6 Air Quality

6.1 Introduction

6.1.1 This chapter has been prepared by Cundall on behalf of Colt Data Centre Services.

6.1.2 LON 6, LON 7, and the Innovation Hub are to be located on the site of Hayes Bridge Retail Park with LON 8 (and the substation for which there is a separate application for full planning permission for) to be located on the site of Heathrow Interchange.

6.1.3 Cundall's Air Quality Team are all Members or Associate Members of the Institute of Air Quality Management (IAQM). The work has been managed by a team member who is also professionally chartered.

6.1.4 Any development proposal involving significant changes in the nature and location of emissions to air has the potential to impact on local air quality. Any changes to traffic volume, speed and composition, and/or installation of new industrial and/or combustion plant, have the potential to impact emissions to air, and thus ambient air quality at nearby receptors.

6.1.5 The chapter describes the baseline conditions at the Site and surrounding area, the assessment methodology, the anticipated significant environmental effects associated with the construction and operational phases (including consideration of inherent mitigation), the mitigation measures required to prevent, reduce, or offset any significant adverse residual effects, and an assessment of cumulative effects.

6.1.6 The air quality assessment has focused on the impacts of the following air pollutants:

- Nitrogen dioxide (NO_2)
- Particulate Matter of aerodynamic diameter ≤10µm (PM_{10})
- Particulate Matter of aerodynamic diameter ≤2.5µm ($PM_{2.5}$)
- Dust (as deposited dust)

6.1.7 The effects are assessed in the context of relevant national, regional and local air quality legislation, policies, and guidance.

6.1.8 Where the potential for impacts is identified, mitigation measures are proposed, as required, in order to reduce the effect of the Proposed Development to negligible, as far as reasonably practicable.

6.1.9 This chapter is supported by Appendix 6.1 of the ES which includes a screening assessment, construction dust risk assessment and methodology, construction dust mitigation measures, methodology and results of dispersion modelling of generator emissions.

6.2 Assessment Methodology

Baseline Assessment

6.2.1 The current/baseline conditions have been established by reviewing relevant air quality information that is readily available from relevant local authorities, including Annual Status Reports and historic monitoring data.

6.2.2 Existing sources of emissions and baseline air quality conditions within the study area (defined as within 2 km of the Proposed Development) have been defined using a number of approaches:

- Industrial and waste management sources that may affect the area have been identified using the Environment Agency Pollutant Inventory[1];
- Local sources have also been identified through examination of the LBH's Air Quality Annual Status Reports[2];
- Information on existing air quality has been obtained by collating the results of monitoring carried out by the LBH[2];
- Background concentrations have been defined using the national pollution maps published by Defra[3]. These cover the whole country on a 1x1 km grid; and
- The London Atmospheric Emissions Inventory (LAEI) database[4] of geographically referenced datasets of pollutant emissions and sources in Greater London.

6.2.3 These data sets have been evaluated to understand current/baseline pollutant concentrations within the study area, and the risk that any changes in air quality may cause exceedances of AQOs at these locations.

Construction Phase

Construction Dust

6.2.4 The construction works associated with the Proposed Development have the potential to generate dust, giving rise to impacts on dust soiling and human health, especially through the generation of PM_{10} and $PM_{2.5}$. The generation of dust on-site has the potential to cause adverse air quality impacts where there are human receptors within 250 m and ecological receptors within 50 m of construction works. A Construction Dust Assessment has therefore been scoped in.

6.2.5 An assessment of ecological receptors has been scoped out of the construction dust assessment as there are no sensitive ecological receptors within 50 m of the Site. The nearest is Yeading Meadows Local Nature Reserve (LNR) located 1.6 km to the north-west of the Site.

6.2.6 The potential impacts that may arise as a result of the construction activities at the Site are dust deposition, resulting in the soiling of surfaces; visible dust plumes; elevated PM_{10} concentrations as a result of dust generating activities on Site; and an increase in NO_2 and PM_{10} concentrations due to exhaust emissions from non-road mobile machinery (NRMM) and vehicles accessing the Site.

6.2.7 The impact of proposed construction work associated with the Proposed Development has been assessed in accordance with IAQM guidance. The IAQM guidance considers the potential for dust emissions from the following applicable activities:

[1] *Environment Agency, Pollution Inventory https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory*
[2] *The London Borough of Hillingdon (2024), Air Quality Annual Status Report, 2024, May 2024, The London Borough of Hillingdon*
[3] *Defra, Interactive monitoring networks map https://uk-air.defra.gov.uk/interactive-map?network=nondefraaqmon*
[4] *Mayor of London, London Atmospheric Emissions (LAEI) 2016 https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2016*

- Demolition
- Earthworks, such as soil stripping, ground levelling and, excavation
- Construction
- Trackout, i.e., incidental movement of dust and dirt from the Site onto the public road network via construction vehicles tracking out from the Site

6.2.8 For each of the potentially dust generating activity, the IAQM guidance considers three separate dust effects:

- Annoyance due to dust soiling
- The risk of health effects due to an increase in exposure to PM_{10} and $PM_{2.5}$
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects

6.2.9 The assessment involves the identification of whether each phase of on-site activity (demolition, earthworks, construction, and trackout) represents a low, medium, or high risk of causing a significant effect and then identifies suitable mitigation measures for the relevant level of risk assigned. The assessment methodology is detailed further in Section 5.1 of the Air Quality Appendix 6.1.

On-Site Exhaust Emissions

6.2.10 An assessment of non-road mobile machinery (NRMM) has been scoped out of the assessment, as it assumed that machinery will be selected to conform to the regulatory requirements outlined in the Department for Transport document on reducing emissions from NRMM[5].

6.2.11 Additionally, the use of a Construction Environmental Management Plan (CEMP) will ensure emissions generated by NRMM are controlled. It is judged that there will be no risk of significant effects at existing receptors as a result of on-site machinery emissions subject to compliance with an approved CEMP.

6.2.12 On this basis, the impacts from NRMM are not considered further in this ES chapter. However, suitable compliance requirements and mitigation measures for Site plant are presented as part of the mitigation measures based on advice presented in the IAQM documents, see Section 7 of the Air Quality Appendix.

Construction Traffic

6.2.13 Construction traffic accessing the Site during the construction period will result in a temporary increase in vehicles on the local road network. This will result in increased vehicle emissions, and the potential for trackout of dust generated from construction activities.

6.2.14 As the Site is located within an AQMA, the following criteria for screening construction traffic flows from the EPUK/IAQM land-use guidance document is applicable.

[5] 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

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

6.2.15 Due to the phased nature of the development, it is unlikely that the construction traffic will exceed the above criteria. However, should the criteria be exceeded, a detailed assessment would need to be carried out using detailed dispersion modelling.

6.2.16 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. It is therefore proposed that the details of the impact of future construction traffic will come forward with each reserved matters 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.

6.2.17 The details of the construction traffic routes are expected to be controlled through a construction environmental management plan (CEMP).

Operational Phase

Combustion Plant

6.2.18 On-site combustion plant such as boilers and generators have the potential to have an adverse impact on local air quality. Typically, any combustion plant where the NOx emission rate is less than 5 mg per sec (mg/s) is unlikely to give rise to significant effects on air quality, provided that the emissions are released from a vent or a stack in a location and at a height that provides adequate dispersion.

6.2.19 The Proposed Development includes a total of 74 back-up/life-safety generators. Given the scale of the proposed on-site generators that are required to provide standby power and the presence of nearby sensitive receptors, a detailed assessment is required. This was carried out using ADMS dispersion modelling software. The full details of the modelling methodology are presented in Section 3 of the Air Quality Appendix 6.1. A summary of this methodology if provided in the following paragraphs.

6.2.20 Emission parameters have been calculated based on technical specifications and proposed operating schedule of the on-site generators.

- Emissions have been calculated based on the use of diesel as a worst-case assessment.
- The use of selective catalytic reduction (SCR) has been applied, on the assumption that SCR will generate a resultant 96% reduction in emissions after a warm-up period of 20 minutes.

6.2.21 The generators have been modelled based on the anticipated testing and maintenance schedule and an emergency scenario. Hourly sequential meteorological data is required as an input to the model. Data from London Heathrow Airport meteorological station for 2021, 2022 and 2023 have been used in the modelling assessment.

6.2.22 The future setting of the Proposed Development is 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 was selected for the meteorological station, which is described in the model as representative of ‘parkland, open suburbia’.

6.2.23 The minimum Monin-Obukhov Length Scale for the Proposed Development is set to 30 m. A value of 10 m is used for the land around London Heathrow Airport meteorological station.

6.2.24 The assessment considered the buildings in the vicinity of the proposed flues with the potential to impact dispersion. ADMS 6 offers a feature in which the software will automatically determine the building which is likely to have the most effect on dispersion from a given source. All modelling scenarios were run with this option selected as sensitivity confirmed this was the most conservative approach.

6.2.25 Worst case receptors points were selected to include various residential dwellings of high sensitivity, at various heights where applicable.

6.2.26 A grid of regularly spaced receptors is created to cover a domain of 2km x 2km with 20m grid spacing. The receptor grid is modelled at a height of 1.5m to represent the breathing zone of the average adult.

6.2.27 Predicted NOx concentrations were processed to determine annual mean nitrogen dioxide (NO_2) concentrations for comparison with annual mean and short-term NO_2 objectives. For the on-site combustion plant sources, Environment Agency guidance is 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.

6.2.28 For each receptor point, 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.

6.2.29 The results of dispersion modelling at sensitive receptors have been compared to relevant air quality objectives, WHO guidelines, and the emerging Hillingdon Council matrix for $PM_{2.5}$.

Operational Traffic

6.2.30 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 Proposed Development during the operational phase.

6.2.31 A screening assessment has been undertaken using the criteria contained in the EPUK/IAQM land-use guidance document to determine potential local air quality effects associated with increased traffic emissions as a result of the operation of the Proposed Development. As the Site is located within an AQMA, the following criteria for screening of traffic flows from the EPUK/IAQM land-use guidance document has been used to determine whether a detailed air quality assessment is likely to be considered necessary for operational traffic:

- A change of Light Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) movements; and
- A change of Heavy-Duty Vehicle (HDV) flows of more than 100 AADT movements.

6.2.32 Meeting either of the criteria would indicate that detailed dispersion modelling of the road traffic emissions would be required.

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 change in AADT vehicle movements will not 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.

Air Quality Neutral Assessment

6.2.34 The Mayor of London's London Plan Guidance on Air Quality Neutral Assessment (AQN) was updated in February 2023. The 2023 guidance provides specialist consultants with an updated methodology to undertake an 'Air Quality Neutral' assessment, as well as emission benchmarks for buildings and transport, against which the predicted values for the Proposed Development can be compared. The guidance relating to Air Quality Neutral follows a tiered approach, such that all developments are expected to comply with minimum standards for emissions associated with land-use. Compliance with "Air Quality Neutral" is then founded on emissions benchmarks that have been derived for both building (energy) use and road transport in different areas of London. Developments that exceed the benchmarks are required to implement on-site or off-site mitigation to offset the excess emissions.

6.2.35 An AQN development is defined as one that meets or improves upon the AQN benchmarks that are set out within the updated guidance document. The benchmarks set out the maximum allowable emissions of nitrogen oxides (NOx) and particulate matter (PM) 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.

6.2.36 An Air Quality Neutral Assessment has been carried out to determine compliance with the London Plan's policy relating to Air Quality Neutral Development. This has been carried out in accordance with the Air Quality Neutral Guidance issued in February 2023[6]. Consideration has been made of applicable emission benchmarks for buildings and transport for comparison against the predicted values for the Proposed Development. The implementation of on-site or off-site mitigation to offset the excess emissions has been discussed and recommended, as required.

Air Quality Positive

6.2.37 The Mayor of London's London Plan Guidance on Air Quality Neutral Positive (AQP) was updated in February 2023. The Air Quality Positive approach aims to maximise benefits to local air quality in and around large-scale development sites and masterplan areas while also minimising exposure to existing sources of poor air quality. It requires planners, designers, architects, and air quality experts to demonstrate what measures have been taken during the design stages to achieve the best possible outcomes for air quality.

6.2.38 Air Quality Positive should be applied at the plan making stage to masterplans and development briefs that include large-scale development sites that are likely to be subject to an EIA. An AQP Statement should be produced as part of the evidence base outlining the AQP approach taken. An AQP statement has therefore been scoped in and is included within this ES Chapter.

Cumulative Assessment

Construction Phase

6.2.39 The IAQM guidance (upon which the GLA's guidance is based) suggests that cumulative construction dust impacts are only likely where sites are within 500m of each other. According to the Cumulative Development Schedule (see Chapter 5), there are two sites within 500m of

[6] 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

the Proposed Development, Land at Tudor Works (Colt Data Centre) (LON04 and LON05) and 15-17 Uxbridge Road, Hayes, Middlesex, UB4 OJN. These sites have therefore been considered in the construction phase cumulative assessment.

Operational Phase

6.2.40 All the projects considered as part of the cumulative impact assessment have been agreed with London Borough of Hillingdon Council. Both Construction and Operational phases have been considered and the potential for short, medium- and long-term impacts assessed.

6.2.41 LON 4 and 5 datacentres are located in close proximity to the south of the Proposed Development. The emissions from the standby generators at LON 4 and LON 5 have been included in the operational assessment.

6.2.42 London Borough of Hillingdon have highlighted the presence of other sites with large combustion plant within the wider area. The nearest to the Site is at Bulls Bridge Industrial Estate, approximately 1.2 km to the southwest. Due to the distance from the Site, it is considered that significant cumulative impacts associated with these off-site installations are unlikely. For robustness of the cumulative assessment, process contributions from Bulls Bridge have been included in the operational scenario.

6.2.43 The predicted NO_2 process contribution reported for the Union Park at Bulls Bridge development receptor point closest to the Site (Guru Nanak School) has been included in the predicted environmental concentrations reported in the operational assessment 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.

Predicting Effects

6.2.44 The potential impacts associated with the construction and operation of the Proposed Development on sensitive receptors has been assessed in accordance with IAQM guidance[7]. Table 6.1 sets out the scale of sensitivity that has been applied to receptors identified and considered within this assessment.

Table 6.1 Value/sensitivity assessment

Receptor value / sensitivity	Receptor type
High	Receptors of high sensitivity are generally places where people would be expected to be present continuously for extended time periods and would reasonably expect enjoyment of a high level of amenity, such as: – Residential buildings; – Schools and education premises; – Hospitals, clinics, care homes.
Medium	Receptors of medium sensitivity are generally places where people would not be expected to be present continuously and would expect to enjoy a reasonable level of amenity, but

[7] (IAQM), Institute of Air Quality Management. Guidance on the Assessment of Dust from Demolition and Construction (Version 1.1). [Online] 2016. https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf.

Receptor value / sensitivity	Receptor type
	wouldn't reasonably expect to enjoy the same level of amenity as in their home: – Commercial sites; – Parks and places of worship.
Low	Receptors of low sensitivity are generally places where people would only be expected to be present for limited time periods and where enjoyment of amenity would not reasonably be expected: – Industrial sites; – Farmland, footpaths, short-term car parks and roads.
Negligible	Commercial and industrial sites not deemed sensitive

6.2.45 Section 4.6 of the Air Quality Appendix 6.1 discusses the presence of nearby sensitive receptors. There are no designated ecological receptors within 1 km of the Proposed Development. The Site is located within an urbanised area and there are several highly sensitive residential properties and medium sensitivity commercial properties in the surrounding area. The construction and operational phase assessments therefore considers the presence of these receptors in assessing the likelihood of impact associated with air quality.

- The sensitivity of the area and selection of receptors for the construction dust assessment is discussed in Section 5.2.3, of the Air Quality Appendix.
- High sensitivity residential receptors selected for the dispersion modelling assessment of operational emissions are detailed in Section 3.5 of the Air Quality Appendix.

6.2.46 Within the wider project context, the importance of impacts is defined in terms of the importance of the receptors (as defined in Table 6.1), with due regard of the significance of impacts. These are summarised in Table 6.2.

Table 6.2 Magnitude of impact

Magnitude	Description
High	'High' increase in airborne pollution resulting in AQO being exceeded.
Medium	'Medium' increase in airborne pollution resulting in AQO being exceeded
Low	'Small' increase in airborne pollution; or 'Medium' or 'Large' increase in air quality, but which does not result in AQO being exceeded or approached.
Negligible	Not Significant impact

6.2.47 The predicted level of effect is based upon the consideration of magnitude of impact and sensitivity of the resource/receptor to come to a professional judgement of how important this effect is. Table 6.3 identifies the receptor level across the top of the matrix and the magnitude of environmental impact down the side and where they meet within the matrix identifies the significance of the effect.

Table 6.3 Level of effect

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Substantial	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.2.48 For the purpose of producing this Chapter, it is proposed that the above project-wide Significance Matrix table is modified to take into account the specific relationship between air quality. To this end, Table 6.4 sets out the modified Significance Matrix values at sensitive receptors.

6.2.49 The EPUK/IAQM [8] land-use planning guidance provides an approach to determining the significance of likely effects resulting from the Proposed Development on local air quality. The guidance also provides advice on how to describe the significance of the effects predicted from air quality modelling. The guidance incorporates the latest position of the IAQM on effect significance.

6.2.50 A framework for describing the air quality impacts set out in EPUK/IAQM guidance is summarised in Table 6.4. Impacts listed as substantial and slight in EPUK/IAQM guidance have been renamed as major/substantial and slight/minor, in order to align with the criteria used in the significance of impact ES matrix in Chapter 5 of the ES.

6.2.51 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.

Table 6.4 Air quality environmental impacts

Long-term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQO)			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight/Minor*	Moderate
76-94% of AQO	Negligible	Slight/Minor*	Moderate	Moderate
95-102% of AQO	Slight/Minor*	Moderate	Moderate	Major
103-109% of AQO	Moderate	Moderate	Major *	Major
110% or more of AQO	Moderate	Major	Major *	Major
75% or less of AQO	Negligible	Negligible	Slight/Minor*	Moderate
*Listed as slight and substantial in IAQM guidance have been re-labelled here as Slight/Minor to align with wider ES assessment methodology				

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

6.2.52 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[9] 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 outline in paragraph 6.39 of EPUK/IAQM[8] 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*".

6.2.53 The expected number of exceedances of the PM_{10} 24-hour mean objective (50 µg/m3) was determined based on the relationship between the annual mean and 24-hour mean PM10 concentrations set out in LAQM (TG22)[10] guidance, stated below.

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

6.2.54 An emerging significance impact matrix for $PM_{2.5}$ was provided by Hillingdon and is listed in **Error! Reference source not found.** of Appendix 6.1. 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.

Consultation

6.2.55 Detailed consultation with Environmental Health at LBH was carried out between November 2024 and February 2025.

6.2.56 Initially, an Air Quality Technical Note[11] was provided to LBH, outlining the proposed scope and methodology of the assessment. LBH comments on the technical note were discussed in subsequent email correspondence and meetings.

6.2.57 In summary, agreement was reached with LBH on all aspects of the scope and methodology of the assessment. This included the generator emissions calculations, detailed model inputs, the scenarios to be modelled (including the emergency scenario), the background data to be utilised, receptor selection, and selection of air quality objectives/targets and significance matrices to assess the results against.

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[9] Environment Agency (2006), Air Quality Management and Assessment Unit- Conversion Ratios for NO_x and NO_2.
[10] 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
[11] Cundall (2024) Colt 4a Masterplan and LON6, Air Quality Technical Note, Ref: 1042145-04-02-AQ, Rev.03, 25/10/2024

Assumption and Limitations

6.2.58 Assumptions relating to the construction dust assessment for demolition, earthworks, construction and trackout are based on available design details, which have been provided by the project team. 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.

6.2.59 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. Screening of construction traffic predictions is therefore not possible at this stage. It is assumed that due to the phased nature of the development, it is unlikely that the construction traffic will exceed the criteria. This will need to be confirmed once data is available. It is expected that the proposed details of the impact of future construction traffic will come forward with each reserved matters submission in the form of a Construction Management Plan to include the proposed construction logistics.

6.2.60 A series of assumptions have been made in relation to the dispersion modelling used to predict impacts of the emissions from operation of the generators.

- 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 and their required testing and maintenance schedule. 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.
- It has been assumed that SCR would become operational after 20 minutes.
- The emergency scenario assumes the generators would be operational for 33 hours continuously. This 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.
- Environment Agency guidance 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.

6.3 Baseline Conditions

Current Baseline

6.3.1 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.

6.3.2 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.

Air Quality Management Areas (AQMAs)

6.3.3 The Site is located within the London Borough of Hillingdon, close to the boundary with London Borough of Ealing and the baseline assessment included a review of the Council's latest LAQM Annual Status Report (ASR)[12]. The Site is located within the Hillingdon Air Quality Management Area (AQMA), designated for exceedances of the annual mean nitrogen dioxide (NO_2) air quality 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.

Automatic Air Quality Monitoring

6.3.4 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 Application Site is shown in Figure 6.1 and details about the automatic monitoring site are provided in Table 6.5.

[12] The London Borough of Hillingdon (2024), Air Quality Annual Status Report, 2024, May 2024, The London Borough of Hillingdon

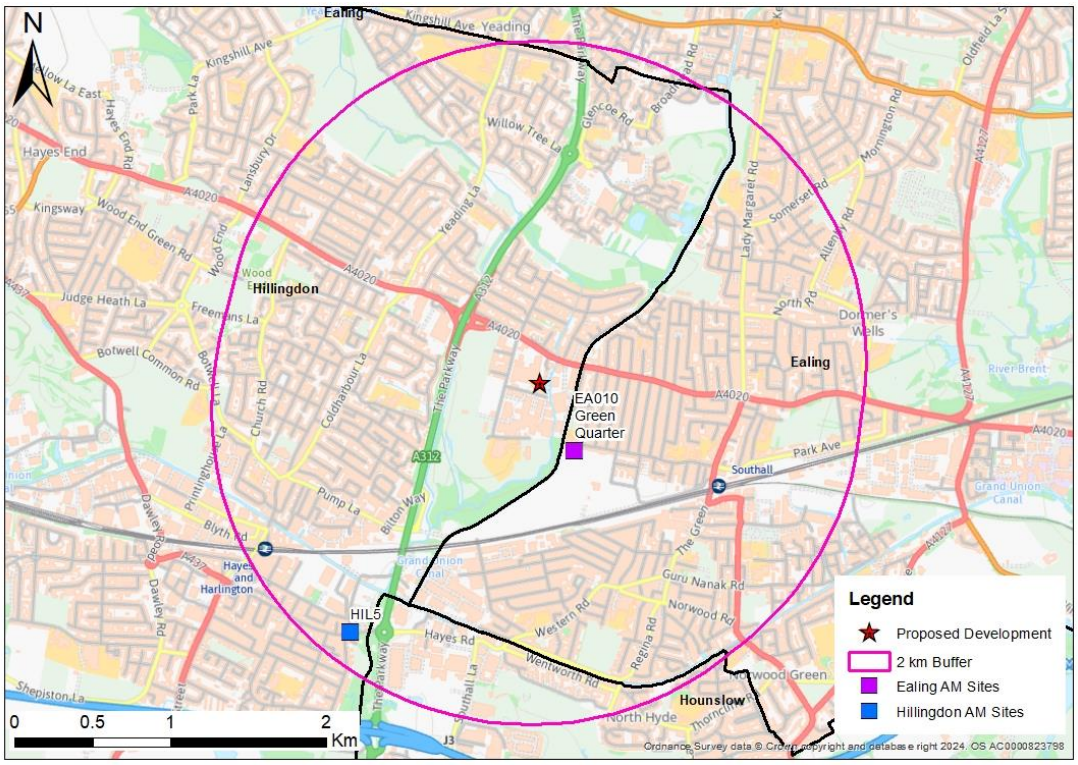

Figure 6.1 Automatic Monitoring Site Locations within 2 km

Table 6.5 Automatic Monitoring Site Details

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

6.3.5 Available NO_2 monitoring results from 2018 to 2023 are shown in Table 6.6, 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.

Table 6.6 NO_2 Monitoring Results from 2018 to 2023

Site ID	Site Type	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m^3)					
			2018	2019	2020	2021	2022	2023
HIL5	Roadside	1.8 SW	**43** (12)	**41** (0)	31 (0)	34 (0)	34 (0)	34 (0)

EA010 Green Quarter	Suburban Background	0.35 SE	-	-	-	-	16.7 (0)	21.0 (0)

Notes:
- no data available
Exceedance of the NO_2 annual mean objective is shown in **bold**.

6.3.6 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 HIL2 roadside site. The NO_2 concentrations since 2020 were below the annual mean objective (40 µg/m^3) at both sites.

6.3.7 The short-term NO_2 objective (60 µg/m^3) was also met at both sites between 2018 and 2023. 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. Exceedances of the short-term objective for NO_2 are therefore considered to be unlikely.

6.3.8 Annual mean concentrations of PM_{10} recorded at the automatic monitoring sites within 2 km are shown in Table 6.7, with number of days exceedance 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.

Table 6.7 PM_{10} Monitoring Results from 2018 to 2023

Site ID	Site Type	Distance from Site (km)	Annual Mean PM_{10} Concentration (µg/m^3)					
			2018	2019	2020	2021	2022	2023
HIL5	Roadside	1.8 SW	30 (22)	28 (25)	25 (16)	26 (25)	30 (23)	27 (16)
EA010 Green Quarter	Suburban Background	0.35 SE	-	-	-	-	16.4 (6)	18.3 (3)

Notes:
- no data available

6.3.9 The monitoring results between 2018 and 2023 show that the recorded annual mean concentrations at both sites are well 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 well below the permissible 35 days per year at both sites, with a maximum of 25 days recorded in 2019 and 2021 at HIL5 site.

6.3.10 Annual mean concentrations of $PM_{2.5}$ recorded at the automatic monitoring sites within 2 km are shown in Table 6.8. An exceedance is defined as an annual mean greater than 20 µg/m^3 for $PM_{2.5}$.

Table 6.8 $PM_{2.5}$ Monitoring Results from 2018 to 2023

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

6.3.11 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.

Non-Automatic (Diffusion Tube) Air Quality Monitoring

6.3.12 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 6.2.

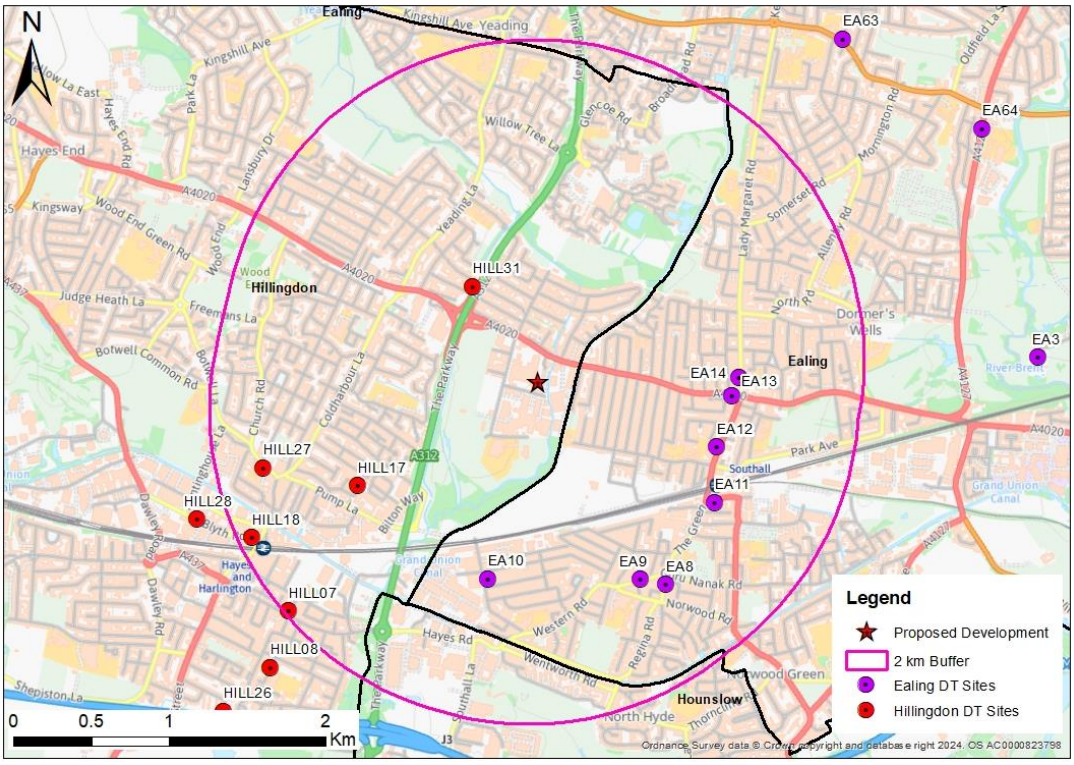

Figure 6.2 Diffusion Tube Monitoring Site Locations within 2 km

6.3.13 Monitoring results of the diffusion tubes within 2 km are provided in Table 6.9. An exceedance is defined as an annual mean greater than 40 µg/m^3 for NO_2.

Table 6.9 NO_2 Monitoring Results from 2018 to 2023

Site ID	Site Type	Annual Mean NO_2 Concentration ($\mu g/m^3$)					
		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:
- no data available
Exceedance of the NO_2 annual mean objective is shown in **bold**.

6.3.14 Of the 12 diffusion tube monitoring locations within 2 km, three of the sites exceeded the NO_2 objective (40 $\mu g/m^3$) during the period between 2018 and 2023. The maximum recorded concentration was 46 $\mu g/m^3$, 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 well below the annual mean objective, with maximum of 34.2 $\mu g/m^3$ recorded at the roadside site EA13 which is located near a junction and alongside an A Road (A4020).

6.3.15 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 showed NO_2 concentrations of below 25 $\mu g/m^3$ since 2020.

6.3.16 The annual mean NO_2 concentrations recorded at all the sites within 2 km between 2018 and 2023 are well below 60 µg/m^3. Exceedances of the short-term objective are therefore considered to be unlikely.

Local Sources of Transport Emissions

6.3.17 The presence of any heavily trafficked roads, with emissions that could give rise to significantly higher concentrations of pollutants (e.g., NO_2, PM_{10}, $PM_{2.5}$), may cause unacceptably high exposure for users of the new development.

6.3.18 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 background concentrations provided by Defra and have also been considered as part of the assessment of operational traffic emissions.

6.3.19 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.

Local Sources of Industrial Emissions

6.3.20 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 the Pollution Prevention and Control (PPC) system which has been transposed into National legislation. 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.

6.3.21 A review of the Environment Agency Pollutant Inventory for 2023 indicated that there is one Part A site within 2km of the Site which is the Amazon Data Services UK Ltd combustion site located 1.3 km southwest of the Proposed Development and is classified as an air polluter with respect of ammonia. Location of this Part A site with respect of the Proposed Development is shown in Figure 6.3.

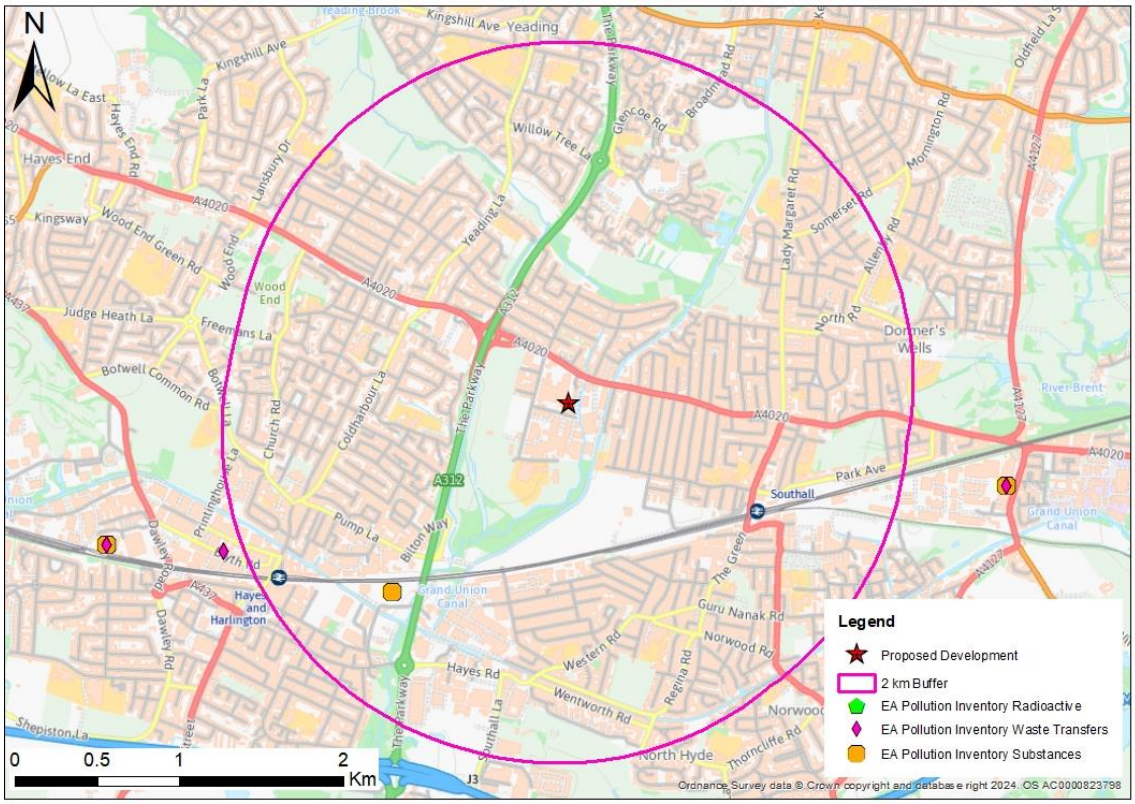

Figure 6.3 Part A Permit Site

6.3.22 The Part B processes are regulated and reviewed by the Local Authorities and given the nature of these processes, are unlikely to significantly impact ambient air quality in the vicinity of the Site.

6.3.23 Any emissions from these installations are assumed to be represented in the Defra and LAEI background concentrations.

6.3.24 The most recent 2024 ASR[13] 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.

London Atmospheric Emission Inventory

6.3.25 The London Atmospheric Emissions Inventory (LAEI) is a database of geographically referenced datasets of pollutant emissions and sources in Greater London[14]. 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 NOx 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.

[13] The London Borough of Hillingdon (2024), Air Quality Annual Status Report, 2024, May 2024, The London Borough of Hillingdon
[14] Greater London Authority, London Atmospheric Emissions Inventory (LAEI) 2019, GLA and TfL Air Quality https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019

6.3.26 The 2019 annual mean NO_2 concentration map shows that modelled concentrations at the Proposed Development are expected to range between 25 µg/m^3 and 34 µg/m^3 across the redline boundary, as shown in Figure 6.4, 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/m^3 and 25 µg/m^3, as shown in Figure 6.5, with higher concentrations at the northern boundary of the Site. Maximum modelled concentrations within the redline boundary are therefore below the objective (40 µg/m^3).

6.3.27 The 2019 annual mean PM_{10} concentration map shows that modelled concentrations at the Proposed Development are expected to range between <16 µg/m^3 and 22 µg/m^3, as shown in Figure 6.6. The 2025 annual mean PM_{10} 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/m^3 at the northern boundary of the Site, as shown in Figure 6.7. Maximum modelled concentrations within the redline boundary are therefore below the objective (40 µg/m^3).

6.3.28 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 6.8, 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 6.9 and are therefore below the objective.

6.3.29 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 6.10. 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 6.11. The 2019 and 2025 modelled concentrations of $PM_{2.5}$ are therefore below the objective (20 µg/m^3).

6.3.30 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 and 2025 at the proposed Site.

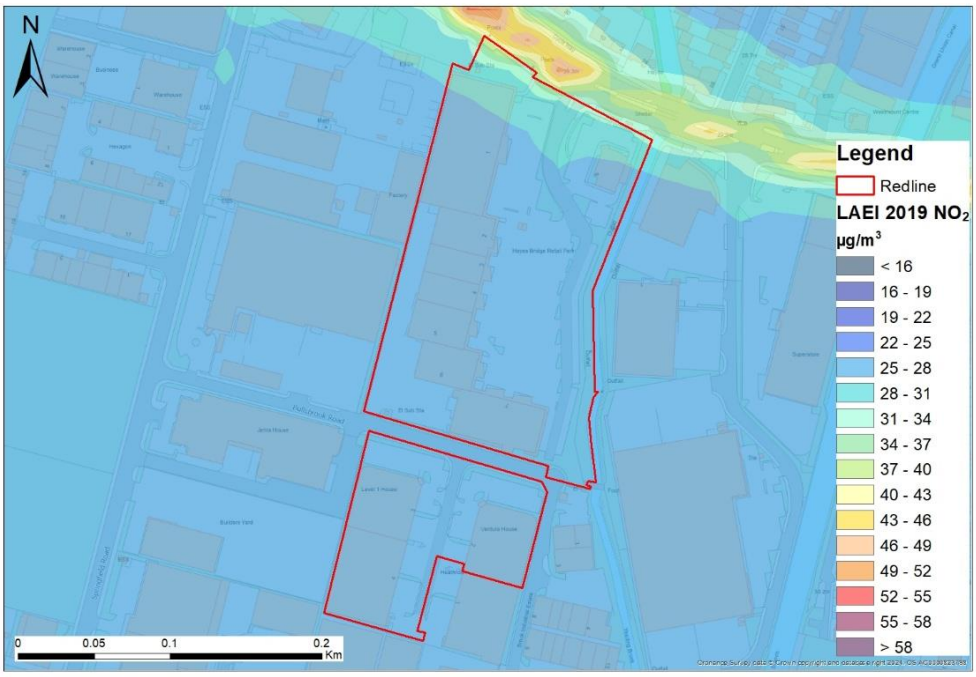

Figure 6.4 LAEI NO_2 concentration map for 2019

Figure 6.5 LAEI NO_2 concentration map for 2025

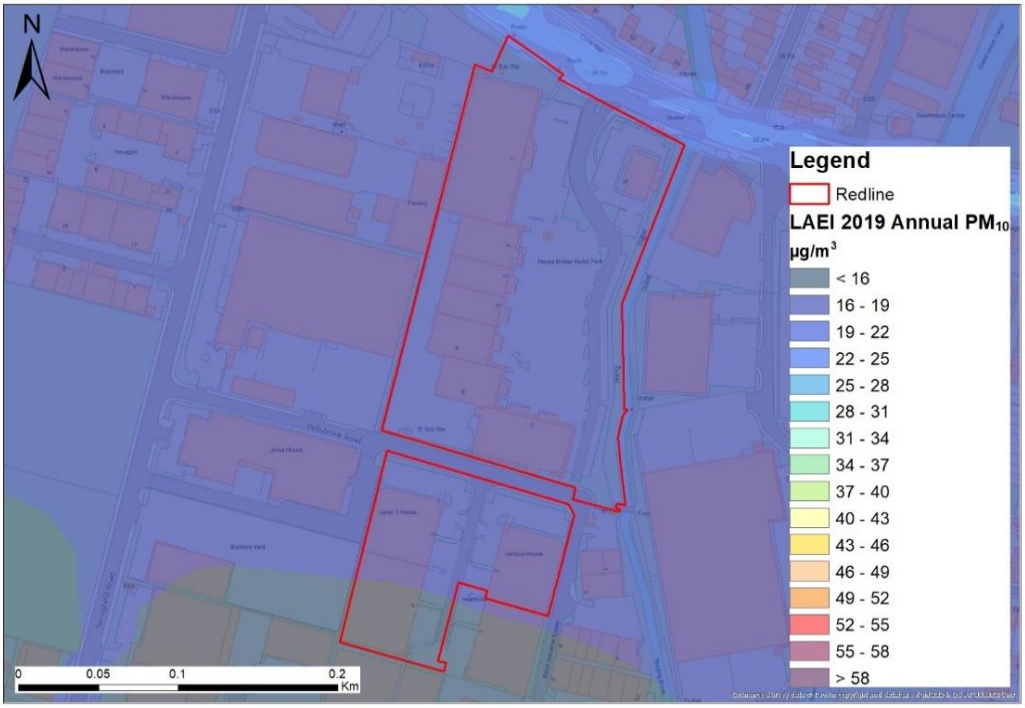

Figure 6.6 LAEI PM_{10} concentration map for 2019

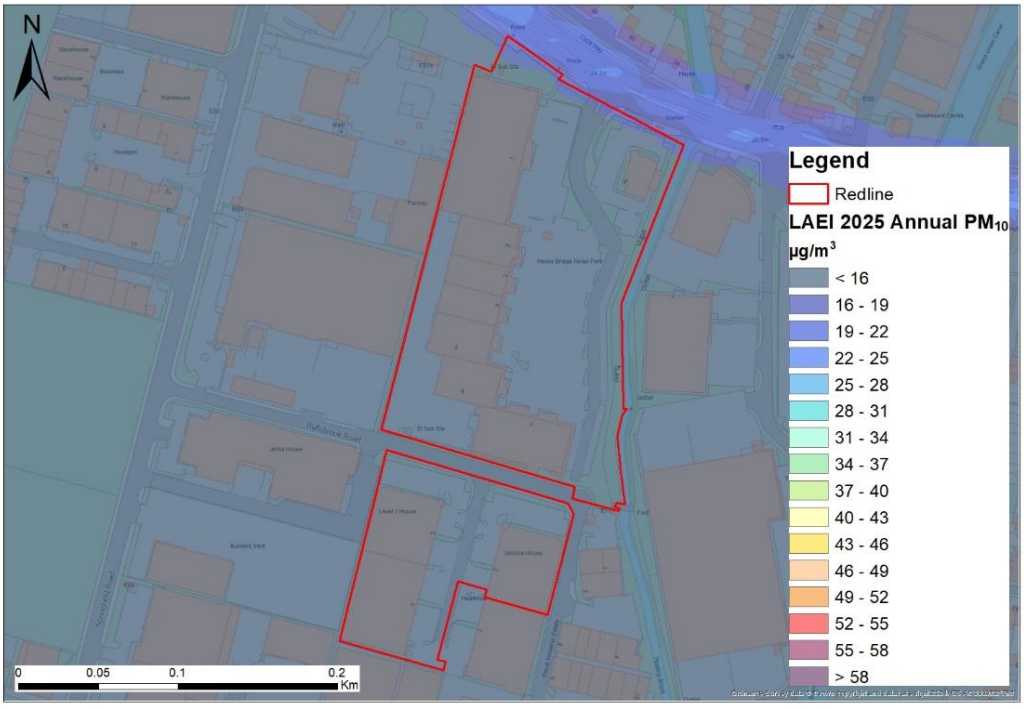

Figure 6.7 LAEI PM_{10} concentration map for 2025

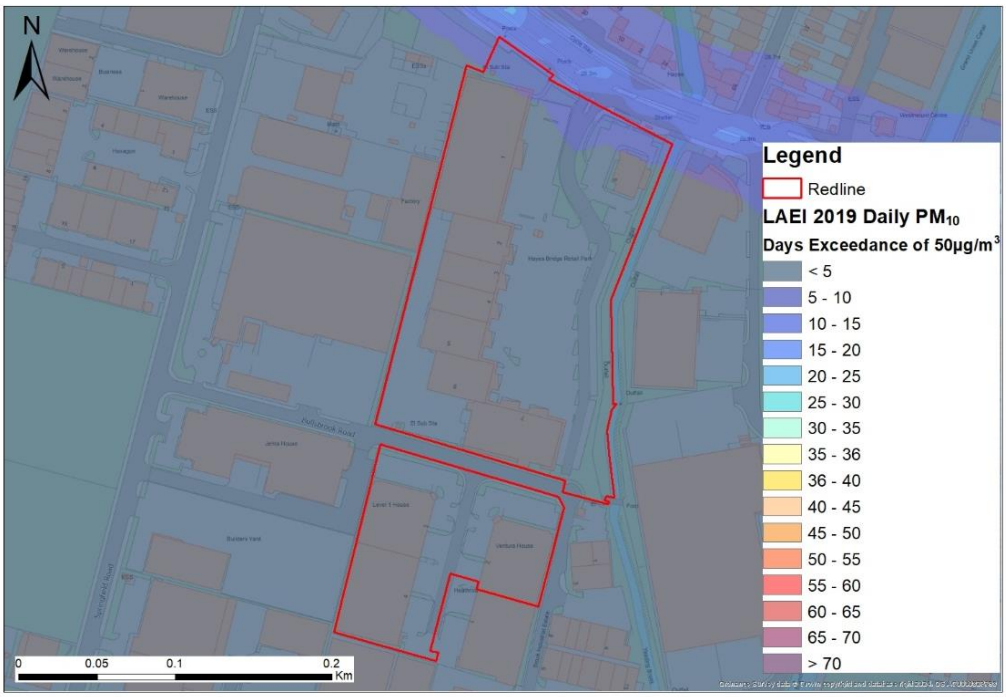

Figure 6.8 Daily LAEI PM_{10} concentration map for 2019

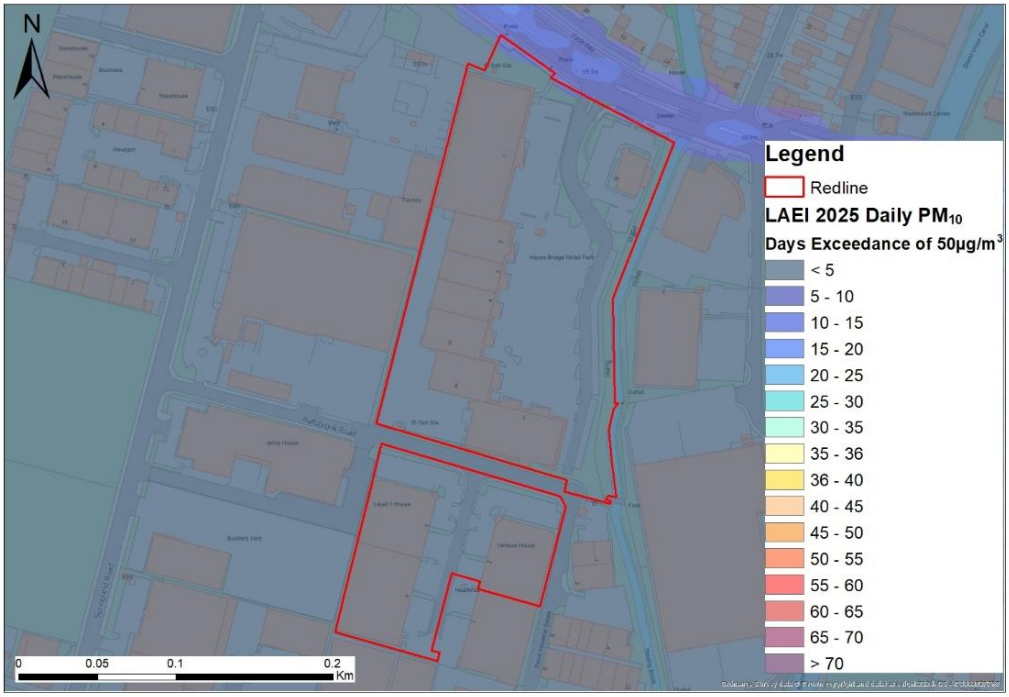

Figure 6.9 Daily LAEI PM_{10} concentration map for 2025

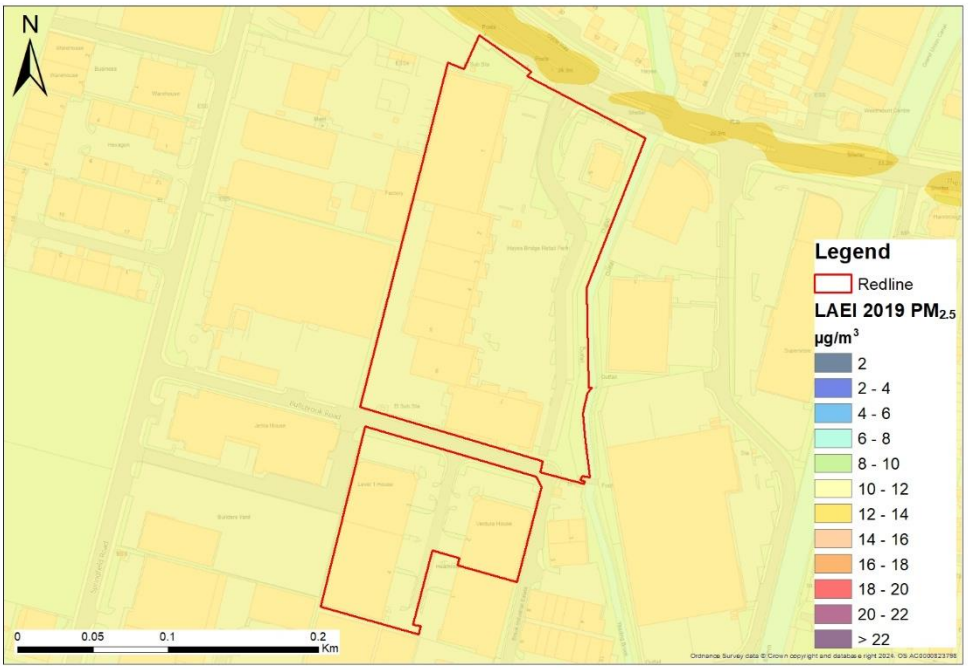

Figure 6.10 LAEI $PM_{2.5}$ concentration map for 2019

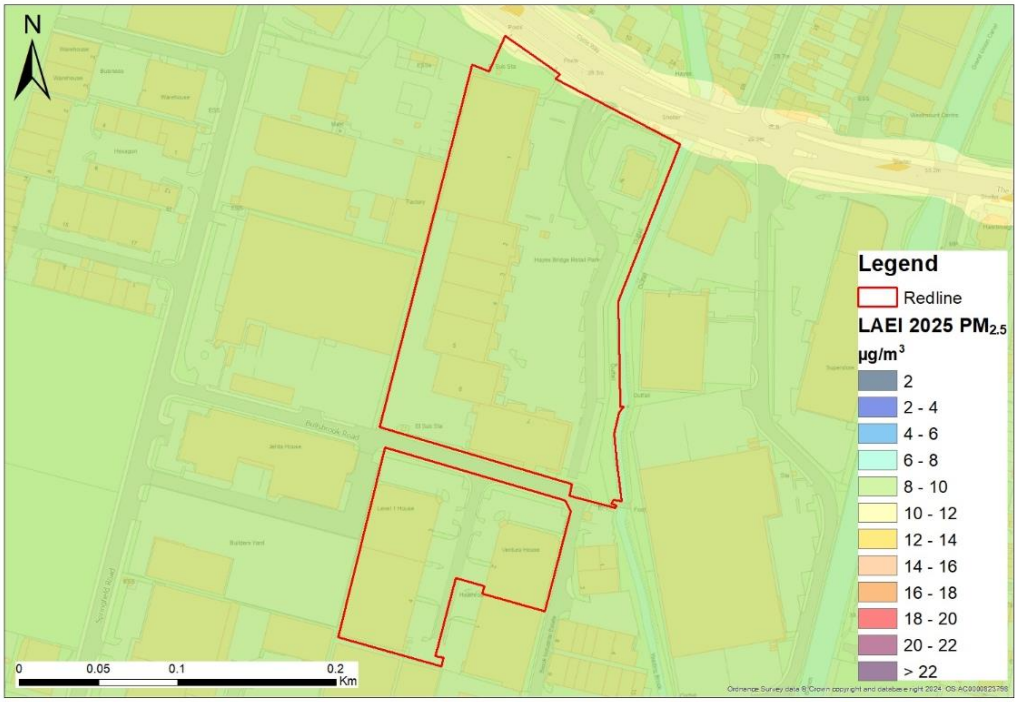

Figure 6.11 LAEI $PM_{2.5}$ concentration map for 2025

Future Baseline

6.3.31 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.

6.3.32 Transport for London (TfL) report 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.

6.3.33 The London Air Quality Map on the Mayor of London website shows projected levels for 2025 following the Mayor's actions set out in the London Environment Strategy. This has been reproduced 14 for the area of the Proposed Development. It in section 4.7 of the Technical Appendix and shows that modelled NO_2 concentrations for most of the Proposed Development is expected to range between 20 µg/m^3 and 25 µg/m^3.

Defra's Background Pollutant Concentration Mapping

6.3.34 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 for every 1km x 1km OS grid square across the UK for NOx, NO_2, PM_{10} and $PM_{2.5}$. Background pollutant mapping has been reviewed for the grid square in which the Site lies and surrounding grid squares. The 2025 and 2027 concentrations (which are based on 2021 monitoring data) are presented in Table 6.10. The concentrations in 2027 gives an idea of how the current baseline may evolve in the absence of the Proposed Development.

Table 6.10 Defra's Background Monitoring Data for 2025 and 2027

OS Grid Square		Annual Mean Concentration (µg/m^3)							
		NOx		NO_2		PM_{10}		$PM_{2.5}$	
X	Y	2025	2027	2025	2027	2025	2027	2025	2027
511500	180500	22.5	20.8	16.2	15.1	14.0	13.9	8.2	8.0
511500	181500	21.1	19.4	15.4	14.2	14.1	14.0	8.2	8.0
512500	180500	22.3	20.7	16.1	15.1	14.3	14.1	8.3	8.1
511500	179500	23.0	21.6	16.5	15.6	13.5	13.4	8.0	7.9
510500	180500	22.4	20.7	16.1	15.0	14.1	14.0	8.2	8.1
Average:		**22.3**	**20.6**	**16.1**	**15.0**	**14.0**	**13.9**	**8.2**	**8.0**

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

London Air Quality Map

6.3.36 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.

6.3.37 Transport for London (TfL) report15 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.

6.3.38 The London Air Quality Map on the Mayor of London website[16] shows projected levels for 2025 following the Mayor's actions set out in the London Environment Strategy[17]. This has been reproduced as Figure 6.12 for the area of the Proposed Development. It can be seen that, 2025 modelled NO_2 concentrations for most of the Proposed Development is expected to range between 20 µg/m^3 and 25 µg/m^3.

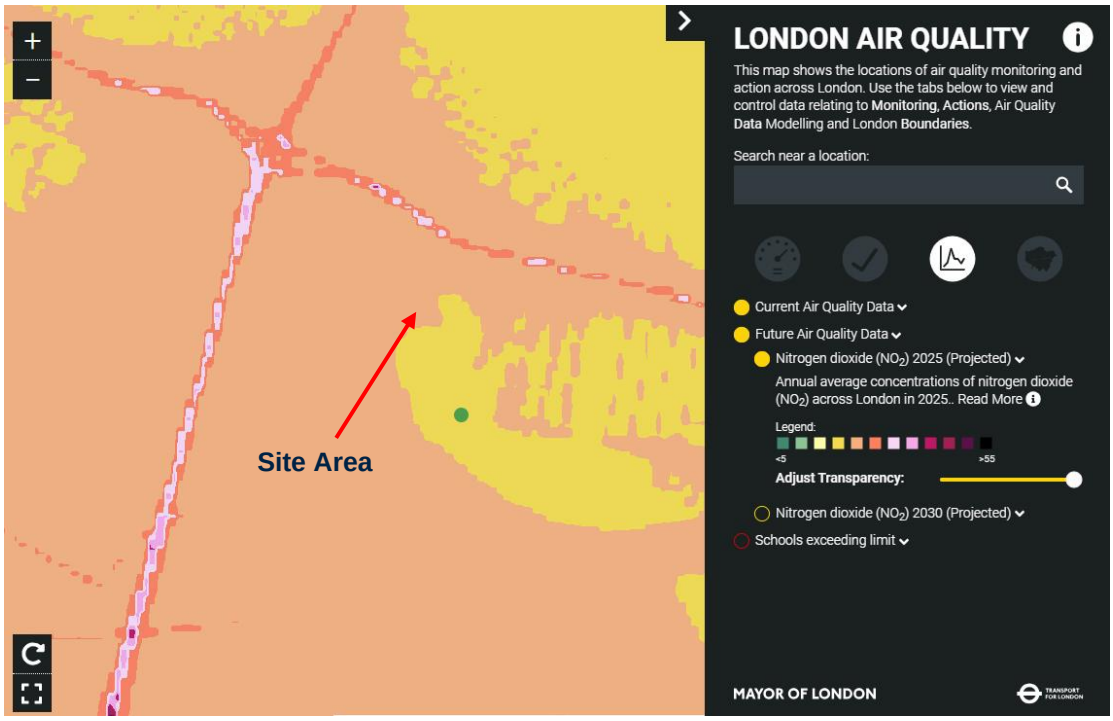

Figure 6.12 2025 Projected Nitrogen Dioxide (NO_2)

[15] Transport for London (TfL) Air Quality, https://tfl.gov.uk/corporate/about-tfl/air-quality
[16] Mayor of London / London Assembly, Air Quality Data, London Air Quality Map https://data.london.gov.uk/air-quality/
[17] Mayor of London / London Assembly, London Environment Strategy, https://www.london.gov.uk/what-we-do/environment/london-environment-strategy

6.4 Inherent Mitigation

6.4.1 The Energy and Sustainability Statement has indicated that there will be a water source heat pump-based cooling system which was concluded to be 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 hybrid cooling system using water-cooled chillers, which will meet the substantial cooling loads while consuming a fraction of the energy of conventional cooling systems.
- 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.

6.4.2 The 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.

6.4.3 A Construction Environmental Management Plan (CEMP) will be provided to address the inherent construction phase mitigation required to enable the implementation of the Proposed Development.

6.5 Potential effects prior to additional mitigation

6.5.1 The following sub-sections provide an assessment of air quality through the construction and operational phases. Where applicable, comparison against the significance criteria listed in Table 6.3 has been made.

Construction Phase

Construction Dust

6.5.2 A construction dust assessment was carried out in accordance with the IAQM Assessment of Dust from Demolition and Construction. The methodology and assessment are detailed in Section 5 of Appendix 6.1.

6.5.3 The assessment determined that there are between 10-100 high sensitivity receptors located within 20m of the Site. The assessment concluded that the highest overall risk of unmitigated impacts is medium for demolition, earthworks, construction and trackout.

6.5.4 The IAQM Guidance also states that with the good practice dust management measures in place (that are determined based on the dust impact risk rating of a construction site), normally the effects will be not significant. In requiring that appropriate dust management and mitigation measures are employed at the Proposed Development, significant effects from construction site activities at the Proposed Development will be avoided.

6.5.5 It can therefore be concluded that with the recommended dust management and mitigation measures in place (which will be set out within a Dust Management Plan (DMP) as part of the Construction Environmental Management Plan (CEMP) to be conditioned with the granting of planning permission, no significant effects will occur.

Construction Traffic

6.5.6 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. It is therefore proposed that the details of the impact of future construction traffic will come forward with each reserved matters submission in the form of a Construction Management Plan to include the proposed construction logistics.

6.5.7 Due to the phased nature of the development, it is considered unlikely that the construction traffic will exceed the criteria for detailed assessment. However, should the criteria be exceeded, a quantitative assessment would need to be carried out using detailed dispersion modelling.

6.5.8 The details of the construction traffic routes are expected to be controlled through a construction environmental management plan (CEMP).

Operational Phase

Combustion Plant

6.5.9 On-site combustion plant such as boilers and generators have a potential to have an adverse impact on local air quality due to NOx and PM emissions.

6.5.10 The full scope, methodology, and results of the operational phase combustion plant dispersion modelling is provided within Appendix 6.1 and are summarised below.

6.5.11 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the modelled receptors were predicted for the following scenarios:

- Testing Scenario - all annual testing for Lon 6, 7 and * generators, a total of 12 hours per generator)
- Emergency Scenario - 33 hours of continuous emergency operation of all Lon 6, 7 and generators at 100% load (worse-case met conditions)

6.5.12 For each scenario 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 the cumulative impact of LON 4 & LON 5 (emissions of NO_2, PM_{10} and $PM_{2.5}$) and Bulls Bridge (NO_2 only as no particulate emissions associated with the gas fired plant).

Testing Scenario

6.5.13 Predicted NO_2 concentrations do not exceed the annual mean NO_2 objective (40 µg/m^3), or the second WHO interim target (30 µg/m^3) at any modelled receptor location. The majority of the receptor locations do exceed the WHO lowest interim target (20 µg/m^3) and all receptors exceed the WHO air quality guideline (10 µg/m^3). The maximum predicted NO_2 concentration is 28.30 µg/m^3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible.

6.5.14 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).

6.5.15 Due to the moderate impacts predicted for short-term NO_2 in the testing scenarios, which are based on a total of 4 generators running at a given time, results have also been generated 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 do not coincide with the on-site testing of the main generators.

6.5.16 Predicted $PM_{2.5}$ concentrations do not exceed the annual mean $PM_{2.5}$ objective (20 µg/m^3). All receptor locations also do not exceed the Mayor of London target (10 µg/m^3), or the lowest WHO interim target (10 µg/m^3). All receptor locations do exceed the WHO air quality guideline (5 µg/m^3). The maximum predicted $PM_{2.5}$ concentration is 9.87 µg/m^3. 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/m^3, even though the process contributions are well below 0.2 µg/m^3 (maximum of 0.04 µg/m^3), in accordance with Hillingdon Council matrix, the lowest predicted impact is slight.

6.5.17 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. 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.

6.5.18 As all predicted impacts are negligible or slight (based on the recommendation that only 3 generators are tested at any one time), and all predicted environmental concentrations (PECs) are below the applicable air quality objectives for all pollutants, the potential effects of the proposed testing of the generators is expected to be not significant.

Emergency Scenario

6.5.19 Predicted NO_2 concentrations do not exceed the annual mean NO_2 objective (40 µg/m^3), or the second WHO interim target (30 µg/m^3) at any modelled receptor location. All but two of the receptor locations do exceed the WHO lowest interim target (20 µg/m^3) and all receptors exceed the WHO air quality guideline (10 µg/m^3). The maximum predicted NO_2 concentration is 28.65 µg/m^3. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are negligible.

6.5.20 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 1383.21 µg/m^3 at C3. 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 to substantial in subsequent hours.

6.5.21 Predicted $PM_{2.5}$ concentrations do not exceed the annual mean $PM_{2.5}$ objective (20 µg/m^3). 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/m^3), or the lowest WHO interim target (10 µg/m^3). All receptor locations do exceed the WHO air quality guideline (5 µg/m^3). The maximum predicted $PM_{2.5}$ concentration is 10.24 µg/m^3. 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/m^3, even though the process contributions are well below 0.2 µg/m^3 (maximum of 0.02 µg/m^3), in accordance with Hillingdon Council matrix, the lowest predicted impact is slight.

6.5.22 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.

6.5.23 As all predicted impacts in relation to long-term NO_2, PM_{10} and $PM_{2.5}$ are negligible or slight, and all predicted environmental concentrations (PECs) are below the applicable air quality objectives for all pollutants, the potential effects of the emergency scenario generator operation on long-term pollutant concentrations is expected to be not significant.

6.5.24 Predicted impacts for short-term NO_2 are moderate-substantial, and three receptors show exceedances of the 1-hour mean NO_2 objective. However, the 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.

Air Quality Neutral

6.5.25 An Air Quality Neutral Assessment has been undertaken to determine compliance with the London Plan's policy relating to "Air Quality Neutral Development". The Air Quality Neutral Planning Support document was first published in March 2013 and updated in April 2014 to accompany the 2014 publication of the Greater London Authority's (GLA's) Sustainable Design and Construction SPG. An update to the Air Quality Neutral Guidance was issued on 8th February 2023[25] and outlines the methodology that needs to be followed when undertaking Air Quality Neutral Assessments.

6.5.26 The 2023 guidance provides specialist consultants with an updated methodology to undertake an 'Air Quality Neutral' assessment, as well as emission benchmarks for buildings and transport, against which the predicted values for the Proposed Development can be compared. The guidance relating to Air Quality Neutral follows a tiered approach, such that all developments are expected to comply with minimum standards for emissions associated with land-use. Compliance with "Air Quality Neutral" is then founded on emissions benchmarks that have been derived for both building (energy) use and road transport in different areas of London. Developments that exceed the benchmarks are required to implement on-site or off-site mitigation to offset the excess emissions.

6.5.27 According to the 2023 guidance, developments which do not include additional emission sources are assumed to be Air Quality Neutral. This would include development that have no new combustion plant and no additional motor vehicle parking and therefore are not expected to lead to an increase in motor vehicle movements.

6.5.28 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of the Proposed Development, as assessed in this section, does not directly indicate the potential of the Proposed Development to have significant impacts on human health (this has been assessed separately in the previous section).

Building Emissions

6.5.29 The proposed heating and cooling provision for the Proposed Development is expected to be water source heat pumps powered by electricity. According to the Air Quality Neutral guidance, the NOx emissions rate for grid electricity use should be assumed to be zero, based on the assumption that any NOx emissions associated with electricity generation at power stations will be dealt with in local permissions for those facilities. As there are no emissions associated with the main energy provision, it can be assumed that the building emissions will meet NO_2 and PM_{10} benchmark values and therefore meet Air Quality Neutral requirements.

6.5.30 There will also be a requirement for standby generators and initial load analysis indicates that a total of 608 MWth generators are required for backup support. Accounting for required testing and maintenance, actual annual operating hours of the units are expected to be 12 hours and therefore well below 50 hours per year. According to the Air Quality Neutral guidance, backup plants installed for emergency and life safety power supply, such as generators, may be excluded from the calculation of predicted building emissions.

Transport Emissions

6.5.31 The Transport Planners (Arup) have indicated that there are expected to be a total of 1082 daily trips associated with the Proposed Development. This in an indicative value at present which may be updated as part of the detailed application.

6.5.32 It is noted that the predicted daily trips associated with the Proposed Development are a net change of -3922 daily trips when compared to the existing uses (retail and warehousing).

6.5.33 In accordance with the 2023 Air Quality Neutral guidance[Error! Bookmark not defined.], the Transport Emission Benchmarks (TEB) are calculated based on the gross internal area (GIA). Benchmark Trip Rates listed in the 2023 guidance[Error! Bookmark not defined.] are defined for different land uses and different areas of London and are based on data from TRAVL (Trip Rate Assessment Valid for London)[18].

6.5.34 The development lies within Hillingdon, in an area that is defined as Outer London. The TRAVL benchmark trip rates for the applicable land uses are presented in Table 6.11. These have been multiplied by the GIA (or the GEA, where GIA was not available) to determine the number of annual trips required to exceed the benchmark.

6.5.35 The Innovation Hub land use sui generis has been assumed to be schools, nurseries, doctors' surgeries, other non-residential institutions.

[18] The TRAVL system and TRICS provide information based on observed trip rates from developments, and these will be monitored and updated where necessary

Table 6.11 Benchmark Trip Rates

Building	Land Use	GIA (m^2)	GEA (m^2)	Benchmark Trip Rates (Outer London)	Total Benchmark Trip Rate
LON6	B8 Storage and Distribution	24,111	25,235	6.5	156,722
LON7	B8 Storage and Distribution		53,415	6.5	347,198
LON8	B8 Storage and Distribution		29,656	6.5	192,764
Innovation Hub	- Sui Generis (Schools, nurseries, doctors' surgeries, other non-residential institutions assumed to be most applicable)		2,000	44.4	88,800
				Total (TEB):	785,502.5

6.5.36 The total benchmark trip rate is 785,502.5 trips per annum. The number of trips made by non-electric vehicles associated with the Proposed Development would need to exceed 785,502.5 trips per year before the Transport Benchmark would be exceeded.

6.5.37 The Transport Planners have predicted the daily trips are expected to be 1,082, annual trips are therefore anticipated to be 394,930. This does not exceed the Transport Benchmark.

6.5.38 It is therefore concluded that the Proposed Development is likely to be "air quality neutral" with respect to transport emissions and would therefore comply with the requirements of the London Plan 2021 which requires that emission associated with development proposals must meet the requirements of Air Quality Neutral.

Air Quality Positive

6.5.39 Air Quality Positive outlines the London Plan's Air Quality Positive approach and is reported in a consultation draft document, which was published in November 2021[19]. The "approach aims to maximise the benefits to local air quality in and around large-scale development in London. It requires planners, designers, architects and air quality experts to show what measures have been taken during the design stages to achieve the best possible outcomes for air quality".

6.5.40 The Air Quality Positive approach contains the expectation that masterplans and large-scale developments, including those subjective to Environmental Impact Assessment (EIA) must also take an Air Quality Positive approach (in addition to Air Quality Neutral). As best practice, the development should consider how selecting the most sustainable design options will result in better design and reduced exposure, lower or zero building emissions and transport emissions

[19] Mayor of London, Greater London Authority (2021) London Plan Guidance, Air Quality Positive, consultation draft, November 2021, https://consult.london.gov.uk/air-quality-neutral

and innovation and future proofing. This is an integral part of the Proposed Development's design.

6.5.41 The Proposed Development comprises two land parcels which together have an area of approximately 4.4 hectares. The Site area for the datacentre LON6 is approximately 1.6 hectares. Proposals are for LON7 and LON 8 to be located on the remaining 2.6 hectares.

6.5.42 The provision of heating and hot water for the Proposed Development will utilise an all-electric energy strategy based on the use of water source heat pumps (ASHPs). There is the requirement for 74 generators for standby power; the testing and maintenance regime is assumed to require 12 hours of operation per year for each generator and will therefore fall well below 50 hours per year.

6.5.43 The on-site combustion (generator) emissions assessment has demonstrated that the Proposed Development will not generate any significant emissions during normal operation associated with the testing and maintenance of the generators.

6.5.44 Emissions from the proposed generators will be emitted at roof level, where dispersion is optimised and the contribution to emissions at ground level concentrations will be minimal.

6.5.45 A Framework Travel Plan will be implemented and monitored to encourage sustainable and active travel.

6.5.46 The measures that have been adopted within the design of the Proposed Development are listed as follows

Ventilation Strategy

- 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.
- Acceptable internal air quality conditions are expected without the need for particulate or gaseous filtration. Externally, there are no exceedances of short-term air quality objectives which may affect receptors who are likely to spend one hour or more at a given location.
- Should additional filtration be considered, this could be used to reduce pollutant concentrations to meet the more stringent World Health Organisation (WHO) threshold values.
- Air quality assessment shows air quality is acceptable for future users. However, more stringent controls may be implemented to safeguard sensitive electronic equipment.

Energy and Sustainability Strategy

The follow measures are included in the design to reduce carbon emissions. Due to decreased energy requirements, there will also be reduced air quality emissions associated with electrical supply.

- 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 hybrid cooling system using water-cooled chillers, which will meet the substantial cooling loads while consuming a fraction of the energy of conventional cooling systems.
- Centralized 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.
- PV system has been maximized within the available roof space, providing:
    - 300 m² of PV installation for LON 6.
    - For the Innovation Hub, LON 7 and LON 8, an allowance has been made for outline planning (70 m² of PV installation for the Innovation Hub and 300 m² each for LON 7 and LON 8). However, these will need to be reviewed once detailed planning is undertaken in the future.

Sustainable and Active Travel

6.5.47 A Framework Travel Plan has been developed for the Proposed Development, which includes the measures to promote sustainable travel. A reduction in car usage will result in a reduction in vehicle emissions. This will have a beneficial impact on air pollutant concentrations in the vicinity of the Proposed Development.

- Provide travel information on notice boards/ websites/ promotional material
- Participate in local and national campaigns
- Raise awareness of health benefits through promotional material/ events
- Provide walking maps / highlight connections to the other destinations
- Audit of pedestrian links to identify any barriers to walking
- Provide high quality cycle parking
- Promote cycling to the Site via leaflets, information packs etc
- Promotion of E-bike advantages for those with a longer commute/carrying loads
- Promotion of cycle hire schemes operating in the local area
- Provide information on all public transport connections
- Promote travel planning smartphone apps
- Provide information on taxi services and local car clubs

6.5.48 The Framework Travel Plan will be subject to continual monitoring and review. An appointed Travel Plan Co-ordinator will be responsible for this. Monitoring will include travel surveys, site audits, and cycle and car parking counts.

6.6 Additional Mitigation

Construction Phase

6.6.1 The GLA's SPG on The Control of Dust and Emissions During Construction and Demolition and IAQM Guidance describe measures that should be employed, as appropriate, to reduce the impacts, along with guidance on what monitoring should be undertaken during the construction phase. This reflects best practice experience and has been used to draw up a set of measures that should be incorporated into the specification for the works. The full suite of mitigation measures set out for a medium risk site will need to be implemented during the construction phase of the Proposed Development. These are listed in Section 7.1.1 of Appendix 6.1.

6.6.2 The mitigation measures will be integrated into a Dust Management Plan (DMP). The DMP may be integrated into a detailed Construction Environmental Management Plan (CEMP), which would be conditioned with the granting of planning permission and may require construction phase monitoring.

6.6.3 Furthermore, a Construction Logistics Plan (CLP) will be implemented to minimise the environmental and road traffic related impacts of the construction works. Due to the location of the Proposed Development within London's ULEZ, all construction vehicles will also need to meet the most stringent Euro VI emissions standards.

6.6.4 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which was implemented through UK law), and through encouragement to accelerate the take up of low emission vehicles, for example through the ULEZ.

6.6.5 A construction dust assessment, carried out in accordance with the IAQM Assessment of Dust from Demolition and Construction document, is summarised in Section 5.2 of the Air Quality Appendix and concludes that the highest overall risk of unmitigated impacts is Medium for demolition, earthworks, construction and trackout. IAQM guidance recommends that for all Medium and High-risk sites, dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations should be agreed with the Local Authority. Where possible, baseline monitoring should commence at least three months before work commences on Site or, if it a large site, before work on a phase commences. The dust monitoring should be carried out in accordance with the latest available guidance, and in particular GLA guidance 'The Control of Dust and Emissions during Construction and Demolition SPG (July 2014)'.

Operational Phase

6.6.6 The assessment has demonstrated that the overall air quality effect of the completed and operational Proposed Development with regards to road traffic and generators emissions will be 'not significant'.

6.6.7 As such, there is no requirement for mitigation beyond the best practice design measures highlighted above under the 'Air Quality Positive Statement' section.

6.6.8 The following energy efficiency measures are included as part of the Proposed Development:

- The energy efficiency measures employed in the development include a highly efficient hybrid cooling system using water-cooled chillers, which will meet the substantial cooling loads while consuming a fraction of the energy of conventional cooling systems.

- 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.
- High efficacy lighting coupled with occupancy sensing to reduce emissions associated with lighting.

6.6.9 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.

6.6.10 Operational traffic flows are predicted to significantly decrease as a result of the Proposed Development. In addition, measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent national emissions standards and through encouragement to accelerate the take up of low emission vehicles, for example through the ULEZ.

6.7 Residual Effects

Construction Phase

6.7.1 The overall impact of the proposal in terms of air quality and dust issues during the construction phase is highlighted in Table 6.12.

6.7.2 In recognition that there is the potential for short term impacts to arise on occasion, and therefore result in nuisance issues at nearby sensitive human receptors, it has been assumed that even with the implementation of a Construction Environmental Management Plan (CEMP), it cannot be guaranteed that all impacts will be reduced to negligible significance. This is potentially relevant where there are construction activities taking place near sensitive receptors close to the Site boundary. Under these conditions, it is predicted that worst-case residual impacts will be reduced to Minor Adverse. These impacts are temporary, during the construction phase.

6.7.3 In conclusion, it is considered that following the provision of appropriate mitigation during all phases of construction, the overall effects are considered to be not significant.

Operational Phase

6.7.4 The overall impact of the proposal in terms of air quality issues during the operational phase is highlighted in Table 6.12.

6.7.5 In conclusion, it is considered that following appropriate mitigation, which is embedded in the detailed design, the overall effects are considered to be not significant.

6.8 Implications of Climate Change

6.8.1 The following climate change projections are of direct relevance to air quality:

- Hotter drier summers
- Milder and wetter winters
- Drier soils
- Decreased snowfall;
- More frequent storms, having and extreme rainfall and extreme winds

6.8.2 Whilst future changes in climate are anticipated, they are not expected to alter the sensitivity of the receptors assessed within this assessment.

6.9 Cumulative Effects

Construction Phase

6.9.1 The cumulative assessment has included consideration of the developments as listed in the Cumulative Development Schedule.

6.9.2 The IAQM guidance (upon which the GLA's guidance is based) states that with appropriate mitigation measures in place, any residual construction dust effects from an individual site will be not significant. The guidance also suggests that cumulative construction dust impacts are only likely where sites are within 500m of each other. Work would also have to be taking place in areas of both sites that are close to a receptor in order for cumulative effects to occur.

6.9.3 In accordance with the mitigation measures set out in Section 7.1 of the Air Quality Appendix, if there is concurrent construction work on sites within 500m of each other, the construction contractors should "*hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised*".

6.9.4 Of the cumulative schemes listed in the Cumulative Development Schedule, there are two sites within 500m of the Proposed Development, Land at Tudor Works (Colt Data Centre) (LON04 and LON05) and 15-17 Uxbridge Road, Hayes, Middlesex, UB4 OJN.

6.9.5 Any potential cumulative effects with the Proposed Development will be limited and very short term only when the works are approaching and entering into the Site, with the potential for very temporary disruption to the local road network. It is anticipated that all construction sites will adopt appropriate mitigation measures to limit emissions of dust, will hold liaison meetings recommended above and will ensure that plans are co-ordinated to minimise impacts upon the most sensitive receptors. With these measures in place, the cumulative effect of construction activities are anticipated to be not significant.

Operational Phase

6.9.6 The dispersion modelling of the emissions from the operation of the on-site generators has included the cumulative impact of emissions from the generators at the nearby LON 4 and LON 5 and the maximum predicted process contribution from the gas fired boilers at Bulls Bridge. The assessment has also included the 2025 LAEI backgrounds, which include emissions from various sources in the area.

6.9.7 The addition of the cumulative impacts did not result in any increase in the significance of the predicted air quality effect, when compared to the Proposed Development only.

6.10 Summary

6.10.1 The baseline air quality conditions at the Proposed Development and surroundings were assessed via a desktop review; the potential for any significant environmental effects were assessed using qualitative and quantitative methodology; and mitigation measures required to prevent, reduce, or offset any significant adverse effects were identified.

6.10.2 A qualitative assessment of the construction phase dust impacts has been undertaken following guidance published by the Institute of Air Quality Management (IAQM). Following the implementation of recommended mitigation measures, no significant effects are expected.

6.10.3 The mitigation of construction phase pollutant and dust emissions will be addressed by an appropriate Construction Environmental Management Plan, developed by the main contractor. Several Best Practicable Means (BPM) construction dust emissions mitigation measures have been proposed for adoption.

6.10.4 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.

6.10.5 Dispersion modelling based on a worst-case emergency scenario of 33 hours of operation has indicated that the annual mean objectives would not be exceeded. Impacts at all modelled receptor locations are negligible to slight. In addition, the 24-hour objective for PM_{10} is also not expected to be exceeded. 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). 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. In line with EPUK/IAQM guidance, impacts at all modelled receptor locations are substantial in the initial hour, and moderate to substantial in subsequent hours. 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 100th percentile results has been used in the results processing. 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.

6.10.6 As such, there is no requirement for mitigation beyond the best practice design measures highlighted above under the ‘Air Quality Positive Statement’ section.

6.10.7 As there are no emissions associated with the main energy provision, it can be assumed that the building emissions will meet NO_2 and PM_{10} benchmark values and therefore the Proposed Development is likely to be “air quality neutral” with respect to building emissions.

6.10.8 The predicted annual trip generation associated with the Proposed Development does not exceed the Transport Benchmark. It is therefore concluded that the Proposed Development is likely to be “air quality neutral” with respect to transport emissions.

6.10.9 Overall, the impact of the Proposed Development is considered to be negligible with regards to emissions of NO_2, $PM_{2.5}$ and PM_{10}, and the overall effect is considered to be ‘not significant’.

6.10.10 A summary of the assessment is set out in Table 6.12 overleaf. A summary of the mitigation requirements is provided in Table 6.13.

6.11 References

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Table 6.12 Summary of effects

Receptor	Receptor sensitivity	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Construction Phase					
Sensitive human receptors	High	PM_{10}, $PM_{2.5}$ and NOx from on-site construction NRMM machinery	Specification of minimum NRMM emission requirements	Negligible	Not Significant
Sensitive human receptors	High	PM_{10}, $PM_{2.5}$ and NO_x from Construction traffic exhaust emissions	To be outlined in a Construction Management Plan which will include proposed construction logistics and is expected to be required for each reserved matters submission.	Due to the phased nature of the development, it is considered unlikely that the construction traffic will exceed the criteria for detailed assessment and therefore residual effects are anticipated to be negligible.	Anticipated to be not significant due to the phase nature of the construction works and the provision of appropriate mitigation.
Sensitive human receptors	High	Dust and PM_{10} emissions associated with construction activities	Mitigation measures will be implemented via a Construction Environmental Management Plan (CEMP) to avoid, minimise or mitigate any construction effects on the environment in respect. It is anticipated that this will be formally requested by Planning Condition.	Negligible	Not Significant

Receptor	Receptor sensitivity	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Operation Phase					
Sensitive human receptors	High	Emission from testing and maintenance of the on-site generators	Embedded mitigation of locating flue heights at 41.6 m, 46.6 m, 56 m or 40.2 m above ground level. Limiting operating hours to required testing and maintenance schedule (12 hours per year per generator). Maximum of 4 generator to be tested at any given time.	Negligible / Slight	Not Significant

6.12 Mitigation commitments Summary

Table 6.13 Summary for Securing Mitigation

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
Construction Phase				
Sensitive human receptors	Specification of minimum NRMM emission requirements	Legal requirement expected to be formally requested by Planning Condition.	Contractor	LBH
Sensitive human receptors	Mitigation measures during demolition, earthworks and construction appropriate for a medium risk site in accordance with IAQM guidance.	Provision of a CEMP. Assumed to be a Planning Condition.	Contractor	LBH
Operation Phase				
Sensitive human receptors	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.	n/a	Applicant	n/a