



Air Quality Assessment: The Printworks, High Road West

August 2023



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management & assessment

Document Control

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Executive Summary

The air quality impacts associated with the proposed mixed-use, student accommodation-led development at 819-829 High Road in Tottenham have been assessed. The development is known as “The Printworks” and the proposals involve the demolition of some of the existing buildings and structures occupying the site, and the subsequent redevelopment of the site to provide a student accommodation-led development, with supporting commercial, business and service uses.

During the construction works, a range of best practice mitigation measures will be implemented to reduce dust emissions and the overall effect will be ‘not significant’; appropriate measures have been set out in this report, to be included in the Dust Management Plan for the works.

The proposed development will be ‘car-free’ and will not provide any car parking spaces, with the exception of one accessible parking space for blue-badge holders only. As such, there will be no significant effect upon local air quality with regards to development-generated traffic emissions.

The proposed development will utilise an all-electric energy strategy and will not include any back-up emergency diesel generators. As such, there will be no combustion plant and thus no point sources of emissions within the proposed development.

The suitability of the site for its proposed uses has also been considered. Pollutant concentrations will be below the relevant air quality objectives and air quality for future users and residents will thus be acceptable.

Overall, the construction and operational air quality effects of the proposed development are judged to be ‘not significant’.

The proposed development has also been shown to meet the London Plan’s requirement that new developments are at least ‘air quality neutral’.

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1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed mixed-use, student accommodation-led development at 819-829 High Road in Tottenham (the 'site'). The development is known as "The Printworks" and the description of the development is as follows:

"(i) Full planning application: Full planning application for the demolition of existing buildings and structures to the rear of 819-829 High Road; the demolition of 829 High Road; and redevelopment for purpose-built student accommodation (Sui Generis) and supporting flexible commercial, business and service uses (Class E), hard and soft landscaping, parking, and associated works. To include the change of use of 819-827 High Road to student accommodation (Sui Generis) and commercial, business and service (Class E) uses.

(ii) Listed building consent: Internal and external alterations to 819/821 High Road (Grade II), including reinstatement of hipped roof, demolition works to the rear, façade and related external works, internal alterations and associated works."

- 1.2 The site is located within the borough-wide Air Quality Management Area (AQMA) declared by the London Borough of Haringey (LBH) for exceedances of the annual mean nitrogen dioxide (NO₂) and 24-hour mean particulate matter (PM₁₀) objectives, predominantly as a result of road transport emissions. It also lies approximately 425 m south of one of the Greater London Authority's (GLA's) air quality Focus Areas; this being the 'A406 North Circular Edmonton A1010 and Fore Street A1010' Focus Area. These are locations with high levels of human exposure where the annual mean limit value for NO₂ is exceeded.
- 1.3 The proposed development will introduce new residential exposure into this area of potentially poor air quality, thus an assessment is required to determine the air quality conditions that future residents will experience.
- 1.4 The proposed development will be 'car-free' and will not provide any car parking spaces, with the exception of one accessible parking space for blue-badge holders only. As such, there will be no significant effect upon local air quality with regards to development-generated traffic emissions. Additionally, the proposed development will utilise an all-electric energy strategy and will not include any back-up emergency diesel generators. As such, there will be no combustion plant and thus no point sources of emissions within the proposed development.
- 1.5 The location and setting of the proposed development are shown in Figure 1, along with the nearby Focus Area.

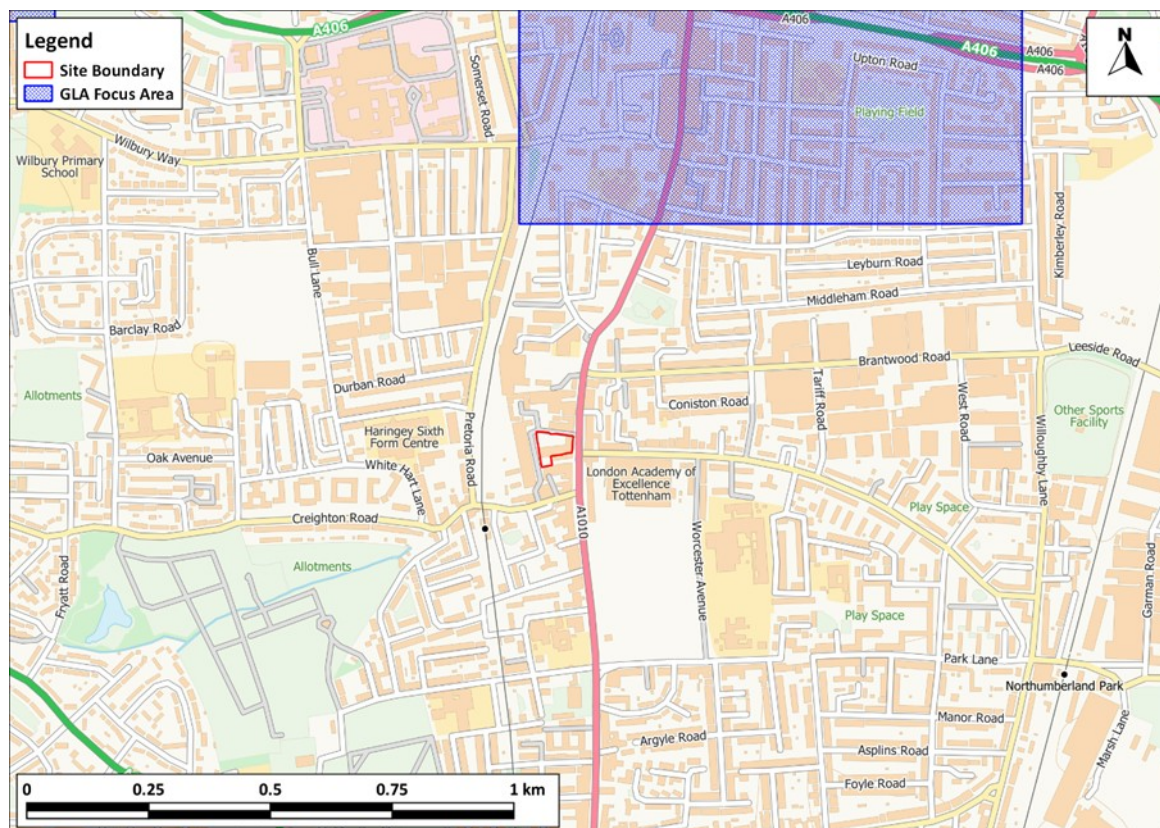


Figure 1: Proposed Development Setting in the Context of Air Quality

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- 1.6 The GLA's London Plan (2021) requires new developments to be air quality neutral. The air quality neutrality of the proposed development has been assessed following the methodology provided in the GLA's London Plan Guidance (Air Quality Neutral) (2023a).
- 1.7 The GLA has also released Supplementary Planning Guidance (SPG) on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014). The SPG outlines a risk assessment approach for construction dust assessment and helps determine the mitigation measures that will need to be applied. A construction dust assessment has been undertaken and the appropriate mitigation has been set out.
- 1.8 This report describes existing local air quality conditions, and qualitatively considers the air quality conditions at the proposed development once complete and operational in the anticipated opening year of 2026. The assessment of construction dust impacts focuses on the anticipated duration of the works. This report has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

- 2.1 All European legislation referred to in this report is written into UK law and remains in place.

Air Quality Strategy 2007

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an AQMA, and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Air Quality Strategy 2023

- 2.3 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023a) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

- 2.4 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

- 2.5 The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have

zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

- 2.6 The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. The Government has since announced that the phase-out date for the sale of new petrol and diesel cars and vans will be brought forward to 2030 and that all new cars and vans must be fully zero emission at the tailpipe from 2035. If these ambitions are realised then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades.

Environment Act 2021

- 2.7 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- 2.8 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Statutory Instrument 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in Paragraph 3.4.

Environmental Improvement Plan 2023

- 2.9 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018b). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.
- 2.10 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of PM_{2.5}. These targets, which are described in more detail in Paragraph 3.4, include the long-term targets in the Statutory Instrument described in Paragraph 2.8, and interim targets to be achieved by 2028.
- 2.11 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

National Policies

- 2.12 The National Planning Policy Framework (NPPF) (2021) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.

- 2.13 To prevent unacceptable risks from air pollution, Paragraph 174 of the NPPF states that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality”.

- 2.14 Paragraph 185 states:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development”.

- 2.15 More specifically on air quality, Paragraph 186 makes clear that:

“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan”.

- 2.16 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality. The PPG states that:

“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified”.

2.17 Regarding plan-making, the PPG states:

“It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality”.

2.18 The role of the local authorities through the LAQM regime is covered, with the PPG stating that a local authority Air Quality Action Plan *“identifies measures that will be introduced in pursuit of the objectives and can have implications for planning”*. In addition, the PPG makes clear that *“Odour and dust can also be a planning concern, for example, because of the effect on local amenity”*.

2.19 Regarding the need for an air quality assessment, the PPG states that:

“Whether air quality is relevant to a planning decision will depend on the proposed development and its location. 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”.

2.20 The PPG sets out the information that may be required in an air quality assessment, making clear that:

“Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific”.

2.21 The PPG also provides guidance on options for mitigating air quality impacts, as well as examples of the types of measures to be considered. It makes clear that:

“Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented”.

London-Specific Policies

2.22 The key London-specific policies are summarised below, with more detail provided, where required, in Appendix A1.

The London Plan

- 2.23 The London Plan (GLA, 2021) sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The key policy relating to air quality is Policy SI 1 on *Improving air quality*, Part B1 of which sets out three key requirements for developments:

“Development proposals should not:

- a) lead to further deterioration of existing poor air quality*
- b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
- c) create unacceptable risk of high levels of exposure to poor air quality”.*

- 2.24 The Policy then details how developments should meet these requirements, stating:

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

- a) development proposals must be at least Air Quality Neutral*
- b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures*
- c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1*
- d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure”.*

- 2.25 Part C of the Policy introduces the concept of Air Quality Positive for large-scale development, stating:

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

- 1) how proposals have considered ways to maximise benefits to local air quality, and*
- 2) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.”*

2.26 The proposed development is not large-scale development subject to an Environmental Impact Assessment, thus an Air Quality Positive statement is not required.

2.27 Regarding construction and demolition impacts, Part D of Policy SI 1 of the London Plan states:

“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”.

2.28 Part E of Policy SI 1 states the following regarding mitigation and offsetting of emissions:

“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”.

2.29 The explanatory text around Policy SI 1 of the London Plan states the following with regard to assessment criteria:

“The Mayor is committed to making air quality in London the best of any major world city, which means not only achieving compliance with legal limits for Nitrogen Dioxide as soon as possible and maintaining compliance where it is already achieved, but also achieving World Health Organisation targets for other pollutants such as Particulate Matter.

The aim of this policy is to ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. Where limit values are already met, or are predicted to be met at the time of completion, new developments must endeavour to maintain the best ambient air quality compatible with sustainable development principles.

Where this policy refers to ‘existing poor air quality’ this should be taken to include areas where legal limits for any pollutant, or World Health Organisation targets for Particulate Matter, are already exceeded and areas where current pollution levels are within 5 per cent of these limits”¹.

2.30 The London Plan includes a number of other relevant policies, which are detailed in Appendix A1.

¹ The London Plan was developed based on a World Health Organisation guideline for PM_{2.5} of 10 µg/m³ (see Paragraph 2.31).

London Environment Strategy

- 2.31 The London Environment Strategy was published in May 2018 (GLA, 2018a). The strategy considers air quality in Chapter 4; the Mayor's main objective is to create a "zero emission London by 2050". Policy 4.2.1 aims to "reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport". The strategy sets a target to achieve, by 2030, the guideline value for PM_{2.5} which was set by the World Health Organisation (WHO) in 2005. An implementation plan for the strategy has also been published which sets out what the Mayor will do between 2018 and 2023 to help achieve the ambitions in the strategy.

Mayor's Transport Strategy

- 2.32 The Mayor's Transport Strategy (GLA, 2018b) sets out the Mayor's policies and proposals to reshape transport in London over the next two decades. The Strategy focuses on reducing car dependency and increasing active sustainable travel, with the aim of improving air quality and creating healthier streets. It notes that development proposals should "be designed so that walking and cycling are the most appealing choices for getting around locally".

GLA SPG: The Control of Dust and Emissions During Construction and Demolition

- 2.33 The GLA's SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014) outlines a risk assessment based approach to considering the potential for dust generation from a construction site, and sets out what mitigation measures should be implemented to minimise the risk of construction dust impacts, dependent on the outcomes of the risk assessment. This guidance is largely based on the Institute of Air Quality Management's (IAQM's)² guidance (2016), and it states that "the latest version of the IAQM Guidance should be used".

Air Quality Focus Areas

- 2.34 The GLA has identified 160 air quality Focus Areas in London. These are locations that not only exceed the annual mean limit value for NO₂, but also have high levels of human exposure. They do not represent an exhaustive list of London's air quality hotspot locations, but locations where the GLA believes the problem to be most acute. They are also areas where the GLA considers there to be the most potential for air quality improvements and are, therefore, where the GLA and Transport for London (TfL) will focus actions to improve air quality. The proposed development is located approximately 425 m south of the 'A406 North Circular Edmonton A1010 and Fore Street A1010' air quality Focus Area.

² The IAQM is the professional body for air quality practitioners in the UK.

Local Policies

2.35 The LBH's Local Plan sets out a vision and key policies for development in the Borough up to 2026 and is made up of the Strategic Policies, Development Management Policies, Site Allocations and Tottenham Area Action Plan, alongside the London Plan.

2.36 The LBH has prepared a Development Management Development Plan Document (DPD) (LBH, 2017) and within this, 'Policy DM23 Environmental Protection' states with regards to air quality:

"A. All development proposals should consider air quality and be designed to:

a) Improve or mitigate the impact on air quality in the Borough; and

b) Improve or mitigate the impact on air quality for the occupiers of the building or users of the development.

B. Air quality assessments will be required for all major development and other development proposals, where appropriate.

C. Where necessary, adequate mitigate must be provided."

2.37 The LBH has started work on a new Local Plan, which is intended to run from 2022 to 2037. Consultation on a first steps document ran until February 2021.

2.38 The LBH has also adopted a Supplementary Planning Document (SPD) on Sustainable Design and Construction (LBH, 2013). Section 7 of the document relates to 'Pollution' and in relation to air quality states: *"Haringey is designated an Air Quality Management Area for the pollutants of nitrogen dioxide and respirable particulates. Any major development will require an Air Quality Assessment (AQA) to be submitted with the planning application. Developments should have regard to these pollutants at the initial design stage".*

2.39 Additionally, the LBH has published online guidance for 'Pollution Control – Local Air Quality' (LBH, 2023). With regard to development and planning this states:

"Haringey has been declared an Air Quality Management Area for the pollutants of nitrogen dioxide and PM₁₀ (respirable particles). Consideration of air quality, and in particular these two pollutants, must be given to the design and location of new developments. Air Quality is a material planning consideration and in some instances an Air Quality Assessment (AQA) will be required. For all developments adjacent to main roads of air pollution concern and air quality hotspot areas, consideration must be given to exposure reduction and mitigation against poor air quality."

Building Standards

2.40 Part F(1) of Schedule 1 of the Building Regulations 2010 as amended June 2022 (Ministry of Housing, Communities & Local Government, 2022) places a duty on building owners, or those

responsible for relevant building work³, to ensure adequate ventilation is provided to building occupants.

- 2.41 Approved Document F (HM Government, 2021a), which accompanies the Building Regulations, explains that care should be taken to minimise entry of external air pollutants. Specific steps should be taken to manage ventilation intakes where the building is near to a significant source of emissions, or if local ambient concentrations exceed values set in the Air Quality Standards Regulations 2010 (see Paragraph 3.9, later). These steps include maximising the distance between emission source and air intake, considering likely dispersion patterns, and considering the timing of pollution releases when designing the ventilation system.
- 2.42 Part S(1) of Schedule 1, and Regulation 44D, of the Building Regulations 2010 (Ministry of Housing, Communities & Local Government, 2022) define a requirement for the provision of infrastructure for charging electric vehicles. Precise requirements are explained further within Approved Document S (HM Government, 2021b) and depend on the overall number of parking spaces provided and the average financial cost of installation.
- 2.43 Compliance with the Building Regulations is not required for planning approval, but it is assumed that the Regulations will be complied with in the completed development.

Air Quality Action Plans

National Air Quality Plan

- 2.44 Defra has produced an Air Quality Plan to tackle roadside NO₂ concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018a) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ). There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

³ Building work is a legal term for work covered by the Building Regulations. With limited exemptions, the Regulations apply to all significant building work, including erecting or extending a building.

Local Air Quality Action Plan

2.45 The LBH declared a borough-wide AQMA for exceedances of the annual mean NO₂ objective and 24-hour mean PM₁₀ objective in 2001; the most recent Air Quality Action Plan covers the period of 2019 to 2024 (LBH, 2019). This Plan outlines the actions that will be taken to improve air quality in the Borough under the following seven broad topics:

1. *“Monitoring and other core statutory duties: maintaining monitoring networks is critical for understanding where pollution is most acute, and what measures are effective to reduce pollution. There are also several other very important statutory duties undertaken by boroughs, which form the basis of action to improve pollution;*
2. *Emissions from developments and buildings: emissions from buildings account for about 15% of the Nitrogen Oxides (NO_x) emissions across London so are important in affecting Nitrogen Dioxide (NO₂) concentrations;*
3. *Public health and awareness raising: increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution;*
4. *Delivery servicing and freight: vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO₂ emissions;*
5. *Borough fleet actions: our fleet includes light and heavy-duty diesel-fuelled vehicles such as minibuses and refuse collection vehicles with high primary NO₂ emissions. Tackling our own fleet means we will be leading by example;*
6. *Localised solutions: these seek to improve the environment of neighbourhoods through a combination of measures; and*
7. *Cleaner transport: road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric).*

3 Assessment Criteria

- 3.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 3.2 The UK-wide objectives for NO₂ and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019). The annual mean objectives for NO₂ and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for NO₂ applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.3 For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see Paragraph 3.9), originally set at 25 µg/m³ and currently set at 20 µg/m³.
- 3.4 Defra has also recently set two new targets, and two new interim targets, for PM_{2.5} concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by the end of 2040, with the interim target being a value of 12 µg/m³ by the start of 2028⁴. The second set of targets relate to reducing overall population exposure to PM_{2.5}. By the end of 2040, overall population exposure to PM_{2.5} should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.
- 3.5 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new

⁴ Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m³ would not exceed the 10 µg/m³ target.

development). Furthermore, as explained in Paragraph 2.11, all four new targets provide metrics against which central Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing PM_{2.5} concentrations against the targets.

- 3.6 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC, 2023) explained that the new PM_{2.5} targets will:

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

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

- 3.8 As explained in Paragraph 2.31, the GLA has set a target to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by 2030. This target was derived from an air quality guideline set by WHO in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy (GLA, 2018a) considers the 2005 guideline of 10 µg/m³. While there is no explicit requirement to assess against the GLA target of 10 µg/m³, it has nevertheless been included within this assessment.

- 3.9 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for NO₂, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010)⁵. The limit values for NO₂, PM₁₀ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

- 3.10 The relevant air quality criteria for this assessment are provided in Table 1.

⁵ As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

Table 1: Air Quality Criteria for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Value
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 times a year
	Annual Mean	40 µg/m ³
PM _{2.5}	Annual Mean	20 µg/m ³ ^a
	Annual Mean	10 µg/m ³ by 2030

^a There is no numerical PM_{2.5} objective for local authorities (see Paragraph 3.3). Convention is to assess against the UK limit value which is currently 20 µg/m³.

Construction Dust Criteria

- 3.11 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM (2016) has been used (the GLA's SPG (GLA, 2014) recommends that the assessment be based on the latest version of the IAQM guidance). Full details of this approach are provided in Appendix A2.

4 Assessment Approach

Existing Conditions

4.1 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

- industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2023c);
- local sources have been identified through examination of the LBH's Air Quality Review and Assessment reports;
- information on existing air quality has been obtained by collating the results of monitoring carried out by the LBH;
- information on existing air quality has also been obtained through examination of the London Atmospheric Emissions Inventory (LAEI) database produced by the GLA (2023b). These predicted concentrations cover the whole of the GLA area at 20 m grid resolution; and
- whether or not there are any exceedances of the annual mean limit value for NO₂ in the study area has been identified using the maps of roadside concentrations published by Defra (2020) (2023d), as well as from any nearby Automatic Urban and Rural Network (AURN) monitoring sites (which operate to the required data quality standards). These are the maps used by the UK Government, together with the AURN results, to identify and report exceedances of the limit value. The national maps of roadside PM₁₀ and PM_{2.5} concentrations (Defra, 2023d), which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

Construction Impacts

4.2 The construction dust assessment considers the potential for impacts within 350 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014), which is based on that provided by IAQM (2016). This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. Appendix A2 explains the approach in more detail.

Impacts of Road Traffic on Future Residents of the Proposed Development

- 4.3 The impacts of concentrations of NO₂, PM₁₀ and PM_{2.5} on new residents of the proposed development have been assessed qualitatively. The assessment considers air quality conditions within the site, taking account of local air quality monitoring data available from the LBH and the predicted concentrations provided in the GLA's LAEI.

Assessment of Significance

Construction Dust Significance

- 4.4 Guidance from IAQM (2016) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version of the guidance upon which the assessment methodology set out in the GLA guidance (2014) is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used). The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

'Air Quality Neutral'

- 4.5 The GLA's London Plan Guidance (Air Quality Neutral) (2023a) sets out guidance on how an 'air quality neutral' assessment should be undertaken. It also provides a methodology for calculating an offsetting payment if a development is not 'air quality neutral' and it is not possible to identify or agree appropriate and adequate mitigation. The guidance has been followed in this report.

5 Baseline Conditions

Relevant Features

- 5.1 The proposed development is located within Tottenham, adjacent to the A1010 High Road to the east, with a mixture of commercial and residential properties to the north and south, and industrial units and warehouses to the west.
- 5.2 The proposed development is located within a borough-wide AQMA and is located approximately 425 m to the south of the 'A406 North Circular Edmonton A1010 and Fore Street A1010' air quality Focus Area, as highlighted in Figure 1.

Industrial Sources

- 5.3 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local Air Quality Monitoring

- 5.4 The LBH operates three automatic monitoring stations within its area, including the roadside site at 639 High Road⁶ which is approximately 750 m to the south of the proposed development. The LBH also operates a number of NO₂ monitoring sites using diffusion tubes prepared and analysed by Lambeth Scientific Services (using the 50% TEA in acetone method). These include two diffusion tubes within 1 km of the proposed development, which were installed in 2021.
- 5.5 Available annual mean NO₂ concentrations for the years 2015 to 2022 are summarised in Table 2, and the monitoring locations are shown in Figure 2. Data for years to 2021 have been taken from the LBH's 2021 Annual Status Report (LBH, 2022), whilst automatic monitoring data for 2022 data have been downloaded from the London Air website (Imperial College, 2023).
- 5.6 Whilst results for 2020 and 2021 are presented for completeness, they are not relied upon since reduced activity brought about by the Covid-19 pandemic has reduced measured pollutant concentrations.

⁶ UK-AIR ID: UKA00260, EU Site ID: GB0637A.

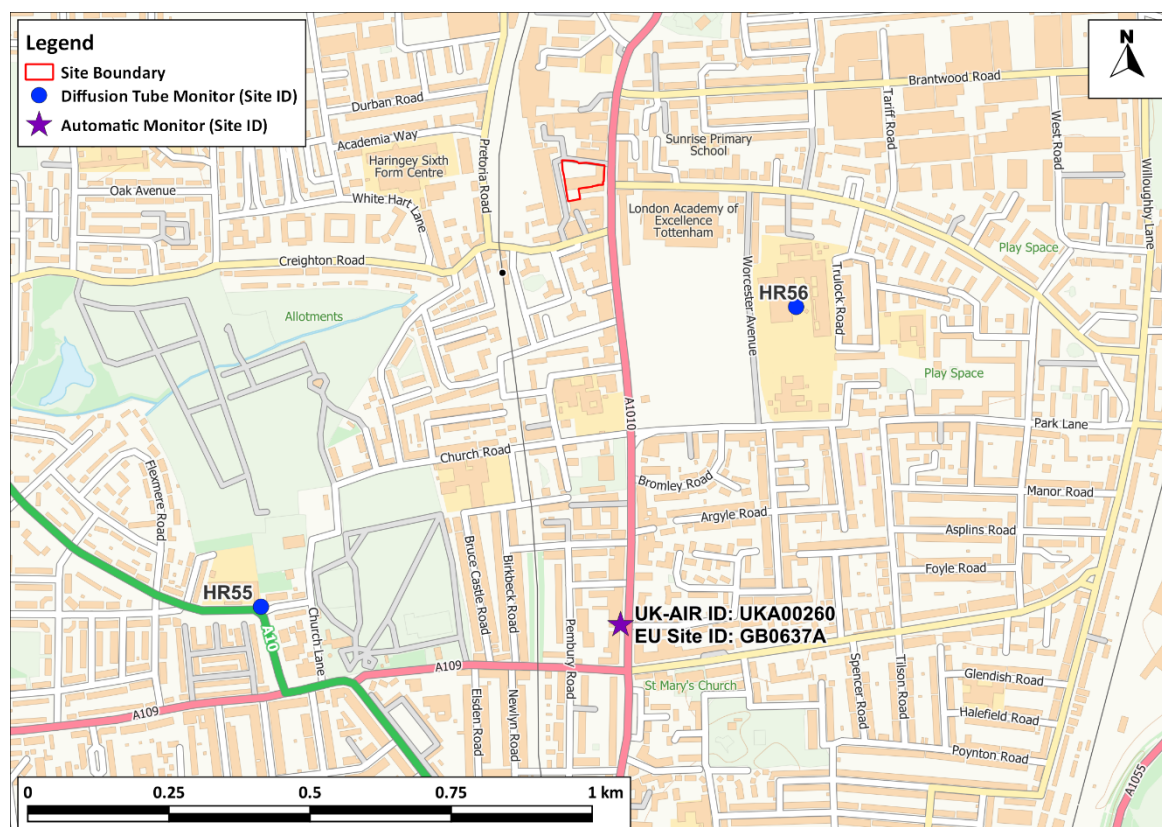
Table 2: Summary of Annual Mean NO₂ Monitoring (2015 – 2022) (µg/m³)^a

Site ID	Site Type	Location	2015	2016	2017	2018	2019	2020	2021	2022
UK-AIR ID: UKA00260 EU Site ID: GB1024A	Roadside - Automatic	Haringey Roadside (639 High Road)	40	43	40	39	37	33	32	30
HR55	Roadside	Risley Avenue	-	-	-	-	-	-	31.2	N/A
HR56	Roadside	Dukes Aldridge Academy	-	-	-	-	-	-	22.5	N/A
Objective			40							

N/A = data not yet available

^a Exceedances of the objective are shown in **bold**. Data presented to the same level of accuracy as the 2021 ASR (LBH, 2022).

- 5.7 Annual mean concentrations have been below the objective since 2018, and there has been an overall reduction in concentrations since 2016 at the automatic monitor. The 1-hour mean objective has not been exceeded at the automatic monitor in recent years (LBH, 2022).

**Figure 2: Monitoring Locations**

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- 5.8 The automatic monitor located at 639 High Road does not measure PM₁₀ or PM_{2.5} concentrations. In 2021, the LBH commenced monitoring of PM₁₀ and PM_{2.5} concentrations at a roadside site located approximately 3 km to the southwest of the proposed development (site ID: HG005). Data are only available for 2021 and data capture is less than 75%; as such, the data should be treated with caution. Notwithstanding, measured concentrations were well below the relevant objectives, and the measured annual mean PM_{2.5} concentration (of 10 µg/m³) met the GLA target value.

LAEI Concentration Maps

- 5.9 In addition to the locally measured concentrations discussed above, the maximum pollutant concentrations predicted across the site in 2019 and 2025 (years for which data are available) have been determined from the London Atmospheric Emissions Inventory (LAEI) database produced by the GLA (2023b).

Table 3: Maximum Predicted Annual Mean Concentrations (µg/m³)

Pollutant	2019	2025
NO ₂	30.5	20.6
PM ₁₀	17.1	16.7
PM _{2.5}	11.0	9.8

- 5.10 These predicted concentrations are below the respective objectives and will remain below the objectives by the time the proposed development is operational. By 2025, the predicted maximum PM_{2.5} concentration is below the GLA target; the GLA's aspiration is to meet the target of 10 µg/m³ by 2030.

Exceedances of Limit Value

- 5.11 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean NO₂ limit value (Defra, 2023e). Furthermore, Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2023d), which are used to identify and report exceedances of the limit value, identify exceedances of this limit value in 2019 along many roads in London. The Greater London Urban Area has thus been reported as exceeding the limit value for annual mean NO₂ concentrations.
- 5.12 These roads do not, however, include the A1010 High Road adjacent to the proposed development; Defra's predicted concentrations for 2019 and 2026 (the anticipated year of first occupation of the proposed development) (Defra, 2020) do not identify any exceedances of the limit value in the immediate vicinity of the site. This is consistent with the measurements at the Haringey AURN monitor (Table 2), at which measured annual mean concentrations have been below the limit value since 2018. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.

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

6 Construction Phase Impact Assessment

Construction Traffic

- 6.1 Typical traffic volumes generated by the site during the construction works will be below the relevant screening criteria of 25 Annual Average Daily Traffic (AADT) flows for heavy vehicles and 100 AADT for light vehicles, recommended by EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017). It is, therefore, not considered necessary to assess the impacts of traffic emissions during the construction phase and it can be concluded that the proposed development will not have a significant impact on local roadside air quality as a result of construction traffic emissions.

On-Site Exhaust Emissions

- 6.2 The IAQM guidance (2016) states:

“Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur”.

- 6.3 The proposed development is relatively small, thus the number of NRMM able to operate at any one time will be limited. As the proposed development is located in an opportunity area, all NRMM operating within this area need to meet stage IV emissions standards. Additionally, there will be no idling when vehicles are not in use, and machinery will be located away from sensitive receptors as far as possible. With these standards and measures in place, it is judged that there will be no risk of significant effects at existing receptors as a result of on-site machinery emissions.

Construction Dust and Particulate Matter Emissions

- 6.4 The construction works will give rise to a risk of dust impacts during demolition, earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see Appendix A2), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition

- 6.5 There will be a requirement to demolish some of the existing buildings occupying the site, with an approximate total volume of less than 20,000 m³. The method of demolition has not yet been decided. Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for demolition is considered to be *small*.

Earthworks

- 6.6 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website (British Geological Survey, 2023), as set out in Table 4. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table 4: Summary of Soil Characteristics

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

^a grain size 0.06 – 2.0 mm.

^b grain size > 2.0 mm.

^c a loam is composed mostly of sand and silt.

- 6.7 The site covers approximately 3,600 m² and most of this will be subject to earthworks, involving removal of the foundations of the demolished buildings and breaking up of a paved area. The duration of the earthworks is currently unknown, however, dust will arise mainly from vehicles travelling over unpaved ground and from the handling of dusty materials (such as dry soil). Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for earthworks is considered to be *medium*.

Construction

- 6.8 Construction will involve the erection of a new building comprising of brick clad on a concrete frame, with a total volume of approximately 28,000 m³. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, and from the cutting of concrete. The duration of the construction works is currently unknown. Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for construction is considered to be *medium*.

Trackout

- 6.9 The number of heavy vehicles accessing the site, which may track out dust and dirt, is currently unknown, but given the relatively small size of the site, it is likely that there will be a maximum of between 10-20 outward heavy vehicle movements per day occurring during peak works (concreting and groundworks). Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for trackout is considered to be *medium*.
- 6.10 Table 5 summarises the dust emission magnitude for the proposed development.

Table 5: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Medium
Construction	Medium
Trackout	Medium

Sensitivity of the Area

- 6.11 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM₁₀ concentrations.
- 6.12 The IAQM guidance, upon which the GLA's guidance is based, explains that residential properties are 'high' sensitivity receptors to dust soiling and human health effects, whilst places of work are 'medium' sensitivity receptors (Table A2.2 in Appendix A2). There are more than 10 residential properties and multiple places of work within 20 m of the site (see Figure 3).

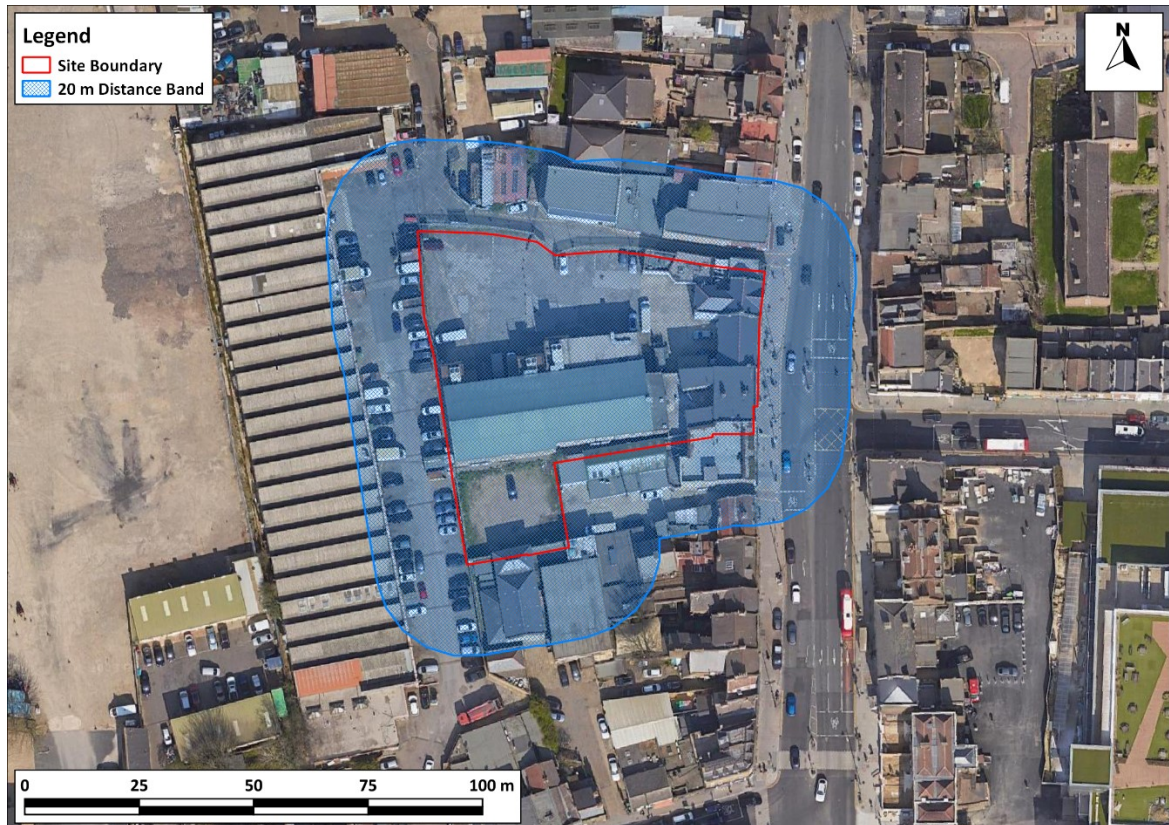


Figure 3: 20 m Distance Band around Site Boundary

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

- 6.13 Table 5 shows that the dust emission magnitude for trackout is *medium* and Table A2.3 in Appendix A2 thus explains that there is a risk of material being tracked 200 m from the site exit. It has been assumed that all construction traffic will utilise the A1010 High Road. There are more than 10 residential properties and multiple places of work within 20 m of the roads along which material could be tracked (see Figure 4).

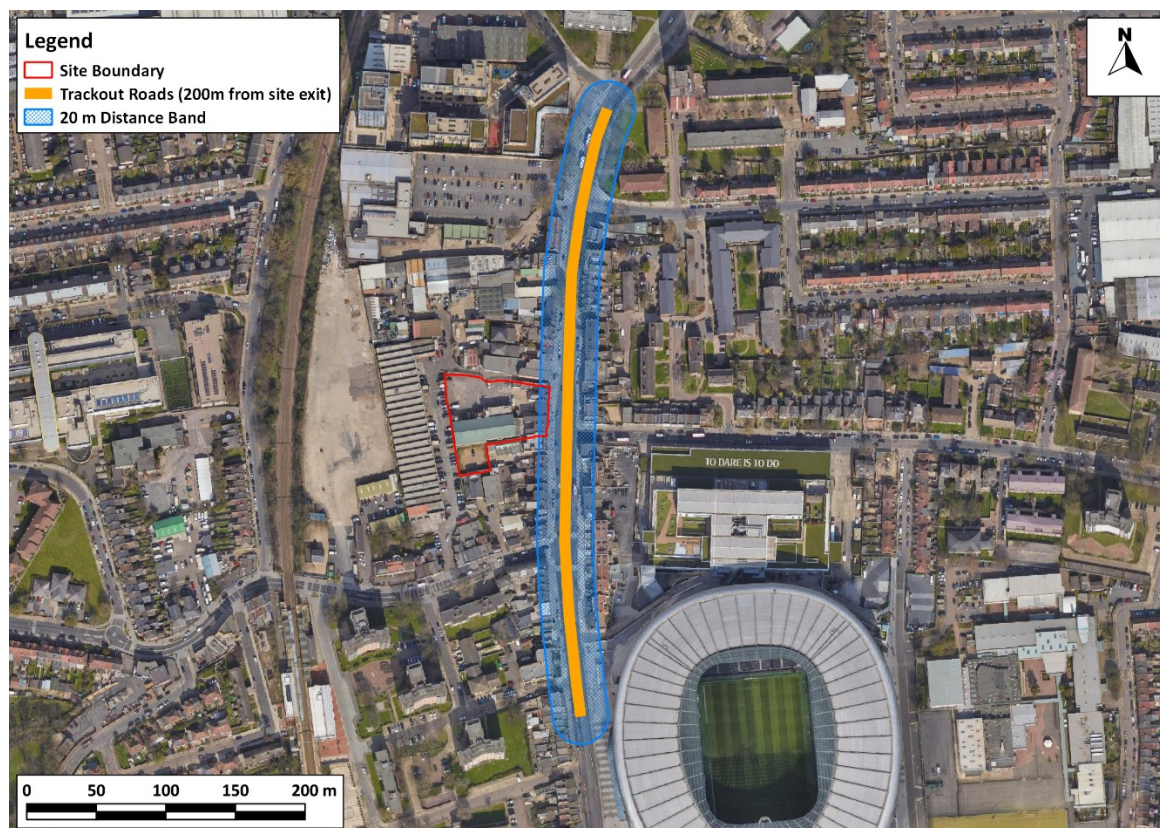


Figure 4: 20 m Distance Band around Roads Used by Construction Traffic Within 200 m of the Site Exit

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Sensitivity of the Area to Effects from Dust Soiling

- 6.14 Using the information set out in Paragraph 6.12 and Figure 3 alongside the matrix set out in Table A2.3 in Appendix A2, the area surrounding the onsite works is of 'high' sensitivity to dust soiling. Using the information set out in Paragraph 6.13 and Figure 4 alongside the same matrix, the area is also of 'high' sensitivity to dust soiling due to trackout.

Sensitivity of the Area to any Human Health Effects

- 6.15 The matrix in Table A2.4 in Appendix A2 requires information on the baseline annual mean PM₁₀ concentration in the area. The baseline annual mean PM₁₀ concentration at the site is considered to be best described by the predicted concentrations from the LAEI database (17.1 µg/m³; see Table 3).
- 6.16 Using the information set out in Paragraphs 6.12 and Figure 3 alongside the matrix in Table A2.4 in Appendix A2, the area surrounding the onsite works is of 'low' sensitivity to human health effects. Using the information set out in Paragraph 6.13 and Figure 4 alongside the same matrix, the area surrounding roads along which material may be tracked from the site is also of 'low' sensitivity.

Sensitivity of the Area to any Ecological Effects

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

Summary of the Area Sensitivity

- 6.18 Table 6 summarises the sensitivity of the area around the proposed construction works.

Table 6: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	Trackout
Dust Soiling	High Sensitivity	High Sensitivity
Human Health	Low Sensitivity	Low Sensitivity

Risk and Significance

- 6.19 The dust emission magnitudes in Table 5 have been combined with the sensitivities of the area in Table 6 using the matrix in Table A2.6 in Appendix A2, in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 7. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 9 (step 3 of the assessment procedure).

Table 7: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health
Demolition	Medium Risk	Negligible Risk
Earthworks	Medium Risk	Low Risk
Construction	Medium Risk	Low Risk
Trackout	Medium Risk	Low Risk

- 6.20 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant' (IAQM, 2016).

7 Site Suitability Assessment

- 7.1 The proposed development will represent relevant exposure to the annual- and 1-hour mean NO₂ objectives, as well as the annual PM₁₀ and PM_{2.5} objectives, and the 24-hour mean PM₁₀ objective.
- 7.2 As discussed in Paragraph 5.7, measured annual mean NO₂ concentrations at the automatic monitor close to the site have remained below the objective since 2018, and there have been no recorded exceedances of the 1-hour mean NO₂ objective at this site in recent years (LBH, 2022). This automatic monitor is considered to be representative of the air quality conditions at worst-case locations within the proposed development given its comparable roadside location adjacent to the A1010 High Road. As such, it is reasonable to conclude that annual- and 1-hour mean NO₂ concentrations will be below the objectives at the proposed development.
- 7.3 Predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations presented in the LAEI database (GLA, 2023b) for 2025 (the closest year to the anticipated opening year of 2026) at the proposed development site boundary are well below the respective air quality objectives (Table 3). The predicted PM_{2.5} annual mean concentration also meets the GLA target.
- 7.4 Based on the local monitoring data and the predicted LAEI concentration data, and taking account of the fact that concentrations are expected to continue to decline in future years, it is judged that future residents will experience acceptable air quality.

8 'Air Quality Neutral'

- 8.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant impacts on human health. The air quality neutral assessment has been undertaken using the latest GLA's London Plan Guidance (Air Quality Neutral) (2023a).
- 8.2 Energy provision to the proposed development will be via all-electric sources which have no on-site emissions. The proposed development will also be 'car-free' and will not provide any car parking spaces, with the exception of one accessible parking space for blue-badge holders only.
- 8.3 Although the proposed development itself classifies as a 'major' development, Paragraph 2.2.1 of the GLA's Air Quality Neutral guidance states:
- "developments, including major developments, that do not include additional emissions sources are assumed to be Air Quality Neutral and to meet the Air Quality Neutral benchmarks. As such, there is no need to do an AQN assessment. This would include, for example, developments that have no additional motor vehicle parking, do not lead to an increase in motor vehicle movements, and do not include new combustion plant such as gas-fired boilers".*
- 8.4 Additionally, Paragraph 4.1.2 states: *"where major developments meet the definition of 'car-free', they can be assumed to meet the TEB".*
- 8.5 Taking the above into account, the proposed development is therefore air quality neutral and meets the requirement of the London Plan.

9 Mitigation

Good Design and Best Practice

- 9.1 As required by Policy SI 1 of the London Plan, a preliminary air quality assessment has been undertaken for the proposed development and is provided in Appendix A5.
- 9.2 The proposed development incorporates the following good design and best practice measures:
- scheme design such that the most sensitive uses (residential) are the furthest from source of pollution (roads), for example the commercial, business and service units are located adjacent to the A1010 High Road, with residential units set further back;
 - 'car-free' development with provision of one car parking space for blue badge holders only, to discourage the use of private vehicles to access the proposed development;
 - provision of pedestrian and cycle access to the new development, including 237 cycle parking spaces; and
 - use of an all-electric energy strategy to avoid on-site combustion.

Construction Impacts

- 9.3 Measures to mitigate dust emissions will be required during the construction phase of the development in order to minimise effects upon nearby sensitive receptors.
- 9.4 The site has been identified as a *Medium Risk* site during demolition, earthworks and construction, as well as for trackout, as set out in Table 7. The GLA's SPG on *The Control of Dust and Emissions During Construction and Demolition* (GLA, 2014) describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on what monitoring should be undertaken during the construction phase. This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A4.
- 9.5 The mitigation measures should be written into a dust management plan (DMP). The DMP may be integrated into a Code of Construction Practice or the Construction Environmental Management Plan (CEMP) and may require monitoring. The GLA's guidance suggests that, for a Medium Risk site, automatic monitoring of particulate matter (as PM₁₀) will be required. It also states that, on certain sites, it may be appropriate to determine the existing (baseline) pollution levels before work begins. However, the guidance is clear that the Local Authority should advise as to the appropriate air quality monitoring procedure and timescale on a case-by-case basis.

- 9.6 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.
- 9.7 The IAQM guidance, on which the GLA's guidance is based, is clear that, with appropriate mitigation in place and effectively implemented, the residual effects will normally be 'not significant'. The mitigation measures set out in Appendix A4 are based on the GLA guidance.
- 9.8 The IAQM guidance does, however, recognise that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. During these events, short-term dust annoyance may occur, however, the scale of this would not normally be considered sufficient to change the conclusion that overall the effects will be 'not significant'.

Impacts of Existing Sources on Residents of the Development

- 9.9 The assessment has demonstrated that future residents and users of the proposed development will experience acceptable air quality. It is, therefore, not considered appropriate to propose further mitigation measures for this development.
- 9.10 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law). The local air quality action plan that the GLA is required to produce in order to address limit value exceedances in its area will also help to improve air quality.

Air Quality Neutral

- 9.11 The assessment has demonstrated that the proposed development is air quality neutral, as required by the London Plan. It is, therefore, not considered appropriate to propose further mitigation measures for this development.

10 Conclusions

- 10.1 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction. It has also identified the air quality conditions that future residents and users will experience, and whether or not the proposed development is air quality neutral (as required by the London Plan).

Construction Impacts

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

Operational Impacts

- 10.3 The proposed development will be 'car-free' and will not provide any car parking spaces, with the exception of one accessible parking space for blue-badge holders only. Additionally, the proposed development will utilise an all-electric energy strategy and will not include any back-up emergency diesel generators. As such, the proposed development will not have a significant effect on local air quality.
- 10.4 The assessment has demonstrated that future residents and users of the proposed development will experience acceptable air quality.

Air Quality Neutral

- 10.5 The proposed development has been shown to be air quality neutral, as required by the London Plan.

Policy Implications

- 10.6 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 185 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents. It is also consistent with Paragraph 186, as it will not affect compliance with relevant limit values or national objectives.
- 10.7 The proposed development is also consistent with Policy DM23 of LBH's Local Plan, as an assessment has been completed, and the findings confirm that there will be no significant impact either on existing air quality or air quality conditions for future residents and users of the proposed development. The proposed development is also compliant with Policy SI 1 of the London Plan in the following ways:

- it will not lead to further deterioration of existing poor air quality;
- it will not cause or extend any exceedances of legal air quality limits;
- it will not create new exposure to poor air quality;
- design solutions have been used to address air quality issues rather than post-design mitigation, including design measures to minimise exposure; and
- it is better than air quality neutral.

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12 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CAZ	Clean Air Zone
CEMP	Construction Environmental Management Plan
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the annual mean limit value for NO ₂ but also has a high level of human exposure
GLA	Greater London Authority
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationery Office
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBH	London Borough of Haringey
LEZ	Low Emission Zone
µg/m³	Microgrammes per cubic metre
NO₂	Nitrogen dioxide

NPPF	National Planning Policy Framework
NRMM	Non-road Mobile Machinery
OEP	Office for Environmental Protection
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
OLEV	Office for Low Emission Vehicles
PHV	Private Hire Vehicle
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
SCR	Selective Catalytic Reduction
SPG	Supplementary Planning Guidance
SPD	Supplementary Planning Document
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide
TfL	Transport for London
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation
ZEC	Zero Emission Capable

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A1 London-Specific Policies and Measures

London Plan

Design-led Approach

- A1.1 Policy D3 on optimising site capacity through the design-led approach states that “*development proposals should...help prevent or mitigate the impacts of noise and poor air quality*”. The explanatory text around this Policy states the following:

“Measures to design out exposure to poor air quality and noise from both external and internal sources should be integral to development proposals and be considered early in the design process. Characteristics that increase pollutant or noise levels, such as poorly-located emission sources, street canyons and noise sources should also be designed out wherever possible. Optimising site layout and building design can also reduce the risk of overheating as well as minimising carbon emissions by reducing energy demand”.

Preliminary Air Quality Assessment

- A1.2 The London Plan sets out expectations around the consideration of air quality in the design of all major developments:

“For major developments, a preliminary Air Quality Assessment should be carried out before designing the development to inform the design process. The aim of a preliminary assessment is to assess:

- The most significant sources of pollution in the area*
- Constraints imposed on the site by poor air quality*
- Appropriate land uses for the site*
- Appropriate design measures that could be implemented to ensure that development reduces exposure and improves air quality.*

Further assessments should then be carried out as the design evolves to ensure that impacts from emissions are prevented or minimised as far as possible, and to fully quantify the expected effect of any proposed mitigation measures, including the cumulative effect where other nearby developments are also underway or likely to come forward”.

Electric Vehicle Charging

- A1.3 To support the uptake of zero tailpipe emission vehicles, Policy T6.1 of the London Plan states:

“All residential car parking spaces must provide infrastructure for electric or Ultra-Low Emission vehicles. At least 20 per cent of spaces should have active charging facilities, with passive provision for all remaining spaces”.

London Environment Strategy

A1.4 The air quality chapter of the London Environment Strategy sets out three main objectives, each of which is supported by sub-policies and proposals. The Objectives and their sub-policies are set out below:

“Objective 4.1: Support and empower London and its communities, particularly the most disadvantaged and those in priority locations, to reduce their exposure to poor air quality.

- Policy 4.1.1 Make sure that London and its communities, particularly the most disadvantaged and those in priority locations, are empowered to reduce their exposure to poor air quality*
- Policy 4.1.2 Improve the understanding of air quality health impacts to better target policies and action*

Objective 4.2: Achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action from London Boroughs, government and other partners

- Policy 4.2.1 Reduce emissions from London’s road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport*
- Policy 4.2.2 Reduce emissions from non-road transport sources, including by phasing out fossil fuels*
- Policy 4.2.3 Reduce emissions from non-transport sources, including by phasing out fossil fuels*
- Policy 4.2.4 The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality*
- Policy 4.2.5 The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence based steps to improve air quality*

Objective 4.3: Establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting world health organization health-based guidelines for air quality

- *Policy 4.3.1 The Mayor will establish new targets for PM_{2.5} and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners*
- *Policy 4.3.2 The Mayor will encourage the take up of ultra low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines*
- *Policy 4.3.3 Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality*
- *Policy 4.3.4 Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces"*

A1.5 While the policies targeting transport sources are significant, there are less obvious ones that will also require significant change. In particular, the aim to phase out fossil-fuels from building heating and cooling and from NRMM will demand a dramatic transition.

Low Emission Zone (LEZ)

A1.6 The LEZ was implemented as a key measure to improve air quality in Greater London. It entails charges for vehicles entering Greater London not meeting certain emissions criteria, and affects diesel-engined lorries, buses, coaches, large vans, minibuses and other specialist vehicles derived from lorries and vans. Since 1 March 2021, a standard of Euro VI has applied for HGVs, buses and coaches, while a standard of Euro 3 has applied for large vans, minibuses and other specialist diesel vehicles since 2012.

Ultra Low Emission Zone (ULEZ)

A1.7 London's ULEZ was introduced on 8 April 2019. The ULEZ currently operates 24 hours a day, 7 days a week in the same area as the current Congestion Charging zone. All cars, motorcycles, vans and minibuses are required to meet exhaust emission standards (ULEZ standards) or pay an additional daily charge to travel within the zone. The ULEZ standards are Euro 3 for motorcycles, Euro 4 for petrol cars, vans and minibuses and Euro 6 for diesel cars, vans and minibuses. The ULEZ does not include any requirements relating to heavy vehicle (HGV, coach and bus) emissions, as these are addressed by the amendments to the LEZ described in Paragraph A1.6.

A1.8 The ULEZ currently covers the entire area within the North and South Circular roads, applying the emissions standards set out in Paragraph A1.7. The ULEZ is expected to be expanded across all London boroughs in August 2023.

Other Measures

- A1.9 Since 2018, all taxis presented for licencing for the first time had to be zero emission capable (ZEC). This means they must be able to travel a certain distance in a mode which produces no air pollutants, and all private hire vehicles (PHVs) presented for licensing for the first time had to meet Euro 6 emissions standards. Since January 2020, all newly manufactured PHVs presented for licensing for the first time had to be ZEC (with a minimum zero emission range of 10 miles). The Mayor's aim is that the entire taxi and PHV fleet will be made up of ZEC vehicles by 2033.
- A1.10 The Mayor has also proposed to make sure that TfL leads by example by cleaning up its bus fleet, implementing the following measures:
- TfL will procure only hybrid or zero emission double-decker buses from 2018;
 - a commitment to providing 3,100 double decker hybrid buses by 2019 and 300 zero emission single-deck buses in central London by 2020;
 - introducing 12 Low Emission Bus Zones by 2020;
 - investing £50m in Bus Priority Schemes across London to reduce engine idling; and
 - retrofitting older buses to reduce emissions (selective catalytic reduction (SCR) technology has already been fitted to 1,800 buses, cutting their NOx emissions by around 88%).

A2 Construction Dust Assessment Procedure

A2.1 The criteria developed by IAQM (2016), upon which the GLA's guidance is based, divide the activities on construction sites into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

A2.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

A2.3 An assessment is required where there is a human receptor within 350 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), or where there is an ecological receptor within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

A2.4 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is *negligible* and that any effects will be 'not significant'. No mitigation measures beyond those required by legislation will be required.

STEP 2: Assess the Risk of Dust Impacts

A2.5 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and
- the sensitivity of the area to dust effects (Step 2B).

A2.6 These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

Step 2A – Define the Potential Dust Emission Magnitude

A2.7 Dust emission magnitude is defined as either 'Small', 'Medium', or 'Large'. The IAQM guidance explains that this classification should be based on professional judgement, but provides the examples in Table A2.1.

Table A2.1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
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
Medium	Total building volume 20,000 m ³ – 50,000 m ³ , potentially dusty construction material, demolition activities 10-20 m above ground level
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
Earthworks	
Large	Total site area >10,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes
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
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
Construction	
Large	Total building volume >100,000 m ³ , piling, on site concrete batching; sandblasting
Medium	Total building volume 25,000 m ³ – 100,000 m ³ , potentially dusty construction material (e.g. concrete), piling, on site concrete batching
Small	Total building volume <25,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout ^a	
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
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
Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

^a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B – Define the Sensitivity of the Area

A2.8 The sensitivity of the area is defined taking account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

- A2.9 The first requirement is to determine the specific sensitivities of local receptors. The IAQM guidance recommends that this should be based on professional judgment, taking account of the principles in Table A2.2. These receptor sensitivities are then used in the matrices set out in Table A2.3, Table A2.4 and Table A2.5 to determine the sensitivity of the area. Finally, the sensitivity of the area is considered in relation to any other site-specific factors, such as the presence of natural shelters etc., and any required adjustments to the defined sensitivities are made.

Step 2C – Define the Risk of Impacts

- A2.10 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the *risk* of impacts with no mitigation applied. The IAQM guidance provides the matrix in Table A2.6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

- A2.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance has been used as the basis for the requirements set out in Appendix A4.

STEP 4: Determine Significant Effects

- A2.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.
- A2.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

Table A2.2: Principles to be Used When Defining Receptor Sensitivities

Class	Principles	Examples
Sensitivities of People to Dust Soiling Effects		
High	users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms
Medium	users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land	parks and places of work
Low	the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads
Sensitivities of People to the Health Effects of PM₁₀		
High	locations where members of the public may be exposed for eight hours or more in a day	residential properties, hospitals, schools and residential care homes
Medium	locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	may include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀
Low	locations where human exposure is transient	public footpaths, playing fields, parks and shopping streets
Sensitivities of Receptors to Ecological Effects		
High	locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species	Special Areas of Conservation with dust sensitive features
Medium	locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition	Sites of Special Scientific Interest with dust sensitive features
Low	locations with a local designation where the features may be affected by dust deposition	Local Nature Reserves with dust sensitive features

Table A2.3: Sensitivity of the Area to Dust Soiling Effects on People and Property ⁷

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
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

⁷ For demolition, earthworks and construction, distances are taken either from the dust source or from the boundary of the site. For trackout, distances are measured from the sides of roads used by construction traffic. Without mitigation, trackout may occur from roads up to 500 m from sites with a *large* dust emission magnitude for trackout, 200 m from sites with a *medium* dust emission magnitude and 50 m from sites with a *small* dust emission magnitude, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table A2.4: Sensitivity of the Area to Human Health Effects ⁷

Receptor Sensitivity	Annual Mean PM ₁₀	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A2.5: Sensitivity of the Area to Ecological Effects ⁷

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

Table A2.6: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A3 Professional Experience

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Dr Evans is an Associate Director with AQC, with more than 23 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Samantha Barber, MChem (Hons) AMEnvSc AMIAQM

Miss Barber is a Senior Consultant with AQC, having joined the company in November 2017. She has carried out assessments of air quality impacts for a range of projects, including EIA schemes, residential, commercial and mixed-use schemes, energy centres and power generation schemes. Miss Barber has also prepared construction dust risk assessments, Air Quality Neutral assessments, local authority Annual Status Reports (ASRs) and odour assessments. She has carried out numerous passive nitrogen dioxide monitoring surveys, and construction dust monitoring, at sites across Greater London.

A4 Construction Mitigation

A4.1 Table A4.1 presents a set of best-practice measures from the GLA guidance (2014) that should be incorporated into the specification for the works. These measures should be written into a DMP. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the DMP.

Table A4.1: Best-Practice Mitigation Measures Recommended for the Works

Measure	Desirable	Highly Recommended
Site Management		
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site		✓
Develop a Dust Management Plan (DMP)		✓
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 and emissions are being carried out and during prolonged dry or windy conditions		✓
Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and ensure that the action taken to resolve the situation is recorded in the log book		✓
Preparing and Maintaining the Site		
Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible		✓
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		✓
Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution	✓	
Avoid site runoff of water or mud		✓
Keep site fencing, barriers and scaffolding clean using wet methods		✓

Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below		✓
Cover, seed, or fence stockpiles to prevent wind whipping		✓
Carry out regular dust soiling checks of buildings within 100 m of site boundary and provide cleaning if necessary	✓	
Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly		✓
Agree monitoring locations with the Local Authority		✓
Where possible, commence baseline monitoring at least three months before work begins		✓
Operating Vehicle/Machinery and Sustainable Travel		
Ensure all on-road vehicles comply with the requirements of the London LEZ (and ULEZ)		✓
Ensure all Non-road Mobile Machinery (NRMM) comply with London's NRMM emission standards. Currently, NRMM used on any site within Greater London are required to meet Stage IIIB of EU Directive 97/68/EC (The European Parliament and the Council of the European Union, 1997) and its subsequent amendments as a minimum, while NRMM used on any site within the Central Activity Zone, Canary Wharf or one of London's Opportunity Areas are required to meet Stage IV of the Directive as a minimum. The proposed development is located within an area where this stricter requirement applies. From January 2025, NRMM used anywhere in London will be required to meet stage IV, while from January 2030 the stage V standard will apply. From January 2040 only zero emission machinery will be allowed.		✓
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 practicable		✓
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials		✓
Implement a Travel Plan that supports and encourages sustainable staff 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 suppression/mitigation, using non-potable water where possible and appropriate		✓
Use enclosed chutes, conveyors and covered skips		✓
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate		✓
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		✓

Waste Management		
Reuse and recycle waste to reduce dust from waste materials		✓
Avoid bonfires and burning of waste materials		✓
Measures Specific to 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)	✓	
Ensure water suppression is used during demolition operations.		✓
Avoid explosive blasting, using appropriate manual or mechanical alternatives		✓
Bag and remove any biological debris or damp down such material before demolition		✓
Measures Specific to Earthworks		
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable	✓	
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable	✓	
Only remove the cover from small areas during work, not all at once	✓	
Measures Specific to Construction		
Avoid scabbling (roughening of concrete surfaces), if possible	✓	
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		✓
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	✓	
For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust	✓	
Measures Specific to Trackout		
Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site		✓
Avoid dry sweeping of large areas		✓
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport		✓
Access gates should be located at least 10 m from receptors, where possible		✓
Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site	✓	

A5 Preliminary Air Quality Assessment



Preliminary Air Quality Assessment: The Printworks, Tottenham

June 2023



Experts in air quality
management & assessment

Document Control

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1 Introduction

Background

- 1.1 This report provides a preliminary air quality assessment, as required by the Greater London Authority's (GLA's) London Plan (2021a), for the proposed residential development at 819-829 High Road in Tottenham (the 'site').
- 1.2 The proposals involve the demolition of the existing buildings and structures occupying the site, and the subsequent redevelopment of the site to provide a residential, student accommodation-led development known as 'The Printworks' (hereafter referred to as the 'proposed development'), with a potential for commercial ground floor and street frontage or mixed public commercial and private student amenities.
- 1.3 Policy SI 1 of the London Plan specifically states, *"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"*.
- 1.4 This preliminary air quality assessment has thus been undertaken to identify any constraints to the proposed development in terms of air quality, and to allow for air quality design principles to be included within the design of the proposed development. The aim of the preliminary assessment is to assess:
 - the most significant sources of pollution in the area;
 - constraints imposed on the site by poor air quality;
 - appropriate land uses for the site; and
 - appropriate design measures that could be implemented to ensure that the proposed development reduces exposure and improves air quality.

Assessment Criteria

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

- 1.6 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019). The annual mean objectives apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes; they do not apply at hotel or commercial/retail premises. The 24-hour mean objectives apply at the same locations as the annual mean objective, as well as in gardens of residential properties and hotels. The 1-hour mean objectives apply wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 1.7 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
NO ₂	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5}	Annual Mean	20 µg/m ³ ^a
	Annual Mean	10 µg/m ³ by 2030

^a There is no numerical PM_{2.5} objective for local authorities. Convention is to assess against the UK limit value which is currently 20 µg/m³.

- 1.8 The GLA has set a target to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by 2030, as detailed in the London Environment Strategy (GLA, 2018). This target was derived from an air quality guideline set by the World Health Organisation (WHO) in 2005. The guideline is not currently in UK regulations and there is no explicit requirement to assess against it. However, achievement of the guideline is a long-term aspiration of the UK Government (Defra, 2019), and the London Environment Strategy (GLA, 2018) sets out the what the Mayor will do to help achieve the ambitions in the strategy.

2 Baseline Air Quality

- 2.1 The site is located within the borough-wide Air Quality Management Area (AQMA) declared by the London Borough (LB) of Haringey for exceedances of the annual mean nitrogen dioxide (NO₂) and 24-hour mean PM₁₀ objectives, predominantly as a result of road transport emissions. The proposed

development also lies approximately 425 m south of the 'A406 North Circular Edmonton A1010 and Fore Street A1010' Focus Area identified by the GLA¹, as shown in Figure 1.

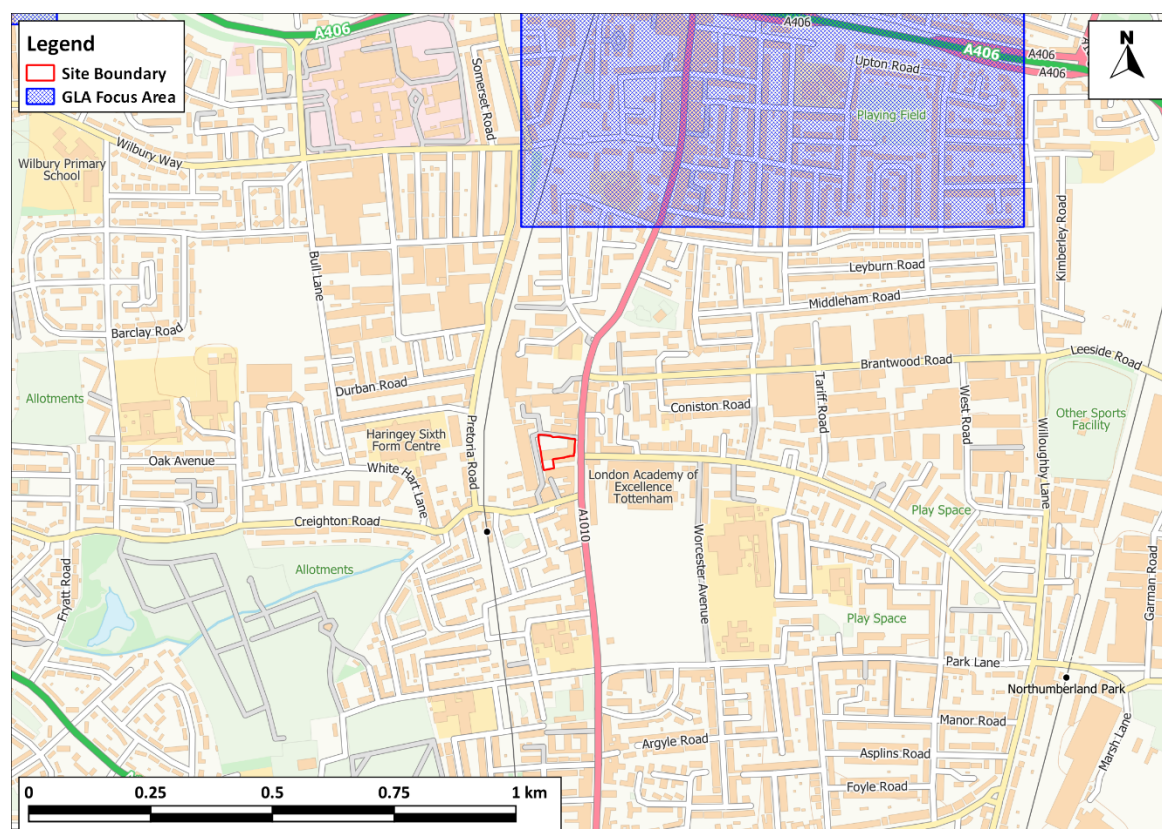


Figure 1: Proposed Development and Air Quality Focus Area

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- 2.2 A search of the UK Pollutant Release and Transfer Register (Defra, 2023) website has not identified any significant industrial sources that are likely to affect the proposed development, in terms of air quality.

Local Monitoring

- 2.3 The LB of Haringey operates three automatic monitoring stations within its area, including the roadside site at 639 High Road² which is approximately 750 m to the south of the proposed development. The LB of Haringey also operates a number of NO₂ monitoring sites using diffusion tubes prepared and analysed by Lambeth Scientific Services (using the 50% TEA in acetone

¹ Focus Areas are locations with high levels of human exposure where the annual mean limit value for NO₂ is exceeded.

² UK-AIR ID: UKA00260, EU Site ID: GB0637A.

method). These include two diffusion tubes within 1 km of the proposed development, which were installed in 2021.

- 2.4 Available annual mean NO₂ concentrations for the years 2015 to 2022 are summarised in Table 2, and the monitoring locations are shown in Figure 2. Data for years to 2021 have been taken from the LB of Haringey's 2021 Annual Status Report (LB of Haringey, 2022), whilst automatic monitoring data for 2022 data have been downloaded from the London Air website (Imperial College, 2023).

Table 2: Summary of Annual Mean NO₂ Monitoring (2015 – 2022) (µg/m³)^a

Site ID	Site Type	Location	2015	2016	2017	2018	2019	2020	2021	2022
UK-AIR ID: UKA00260 EU Site ID: GB1024A	Roadside - Automatic	Haringey Roadside (639 High Road)	40	43	40	39	37	33	32	30
HR55	Roadside	Risley Avenue	-	-	-	-	-	-	31.2	n/a
HR56	Roadside	Dukes Aldridge Academy	-	-	-	-	-	-	22.5	n/a
Objective			40							

^a Exceedances of the objective are shown in **bold**. Data presented to the same level of accuracy as the 2021 ASR (LB of Haringey, 2022).

- 2.5 Annual mean concentrations have been below the objective since 2018, and there has been an overall reduction in concentrations since 2016 at the automatic monitor. The 1-hour mean objective has not been exceeded at the automatic monitor in recent years (LB of Haringey, 2022).
- 2.6 Whilst results for 2020 and 2021 are presented for completeness, they are not relied upon since reduced activity brought about by the Covid-19 pandemic has reduced measured pollutant concentrations.

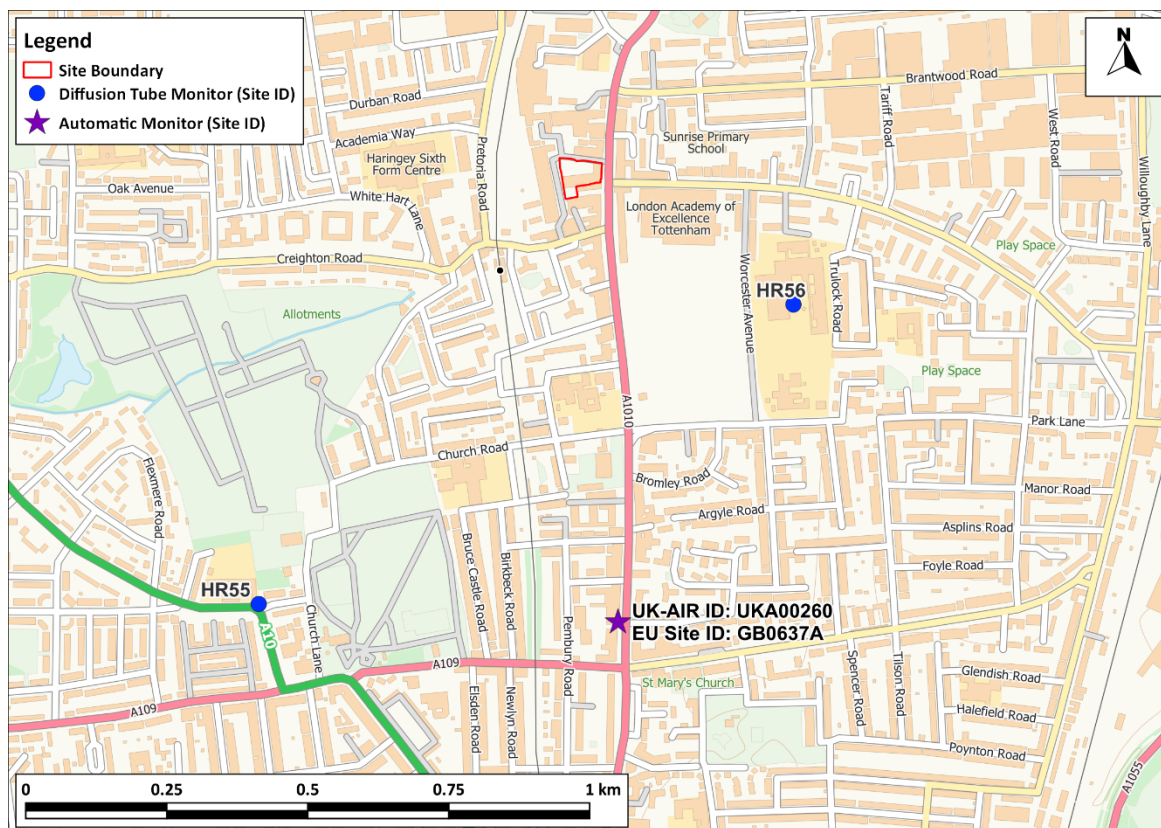


Figure 2: Monitoring Locations

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- 2.7 The automatic monitor located at 639 High Road does not measure PM₁₀ or PM_{2.5} concentrations. In 2021, the LB of Haringey commenced monitoring of PM₁₀ and PM_{2.5} concentrations at a roadside site located approximately 3 km to the southwest of the proposed development (site ID: HG005). Data are only available for 2021 and data capture is less than 75%; as such, the data should be treated with caution. Notwithstanding, measured concentrations were well below the relevant objectives, and the measured annual mean PM_{2.5} concentration (of 10 µg/m³) met the GLA target value.

LAEI Concentration Maps

- 2.8 In addition to the locally measured concentrations discussed above, the maximum pollutant concentrations predicted across the site in 2019 have been determined from the London Atmospheric Emissions Inventory (LAEI) database produced by the GLA (2021b).
- 2.9 The maximum predicted annual mean concentrations within the site in 2019 are:
- NO₂ – 30.5 µg/m³;

- PM_{10} – $17.1 \mu\text{g}/\text{m}^3$; and
- $PM_{2.5}$ – $11.0 \mu\text{g}/\text{m}^3$.

2.10 These predicted concentrations are below the respective objectives and will remain below the objectives by the time the proposed development is operational. The predicted maximum $PM_{2.5}$ concentration is marginally above the GLA target; the GLA's aspiration is to meet the target of $10 \mu\text{g}/\text{m}^3$ by 2030. It is reasonable to expect the $PM_{2.5}$ concentrations within the site to be approaching the target value by the opening year of 2026 as a result of wider improvements in air quality, including through the implementation of the London Environment Strategy (GLA, 2018), Low Emission Zone (LEZ) and expanded Ultra Low Emission Zone (ULEZ).

3 Air Quality Constraints

- 3.1 The proposed development will be 'car-free', providing just one accessible car parking space in line with London Plan requirements. Consequently, the proposed development will generate very few additional vehicle trips on the local road network. The trip generation of the proposed development is therefore likely to be well below published screening criteria.
- 3.2 Additionally, it is currently anticipated that the proposed development will utilise an all-electric energy strategy and will not include any back-up emergency diesel generators. As such, there will be no on-site emissions generated by combustion plant.
- 3.3 Taking account of the above, the effect of the proposed development upon local air quality will be 'not significant'.

4 Site Suitability

- 4.1 The proposed development will represent relevant exposure to the annual- and 1-hour mean NO_2 objectives, as well as the annual PM_{10} and $PM_{2.5}$ objectives, and the 24-hour mean PM_{10} objective.
- 4.2 As discussed in Paragraph 2.5, measured annual mean NO_2 concentrations at the automatic monitor close to the site have remained below the objective since 2018, and there have been no recorded exceedances of the 1-hour mean NO_2 objective at this site in recent years (LB of Haringey, 2022). This automatic monitor is considered to be representative of the air quality conditions at worst-case locations within the proposed development given its comparable roadside location adjacent to the A1010 High Road. As such, it is reasonable to conclude that annual- and 1-hour mean NO_2 concentrations will be below the objectives at the proposed development.
- 4.3 The only recent monitoring of PM_{10} and $PM_{2.5}$ is undertaken adjacent to the A105, which experiences greater traffic volumes than the A1010; the measurements are well below the relevant objectives, suggesting that the objectives are likely to be within the proposed development.

- 4.4 Modelled annual mean NO₂, PM₁₀ and PM_{2.5} concentrations presented in the LAEI database (GLA, 2021b) for 2019 at the proposed development site boundary are well below the respective air quality objectives (Paragraph 2.10). The predicted PM_{2.5} annual mean concentration marginally exceeds the GLA target in 2019.
- 4.5 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law), as well as the implementation of the LEZ and expanded ULEZ, and air quality is expected to continue to improve into the future.
- 4.6 Taking all of these aspects into account, it is, therefore, judged that future residents will experience acceptable air quality in the opening year of 2026.

5 Air Quality Design Principles

- 5.1 The following design principles to reduce exposure to air pollution and improve air quality should be considered and incorporated within the design of the proposed development:
- It is understood that emergency diesel generators are currently not included within the design of the proposed development. Should the requirement for back-up power provision be identified, then alternatives to the use of the diesel generators for emergency power provision should be considered to reduce or avoid associated emissions;
 - If diesel generators are unavoidable, the testing and maintenance schedule should be minimised as far as possible and careful consideration of the exhaust stack(s) location will be required; the exhaust stack(s) should be located at roof level on the tallest building, and away from any amenity space accessible to the residents (i.e. roof terraces);
 - It is understood that the energy strategy is currently based on an all-electric system. Should the energy strategy be revised to include combustion plant (such as gas-fired CHP) careful consideration should be given to the location of the exhaust stack(s);
 - Increasing the set-back distance of properties from the adjacent roads as far as practically possible, to reduce exposure to vehicle emissions, and use of building form and distribution to promote dispersion (i.e. avoid street canyons);
 - Ensuring that any ventilation air intakes, where proposed, are distanced appropriately from sources of air pollution, including the adjacent road network and the flues of any existing or proposed combustion plant exhausts (should the current design of the development change);

- Boundary planting around the site taking account of the GLA's guide to using green infrastructure to protect people from air pollution³;
- Maximise access to public transport options, prioritisation of cycle parking, as well as cycle and walking routes;
- Provision of cycle storage facilities at locations which are easy to access and are close to cycle routes both within and outside of the proposed development;
- Incorporating the Healthy Streets Approach into the scheme to reduce the need to travel, or to promote sustainable transport opportunities; and
- Providing electric vehicle charging for the accessible parking space.

6 Conclusions

- 6.1 The proposed development is located within the borough-wide AQMA declared by the LB of Haringey for road transport emissions, and is also located close to one of the GLA's air quality Focus Areas.
- 6.2 The proposed development will be 'car-free', with just one accessible car parking space proposed. Additionally, an all-electric energy strategy is currently proposed and the proposed development will not include back-up emergency diesel generators. As such, the effect of the proposed development upon local air quality will be 'not significant'.
- 6.3 Representative local monitoring and predictions from the LAEI indicate that conditions for future residents of the proposed development will be acceptable, with concentrations below the relevant objectives in the anticipated year of opening.
- 6.4 A list of design principles to reduce exposure to air pollution has been provided, which should be considered and incorporated within the design of the proposed development.

³ https://www.london.gov.uk/sites/default/files/green_infrastructure_air_pollution_may_19.pdf

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8 Glossary

AQMA	Air Quality Management Area
Defra	Department for Environment, Food and Rural Affairs
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the EU annual mean limit value for NO ₂ but also has a high level of human exposure
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LB	London Borough
LEZ	Low Emission Zone
µg/m³	Microgrammes per cubic metre
NO₂	Nitrogen dioxide
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation

9 Appendices

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A1 Professional Experience

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Dr Evans is an Associate Director with AQC, with more than 23 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Samantha Barber, MChem (Hons) AMEnvSc AMIAQM

Miss Barber is a Senior Consultant with AQC, having joined the company in November 2017. She has carried out assessments of air quality impacts for a range of projects, including EIA schemes, residential, commercial and mixed-use schemes, energy centres and power generation schemes. Miss Barber has also prepared construction dust risk assessments, Air Quality Neutral assessments, local authority Annual Status Reports (ASRs) and odour assessments. She has carried out numerous passive nitrogen dioxide monitoring surveys, and construction dust monitoring, at sites across Greater London.