HARRY MOTORS II LTD.

139-147 CAMDEN ROAD, CAMDEN

AIR QUALITY ASSESSMENT

REPORT REF – 2205351-R01

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1.0 INTRODUCTION

Proposed Development

1.1 Ardent Consulting Engineers Ltd. (ACE) have been commissioned by Harry Motors II Ltd. to carry out an Air Quality Assessment (AQA) in support of a detailed planning application for a proposed residential development located at 139-147 Camden Road, within the London Borough of Camden (LBC).

1.2 The proposed development description is as follows:

"Erection of 4 storey block of flats with ground floor bin and bicycle stores and front paving and planting."

Scope

1.3 This AQA describes existing air quality within the study area and considers both the suitability of the Site for the proposed development and the potential impact of the proposed development on local air quality during both the construction and the operational phases.

1.4 The main air pollutants of concern related the construction phase are dust and particulate matter (PM_{10}) from on-site construction activities and as a result of material tracked out by construction vehicles, and emissions of nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) from construction vehicles which may impact on existing sensitive human receptors. There is also the potential for impacts on nearby designated ecological sites as a result of emissions of nitrogen oxides (NO_X), NO_2 and ammonia (NH_3) from construction vehicles.

1.5 The main air pollutants of concern related to the operational phase are emissions of NO_2, PM_{10} and $PM_{2.5}$ associated with operational traffic which may impact on existing sensitive human receptors. There is also a potential for impacts on existing designated ecological sites as a result of emissions of NO_X, NO_2 and NH_3 from operational vehicles.

1.6 In terms of the suitability of the Site for its proposed end-use, the main air pollutants of concern are concentrations of NO_2, PM_{10} and $PM_{2.5}$ within the Site as a result of emissions from the local road network and background pollutant

concentrations, as well as emissions of NO_2 associated with the nearby railway lines.

1.7 The proposed energy strategy is anticipated to comprise individual 'low-NO_X emission' gas boilers designed to serve each dwelling[1]. Taking into consideration the relatively low volume of emissions anticipated to be associated with each individual boiler (i.e. low-NO_X emitting domestic boilers of <40 mg NO_X / kWh)), it is appropriate to screen out the proposed energy strategy as not having the potential to result in significant effects. As such, the proposed energy strategy is not considered further by this AQA.

1.8 An assessment has been carried out to determine whether the proposed development is 'air quality neutral' in terms of transport and building emissions.

1.9 This AQA has been prepared taking into account relevant local and national guidance, policy and legislation.

Consultation

1.10 ACE contacted LBC's Air Quality Team via email correspondence in April 2023 in order to discuss the scope and methodology of this AQA. No response has been received to date.

[1] Information provided by the project's energy consultant; EEABS.

2.0 LEGISLATION, POLICY AND GUIDANCE

National Air Quality Legislation and Strategy; Human Health

The Air Quality Strategy

2.1 The Air Quality Strategy (Defra, 2007) established the policy framework for ambient air quality management in the UK, with the objective of ensuring a quality of ambient air for all that would not pose a significant risk to health or quality of life. This document set out the National Air Quality Objectives (NAQOs) and the policy for achieving them. It followed part IV of the Environment Act (UK Government, 1995) which introduced a system of Local Air Quality Management (LAQM) requiring local authorities to regularly review and assess air quality within their boundary and appraise plans in light of these assessments.

2.2 Where an NAQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) which should include measures expected to ensure that the NAQOs are met within the AQMA.

National Air Quality Objectives

2.3 NAQOs were defined by The Air Quality Strategy (Defra, 2007) and enshrined in regulations by the Air Quality Standards Regulation (Statutory Instrument, 2010, No 1001) and Air Quality Standards (Amendment) Regulations (Statutory Instrument, 2016 No. 1184) which implemented the European Union Directive on ambient air quality and cleaner air for Europe (Directive 2008/50/EC). Relevant objectives are set out in **Table 2-1**.

2.4 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (UK Government, 2023) sets out new concentration and exposure reduction targets for $PM_{2.5}$, to be achieved by 2040. The new concentration target is an annual mean concentration of 10 µg/m^3. The new exposure reduction target is a minimum of 35% reduction in population exposure, as compared with the average population exposure in a three year baseline period (2016-2018). As these new targets are not applicable until 2040, this AQA predominantly focusses on the currently applicable objectives (as set out in **Table 2-1**).

Table 2-1: NO_2, PM_{10} and $PM_{2.5}$ Objectives

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	50 µg/m^3 not to be exceeded more than 35[2] times a year
	Annual mean	40 µg/m^3 [3]
$PM_{2.5}$	Annual mean	25 µg/m^3 [4]
	Annual mean	20 µg/m^3 [5]
	Exposure reduction target	15% reduction between 2010 and 2020 at Urban Background sites

2.5 Analysis of long-term monitoring data suggests that if the annual mean NO_2 concentration is less than 60 µg/m^3 then the 1-hour mean NO_2 objective is unlikely to be exceeded where road transport is the main source of pollution (Defra, 2022). This concentration has therefore been used in this AQA to screen whether an exceedance of the 1-hour mean objective is likely. Similarly, an annual mean PM_{10} concentration of 32 µg/m^3 is used to screen whether an exceedance of the 24-hour mean PM_{10} objective is likely.

2.6 The London Local Air Quality Management Technical Guidance 2019 (LLAQM.TG(19)) (Mayor of London, 2019) provides guidance to local authorities in London as to where objectives apply. These are summarised in **Table 2-2**.

[2] 7 times a year for Scotland

[3] 18 µg/m^3 for Scotland

[4] 12 µg/m^3 for Scotland

[5] Indicative stage 2 limit value post 2020, derived based on the exposure reduction target of a 15% reduction between 2010 and 2020. This value has been used as the relevant air quality objective throughout this assessment in order to ensure a conservative approach.

Table 2-2: Relevant Exposure

Averaging Period	Relevant Locations	NAQOs should apply	NAQOs don't usually apply
Annual mean	Where individuals are exposed for a cumulative period of 6 month in a year	Facades of residential properties, schools, hospitals and gardens of residences	Facades of offices, hotels and shops or kerbside sites
24-hour mean	Where individuals are expected to be exposed for 24-hours or longer	As above, with the addition of hotels	Kerbside sites and areas where the public is unlikely to spend significant time
1-hour mean	Where individuals are expected to spend one hour or longer	As above, with the addition of parts of car parks, bus stations, railway stations etc. which are not fully enclosed, and any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Locations not publicly accessible or where occupation is not regular

National Air Quality Plan for Nitrogen Dioxide (NO_2) in the UK

2.7 The National Air Quality Plan (Defra and DfT, 2017) was written as a joint venture between the Department for Environment, Food and Rural Affairs (Defra) and the Department for Transport (DfT) and aims to tackle roadside concentrations of NO_2 in the UK. It includes a number of measures such as those aimed at investing in Ultra Low Emission Vehicles (ULEVs) charging infrastructure, public transport and grants to help local authorities in improving air quality.

2.8 The plan requires all local authorities in England with areas expected not to meet the Limit Values by 2020 (known as 'air quality hotspots') to develop plans to bring concentrations within these values in *"the shortest time possible".* These plans are to be reviewed by the government and suggestions included in the

plan include actions such as utilising retrofitting technologies, changing road layout and encouraging public transport and ULEV use. Where these approaches are not considered sufficient, the local authority may need to consider implementation of a Clean Air Zone which places restrictions on vehicle access to an area and may include charging certain (or all) vehicles or restrictions on the type of vehicle allowed to access an area.

The Road to Zero Strategy

2.9 The 'Road to Zero' strategy (HM Government, 2018) set out the governments aims regarding zero emissions vehicles. These include the aim that all new cars and vans have zero tailpipe emissions by 2040 and for almost every car to be zero emission by 2050. Measures are aimed at encouraging uptake of the cleanest vehicles and supporting electric charging infrastructure.

Clean Air Strategy

2.10 The Clean Air Strategy (Defra, 2019) sets out policies to lower national emissions of pollutants in order to reduce background pollution and human exposure. It aims to create a strong framework to tackle air pollution and to reduce the number of people living in locations with $PM_{2.5}$ concentrations exceeding 10 µg/m^3 by 50% by 2025.

National Air Quality Legislation; Ecology

2.11 Poor air quality can have a negative impact on ecological habitats as well as human health. The Conservation of Habitats and Species Regulations (Statutory Instrument, 2017) was put in place in order to protect ecological sites following the publication of European Directive 92/43/EEC (European Economic Community (EEC), 1992) regarding the designation of Special Areas of Conservation (SACs) and 2009/147/EC (European Community, 2009) regarding the designation of Special Protection Areas (SPAs). These regulations require that the competent authority (the planning authority in this case) consider whether a development will have a likely significant effect on an SAC or SPA (known as 'European Sites'). Should this be considered to be likely then an 'appropriate assessment' is required to identify whether the new development will indeed have a significant adverse effect on the ecological site(s).

2.12 The Wildlife and Countryside Act (UK Governmant, 1981) sets out the requirement for the identification of areas of land that are considered to be of 'special interest' (due to flora, fauna and / or geological or physiographical features) as Sites of Special Scientific Interest (SSSIs), and the Countryside and Rights of Way (CROW) Act (HM Government, 2000) sets out the specific protections afforded to SSSI, stating that where a development is 'likely to damage' a SSSI then the appropriate conservation body must be consulted.

2.13 The Environment Act (UK Government, 1995) and the Natural Environment and Rural Communities Act (HM Government, 2006) set out a general requirement for conservation of biodiversity.

Critical Levels

2.14 Critical levels have been set for a number of gaseous pollutants. These are the concentrations of pollutants below which there is no known harmful effects on vegetation or ecosystems. These levels have been set by UK government and are considered to be relevant objectives for all internationally designated sites such as SACs and SPAs, as well as for nationally designated sites such as SSSIs, and locally designated sites such as Sites of Importance for Nature Conservation (SINCs). The relevant critical levels are set out in **Table 2-3**.

Table 2-3: Ecological Critical Levels

Pollutant	Time Period	Objective
Nitrogen Oxides (expressed as NO_2)	Annual Mean	30 µg/m³
Ammonia (NH_3)	Annual Mean	3 µg/m³ (unless lichens or bryophytes are present, then 1 µg/m³)

Critical Loads

2.15 Critical loads represent the amount of pollutant deposited to a given ecosystem over a year, below which it is understood that there is no harmful effect to the ecosystem. Critical loads have been identified for a number of different types of ecosystem, based on their sensitivity to adverse effects. Critical loads for the deposition of nitrogen have been set for the protection from eutrophication, whilst critical loads for the purpose of protection against acidification have been set for deposition of both nitric acid and sulphuric acid, together termed as acid deposition. Critical loads for sensitive ecological sites vary throughout the UK.

Planning Policy

National Planning Policy

2.16 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the Government's planning policies for England and how they expect these to be implemented. Consideration of air quality within planning is considered an important element of this framework which recommends that transport and the potential impact on the environment should be considered at an early stage in order to allow for mitigation or even avoidance of impacts through location and layout of developments.

2.17 It is recommended that both the impacts of a potential development on the environment and the risk to new development from existing pollution be taken into account when planning policy is drafted. Furthermore these should contribute to compliance with relevant limit values or objectives and should be consistent with any local AQAP.

2.18 The NPPF also recommends that *"existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

2.19 The NPPF also states that:

"*Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- *Protecting and enhancing…sites of biodiversity or geological values…*
- *minimising impacts on…biodiversity…"*

2.20 The Planning Practice Guidance (PPG) provides guidance on how planning can enact the policies set out in NPPF. It is set out as separate papers for different sectors and therefore the 'Air Quality' PPG (Ministry of Housing, Communities and Local Government, 2019) is aimed at addressing policy relating specifically to air quality. This document gives guidelines for when air quality is likely to be relevant to a planning decision:

"Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."

2.21 The 'Air Quality' PPG also states that more detailed information such as whether the development could have a significant impact on air quality, baseline air quality and whether occupiers of the development could experience poor air quality may be required in order to make an informed decision. Further, it notes that any assessment should be proportionate, taking into account the scale of the proposed development, as well as any potential impacts.

2.22 Some suggestions on mitigation measures are set out within the PPG, such as separation distances, filtration/ventilation, green infrastructure, promotion of low emission forms of transport, control of dust and emissions from construction and, finally, contributing funding to measures such as those identified in AQAPs to offset impacts from the development.

Regional Policy

The London Plan

2.23 In London, a London Plan has been developed (Mayor of London, 2021). This includes a number of references to air quality, however, these are all incorporated into policy SI1: Air Quality, which states:

A. Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B. To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:

1. Development proposals should not:

a) lead to further deterioration of existing poor air quality;

b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits; and

c) create unacceptable risk of high levels of exposure to poor air quality.

2. In order to meet the requirements in Part 1, as a minimum:

a) development proposals must be at least Air Quality Neutral;

b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures;

c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1; and

d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor

air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.

C. *Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:*

   a) *how proposals have considered ways to maximise benefits to local air quality; and*

   b) *what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*

D. *In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.*

E. *Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development."*

The London Environment Strategy

2.24 The London Environmental Strategy (Mayor of London, 2018) considers policies aimed at improving the environment in London, across a number of different areas such as air quality, noise and climate change. There are a number of objectives but notable in relation to air quality is the objective: *"for London to have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities."*

2.25 Chapter 4 of the Environmental Strategy relates specifically to air quality and identifies a number of key issues to be addressed:

- Achieving legal compliance as quickly as possible;
- Diesel vehicles, especially cars and vans;
- Tackling all sources of pollution;
- Government action;
- Maximising co-benefits between air quality and climate change policies; and
- Further reductions are needed in PM_{10} and $PM_{2.5}$, particularly from transboundary pollution, tyre and brake wear and wood burning.

Local Policy

LBC Local Plan

2.26 The Camden Local Plan (LBC, 2017) was adopted in July 2017 and sets out the Council's planning policies which aim to be robust and effective during the plan period from 2016 to 2031. The Council's decisions on planning applications should be taken in line with the Camden Local Plan unless there are significant matters (material considerations) that indicate otherwise. The Plan includes the following relevant policies:

- Policy A1 'Managing the impact of development' notes that:

  "The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.

  We will:

  a. seek to ensure that the amenity of communities, occupiers and neighbours is protected;

  …

d. require mitigation measures where necessary.

The factors we will consider include: …

i. impacts of the construction phase, including the use of Construction Management Plans …

k. odour fumes and dust …"

- Policy CC4 'Air Quality' states that:

"The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the Borough.

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan."

LBC AQAP

2.27 Under LLAQM (Mayor of London, 2019), LBC are required to regularly review and assess air quality within the Borough and determine whether or not the air quality objectives are likely to be achieved.

2.28 In September 2002, the whole-borough 'Camden AQMA' was declared as a result of exceedances of the annual mean NO_2 objective and the 24-hour mean PM_{10} objective.

2.29 Following the declaration of the AQMA, an AQAP was developed in order to tackle poor air quality in the Borough. LBC's most recent AQAP (i.e. the 'Camden Clean Air Action Plan 2023-2026', (LBC, 2022)) outlines the actions that Camden will deliver during the period to reduce concentrations of air pollution and exposure to air pollution, as well as to affect positively the health and quality of life of residents and visitors to the Borough. The AQAP seeks to focus on the following seven broad themes: Construction and development; Buildings; Transport; Communities and schools; Indirect emissions and lobbying; Public health and awareness; and Indoor air quality and occupational exposure.

Assessment Guidance

2.30 This assessment has been based on a number of guidance documents, the most significant of which are set out below:

Local Air Quality Management Technical Guidance (LAQM.TG(22))

2.31 The LAQM guidance (Defra, 2022) was published for use by local authorities for review and assessment work, but also includes a number of technical guidelines on carrying out modelling assessment and management of monitoring data which set out best practice and are, therefore, relevant to all air quality assessments.

London Local Air Quality Management Technical Guidance (LLAQM.TG(19))

2.32 The LLAQM.TG(19) guidance (Mayor of London, 2019) was published for use by London local authorities for review and assessment work and includes a number of technical guidelines on carrying out modelling assessment and management of monitoring data which set out best practice and are, therefore, relevant to all air quality assessments.

Land-Use Planning and Development Control: Planning For Air Quality

2.33 The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) have published joint guidance on the assessment of air quality impacts for planning purposes (EPUK & IAQM, 2017). This includes information on when an air quality assessment is required, what should be included in an assessment and the assessment of significance.

The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (SPG)

2.34 The Greater London Authority (GLA) have produced an SPG (GLA, 2014) which includes a methodology for identifying the risk of potential dust sources associated with demolition, construction, earthworks and trackout in London. This is then used to identify the level of mitigation necessary in order for the overall residual effect to be 'not significant'.

Guidance on the Assessment of Dust from Demolition and Construction

2.35 The IAQM have produced guidance which includes a methodology for identifying the risk magnitude of potential dust sources associated with demolition, construction, earthworks and trackout (IAQM, 2014). This is then used to identify the level of mitigation necessary in order for the overall residual effect to be 'not significant'. 'The Control of Dust and Emissions During Construction and Demolition' SPG (GLA, 2014) published by the GLA is based on this guidance, however, the original IAQM document is more detailed and, therefore, has been used to provide additional information where necessary.

A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites

2.36 The IAQM guidance 'Assessment of Air Quality Impacts on Designated Nature Conservation Sites', (IAQM, 2020) sets out the appropriate approach for this element of assessment. Due to the complexity of ecological impacts, an air quality professional alone can only identify whether emissions are unlikely to have a significant impact when compared against the relevant critical load / level. Where it cannot be ascertained that emissions are below this level, the combined input of both an air quality professional and an ecologist is required; the former to identify any changes to concentrations of deposition and the latter

to consider the overall effect taking into consideration the location and sensitivity of any given habitat.

London Plan Guidance; Air Quality Neutral

2.37 In February 2023, the 'London Plan Guidance; Air Quality Neutral' (GLA, 2023) was published by the GLA following a period of consultation. This guidance sets out the updated methodology for considering the 'air quality neutrality' of new developments, including details of updated 'air quality neutral' benchmarks (see **Appendix B**), as well as recommendations regarding mitigation and offsetting.

LBC CPG

2.38 In January 2021, LBC published their 'Camden Planning Guidance; Air Quality' (CPG) (LBC, 2022), which support the policies in the Camden Local Plan (see **Paragraph 2.26**).

2.39 The CPG sets out when assessments for air quality are required and the level of information that should be included according to the type and circumstances of development being assessed. The CPG also outlines a series of assumptions that should be taken into account within the methodological approach employed by the AQA.

2.40 The triggers for undertaking an AQA are set out in **Table 2-4** overleaf.

2.41 Furthermore, LBC have adopted the World Health Organisation (WHO) air quality guideline limits as published in 2005 (WHO, 2005) for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, which are shown in **Table 2-5** overleaf. However, since the WHO limits are not statutory, this analysis has been limited to a simple comparison between predicted annual mean pollutant concentrations and the adopted limits; and is presented separately in **Appendix F** for informational purposes. The assessment of Site suitability and any subsequent mitigation recommendations are based on the comparison of predicted annual mean pollutant concentrations and the current statutory national air quality objectives as shown in **Table 2-1**.

Table 2-4: AQA Triggers

Criteria met →				→ Assessments required		
Scale	*Area of poor air quality*[1]	*Scheme brings sensitive receptors*	*Scheme brings air quality impacts* [2]	*Air Quality Assessment type*	*Air Quality Neutral*	*Construction and Demolition Impacts*
Major	Yes	Yes	Yes	Detailed	Required	Required
			No			
		No	Yes	Detailed		
			No	Basic		
	No	Yes	Yes	Detailed		
			No	Basic		
		No	Yes	Detailed		
			No	Basic		
Minor	Yes	Yes	Yes	Detailed	*Not required*	*[3]May be required*
			No	Basic		
		No	Yes	Basic		
			No	*Not required*		
	No	Yes	Yes	Detailed		
			No	*Not required*		
		No	Yes	Basic		
			No	*Not required*		

[1] Area of poor air quality - an area with NO_2 or PM_{10} concentrations within 5% below the air quality objective, 38µg/m^3 (micrograms per cubic metre).
[2] Air quality impacts - Produces changes in emissions from building sources, small industrial processes (including generators for emergency backup power, Short Term Operating Reserve and similar), or vehicle movements. (STOR power generators are those used intermittently to supply intensive amounts of electricity to the grid at short notice).
3 An assessment for demolition and construction impacts may be required for certain minor applications, such as basements. It is best to contact a planning officer if there is any uncertainty.

Table 2-5: WHO Air Quality Guideline Limits for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
NO_2	Annual mean	40 µg/m^3
PM_{10}		20 µg/m^3
$PM_{2.5}$		10 µg/m^3

3.0 METHODOLOGY

3.1 The methodology set out in the following sections has been identified as being the most appropriate approach to assess potential impacts associated with the proposed development, along with any required mitigation.

Baseline Air Quality

3.2 Information regarding the 'current'[6] baseline air quality has been obtained by collating the results of monitoring carried out by LBC, referring to maps of AQMAs and Air Quality Focus Areas (AQFAs), considering any exceedances of the EU Limit Values that are identified by Defra's Pollution Climate Mapping (PCM) model (Defra, 2020a) or measured by any nearby Automatic Urban and Rural Network (AURN) monitoring site(s) and considering predicted background concentrations, which have been defined based on the national pollution maps published by Defra (Defra, 2020b). In addition, baseline modelling has been carried out.

Construction Dust Impacts

3.3 There is a potential for dust and PM_{10} from on-site activities and off-site trackout during the construction phase to have an impact on sensitive human and ecological receptors within the study area.

3.4 The suspension of dust and PM_{10} is related to weather conditions and wind direction, ground and particle characteristics and on-site activities. There is a potential for impacts to occur when dust generating activities coincide with dry, windy conditions and where sensitive receptors are located downwind of the dust source.

3.5 Separation distance is an important factor as large particles (>30 µm) which are responsible for most dust annoyance largely deposit within 100 m of sources. Intermediate particles (10-30 µm) can travel 200-500 m but are less likely to trigger annoyance. Significant annoyance is therefore generally limited to a few hundred metres of the source. Small particles (<10 µm) are deposited slowly and may travel up to 1 km. Whilst these particles are responsible for most

[6] The 'current' baseline year for the purposes of this assessment has been taken to be 2021 as this is the most recent year for which representative local monitoring data are available.

impacts on human health, impacts are not likely to be experienced at significant distance due to dispersion effects.

3.6 The assessment of construction dust impacts has been carried out following the GLA's SPG on 'The Control of Dust and Emissions During Construction and Demolition (GLA, 2014), which is based on the IAQM 'Guidance on the Assessment of Dust from Construction and Demolition' (IAQM, 2014). Within this guidance, an 'impact' is described as a change in pollutant concentration or dust deposition and an 'effect' is described as the consequence of an impact.

3.7 The assessment considered three potential dust impacts:

- Loss of amenity due to dust soiling;
- Human health effects due to an increase in concentrations of PM_{10}; and
- Harm caused to ecological receptors due to dust deposition.

3.8 Full details of the approach taken to assessing dust are provided in **Appendix C**, the stages of the assessment are:

- Identify whether there are sensitive receptors within the relevant distances (study area) for site activities during the construction phase;
- Assess the risk of dust impacts for each site activity type (demolition, earthworks, construction and trackout) – this includes identifying the emissions magnitude for each activity type, the sensitivity of the area and then combining these factors to identify risk;
- Identify mitigation measures, based on assessed risk, sufficient to ensure off-site effects are 'not significant'; and
- Assess impacts with mitigation in place. This should normally result in residual effects which are 'not significant'.

3.9 The IAQM guidance makes it clear that no assessment of the significance of effects without mitigation should be carried out as mitigation measures will be required due to planning conditions as well as best practice for construction companies. The IAQM guidance also states that the residual effect, taking into account the proposed mitigation, will usually be 'not significant'.

Construction and Operational Road Traffic Impacts

Human Health

3.10 The EPUK/IAQM guidance 'Land Use Planning and Development Control: Planning for Air Quality' (EPUK & IAQM, 2017) includes a list of indicative criteria for where a detailed air quality assessment is likely to be needed. The criteria relating to screening air quality impacts relating to additional traffic are:

- An increase in Light Duty Vehicle (LDV) traffic of >500 annual average daily traffic (AADT) (or >100 AADT within or adjacent to an AQMA); and / or
- An increase in Heavy Duty Vehicle (HDV) traffic of >100 AADT (or >25 AADT within or adjacent to an AQMA).

3.11 The above criteria apply to any individual link and therefore, a development generating >500 AADT (or >100 AADT within an AQMA) may be considered to fall below the screening criteria where the increase is spread over a number of different road links.

3.12 Where it is not possible to screen out significant effects from road sources, detailed modelling is then generally required.

Ecology

3.13 Based on the IAQM guidance (IAQM, 2020) there is a potential for 'significant' effects on ecology as a result of transport emissions in cases where sensitive designated ecological sites are located within 200 m of a road where a development alone, or in combination with other committed developments, will increase traffic flows by >1,000 total AADT and / or >200 HDV AADT.

3.14 In cases where committed development traffic is not available and / or the screening criteria referenced by the IAQM guidance is exceeded, then an alternative screening criteria of >50 total AADT and / or >10 HDV AADT for proposed development traffic only is commonly used.

3.15 Where it is not possible to screen out significant effects from road sources, detailed modelling and / or additional assessment in conjunction with an ecologist is then generally required.

Site Suitability

Screening Assessment

3.16 The potential for exceedances of the relevant objectives at sensitive locations within the proposed development has been screened qualitatively, taking into consideration the location of the Site in relation to nearby emission sources (e.g. local roads and railway lines), the layout of the proposed development and baseline air quality conditions within the Site and in the surrounding area.

3.17 The potential for significant effects as a result of emissions associated with moving locomotives using the nearby railway line has been assessed using the screening criteria outlined within the LAQM.TG(22) (Defra, 2022). This guidance outlines that there is only a risk of exceedances of the annual mean NO_2 objective as a result of moving locomotives in instances where:

- There is relevant exposure within 30 m of specific rail lines with a heavy traffic of diesel passenger trains as listed within the guidance; AND
- Background annual mean NO_2 concentrations are >25 µg/m^3.

3.18 Where it is not possible to screen out the potential for significant effects, detailed assessment is then generally required.

Detailed Assessment

3.19 Annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ associated with background and road vehicle emissions have been predicted at sensitive locations introduced by the proposed development, including worst-case locations. Predicted concentrations have then been compared against the current relevant national objectives (see **Table 2-1** and **Table 2-2**) in order to determine significance.

3.20 Relevant sensitive locations are those where members of the public will be regularly present over the averaging period of the air quality objective(s). For pollutants of interest in this assessment (i.e. NO_2, PM_{10} and $PM_{2.5}$), sensitive locations include the façades of proposed residential properties (sensitive to the annual mean NO_2, PM_{10} and $PM_{2.5}$ objectives, the 24-hour mean PM_{10} objective and the 1-hour mean NO_2 objective). When identifying receptors, particular attention

has been paid to locations close to local roads where the impact of slow and congested traffic may increase emissions.

3.21 Based on the criteria above, 6 no. proposed receptors have been identified for assessment. Receptors P1 and P2 have been chosen to represent worst-case locations where pollutant concentrations are likely to be high, while receptors P3 to P5 represent other areas within the development, with P6 chosen to represent locations where concentrations are likely to be lowest. The locations of these receptors are shown in **Table 3-1** and **Figure 3-1** to **Figure 3-4**.

3.22 In addition, concentrations of NO_2 have been modelled at the CA23 diffusion tube monitoring site for use in model verification. Further details of model verification are provided in **Appendix D**.

Table 3-1: Proposed Receptor Locations

Receptor	Description	Coordinates		Height (m)	Approx. No. properties represented
		X	Y		
P1	Southeast balcony of proposed property fronting onto Camden Road	529543	184670	4.45, 7.4, 10.35	1
P2	Southeast balcony of proposed property fronting onto Camden Road	529546	184673	4.45, 7.4, 10.35	1
P3	Southwest façade of proposed property set back from Camden Road	529540	184671	4.45, 7.4, 10.35	1
P4	Northeast façade of proposed property/balcony set back from Camden Road	529544	184677	4.45, 7.4, 10.35	1
P5	Southwest façade of proposed property set back from Camden Road	529535	184675	1.5, 4.45, 7.4, 10.35	1
P6	Northwest (rear) façade of proposed winter garden	529531	184686	1.5, 4.45, 7.4, 10.35	1

Receptors P1 to P4 have not been modelled at ground floor level as there are no sensitive receptors present.
Façade locations at 3rd floor level are slightly set back from lower floors, hence receptors P1 and P2 at 3rd floor level are worst-case.

Figure 3-1: Proposed Receptor Locations; Ground Floor

Figure contains data taken from Engine Room (drawing ref.: CAMD-ERA-ZZ-XX-M3-A-0008 - 210 - Proposed Ground Floor GA Plan)

Figure 3-2: Proposed Receptor Locations; 1st Floor

Figure contains data taken from Engine Room (drawing ref.: CAMD-ERA-ZZ-XX-M3-A-0008 - 211 - Proposed First Floor GA Plan)

Figure 3-3: Proposed Receptor Locations; 2nd Floor

Figure contains data taken from Engine Room (drawing ref.: CAMD-ERA-ZZ-XX-M3-A-0008 - 212 - Proposed Second Floor GA Plan)

Figure 3-4: Proposed Receptor Locations; 3rd Floor

Figure contains data taken from Engine Room (drawing ref.: CAMD-ERA-ZZ-XX-M3-A-0008 - 213 - Proposed Third Floor GA Plan)

3.23 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the identified receptors have been modelled using the ADMS-Roads dispersion model (v5.0.1). This model requires a number of inputs including traffic flow (in AADT format), composition (i.e. proportion of HDVs) and average speed data, as well as road characteristics such as width, gradient and street canyon dimensions, as applicable.

3.24 Traffic flow and composition data have been obtained from the DfT database (DfT, 2023) and the London Atmospheric Emissions Inventory (LAEI) database (GLA, 2022). Where necessary, data has been adjusted to represent later years utilising Trip End Model Presentation Program (TEMPro) growth factors, as provided by the ACE's transport team. Cumulative impacts arising from additional traffic movements associated with committed developments during the operational phase have been accounted for through the application of TEMPro growth factors as necessary; this is considered to be a commensurate approach when considering the level of development. A summary of the traffic data and the assumptions used in this assessment are provided in **Appendix E**.

3.25 The emissions associated with the traffic have been calculated using the Emissions Factor Toolkit (EFT) v11.0 (Defra, 2021). This utilises emissions factors taken from the European Monitoring and Evaluation Programme (EMEP) / European Environment Agency (EEA) Air Pollution Emission Inventory Guidebook 2019 (EMEP / EEA, 2019) which is consistent with the COPERT 5.3 emission calculation tool (EMISIA, 2019), fleet composition data collected as part of the National Atmospheric Emissions Inventory (NAEI) and by Transport for London (TfL), along with data relating to the fleet and vehicle turnover in the UK. Traffic data have been entered into the EFT to provide emissions rates for each of the road links modelled for 2021, along with road type, vehicle fleet composition and speed. Whilst NO_X emissions rates are related to exhaust only, emissions rates for PM_{10} and $PM_{2.5}$ also include increments for road, tyre and break wear.

3.26 The model also requires meteorological data and inputs. The model has been run utilising 2021 data from the London City meteorological station which is considered suitable for the study area. **Appendix D** provides additional information on the meteorological inputs.

Air Quality Impacts Significance Criteria

3.27 In the absence of official guidance in the UK on how to assess the significance of air quality impacts on a new development, this assessment has been limited to a comparison of predicted pollutant concentrations within the proposed development, against the relevant objectives (see **Table 2-1** and **Table 2-2**).

Assumptions and Limitations

3.28 There are many components that contribute to the uncertainty in predicted concentrations. The model used in this assessment is dependent on the traffic data that have been input which will have inherent uncertainties associated with them. There is then the uncertainty as the model is required to simplify real-world conditions into a series of algorithms.

3.29 The model relies on meteorological data for 2021 which may not represent conditions in the future, particularly when taking into consideration additional uncertainties introduced as a result of climate change.

3.30 In accordance with the CPG (LBC, 2022), impacts of the Proposed Development have been assessed using background concentrations and emissions predicted for 2021 (i.e. the baseline year), assuming no improvements to vehicle emissions or background concentrations in future years, which forms part of a conservative assessment. Since traffic in the UK is generally expected to increase over time, in order to take a worst-case approach, traffic data relating to 2025 (i.e. when the Proposed Development will be fully operational) has been applied. These assumptions will contribute to an appropriately conservative assessment.

3.31 Per-vehicle exhaust emissions are predicted to reduce year-on-year due to technological advances and changes to the vehicle mix such as uptake of Euro VI/6 vehicles as well as Low and Ultra Low emission technology. Whilst there has been uncertainty regarding the accuracy of these predictions in the past, more recent evidence (Air Quality Consultants Ltd., 2020) suggests that the current emissions factor predictions are likely to reflect real world conditions without the need for a sensitivity test. Additionally, the model has undergone a verification process in order to adjust the model to real-world conditions (i.e. local monitoring). It is, therefore, considered appropriate to use emissions factors as provided by the EFT for this assessment without adjustment beyond appropriate verification.

3.32 It should be noted that some of the traffic data (i.e. LAEI derived data and the TEMPro growth factors) and the emissions factors within the EFT used within this assessment are based on assumptions which were current before the occurrence of the Covid-19 pandemic. As such, these data will not reflect any changes that have occurred or may occur in the future as a result of behavioural change caused by the pandemic and / or as a result of measures implemented by governing authorities (e.g. lockdowns, travel restrictions etc.). The current understanding of how trends have changed due to the Covid-19 pandemic is that UK traffic has generally stabilised or slightly reduced due to factors such as increases in homeworking and online shopping. It is, therefore, considered likely that assumptions based on pre-Covid conditions will be appropriately conservative.

3.33 Defra's EFT and background maps only provide data for future scenarios up to 2030. As such, it is not possible to use these tools to support predictions regarding future concentrations of $PM_{2.5}$ from 2040 onwards; i.e. when the new targets introduced by The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (UK Government, 2023) become applicable. Furthermore, the CPG requests that projections regarding future pollutant concentrations are not considered; as a conservative approach (LBC, 2022).

Air Quality Neutral

3.34 The approach set out within the 'London Plan Guidance; Air Quality Neutral' (GLA, 2023) has been followed in order to assess whether the proposed development is 'air quality neutral'.

4.0 BASELINE CONDITIONS

Site Context and Study Area

4.1 The Site is located in urban surroundings and is bound to the north by Cantelowes Skatepark, to the west by a railway line and to the south and east by Camden Road (A503) beyond which are residential properties. The Site is currently occupied by a carpark.

4.2 There are some locally designated ecological sites in close proximity to the Site, including the Rochester Terrace Gardens SINC and the London's Canals SINC located to the southwest of the Site.

4.3 The study area in relation to air quality has been defined as:

- For the construction dust risk assessment, the study area is the area up to 350 m from the Site boundary and up to 50 m of the route(s) used by construction vehicles on the public highway (up to 500 m from the Site exit(s)). This is based on the IAQM guidance (IAQM, 2014) which is more precautionary in this instance than the GLA guidance (GLA, 2014);
- For the assessment of the effect of traffic generated by the proposed development on human health, the study area incorporates all main roads (and adjacent sensitive human receptors) along which such traffic may travel;
- For the assessment of the effect of traffic generated by the proposed development on ecology, the study area incorporates all main roads located within 200 m of designated ecological sites along which such traffic may travel, as well as parts of the designated ecological site(s) located within 200 m of the road(s). This is based on the IAQM guidance (IAQM, 2020); and
- For the assessment of Site suitability, the study area has been identified as the area within the boundary of the Site and sources which will influence this area.

EU Limit Values and Clean Air Zones

4.4 The Site is located within the Low Emissions Zone (LEZ) which currently charges Heavy Goods Vehicles (HGVs), Light Goods Vehicles (LGVs), buses / minibuses and coaches that do not meet Euro VI (NO_X and particulate matter (PM)) standards, and vans, minibuses and specialist diesel vehicles that do not meet Euro 3 PM standards. The Site is located within the current Ultra-Low Emission Zone (ULEZ) which charges cars, motorcycles, vans and other specialist vehicles (up to and including 3.5 tonnes) and minibuses (up to and including 5 tonnes) that do not meet the required ULEZ emissions standards when driving within the zone. The ULEZ standards are Euro III (NO_x), Euro IV (NO_x) and Euro VI (NO_x and PM) standards.

4.5 The Camden Kerbside AURN monitoring site is located approximately 2.9 km to the west of the proposed development Site. The AURN monitor measured annual mean NO_2 concentration of 44 µg/m^3 in 2021, thus exceeding the EU Limit Value. The monitoring site also measured annual mean PM_{10} and $PM_{2.5}$ concentrations of 17 µg/m^3 and 10 µg/m^3 respectively in 2021, thus meeting the EU Limit Value for particulate matter. Furthermore, the London Bloomsbury Urban Background AURN monitoring site is located approximately 2.5 km to the south of the proposed development Site. This AURN monitor measured annual mean NO_2, PM_{10} and $PM_{2.5}$ concentration of 27 µg/m^3, 16 µg/m^3 and 11 µg/m^3 respectively in 2021, thus meeting the EU Limit Value for all pollutants.

4.6 Defra's PCM model does not predict any exceedances of the NO_2 annual mean EU Limit Value alongside roads in close proximity to the Site in 2021 (including Camden Road (A503)). No exceedances of the PM_{10} and $PM_{2.5}$ EU Limit Values were predicted on roads in close proximity to the Site in 2020[7].

LLAQM

4.7 LBC has assessed air quality within its area as part of its responsibilities under LLAQM. LBC declared a whole-borough AQMA, the 'Camden AQMA', in 2002 as a

[7] 2021 data is not available for PM, and so data for 2020 has been considered instead as a worst-case.

result of exceedances of the annual mean NO_2 objective and the 24-hour mean PM_{10} objective. The Site is located within this AQMA.

AQFAs

4.8 The GLA has declared 187 AQFAs within Greater London. AQFAs are locations that exceed the annual mean NO_2 Limit Value as well as being locations with high levels of human exposure to NO_2. The closest AQFA is located approximately 450 m to the southwest of the Site (i.e. 'Camden High Street from Mornington Crescent to Chalk Farm and Camden Road' AQFA).

Monitoring

4.9 LBC carried out NO_2 monitoring at four automatic and 33 diffusion tube monitoring sites in 2021. The closest locations to the Site are identified in **Figure 4-1** and measured concentrations for 2016 to 2021[8] are shown in **Table 4-1**.

4.10 Exceedances of the annual mean NO_2 objective were measured at diffusion tube monitors CA16 between 2016 and 2019 and at monitor CA23 between 2016 and 2020. There were no exceedances of the annual mean NO_2 objective in 2021.

4.11 CA16 measured concentrations in excess of 60 µg/m^3 in 2017, and CA23 measured concentrations in excess of 60 µg/m^3 in 2016 and 2017, suggesting that exceedances of the 1-hour mean NO_2 objective were likely during this period at these monitoring sites. Although no exceedances in excess of 60 µg/m^3 were measured between 2018 and 2021.

4.12 Overall, there is a clear trend of decreasing measured annual mean NO_2 concentrations at both monitors between 2016 and 2021.

[8] As a result of the Covid-19 pandemic and associated behavioural changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this assessment.

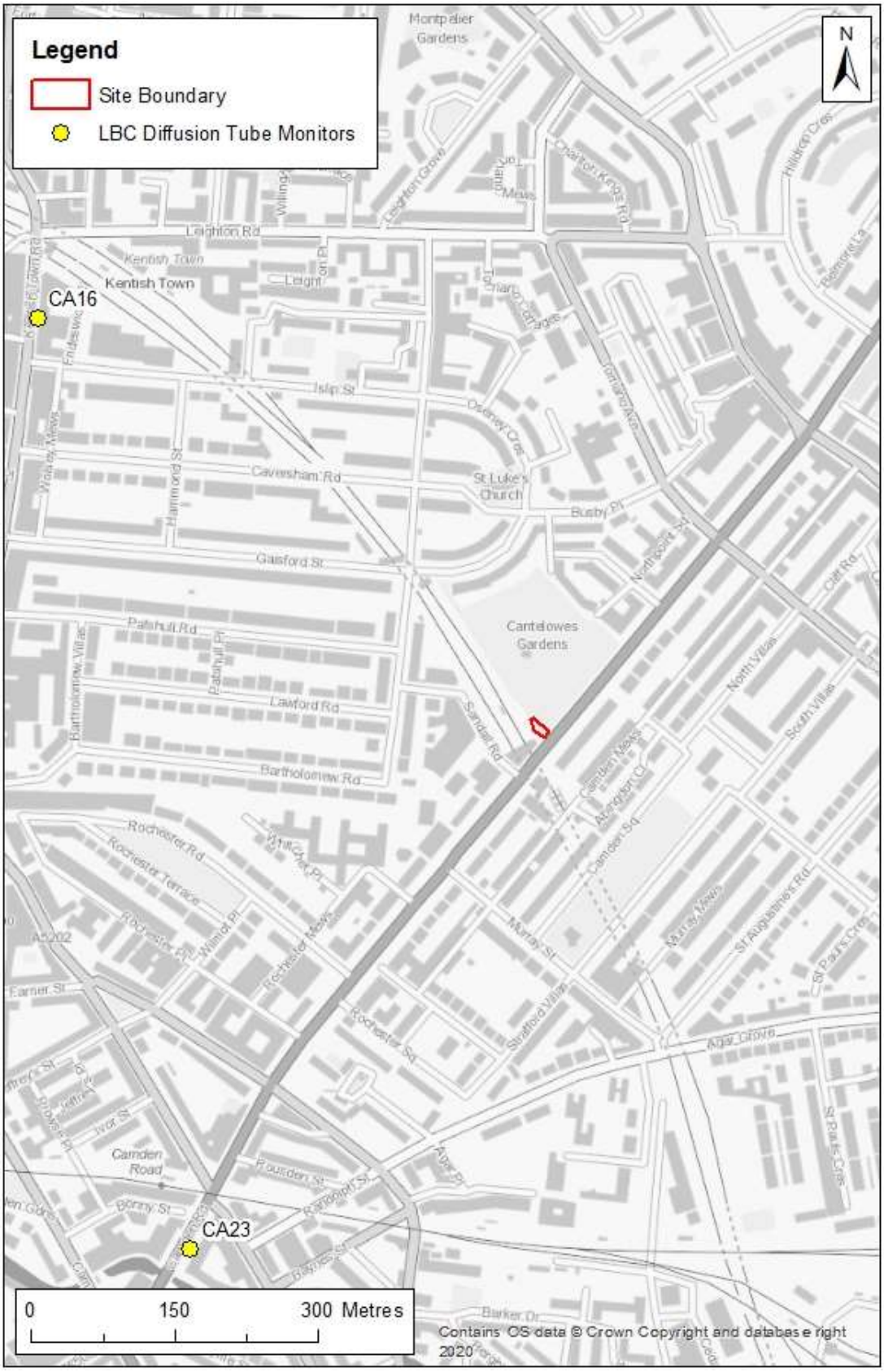

Figure 4-1: Local Monitoring Locations

Table 4-1: Measured Annual Mean NO_2 Concentrations (µg/m³)

Site ID	Site Name	Site Type	2016	2017	2018	2019	2020	2021
Diffusion Tube Sites								
CA16	Kentish Town Road	Roadside	**59**	**69**	**55**	**46**	34	33
CA23	Camden Road	Kerbside	**62**	**69**	**56**	**54**	**44**	37
Objective			**40**					

Exceedances of the annual mean objective are shown in **BOLD.**
Annual mean NO_2 concentrations in excess of 60 µgm^{-3}, indicating a potential exceedance of the 1-hour mean NO_2 objective, are shown in **BOLD UNDERLINED**
Data taken from LBC's 2021 Air Quality Annual Status Report (ASR) (LBC, 2022).

4.13 LBC did not undertake PM_{10} or $PM_{2.5}$ monitoring in the vicinity of the development Site between 2016 to 2021[8].

Predicted Background Concentrations

4.14 Predicted annual mean background concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been obtained from national maps provided by Defra (Defra, 2020b).

4.15 The predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are all well below the relevant objectives within the Site in 2021.

4.16 The future annual mean $PM_{2.5}$ target introduced by The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (UK Government, 2023) is not applicable until 2040. However, it is noted that the background $PM_{2.5}$ concentrations in 2021 are slightly above the future concentration target of 10 µg/m³.

Table 4-2: Predicted Annual Mean Background Concentrations (µg/m³)

Year	Location	NO_2	PM_{10}	$PM_{2.5}$
2021	Development Site	28	19	12
Objectives:		**40**	**40**	**20**

Predicted concentrations are rounded as appropriate taking into consideration the level of accuracy of the data source as well as the relevant objectives.

5.0 PREDICTED IMPACTS

Construction Dust Impacts

Screening Assessment

5.1 The primary potential effects during the construction phase relate to annoyance and loss of amenity caused by dust soiling, health impacts relating to PM_{10} and ecological impacts due to dust deposition. Based on the screening criteria set out by the GLA and the IAQM, it is considered necessary to carry out a construction dust risk assessment as there are sensitive human receptors located within 350 m of the Site boundary and within 50 m of the roads along which dust may be tracked out by construction vehicles.

5.2 There are no designated ecological sites located within 50 m of the Site boundary or roads along which dust may be tracked. Therefore, the assessment of dust deposition on ecological sites has been scoped out of this construction dust risk assessment.

Further Assessment

Dust Emission Magnitude

5.3 The dust emission magnitude relating to demolition, earthworks and construction activities and as a result of trackout have been determined based on the GLA and IAQM guidance (as set out in **Appendix C**).

5.4 There are not anticipated to be any demolition activities associated with the proposed development as the existing Site is currently a carpark, with no above-ground structures. The risk of dust emissions associated with demolition activities is, therefore, not considered further.

5.5 Proposed earthworks activities include the breaking up of existing hardstanding and the excavation for foundations of the proposed development; and could extend up to approximately 141 m^2 (the approximate area of the Site). The soil composition at the Site is deep, with a clayey loam to silty loam texture and a prequaternary marine / estuarine sand and silt subsoil. Grains are argillaceous[9] in

[9] Typical particle size of < 0.06 mm.

size (UK Soil Observatory, 2023). As such the soil composition is considered to have the potential to be moderately dusty. Based on the above, the dust emission magnitude associated with the earthwork activities is considered to be 'small'.

5.6 The proposed development will involve the construction of a 4 no. storey residential block, with an estimated total building volume of <25,000 m^3. The dust emission magnitude associated with construction activities is therefore considered to be 'small'.

5.7 The peak number of HDV movements exiting the Site which may track material onto roads is anticipated to be <10 per day. The dust emission magnitude associated with trackout activities is therefore considered to be 'small'.

Area Sensitivity

5.8 The sensitivity of the area to dust soiling and human health impacts has been assessed based on the criteria shown in **Appendix C**.

5.9 Residential properties and car showrooms are considered to be of 'high' sensitivity to dust soiling impacts, whilst commercial properties and parks are considered to be of 'medium' sensitivity. There is one car showroom and one park located within 20 m of the Site boundary and between 1 to 10 residential units located within 50 m of the Site boundary. The sensitivity of the area surrounding the Site to dust soiling impacts is therefore considered to be 'medium'.

5.10 The guidance states that trackout can occur on roads up to 50 m from 'small' sized sites (i.e. the proposed development Site). Construction vehicles are anticipated to travel either northeast or southwest along Camden Road before dispersing onto the wider road network, therefore, the assumption has been made that dust and mud may be tracked up to 50 m along these sections of road from the Site exit. There are estimated to be between 10 and 100 residential properties, between 1 and 10 commercial properties, one park and one leisure facility located within 20 m of roads which may be subject to trackout. The sensitivity to dust soiling impacts relating to trackout is therefore considered to be 'high'.

5.11 Residential properties are also considered to be of 'high' sensitivity in terms of human health impacts, whilst commercial properties are considered to be of 'medium' sensitivity and parks considered to be of 'low' sensitivity. For the purposes of the construction dust risk assessment, the assumption has been made

that annual mean baseline concentrations of PM_{10} within the study area are comparable to the highest of the modelled 'current'[6] baseline concentrations at the Site (i.e. 20 µg/m^3). Taking into account the assumed baseline PM_{10} concentrations and the number of sensitive properties located in close proximity of the Site boundary (see **Paragraph 5.9**) and roads where trackout may occur (see in **Paragraph 5.10**), the sensitivity of the surrounding area to human health impacts is, therefore, considered to be 'low' for both on-site and trackout activities.

Risk of Impacts

5.12 The risk of construction dust impacts, without mitigation, has been assessed based on the tables provided in **Appendix C** and the identified risks are shown in **Table 5-1**.

Table 5-1: Risk of Construction Dust Impacts Without Mitigation

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low
Human Health	Negligible	Negligible	Negligible

5.13 Overall, taking into consideration the risks set out in **Table 5-1**, appropriate mitigation measures corresponding to a 'low' risk site are required. The recommended list of mitigation measures is set out in **Section 6.0**.

5.14 The IAQM recommends that no judgement of the significance of construction dust effects should be made without taking mitigation into account. This is due to the fact that mitigation measures are assumed to be secured by planning conditions and legal requirements as well as construction codes of conduct. Following implementation of the recommended mitigation (as set out in **Section 6.0**), residual effects will be 'not significant'.

Construction and Operational Road Traffic Impacts

Human Health

5.15 The proposed development is anticipated to generate <100 total AADT (and <25 HDV AADT) during the construction and operational phase respectively. Therefore, the volume of construction and operational traffic falls below the relevant EPUK/IAQM screening criteria (see **Paragraphs 3.10** and **3.11**).

5.16 Additionally, it should also be taken into consideration that any impacts associated with the construction phase will be temporary in nature, with the construction phase anticipated to have a maximum duration of up to two years.

5.17 On the basis of the above, it is possible to screen out the overall effect of construction and operational traffic on nearby existing sensitive human receptors as being 'not significant' without the need for a detailed assessment.

Ecology

5.18 The Rochester Terrace Gardens, London's Canals and St Martin's Gardens SINCs are located within 200 m of roads along which construction and operational traffic is anticipated to travel.

5.19 Isolated data on committed development traffic is not currently available, therefore, it is not possible to compare combined proposed development and committed development traffic with the relevant screening criteria (see **Paragraph 3.13**). However, the proposed development is anticipated to generate <50 total AADT (and <10 HDV AADT) during the construction and operational phases respectively based on the size of the scheme. As such, volumes of construction and operational traffic are anticipated to fall below the relevant screening criteria (see **Paragraph 3.14**).

5.20 Furthermore, as described in **Paragraph 5.16**, it should also be noted that the construction phase will be temporary (with an anticipated maximum duration of up to two years).

5.21 On the basis of the above, it is possible to screen out the overall effect of construction and operational traffic on the nearby designated ecological sites as being 'not significant'.

Site Suitability

Screening Assessment

5.22 The proposed development will introduce new areas of sensitive exposure which are sensitive to the long-term and short-term NO_2, PM_{10} and $PM_{2.5}$ objectives (i.e. the proposed residences). These sensitive introduced receptors are located within the 'Camden AQMA' and in close proximity to a nearby emissions source (i.e.

Camden Road (A503)). As such, it is not possible to screen out the potential for significant effects and a detailed assessment has therefore been undertaken.

5.23 Sensitive locations within the proposed development are located <30 m from nearby railway lines and background annual mean concentrations of NO_2 within the Site are predicted to be >25 µg/m^3 in 2021 (see **Table 4-2**). However, these railway lines are not identified by the LAQM.TG(22) as having a heavy traffic of diesel passenger trains. As such, according to the screening criteria set out in LAQM.TG(22) (see **Paragraph 3.17**), it is possible to screen out the potential risk of exceeding the annual mean NO_2 objective as a result of emissions associated with moving locomotives.

Detailed Assessment

5.24 Predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ in 2021 at modelled receptor locations (as identified in **Table 3-1** and **Figure 3-1**) are presented in **Table 5-2**.

Table 5-2: Predicted Annual Mean Concentrations Within the Proposed Development in 2021 (µg/m³)

Receptor	Height	NO_2	PM_{10}	$PM_{2.5}$
P1	4.45	33	20	13
	7.4	33	20	13
	10.35	32	20	13
P2	4.45	33	20	13
	7.4	33	20	13
	10.35	32	20	13
P3	4.45	33	20	13
	7.4	32	20	13
	10.35	32	20	13
P4	4.45	33	20	13
	7.4	32	20	13
	10.35	31	20	13
P5	1.5	29	19	12
	4.45	29	19	12
	7.4	29	19	12
	10.35	29	19	12
P6	1.5	29	19	12
	4.45	29	19	12
	7.4	29	19	12
	10.35	29	19	12
Objectives		**40**	**40**	**20**

Predicted concentrations are rounded to zero decimal places taking into consideration the level of accuracy of the model and data sources.

5.25 Predicted annual mean concentrations of NO_2 in 2021 are below the objective at receptors P1 to P4 at all heights, and well below the objective at receptors P5 and P6 at all modelled heights. Predicted annual mean concentrations of PM_{10} and $PM_{2.5}$ in 2021 are all well below the annual mean objectives at all receptors.

5.26 Furthermore, predicted annual mean concentrations of NO_2 and PM_{10} fall below 60 µg/m³ and 32 µg/m³ respectively at all receptors, indicating that exceedances of the short-term NO_2 and PM_{10} objectives are not likely to occur at these locations.

5.27 The predicted concentrations are slightly above the new target annual mean $PM_{2.5}$ concentration value (UK Government, 2023) at all receptors. However, it should be noted that the future annual mean $PM_{2.5}$ target value will not be applicable until 2040; i.e. 19 years after the (2021) concentrations considered by this AQA. As such, taking into consideration the expected reduction in vehicle emissions and background concentrations over the coming decade, as well as measures expected

to be introduced by government in response to the newly adopted legislation, it is reasonable to assume that $PM_{2.5}$ concentrations will be considerably lower than those predicted (**Table 5-2**) by 2040.

5.28 Based on the predicted concentrations of pollutants in relation to the relevant objectives, it is considered that future residents of the proposed development will experience acceptable air quality and, therefore, that the Site is suitable for the proposed end-use.

5.29 Comparison between predicted annual mean pollutant concentrations and the WHO limits is presented separately in **Appendix F.**

Air Quality Neutral Calculations

5.30 Air quality neutral calculations have been carried out following the methodology set out in the 'London Plan Guidance; Air Quality Neutral' (GLA, 2023).

Building Emissions

5.31 The guidance states that "*where minor developments include new heating systems, they can be assumed to meet the BEB in any of the following instances: … the new heating system includes one or more individual gas boilers with NOx emissions rated at less than 40 mg/kW…"* (GLA, 2023). As such, on the basis that the proposed development will comprise individual "low-NO_X emission gas boilers" (see **Paragraph 1.7**), the proposed development can be considered to be at least 'air quality neutral' in terms of building emissions.

Transport Emissions

5.32 The guidance states that "*where … developments meet the definition of 'car-free', they can be assumed to meet the TEB [(Transport Emissions Benchmark)]…*" (GLA, 2023) and therefore can be assumed to be at least 'air quality neutral' in terms of transport emissions. As such, on the basis that the proposed development will be 'car-free', the proposed development can be considered to be at least 'air quality neutral'.

6.0 MITIGATION

Embedded Mitigation

6.1 The proposed development will be 'car-free' and is expected to provide on-site cycle parking in accordance with the London Plan standards (Mayor of London, 2021).

Construction Dust

6.2 The following standard mitigation measures have been identified as being appropriate for a 'low' risk site. This is based on the recommendations within the GLA's SPG on 'The Control of Dust and Emissions during Construction and Demolition' (GLA, 2014).

6.3 It is recommended that an Air Quality and Dust Management Plan (AQDMP) should be submitted to LBC prior to works commencing on the Site. An AQDMP is not directly required by the GLA's SPG based on the outcome of the construction dust risk assessment, however this has been recommended as a best-practice measure based on the CPG (LBC, 2022).

Site Management

- Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the Site boundary;
- Display the head or regional office contact information;
- Record and respond to all dust and air quality pollutant emissions complaints;
- Make a complaints log available to the local authority when asked;
- Carry out regular Site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked;
- Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high

potential to produce dust are being carried out and during prolonged dry or windy conditions; and

- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on- or off- site, and the action taken to resolve the situation in the log book.

Preparing and maintaining the site

- Plan site layout: machinery and dust causing activities should be located away from receptors;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on Site;
- Fully enclose Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period;
- Avoid Site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods; and
- Remove materials from Site as soon as possible.

Operating vehicle/machinery and sustainable travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone (LEZ);
- Ensure all non-road mobile machinery (NRMM) comply with the standards set within the GLA's SPG;
- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible;
- Impose and signpost a maximum-speed-limit of 10 mph on any surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided,

subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate); and

- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Operations

- Only use cutting, grinding or sawing equipment fitted, or in conjunction, with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the Site for effective dust/particulate matter mitigation (using recycled water where possible);
- Use enclosed chutes, conveyors and covered skips; and
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Waste Management

- Reuse and recycle waste to reduce dust from waste materials; and
- Avoid bonfires and burning of waste materials.

Construction

- Avoid scabbling (roughening of concrete surfaces) if possible; and
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Trackout

- Regularly use a water-assisted dust sweeper on the access and local roads, to remove, as necessary, to remove any material tracked out of the site;
- Avoid dry sweeping of large areas;

- Ensure vehicles entering and leaving the Site are securely covered to prevent escape of materials during transport; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable).

6.4 Should the proposed development undergo construction at the same time as any other nearby development, there is a risk of increased impacts at off-site receptors due to the combined dust emission. However, it is expected that other construction sites within close proximity to the Site would adhere to the required level of mitigation and good site practice as set out within the GLA's SPG (GLA, 2014). Liaison with other construction sites within 500 m is encouraged to ensure cumulative impacts are minimised. This measure has been included as a conservative measure based on the CPG (LBC, 2022).

Road Traffic Impacts

6.5 The overall effects, without mitigation, of construction and operational traffic generated by the proposed development on existing human and ecological receptors in the study area will be 'not significant'. Therefore, no further mitigation measures are considered to be necessary.

Site Suitability

6.6 Baseline concentrations of pollutants at sensitive locations within the proposed development Site in 2021 are predicted to be below the relevant objectives. Therefore, air quality for future residents of the proposed development is considered to be acceptable and no mitigation is recommended as being necessary.

Air Quality Neutral

6.7 The proposed development is considered to be better than 'air quality neutral' in terms of both building and transport emissions. Therefore, no additional mitigation is considered to be necessary.

7.0 CONCLUSIONS

7.1 The potential air quality impacts associated with the proposed mixed-use development at 139-147 Camden Road in LBC have been assessed.

7.2 There is the potential for dust and PM_{10} impacts during the construction phase. However, with the proposed mitigation measures in place, the overall residual effect will be 'not significant'.

7.3 The impacts of construction and operational traffic generation associated with the proposed development on nearby existing human and ecological receptors has been considered and volumes of traffic will fall below the relevant screening criteria. As such, the overall effect of development traffic on nearby existing human and ecological receptors will be 'not significant'.

7.4 The impact of local air quality on future residents of the proposed development has been considered, with modelling of pollutant concentrations having been undertaken at worst-case sensitive locations within the proposed development. Concentrations of pollutants within the proposed development are predicted to be below the relevant objectives. As such, it is judged that future residents of the proposed development will experience acceptable air quality and that the Site is suitable for its proposed end-use without mitigation.

7.5 The development is considered to be better than 'air quality neutral' in terms of both building and transport emissions.

7.6 Overall, it is concluded that there are no air quality constraints to the proposed development which is in accordance with regional and national policy and guidance.

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Appendix A Glossary

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
ACE	Ardent Consulting Engineers
ADMS	Air Dispersion Modelling System
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQDMP	Air Quality Dust Management Plan
AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
BEB	Building Emission Benchmark
BST	British Summer Time
CPG	Camden Planning Guidance
CROW Act	Countryside and Rights of Way Act
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
Diffusion Tube	A passive sampler used for collecting NO_2 in the air
DMP	Dust Management Plan
EC	European Commission
EEA	European Environment Agency
EEC	European Economic Community
EFT	Emission Factor Toolkit
EPUK	Environmental Protection UK
GIA	Gross Internal Area
GLA	Greater London Authority
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes, includes Heavy Goods Vehicles and buses
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBC	London Borough of Camden
LDV	Light Duty Vehicle; a vehicle with a gross vehicle weight equal to or less than 3.5 tonnes, includes Light Goods Vehicles, cars and motorbikes
LEZ	Low Emission Zone
LGV	Light Goods Vehicle
LLAQM	London Local Air Quality Management
NAEI	National Atmospheric Emissions Inventory
NAQO	National Air Quality Objective as set out in Air Quality Strategy and the Air Quality Regulations
NH_3	Ammonia
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides, generally considered to be nitric oxide and NO_2. The main source is from combustion of fossil fuels, including petrol and diesel used in road vehicles and natural gas used in gas-fired boilers.

Abbreviations	Meaning
NPPF	National Planning Policy Framework
NRMM	Non-road mobile machinery
PCM	Pollution Climate Mapping
PM_{10} or $PM_{2.5}$	Small airborne particles less than 10/2.5 µg in diameter
PPG	Planning Practice Guidance
Receptor	A location where the effects of pollution may occur
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
TEB	Transport Emission Benchmark
TEMPro	Trip End Model Presentation Programme
TfL	Transport for London
ULEV	Ultra-Low Emission Vehicle
ULEZ	Ultra-Low Emission Zone
WHO	World Health Organisation

Appendix B Air Quality Neutral Benchmarks

B1 'London Plan Guidance; Air Quality Neutral'

Building Emissions

B1.1 **Table B.1** shows the benchmark emissions rates set out within the 'London Plan Guidance; Air Quality Neutral' (GLA, 2023) based on the type of the type of technology used for various types of development class[10]. Benchmark emissions rates are based on achievable emission rates for the type of technology used.

Table B.1: Benchmark Emissions Rates (g NO_X/m^2/annum)

Land Use	Individual Gas Boilers	Gas Boiler Network	CHP + Gas Boiler Network	Heat Pumps + Gas Boiler Network
Residential	3.5	5.7	7.8	5.7
Retail	0.53	0.97	4.31	0.97
Restaurant / bars	1.76	3.23	14.34	3.23
Offices	1.43	2.62	11.68	2.62
Industrial	1.07	1.95	8.73	1.95
Storage and distribution	0.55	1.01	4.50	1.01
Hotel	9.47	15.42	38.16	15.42
Care homes and hospitals	9.15	14.90	36.86	14.90
Schools, nurseries, doctor's surgeries, other non-residential institutions	0.90	1.66	7.39	1.66
Assembly and leisure	2.62	4.84	21.53	4.84

[10] Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the separate use is not specified, or where use class E has been specified, the benchmark for retail should be used (GLA, 2023).

Transport Emissions

B1.2 **Table B.2** shows the benchmark trips rates set out within the 'London Plan Guidance; Air Quality Neutral' (GLA, 2023) based on the number of residences / GIA for various types of development class[11]. Benchmark trip rates are based on data from TRAVL (Trip Rate Assessment Valid for London) and are defined for different land uses and different areas of London.

Table B.2: Benchmark Trip Rates (annual trips/dwelling or m²) [a]

Land Use	Central Activities Zone	Inner London	Outer London
Residential	68	114	447
Office / Light Industrial	2	1	16
Retail (Superstore)	39	73	216
Retail (Convenience)	18	139	274
Restaurant / Café	64	137	170
Drinking establishment	0.8	8	-
Hot food takeaway	-	32.4	590
Industrial	-	5.6	6.5
Storage and distribution	-	5.5	6.5
Hotel	1	1.4	6.9
Care home / hospital	-	1.1	19.5
Schools, nurseries, doctor's surgeries, other non-residential institutions	0.1	30.3	44.4
Assembly and leisure	3.6	10.5	47.2

[a] Annual trips / dwelling is applicable to proposed residential land use. Annual trips / m^2 is applicable to all other land uses.

[11] Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the separate use is not specified, or where use class E has been specified, the benchmark for office / light industrial should be used (GLA, 2023).

Appendix C London SPG Dust Assessment Approach

C1 Step 1: Screen the need for an assessment

C1.1 Step 1 is the screen the need for an assessment against the following criteria:

- 'Human receptor' within:
  - 350 m (50 m in London) of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- 'Ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

C1.2 Where there are no sensitive receptors within these distances, it can be concluded that the impact is negligible and no further assessment relating to construction dust impacts is required.

C2 Step 2: Assess the risk of dust impacts

C2.1 The risk of dust at sufficient quantum to cause annoyance/health/ecological impacts should be based on:

- The scale and nature of the works (potential dust emission magnitude) (**Table C.1**); and
- The sensitivity of the area to dust impacts based on the matrices shown in **Table C.2**, **Table C.3** and **Table C.4**.

C2.2 These factors are then combined to determine the risk of dust impacts without mitigation applied for each of the four activities (Demolition, Earthworks, Construction and Trackout) following the matrices shown in in **Table C.5**, **Table C.6** and **Table C.7**.

Table C.1: Potential Dust Emission Magnitude

Size	Definition
Demolition	
Small	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.
Medium	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level.
Large	Total building volume >50,000 m^3, potentially dusty construction material (e.g. Concrete), on-site crushing and screening, demolition activities >20 m above ground level.
Earthworks	
Small	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes earthworks during wetter months.
Medium	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.
Large	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height.
Construction	
Small	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Medium	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.
Large	Total building volume >100, 000 m^3, on site concrete batching, sandblasting.
Trackout	
Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.
Medium	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.

Table C.2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	<10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table C.3: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<350
High	>32 µg/m^3 [a]	>100	High	High	High	Low
		10-100	High	High	Medium	Low
		<10	High	Medium	Low	Low
	28-32 µg/m^3 [b]	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		<10	High	Medium	Low	Low
	24-28 µg/m^3 [c]	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		<10	Medium	Low	Low	Low
	<24 µg/m^3 [d]	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		<10	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low
	-	1-10	Medium	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table C.4: Sensitivity of the Area to Ecological Impacts

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

Table C.5: Risk of Impacts – Demolition

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

Table C.6: Risk of Impacts – Earthworks and Construction

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

Table C.7: Risk of Impacts – Trackout

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

C3 Step 3: Site-specific Mitigation

C3.1 Based on the outcome of Step 2, appropriate mitigation measures are recommended. The guidance includes a list of mitigation measures for Low, Medium and High Risk sites but final recommendations should be based on professional judgement and take into account particular site sensitivities and differences in risk for different activities or areas of the site. The mitigation recommended in the guidance are shown in **Table C.8**.

Table C.8: Mitigation Measures

Mitigation Measure	Low Risk	Medium Risk	High Risk
Site Management			
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
Develop and implement a Dust Management Plan (DMP).	D	H	H
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
Display the head or regional office contact information.	H	H	H
Record and respond to all dust and air quality pollutant emission complaints.	H	H	H
Make the complaints log available to the local authority when asked.	H	H	H
Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.	H	H	H
Increase the frequency of site inspections by those accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
Record any exceptional incidents that cause dust and air quality pollutant emissions, either on- or off- site, and the action taken to resolve the situation in the log book.	H	H	H
Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.	N	N	H

Mitigation Measure	Low Risk	Medium Risk	High Risk
Monitoring			
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.	D	D	H
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	N	H	H
Preparing and maintaining the site			
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	D	H	H
Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution.	N	D	D
Avoid site runoff of water or mud.	H	H	H
Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
Remove materials from site as soon as possible.	D	H	H
Cover, seed or fence stockpiles to prevent wind whipping.	N	H	H
Carry out regular dust soiling checks of buildings within 100 m of site boundary and cleaning to be provided if necessary.	N	D	D
Provide showers and ensure a change of shoes and clothes are required before going off-site to reduce transport of dust.	N	N	D
Agree monitoring locations with the Local Authority.	N	H	H
Where possible, commence baseline monitoring at least three months before phase begins.	N	H	H
Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.	N	H	H
Operating vehicle/machinery and sustainable travel			
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable	H	H	H
Ensure all non-road mobile machinery (NRMM) comply with the standards set out within the SPG	H	H	H

Mitigation Measure	Low Risk	Medium Risk	High Risk
Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
Impose and signpost a maximum-speed-limit of 15 mph on surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	D	D	H
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	H	H	H
Operations			
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
Use enclosed chutes and conveyors and covered skips.	H	H	H
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H
Waste Management			
Avoid bonfires and burning of waste materials.	H	H	H
Reuse and recycle waste to reduce dust from waste materials.	H	H	H
Demolition			
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
Ensure water suppression is used during demolition operations.	H	H	H
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
Bag and remove any biological debris or damp down such material before demolition.	H	H	H
Earthworks			
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	N	D	H

Mitigation Measure	Low Risk	Medium Risk	High Risk
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil.	N	D	H
Only remove the cover in small areas during work and not all at once.	N	D	H
Construction			
Avoid scabbling (roughening of concrete surfaces) if possible	D	D	H
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	D	H	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	N	D	H
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D
Trackout			
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.	D	H	H
Avoid dry sweeping of large areas.	D	H	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	N	H	H
Access gates to be located at least 10 m from receptors where possible.	N	H	H
Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.	N	D	H

(H = Highly Recommended, D = Desirable and N = Not Recommended).

C4 Step 4: Determine Significant Effects

C4.1 Recommended mitigation measures should be sufficient to ensure that the impact is normally 'not significant'. There may at times be limitations to appropriate mitigation measures (such as a lack of water) and therefore, an

assessment should always be made based on the characteristic of each site and the surrounding area.

C5 Step 5: Dust Assessment Report

C5.1 The dust assessment report should include enough detail to ensure that the basis for the determination of emission magnitude and sensitivity of the area, and therefore the site risk, are clear. The required mitigation so also be set out within the report, along with a description of the mechanism that will ensure that the appropriate level of mitigation will be implemented (such as through a planning condition).London SPG Dust Assessment Approach

Appendix D Model Inputs and Results Processing

D1 Model Inputs and Results Processing Tools

Model Version	ADMS-Roads v5.0.1, January 2022
Street Canyons	The ADMS Advanced Street Canyon Module was used to represent the effect of reduced dispersion and recirculating pollutants in street canyons. The canyons are shown in **Appendix E**.
British Summer Time (BST)	Adjustment for BST was made within the model, based on the following dates and times: BST begins – 01:00 on 28/03/2021 BST ends – 02:00 on 31/10/2021
Emission Factor Toolkit (EFT)	v11.0, November 2021 **(Defra, 2021)**
Time Varying Emissions Factors	Based on Department for Transport (DfT) statistics, Table TRA0307: Motor Vehicle Traffic Distributed by Time of Day and Day of the Week on all roads, Great Britain: 2021.
Meteorological Data	2021 hourly meteorological data from London City met station has been used in the model. The wind rose is shown in **Figure D.1**.
Latitude	51.32°
Surface Roughness	A value of 1.5 for 'Large urban areas' was used to represent the modelled area. A value of 0.613 was used to represent the meteorological station site.

Minimum Monin-Obukhov Length	A value of 100 for 'Large conurbations >1 million' was used to represent the modelled area. A value of 24.368 was used to represent the meteorological station site.
Surface Albedo	A value of 0.23 (default) was used to represent the modelled area. A value of 0.182 was used to represent the meteorological station site.
NO_X to NO_2 Conversion	NO_X to NO_2 Calculator v8.1 **(Defra, 2020c)**
Background Maps	2018 reference year background maps **(Defra, 2020b)**

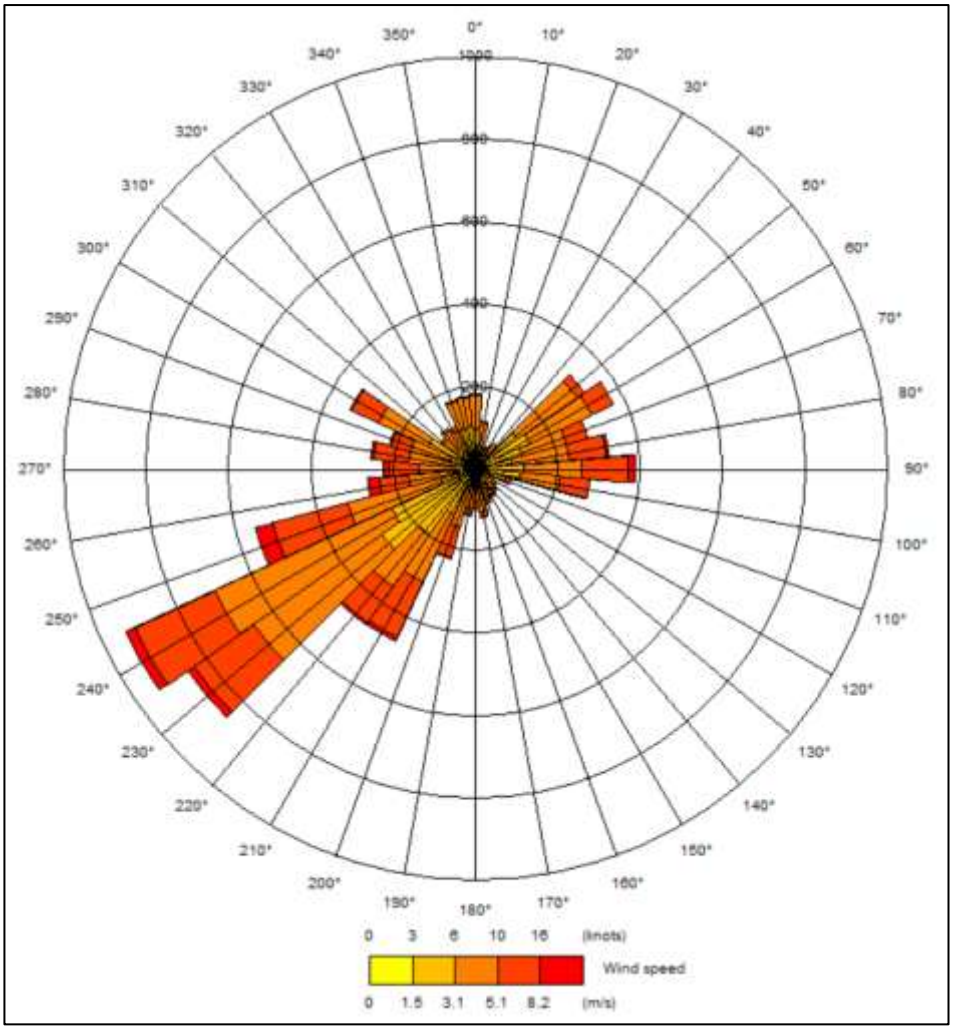

Figure D.1: 2021 London City Wind Rose

D2 Verification

Nitrogen Dioxide

D2.1 Most NO_2 is produced in the atmosphere by a reaction between nitric oxide (NO) and ozone. It is, therefore, most appropriate to verify the model in terms of primary pollutant emission of nitrogen oxides (NO_X = NO + NO_2). The model has been run to predict the annual mean road-NO_X contribution in 2021 at the SDT 92 diffusion tube monitoring site. Concentrations have been modelled at a height of 2.5 m.

D2.2 The choice of appropriate monitoring site for verification has been based on:

- Appropriateness of site (roadside rather than background sites, presence of additional emission sources etc.);
- Distance from study area;
- Availability of traffic data for modelling; and
- Data capture (diffusion tube monitoring site CA23 has 75% data capture in 2021).

D2.3 Annual mean background NO_2 concentrations at the CA23 monitoring site used for verification purposes are based on the measured NO_2 concentrations from the London Bloomsbury Urban Background AURN monitoring site (see **Paragraph 4.5**) and are presented in **Table D.1** below.

D2.4 Measured concentrations from the London Bloomsbury monitor are lower than the Defra background map concentrations for 2021 and as such are considered to be worst-case for the purpose of model verification.

Table D.1: Predicted Annual Mean Background Concentrations (µg/m³)

Monitoring Site	NO_2
CA23	27

Predicted concentrations are rounded as appropriate taking into consideration the level of accuracy of the data source. Unrounded values have been used in assessment calculations.

D2.5 'Measured' road-NO_X was calculated by subtracting calibrated background NO_2 from measured NO_2 within the NO_X from NO_2 calculator. The model output of

road-NO_X was then compared with this 'measured' road-NO_X, using the following calculation:

'Measured' road-NO_X (23.8 µg/m^3) / Modelled road-NO_X (23.5 µg/m^3) = NO_X verification factor (**1.01**[12]).

PM_{10} and $PM_{2.5}$

D2.6 There are no suitable PM_{10} and $PM_{2.5}$ located in close proximity to the proposed development Site. Therefore, the primary adjustment factor calculated for road-NO_X concentrations has been applied to the modelled road-PM_{10} and road-$PM_{2.5}$ concentrations.

[12] Based on unrounded values.

Appendix E Traffic Data and Road Network

Figure E.1: Modelled Road Network (inc. Avg. Speeds (kph) and Modelled Street Canyons); Site Area

Figure E.2: Modelled Road Network (inc. Avg. Speeds (kph) and Modelled Street Canyons); Verification Area

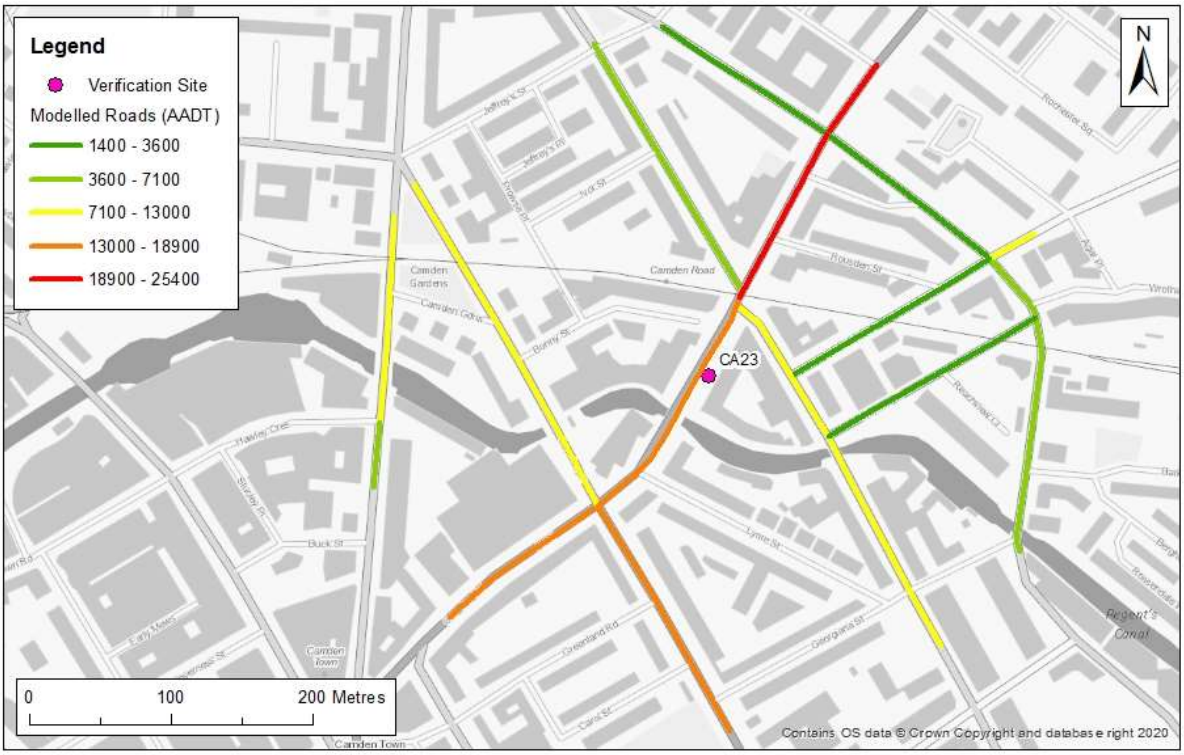

Figure E.3: Modelled AADT (2021 Baseline Scenario); Verification Area

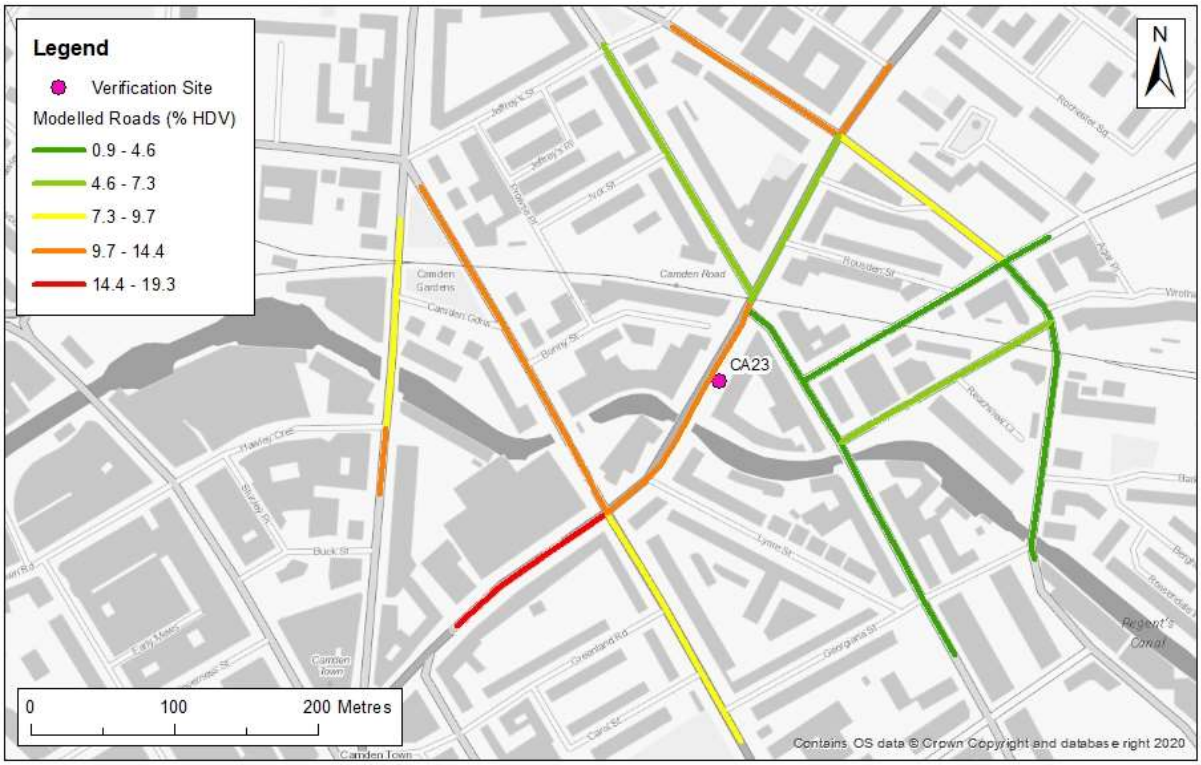

Figure E.4: Modelled %HDV (2021 Scenario); Verification Area

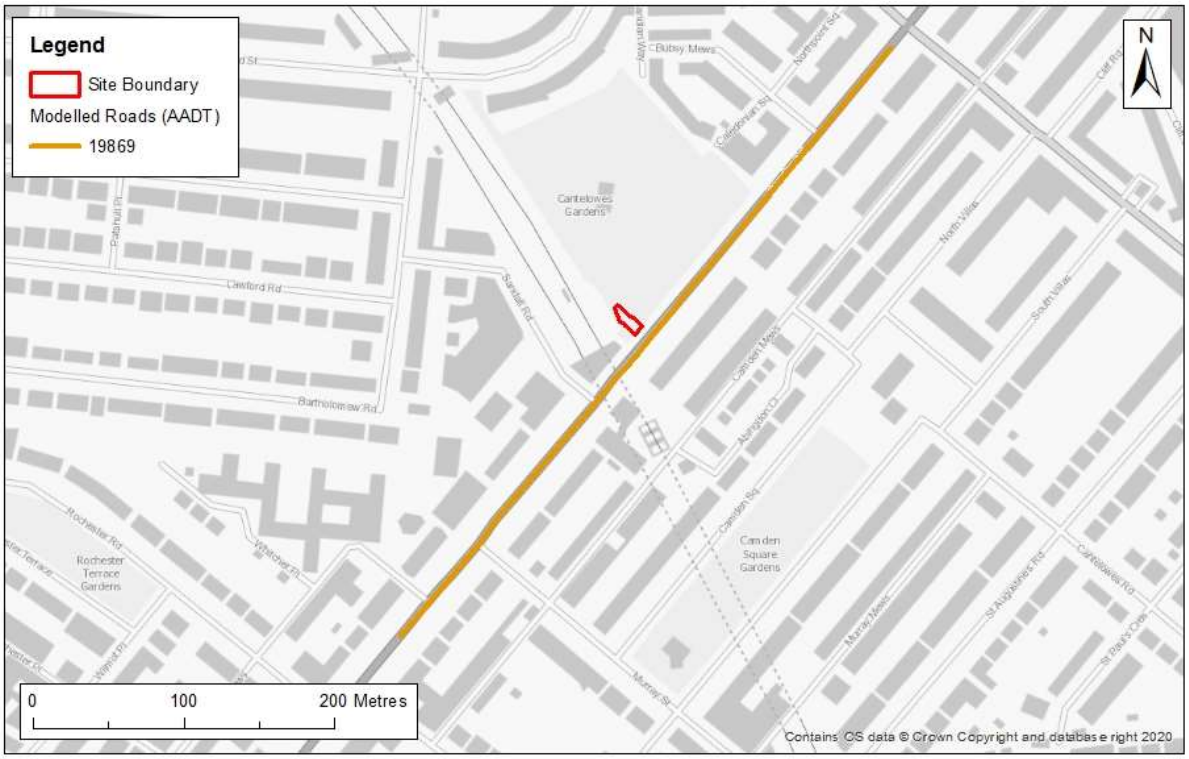

Figure E.5: Modelled AADT (2025 Scenario)

Figure E.6: Modelled %HDV (2025 Scenario)

Appendix F WHO Guideline Limits

F1 WHO Air Quality Guideline Limits (2005)

F1.1 LBC have adopted the WHO air quality guideline limits published in 2005 for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations which are shown in **Table 2-5 (WHO, 2005)**. It should be noted that new air quality guideline limits were published by the WHO in 2021 **(WHO, 2021)**, however these have not been adopted by LBC. The WHO air quality guideline limits are not statutory.

F1.2 The assessment of Site suitability and any subsequent mitigation recommendations are based on the comparison of predicted pollutant concentrations and the current statutory national air quality objectives (as presented in **Paragraphs 5.22 to 5.28**).

F1.3 Predicted annual mean concentrations of NO_2 in 2021 are below the adopted limit at receptors P1 to P4 at all modelled heights and well below the adopted limit at receptors P5 and P6 at all modelled heights.

F1.4 Predicted annual mean concentrations of PM_{10} are above the adopted limit at receptors P1 to P4 at all modelled heights but are below the adopted limit at receptors P5 and P6 at all modelled heights.

F1.5 Predicted annual mean concentrations of $PM_{2.5}$ are above the adopted limit at all receptors at all modelled heights. It should be noted however that background concentrations at the Site are above the adopted annual mean $PM_{2.5}$ limit, thus reducing the ability for the proposed development to meet the adopted limit.

F1.6 It should be noted that the predicted concentrations are based on worst-case assumptions including no future projection in EFT emission factors and background concentrations, as described in **Paragraph 3.32**. Therefore it is expected that pollutant concentrations are likely to reduce over time.

Table F.1: Predicted Annual Mean Concentrations Within the Proposed Development in 2021 (µg/m³)

Receptor	Height	NO_2	PM_{10}	$PM_{2.5}$
P1	4.45	33	**20**	**13**
	7.4	33	**20**	**13**
	10.35	32	**20**	**13**
P2	4.45	33	**20**	**13**
	7.4	33	**20**	**13**
	10.35	32	**20**	**13**
P3	4.45	33	**20**	**13**
	7.4	32	**20**	**13**
	10.35	32	**20**	**13**
P4	4.45	33	**20**	**13**
	7.4	32	**20**	**13**
	10.35	31	**20**	**13**
P5	1.5	29	19	**12**
	4.45	29	19	**12**
	7.4	29	19	**12**
	10.35	29	19	**12**
P6	1.5	29	19	**12**
	4.45	29	19	**12**
	7.4	29	19	**12**
	10.35	29	19	**12**
Objectives		**40**	**20**	**10**

Predicted concentrations are rounded to zero decimal places taking into consideration the level of accuracy of the model and data sources.
Exceedances of the annual mean WHO guideline limits are shown in **BOLD.**