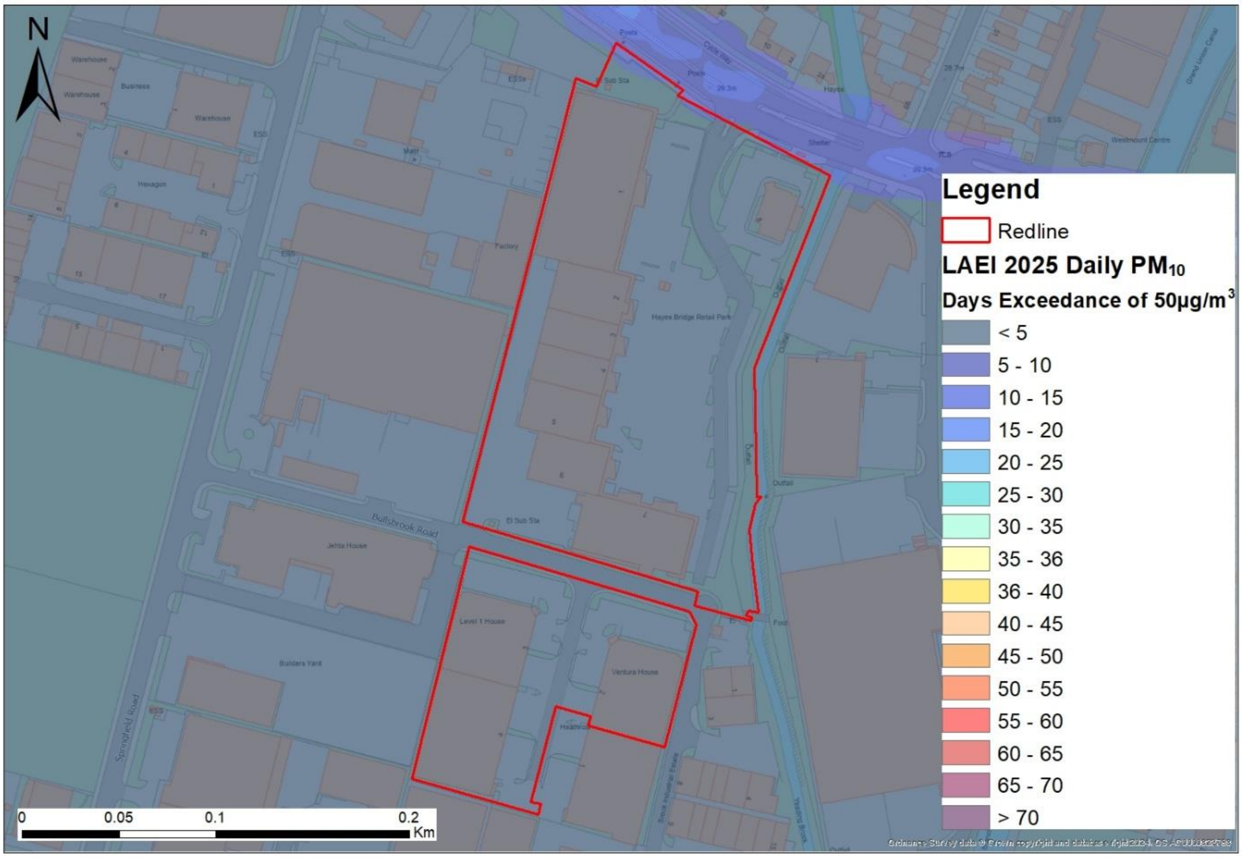

Figure 4-10: Daily PM_{10} concentration exceedance map for 2025

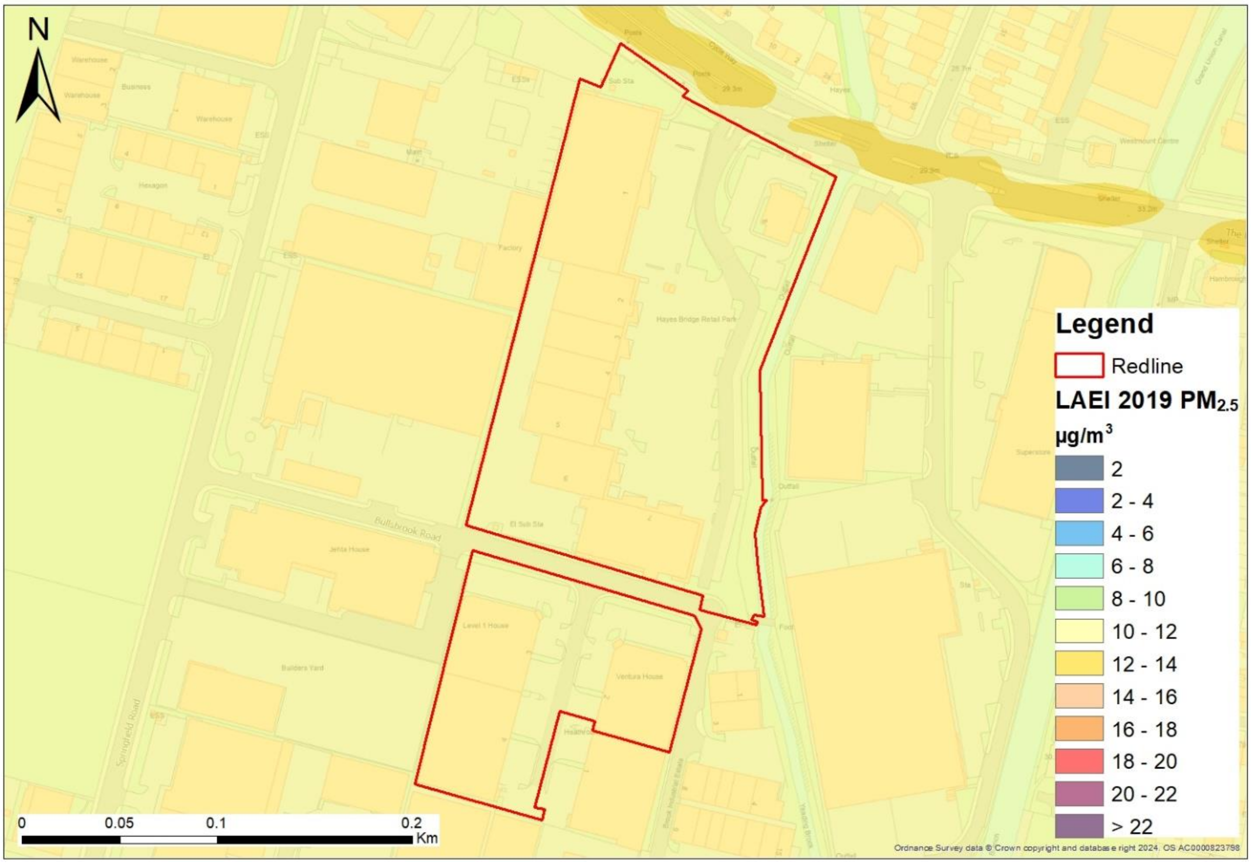

Figure 4-11: LAEI $PM_{2.5}$ concentration map for 2019

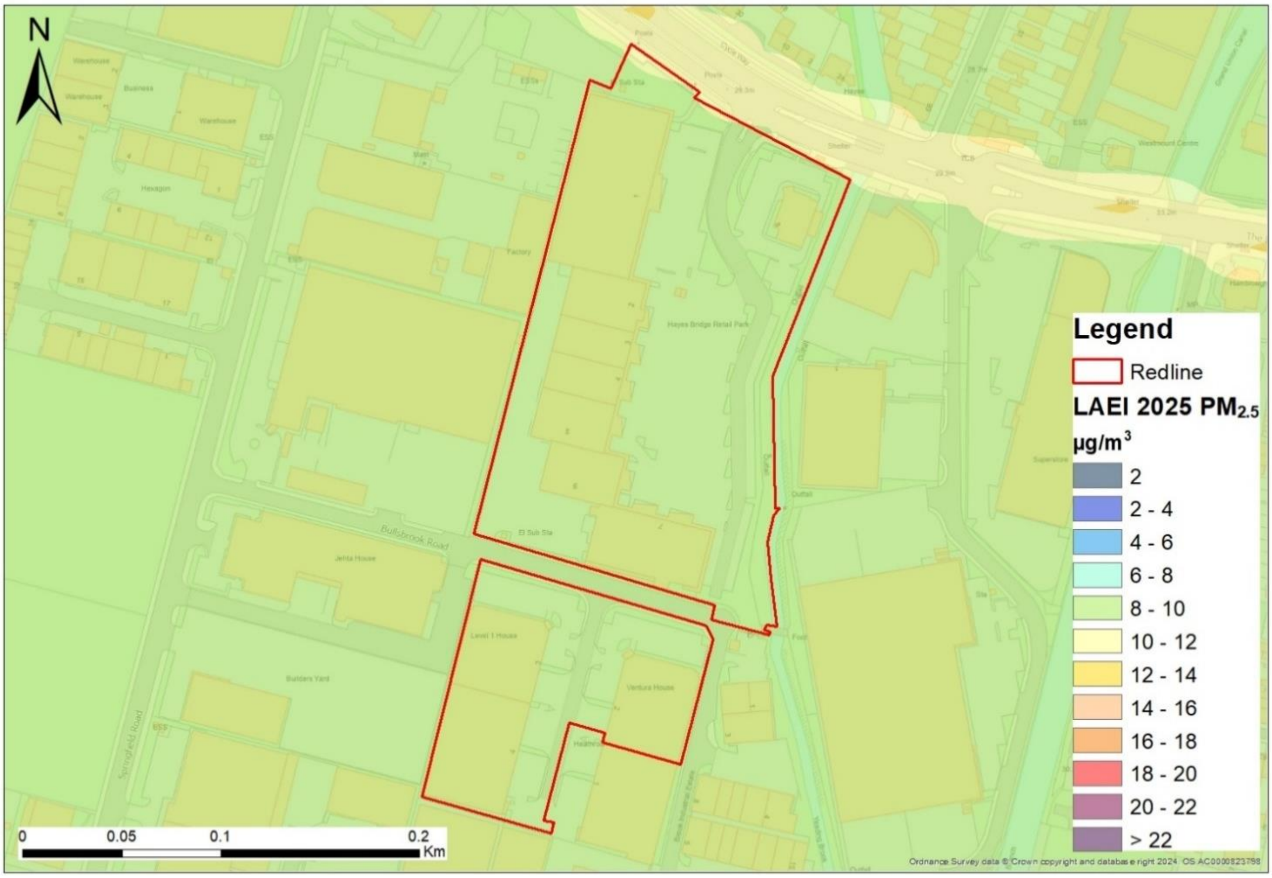

Figure 4-12: LAEI $PM_{2.5}$ concentration map for 2025

4.5 Local Traffic Data

The presence of any heavily trafficked roads, with emissions that could give rise to significantly higher concentrations of pollutants (e.g., NO_2), may cause unacceptably high exposure for users of the new development. The emissions from roads in the area are assumed to be represented in the background concentrations used.

As the A42020 is located to the north, emissions from road traffic are expected to have a significant influence on concentrations at the Site, particular in the areas of the Site closest to the road. The emissions from roads in the area are assumed to be represented in the LAEI background concentrations.

There is an electrified railway line located approximately 0.7km to the south of the Site and a diesel local siding that terminates at the industrial site is at the same location. Due to the distances of these lines, associated rail emissions are not expected to have a significant impact on concentrations at the Site and are also assumed to be included in the Defra background concentrations.

4.6 Sensitive Receptors

Sensitive receptors near the development were identified with reference to mapping data. The Site is located within an urbanised area. There are several properties surrounding the Site including both, commercial, but also residential properties. Commercial properties include, but are not limited to, Veetec Motor Group, Mak's MOT Centre, the Carpet Centre, Wealmoor Ltd food service, and Siras Cash & Carry Supermarket. There is therefore the potential for a high number of highly sensitive receptors to be located in the vicinity of the Site. Receptor locations have been included in the modelling assessment to cover the anticipated worst-case locations, as detailed further in Section 4.0.

Defra MAGIC mapping[54] has been reviewed to determine the presence of any sensitive ecological sites[55]. There are no designated ecological receptors within 1 km of the site boundary. Yeading Meadows, a local nature reserve (LNR), is located approximately 1.6km north-west of the Proposed Development, illustrated in Figure 4-13.

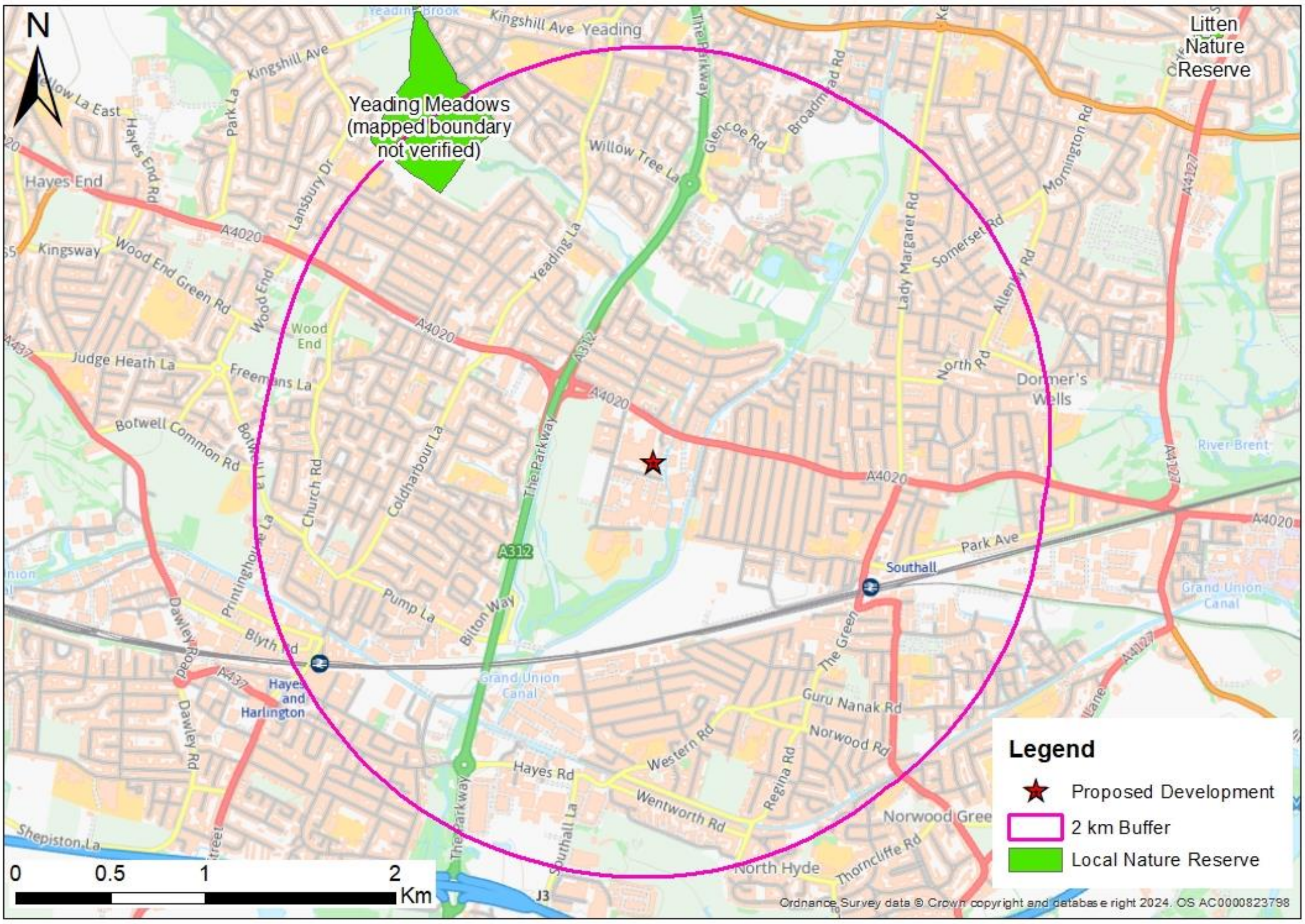

Figure 4-13: Sensitive Ecological Sites

4.7 Future Baseline

The Proposed Development is currently located within the Central London Ultra Low Emission Zone (ULEZ). On 25 October 2021, the ULEZ expanded from Central London to create a single, larger zone up to, but not including the North Circular Road (A406) and South Circular Road (A205). From August 2023, the ULEZ expanded to include all London boroughs.

Transport for London (TfL) report[56] that since the launch of the Ultra-Low Emission Zone (ULEZ) in 2019 has helped reduce some harmful pollutants in central London by almost half by cutting the number of older more polluting vehicles on the roads and contributing to a 44% reduction in roadside nitrogen dioxide within its boundaries. There are many areas outside of central London where concentrations of airborne pollutants are over the legal limits. TfL have therefore expanded the ULEZ to help improve air quality for millions more Londoners, which will further consolidate the improvement delivered within the Central ULEZ.

The London Air Quality Map on the Mayor of London website[57] shows projected levels for 2025 following the

---

[54] Department for Environment, Food and Rural Affairs (Defra) (2019). MAGIC https://magic.defra.gov.uk/MagicMap.aspx

[55] Typical ecological receptors of significance include Special Conservation Areas (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs), RAMSAR sites, Local Nature Reserves with dust sensitive features.

[56] Transport for London (TfL) Air Quality, https://tfl.gov.uk/corporate/about-tfl/air-quality

[57] Mayor of London / London Assembly, Air Quality Data, London Air Quality Map https://data.london.gov.uk/air-quality/

Mayor's actions set out in the London Environment Strategy[58]. This has been reproduced as Figure 4-14for the area of the Proposed Development. It can be seen that modelled NO_2 concentrations for most of the Proposed Development site is expected to range between 20 µg/m^3 and 25 µg/m^3.

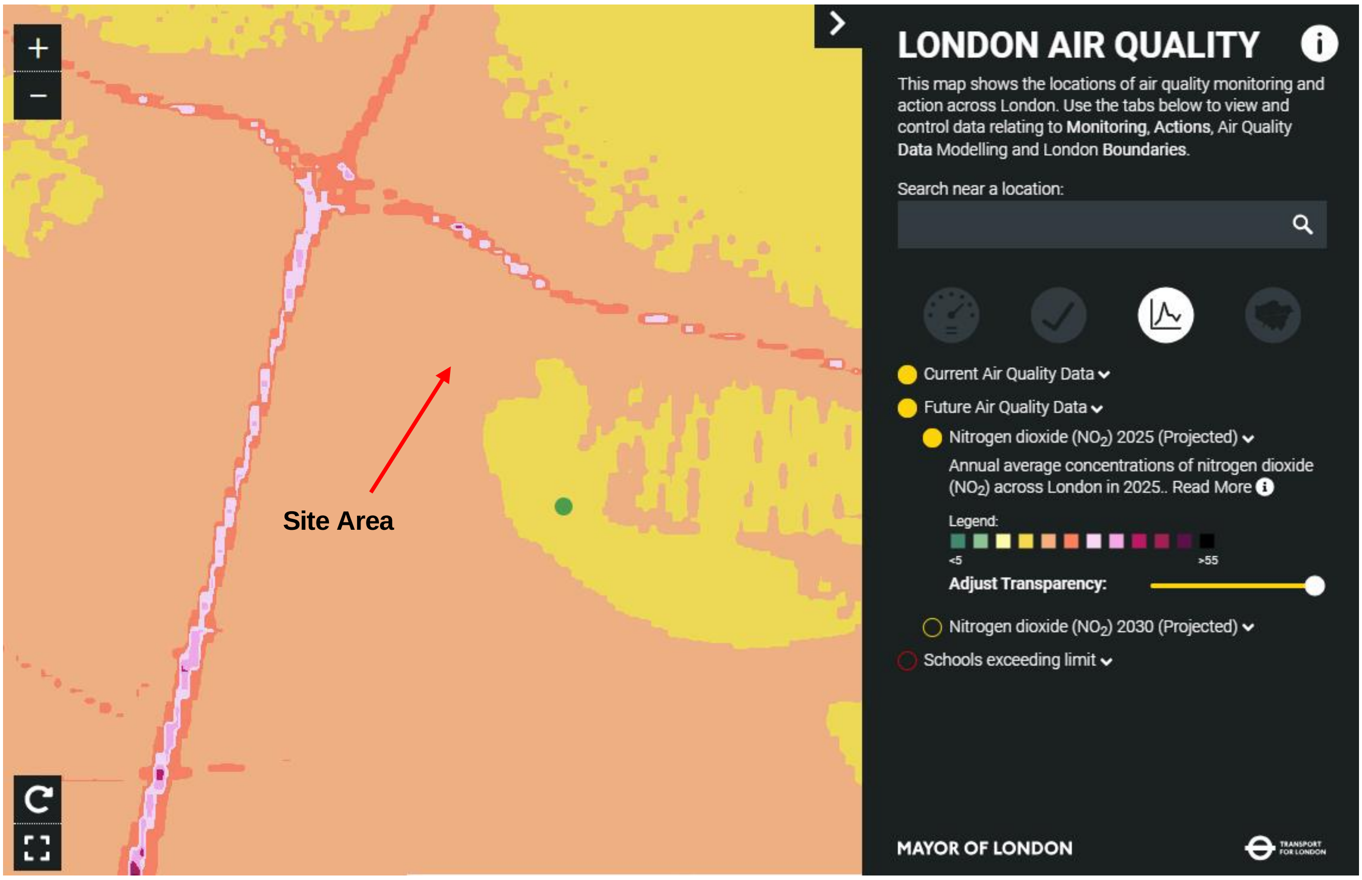

Figure 4-14: 2025 Projected Nitrogen Dioxide (NO_2)

[58] Mayor of London / London Assembly, London Environment Strategy, https://www.london.gov.uk/what-we-do/environment/london-environment-strategy

5.0

Construction Dust Risk Assessment

5.0 Construction Dust Risk Assessment

5.1 IAQM Construction Assessment Methodology

Screening (Step 1)

As ‘human receptors’ were identified within 250 m of the boundary of the site; and within 50 m of the route(s) to be used by construction vehicles on the public highway, up to 250 m from the site entrance, a detailed risk assessment was undertaken.

Dust Emission (Step 2A)

The potential dust emission magnitude for different activities have been defined based on the criteria listed in Table 5-1.

Stage	Description	Large	Medium	Small
Demolition	Definitions for demolition are:	1. Total building volume >75,000 m^3 2. Potentially dusty construction material (e.g. concrete) 3. On-site crushing and screening 4. Demolition activities >12 m above ground level	5. Total building volume 12,000 m^3 – 75,000 m^3 6. Potentially dusty construction material (e.g. concrete) 7. Demolition activities 6 – 12 m above ground level	8. Total building volume <12,000 m^3 9. Construction material with low potential for dust release (e.g. metal cladding or timber) 10. Demolition activities <6 m above ground, demolition during wetter months
Earthworks	Earthworks will primarily involve excavating material, haulage, tipping, and stockpiling. This may also involve levelling the site and landscaping.	11. Total site area >110,000 m^2 12. Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) 13. >10 heavy earth moving vehicles active at any one-time formation of bunds >6 m in height	14. Total site area 18,000 m^2 – 110,000 m^2 15. Moderately dusty soil type (e.g. silt) 16. 5-10 heavy earth moving vehicles active at any one-time formation of bunds 3 m – 6 m in height	17. Total site area <18,000 m^2 18. Soil type with large grain size (e.g. sand) 19. <5 heavy earth moving vehicles active at any one-time formation of bunds <3 m in height

Stage	Description	Large	Medium	Small
Construction	The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s) / infrastructure, method of construction, construction materials, and duration of build.	20. Total building volume >75,000 m^3 21. On-site concrete batching and sandblasting	22. Total building volume 12,000 m^3 – 75,000 m^3 23. Potentially dusty construction material (e.g. concrete) 24. On-site concrete batching	25. Total building volume <12,000 m^3 26. Construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology, and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories.	27. >50 HDV (>3.5 tonnes) outward movements in any one day 28. Potentially dusty surface material (e.g. high clay content) 29. Unpaved road length >100 m	30. 20-50 HDV (>3.5 tonnes) outward movements in any one day 31. Moderately dusty surface material (e.g. high clay content) 32. Unpaved road length 50 m – 100 m	33. <20 HDV (>3.5 tonnes) outward movements in any one day 34. Surface material with low potential for dust release 35. Unpaved road length <50 m

Table 5-1: Potential Dust Emission Magnitude Criteria

Sensitivity of the Area (Step 2B)

The sensitivity of the area takes account of several factors:

1. The specific sensitivities of receptors in the area;
2. The proximity and number of those receptors;
3. In the case of PM_{10}, the local background concentration; and
4. Site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Table 5-2 provides guidance on the sensitivity of different types of receptor.

Description	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
Sensitivities of People to Dust Soiling Effects	1. Users can reasonably expect enjoyment of a high level of amenity 2. The appearance, aesthetics, or value of their property would be diminished by soiling 3. The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land 4. Indicative examples include dwellings, museums, and other culturally important collections, medium, and long-term car parks, and car showrooms	5. Users would expect a to enjoy a reasonable level of amenity, but would not reasonably expect a to enjoy the same level of amenity as in their home 6. The appearance, aesthetics, or value of their property could be diminished by soiling 7. The people or property wouldn't reasonably be expected a to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land 8. Indicative examples include parks and places of work	9. The enjoyment of amenity would not reasonably be expected; or 10. Property would not reasonably be expected a to be diminished in appearance, aesthetics, or value by soiling 11. There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land 12. Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks, and roads
Sensitivities of People to the Health Effects of PM_{10}	13. Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day) 14. Indicative examples include residential properties. Hospitals, schools, and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment	15. Locations where the people exposed are workers d, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). 16. Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation	17. Locations where human exposure is transient. 18. Indicative examples include public footpaths, playing fields, parks, and shopping streets

Description	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
Sensitivities of Receptors to Ecological Effects	19. Locations with an international or national designation and the designated features may be affected by dust soiling 20. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain 21. Indicative examples include a Special Area of Conservation designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings	22. Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown 23. Locations with a National designation where the features may be affected by dust deposition 24. Indicative example is a Site of Special Scientific Interest with dust sensitive features	25. Locations with a local designation where the features may be affected by dust deposition. 26. Indicative example is a local Nature Reserve with dust sensitive features

Table 5-2: Sensitivities of People to Dust Soiling Effects, Health Effects of PM_{10}, and Sensitivities of Receptors to Ecological Effects

Full details of the sensitivities of receptors are provided in the IAQM Guidance document.

Table 5-3, Table 5-4, and Table 5-5show how the sensitivity of the area has been determined for dust soiling, human-health, and ecosystem impacts respectively.

These tables take account of several factors which may influence the sensitivity of the area. The highest level of sensitivity from each table has been recorded.

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 5-3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors [d]	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors [d]	Distance from the Source (m)			
			<20	<50	<100	<250
	24-28	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 5-4: Sensitivity of the Area to Human-Health Impacts

Sensitivity of Area	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table 5-5:Sensitivity of the Area to Ecological Impact

The highest level of sensitivity from each table has been recorded. Professional judgement has been used to determine alternative sensitivity categories with consideration of additional factors, such as any pre-existing screening between the source and the receptors, the season during which the works will take place, and duration of the potential impact.

Risk of Impact Definition

The dust emission magnitude (Step 2A) was combined with the sensitivity of the area (Step 2B) to determine the risk of impact with no mitigation applied. Table 5-6 to Table 5-9 provide the method of assigning the level of risk of each activity and used to determine the level of site-specific mitigation.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible

Table 5-6 Risk of Impact – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

Table 5-7: Risk of Impact – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

Table 5-8: Risk of Impact – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

Table 5-9: Risk of Impact – Trackout

5.2 Construction Phase Impacts

5.2.1 Need for a Detailed Assessment

An assessment was undertaken as there are 'human receptors' within 250 m of the boundary of the site; and 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

5.2.2 Dust Emission Magnitude Analysis

The dust emission magnitude is based on the scale of the anticipated work and classified as Table 5-10 below. Information listed is based on indicative design information and estimations have been made based on professional judgement.

Stage	Relevant Definition	Highest Potential Dust Emission Magnitude
Demolition	▪ **Estimated** demolition volume is 12,000 m^3- 75,000 m^3 ▪ Moderately dusty demolition material (concrete, blocks, masonry) ▪ On site crushing and screening will take place ▪ Demolition activities 6-12 m above ground level	Medium
Earthworks	▪ **Estimated** site area is 18,000 m^2 - 110,000 m^2 ▪ Moderately dusty soil type (made ground 0.5-1.7 m depth, brown clayey gravelly sand with varying amounts of red brick and concrete fragments)	Medium
Construction	▪ **Estimated** total building volume is >75,000 m^3 ▪ Moderately dusty construction material (concrete, blocks, masonry)	Large
Trackout	▪ **Estimated** to be 20-50 HDV (>3.5 tonnes) outward movements in any one day ▪ Moderately dusty surface material (made ground 0.5-1.7 m depth, brown clayey gravelly sand with varying amounts of red brick and concrete fragments) ▪ Unpaved road length is **estimated** to be <50 m	Medium

Table 5-10: Determination of the potential dust emission magnitude

The highest dust emission magnitude is likely to be **large**.

5.2.3 Sensitivity of the Area

The surrounding area has a significant density of sensitive receptors, which have wide range of sensitivities to dust soiling and health effects. The numbers of these receptors likely to be affected by demolition, earthworks and construction activities during the construction phase has been assessed. The analysis involved counting receptors within each of the distance bands from the site boundary (20, 50, 100 and 250m), as illustrated in Figure 5-1. The analysis of sensitive receptors within each distance band is presented in Table 5-11.

Sensitive receptors are also susceptible to dust soiling and health effects resulting from construction vehicle trackout. It is understood that construction traffic will use Bullsbrook Road and Uxbridge Road (left turn only out of Site) to access and egress the Site. A 250m distance band has been applied accounting for sensitive receptors 50m from the construction traffic route (Figure 5-2). The analysis of sensitive receptors within each distance band is presented in Table 5-11.

Defra MAGIC mapping[54] has been reviewed to determine the presence of any sensitive ecological sites. There are no designated ecological receptors sensitive to dust within 1 km of the Site boundary and therefore the sensitivity of the area to ecological receptors is not applicable.

Potential Impact	Sensitivity of the Area		
	Description	During Demolition, Earthworks and Construction	During Trackout
Dust Soiling	Receptor sensitivity	High	High
	Number of receptors and distance from source	10-100 high sensitivity receptors 20-50 m and >1 medium sensitivity receptor <20 m from the Site boundary	1-10 high sensitivity receptors <20 m and >1 medium sensitivity receptor <20 m from the trackout boundary
	Sensitivity of the Area	**Medium**	**Medium**
Human Health	Receptor sensitivity	High	High
	Annual mean PM_{10} concentration	<24 µg/m^3	<24 µg/m^3
	Number of receptors and distance from source	10-100 high sensitivity receptors 20-50 m and 1-10 medium sensitivity receptors <20 m from the Site boundary	1-10 high sensitivity receptors <20 m and 1-10 medium sensitivity receptors <20 m from the trackout boundary
	Sensitivity of the Area	**Low**	**Low**
Ecological	Receptor sensitivity	N/A	N/A
	Number of receptors and distance from source	N/A	N/A
	Sensitivity of the Area	**N/A**	**N/A**

Table 5-11: Sensitivity of the Area Summary

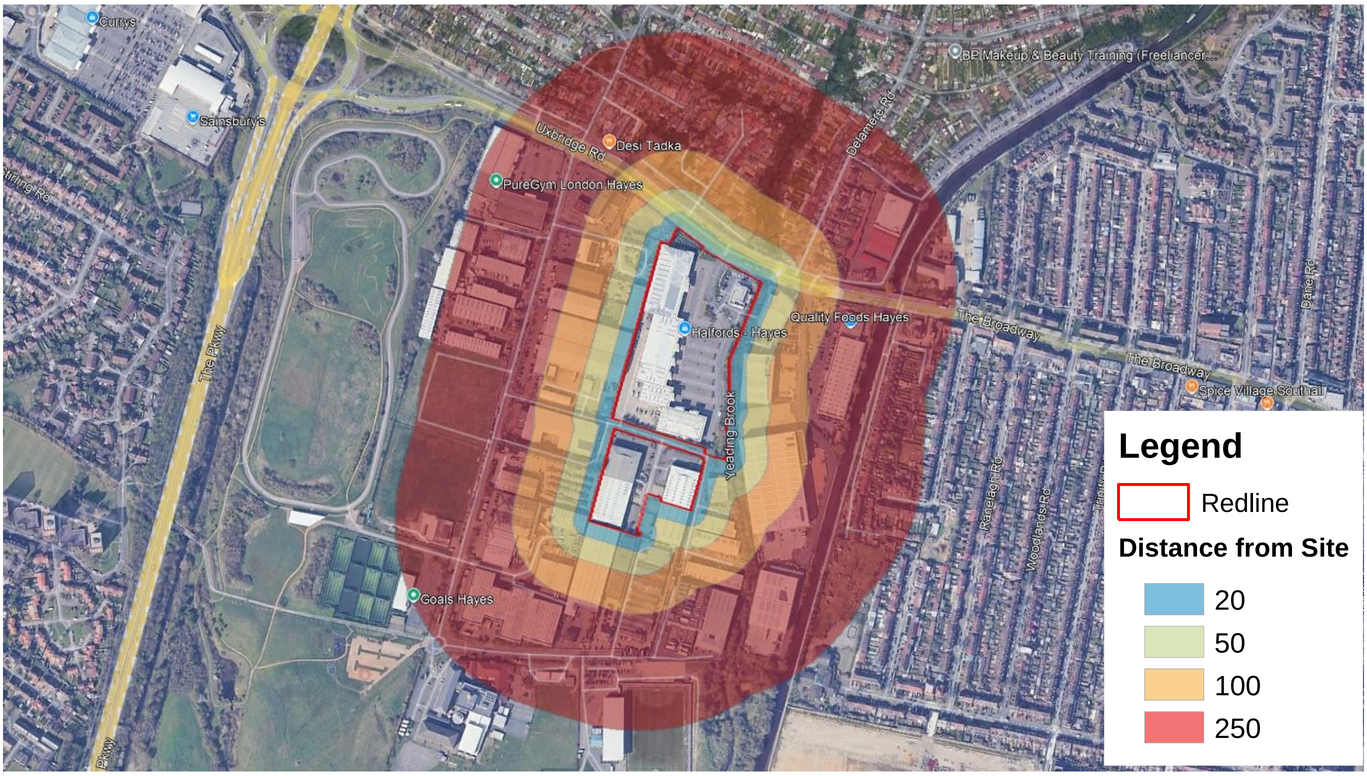

Figure 5-1: Construction Dust Buffer Zones (courtesy of Google Earth)

There are 10-100 high sensitivity receptors 20-50 m and >1 medium sensitivity receptor <20m from the Proposed Development boundary. The sensitivity of the area to dust soiling effects on people and property from earthworks and construction activities is therefore **medium**. The Defra PM_{10} background concentration in the area of the Proposed Development is <24µg/m^3. The sensitivity of the area to human health impacts from earthworks and construction activities is therefore **low**.

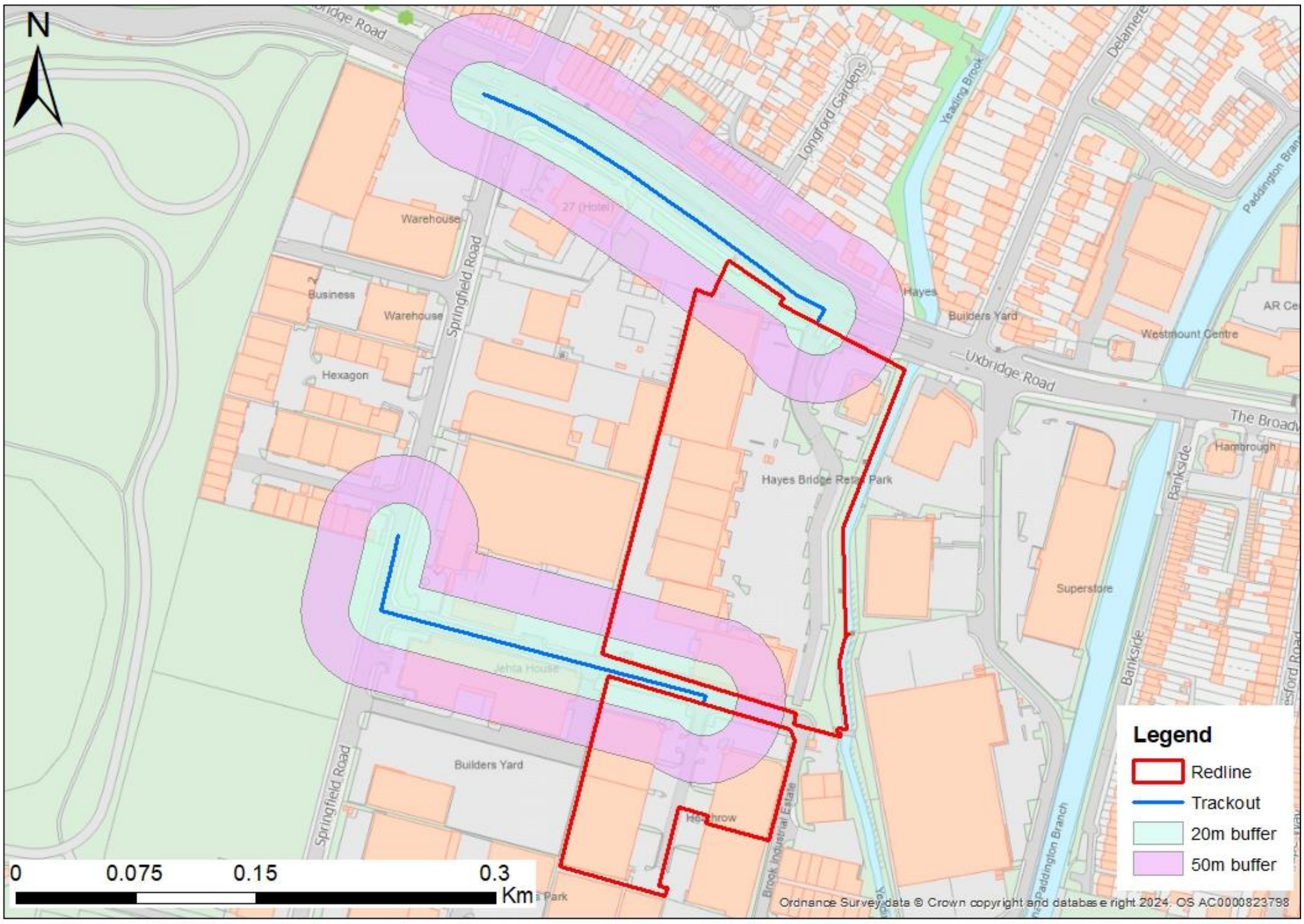

Figure 5-2: Trackout 250 m Distance Band around the Site Exit Route

There are 1-10 high sensitivity receptors <20 m and >1 medium sensitivity receptor <20 m from the Proposed Development trackout boundary (along roads used by construction traffic within 250m of the assumed site egress routes). The sensitivity of the area to dust soiling effects on people and property from trackout activities is therefore **medium**. The Defra PM_{10} background concentration in the area of the Proposed Development is <24µg/m^3. The sensitivity of the area to human health impacts for trackout activities is therefore **low**.

5.2.4 Risk of Impact

The dust emission magnitudes have been combined with the sensitivity of the area to determine the overall risk of dust impacts with no mitigation applied. The risk of impacts for dust soiling and human health for each construction activity are summarised in Table 5-12.

Potential Impact (Sensitivity of the Area)	Dust Risk (Dust Emission Category)				
	Demolition (Medium)	Earthworks (Medium)	Construction (Large)	Trackout (Medium)	Overall Risk
Dust Soiling (Medium)	Medium	Medium	Medium	Medium	Medium
Human Health (Low)	Low	Low	Low	Low	Low
Overall Risk	Medium	Medium	Medium	Medium	**Medium**

Table 5-12: Risk of Impacts

The dust impact assessment has demonstrated that the risk of dust soiling without any mitigation is medium for demolition, earthworks, construction and trackout.

The risk of adverse human health effects of PM_{10} without any mitigation is low for demolition, earthworks, construction and trackout.

The overall risk of unmitigated impacts is **medium** for demolition, earthworks, construction and trackout.

5.3 Assumptions relating to the Construction Dust Assessment

Details for demolition, earthworks, construction and trackout listed are based on indicative design information provided by the project team. Estimations/assumptions have been made where information is not available, based on our experience of similar sites and professional judgement.

The Proposed Development is to be delivered in phases. However, due to the continuous nature of the construction programme, the phases have not been considered separately within the construction phase assessment.

6.0

Operational Phase Impacts

6.0 Operational Phase Impacts

6.1 Modelling Results

6.1.1 Long-Term NO_2 Concentrations

Predicted annual mean NO_2 concentrations at the modelled receptors are presented in Table 6-1. Results are presented for two different scenarios:

- Testing scenario - all annual testing, total of 12 hours per generator
- Emergency scenario - 33 hours of continuous emergency operation (worse-case met conditions)

Process contributions (PC) relate to the contribution associated with the Proposed Development (LON 6, 7, 8). Predicted Environmental Concentrations (PEC) include the 2025 LAEI background concentrations and the cumulative impact of LON 4 and LON 5 and Bulls Bridge.

Receptor	Height (m)	Testing Scenario			Emergency Scenario		
		NO_2 Concentration (µg/m³)		Significance	NO_2 Concentration (µg/m³)		Significance
		PC	PEC		PC	PEC	
C1	1.5	0.46	24.26	Negligible	0.22	24.58	Negligible
C2	1.5	0.47	28.30	Negligible	0.23	28.65	Negligible
C3	1.5	0.37	22.05	Negligible	0.18	22.67	Negligible
C4	1.5	0.14	20.13	Negligible	0.07	20.90	Negligible
C5	1.5	0.25	20.88	Negligible	0.12	21.73	Negligible
C6	1.5	0.11	24.42	Negligible	0.05	25.15	Negligible
C7	1.5	0.09	20.01	Negligible	0.05	20.62	Negligible
C8	1.5	0.23	24.67	Negligible	0.11	25.28	Negligible
C9	1.5	0.07	20.44	Negligible	0.03	20.94	Negligible
C10	1.5	0.20	22.04	Negligible	0.10	22.29	Negligible
C11	1.5	0.11	21.79	Negligible	0.05	22.02	Negligible
C12	1.5	0.16	22.81	Negligible	0.08	23.09	Negligible
C13	1.5	0.23	22.10	Negligible	0.11	22.28	Negligible
C14	1.5	0.29	21.71	Negligible	0.14	21.93	Negligible
C15	1.5	0.30	21.77	Negligible	0.15	22.13	Negligible
C16	1.5	0.20	22.02	Negligible	0.10	22.34	Negligible
C17	1.5	0.04	19.21	Negligible	0.02	19.48	Negligible
R1	1.5	0.09	24.64	Negligible	0.05	25.15	Negligible
	4.5	0.09	24.64	Negligible	0.05	25.16	Negligible
R2	1.5	0.10	21.63	Negligible	0.05	21.95	Negligible
	4.5	0.10	21.63	Negligible	0.05	21.95	Negligible
R3	1.5	0.18	27.55	Negligible	0.09	27.88	Negligible
	4.5	0.18	27.55	Negligible	0.09	27.88	Negligible
R4	1.5	0.12	21.50	Negligible	0.06	21.81	Negligible

Receptor	Height (m)	Testing Scenario			Emergency Scenario		
		NO_2 Concentration (µg/m^3)		Significance	NO_2 Concentration (µg/m^3)		Significance
		PC	PEC		PC	PEC	
	4.5	0.12	21.50	Negligible	0.06	21.81	Negligible
R5	1.5	0.11	21.77	Negligible	0.05	21.97	Negligible
	4.5	0.11	21.77	Negligible	0.05	21.97	Negligible
R6	1.5	0.07	21.42	Negligible	0.03	21.82	Negligible
	4.5	0.07	21.42	Negligible	0.03	21.82	Negligible
R7	1.5	0.14	25.76	Negligible	0.07	26.00	Negligible
	4.5	0.14	25.76	Negligible	0.07	26.00	Negligible
R8	1.5	0.16	21.72	Negligible	0.08	21.98	Negligible
	4.5	0.16	21.72	Negligible	0.08	21.98	Negligible
R9	1.5	0.11	20.25	Negligible	0.06	20.89	Negligible
	4.5	0.11	20.25	Negligible	0.06	20.88	Negligible
R10	1.5	0.13	20.67	Negligible	0.06	21.18	Negligible
	4.5	0.13	20.67	Negligible	0.06	21.18	Negligible
R11	1.5	0.07	21.71	Negligible	0.03	22.37	Negligible
	4.5	0.07	21.71	Negligible	0.03	22.37	Negligible
R12	1.5	0.18	20.23	Negligible	0.09	20.73	Negligible
	4.5	0.18	20.23	Negligible	0.09	20.73	Negligible
R13	1.5	0.09	21.03	Negligible	0.04	21.94	Negligible
	4.5	0.09	21.03	Negligible	0.04	21.95	Negligible
R14	1.5	0.08	23.85	Negligible	0.04	24.45	Negligible
	4.5	0.08	23.85	Negligible	0.04	24.45	Negligible
	28.5	0.08	23.88	Negligible	0.04	24.63	Negligible
R15	1.5	0.06	23.82	Negligible	0.03	24.45	Negligible
	4.5	0.06	23.82	Negligible	0.03	24.45	Negligible
	28.5	0.06	23.84	Negligible	0.03	24.50	Negligible
B1	1.5	0.02	-	-	0.01	-	-
B2	1.5	0.02	-	-	0.01	-	-
B3	1.5	0.03	-	-	0.01	-	-
B4	1.5	0.02	-	-	0.01	-	-
B5	1.5	0.02	-	-	0.01	-	-
B6	1.5	0.02	-	-	0.01	-	-
B7	1.5	0.02	-	-	0.01	-	-
B8	1.5	0.09	19.71	Negligible	0.05	19.74	Negligible
B9	1.5	0.02	-	-	0.01	-	-
B10	1.5	0.03	-	-	0.01	-	-
B11	1.5	0.02	-	-	0.01	-	-

Receptor	Height (m)	Testing Scenario			Emergency Scenario		
		NO_2 Concentration (µg/m³)		Significance	NO_2 Concentration (µg/m³)		Significance
		PC	PEC		PC	PEC	
B12	1.5	0.03	-	-	0.01	-	-
B13	1.5	0.02	-	-	0.01	-	-
B14	1.5	0.03	-	-	0.01	-	-
B15	1.5	0.02	-	-	0.01	-	-
B16	1.5	0.03	-	-	0.01	-	-
B17	1.5	0.02	-	-	0.01	-	-
B18	1.5	0.02	-	-	0.01	-	-
B19	1.5	0.03	-	-	0.02	-	-
Notes: The cumulative impact PECs have not been reported for receptors B1-B7 or B9-B19 due to inconsistencies within the Phlorum report[45].							

Table 6-1: NO_2 Annual Mean Concentrations at Modelled Receptors During the Operation Phase

In the testing scenario, predicted NO_2 concentrations do not exceed the annual mean NO_2 objective (40 µg/m³), or the second WHO interim target (30 µg/m³) at any modelled receptor location. The majority of the receptor locations do exceed the WHO lowest interim target (20 µg/m³) and all receptors exceed the WHO air quality guideline (10 µg/m³). The maximum predicted NO_2 concentration is 28.30 µg/m³. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible. A contour plot illustrating the NO_2 annual mean process contribution for Proposed Development scenario is presented in Figure 6-1.

In the emergency scenario, predicted NO_2 concentrations do not exceed the annual mean NO_2 objective (40 µg/m³), or the second WHO interim target (30 µg/m³) at any modelled receptor location. All but two of the receptor locations do exceed the WHO lowest interim target (20 µg/m³) and all receptors exceed the WHO air quality guideline (10 µg/m³). The maximum predicted NO_2 concentration is 28.65 µg/m³. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible.

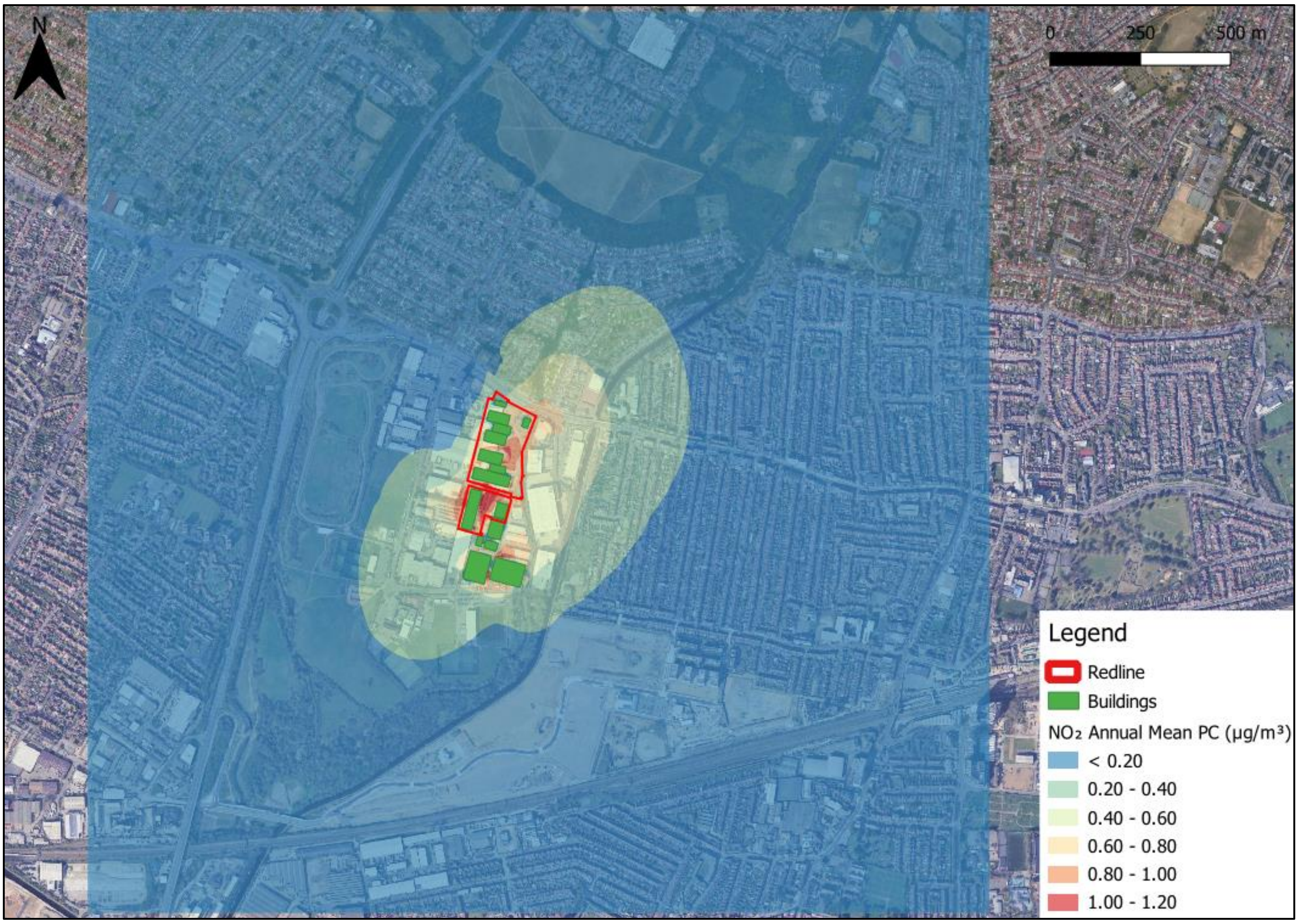

Figure 6-1: NO_2 Annual Mean Process Contribution

6.1.2 Short-Term NO_2 Concentrations

Predicted short-term NO_2 concentrations at the receptors are presented in Table 6-2.

- Testing scenarios, based on a maximum of 4 on-site generators running at any given hour.
  – 100% load (1 hour per year per generator)
  – 50% load (11 hours per year per generator)
- Emergency scenario - 33 hours of continuous emergency operation of all on-site generators (worse-case met conditions)

Process contributions (PC) relate to the contribution associated with the Proposed Development (LON 6, 7, 8). Predicted Environmental Concentrations (PEC) include the 2025 LAEI background concentrations and the cumulative impact of LON 4 and LON 5 and Bulls Bridge.

Receptor	Height (m)	Testing Scenarios						Emergency Scenario					
		100% load			50% load			First Hour (initial 20 minutes warm-up time for SCR)			Subsequent Hours (SCR fully operational)		
		NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance
		PC	PEC		PC	PEC		PC	PEC		PC	PEC	
C1	1.5	59.40	124.72	Moderate	44.51	109.83	Moderate	1098.93	1164.25	Substantial	122.10	187.43	Substantial
C2	1.5	60.71	134.08	Moderate	45.51	118.88	Moderate	1123.05	1196.42	Substantial	124.78	198.15	Substantial
C3	1.5	71.46	132.61	Moderate	53.60	114.74	Moderate	1322.07	1383.21	Substantial	146.90	208.04	Substantial
C4	1.5	71.33	129.17	Moderate	53.59	111.42	Moderate	1319.59	1377.42	Substantial	146.62	204.46	Substantial
C5	1.5	71.20	130.33	Moderate	53.47	112.60	Moderate	1317.15	1376.29	Substantial	146.35	205.49	Substantial
C6	1.5	60.35	126.87	Moderate	45.32	111.84	Moderate	1116.53	1183.05	Substantial	124.06	190.58	Substantial
C7	1.5	54.69	112.45	Moderate	41.02	98.77	Moderate	1011.80	1069.55	Substantial	112.42	170.18	Substantial
C8	1.5	54.63	121.41	Moderate	40.97	107.76	Moderate	1010.59	1077.38	Substantial	112.29	179.07	Substantial
C9	1.5	46.94	105.61	Moderate	35.21	93.87	Slight	868.48	927.14	Substantial	96.50	155.16	Moderate
C10	1.5	39.59	101.09	Slight	29.66	91.16	Slight	732.42	793.92	Substantial	81.38	142.88	Moderate
C11	1.5	29.64	90.90	Slight	22.22	83.48	Slight	548.29	609.55	Substantial	60.92	122.18	Moderate
C12	1.5	40.99	103.87	Slight	30.72	93.60	Slight	758.25	821.13	Substantial	84.25	147.13	Moderate
C13	1.5	38.32	99.70	Slight	28.71	90.10	Slight	708.84	770.23	Substantial	78.76	140.15	Moderate
C14	1.5	44.60	105.14	Moderate	33.40	93.94	Slight	825.03	885.57	Substantial	91.67	152.21	Moderate
C15	1.5	54.30	115.07	Moderate	40.72	101.50	Slight	1004.47	1065.25	Substantial	111.61	172.39	Substantial
C16	1.5	46.51	108.01	Moderate	34.85	96.35	Slight	860.38	921.88	Substantial	95.60	157.10	Moderate
C17	1.5	21.69	77.98	Slight	16.27	72.56	Negligible	401.34	457.62	Substantial	44.59	100.88	Moderate
R1	1.5	45.12	107.56	Moderate	33.85	96.30	Slight	834.64	897.09	Substantial	92.74	155.19	Moderate
	4.5	45.29	112.14	Moderate	33.98	100.83	Slight	837.89	904.74	Substantial	93.10	159.95	Moderate
R2	1.5	38.99	95.87	Slight	29.24	86.12	Slight	721.38	778.26	Substantial	80.15	137.03	Moderate
	4.5	39.04	99.82	Slight	29.28	90.05	Slight	722.33	783.11	Substantial	80.26	141.04	Moderate
R3	1.5	56.36	128.37	Moderate	42.25	114.26	Moderate	1042.62	1114.63	Substantial	115.85	187.86	Substantial
	4.5	56.54	128.55	Moderate	42.40	114.41	Moderate	1046.03	1118.04	Substantial	116.23	188.24	Substantial
R4	1.5	35.33	90.12	Slight	26.47	81.26	Slight	653.59	708.38	Substantial	72.62	127.41	Moderate
	4.5	35.34	95.83	Slight	26.48	86.97	Slight	653.82	714.30	Substantial	72.65	133.13	Moderate
R5	1.5	29.85	82.75	Slight	22.37	75.28	Slight	552.19	605.09	Substantial	61.35	114.26	Moderate
	4.5	29.85	90.95	Slight	22.37	83.47	Slight	552.20	613.30	Substantial	61.36	122.46	Moderate
R6	1.5	33.71	86.28	Slight	25.28	77.85	Slight	623.69	676.26	Substantial	69.30	121.87	Moderate
	4.5	33.73	94.30	Slight	25.29	85.86	Slight	623.99	684.56	Substantial	69.33	129.90	Moderate
R7	1.5	45.50	111.57	Moderate	34.10	100.17	Slight	841.67	907.75	Substantial	93.52	159.59	Moderate
	4.5	45.55	114.33	Moderate	34.14	102.91	Slight	842.77	911.54	Substantial	93.64	162.41	Moderate
R8	1.5	36.94	91.42	Slight	27.69	82.17	Slight	683.32	737.80	Substantial	75.92	130.40	Moderate
	4.5	37.01	97.79	Slight	27.74	88.52	Slight	684.72	745.50	Substantial	76.08	136.86	Moderate

Receptor	Height (m)	Testing Scenarios						Emergency Scenario					
		100% load			50% load			First Hour (initial 20 minutes warm-up time for SCR)			Subsequent Hours (SCR fully operational)		
		NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance
		PC	PEC		PC	PEC		PC	PEC		PC	PEC	
R9	1.5	49.57	106.43	Moderate	37.17	94.02	Slight	917.13	973.98	Substantial	101.90	158.76	Substantial
	4.5	49.62	107.37	Moderate	37.19	94.95	Slight	917.91	975.67	Substantial	101.99	159.74	Substantial
R10	1.5	52.58	108.94	Moderate	39.43	95.79	Slight	972.64	1029.00	Substantial	108.07	164.43	Substantial
	4.5	52.66	111.32	Moderate	39.49	98.15	Slight	974.18	1032.84	Substantial	108.24	166.90	Substantial
R11	1.5	39.44	95.54	Slight	29.58	85.68	Slight	729.66	785.76	Substantial	81.07	137.18	Moderate
	4.5	39.44	100.44	Slight	29.58	90.58	Slight	729.56	790.56	Substantial	81.06	142.07	Moderate
R12	1.5	51.76	102.03	Moderate	38.80	89.06	Slight	957.59	1007.85	Substantial	106.40	156.66	Substantial
	4.5	51.76	109.73	Moderate	38.79	96.76	Slight	957.57	1015.53	Substantial	106.40	164.36	Substantial
R13	1.5	52.63	109.83	Moderate	39.48	96.69	Slight	973.63	1030.83	Substantial	108.18	165.39	Substantial
	4.5	52.85	112.36	Moderate	39.65	99.16	Slight	977.82	1037.32	Substantial	108.65	168.15	Substantial
R14	1.5	43.72	107.94	Moderate	32.79	97.01	Slight	808.84	873.06	Substantial	89.87	154.09	Moderate
	4.5	43.77	109.09	Moderate	32.86	98.18	Slight	809.73	875.06	Substantial	89.97	155.29	Moderate
	28.5	50.28	115.60	Moderate	37.71	103.03	Slight	930.19	995.52	Substantial	103.35	168.68	Substantial
R15	1.5	43.40	105.82	Moderate	32.55	94.98	Slight	802.93	865.35	Substantial	89.21	151.64	Moderate
	4.5	43.42	108.74	Moderate	32.56	97.89	Slight	803.20	868.52	Substantial	89.24	154.57	Moderate
	28.5	46.09	111.41	Moderate	34.58	99.90	Slight	852.58	917.90	Substantial	94.73	160.05	Moderate
B1	1.5	20.52	-	-	15.41	-	-	379.66	-	-	42.18	-	-
B2	1.5	20.39	-	-	15.31	-	-	377.24	-	-	41.92	-	-
B3	1.5	18.72	-	-	14.06	-	-	346.36	-	-	38.48	-	-
B4	1.5	19.84	-	-	14.89	-	-	366.97	-	-	40.77	-	-
B5	1.5	16.97	-	-	12.74	-	-	313.93	-	-	34.88	-	-
B6	1.5	19.37	-	-	14.53	-	-	358.31	-	-	39.81	-	-
B7	1.5	18.67	-	-	14.00	-	-	345.47	-	-	38.39	-	-
B8	1.5	39.39	95.57	Slight	29.53	85.71	Slight	728.76	784.94	Substantial	80.97	137.15	Moderate
B9	1.5	19.72	-	-	14.80	-	-	364.86	-	-	40.54	-	-
B10	1.5	18.95	-	-	14.24	-	-	350.65	-	-	38.96	-	-
B11	1.5	21.02	-	-	15.77	-	-	388.86	-	-	43.21	-	-
B12	1.5	20.75	-	-	15.59	-	-	383.93	-	-	42.66	-	-
B13	1.5	19.25	-	-	14.46	-	-	356.12	-	-	39.57	-	-
B14	1.5	19.00	-	-	14.28	-	-	351.48	-	-	39.05	-	-
B15	1.5	22.51	-	-	16.89	-	-	416.38	-	-	46.26	-	-
B16	1.5	23.11	-	-	17.35	-	-	427.62	-	-	47.51	-	-
B17	1.5	20.18	-	-	15.15	-	-	373.31	-	-	41.48	-	-

Receptor	Height (m)	Testing Scenarios						Emergency Scenario					
		100% load			50% load			First Hour (initial 20 minutes warm-up time for SCR)			Subsequent Hours (SCR fully operational)		
		NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance	NO_2 Conc. (µg/m^3)		Significance
		PC	PEC		PC	PEC		PC	PEC		PC	PEC	
B18	1.5	19.26	-	-	14.44	-	-	356.40	-	-	39.60	-	-
B19	1.5	23.36	-	-	17.52	-	-	432.15	-	-	48.02	-	-
Notes: The cumulative impact PECs have not been reported for receptors B1-B19 due to inconsistencies within the Phlorum report[45].													

Table 6-2: NO_2 Short-Term Concentrations at Modelled Receptors During the Operation Phase - Total of 4 generators concurrently operating in testing scenario)

In the testing scenarios, predicted short-term NO_2 concentrations do not exceed the 1-hour mean NO_2 objective (200 µg/m^3). The maximum predicted short-term NO_2 concentration is 134.08 µg/m^3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations in both the 100% and 50% load testing scenarios are slight-moderate (apart from C17 in the 50% load scenario, where the impact is negligible). Due to the moderate impacts predicted in the testing scenarios reported in Table 6-2, which are based on a total of 4 generators running at a given time, results have also been presented in Table 6-3 based on a total of 3 generators running at a given time. In this scenario, the maximum predicted short-term NO_2 concentration is 118.9 µg/m^3. The impacts for the 11 hours per year per generator testing at 50% load are negligible to slight at all modelled receptors. For the once a year per generator test at 100% load, the impacts are slight-moderate (apart from C17, where the impact is negligible). It is understood that a maximum of 3 of the main generators at LON 6, 7, and 8 can be tested at any given time, with the potential for this to be undertaken alongside one life safety generator test. To reduce impacts during the testing, consideration should be made to ensure that testing of the life safety generators does not coincide with the on-site testing of the main generators.

In the emergency scenario, predicted short-term NO_2 concentrations exceed the 1-hour mean NO_2 objective (200 µg/m^3) at all receptors in the initial hour (20 minutes warm-up time for the SCR). The maximum predicted short-term NO_2 concentration is 1,383.21 µg/m^3 at C3. This is related to the first hour of emergency operation when the generators would be running unabated for the first 20 minutes before the units get to temperature to enable the SCR to become effective. In subsequent hours (SCR fully operational), predicted concentrations do not exceed the 1-hour mean NO_2 objective (200 µg/m^3), apart from C3, C4 and C5, which do slightly exceed the objective. The maximum predicted short-term NO_2 concentration is 208.04 µg/m^3 at C3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are substantial in the initial hour, and moderate-substantial in subsequent hours.

Receptor	Height (m)	Testing Scenarios					
		100% load			50% load		
		NO_2 Concentration (µg/m^3)		Significance	NO_2 Concentration (µg/m^3)		Significance
		PC	PEC		PC	PEC	
C1	1.5	44.55	109.87	Moderate	33.38	98.71	Slight
C2	1.5	45.53	118.90	Moderate	34.13	107.50	Slight
C3	1.5	53.60	114.74	Moderate	40.20	101.34	Slight
C4	1.5	53.50	111.34	Moderate	40.19	98.03	Slight
C5	1.5	53.40	112.53	Moderate	40.10	99.24	Slight
C6	1.5	45.26	111.78	Moderate	33.99	100.51	Slight
C7	1.5	41.02	98.77	Moderate	30.77	88.52	Slight

Receptor	Height (m)	Testing Scenarios					
		100% load			50% load		
		NO_2 Concentration (µg/m^3)		Significance	NO_2 Concentration (µg/m^3)		Significance
		PC	PEC		PC	PEC	
C8	1.5	40.97	107.76	Slight	30.73	97.51	Slight
C9	1.5	35.21	93.87	Slight	26.41	85.07	Slight
C10	1.5	29.69	91.19	Slight	22.25	83.75	Slight
C11	1.5	22.23	83.49	Slight	16.66	77.92	Negligible
C12	1.5	30.74	93.62	Slight	23.04	85.92	Slight
C13	1.5	28.74	90.12	Slight	21.54	82.92	Slight
C14	1.5	33.45	93.99	Slight	25.05	85.59	Slight
C15	1.5	40.72	101.50	Slight	30.54	91.32	Slight
C16	1.5	34.88	96.38	Slight	26.14	87.64	Slight
C17	1.5	16.27	72.56	Negligible	12.20	68.49	Negligible
R1	1.5	33.84	96.29	Slight	25.39	87.83	Slight
	4.5	33.97	100.82	Slight	25.49	92.34	Slight
R2	1.5	29.25	86.12	Slight	21.93	78.81	Slight
	4.5	29.28	90.06	Slight	21.96	82.74	Slight
R3	1.5	42.27	114.28	Moderate	31.69	103.70	Slight
	4.5	42.41	114.42	Moderate	31.80	103.81	Slight
R4	1.5	26.50	81.28	Slight	19.85	74.64	Negligible
	4.5	26.51	86.99	Slight	19.86	80.35	Negligible
R5	1.5	22.39	75.29	Slight	16.78	69.68	Negligible
	4.5	22.39	83.49	Slight	16.78	77.88	Negligible
R6	1.5	25.28	77.86	Slight	18.96	71.53	Negligible
	4.5	25.30	85.87	Slight	18.97	79.54	Negligible
R7	1.5	34.12	100.20	Slight	25.57	91.65	Slight
	4.5	34.17	102.94	Slight	25.60	94.38	Slight
R8	1.5	27.70	82.18	Slight	20.77	75.25	Negligible
	4.5	27.76	88.54	Slight	20.80	81.58	Negligible
R9	1.5	37.18	94.03	Slight	27.88	84.73	Slight
	4.5	37.21	94.97	Slight	27.90	85.65	Slight
R10	1.5	39.43	95.79	Slight	29.57	85.94	Slight
	4.5	39.49	98.16	Slight	29.62	88.28	Slight
R11	1.5	29.58	85.68	Slight	22.19	78.29	Slight
	4.5	29.58	90.58	Slight	22.18	83.19	Slight
R12	1.5	38.82	89.09	Slight	29.10	79.36	Slight
	4.5	38.82	96.78	Slight	29.10	87.06	Slight
R13	1.5	39.47	96.68	Slight	29.61	86.82	Slight

Receptor	Height (m)	Testing Scenarios					
		100% load			50% load		
		NO_2 Concentration (µg/m³)		Significance	NO_2 Concentration (µg/m³)		Significance
		PC	PEC		PC	PEC	
	4.5	39.64	99.15	Slight	29.74	89.25	Slight
R14	1.5	32.79	97.01	Slight	24.59	88.82	Slight
	4.5	32.83	98.15	Slight	24.64	89.97	Slight
	28.5	37.71	103.03	Slight	28.28	93.60	Slight
R15	1.5	32.55	94.97	Slight	24.41	86.84	Slight
	4.5	32.56	97.88	Slight	24.42	89.75	Slight
	28.5	34.56	99.89	Slight	25.94	91.26	Slight
B1	1.5	15.39		-	11.56		-
B2	1.5	15.29		-	11.48		-
B3	1.5	14.04		-	10.54		-
B4	1.5	14.88		-	11.17		-
B5	1.5	12.73		-	9.55		-
B6	1.5	14.53		-	10.89		-
B7	1.5	14.01		-	10.50		-
B8	1.5	29.54	85.72	Slight	22.15	78.32	Slight
B9	1.5	14.79		-	11.10		-
B10	1.5	14.22		-	10.68		-
B11	1.5	15.76		-	11.83		-
B12	1.5	15.56		-	11.70		-
B13	1.5	14.44		-	10.85		-
B14	1.5	14.25		-	10.71		-
B15	1.5	16.88		-	12.67		-
B16	1.5	17.34		-	13.01		-
B17	1.5	15.13		-	11.36		-
B18	1.5	14.45		-	10.83		-
B19	1.5	17.52		-	13.14		-
Notes: The cumulative impact PECs have not been reported for receptors B1-B19 due to inconsistencies within the Phlorum report[45].							

Table 6-3: NO_2 Short-Term Concentrations at Modelled Receptors During the Operation Phase (Total of 3 generators concurrently operating in testing scenario)

6.1.3 Particulate Matter - $PM_{2.5}$

Predicted annual mean $PM_{2.5}$ concentrations at the receptors are presented in Table 6-4. Results are presented for two different scenarios:

- Testing scenario - all annual testing, total of 12 hours per generator
- Emergency scenario - 33 hours of continuous emergency operation (worse-case met conditions)

Process contributions (PC) relate to the contribution associated with the Proposed Development (LON 6, 7, 8). Predicted Environmental Concentrations (PEC) include the 2025 LAEI background concentrations and the cumulative impact of LON 4 and LON 5.

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		$PM_{2.5}$ Concentration (µg/m³)		Significance	Significance (Hillingdon Matrix)	$PM_{2.5}$ Concentration (µg/m³)		Significance	Significance (Hillingdon Matrix)
		PC	PEC			PC	PEC		
C1	1.5	0.04	9.19	Negligible	Slight	0.02	9.29	Negligible	Slight
C2	1.5	0.04	9.56	Negligible	Slight	0.02	9.67	Negligible	Slight
C3	1.5	0.03	9.11	Negligible	Slight	0.02	9.24	Negligible	Slight
C4	1.5	0.01	8.84	Negligible	Slight	0.01	8.98	Negligible	Slight
C5	1.5	0.02	8.90	Negligible	Slight	0.01	9.05	Negligible	Slight
C6	1.5	0.01	9.79	Negligible	Slight	0.01	9.91	Negligible	Slight
C7	1.5	0.01	8.87	Negligible	Slight	<0.01	8.98	Negligible	Slight
C8	1.5	0.02	9.85	Negligible	Slight	0.01	9.98	Negligible	Slight
C9	1.5	0.01	8.89	Negligible	Slight	<0.01	8.99	Negligible	Slight
C10	1.5	0.02	8.91	Negligible	Slight	0.01	9.03	Negligible	Slight
C11	1.5	0.01	9.01	Negligible	Slight	0.01	9.11	Negligible	Slight
C12	1.5	0.01	9.08	Negligible	Slight	0.01	9.34	Negligible	Slight
C13	1.5	0.02	8.93	Negligible	Slight	0.01	9.12	Negligible	Slight
C14	1.5	0.03	8.84	Negligible	Slight	0.01	9.00	Negligible	Slight
C15	1.5	0.03	8.86	Negligible	Slight	0.01	8.96	Negligible	Slight
C16	1.5	0.02	8.91	Negligible	Slight	0.01	9.01	Negligible	Slight
C17	1.5	0.00	8.63	Negligible	Slight	<0.01	8.70	Negligible	Slight
R1	1.5	0.01	9.42	Negligible	Slight	<0.01	9.78	Negligible	Slight
	4.5	0.01	9.42	Negligible	Slight	<0.01	9.78	Negligible	Slight
R2	1.5	0.01	8.86	Negligible	Slight	<0.01	9.13	Negligible	Slight
	4.5	0.01	8.86	Negligible	Slight	<0.01	9.13	Negligible	Slight
R3	1.5	0.02	9.87	Negligible	Slight	0.01	10.24	Negligible	Slight
	4.5	0.02	9.87	Negligible	Slight	0.01	10.24	Negligible	Slight
R4	1.5	0.01	8.82	Negligible	Slight	0.01	9.03	Negligible	Slight
	4.5	0.01	8.82	Negligible	Slight	0.01	9.03	Negligible	Slight
R5	1.5	0.01	8.87	Negligible	Slight	0.01	9.03	Negligible	Slight
	4.5	0.01	8.87	Negligible	Slight	0.01	9.03	Negligible	Slight

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		$PM_{2.5}$ Concentration (μg/m³)		Significance	Significance (Hillingdon Matrix)	$PM_{2.5}$ Concentration (μg/m³)		Significance	Significance (Hillingdon Matrix)
		PC	PEC			PC	PEC		
R6	1.5	0.01	8.81	Negligible	Slight	0.00	8.99	Negligible	Slight
	4.5	0.01	8.81	Negligible	Slight	<0.01	8.99	Negligible	Slight
R7	1.5	0.01	9.68	Negligible	Slight	0.01	9.96	Negligible	Slight
	4.5	0.01	9.68	Negligible	Slight	0.01	9.96	Negligible	Slight
R8	1.5	0.01	8.87	Negligible	Slight	0.01	9.10	Negligible	Slight
	4.5	0.01	8.87	Negligible	Slight	0.01	9.10	Negligible	Slight
R9	1.5	0.01	8.90	Negligible	Slight	0.01	9.42	Negligible	Slight
	4.5	0.01	8.90	Negligible	Slight	0.01	9.43	Negligible	Slight
R10	1.5	0.01	8.92	Negligible	Slight	0.01	9.31	Negligible	Slight
	4.5	0.01	8.92	Negligible	Slight	0.01	9.31	Negligible	Slight
R11	1.5	0.01	9.23	Negligible	Slight	<0.01	9.52	Negligible	Slight
	4.5	0.01	9.23	Negligible	Slight	<0.01	9.52	Negligible	Slight
R12	1.5	0.01	8.82	Negligible	Slight	0.01	9.05	Negligible	Slight
	4.5	0.01	8.82	Negligible	Slight	0.01	9.05	Negligible	Slight
R13	1.5	0.01	8.94	Negligible	Slight	<0.01	9.29	Negligible	Slight
	4.5	0.01	8.94	Negligible	Slight	<0.01	9.29	Negligible	Slight
R14	1.5	0.01	9.16	Negligible	Slight	<0.01	9.50	Negligible	Slight
	4.5	0.01	9.16	Negligible	Slight	<0.01	9.51	Negligible	Slight
	28.5	0.01	9.16	Negligible	Slight	<0.01	9.61	Negligible	Slight
R15	1.5	0.01	9.16	Negligible	Slight	<0.01	9.42	Negligible	Slight
	4.5	0.01	9.16	Negligible	Slight	<0.01	9.42	Negligible	Slight
	28.5	0.01	9.16	Negligible	Slight	<0.01	9.46	Negligible	Slight
B1	1.5	<0.01	8.58	Negligible	Slight	<0.01	8.62	Negligible	Slight
B2	1.5	<0.01	8.58	Negligible	Slight	<0.01	8.63	Negligible	Slight
B3	1.5	<0.01	8.59	Negligible	Slight	<0.01	8.65	Negligible	Slight
B4	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.61	Negligible	Slight
B5	1.5	<0.01	8.56	Negligible	Slight	<0.01	8.59	Negligible	Slight
B6	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.61	Negligible	Slight
B7	1.5	<0.01	8.58	Negligible	Slight	<0.01	8.61	Negligible	Slight
B8	1.5	<0.01	8.70	Negligible	Slight	<0.01	8.90	Negligible	Slight
B9	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.61	Negligible	Slight
B10	1.5	<0.01	8.58	Negligible	Slight	<0.01	8.62	Negligible	Slight
B11	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.60	Negligible	Slight
B12	1.5	<0.01	8.59	Negligible	Slight	<0.01	8.64	Negligible	Slight

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		$PM_{2.5}$ Concentration (µg/m³)		Significance	Significance (Hillingdon Matrix)	$PM_{2.5}$ Concentration (µg/m³)		Significance	Significance (Hillingdon Matrix)
		PC	PEC			PC	PEC		
B13	1.5	<0.01	8.61	Negligible	Slight	<0.01	8.67	Negligible	Slight
B14	1.5	<0.01	8.66	Negligible	Slight	<0.01	8.73	Negligible	Slight
B15	1.5	<0.01	8.56	Negligible	Slight	<0.01	8.61	Negligible	Slight
B16	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.62	Negligible	Slight
B17	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.62	Negligible	Slight
B18	1.5	<0.01	8.57	Negligible	Slight	<0.01	8.61	Negligible	Slight
B19	1.5	<0.01	8.61	Negligible	Slight	<0.01	8.66	Negligible	Slight

Table 6-4: $PM_{2.5}$ Annual Mean Concentrations at Modelled Receptors During the Operation Phase

In the testing scenario, predicted $PM_{2.5}$ concentrations do not exceed the annual mean $PM_{2.5}$ objective (20 µg/m³). All receptor locations also do not exceed the Mayor of London target (10 µg/m³), or the lowest WHO interim target (10 µg/m³). All receptor locations do exceed the WHO air quality guideline (5 µg/m³). The maximum predicted $PM_{2.5}$ concentration is 9.87 µg/m³. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible. In line with the Hillingdon Council matrix, impacts at all modelled receptor locations are slight. As the background concentrations of $PM_{2.5}$ are between 8 to 10 µg/m³, even though the process contributions are well below 0.2 µg/m³ (maximum of 0.04 µg/m³), in accordance with Hillingdon Council matrix, the lowest predicted impact is slight. A contour plot illustrating the $PM_{2.5}$ annual mean process contribution for the Proposed Development scenario is presented in Figure 6-2.

In the emergency scenario, predicted $PM_{2.5}$ concentrations do not exceed the annual mean $PM_{2.5}$ objective (20 µg/m³). All receptor locations apart from R3 (1.5 m and 4.5 m heights) also do not exceed the Mayor of London target (10 µg/m³), or the lowest WHO interim target (10 µg/m³). All receptor locations do exceed the WHO air quality guideline (5 µg/m³). The maximum predicted $PM_{2.5}$ concentration is 10.24 µg/m³. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible. In line with the Hillingdon Council matrix, impacts at all modelled receptor locations are slight.

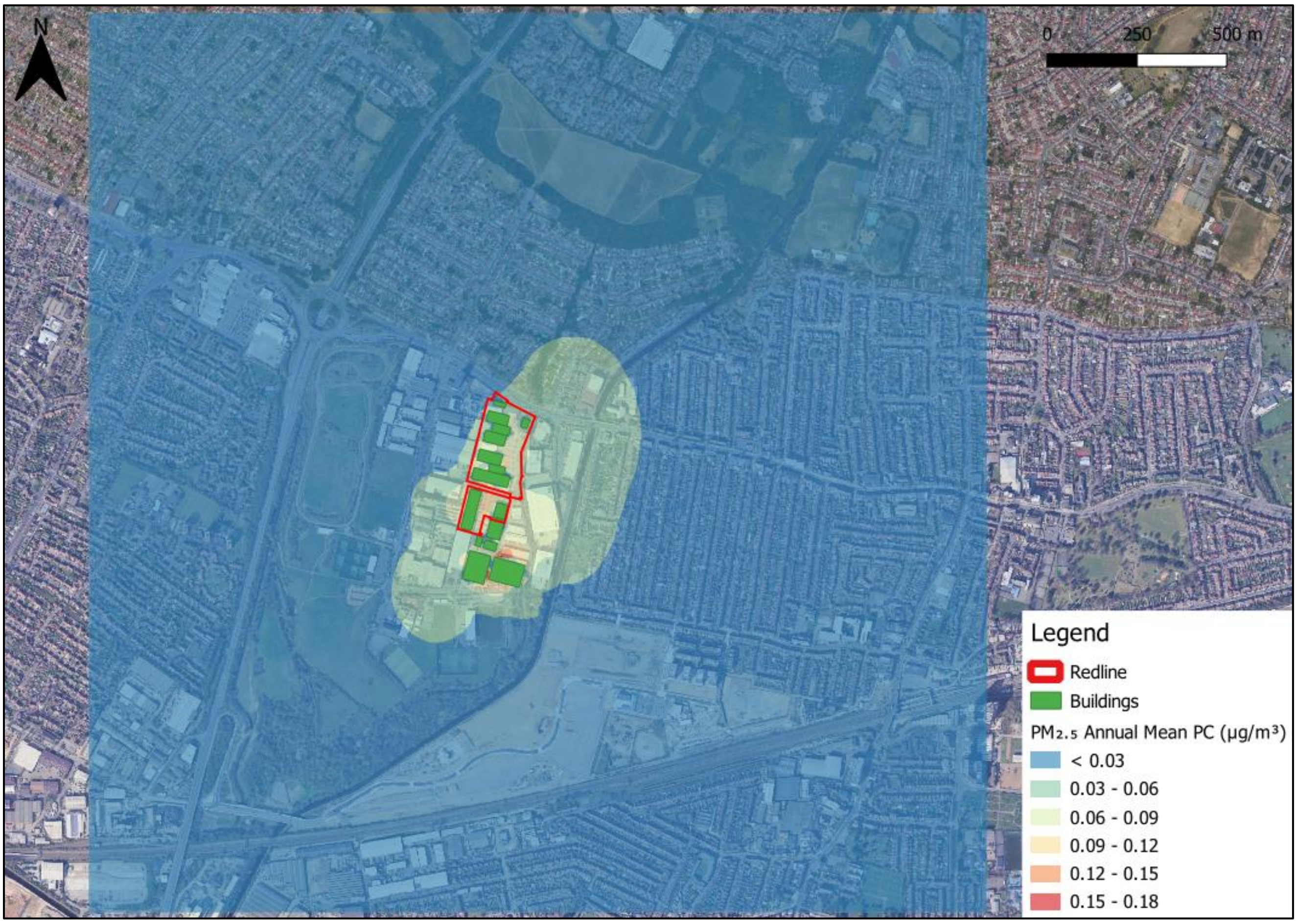

Figure 6-2: $PM_{2.5}$ Annual Mean Process Contribution

6.1.4 Particulate Matter - PM_{10}

Predicted PM_{10} concentrations at the receptors are presented in Table 6-5. Results are presented for two different scenarios:

- Testing scenario - all annual testing, total of 12 hours per generator
- Emergency scenario - 33 hours of continuous emergency operation (worse-case met conditions)

Process contributions (PC) relate to the contribution associated with the Proposed Development (LON 6, 7, 8). Predicted Environmental Concentrations (PEC) include 2025 LAEI background concentrations and the cumulative impact of LON 4 and LON 5.

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		PM_{10} Concentration (µg/m^3)		Significance	Days of exceedance of the 24hr mean (50 µg/m^3)	PM_{10} Concentration (µg/m^3)		Significance	Days of exceedance of the 24hr mean (50 µg/m^3)
		PC	PEC			PC	PEC		
C1	1.5	0.04	17.00	Negligible	1	0.02	17.09	Negligible	1
C2	1.5	0.04	18.65	Negligible	2	0.02	18.75	Negligible	2
C3	1.5	0.03	16.70	Negligible	1	0.02	16.83	Negligible	1
C4	1.5	0.01	15.42	Negligible	0	0.01	15.56	Negligible	0
C5	1.5	0.02	15.75	Negligible	0	0.01	15.89	Negligible	0
C6	1.5	0.01	19.58	Negligible	3	0.01	19.70	Negligible	3
C7	1.5	0.01	15.55	Negligible	0	0.00	15.66	Negligible	0
C8	1.5	0.02	20.22	Negligible	4	0.01	20.35	Negligible	4
C9	1.5	0.01	15.74	Negligible	0	0.00	15.83	Negligible	0
C10	1.5	0.02	15.79	Negligible	0	0.01	15.90	Negligible	0
C11	1.5	0.01	16.26	Negligible	0	0.01	16.35	Negligible	0
C12	1.5	0.01	16.59	Negligible	1	0.01	16.86	Negligible	1
C13	1.5	0.02	15.93	Negligible	0	0.01	16.11	Negligible	0
C14	1.5	0.03	15.53	Negligible	0	0.01	15.68	Negligible	0
C15	1.5	0.03	15.64	Negligible	0	0.01	15.75	Negligible	0
C16	1.5	0.02	15.78	Negligible	0	0.01	15.88	Negligible	0
C17	1.5	0.00	14.79	Negligible	0	0.00	14.87	Negligible	0
R1	1.5	0.01	18.18	Negligible	2	0.00	18.54	Negligible	2
	4.5	0.01	18.18	Negligible	2	0.00	18.54	Negligible	2
R2	1.5	0.01	15.64	Negligible	0	0.00	15.91	Negligible	0
	4.5	0.01	15.64	Negligible	0	0.00	15.91	Negligible	0
R3	1.5	0.02	19.93	Negligible	3	0.01	20.30	Negligible	4
	4.5	0.02	19.93	Negligible	3	0.01	20.30	Negligible	4
R4	1.5	0.01	15.47	Negligible	0	0.01	15.68	Negligible	0
	4.5	0.01	15.47	Negligible	0	0.01	15.68	Negligible	0
R5	1.5	0.01	15.64	Negligible	0	0.01	15.80	Negligible	0
	4.5	0.01	15.64	Negligible	0	0.01	15.80	Negligible	0

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		PM_{10} Concentration (µg/m³)		Significance	Days of exceedance of the 24hr mean (50 µg/m³)	PM_{10} Concentration (µg/m³)		Significance	Days of exceedance of the 24hr mean (50 µg/m³)
		PC	PEC			PC	PEC		
R6	1.5	0.01	15.46	Negligible	0	<0.01	15.63	Negligible	0
	4.5	0.01	15.46	Negligible	0	<0.01	15.63	Negligible	0
R7	1.5	0.01	19.32	Negligible	3	0.01	19.60	Negligible	3
	4.5	0.01	19.32	Negligible	3	0.01	19.60	Negligible	3
R8	1.5	0.01	15.65	Negligible	0	0.01	15.88	Negligible	0
	4.5	0.01	15.65	Negligible	0	0.01	15.88	Negligible	0
R9	1.5	0.01	15.59	Negligible	0	0.01	16.10	Negligible	0
	4.5	0.01	15.59	Negligible	0	0.01	16.11	Negligible	0
R10	1.5	0.01	15.76	Negligible	0	0.01	16.15	Negligible	0
	4.5	0.01	15.76	Negligible	0	0.01	16.15	Negligible	0
R11	1.5	0.01	17.09	Negligible	1	<0.01	17.37	Negligible	1
	4.5	0.01	17.09	Negligible	1	<0.01	17.37	Negligible	1
R12	1.5	0.01	15.41	Negligible	0	0.01	15.64	Negligible	0
	4.5	0.01	15.41	Negligible	0	0.01	15.64	Negligible	0
R13	1.5	0.01	15.88	Negligible	0	<0.01	16.23	Negligible	0
	4.5	0.01	15.88	Negligible	0	<0.01	16.23	Negligible	0
R14	1.5	0.01	16.96	Negligible	1	<0.01	17.31	Negligible	1
	4.5	0.01	16.96	Negligible	1	<0.01	17.31	Negligible	1
	28.5	0.01	16.97	Negligible	1	<0.01	17.41	Negligible	1
R15	1.5	0.01	16.96	Negligible	1	<0.01	17.23	Negligible	1
	4.5	0.01	16.96	Negligible	1	<0.01	17.23	Negligible	1
	28.5	0.01	16.96	Negligible	1	<0.01	17.26	Negligible	1
B1	1.5	<0.01	14.56	Negligible	0	<0.01	14.60	Negligible	0
B2	1.5	<0.01	14.60	Negligible	0	<0.01	14.65	Negligible	0
B3	1.5	<0.01	14.65	Negligible	0	<0.01	14.71	Negligible	0
B4	1.5	<0.01	14.54	Negligible	0	<0.01	14.58	Negligible	0
B5	1.5	<0.01	14.44	Negligible	0	<0.01	14.47	Negligible	0
B6	1.5	<0.01	14.47	Negligible	0	<0.01	14.50	Negligible	0
B7	1.5	<0.01	14.46	Negligible	0	<0.01	14.49	Negligible	0
B8	1.5	0.01	14.83	Negligible	0	<0.01	15.02	Negligible	0
B9	1.5	<0.01	14.54	Negligible	0	<0.01	14.58	Negligible	0
B10	1.5	<0.01	14.56	Negligible	0	<0.01	14.60	Negligible	0
B11	1.5	<0.01	14.50	Negligible	0	<0.01	14.54	Negligible	0
B12	1.5	<0.01	14.65	Negligible	0	<0.01	14.70	Negligible	0
B13	1.5	<0.01	14.72	Negligible	0	<0.01	14.78	Negligible	0

Receptor	Height (m)	Testing Scenario				Emergency Scenario			
		PM_{10} Concentration (µg/m^3)		Significance	Days of exceedance of the 24hr mean (50 µg/m^3)	PM_{10} Concentration (µg/m^3)		Significance	Days of exceedance of the 24hr mean (50 µg/m^3)
		PC	PEC			PC	PEC		
B14	1.5	<0.01	15.01	Negligible	0	<0.01	15.08	Negligible	0
B15	1.5	<0.01	14.48	Negligible	0	<0.01	14.52	Negligible	0
B16	1.5	<0.01	14.54	Negligible	0	<0.01	14.59	Negligible	0
B17	1.5	<0.01	14.54	Negligible	0	<0.01	14.59	Negligible	0
B18	1.5	<0.01	14.50	Negligible	0	<0.01	14.55	Negligible	0
B19	1.5	<0.01	14.72	Negligible	0	<0.01	14.77	Negligible	0

Table 6-5: PM_{10} Annual Mean Concentrations and Days of Exceedance of the 24-hour Mean at Modelled Receptors During the Operation Phase

In the testing scenario, predicted PM_{10} concentrations do not exceed the annual mean PM_{10} objective (40 µg/m^3), and all but one receptor (C8) also does not exceed the lowest WHO interim target (20 µg/m^3). The majority of receptor locations do exceed the WHO air quality guideline (15 µg/m^3). The maximum predicted PM_{10} concentration is 20.22 µg/m^3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible. A contour plot illustrating the PM_{10} annual mean process contribution for the Proposed Development scenario is presented in Figure 6-3. The number of exceedances of the 24-hour mean objective (50 µg/m^3) was predicted to be a maximum of 4 days, which is well below the permissible 35 days.

In the emergency scenario, predicted PM_{10} concentrations do not exceed the annual mean PM_{10} objective (40 µg/m^3), and all but three receptors (C8, R3 (1.5 m and 4.5 m heights) also do not exceed the lowest WHO interim target (20 µg/m^3). The majority of receptor locations do exceed the WHO air quality guideline (15 µg/m^3). The maximum predicted PM_{10} concentration is 20.35 µg/m^3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible. The number of exceedances of the 24-hour mean objective (50 µg/m^3) was predicted to be a maximum of 4 days, which is well below the permissible 35 days.

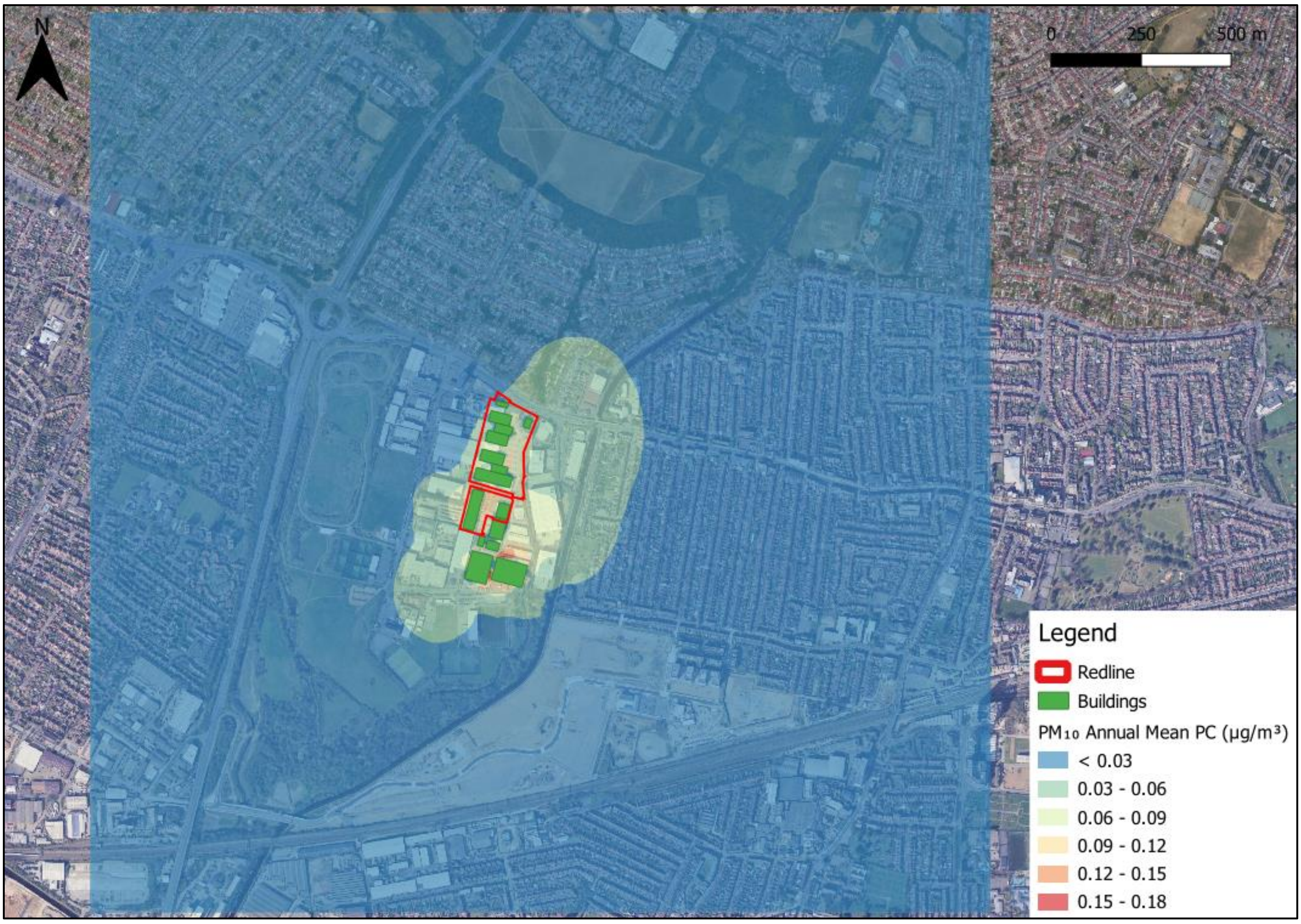

Figure 6-3: PM_{10} Annual Mean Process Contribution

7.0

Mitigation

7.0 Mitigation

7.1 Construction Phase

7.1.1 Construction Dust Mitigation Measures

The primary aim of the dust risk assessment is to identify the appropriate site-specific mitigation measures that will be adopted to ensure there will be no significant effect on local amenity and public health. Full details of mitigation measures are presented in the following tables and have been selected based on the findings of the construction dust assessment (Section 5).

Key to tables:

H Highly recommended

D Desirable

N Not required

Mitigation for all sites: Communications	Medium Risk
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	H
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H
3. Display the head or regional office contact information.	H
4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	H
Site Management	
5. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H
6. Make the complaints log available to the local authority when asked.	H
7. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	H
8. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	N
Monitoring	
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	D
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	H
11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H

Mitigation for all sites: Communications	Medium Risk
12. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	H
Preparing and maintaining the site	
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	H
16. Avoid site runoff of water or mud.	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	H
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	H
19. Cover, seed or fence stockpiles to prevent wind whipping.	H
Operating vehicle/machinery and sustainable travel	
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	H
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H
22. Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	H
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	D
Operations	
26. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate	H
28. Use enclosed chutes and conveyors and covered skips.	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	H
Waste management	
31. Avoid bonfires and burning of waste materials.	H

Table 7-1: Mitigation for all sites: Communication

Measures specific to demolition	Medium Risk
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D
33. Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	H
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H
35. Bag and remove any biological debris or damp down such material before demolition.	H

Table 7-2: Measures specific to demolition

Measures specific to earthworks	Medium Risk
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	D
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	D
38. Only remove the cover in small areas during work and not all at once.	D

Table 7-3: Measures specific to earthworks

Measures specific to construction	Medium Risk
39. Avoid scabbling (roughening of concrete surfaces) if possible.	D
40. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	H
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	D
42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	D

Table 7-4: Measures specific to construction

Measures specific to trackout	Medium Risk
43. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	H
44. Avoid dry sweeping of large areas.	H
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	H
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	H
47. Record all inspections of haul routes and any subsequent action in a site log book.	H
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	H
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	H
50. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	H
51. Access gates to be located at least 10 m from receptors where possible.	H

Table 7-5: Measures specific to trackout

The Client will commit to the implementation of the best practice mitigation measures identified above during the construction phase of the development. It is anticipated that the generation of dust and harmful pollutants emissions from construction site activities will be reduced with the correct implementation of these measures. Best practice monitoring methods that may be required by local planning authority are set out in the Mayor of London SPG[28] Appendix 8.

7.1.2 Construction Dust Monitoring

As the unmitigated risk for construction medium, construction dust monitoring is likely to be required. This will need to include monitoring during a baseline period, prior to the commencement of any on-site works. London Borough of Hillingdon's Environmental Health team will need to be consulted to agree the methodology for the dust monitoring.

The required monitoring protocol is also summarised below.

Risk	Protocol
Low Risk	1. Take into account the impact of air quality and dust on occupational exposure standards to minimise worker exposure and breaches of AQO that may occur outside the site boundary, such as by visual assessment 2. Keep an accurate log of complaints from the public, and the measures taken to address any complaints
Medium Risk As for Low Risk sites PLUS	3. Determine prevailing wind direction across the site using data from a nearby weather station 4. Set up a line across the site according to the direction of the prevailing wind and operate a minimum of two automatic particulate monitors to measure PM_{10} concentrations at either end of the transect – either inside or outside the site boundary. These instruments should provide data that can be downloaded in real-time by the local authority 5. Identify which location(s) need to be monitored and set up an automatic particulate monitor at each of these to measure representative PM_{10} concentrations. These instruments should provide data that can be downloaded in real-time by the local authority 6. Supplement PM_{10} monitoring with hand-held monitors to get on-the-spot readings at selected points, such as close to sensitive receptors 7. Consider also monitoring dust deposition and soiling rate as these can be used to indicate nuisance
High Risk As for Medium Risk sites PLUS	8. Set up a weather station on-site to measure local wind direction and speed 9. Carry out a visual inspection of site activities, dust controls and site conditions and record in a daily dust log; 10. Identify a responsible trained person on-site for dust monitoring who can access real-time PM_{10} data from automatic monitors (e.g., at hourly, or 15-minute intervals). Ensure that adequate quality assurance/quality control is in place 11. Agree a procedure to notify the local authority, so that immediate, and appropriate measures can be put in place to rectify any problem. Alert mechanisms could include email, texts, or alarm systems

Table 7-6: Monitoring Protocol

7.1.3 Dust Management Plan

Measures to control emissions during the construction phase are to be included in an Air Quality and Dust Management Plan (AQDMP) or form part of a Construction Environmental Management Plan (CEMP) and a Construction Logistics Plan which conform to the requirements of London Borough of Hillingdon's planning requirements, the London Plan and the Control of Dust and Emissions during Construction and Demolition SPG[26]. will be submitted in support of the Planning Application. The AQDMP should be approved by London Borough of Hillingdon's Planning Authority and the measures and monitoring protocols are to be implemented throughout the construction phase.

7.1.4 Non-Road Mobile Machinery (NRMM)

From 1st January 2025, developers and contractors of sites within Greater London should ensure all Non-Road Mobile Machinery (NRMM) meet compliance with EU Stage IV as a minimum. Construction site operators have the following requirements:

- Review their NRMM register
- Ensure that all registered NRMM complies with the required standards
- Continue to log all NRMM between 37kW – 560kWFurther information is provided on Mayor of London, London Assembly website[59].

7.2 Operation

The assessment has demonstrated that the overall air quality effect of the completed and operational Proposed Development with regards to generators emissions will be not significant. It is anticipated that the impact of the operation phase on existing receptors is likely to be negligible, and therefore no mitigation measures are required.

The following inherent mitigation in included as part of the design.

- Fresh air ventilation will be the minimum required for data hall processes. The associated minor office type areas will have supply ventilation with heat recovery. WCs will have extract ventilation to avoid odour build up.
- Filtration is not required to meet national air quality objectives but would further improve conditions to meet the more aspirational World Health Organisation (WHO) targets. Specific filtration on Air Handling Units may be required to safeguard sensitive electronic equipment, which will have beneficial impacts on indoor environmental quality.
- The diesel generator flues will terminate above roof level (41.6 m, 46.6 m, 56 m or 40.2 m above ground) to maximise dispersion. Dispersion modelling has demonstrated that operation of the generators associated with the routine testing and maintenance will not present a significant impact to nearby sensitive receptors. Therefore, no further mitigation is required subject to a control over the maximum hours of use of the generators.

[59] Mayor of London, London Assembly, Non-road Mobile Machinery (NRMM), https://www.london.gov.uk/programmes-and-strategies/environment-and-climate-change/pollution-and-air-quality/nrmm

8.0

References

8.0 References

AEA Energy & Environment (2008) Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective, A report produced for the Department for Environment, Food and Rural Affairs, the Scottish Government, the Welsh Assembly Government and the Department of the Environment in Northern Ireland, Issue 1, May 2008, ref: AEAT/ENV/R/2641, https://laqm.defra.gov.uk/documents/NO2relationship_report.pdf

Air Quality Consultants / Environ (2014) Air Quality Neutral Planning Support Update: GLA 80371, April 2014 https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=226d8d5e-d7e9-40e1-bf0d-85c4554496da

Department for Environment, Food and Rural Affairs (Defra) / Greater London Authority (2021). Covid-19: Supplementary Guidance, Local Air Quality Management Reporting in 2021, April 2021, Version 1.0, https://laqm.defra.gov.uk/supporting-guidance.html

Department for Environment, Food and Rural Affairs (Defra) (2022). Local Air Quality Management Policy Guidance (PG22). https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-Policy-Guidance-2022.pdf

Department for Environment, Food and Rural Affairs (Defra) (2022). Local Air Quality Management Technical Guidance (TG22) https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

Department for Environment Food & Rural Affairs (Defra) UK Air Information Resource (UK AIR), National air quality objectives, https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

Department for Environment, Food and Rural Affairs (Defra) (2019). The Clean Air Quality Strategy. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

Department for Environment, Food and Rural Affairs (Defra) (2019) Interactive monitoring networks map, https://uk-air.defra.gov.uk/interactive-map

Department for Environment, Food and Rural Affairs (Defra) (2019) Background Mapping data for local authorities (http://uk-air.defra.gov.uk/data/laqm-background-home).

Department for Environment, Food and Rural Affairs (Defra) (2019). MAGIC https://magic.defra.gov.uk/

Department for Environment, Food and Rural Affairs (Defra). Department for Transport (DfT) (2017). UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations. July 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633269/air-quality-plan-overview.pdf

Department for Environment, Food and Rural Affairs (Defra) (2012) UK Pollutant Release and Transfer Register (PRTR) data sets https://www.gov.uk/guidance/uk-pollutant-release-and-transfer-register-prtr-data-sets

Department for Environment, Food and Rural Affairs (Defra) (2009) Guidance on Assessing Emissions from Railway Locomotives, 10th February 2009, https://laqm.defra.gov.uk/documents/Railway_Locomotives_100209.pdf

Department for Transport, Road traffic statistics https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints

Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Environment Agency, Pollution Inventory https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory

The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390

Environmental Protection UK (EPUK)/ Institute of Air Quality Management (IAQM), (2017) Land-Use Planning & Development Control: Planning for Air Quality https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

HMSO (2021) Environment Act 2021, November 2021, https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

HMSO (1990) Environmental Protection Act 1990, Chapter 43, Part III Statutory Nuisances and Clean Air https://www.legislation.gov.uk/ukpga/1990/43/part/III

HMSO (1995). 'The Environment Act', Chapter 25, Part IV Air Quality London: HMSO.

HMSO (2016). Statutory Instrument 2016 No. 1184, Environmental Protection, England, The Air Quality Standards (Amendment) Regulations 2016, London: HMSO, https://www.legislation.gov.uk/uksi/2016/1184/contents/made

HMSO (2010). Statutory Instrument 2010 No. 1001, The Air Quality Standards Regulations 2010, London: HMSO.

Institute of Air Quality Management (IAQM) (2021), Indoor Air Quality Guidance: Assessment, Monitoring, Modelling and Mitigation, version 1.0, September 2021, https://iaqm.co.uk/wp-content/uploads/2013/02/iaqm_indoorairquality.pdf

Institute of Air Quality Management (IAQM) (2020) A guide to the assessment of air quality impacts on designated nature conservation sites, version 1.1, May 2020, https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf

Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction, August 2023 (Version 2.2) https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf

The London Air Pollution Planning and the Local Environment (APPLE) working group (2007) London Councils Air Quality and Planning Guidance, revised version January 2007 https://www.londoncouncils.gov.uk/our-key-themes/environment/air-quality/london-councils-air-quality-and-planning-guidance

Mayor of London (2023) Air Quality Neutral London Planning Guidance, 8th February 2023. https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance

Major of London (2021) The London Plan, The Spatial Development Strategy for Greater London, March 2021 https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf

Mayor of London (2019) London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf

Mayor of London (2019) London Local Air Quality Management (LLAQM), Policy Guidance 2019 (LLAQM.PG (19)), Pursuant to Part IV of the Environment Act 1995, https://www.london.gov.uk/sites/default/files/llaqm_policy_guidance_2019.pdf

Major of London (2019) The London Plan, Intend to Publish (clean version) Spatial Development Strategy for Greater London, December 2019 https://www.london.gov.uk/sites/default/files/intend_to_publish_-_clean.pdf

Mayor of London, Mayor's Transport Strategy, March 2018 https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf

Mayor of London (2018) London Environment Strategy, May 2018 https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf

Major of London (2016) The London Plan, Spatial Development Strategy for London Consolidated with Alterations since 2011, March 2016 https://www.london.gov.uk/sites/default/files/the_london_plan_2016_jan_2017_fix.pdf

Mayor of London (2014) Sustainable Design and Construction Supplementary Planning Guidance, London plan 2011 Implementation Framework, April 2014 https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Sustainable%20Design%20%26%20Construction%20SPG.pdf

Mayor of London (2014) The Control of Dust and Emissions during Construction and Demolition, Supplementary Planning Guidance, London Plan 2011 Implementation Framework, July 2014 https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance-and-spgs/control-dust-and

Mayor of London, London Atmospheric Emissions (LAEI) 2016 https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2016.

Mayor of London (2010) Clearing the air, The Mayor's Air Quality Strategy, December 2010 https://www.london.gov.uk/sites/default/files/air_quality_strategy_v3.pdf

Ministry of Housing, Communities & Local Government, National Planning Policy Framework, December 2024 National Planning Policy Framework

Ministry of Housing, Communities and Local Government (2019) Planning Practice Guidance: Air Quality, updated 1 November 2019 https://www.gov.uk/guidance/air-quality--3

World Health Organisation (WHO) (2021) WHO global air quality guidelines, Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide, https://apps.who.int/iris/handle/10665/345329.

9.0

Glossary

9.0 Glossary

Term/Acronym	Details
$\mu g/m^3$	Micrograms (one-millionth of a gram) per cubic metre of air
AADT	Annual average daily traffic
AQAL	Air quality assessment level
AQAP	Air quality action plan
AQMA	Air quality management area. Areas where the air quality objectives are likely to be exceeded. Declared by way of an order issued under the Section 83(1) of the Environment Act 1995.
AQO	Air quality objective. Air quality targets to be achieved locally as set out in the Air Quality Regulations 2000 and subsequent Regulations. Objectives are expressed as pollution concentrations over certain exposure periods, which should be achieved by a specific target date. Some objectives are based on long term exposure (e.g. annual averages), with some based on short term objectives. Objectives only apply where a member of the public may be exposed to pollution over the relevant averaging time.
AQS	Air quality strategy
ASR	Annual status report
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
Earthworks	The process of soil stripping, ground-levelling, excavation and landscaping.
EU	European union
Exceedance	Concentrations of a specified air pollutant greater than the appropriate Air Quality Objective.
HDV	Heavy duty vehicle
IAQM	Institute of Air Quality Management
LA	Local authority
LAQM	Local air quality management
LAQM, TG	Local air quality management technical guidance
LDV	Light duty vehicle
Limit Values / EU limit values	The maximum pollutant levels set out in the EU Daughter Directives on Air Quality. In some cases, the limit values are the same as the national air quality objective but may allow a longer period for achieving.
LT	Long-term averaging period (i.e. Annual mean)
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
PM_{10}	The fraction of particulates in air of very small size (less than 10 micrometres).
$PM_{2.5}$	Fine particles in the (ambient) air 2.5 micrometres or less in size.
Ramsar/ Ramsar site	The Convention on Wetlands of International Importance, called the Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Ramsar sites are wetlands of international importance, designated under the Ramsar Convention.
SAC/ pSAC/ cSAC	Special area of conservation / potential SAC / candidate SAC
SPA / pSPA	Special protection area / potential special protection area
SPG	Supplementary planning guidance
SSSI	Site of special scientific interest
ST	Short-term averaging period (i.e. Daily, hourly, or 15-min means)
Trackout	The transfer of dust or dirt on the local road network and then re-suspended by vehicles on the network.

Table 9-1: Glossary

Annex A – Generator Technical Specifications

Cundall Johnston & Partners LLP
4th Floor 15 Colmore Row Birmingham B3 2BH
Tel:+44 (0)121 262 2720
Asia Australia Europe MENA UK and Ireland
www.cundall.com

ZERO CARBON DESIGN 2030