Chapter 8: Air Quality

AIR QUALITY	
AUTHOR	Air Quality Consultants Ltd (AQC)
SUPPORTING APPENDIX	**ES Volume 3, Appendix: Air Quality** Annex 1: Glossary; Annex 2: Legislative and Planning Policy Context; Annex 3: Construction Dust Assessment Procedure; Annex 4: EPUK & IAQM Planning for Air Quality Guidance; Annex 5: Professional Experience; Annex 6: Modelling Methodology; Annex 7: No Improvement Scenario; Annex 8: London Vehicle Fleet Projections; Annex 9: Preliminary Air Quality Assessment; Annex 10: Air Quality Positive Statement; Annex 11: Construction Mitigation; and Annex 12: References.
KEY CONSIDERATIONS	The London Borough of Camden (LBC) has declared a borough-wide Air Quality Management Area (AQMA) for exceedances of the annual mean nitrogen dioxide (NO_2) and the 24-hour mean particulate matter (PM_{10}) objectives. Activities associated with the deconstruction and construction works of the Proposed Development will give rise to a risk of dust impacts at existing sensitive receptors during deconstruction[1], earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. A qualitative construction dust risk assessment has thus been carried out. In addition, the potential for construction vehicles to impact upon local air quality has been considered quantitatively within the 2025 assessment scenario, which has applied traffic flows from the peak year[2] of construction for the Proposed Development to the first year of construction phase as a worst-case. The main air pollutants of concern related to construction traffic emissions are NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$). Once complete and operational, the Proposed Development will lead to changes in vehicle flows on local roads which may impact on air quality at existing residential properties. The proposed retail uses within the Proposed Development will also be subject to the impacts of road traffic emissions from the adjacent road network. The air quality assessment has considered the impacts on future receptors and the site suitability assuming a fully completed development in 2030. The Proposed Development also includes an all-electric system comprising Air-Source Heat Pumps (ASHPs), supplemented by photovoltaic panels (PVs) for the provision of heat and hot water. There are also two options under consideration for emergency power provision to incorporate either a life safety generator and future tenant generator (Option 1) or Dual Utility Supplies (Option 2), for emergency purposes. However, not enough information is available at this stage to undertake a meaningful assessment of the impacts from these options on air quality; it is therefore proposed, should planning permission be granted, that LBC include a planning condition that requires any plant with emissions to air is assessed and the results presented to LBC prior to commencement. This approach will reduce the potential for likely significant effects to occur. The Proposed Development will include allocation for fume cupboards, to allow potential end users operating research and development type activities to occupy some of the development. Although the use of such facilities requires extraction of air, there are tight regulations on the design and operation of fume cupboards. Given these strict regulations on their operation, there can be a high level of confidence that provided the air extraction system is appropriately designed, and therefore likely significant air quality effects will be avoided. In summary, in terms of the potential air quality effects, the assessment has considered: • The impacts of the deconstruction and construction works associated with the Proposed Development on dust soiling and concentrations of PM_{10} at existing sensitive receptors during the deconstruction and construction period; • The impact of the deconstruction and construction works of the Proposed Development on concentrations of NO_2, PM_{10} and $PM_{2.5}$ from construction traffic on existing sensitive receptors; • The impacts of the complete and operational Proposed Development on concentrations of NO_2, PM_{10} and $PM_{2.5}$ from road traffic, at existing local sensitive receptors, in the proposed first year of opening; • The impacts of existing and proposed emission sources of NO_2, PM_{10} and $PM_{2.5}$ on future users of the Proposed Development;

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	• Whether or not the Proposed Development is 'air quality neutral'; • The measures included within the Proposed Development to maximise benefits to local air quality and reduce exposure (Air Quality Positive Statement); and • The cumulative impacts on air quality of the Proposed Development in combination with cumulative schemes identified in the local area.
CONSULTATION	An EIA Scoping Opinion Request Report ('EIA Scoping Report') was submitted to the LBC on 4 August 2023 (refer to **ES Volume 3, Appendix: EIA Methodology – Annex 1**) which sets out the proposed scope and method proposed for this ES chapter. A draft of the 'EIA Scoping Report Review' (prepared by CBRE, the LBC's appointed EIA advisors) was issued on 4 October 2023 (refer to **ES Volume 3, Appendix: EIA Methodology - Annex 2**), and a final EIA Scoping Opinion was subsequently issued on the 16 November 2023. The EIA Scoping Report Review accepts the proposed air quality assessment methodology set out in the EIA Scoping Report but requests clarification on: • The assumptions for vehicular movements in the baseline scenario; the assessment has assumed that the existing Euston Tower building is vacant (i.e., no operational movements which is conservative although it is acknowledged that there may be a small number associated with the retail units) but servicing and deliveries associated with the wider Regent's Campus have been considered as set out in **ES Volume 1, Chapter 7: Traffic and Transport**; and • Clarification that the traffic scenarios (predominately comprising of the 2023 Baseline, 2030 Future Baseline and 2030 Future Baseline with the Proposed Development) used for the assessment are consistent across the ES and are representative of a reasonable worst-case, this is set out in **ES Volume 1, Chapter 7: Traffic and Transport.**

ASSESSMENT METHODOLOGY

Defining the Baseline

Current Baseline Conditions

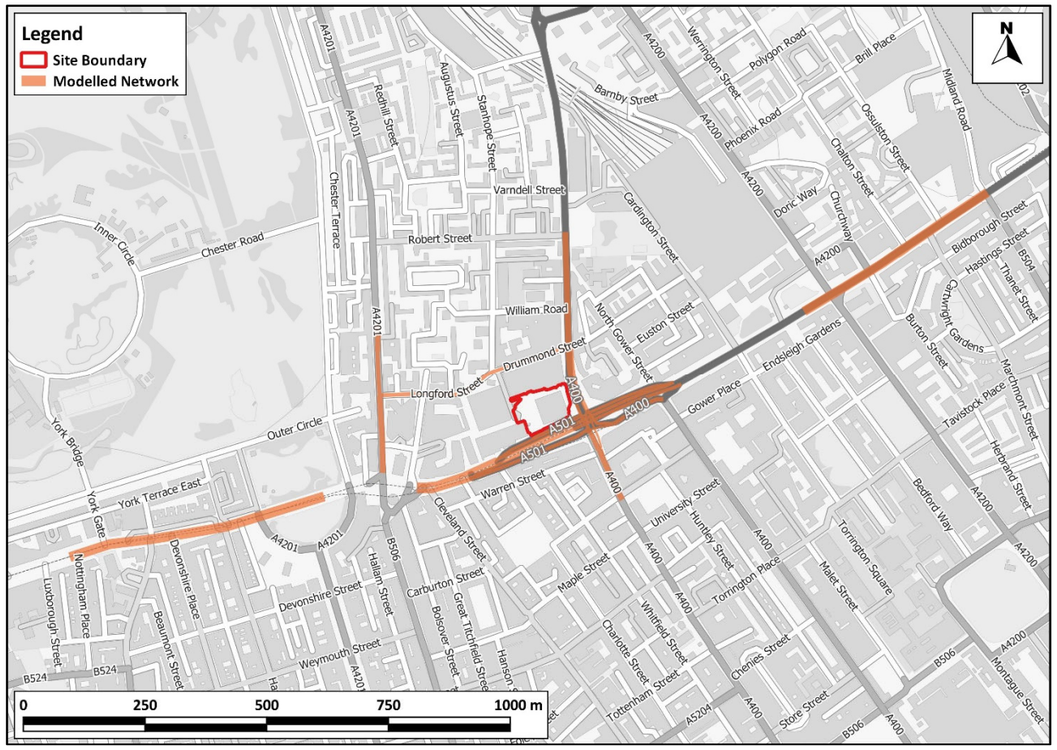
8.1 Existing sources of emissions within the study area have been defined using a number of approaches. The study area is effectively defined by the extent of the road network included in the air quality modelling assessment of the road traffic impacts from the deconstruction and construction works and the complete and operational Proposed Development (see Figure 8.1). Industrial and waste management sources that may affect the area have been identified using the Department for the Environment, Food and Rural Affairs (Defra) Pollutant Release and Transfer Register[3]. Local sources have also been identified through examination of the LBC's Air Quality Review and Assessment reports and a review of aerial mapping.

[1] 'Demolition' is the terminology used in the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition and has been used in places for consistency however refers to the deconstruction phase of works.

[2] Peak year is the year with the greatest construction vehicle traffic flows (2026).

[3] Defra (2023) UK Pollutant Release and Transfer Register, [Online], Available: prtr.defra.gov.uk.

Figure 8.1 Study Area



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8.2 Information on existing air quality has been obtained by collating the results of monitoring carried out by LBC. Background concentrations have been defined using the national pollution maps published by Defra[4]. These cover the whole country on a 1x1km grid. Further details are provided in **ES Volume 3, Appendix: Air Quality – Annex 6**.

8.3 Exceedances of the annual mean European Union (EU) limit value for NO_2 in the study area has been identified using the maps of roadside concentrations published by Defra[5,6]. These are the maps used by the UK Government, together with results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to EU data quality standard, to report exceedances of the limit value to the EU. The national maps of roadside PM_{10} and $PM_{2.5}$ concentrations, which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

8.4 Current baseline concentrations have been modelled using the ADMS-Roads dispersion model. Details of the model inputs, assumptions and the verification are provided in **ES Volume 3, Appendix: Air Quality – Annex 6**. Where assumptions have been made, a realistic worst-case approach has been adopted, as discussed in paragraph 8.59.

Future Baseline Conditions

8.5 Future baseline concentrations have been predicted using the ADMS-Roads dispersion model for the opening year of the construction period (2025) assuming the peak construction traffic flows and the first year of operation of the Proposed Development (2030). Details of the model inputs, assumptions and the verification are provided in **ES Volume 3, Appendix: Air Quality – Annex 6**, together with the method used to derive future year background concentrations. Where assumptions have been made, a realistic worst-case approach has been adopted.

Evolution of the Baseline

8.6 If the Proposed Development was not to come forward, it is expected that the site would remain as its current use (as a vacant building with some active retail elements). Air quality is generally expected to improve with time, due, for example, to more stringent emissions standards for motor vehicles and the uptake of cleaner vehicles. The likely evolution of the baseline conditions if the Proposed Development did not come forward has been considered in this assessment in the 2025 and 2030 scenarios.

Assessment Criteria

UK Criteria

8.7 The UK Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations, below which effects are unlikely, even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the UK Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility, and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations 2000[7] and the Air Quality (England) (Amendment) Regulations 2002[8].

8.8 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The Greater London Authority (GLA) explains where these objectives will apply in London[9]. The annual mean objectives for NO_2 and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals, and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The objectives do not apply at offices or other places of work where members of the public do not have regular access. The 24-hour mean objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for NO_2 applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets and hotels.

8.9 The UK-wide objectives for NO_2 and PM_{10} were to have been achieved by 2005 and 2004[7], respectively, and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour NO_2 objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 $\mu g/m^3$[3,10]. Therefore, 1-hour NO_2 concentrations will only be considered if the annual mean concentration is above this level.

8.10 For $PM_{2.5}$, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see paragraph 8.17), originally set at 25 $\mu g/m^3$ and currently set at 20$\mu g/m^3$.

8.11 Defra has also recently set two new targets, and two new interim targets, for $PM_{2.5}$ concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean $PM_{2.5}$ concentration of 10$\mu g/m^3$ by the end of 2040, with the interim target being a value of 12 $\mu g/m^3$ by the

[4] *Defra (2023) Local Air Quality Management (LAQM) Support Website, [Online], Available: http://laqm.defra.gov.uk/.*
[5] *Defra (2020) 2020 NO2 projections data (2018 reference year), Available: https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data.*
[6] *Defra (2023) UK Ambient Air Quality Interactive Map, Available: https://uk-air.defra.gov.uk/data/gis-mapping*
[7] *The Air Quality (England) Regulations, 2000, Statutory Instrument 928 (2000), HMSO, Available: http://www.legislation.gov.uk/uksi/2000/928/contents/made.*
[8] *The Air Quality (England) (Amendment) Regulations, 2002, Statutory Instrument 3043 (2002), HMSO, Available: https://www.legislation.gov.uk/uksi/2002/3043/contents/made.*
[9] *GLA (2019) London Local Air Quality Management Technical Guidance 2019, Available: https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf*
[10] *Defra (2018) Review & Assessment: Technical Guidance LAQM.TG16 February 2018 Version, Defra, Available: https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf.*

start of 2028[11, 12]. The second set of targets relate to reducing overall population exposure to $PM_{2.5}$. By the end of 2040, overall population exposure to $PM_{2.5}$ should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

8.12 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, as explained in **ES Volume 3, Appendix: Air Quality – Annex 2**, all four new targets provide metrics against which the UK Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing $PM_{2.5}$ concentrations against the targets.

8.13 In March 2023, the Department for Levelling Up, Housing and Communities[13] (DLUHC) explained that the new $PM_{2.5}$ targets will:

"need to be integrated into the planning system, and in setting out planning guidance for local authorities and businesses, we will consider the specific characteristics of $PM_{2.5}$. The guidance will be forthcoming in due course, until then we expect local authorities to continue to assess local air quality impacts in accordance with existing guidance."

8.14 Defra has also provided advice[14] which explains that there is no current requirement to consider the new $PM_{2.5}$ targets in planning decisions and that guidance to local planning authorities will be forthcoming before this position changes. In the future, when planning decisions do need to consider the new targets, the expectation is that this will focus on reducing emissions from new development rather than being a direct requirement for planning-related air quality assessments to predict $PM_{2.5}$ concentrations.

8.15 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new $PM_{2.5}$ targets and they are not considered further.

8.16 As explained in **ES Volume 3, Appendix: Air Quality – Annex 2**, the GLA has set a target to achieve an annual mean $PM_{2.5}$ concentration of 10µg/m^3 by 2030. This target was derived from an air quality guideline set by WHO in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy[15] considers the 2005 guideline of 10µg/m^3. While there is no explicit requirement to assess against the GLA target of 10µg/m^3, it has nevertheless been included within this assessment.

8.17 EU Directive 2008/50/EC[16] sets limit values for NO_2, PM_{10} and $PM_{2.5}$, and is implemented in UK law through the Air Quality Standards Regulations (2010)[17,18]. The limit values for NO_2, PM_{10} and $PM_{2.5}$ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by the UK Government meets the specification required to assess compliance with the limit values. The UK Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

8.18 The relevant air quality criteria for this assessment are provided in Table 8.1.

Table 8.1 Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
NO_2	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 µg/m^3
PM_{10}	24-hour mean	50µg/m^3 not to be exceeded more than 35 times a year
	Annual mean	40 µg/m^3
$PM_{2.5}$	Annual mean	20 µg/m^3 [a]
	Annual mean	10 µg/m^3 by 2030

[a] *There is no numerical $PM_{2.5}$ objective for local authorities (see paragraph 8.10). Convention is to assess against the UK limit value which is currently 20µg/m^3.*

LBC Criteria

8.19 LBC has committed within their Air Quality Camden Planning Guidance (CPG) and Clean Air Action Plan (CAAP) to meeting the WHO guideline limits for NO_2, PM_{10} and $PM_{2.5}$. However, the two documents quote different WHO limits; the CPG refers to the previous WHO limits to be met in 2030 while the CAAP refers to the current WHO limits to be met in 2034.

8.20 The commitment to meet the new WHO guidelines in the CAAP is described within the context of the Council's local air quality management; the CAAP states that *"We will not consider that we have achieved the WHO guideline objectives until every monitoring location at which the pollutants are measured records annual mean concentrations which meet the relevant standards"*. The purpose of the CAAP is to help fulfil their requirements under the Local Air Quality Management (LAQM) regime, rather than development control. The CAAP does not reference the WHO guidelines for planning, nor does the CAAP include any measures with respect to updating the Air Quality CPG to account for the latest WHO guidelines.

8.21 For the purpose of this assessment, the WHO guidelines outlined in the Air Quality CPG have been used as these relate to planning and are the guidelines quoted in the LBC Air Quality Proforma to be submitted to accompany planning applications. These guidelines are presented in Table 8.2 below. The target years for achievement as outlined in the Camden CAAP have also been provided.

Table 8.2 Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Guideline target (as an annual mean)	Target achievement timeframe
NO_2	38 µg/m^3 [a]	- [b]
PM_{10}	20 µg/m^3	2026
$PM_{2.5}$	10 µg/m^3	2030

[a] While the WHO guideline is 40 µg/m^3, 38 µg/m^3 has been used in accordance with the Air Quality CPG which states that *"consideration must be paid to uncertainty in NO_2 data, therefore 38 µg/m^3 (the 40 µg/m^3 WHO limit less 5%) shall be taken as the limit for this pollutant."*

[b] *No achievement target timeframe for NO_2 as a target of 38 µg/m^{3}should have already been met.*

Construction Dust Criteria

8.22 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the Institute of Air Quality Management (IAQM)[19,20] has been used (the GLA's Supplementary Planning

[11] *Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 mg/m^3 would not exceed the 10 mg/m^3 target.*
[12] *Defra (2023) Environmental Improvement Plan 2023*
[13] *DLUHC (2023) Planning Newsletter, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1140170/03_Chief_Planners_Newsletter_March_2023.pdf*
[14] *Defra (2023) Integrating the Environment Act air quality targets into the planning system. Edition: Proc. IAQM Routes to Clean Air conf. Manchester, 10th October 2023*
[15] *GLA (2018) London Environment Strategy*
[16] *The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council, Available: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0050.*
[17] *The Air Quality Standards Regulations 2010 Statutory Instrument 1001 (2010), HMSO, Available: http://www.legislation.gov.uk/uksi/2010/1001/pdfs/uksi_20101001_en.pdf.*
[18] *As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.*
[19] *IAQM (2016) Guidance on the Assessment of Dust from Enabling works and Construction v1.1, Available: http://iaqm.co.uk/guidance/.*
[20] *The IAQM is the professional body for air quality practitioners in the UK.*

Guidance (SPG)[21] recommends that the assessment be based on the latest version of the IAQM guidance). Full details of this approach are provided in **ES Volume 3, Appendix Air Quality – Annex 3**.

Road Traffic Screening Criteria

8.23 Environmental Protection UK (EPUK) and the IAQM[22] recommend a two-stage screening approach to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in **ES Volume 3, Appendix Air Quality – Annex 4**, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5ha, or is non-residential and will provide less than 1,000m^2 of floorspace or cover a site area of less than 1ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

8.24 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in **ES Volume 3, Appendix Air Quality – Annex 4**) inside an AQMA are a change in flows of more than 25 heavy duty vehicles (HDVs) or 100 light duty vehicles (LDVs) per day. Where these criteria are exceeded, a detailed assessment is required, although the guidance advises that "*the criteria provided are precautionary and should be treated as indicative*", and "*it may be appropriate to amend them on the basis of professional judgement*".

8.25 While these screening criteria are specifically intended to act as a trigger for a detailed assessment, they can also be used to identify the extent of the road network that requires assessment; where the change in traffic on a given road link is less than the relevant screening threshold, it is unlikely that a significant impact would occur, and these links can be disregarded unless there are additional sources affecting the link (e.g. emissions from a point source).

Impact Assessment Methodology

Deconstruction and Construction

8.26 **ES Volume 1, Chapter 5: Deconstruction and Construction** outlines the proposed deconstruction and construction works. Consideration has been given to the potential for significant effects from the following impacts that will occur during the deconstruction and construction of the Proposed Development:

- Deconstruction and construction dust and particulate matter emissions;
- Deconstruction and construction on-site exhaust emissions; and
- Deconstruction and construction traffic emissions.

Dust and Particulate Matter Emissions

8.27 The deconstruction and construction dust assessment has considered the potential for impacts within 350m of the site boundary; or within 50m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition[21], which is based on that provided by IAQM[19]. This follows a sequence of steps:

- Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required;
- Step 2 consists of determining the risk of dust impacts for each activity (i.e., demolition[23], earthworks, construction and the trackout of material from the site onto the local road network):
  - Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. The 'dust emission magnitude' is determined for each of the four activities listed above, and is defined as 'small', 'medium' or 'large';
  - Step 2b defines the sensitivity of the area to dust soiling and human health effects and is determined based on the number of receptors located within certain distances from the site, and their sensitivity. Area sensitivities are defined for each type of effect (dust soiling or human health) and are described as 'low', 'medium' or 'high'; and
  - Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Risks are defined as 'negligible', 'low', 'medium' or 'high'.
- Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant effects.

8.28 **ES Volume 3, Appendix Air Quality – Annex 3** explains the approach in more detail.

On-Site Exhaust Emissions

8.29 Deconstruction and construction plant emissions will not be explicitly modelled or assessed, as the relevant guidance from the IAQM[19] states *"experience from assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) […] suggests that they are unlikely to make a significant impact on local air quality and in the vast majority of cases they will not need to be quantitatively assessed."* However, suitable mitigation measures for site plant, such as requiring compliance with London's NRMM emission standards and switching off machinery when not in use, are presented as part of the mitigation measures in **ES Volume 3, Appendix: Air Quality – Annex 11**, which are based on advice presented in the IAQM and GLA guidance documents, and detailed in **ES Volume 1, Chapter 15: Environmental Management, Mitigation and Monitoring Schedule**.

8.30 The use of a Construction Management Plan (CMP), notably the mitigation measures contained within it, 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.

8.31 Additionally, all NRMM will be required to meet Stage IIIA of EU Directive 97/68/EC[24] and its subsequent amendments as a minimum. From January 2025, NRMM used anywhere in London will be required to meet Stage IV, while from January 2030 the Stage V standard will apply. From January 2040 only zero emission machinery will be allowed. There will be no idling when vehicles are not in use, and machinery will be located well away from sensitive receptors as far as possible.

Deconstruction and Construction Traffic

8.32 EPUK & IAQM[22] consider that a detailed assessment is required where a development leads to an increase in HDVs of more than 25 Annual Average Daily Traffic (AADT) in an AQMA. The deconstruction and construction phase of the Proposed Development will generate 27 HGV trips (as an AADT) in the peak year[2] (2026), which will access the site from Euston Road (A501) to the west of Albany Street, with 50% entering via the basement access on Longford Street and 50% continuing to the Euston Road (A501) off-slip road to enter the site. On exit, 50% will egress via Drummond Street and 50% will egress via Hampstead Road, south of the junction with Drummond Street. All 27 HGVs will exit via Hampstead Road, north of the junction.

8.33 A quantitative assessment of construction vehicle emissions impacts has, therefore, been carried out to determine the impacts that construction traffic emissions will have on existing sensitive receptors located along the affected routes. The main air pollutants of concern related to traffic emissions are NO_2, PM_{10} and $PM_{2.5}$.

8.34 The impact of construction traffic emissions on local concentrations of NO_2, PM_{10} and $PM_{2.5}$ at existing sensitive receptors has been predicted following the methodology presented in the '*Road Traffic Impacts*' section below, for 2025, being the first year of the commencement of the deconstruction and construction works. Assuming a year of 2025 is considered to be a worst-case scenario, compared to 2026, as air quality is generally expected to improve with time.

Assumptions

8.35 The construction dust risk assessment has assumed that measures described in **ES Volume 1, Chapter 15: Environmental Management, Mitigation and Monitoring Schedule** will be in place.

8.36 Consideration is given to emissions from NRMM based on the control measures that would be implemented to ensure emissions do not result in significant effects at existing or introduced receptors.

[21] *GLA (2014) The Control of Dust and Emissions from Construction and Enabling works SPG.*
[22] *Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2, IAQM, London, Available: http://iaqm.co.uk/guidance/.*
[23] *Refers to the deconstruction works*
[24] *The European Parliament and the Council of the European Union (1997) Directive 97/68/EC of the European Parliament and of the Council.*

Completed Development

8.37 The assessment of the complete and operational Proposed Development's air quality in this ES chapter includes:

- An assessment of road traffic emissions associated with the complete and operational Proposed Development upon existing sensitive receptors;
- The impacts of existing and proposed pollution sources upon future users of the Proposed Development in terms of site suitability;
- Consideration of the emissions from the proposed laboratory fume cupboards on existing air quality;
- Whether the Proposed Development is 'air quality neutral'; and
- The measures the Proposed Development includes to maximise benefits to local air quality and reduce exposure (Air Quality Positive Statement).

8.38 The assessment of the operational impacts that the Proposed Development will have on local air quality has been carried out following the methodologies presented below.

Road Traffic Impacts

Screening Stage

8.39 The first step in considering the road traffic impacts of the Proposed Development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance[22], as described in **ES Volume 3, Appendix: Air Quality – Annex 4**. Where impacts can be screened out there is no need to progress to a more detailed assessment.

8.40 The following sections describe the approach to dispersion modelling of road traffic emissions, which has been required for this project, as the Proposed Development leads to an increase in traffic of 120 LDVs, which is above the screening criteria, along Longford Street. The model has also been used to determine future air quality conditions for future air quality sensitive users of the Proposed Development.

Modelling Methodology

8.41 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's latest Emission Factor Toolkit (EFT) (v11.0). Details of the model inputs, assumptions and the verification are provided in **ES Volume 3, Appendix: Air Quality – Annex 6**, together with the method used to derive base and future year background concentrations. Where assumptions have been made, a realistic worst-case approach has been adopted.

Assessment Scenarios

8.42 NO_2, PM_{10} and $PM_{2.5}$ concentrations have been predicted for a base year of 2022 (the most recent full calendar year of monitoring data available unaffected by the Covid-19 pandemic) and the proposed first year of occupation (2030). For 2030, predictions have been made assuming both that the Proposed Development does proceed ('With Proposed Development') and does not proceed ('Without Proposed Development').

8.43 Predictions for 2030 are based on a return to 'typical' activity levels and assume no impact as a result of the Covid-19 pandemic in this year, to ensure a worst-case assessment (as the influence of the pandemic has generally been to reduce concentrations of the pollutants considered in this assessment).

8.44 In accordance with LBC's Air Quality CPG, concentrations have also been predicted for the proposed earliest year of operation (2030) assuming no improvement in emission factors or background concentrations from the base year (i.e., using 2022 emission factors and background concentrations with 2030 traffic data).

Traffic Data

8.45 Traffic data for the assessment have been provided by Velocity Transport Ltd, the appointed Transport Consultants for the Proposed Development. The assessment has utilised the traffic data from the 'sensitivity test' scenario undertaken by Velocity Transport Ltd, which assumes that the whole Proposed Development is commercial office space, rather than split between office and life science spaces. The traffic flows for the 'sensitivity test' scenario are marginally higher and hence are considered a worst-case. Further details of the traffic data used in this assessment are provided in **ES Volume 3, Appendix: Air Quality – Annex 6**.

8.46 The traffic data used in the assessment for 2030 includes data for all cumulative schemes (**ES Volume 1, Chapter 2: EIA Methodology – Annex 2)**, which would affect flows on the roads included in this assessment. As such, predications of future pollutant concentrations presented in this ES chapter take account of cumulative effects.

Uncertainty

8.47 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.

8.48 An important stage in the process is model verification, which involves comparing the model output with measured concentrations (see **ES Volume 3, Appendix: Air Quality – Annex 6**). The level of confidence in the verification process is necessarily enhanced when data from an automatic analyser have been used, as has been the case for this assessment. Because the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2022) concentrations.

8.49 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. For obvious reasons, the model cannot be verified in the future, and it is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. Historically, Defra's EFT had a tendency to over-state emissions reductions into the future. However, analysis of the most recent versions of Defra's EFT carried out by AQC[25, 26] suggest that, on balance, these versions are unlikely to over-state the rate at which NOx emissions decline in the future at an 'average' site in the UK. In practice, the balance of evidence suggests that NOx concentrations are most likely to decline more quickly in the future, on average, than predicted by the EFT, especially against a base year of 2016 or later. Using EFT v11.0 for future-year forecasts in this report thus provides a robust assessment, given that the model has been verified against measurements made in 2022.

8.50 In spite of the large body of evidence described above indicating that the EFT vehicle projection factors are robust and LBC monitoring data indicating the concentrations have improved in the Borough since 2015 (presented in Table 8.4 and Table 8.5), the LBC Air Quality CPG requests that concentrations are predicted assuming no improvements in vehicle emissions, which is unrealistic given expected future changes in the vehicle fleet (discussed in Paragraph 8.51). The results from this scenario, which are presented in **ES Volume 3, Appendix: Air Quality – Annex 7**, are considered highly conservative; the concentrations at the Proposed Development are expected to be closer to those described for 2030 as presented in the *'Site Suitability'* section of this ES chapter. LBC's approach of disregarding expected future improvements in air quality will more than offset any other uncertainties in the assumptions.

8.51 Changes were made to the Low Emission Zone (LEZ) from 1 March 2021, and to the Ultra Low Emission Zone (ULEZ) from 25 October 2021. The changes are described in detail in **ES Volume 3, Appendix: Air Quality – Annex 2**, and can be expected to significantly reduce NOx emissions in London; however, they are not reflected in Defra's latest EFT and thus have not been considered in this assessment. An extension to the ULEZ to cover the whole of greater London was implemented on the 29 August 2023. The assessment presented in this ES chapter is, therefore, very much worst-case in this regard, and it is expected that background concentrations, baseline concentrations, and the impacts of the Proposed Development will be lower than described in this ES chapter. **ES Volume 3, Appendix: Air Quality – Annex 8** discusses uncertainties regarding the future fleet mix in London and the scale of the reduction in NOx emissions that can be expected with the adoption of these changes.

8.52 This assessment has also considered the GLA target for $PM_{2.5}$. Whilst the overall approach is essentially unchanged from an assessment against the objectives, it must be recognised that there is increased

[25] *AQC (2020) Performance of Defra's Emission Factor Toolkit 2013-2019, Available: https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=7fba769d-f1df-49c4-a2e7-f3dd6f316ec1.*

[26] *AQC (2020) Comparison of EFT v10 with EFT v9, Available: https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=9d6b50e1-3897-46cf-90f1-3669c6814f1d.*

uncertainty as the criteria are numerically reduced. By way of example a 0.5% increase in a PM_{10} concentration with regard to the objective is 0.2 µg/m^3, whereas a 0.5% increase in a $PM_{2.5}$ concentration with regard to the GLA target is just 0.05 µg/m^3. While such increases can be predicted (as the model will generate outputs to many decimal places), such small increases must be treated with increased caution.

Site Suitability

8.53 Site suitability has been determined using dispersion modelling, applying the same modelling methodology for road traffic, as described in paragraph 8.41.

Energy Plant Impacts

8.54 The Proposed Development will be provided with heat and hot water by an all-electric system comprising ASHPs, supplemented by PVs; as such, there will be no centralised energy plant and thus no significant point sources of emissions within the Proposed Development.

8.55 In addition, the following two options are being investigated as part of the design stages for the Proposed Development:

- **Option 1**: inclusion of a life safety generator, located at basement level, to provide standby power to a range of life safety systems in the Proposed Development; and
- **Option 2**: provision of dual utility power supplies of 11kV each to the Proposed Development, from two diverse UKPN primary substations, to provide primary and secondary supplies to life safety equipment. In addition, the space at basement level allocated for the life-safety generator (Option 1) could be used for the installation of a future tenant generator of up to 1,500 kVA.

8.56 Information on the precise sizing, emission rate and testing regime is not currently available for either option (which is common at this stage of planning) and thus it is not possible to undertake a meaningful assessment within the ES. Any assessment at this stage would rely on highly conservative, worst-case assumptions and therefore the conclusions would not be representative of the actual impacts from any generator installed. Subsequently, any assessment undertaken at this stage would need to be updated once the design had been finalised.

8.57 It is, therefore, proposed, should planning be granted, that LBC include a planning condition that requires any plant with emissions to air to be assessed and the results presented to LBC prior to commencement. This approach will ensure likely significant effects to air quality from any plant emissions are unlikely to occur.

Laboratory Fume Cupboard Impacts

8.58 The Proposed Development will include an allocation for fume cupboards to allow potential end users operating research and development type activities to occupy some of the development. Although the use of such facilities requires extraction of air, there are tight regulations on the design and operation of fume cupboards. Any such end users will need to ensure that all activities meet the requirements of various British Standards (e.g., BSEN 14175) and Health and Safety Executive (HSE) / Control of Substances Hazardous to Health (COSHH) standards for all substances handled. Any residual emissions will need to be appropriately minimised using filtration where necessary. Given the strict regulations on the operation of fume cupboards, there can be a high level of confidence that provided the air extraction system is appropriately designed, and that likely significant air quality effects will be avoided.

Assumptions and Limitations

8.59 The following key assumptions have been made in the air quality assessment set out in this ES chapter to facilitate a reasonable worst-case assessment of likely significant effects:

- The Proposed Development is complete and fully operational in 2030. In reality the development may not be fully occupied by 2030, thus it will not be generating its full traffic volumes in 2030. In this instance, the assessment will have overestimated the traffic emissions and hence the 2030 "With Proposed Development" concentrations;
- The London City Airport meteorological monitoring station appropriately represents conditions in the study area (this is discussed further in **ES Volume 3, Appendix Air Quality – Annex 6**);
- The reduction in NO_x emissions in London due to the LEZ and ULEZ expansions are not considered in this assessment as they are not reflected in Defra's latest EFT (see paragraph 8.51), which results in the prediction of higher concentrations and greater impacts; and
- That travel activity patterns in the future assessment years will return to historically normal levels (i.e., pre-pandemic) with no long-lasting changes to travel behavior.

'Air Quality Neutral'

8.60 The GLA's London Plan Guidance (Air Quality Neutral)[27] sets out guidance on how an 'air quality neutral' assessment should be undertaken. It also provides a methodology for calculating an offsetting payment if a development is not 'air quality neutral' and it is not possible to identify or agree appropriate and adequate mitigation.

8.61 **ES Volume 3, Appendix Air Quality – Annex 9** sets out the emissions benchmarks from the guidance. The approach has been to calculate the emissions from the Proposed Development and to compare them with these benchmarks.

'Air Quality Positive'

8.62 The London Plan[28] details expectations regarding 'Air Quality Positive'. The full text is quoted in **ES Volume 3, Appendix Air Quality – Annex 2**, but the expectations can be summarised as follows:

- Air quality should be considered at an early stage in the project design;
- Existing good practice measures should be drawn together in a holistic fashion to identify which options deliver the greatest improvement to air quality, both in terms of on-site exposure and off-site impacts;
- A statement should be developed setting out how air quality can be improved across the proposed area of the development;
- These measures should be incorporated into the design; and
- Delivery of an air quality positive approach is project specific and relies on the opportunities on-site or in the surrounding area to improve air quality.

8.63 AQC has been involved since early in the design process for the Proposed Development and produced a Preliminary Air Quality Assessment to inform the design (see **ES Volume 3, Appendix Air Quality – Annex 9**). The measures recommended were considered in the design and an air quality positive statement has been prepared (**ES Volume 3, Appendix Air Quality – Annex 10**), detailing which measures have been implemented and their benefits in terms of air quality, and how the Proposed Development has been designed to reduce emissions to air and reduce exposure to air pollution on-site.

8.64 The GLA has published guidance[28] on how the requirements for Air Quality Positive development should be met, which has been followed when preparing this ES chapter.

Methodology for Defining Effects

Receptors and Receptor Sensitivity

Deconstruction and Construction Dust and Particulate Matter Emissions

8.65 The IAQM, in their guidance on construction dust[19], provides criteria to define receptor sensitivity to dust soiling or health effects of PM_{10} (See Table A3.2 in **ES Volume 3, Appendix Air Quality – Annex 3**). Residential properties are considered as high sensitivity receptors to both dust soiling and health effects of PM_{10}, while places of work are defined as medium sensitivity receptors.

[27] *GLA (2023) London Plan Guidance – Air Quality Neutral.*

[28] *GLA (2023) London Plan Guidance – Air Quality Positive.*

Deconstruction and Construction Traffic

8.66 The sensitivity of receptors to construction traffic emissions is the same as presented in the *'Completed Development'* section below. However, the assessment of deconstruction and construction traffic has only considered existing sensitive receptors (receptors at the Proposed Development will not be present).

Completed Development

8.67 The 2007 Air Quality Strategy[29] explains that air quality standards and objectives were determined based on expert recommendations and represent *"levels at which no significant health effects would be expected in the population as a whole"*. As described in paragraph 8.8, the objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in its Technical Guidance[9].

8.68 In terms of the Proposed Development, the retail floorspace is considered to represent relevant exposure to the 1-hour mean NO_2 objective while the offices and lab floorspace do not represent relevant exposure to the national air quality objectives. For the existing residential and college properties, there is relevant exposure to both the annual mean and short-term objectives.

8.69 Within this ES chapter, all receptors where the air quality objectives apply are considered to be high sensitivity receptors. Locations where the objectives do not apply are considered to be not sensitive. Therefore, there are no medium or low sensitivity receptors within the context of this assessment.

Magnitude of Impact

Deconstruction and Construction Dust and Particulate Matter Emissions

8.70 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM has been used (the GLA's SPG[21] recommends that the assessment be based on the latest version of the IAQM guidance). The magnitude of impact associated with dust generated from the deconstruction and construction activities is determined during Step 2 of the method, as described in paragraph 8.27.

8.71 Full details of this approach are provided in **ES Volume 3, Appendix Air Quality – Annex 3**.

Deconstruction and Construction Traffic

8.72 The description of the magnitude of air quality impacts and effects from the construction traffic emissions is the same as presented in Table 8.3 below.

Completed Development

8.73 There is no official guidance in the UK in relation to development control on how to describe air quality impacts and effects, nor how to assess their significance. The approach developed jointly by EPUK and the IAQM[22] has therefore been used. This includes defining descriptors of the impacts at individual receptors, which take account of the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, and the absolute concentration relative to the objective.

8.74 Table 8.3 sets out how impact descriptors have been determined within this assessment, being an adapted version of the table presented in **ES Volume 3, Appendix Air Quality – Annex 4**. For the assessment criterion the term Air Quality Assessment Level or AQAL has been adopted, as it covers all pollutants, i.e., those with and without formal standards. Typically, as is the case for this assessment, the AQAL will be the air quality objective value. Note that impacts may be adverse or beneficial, depending on whether the change in concentration is positive or negative.

Table 8.3 Air Quality Impact Scale Descriptors for Individual Receptors for All Pollutants [a]

Long-Term Average Concentration at Receptor in Assessment Year [b,c]				Change in Concentration Relative to AQAL [c,d]				
% of AQAL	Annual Mean NO_2 ($\mu g/m^3$)	Annual Mean PM_{10} ($\mu g/m^3$)	Annual Mean $PM_{2.5}$ ($\mu g/m^3$)	0%	1%	2-5%	6-10%	>10%
75% or less of AQAL	Less than 30.2	Less than 30.2	Less than 7.5	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	30.2 – 37.8	30.2 – 37.8	7.5 – 9.5	Negligible	Negligible	Minor	Moderate	Moderate
95-102% of AQAL	37.8 – 41.0	37.8 – 41.0	9.5 – 10.2	Negligible	Minor	Moderate	Moderate	Major
103-109% of AQAL	41.0 – 43.8	41.0 – 43.8	10.2 – 10.9	Negligible	Moderate	Moderate	Major	Major
110% or more of AQAL	More than 43.8	More than 43.8	More than 10.9	Negligible	Moderate	Major	Major	Major

[a] Values are rounded to the nearest whole number
[b] This is the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme' concentration where there is an increase.
[c] AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
[d] Minor and Major are used as standard EIA terminology and correspond to Slight and Substantial respectively in relevant guidance[22].

Defining the Effect

Effect Scale, Nature and Significance

8.75 It is important to differentiate between the terms impact and effect with respect to the assessment of air quality. The term impact is used to describe a change in pollutant concentration at a specific location. The term effect is used to describe an environmental response resulting from an impact, or series of impacts.

Deconstruction and Construction

8.76 Guidance from the IAQM[19] is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version of the guidance upon which the assessment methodology set out in the GLA guidance[21] is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used). The assessment thus focuses on determining the appropriate level of mitigation to ensure that effects will normally be 'not significant'.

Deconstruction and Construction Traffic

8.77 The overall significance of the air quality effects, from the deconstruction and construction traffic emissions, is the same as presented in the *'Completed Development'* section below.

Completed Development

8.78 Within this ES chapter, the air quality assessment has used published guidance and criteria to determine the likely air quality impacts at a number of sensitive locations (see Table 8.3). The overall significance of the air quality effects is then determined using professional judgement, giving consideration to various factors including the magnitude of the predicted impacts and the presence of any objective exceedances; full details of the EPUK/IAQM approach are provided in **ES Volume 3, Appendix Air Quality – Annex 4**. The experience of the consultants who have prepared this ES chapter is set out in **ES Volume 3, Appendix Air Quality – Annex 5**.

Geographic Extent of Effects

8.79 Dust generated by the Proposed Development during the deconstruction and construction works has the potential to cause effects at a local level (up to 350m from the site boundary).

[29] Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

8.80 The extent of effects arising from the Proposed Development will occur at a 'local' level due to emissions associated with changes in vehicle flows, during the construction and operational phases, on local roads.

Effect Duration

8.81 Dust generated by the Proposed Development during the deconstruction and construction works has the potential to cause temporary medium-term effects.

8.82 Emissions of pollutants from road traffic, from the construction and operational phases, associated with the Proposed Development have the potential to cause permanent long-term effects.

Direct and Indirect Effects

8.83 Dust generated by the Proposed Development during the deconstruction and construction has the potential to cause direct effects.

8.84 Emissions of pollutants from road traffic, from the construction and operational phases, associated with the Proposed Development have the potential to cause direct effects.

Categorising Likely Significant Effects

8.85 The screening approach developed jointly by EPUK/IAQM has been used to determine the significance of effects due to construction traffic.

8.86 Guidance from the IAQM is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

8.87 As set out in paragraph 8.30 above, measures outlined within the CMP as well as legislative and policy controls will ensure emissions generated by NRMM are controlled to the extent that no likely significant effects are anticipated.

8.88 There is no official guidance in the UK in relation to development control on how to assess the significance of operational effects. The approach developed jointly by EPUK and the IAQM has therefore been used.

8.89 The impact assessment matrix shown in Table 8.3 has been used to define the impacts at individual receptors and the overall significance of the air quality effects is then determined using professional judgement, giving consideration to various factors including the frequency, duration and magnitude of the predicted impacts, their relationship to appropriate air quality objectives and the high sensitivity of the receptors; full details of the EPUK/IAQM approach are provided in **ES Volume 3, Appendix Air Quality – Annex 4**. The experience of the consultants who have prepared this ES chapter is set out in **ES Volume 3, Appendix Air Quality – Annex 5.**

8.90 In terms of the site suitability assessment, where the predicted concentrations are below the relevant objectives, the effect of air quality on future occupiers is judged to be 'not significant'.

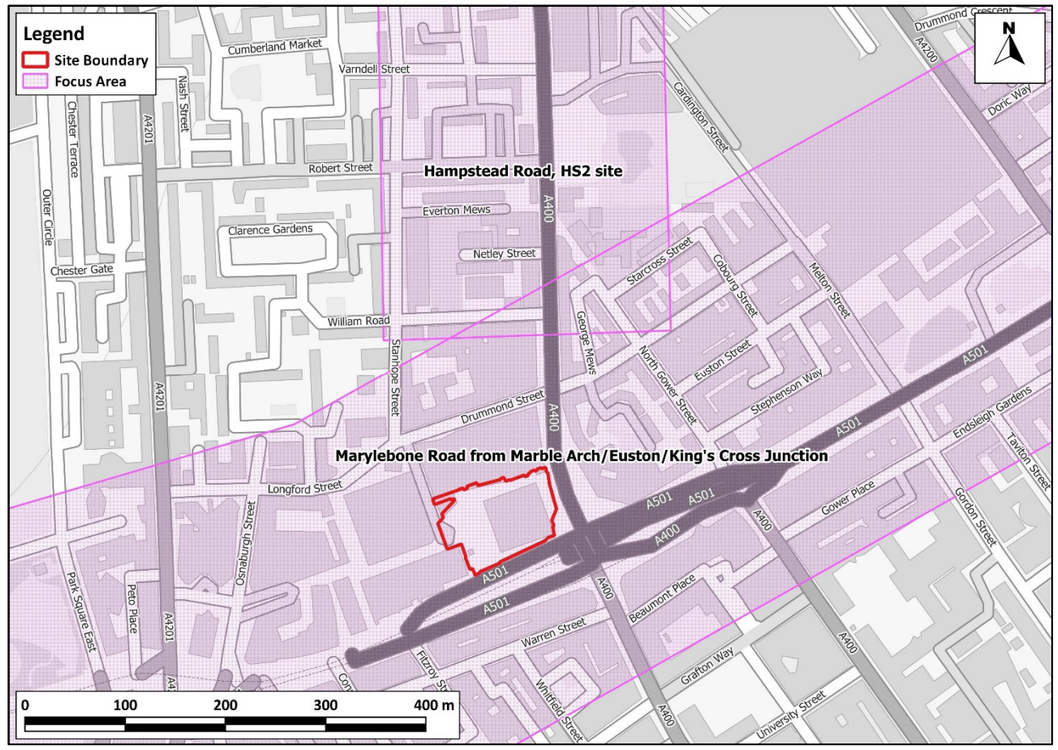
BASELINE CONDITIONS

Current Baseline Conditions

8.91 The site currently comprises the existing 36-storey Euston Tower building and is located in a predominantly commercial area and is bounded by Brock Street and commercial properties to the north, Hampstead Road to the east, Euston Road to the south and commercial properties associated with Regent's Place Plaza to the west.

8.92 The Proposed Development is located within a borough-wide AQMA declared by LBC for exceedances of the annual mean NO_2 and 24-hour PM_{10} objectives. The Proposed Development is also located within one of the GLA's Air Quality Focus Areas (*Marylebone Road from Marble Arch / Euston / King's Cross Junction)*, as shown in as shown in Figure 8.2; these are locations with high levels of human exposure where the annual mean limit value for NO_2 is exceeded.

Figure 8.2 Proposed Development and Air Quality Focus Areas



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Industrial Sources

8.93 A search of the UK Pollutant Release and Transfer Register[3] website has not identified any significant industrial or waste management sources that are likely to affect the Proposed Development, in terms of air quality or dust.

Local Air Quality Monitoring

8.94 The LBC operates five automatic monitoring stations within its administrative area, with one monitoring site ('CD9') located within the study area. The LBC also operates a number of NO_2 monitoring sites using diffusion tubes prepared and analysed by Gradko International Ltd (using the 50% TEA in acetone method), with 15 diffusion tube monitoring sites located within and in close proximity to the study area.

8.95 Annual mean and 1-hour NO_2 results for the years 2015 to 2022 are summarised in Table 8.4. Exceedances of the objectives are shown in bold. The monitoring locations are shown in Figure 8.3. The monitoring data for the LBC have been taken from the LBC's 2022 Annual Status Report (ASR)[30].

8.96 While 2020 and 2021 results have been presented in this section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the considerable impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.

[30] *LBC (2022) Air Quality Annual Status – Report for 2022*

Table 8.4 Summary of LBC NO_2 Monitoring (2015-2022) [a, b]

Site No.	Site Type	Location	2015	2016	2017	2018	2019	2020	2021	2022
Automatic Monitor - Annual Mean (µg/m³)										
CD9	Roadside	Euston Road	**90**	**88**	**83**	**82** [c]	**70**	43	48	45
Objective			**40**							
Automatic Monitor - No. of Hours > 200 µg/m³										
CD9	Roadside	Euston Road	**54**	**39**	**25**	18	7	0	1	2
Objective			**18**							
Diffusion Tubes – Annual Mean (µg/m³)										
CAM46	Roadside	HSS Phase 35 – Netley Primary School	-	-	-	-	-	-	23.8	22.9
CAM71	Roadside	Euston Road LAQN colocation	-	-	-	-	**65.3**	**46.6**	**46.5**	**43.2** [c]
CAM79	Urban Background	Tavistock Gardens	**44.6**	39.7	**46.2**	35.4	33.9	26.8	22.2	23.9
CAM80	Roadside	Ensleigh Gardens	-	-	-	-	**49.5**	35.3	34.3	30.2 [c]
CAM203	Roadside	Torrington-Tavistock/Midland Judd 25–Duke's Road	-	-	-	**50.4**	**42.3**	31.0	-	-
CAM204	Roadside	Torrington-Tavistock/Midland Judd 26-Upper Woburn Place	-	-	-	**68.3**	**59.4**	**43.2**	37.0	37.3
CAM205	Roadside	Torrington-Tavistock/Midland Judd 27-Endsleigh Street	-	-	-	**50.7**	**44.6**	33.2	-	-
CAM206	Roadside	Torrington-Tavistock/Midland Judd 28–Gower Place	-	-	-	-	**47.9**	32.5	-	-
CAM215	Roadside	Torrington-Tavistock/Midland Judd 37–DOC	-	-	-	**44.1**	40.0	31.2	-	-
CAM216	Roadside	WEP 1 – Warren Street	-	-	-	**56.0**	**53.8**	**50.9**	31.4	-
CAM217	Roadside	WEP 2 – Grafton Way	-	-	-	**57.6**	**54.1**	**42.2**	35.1	-
CAM230	Roadside	WEP 15 – Gower Street	-	-	-	**64.3**	**55.1**	32.3	32.1	-
CAM231	Roadside	WEP 16 – Gordon Street	-	-	-	**43.7**	**40.3**	31.5	30.6	-
CAM232	Roadside	WEP 17 – Euston Road	-	-	-	**74.7**	**69.6**	**47.2**	**46.1**	-
CAM301	Roadside	Somers Town 16 – Churchway	-	-	-	-	-	-	-	27.9 [c]
Objective			**40 / 38** [d]							

[a] *Exceedances of the objectives are shown in* ***bold****.*
[b] *Exceedances of the 60 µg/m³ proxy value, indicating a potential exceedance of the 1-hour mean NO_2 objective, are shown in* ***bold and underlined****.*
[c] *Data capture for the monitoring period was less than 75%, and as such the results were annualised in accordance with LLAQM Technical Guidance.*
[d] *38 µg/m³ is the LBC Air Quality CPG target for annual mean NO_2*

8.97 The results presented in Table 8.4 show that exceedances of the annual mean NO_2 objective and the LBC Air Quality CPG target occurred at the majority of the roadside locations within close vicinity of the study area in 2019, with the exception of 'CAM79'. In 2022, only the 'CAM71' diffusion tube monitoring site exceeded the objective and the LBC Air Quality CPG target (although it is noted many of these nearby monitoring sites ceased operating in 2022 so limited data is available for this year).

8.98 Concentrations of more than 60µg/m³ was measured at one site in 2019, indicating a potential exceedance of the 1-hour mean objective. However, the 'CD9' automatic monitoring site has recorded 1-hour mean concentrations below the objective since 2019. There was an overall downward trend in NO_2 concentrations between 2015 and 2022.

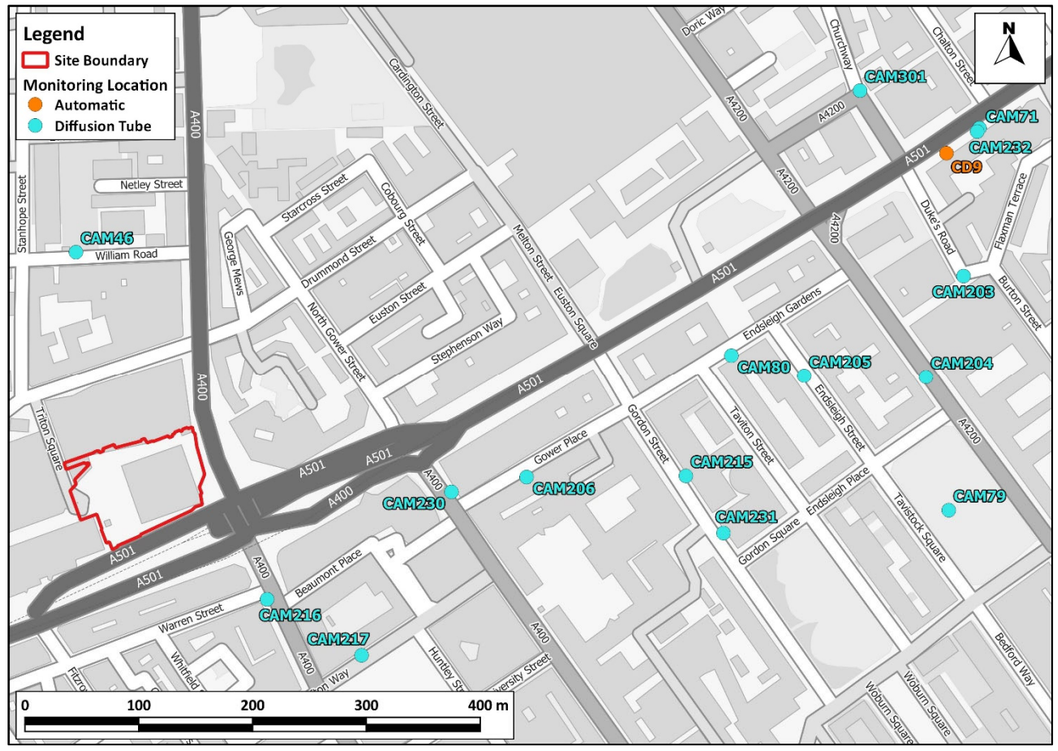
8.99 The LBC also measures PM_{10} and $PM_{2.5}$ concentrations at the 'CD9' automatic station. Measured concentration results for the years 2015 to 2021 are summarised in Table 8.5.

Table 8.5 Summary of LBC PM_{10} and $PM_{2.5}$ Monitoring (2015-2022)

Site No.	Site Type	Location	2015	2016	2017	2018	2019	2020	2021	2022
PM_{10} Annual Mean (µg/m³)										
CD9	Roadside	Euston Road	28	24	20	21	22	18	19	21
Objective			**40 / 20** [a]							
PM_{10} - No. of Days > 50 µg/m³										
CD9	Roadside	Euston Road	5	10	3	2	8	2	2	6
Objective			**35**							
$PM_{2.5}$ Annual Mean (µg/m³)										
CD9	Roadside	Euston Road	17	17	14	15	14	11	11	12
Objective/GLA target			**20/10** [a]							

[a] *20 µg/m³ is the LBC Air Quality CPG target for annual mean PM_{10}; there is no requirement to meet this until 2026.*
[b] *The 20 µg/m³ $PM_{2.5}$ objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m³ is the GLA target and the LBC Air Quality CPG target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this until 2030.*

Figure 8.3 Monitoring Locations and the Site Boundary



8.100 As shown in Table 8.5, the measured annual mean and 24-hour mean PM_{10} concentrations were below their respective objectives between 2015 and 2022. However, annual mean PM_{10} concentrations exceeded the LBC Air Quality CPG target in all years except 2017, 2020 and 2021. In addition, $PM_{2.5}$ concentrations were below the objective in all years presented. However, $PM_{2.5}$ concentrations exceeded the GLA target value/ LBC Air Quality CPG target at 'CD9' monitoring station, which is common across much of London. The nationwide achievement is very unlikely to be possible before 2030, especially in London[31].

Exceedances of Limit Value

8.101 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean NO_2 limit value[32]. Furthermore, Defra's roadside annual mean NO_2 concentrations[6], which are used to identify and report exceedances of the limit value, identify exceedances of this limit value in 2022 along many roads in London, including Tottenham Court Road and Euston Road (A501) adjacent to the Proposed Development. The Greater London Urban Area has thus been reported to the EU as exceeding the limit value for annual mean NO_2 concentrations. Defra's predicted concentrations for 2030[5], however, do not identify any exceedances within the study area. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the Proposed Development by the time that it is operational.

8.102 Defra's Air Quality Plan requires the GLA to prepare an action plan that will "*deliver compliance in the shortest time possible*", and the 2015[33] Plan assumed that a Clean Air Zone (CAZ) was required. The GLA has already implemented a Low Emission Zone (LEZ) and an Ultra-Low Emission Zone (ULEZ); thus, the authority has effectively already implemented the required CAZ. These have been implemented as part of a package of measures including 12 Low Emission Bus Zones, Low Emission Neighbourhoods, the phasing out of diesel buses and taxis and other measures within the Mayors Transport Strategy.

Background Concentrations

8.103 In addition to the locally measured concentrations, estimated background concentrations in the study area have been determined for the baseline year 2022, as well as the future assessment year of 2025 and 2030 using Defra's 2018-based background maps. The background concentrations are set out in Table 8.4 and have been derived as described in **ES Volume 3, Appendix: Air Quality – Annex 6**. The background concentrations are all well below the objectives; however, the $PM_{2.5}$ concentrations are above the GLA target of 10µg/m^3. A range of values is presented as the study area covers multiple 1x1 km grid squares.

Table 8.6 Estimated Annual Mean Background Pollutant Concentrations in 2022 and 2030 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2022	29.9 – 35.4	18.6 – 19.1	11.9 – 12.2
2025	27.5 – 33.1	18.0 – 18.5	11.5 – 11.7
2030	25.9 – 31.5	18.0 – 18.5	11.5 – 11.8
Objective/GLA target	**40 /38 [a]**	**40 / 20 [b]**	**20/10 [c]**

[a] 38 µg/m^3 is the LBC Air Quality CPG target for annual mean NO_2
[b] 20 µg/m^3 is the LBC Air Quality CPG target for annual mean PM_{10}; there is no requirement to meet this until 2026.
[c] The $PM_{2.5}$ objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m^3 is the GLA target and the LBC Air Quality CPG target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this until 2030.

Baseline and Future Baseline Dispersion Model Results

8.104 Baseline concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been modelled at the six existing receptor locations (see Figure 8.4 and Table 8.9). The results, which cover the existing (2022), peak construction year (2025) and future year (2030) baseline (Without Proposed Development), are set out in Table 8.7 and 0. The modelled road components of NO_2 have been increased from those predicted by the model based on a comparison with local measurements (see **ES Volume 3, Appendix: Air Quality – Annex 6** for the verification methodology).

8.105 The modelled concentrations, assuming the no improvement scenario, have been presented in **ES Volume 3, Appendix: Air Quality – Annex 7.**

Table 8.7 Modelled Annual Mean Baseline Concentrations of NO_2 at Existing Receptors (µg/m^3) [a]

Receptor	2022	2025 Without Proposed Development	2030 Without Proposed Development
E1 [c]	32.8	-	27.5
E2 [c]	36.8	-	32.3
E3 [d]	29.9	35.8	-
E4 [d]	29.9	38.2	-
E5 [d]	29.9	35.0	-
E6 [d]	39.5	38.6	-
Objective		**40 / 38 [b]**	

[a] Exceedances of the objective are shown in bold.
[b] 38 µg/m^3 is the LBC Air Quality CPG target for annual mean NO_2
[c] Receptor considered in the operational traffic impacts assessment, future year of 2030 only.
[d] Receptor considered in the construction traffic impacts assessment, future year of 2025 only.

Table 8.8 Modelled Annual Mean Baseline Concentrations of PM_{10} and $PM_{2.5}$ at Existing Receptors (µg/m^3)

Receptor	PM_{10}			$PM_{2.5}$		
	2022	2025 Without Proposed Development	2030 Without Proposed Development	2022	2025 Without Proposed Development	2030 Without Proposed Development
E1 [a]	19.3	-	18.6	*12.3*	-	*11.8*
E2 [a]	19.4	-	18.7	*12.4*	-	*11.9*
E3 [b]	18.6	20.3	-	*11.9*	*12.8*	-
E4 [b]	18.6	21.0	-	*11.9*	*13.2*	-
E5 [b]	18.6	20.1	-	*11.9*	*12.7*	-
E6 [b]	19.8	19.6	-	*12.6*	*12.4*	-
Objective / GLA target	**32 [c] / 20 [d]**			**20/10 [e]**		

[a] Receptor considered in the operational traffic impacts assessment, future year of 2030 only.
[b] Receptor considered in the construction traffic impacts assessment, future year of 2025 only.
[c] While the annual mean PM_{10} objective is 40 µg/m^3, 32 µg/m^3 is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} objective is possible, as outlined in LAQM.TG22[34]. A value of 32 µg/m^3 is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK and the IAQM guidance22.
[d] 20 µg/m^3 is the LBC Air Quality CPG target for annual mean PM10; there is no requirement to meet this until 2026.
[e] The 20 µg/m^3 $PM_{2.5}$ objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m^3 is the GLA target and the LBC Air Quality CPG target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this until 2030. Exceedances of this target are shown in italic.

8.106 The predicted annual mean concentrations of NO_2 without the Proposed Development are below the objective and the LBC Air Quality CPG target at both receptors in 2022, 2025 and 2030. The annual mean NO_2 concentrations are also below 60 µg/m^3 at both receptors in all years; it is, therefore, unlikely that the 1-hour mean NO_2 objective will be exceeded.

8.107 The predicted annual mean concentrations of PM_{10} and $PM_{2.5}$ without the Proposed Development are below the objective and the LBC Air Quality CPG target in all years at both receptors. The annual mean PM_{10} concentrations are also below 32 µg/m^3 and it is, therefore, unlikely that the 24-hour mean PM_{10} objective will be exceeded.

[31] *Defra (2019) Assessing progress towards WHO guideline levels of PM2.5 in the UK*
[32] *Defra (2023) Defra AURN Archive, Available: https://uk-air.defra.gov.uk/interactive-map?network=aurn.*
[33] *Although referencing the previous version of the London Plan this limit value remains relevant in the current version.*
[34] *Defra (2022) Review & Assessment: Technical Guidance LAQM.TG22 August 2022 Version. Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf*

8.108 The annual mean concentrations of $PM_{2.5}$ without the Proposed Development exceed the GLA target/ LBC Air Quality CPG target in all years; however, exceedances of the guideline are common, and their nationwide achievement is very unlikely to be possible before 2030, especially in London.

RECEPTORS AND RECEPTOR SENSITIVITY

Existing Receptors

Deconstruction and Construction Works

8.109 The guidance followed when carrying out the deconstruction and construction dust assessment requires the number of receptors within certain distance bands to be established in order to determine the sensitivity of the surrounding area, rather than focussing on impacts at individual receptors.

8.110 It is, therefore, not necessary to set out specific receptors for the assessment of impacts during the deconstruction and construction.

Construction and Operational Traffic

8.111 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted at six locations in close proximity to the Proposed Development. Receptors have been identified to represent worst-case exposure within these locations, being located on the façades of sensitive properties closest to the roads where the increases in traffic as a result of the construction or operation phase Proposed Development exceeded the screening criteria. When selecting roadside receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested, and where there is a combined effect of several road links. Each receptor location was modelled at the lowest level with relevant exposure, where road traffic impacts will be the greatest.

8.112 Receptors E1 and E2 are receptors for the operational traffic impact assessment only, as the only exceedance of the traffic screening criteria occurs along Longford Street. Receptors E3 to E6 are receptors for the construction traffic impact assessment only as Marylebone Road (A501) and Hampstead Road are the only two roads experiencing an exceedance of the traffic screening criteria.

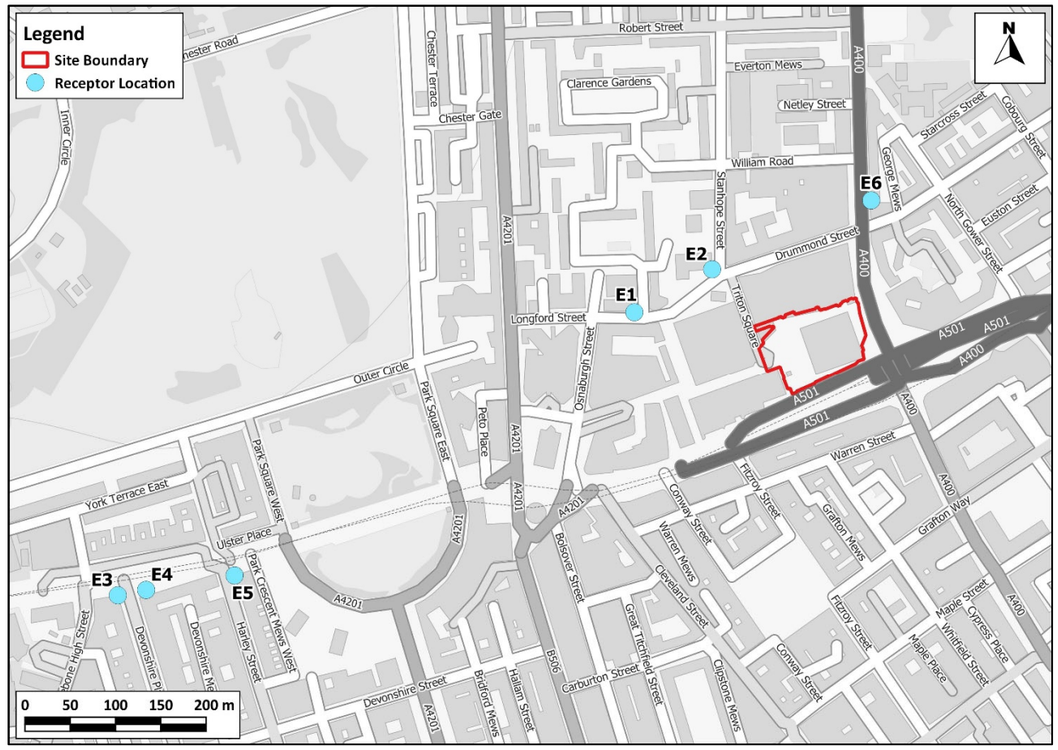
8.113 The EIA Scoping Opinion states that *'…when listing the sensitive receptors relevant to the specific AQOs, no reference has been made to hotels, nothing that the Radisson Hotel is located to the south of the site. In line with DEFRA's LAQM guidance, hotel receptors should be considered for the 1-hour mean AQO'*. The Radisson Hotel is located more than 250 m from the nearest road on which the development-generated traffic exceeds the published screening criteria for a detailed assessment. As the hotel is located more than 200 m away from the affected road (at which distance published guidance requires an assessment), it is not necessary to include it within this modelling assessment, and it is safe to assume that any potential impacts from the Proposed Development at this receptor will be negligible and the overall effects will be 'not significant'.

8.114 Selected receptor locations are presented in Table 8.9 and are shown in Figure 8.4.

Table 8.9 Description of Existing Receptor Locations

Receptor ID	Type	Description	Modelled Height
E1	Residential	26 Longford Street	1.5 m
E2	College	Capital City College Training	1.5 m
E3	Hospital	The London Clinic Duchess of Devonshire Wing	1.5 m
E4	Hospital	The Focal Therapy Clinic	1.5 m
E5	Hospital	Harley Street Vein Clinic	1.5 m
E6	Residential	67 Hampstead Road	1.5 m

Figure 8.4 Monitoring Locations and the Site Boundary



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Introduced Receptors

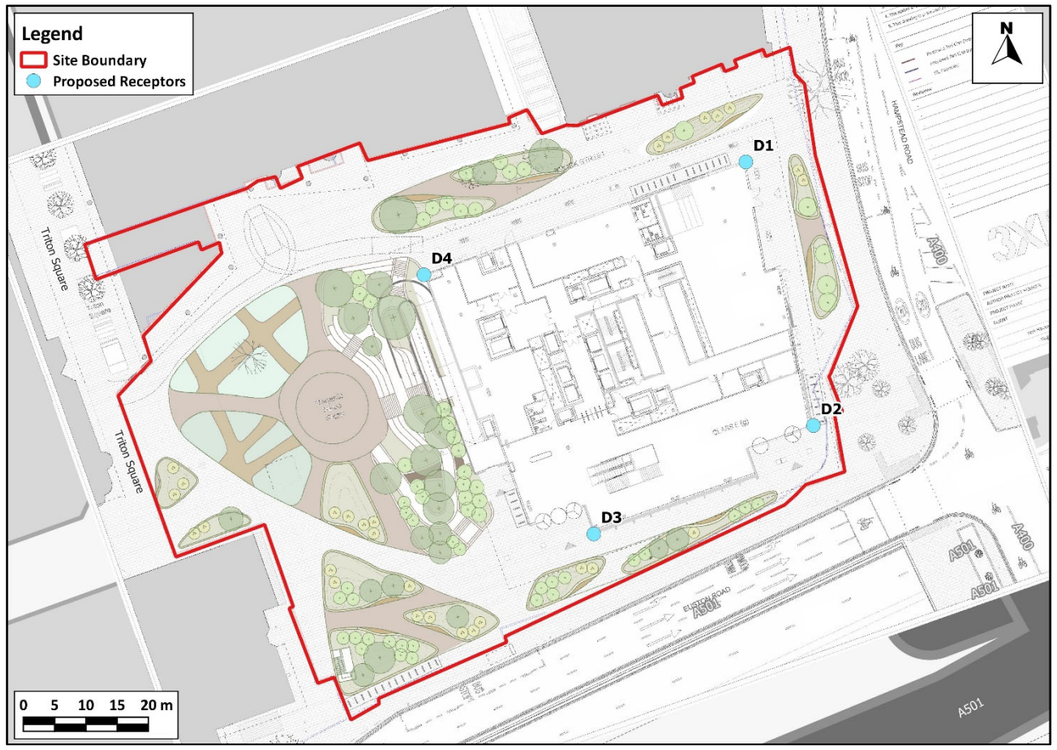
Completed Development

8.115 Four receptor locations have been identified within the Proposed Development for the site suitability assessment, which represent exposure to existing and proposed sources. These receptors represent future exposure for the retail element of the Proposed Development; as such, only the short-term (1-hour) mean nitrogen dioxide objective is relevant to these locations. The Proposed Development also comprises of office and dry laboratory uses, from fourth floor level and above; however, as discussed in Paragraph 8.8, as these are offices/places of work, they are not considered relevant receptors to the air quality objectives. Each receptor location was modelled at the lowest level with relevant exposure, where road traffic impacts will be the greatest. Selected receptor locations are shown in Figure 8.5 and presented in Table 8.10.

Table 8.10 Description of Introduced Receptor Locations

Receptor	Type	Description	Modelled Height
D1	Retail	North-east corner of Proposed Development	1.5m
D2	Retail	South-east corner of Proposed Development	1.5m
D3	Retail	South-west corner of Proposed Development	1.5m
D4	Retail	North-west corner of Proposed Development	1.5m

Figure 8.5 Proposed Receptor Locations



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POTENTIAL EFFECTS

Deconstruction and Construction

Deconstruction and Construction Traffic

8.116 The trip generation of the Proposed Development on local roads (as provided by Velocity Transport Ltd) has been compared to the screening criteria set out in the EPUK/IAQM guidance (see **ES Volume 3, Appendix Air Quality – Annex 3**). The Proposed Development will increase Annual Average Daily Traffic (AADT) flows by more than 25 HDV vehicles along Marylebone Road and Hampstead Road; thus, a detailed assessment of construction road traffic impacts at existing receptors is required and has been undertaken. On all other roads the change in traffic flows is below the screening criteria and therefore based on the EPUK/IAQM guidance the impacts can be screened out (i.e. at Receptors E1 and E2).

8.117 Predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ in 2025 are set out in Table 8.19 to Table 8.21 for both the "Without Proposed Development" and "With Proposed Development" scenarios and take account of emissions from the adjacent road network. These tables also describe the impacts at the receptors using the impact descriptors given in Table 8.3.

8.118 The modelled concentrations, assuming the no improvement scenario, have been presented in **ES Volume 3, Appendix Air Quality – Annex 7.**

NO_2

Table 8.11 Predicted Impacts on Annual Mean NO_2 Concentrations in 2025 (µg/m³)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E3	35.8	35.8	0	Negligible
E4	38.2	38.2	0	Negligible
E5	35.0	35.0	0	Negligible
E6	38.6	38.6	0	Negligible
Objective	**40 / 38 [b]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] 38 µg/m³ is the LBC Air Quality CPG target for annual mean NO_2

8.119 As shown in Table 8.11 the annual mean NO_2 concentrations are below the objective at all receptors, with and without the Proposed Development. As the annual mean NO_2 concentrations are below 60 µg/m³, it is unlikely that the 1-hour mean NO_2 objective will be exceeded. At receptors E4 and E6, the LBC Air Quality CPG criteria is exceeded in both the "Without Proposed Development" and "With Proposed Development". However, the percentage change in concentrations, relative to the air quality objective (when rounded), is predicted to be zero.

8.120 Using the matrix in Table 8.3, this impact is described as Negligible, and the effects are temporary, direct, medium-term and not significant at the local level**.**

PM_{10} and $PM_{2.5}$

Table 8.12 Predicted Impacts on Annual Mean PM_{10} Concentrations in 2025 (µg/m³)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E3	20.3	20.3	0	Negligible
E4	21.0	21.0	0	Negligible
E5	20.1	20.1	0	Negligible
E6	19.6	19.6	0	Negligible
Objective	**32 [b] / 20 [c]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] While the annual mean PM_{10} objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} objective is possible, as outlined in LAQM.TG22. A value of 32 µg/m³ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK & IAQM guidance[22].
[c] 20 µg/m³ is the LBC Air Quality CPG target for annual mean PM_{10}; there is no requirement to meet this until 2026.

Table 8.13 Predicted Impacts on Annual Mean $PM_{2.5}$ Concentrations in 2025 (µg/m³)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E3	12.8	12.8	0	Negligible
E4	13.2	13.2	0	Negligible
E5	12.7	12.7	0	Negligible
E6	12.4	12.4	0	Negligible
Objective	**20 [b]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] The 20 µg/m³ $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

8.121 Table 8.12Table 8.20 and Table 8.13 show the annual mean PM_{10} and $PM_{2.5}$ concentrations are well below the respective objectives. Furthermore, as the annual mean PM_{10} concentrations are below 32µg/m³, it is unlikely that the 24-hour mean PM_{10} objective will be exceeded. The long-term average concentration at all receptors in assessment year is 75% or less of AQAL. At receptors E3 to E5, the LBC Air Quality CPG criteria is exceeded in both the "Without Proposed Development" and "With Proposed Development". However, the percentage changes in both PM_{10} and $PM_{2.5}$ concentrations, relative to the applied annual mean criteria (when rounded),

are predicted to be zero. Using the matrix in Table 8.3, these impacts are described as Negligible and therefore the effects are permanent, direct, medium-term and not significant at the local level.

GLA Target for $PM_{2.5}$

8.122 Table 8.22 8.14 presents the same $PM_{2.5}$ concentrations as Table 8.13 but assesses the impacts against the GLA target for this pollutant (which is the same as the LBC Air Quality CPG criteria).

Table 8.14 Assessment of Annual Mean $PM_{2.5}$ Concentrations in 2025 Against the GLA Target (µg/m³)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E3	*12.8*	*12.8*	0	Negligible
E4	*13.2*	*13.2*	0	Negligible
E5	*12.7*	*12.7*	0	Negligible
E6	*12.4*	*12.4*	0	Negligible
Objective / Guideline	**10 [b]**		**-**	**-**

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] 10 µg/m³ is the GLA target and the LBC Air Quality CPG target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this until 2030. Exceedances of this target are shown in italic.

8.123 The annual mean concentrations of $PM_{2.5}$ exceed the GLA target and the LBC Air Quality CPG criteria with and without the Proposed Development; using the matrix in Table 8.3, the impact is described as Negligible. As discussed in paragraph 8.16, the GLA aims to achieve the GLA target for $PM_{2.5}$ of 10 µg/m³ by 2030. However, exceedances of the target are common, and based on Defra's background maps, their achievement is very unlikely to be possible before 2030[26]. As such, it is unsurprising that there are exceedances for both "With Proposed Development" and "Without Proposed Development" scenarios.

Construction Dust and Particulate Matter Emissions

8.124 The construction works will give rise to a risk of dust impacts during earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway.

8.125 Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see **ES Volume 3, Appendix Air Quality – Annex 3**), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition (Deconstruction)

8.126 There will be a requirement to deconstruct the existing 36 storey tower, with the central core and existing foundations retained, with an approximate total volume of 25,000m³. The deconstruction works are anticipated to occur from top down, whilst the lower podium levels (up to level 2) are reduced in size to the same as the upper floors and are expected to occur over a 2-year period.

8.127 Based on the example definitions set out in Table A3.1 in **ES Volume 3, Appendix Air Quality – Annex 3**, the dust emission class for deconstruction is considered to be *medium*.

Earthworks

8.128 The characteristics of the soil at the Scheme site have been defined using the British Geological Survey's UK Soil Observatory website[35], as set out in Table 8.15. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table 8.15 Summary of Soil Characteristics

Category	Record
Soil Layer Thickness	Deep
Soil Parent Material Grain Size	Arenaceous [a] – Rudaceous [b]
European Soil Bureau Description	River Terrace Sand / Gravel
Soil Group	Light (Sandy) to Medium (Sandy)
Soil Texture	Sand to Sandy Loam[c]

[a] grain size 0.06-2.0 mm.
[b] grain size >2.0 mm.
[c] a loam is composed mostly of sand and silt.

8.129 The site covers some 0.8ha and most of this will be subject to earthworks, involving the removal of ground level slab, installation of a temporary works propping scheme to the basement retaining wall and the removal of the existing basement level slab. Dust will arise mainly from the handling of dusty materials (such as dry soil).

8.130 Based on the example definitions set out in Table A3.1 in **ES Volume 3, Appendix Air Quality – Annex 3**, the dust emission class for earthworks is considered to be *medium*.

Construction

8.131 Construction works, including superstructure and fit-out, are anticipated to begin in Q2 of Year 3, and complete in Q1 of Year 6 (approximately 36 months). Construction quantities have been provided in **ES Volume 1, Chapter 5: Deconstruction and Construction**, including but not limited to, a total of 13,322m³ for excavation material, 20,743m³ for substructure, 234m³ for core concrete stairs, 14,475m³ for concrete slabs, 30,956m³ for steelwork, 26,198m³ for the façades and 79,769m³ for fitout materials. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, and from the cutting of concrete.

8.132 Based on the example definitions set out in Table A3.1 in **ES Volume 3, Appendix: Air Quality – Annex 3**, the dust emission class for construction is considered to be *large*.

Trackout

8.133 The number of vehicles accessing the site, which may track out dust and dirt, will vary throughout the construction period. It is anticipated that the peak number of construction vehicles will occur in Year 2 of the construction period, with approximately 27 outward heavy vehicle movements per day. Access will be from the Euston Road (A501) to the west of Albany Road, with 50% of vehicles entering via basement access on Longford Street and 50% continuing on the Euston Road (A501) off slip.

8.134 Based on the example definitions set out in Table A3.1 in **ES Volume 3, Appendix: Air Quality – Annex 3**, the dust emission class for trackout is considered to be *medium*.

8.135 Table 8.16 summarises the anticipated dust emission magnitude for the Proposed Development.

Table 8.16 Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition (Deconstruction)	Medium
Earthworks	Medium
Construction	Large
Trackout	Medium

Sensitivity of the Area

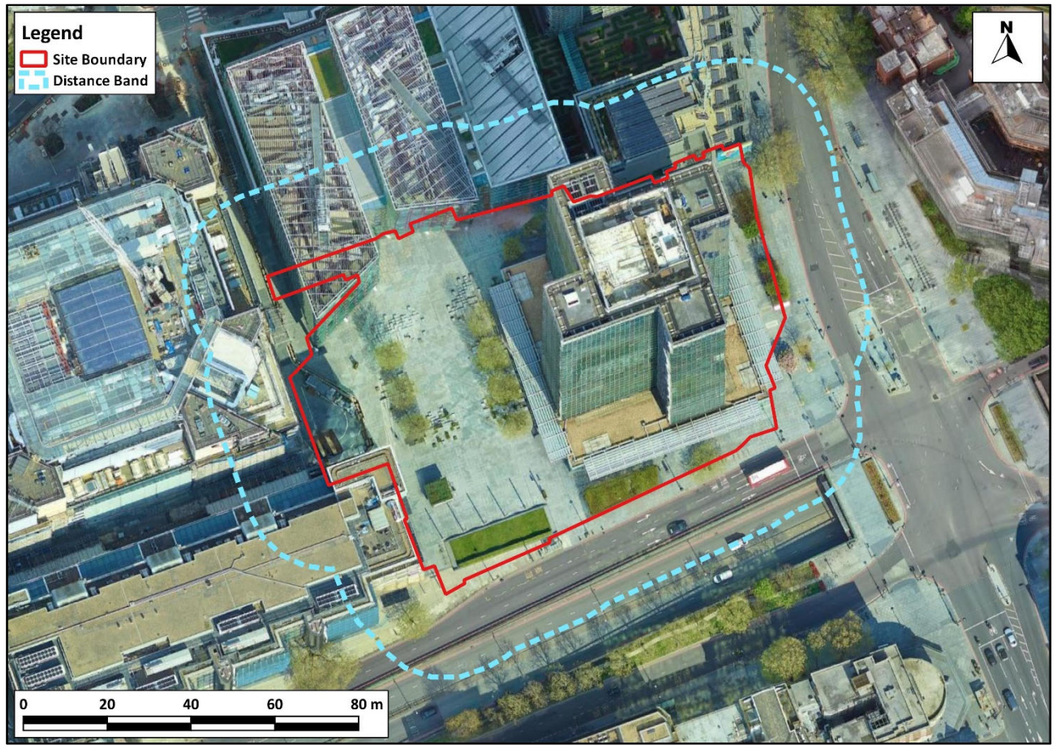
8.136 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM_{10} concentrations.

[35] *British Geological Survey (2022) UK Soil Observatory Map Viewer, [Online], Available: http://mapapps2.bgs.ac.uk/ukso/home.html.*

8.137 The IAQM guidance, upon which the GLA's guidance is based, explains that residential properties are 'high' sensitivity receptors to dust soiling, while places of work are 'medium' sensitivity receptors (Table A3.2 in **ES Volume 3, Appendix Air Quality – Annex 3**).

8.138 There are only four places of work off-site, within 20m of the deconstruction and construction works (see Figure 8.6).

Figure 8.6 20m Distance Bands around On-Site Works



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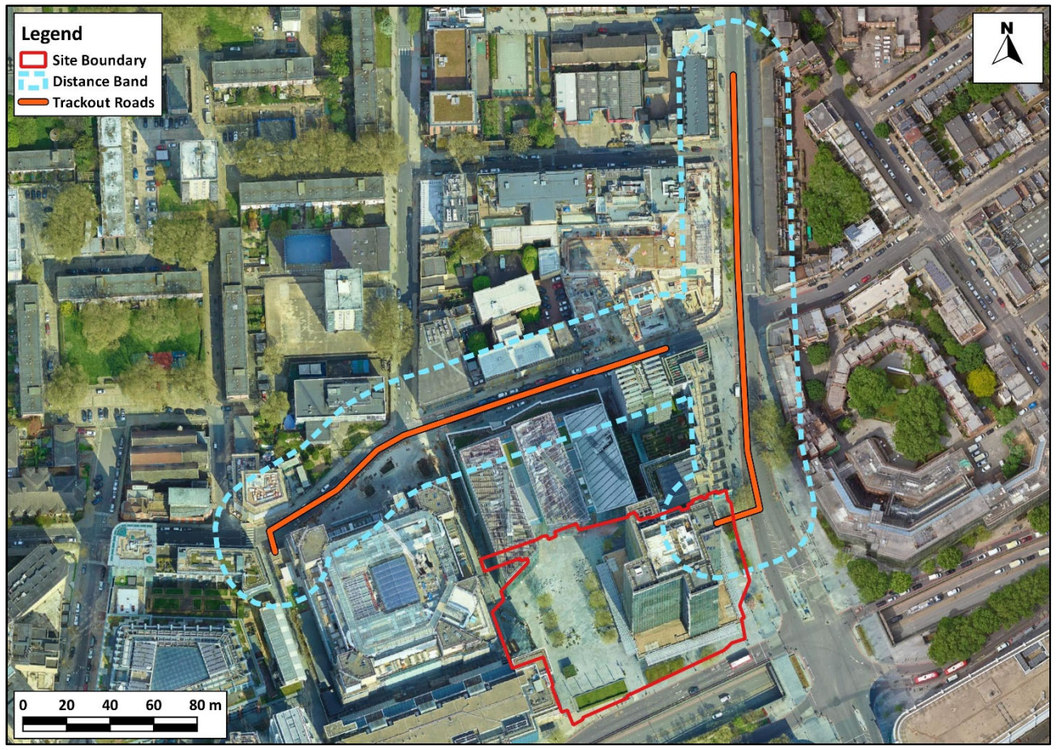
8.139 Table 8.11 shows that the dust emission magnitude for trackout is medium and Table A3.3 in **ES Volume 3, Appendix Air Quality – Annex 3** thus explains that there is a risk of material being tracked 200m from the application site exits. Vehicles will egress the different construction areas using Drummond Steet and Hampstead Road.

8.140 There are more than 10 residential properties within 20m of roads which material could be tracked, as well as a college building and several places of work (see Figure 8.6).

Figure 8.7 20m Distance Bands around Roads Used by Construction Traffic Within 200m of the Site Exits



Imagery ©2023 Google, Imagery ©2023 Bluesky, Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group.

Sensitivity of the Area to Effects from Dust Soiling

8.141 Using the information set out in Paragraph 8.138 and Figure 8.6 alongside the matrix set out in Table A3.3 in, **ES Volume 3, Appendix: Air Quality – Annex 3,** the area surrounding the on-site works is of 'medium' sensitivity to dust soiling. Using the information set out in Paragraph 8.140 and Figure 8.7 alongside the same matrix, the area is also of 'high' sensitivity to dust soiling due to trackout.

Sensitivity of the Area to any Human Health Effects

8.142 Residential properties are also classified as being of 'high' sensitivity to human health effects, while places of work are classified as being of 'medium' sensitivity. The matrix in Table A3.4 in **ES Volume 3, Appendix: Air Quality - Annex 3** requires information on the baseline annual mean PM_{10} concentration in the area. It is considered that the PM_{10} concentration in 2022 measured at the 'CD9' automatic monitor (21 $\mu g/m^3$) is a conservative estimate of conditions near to the site (as this is a roadside monitor adjacent to the busy Euston Road), and this value has been used. Using the information set out in Paragraph 8.138 and Figure 8.6 alongside the matrix in Table A3.4 in **ES Volume 3, Appendix: Air Quality – Annex 3**, the area surrounding the on-site works is of 'low' sensitivity to human health effects. Using the information set out in Paragraph 8.140 and Figure 8.7 alongside the same matrix the area surrounding roads along which material may be tracked from the site is of 'low' sensitivity.

Sensitivity of the Area to any Ecological Effects

8.143 The guidance only considers designated ecological sites within 50m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50m of the site boundary or those roads along which material may be tracked, thus ecological impacts will not be considered further.

Summary of Area Sensitivity

8.144 Table 8.17 summarises the sensitivity of the area around the proposed construction works.

Table 8.17 Summary of the Area Sensitivity

Effects associated with:	Sensitivity of the Surrounding Area	
	On-Site works	Trackout
Dust Soiling	Medium	High
Human Health	Low	Low

Risk and Significance

8.145 The dust emission magnitudes in Table 8.18 have been combined with the sensitivities of the area in Table 8.17 using the matrix in Table A3.6 in **ES Volume 3, Appendix: Air Quality – Annex 3**, in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 8.18. These risk categories have been used to determine the appropriate level of mitigation as set out in **ES Volume 3, Appendix: Air Quality – Annex 11** (Step 3 of the assessment procedure).

Table 8.18 Summary of Risk of Impacts without Mitigation

Source	Dust Soiling	Human Health
Demolition (Deconstruction)	Medium Risk	Low Risk
Earthworks	Medium Risk	Low Risk
Construction	Medium Risk	Low Risk
Trackout	Medium Risk	Low Risk

8.146 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place (see **ES Volume 3, Appendix Air Quality – Annex 11)**, the IAQM guidance[19] is clear that the residual effect will be not significant.

Completed Development

Operational Traffic

8.147 The trip generation of the Proposed Development on local roads (as provided by Velocity Transport Ltd) has initially been compared to the screening criteria set out in the EPUK/IAQM guidance (see **ES Volume 3, Appendix Air Quality – Annex 3**). The Proposed Development will increase Annual Average Daily Traffic (AADT) flows by more than 100 LDV vehicles along Longford Street to the north of the Proposed Development; thus, a detailed assessment of road traffic impacts at existing receptors is required and has been undertaken. On all other roads the change in traffic flows is below the screening criteria and therefore based on the EPUK/IAQM guidance the impacts can be screened out.

8.148 Predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ in 2030 are set out in Table 8.19 to Table 8.21 for both the "Without Proposed Development" and "With Proposed Development" scenarios and take account of emissions from the adjacent road network. These tables also describe the impacts at the receptors using the impact descriptors given in Table 8.3.

8.149 The modelled concentrations, assuming the no improvement scenario, have been presented in **ES Volume 3, Appendix Air Quality – Annex 7.**

NO_2

Table 8.19 Predicted Impacts on Annual Mean NO_2 Concentrations in 2030 (µg/m^3)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E1	27.5	27.5	0	Negligible
E2	32.3	32.3	0	Negligible
Objective	**40 / 38 [b]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] 38 µg/m^3 is the LBC Air Quality CPG target for annual mean NO_2

8.150 As shown in Table 8.19, the annual mean NO_2 concentrations are well below the objective and the LBC Air Quality CPG criteria at both receptors, with and without the Proposed Development. Furthermore, as the annual mean NO_2 concentrations are below 60 µg/m^3, it is unlikely that the 1-hour mean NO_2 objective will be exceeded.

8.151 The percentage change in concentrations, relative to the air quality objective (when rounded), is predicted to be zero. Using the matrix in Table 8.3, this impact is described as Negligible, and the effects are permanent, direct, long-term and not significant at the local level**.**

PM_{10} and $PM_{2.5}$

Table 8.20 Predicted Impacts on Annual Mean PM_{10} Concentrations in 2030 (µg/m^3)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E1	18.6	18.6	0	Negligible
E2	18.7	18.7	0	Negligible
Objective	**32 [b] / 20 [c]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] While the annual mean PM_{10} objective is 40 µg/m^3, 32 µg/m^3 is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} objective is possible, as outlined in LAQM.TG22. A value of 32 µg/m^3 is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK & IAQM guidance[22].
[c] 20 µg/m^3 is the LBC Air Quality CPG target for annual mean PM_{10}; there is no requirement to meet this until 2026.

Table 8.21 Predicted Impacts on Annual Mean $PM_{2.5}$ Concentrations in 2030 (µg/m^3)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E1	11.8	11.8	0	Negligible
E2	11.9	11.9	0	Negligible
Objective	**20 [b]**		-	-

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] The 20 µg/m^3 $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

8.152 Table 8.20 and Table 8.21 show the annual mean PM_{10} and $PM_{2.5}$ concentrations are well below the respective objectives Development. Furthermore, as the annual mean PM_{10} concentrations are below 32µg/m^3, it is unlikely that the 24-hour mean PM_{10} objective will be exceeded. The long-term average concentration at both receptors in assessment year is 75% or less of AQAL.

8.153 The percentage changes in both PM_{10} and $PM_{2.5}$ concentrations, relative to the applied annual mean criteria (when rounded), are predicted to be zero. Using the matrix in Table 8.3, these impacts are described as Negligible and therefore the effects are permanent, direct, long-term and not significant at the local level.

GLA Target for $PM_{2.5}$

8.154 Table 8.22 presents the same $PM_{2.5}$ concentrations as Table 8.21 but assesses the impacts against the GLA target for this pollutant (which is the same as the LBC Air Quality CPG criteria).

Table 8.22 Assessment of Annual Mean $PM_{2.5}$ Concentrations in 2030 Against the GLA Target ($\mu g/m^3$)

Receptor	Without Proposed Development	With Proposed Development	% Change [a]	Impact Descriptor
E1	*11.8*	*11.8*	0	Negligible
E2	*11.9*	*11.9*	0	Negligible
Objective / Guideline	**10 [b]**		**-**	**-**

[a] % changes are relative to the objective and have been rounded to the nearest whole number.
[b] 10 $\mu g/m^3$ is the GLA target and the LBC Air Quality CPG target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this until 2030. Exceedances of this target are shown in italic.

8.155 The annual mean concentrations of $PM_{2.5}$ exceed the GLA target and the LBC Air Quality CPG criteria with and without the Proposed Development; using the matrix in Table 8.3, the impact is described as Negligible. As discussed in paragraph 8.16, the GLA aims to achieve the GLA target for $PM_{2.5}$ of 10 $\mu g/m^3$ by 2030. However, exceedances of the target are common, and based on Defra's background maps, their achievement is very unlikely to be possible before 2030[26]. As such, it is unsurprising that there are exceedances for both 'with Proposed Development' and 'without Proposed Development' scenarios. However, as there is no requirement for the Proposed Development to adhere to this target, this has been provided for contextual purposes only and does not alter the conclusions of the assessment.

Summary of Significance of Operational Air Quality Effects

8.156 The operational air quality effects without mitigation in 2030 are considered to be not significant. This professional judgement is made in accordance with the methodology set out in **ES Volume 3, Appendix: Air Quality – Annex 5** and takes account of the assessment that pollutant concentrations at all of the selected worst-case existing receptors along the local road network will be below the air quality objectives, and all of the impacts are predicted to be negligible.

'Air Quality Neutral'

8.157 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 a Proposed Development, as assessed in this section, does not directly indicate the potential of the Proposed Development to have significant effects on human health (this has been assessed separately in the previous section).

8.158 The air quality assessment has been undertaken using the latest GLA's London Plan Guidance (Air Quality Neutral)[27].

Building Emissions

8.159 The Proposed Development will be provided with heat and hot water via ASHPs, supplemented with PVs. As such, there will be no associated pollutant emissions and no direct building emissions. It may also include a life-safety generator, however the GLA's Air Quality Neutral guidance states that *"backup plant installed for emergency and life safety power supply, such as diesel generators, may be excluded from the calculation of predicted building emissions."*

8.160 The Proposed Development is, therefore, better than air quality neutral in terms of building emissions.

Transport Emissions

8.161 The Proposed Development is 'car-free'; there will be no car parking with the exception of two accessible spaces located at basement level. The Proposed Development is, therefore, compliant with Section 4.1.3 of the GLA's London Plan Guidance (Air Quality Neutral)[27], and is air quality neutral with regards to transport emissions.

Air Quality Positive Statement

8.162 AQC has been involved since early in the design process for the Proposed Development and issued Preliminary Air Quality (**ES Volume 3, Appendix Air Quality – Annex 9**) advice to inform the design. Air quality constraints, and measures to maximise the benefits to air quality, have been discussed throughout the design period with the Project Team. This has resulted in the current design which is the focus of this assessment. The design measures included within the Proposed Development, and their benefits in terms of air quality and exposure to air pollution, are set out in the Air Quality Positive Statement, which is provided in **ES Volume 3, Appendix Air Quality – Annex 10**. A summary of these measures is seen below:

- The masterplan has been designed to reduce exposure to emissions with receptors that are sensitive to the 1-hour NO_2 objective, located approximately 7m away from the nearest road;
- The energy strategy for the Proposed Development will comprise of an all-electric system consisting of ASHPs and PVs. High energy efficiency building fabric will be utilised to reduce carbon emissions and energy demand;
- Cycle and pedestrian access and cycle parking will be provided that meets the requirements of Policy T5 of the London Plan; and
- The Proposed Development will be 'car-free', which will assist in facilitating a move towards a car-free lifestyle and promotion of the future use of local public transport.

MITIGATION, MONITORING AND RESIDUAL EFFECTS

Deconstruction and Construction Mitigation

8.163 Measures to mitigate dust emissions will be required during the enabling works and construction works of the Proposed Development in order to minimise effects upon nearby sensitive receptors.

8.164 The site has been identified as a *Medium* Risk site during demolition (deconstruction), earthworks, construction and trackout. The GLA's SPG on The Control of Dust and Emissions During Construction and Enabling works describes 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. These measures are described in **ES Volume 1, Chapter 5: Deconstruction and Construction** and **ES Volume 3, Appendix: Air Quality – Annex 11**.

8.165 The mitigation measures will be included in a dust management plan (DMP). The DMP is likely to be integrated into a Code of Construction Practice and/or the CMP, require monitoring, and be secured by suitably worded planning condition / planning obligation.

8.166 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There will not be any excessive use of water.

8.167 Assuming that the mitigation measures outlined within the guidance are implemented, the overall effect of construction dust is considered to be '**not significant**'.

8.168 Additionally, the assessment has demonstrated that the overall effect of emissions from deconstruction and construction vehicles generated by the Proposed Development is 'not significant'. It is, therefore, not considered appropriate to propose further mitigation measures with regards to enabling works and construction traffic emissions.

Completed Development Mitigation

8.169 The assessment has demonstrated that the Proposed Development will not cause any exceedances of the air quality objectives and that the overall air quality effect of the Proposed Development will be 'not significant'. As such, there is no requirement for mitigation beyond the best practice design measures highlighted in the Air Quality Positive Statement (see Paragraph 8.162), which is provided in **ES Volume 3, Appendix Air Quality – Annex 10**.

8.170 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 is written into UK law), and through encouragement to accelerate the take up of low emission vehicles, for example through the ULEZ.

Residual Effects

8.171 All of the residual effects resulting from the Proposed Development, are presented in Table 8.23, identifying whether the effect is significant or not.

Table 8.23 Residual Effects

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
Deconstruction and Construction							
Existing Receptors	Deconstruction and Construction Dust	Negligible	Not Significant	L	D	T	Mt
	Road traffic emissions	Negligible	Not Significant	L	D	T	Mt
Completed Development							
Existing Receptors	Road traffic emissions	Negligible	Not significant	L	D	P	Lt

Notes: Residual Effect Scale = Negligible / Minor / Moderate / Major Nature = Beneficial or Adverse Geo (Geographic Extent) = Local (L), Borough (B), Regional (R), National (N) D = Direct / I = Indirect P = Permanent / T = Temporary St = Short Term / Mt = Medium Term / Lt = Long Term N/A = not applicable / not assessed

SITE SUITABILITY

8.172 Predicted air quality conditions for future retail users of the Proposed Development in 2030, taking account of emissions from the adjacent road network, are set out in Table 8.24. As previously discussed, only the short-term (1-hour) mean nitrogen dioxide objective is relevant for these users. The maximum modelled annual mean NO_2 concentration within the Proposed Development is 35.8 µg/m^3. As concentrations are less than 60 µg/m^3, there are unlikely to be exceedances of the 1-hour mean objective at these locations.

8.173 Air quality for future occupants of the Proposed Development is thus considered to be acceptable.

8.174 The modelled concentrations, assuming the no improvement scenario, have been presented in **ES Volume 3, Appendix Air Quality – Annex 7.**

Table 8.24 Predicted Concentrations of NO_2 in 2030 for New Receptors in the Proposed Development

Receptor	Annual Mean NO_2 (µg/m^3)
D1	33.6
D2	35.8
D3	34.9
D4	32.6
Objective	**60** [a]

[a] *Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m^3*

ASSESSMENT OF THE FUTURE ENVIRONMENT

Evolution of the Baseline Scenario

8.175 If the Proposed Development were not to come forward, it is expected that the site would remain as its current use (vacant with some active retail elements). Air quality is generally expected to improve with time, particularly through the introduction of more stringent vehicle emissions standards. Air quality conditions at the site would therefore be expected to improve and this is reflected in the predicted future baseline concentrations presented in Table 8.7 and 0.

Cumulative Effects Assessment

8.176 Cumulative schemes have been outlined in **ES Volume 1, Chapter 2: EIA Methodology**.

Deconstruction and Construction

8.177 The IAQM guidance[19] (upon which the GLA's guidance[21] is based) is clear that, with appropriate mitigation measures in place, any residual enabling works and 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.

8.178 In accordance with the mitigation measures set out in **ES Volume 3, Appendix: Air Quality – Annex 11**, 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"*.

8.179 Of the cumulative schemes identified within **ES Volume 3, Appendix: EIA Methodology – Annex 5**, eight are located within 1km of the site. It is anticipated that all construction sites will adopt appropriate mitigation measures to limit emissions of dust, will hold the 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, in our professional view, are likely to be not significant.

8.180 With regards to cumulative effects from peak enabling works and construction traffic, the baseline traffic flows utilised in the assessment have included traffic generated by all nearby cumulative schemes. The predicted impact for peak enabling works and construction traffic has been shown to be not significant, thus the cumulative effect of enabling works and construction traffic will also be not significant.

Completed Development

8.181 The traffic data used in the 2030 'Without Proposed Development' and 'With Proposed Development' scenarios also incorporate traffic flows associated with all cumulative schemes which would affect flows on the roads included in this assessment. As such, predictions of future pollutant concentrations presented in this ES chapter take account of cumulative road traffic effects.

8.182 Operational impacts, which inherently include the cumulative schemes, have been shown to be not significant.

8.183 As demonstrated in Table 8.19 to Table 8.21 annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ will be below the objectives at the modelled receptor location in 2030, and all impacts resulting from additional road traffic emissions associated with the Proposed Development will be not significant.

LIKELY SIGNIFICANT EFFECTS

8.184 The deconstruction and construction works have the potential to create dust. During deconstruction and construction works it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any residual effects will be not significant.

8.185 The assessment has also shown that the effects of emissions from construction vehicles on local air quality will be '**not significant**'.

8.186 The operation of the Proposed Development is not predicted to result in any significant effects on the existing receptors considered within this assessment in relation to air quality in terms of NO_2, PM_{10} and $PM_{2.5}$ (when assessed against national air quality objectives and the GLA target for $PM_{2.5}$). In addition, the assessment has demonstrated that air quality for future occupants of the Proposed Development will also be acceptable.