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Aylesham Centre, Southwark

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Experts in air quality
management & assessment



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A1 Glossary

AADT	Annual Average Daily Traffic
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
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)
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
LDV	Light Duty Vehicles (<3.5 tonnes)
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
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
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TfL	Transport for London
ULEZ	Ultra Low Emission Zone

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A2 Legislative and Planning Policy Context

A2.1 All European legislation referred to in this report is written into UK law and remains in place.

Air Quality Strategy 2007

A2.2 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 Air Quality Management Area (AQMA) and prepare an Action Plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Air Quality Strategy 2023

A2.3 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.

The Environmental Permitting (England and Wales) (Amendment) Regulations 2018

A2.4 The Medium Combustion Plant Directive (MCPD) (The European Parliament and the Council of the European Union, 2015) regulates pollutant emissions from combustion plant with a rated input between 1 and 50 megawatts (MW_{th}) and was transposed into UK law in January 2018 through an amendment to the Environmental Permitting Regulations (2018). The legislation sets emission limits to be applied from December 2018 for new plant and from 2025 or 2030 for existing plant (depending on the rated input).

A2.5 In addition to addressing emissions from plant with a rated input of 1 to 50 MW_{th} , as required by the MCPD, the amendment also introduces emission limits on generator plant, regardless of their rated input. Generators whose sole purpose is maintaining power supply at a site during an on-site emergency, that are operated for the purpose of testing/maintenance for no more than 50 hours per year, will be exempt from the emission limits. The backup generator will be tested for fewer than 50 hours per year, so will be exempt from the emission limits.

Clean Air Act 1993 & Environmental Protection Act

A2.6 Small combustion plant of less than 20 MW net rated thermal input are controlled under the Clean Air Act 1993 (1993). This requires the local authority to approve the chimney height. Plant which are smaller than 366 kW have no such requirement.

A2.7 Measures to ensure adequate dispersion of emissions from discharging stacks and vents are included in Technical Guidance Note D1 (Dispersion) (1993), issued in support of the Environmental Protection Act (1990).

Clean Air Strategy 2019

A2.8 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the 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

A2.9 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.

A2.10 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 recently announced that 80% of new cars and 70% of new vans sold in Great Britain must be zero emission by 2030, increasing to 100% by 2035. If these ambitions are realised, then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

Environment Act 2021

A2.11 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.

- A2.12 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in **ES Volume 1, Chapter 8: Air Quality**.

Environmental Improvement Plan 2023

- A2.13 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.
- A2.14 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 **ES Volume 1, Chapter 8: Air Quality**, include the long-term targets in the Statutory Instrument described in Paragraph A2.12, and interim targets to be achieved by 2028.
- A2.15 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

- A2.16 The National Planning Policy Framework (NPPF) (2023) 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”.

- A2.17 To prevent unacceptable risks from air pollution, Paragraph 180 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”.

- A2.18 Paragraph 191 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”.

- A2.19 More specifically, on air quality, Paragraph 192 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”.

- A2.20 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”.

- A2.21 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”.

- A2.22 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 *“...dust can also be a planning concern, for example, because of the effect on local amenity”*.

- A2.23 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”.

A2.24 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”.

A2.25 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

The London Plan

A2.26 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”.*

A2.27 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”.

A2.28 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.”*

A2.29 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”.

A2.30 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”.

A2.31 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.

Design-led Approach

A2.32 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".

Development Plans

A2.33 Policy SI 1 of the London Plan (GLA, 2021) states the following regarding strategic development plans:

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

Preliminary Air Quality Assessment

A2.34 The London Plan sets out expectations around the consideration of air quality in the design of all major developments:

¹ The London Plan was developed based on a World Health Organisation guideline for PM_{2.5} of 10 µg/m³ (see Paragraph A2.37).

"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".

Air Quality Positive

A2.35 The London Plan explains what is meant by 'Air Quality Positive' in the explanatory text around Policy SI 1:

"An air quality positive approach is linked to other policies in the London Plan, such as Healthy Streets, energy masterplanning and green infrastructure. One of the keys to delivering this will be to draw existing good practice together in a holistic fashion, at an early stage in the process, to ensure that the development team can identify which options deliver the greatest improvement to air quality. Large schemes, subject to Environmental Impact Assessment, commonly have project and design teams representing a range of expertise, that can feed in to the development of a statement to set out how air quality can be improved across the proposed area of the development.

Single-site schemes, including referable schemes, are often constrained by pre-existing urban form and structure, transport and heat networks. These constraints may limit their ability to consider how to actively improve local air quality. By contrast, large schemes, particularly masterplans, usually have more flexibility to consider how new buildings, amenity and public spaces, transport and heat networks are deployed across the area and will therefore have greater opportunities to improve air quality and reduce exposure through the careful choice of design and infrastructure solutions. Delivery of an air quality positive approach will be project specific and will rely on the opportunities on site or in the surrounding area to improve air quality.

Statements for large-scale development proposals, prepared in response to Part C of this policy, should set out:

- *How air quality is intended to be analysed and opportunities for its improvement identified as part of the design process.*
- *How air quality improvements have informed the design choices made about layout and distribution of buildings, amenity spaces and infrastructure.*
- *What steps will be taken to promote the uptake and use of sustainable and zero-emission modes of transport beyond minimum requirements. This may include specific measures in transport plans or delivery against Healthy Streets indicators.*
- *How air pollutant emissions from the buildings or associated energy centres can be reduced beyond the minimum requirements set out in Part B of this policy. This may include specific measures in heating masterplans or working with existing heat network providers to reduce or eliminate energy centre emissions.*
- *How specific measures that are identified to deliver air quality improvements will be evaluated and secured, including whether more detailed design specifications will be required so that the final development meets the desired performance”.*

Electric Vehicle Charging

A2.36 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

A2.37 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.

A2.38 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”*

A2.39 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

A2.40 The Low Emission Zone (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

A2.41 London's Ultra-Low Emission Zone (ULEZ), originally covering the congestion charge zone, came into force in April 2019, and was expanded outward to the North and South Circular Roads in October 2021. The ULEZ was expanded again to cover all London Boroughs (excluding the M25) at the end of August 2023. The ULEZ currently operates 24 hours a day, 7 days a week and covers the entire area within the North and South Circular roads. 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 A2.40.

Other Measures

A2.42 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.

A2.43 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%).

Mayor's Transport Strategy

A2.44 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

A2.45 The Greater London Authority's (GLA's) Supplementary Planning Guidance (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) guidance (IAQM, 2024), and it states that "*the latest version of the IAQM Guidance should be used*".

GLA LPG: Air Quality Neutral

A2.46 The GLA's Air Quality Neutral LPG outlines the assessment approach for determining whether a development is Air Quality Neutral (GLA, 2023). The guidance sets out benchmarks for the maximum allowable emissions of NOx and particulate matter based on the size and use class of the proposed development. To determine whether the development is Air Quality Neutral, the building and transport emissions from the proposed development are compared to these benchmarks.

Air Quality Focus Areas

A2.47 The GLA has identified 160 air quality Focus Areas in London. These are locations that not only exceed the annual mean limit value for nitrogen dioxide, 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 within the '*Peckham Town Centre*' air quality Focus Area.

Local Policies

The Movement Plan

A2.48 The Movement Plan: Setting a Direction for Transport was adopted by Southwark Council in 2019 and sets out the Council's approach to improve peoples' experience of travel to, within and around the borough (London Borough of Southwark, 2019a). The plan focusses on people and their wellbeing and sets out the Council's vision for the next 20 years up to 2041. The Movement Plan consists of three focus areas to improve movement in the borough; people, place and experience. The following actions are outlined within the Plan that are relevant to air quality:

- Action 4: Deliver infrastructure to support active travel;
- Action 7: Reduce the number of cars owned in the borough;
- Action 8: Use kerbside efficiency and promote less polluting vehicles;
- Action 9: Manage traffic to reduce the demand on our streets;
- Action 11: Introduce time restricted street closures and reallocate space for people;
- Action 15: Reduce exposure to air pollution; and
- Action 21: Ensure people have access to relevant and useful information when they need it.

A2.49 The Local Implementation Plan (LIP) 3 was adopted by Southwark Council in 2019 and supplements the Movement Plan and replaces the previous 2011 Transport Plan (London Borough of Southwark, 2019b). The LIP is based around three broad themes, one of which is relevant to air quality:

"Place – Reducing traffic is the key way to improve people's experience on our streets, reducing pollution, delay and the space required for motor vehicles. We will use parking controls and our traffic management powers to deliver this change. This space will be reallocated for people to use to socialise in or to encourage active travel. Supporting our businesses and local high streets to make the most of a changing borough."

Southwark Local Plan

A2.50 The Southwark Local Plan (London Borough of Southwark, 2022a) is a set of documents that include the Councils' planning policies for Southwark. The Plan includes:

- the regeneration strategy for the Borough;
- policies that are used to make decisions on planning applications;
- key development sites with land use and urban design requirements; and
- visions for each of the Borough's neighbourhoods.

A2.51 Policy P65 'Improving air quality' deals specifically with the air quality requirements for new developments. It states:

"1. Development must:

- 1. Achieve or exceed air quality neutral standards; and*
- 2. Address the impacts of poor air quality on building occupiers and public realm users by reducing exposure to and mitigating the effects of poor air quality. This must be achieved through design solutions that include:*

- 1. Orientation and layout of buildings, taking into account vulnerable building occupiers, and public realm and amenity space users; and*
- 2. Ventilation systems; and*
- 3. Urban greening appropriate for providing air quality benefits proportionate to the scale of the development; and*

2. Any shortfall in air quality standards on site must be secured off site through planning obligations or as a financial contribution."

Supplementary Planning Documents and Guidance

A2.52 LBS has developed a Sustainable Design and Construction Supplementary Planning Document (SPD) (London Borough of Southwark, 2009), which provides guidance on how new development in Southwark should be designed and built so that it has a positive impact on the environment. It considers air quality impacts in relation to building design and materials, mechanical systems, emissions from boiler systems and construction activity. It states that:

- *"Development should maximise the use of passive design features that provide natural background ventilation;*
- *Mechanical systems should only be used as a complement to natural ventilation to ensure a constant standard of indoor air quality...Where mechanical systems are used, careful consideration will need to be given to ensure air intakes are positioned appropriately; and*
- *As a last resort, technical measures such as filters may be required to keep polluting emissions at an acceptable level".*

A2.53 Southwark Council has also published Technical Guidance on Air Quality (London Borough of Southwark, 2017). This document lists all the guidance and policies related to air quality that apply in Southwark and lists the requirements for the assessment of air quality for all new developments.

A2.54 Additionally, Southwark Council has also published Technical Guidance on Demolition and Construction (London Borough of Southwark, 2016) which has been followed for the proposed development.

Building Standards

- A2.55 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 work², to ensure adequate ventilation is provided to building occupants.
- A2.56 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 **ES Volume 1, Chapter 8: Air Quality**). 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.
- A2.57 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.
- A2.58 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

- A2.59 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide 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 the modelling undertaken for 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

² 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.

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.

Local Air Quality Action Plan

- A2.60 Southwark Council has declared an AQMA as a result of exceedances of the annual mean nitrogen dioxide and 24-hour mean PM₁₀ objectives that covers the entire borough (London Borough of Southwark, 2023a).
- A2.61 The Council has also adopted a new Air Quality Strategy and Action Plan (AQAP) (London Borough of Southwark, 2023b), the main aims of which are to:
- “reduce emissions from motorised vehicles;
 - reduce emissions from existing fixed sources;
 - reduce emissions from new developments; and
 - protect public health by monitoring air quality”.
- A2.62 The Council has developed actions under the following seven broad topics:
- *“Monitoring and other core statutory duties: Southwark has expanded its continuous monitoring network to six sites. This improves information about changes in air quality over time. The new equipment allows the Council to monitor more of the pollutants in the air. The Council has made the information publicly available;*
 - *Emissions from developments and buildings: emissions from buildings account for about 21% of the NO_x emissions across London, so are an important source of NO₂. Southwark seeks to reduce emissions from fuel combustion. This aim aligns with the Southwark Carbon strategy;*
 - *Public health and awareness raising: Increasing awareness can drive behavioural change that lowers emissions, and informs the public how to reduce their exposure to air pollution;*
 - *Delivery servicing and freight: Goods and service vehicles are usually diesel powered and have high NO₂ emissions. Low emission logistics requires alternatively fuelled vehicles to combat air pollution from this source;*
 - *Borough fleet actions: Southwark’s fleet includes light and heavy duty diesel-fuelled vehicles such as mini buses and refuse collection vehicles with high primary NO₂ emissions. Southwark can review its own fleet procurement to lead by example;*
 - *Localised solutions: Supporting neighbourhoods to introduce information or undertake actions to improve air quality; and*

- *Cleaner transport: Motor vehicles are the largest source of air pollution in London. There is a need to incentivise a modal shift to walking, cycling and ultra-low emission vehicles (such as electric)”.*

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A3 Construction Dust Assessment Procedure

- A3.1 The criteria developed by IAQM (2024), 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.

A3.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

- A3.3 An assessment is required where there is a human receptor within 250 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 250 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 250 m from the site entrance(s).
- A3.4 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

- A3.5 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).

A3.6 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

A3.7 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 A3.1.

Table A3.1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
Large	Total building volume >75,000 m ³ , potentially dusty construction material (e.g., concrete), on site crushing and screening, demolition activities >12 m above ground level
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material, demolition activities 6-12 m above ground level
Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	
Large	Total site area >110,000 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 >6 m in height
Medium	Total site area 18,000 m ² – 110,000 m ² , moderately dusty soil type (e.g., silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height
Small	Total site area <18,000 m ² , soil type with large grain size (e.g., sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height
Construction	
Large	Total building volume >75,000 m ³ , on site concrete batching, sandblasting
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material (e.g., concrete), on site concrete batching
Small	Total building volume <12,000 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	20-50 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	<20 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

- A3.8 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.

A3.9 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 A3.2. These receptor sensitivities are then used in the matrices set out in

A3.10 Table A3.3, Table A3.4 and Table A3.5 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

A3.11 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 A3.6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

A3.12 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 A8.

STEP 4: Determine Significant Effects

A3.13 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'.

A3.14 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 A3.2: 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	dwelling, 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 A3.3: Sensitivity of the Area to Dust Soiling Effects on People and Property ³

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

Table A3.4: Sensitivity of the Area to Human Health Effects ³

Receptor Sensitivity	Annual Mean PM ₁₀	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m ³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m ³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

³ 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 250 m from sites, 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 A3.5: Sensitivity of the Area to Ecological Effects ³

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

Table A3.6: 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	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

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A4 EPUK & IAQM Planning for Air Quality Guidance

A4.1 The guidance issued by Environmental Protection UK (EPUK) and the IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations”.*

Recommended Best Practice

A4.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

A4.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

A4.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;

- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;
- The provision of at least 1 Electric Vehicle (EV) “rapid charge” point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - Spark ignition engine: 250 mgNO_x/Nm³;
 - Compression ignition engine: 400 mgNO_x/Nm³;
 - Gas turbine: 50 mgNO_x/Nm³.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A4.5 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

“It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the “damage cost approach” used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential”.

A4.6 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

“There may be a requirement to carry out an air quality assessment for the impacts of the local area’s emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- *the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- *the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- *the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and*
- *the presence of a source of odour and/or dust that may affect amenity for future occupants of the development”.*

Impacts of the Development on the Local Area

A4.7 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A4.8 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A4.9 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;
- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A4.10 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A4.11 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

“The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality”.

A4.12 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

“The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer”.

- A4.13 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this chapter.

Assessment of Significance

- A4.14 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

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

- A4.15 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either ‘significant’ or ‘not significant’. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as ‘*slight*’ individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a ‘*moderate*’ or ‘*substantial*’ impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in

measurable changes in health outcomes that could be regarded as significant by health care professionals.

- A4.16 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.
- A4.17 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A5.

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A5 Professional Experience

Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM

Ms Wilson is a Technical Director with AQC, with more than 20 years' relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including dust and odour nuisance. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning and DCO applications. She has provided expert evidence to a number of Public Inquiries and civil court and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Dr Imogen Heard, BSc (Hons) MSc PhD

Dr Heard is an Associate of AQC with over 12 years' experience in the field of air quality. She has been involved in numerous development projects including road schemes, energy from waste facilities, urban extensions and energy centres. These have included the use of ADMS-5 and ADMS-Roads dispersion models to study the impacts of a variety of pollutants, including nitrogen dioxide, PM₁₀ and PM_{2.5}, and the preparation of air quality assessment reports and air quality chapters for Environmental Statements. She also has experience in undertaking construction dust risk assessments, Air Quality Neutral assessments and human health risk assessments, as well as in preparing local authority reports. Prior to joining AQC she worked as a scientist in the Atmospheric Dispersion and Air Quality area at the UK Met Office for four years, modelling the dispersion of a range of pollutants over varying spatial and temporal scales.

George Chousos, BSc MSc AMEnvSc AMIAQM

Mr Chousos is a Consultant with AQC, having joined in May 2019. Prior to joining AQC, he completed an MSc in Air Pollution Management and Control at the University of Birmingham, specialising in air pollution control technologies and management, and data processing using R. He also holds a degree in Environmental Geoscience from the University of Cardiff, where he undertook a year in industry working in the field of photo-catalytic technology. Since joining AQC, George has been gaining experience in undertaking air quality assessments, both qualitatively and using atmospheric dispersion modelling, to accompany planning and permitting applications. Projects have ranged in scale, from small scale residential development to Environmental Impact Assessments (EIAs). The assessments have considered the effects on both human health and ecological habitats. George also has experience completing construction dust risk assessments, Air Quality Neutral assessments, Local Authority Annual Status Reports (ASRs), as well as odour assessments.

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A6 Modelling Methodology

Model Inputs

A6.1 Predictions have been carried out using the ADMS-Roads dispersion model (v5). The model requires the user to provide various input data, including emissions from each section of road and the road characteristics (including road width, street canyon width, street canyon height and porosity, where applicable). Vehicle emissions have been calculated based on vehicle flow, composition and speed data using the EFT (Version 12.0) published by Defra (2024a). Model input parameters are summarised in Table A6.1 and, where considered necessary, discussed further below.

Table A6.1: Summary of Model Inputs

Model Parameter	Value Used
Terrain Effects Modelled?	No
Variable Surface Roughness File Used?	No
Urban Canopy Flow Used?	Yes
Advanced Street Canyons Modelled?	Yes
Noise Barriers Modelled?	No
Meteorological Monitoring Site	London City
Meteorological Data Year	2022
Dispersion Site Surface Roughness Length (m)	1
Dispersion Site Minimum MO Length (m)	100
Met Site Surface Roughness Length (m)	0.2
Met Site Minimum MO Length (m)	75
Gradients?	No

A6.2 Arup, the appointed transport consultant for the scheme, have provided the proposed development’s traffic generation, for both the construction and operational phases, in an AADT format, along with the proportions of HDVs.

A6.3 Traffic speeds have also been provided by Arup with some having been adjusted based on professional judgement, taking account of the road layout, speed limits and the proximity to a junction. The traffic data used in the assessment of operational impacts are summarised in Table A6.2 Diurnal and monthly flow profiles for the traffic have been derived from the national profiles published by DfT (2023).

Table A6.2: Summary of Traffic Data used in the Assessment

Road Link	2022		2028 (Without Construction)		2028 (With Construction)	
	AADT	%HDV	AADT	%HDV	AADT	%HDV
Peckham High Street (west of Rye Lane)	18,729	13.1	17,652	13.9	17,703	14.0
Peckham High Street (east of Rye Lane)	18,273	9.4	17,196	10.0	17,246	10.2
Peckham High Street (west of Clayton Road)	29,955	11.2	28,177	11.9	28,228	12.0
Peckham High Street (east of Clayton Road)	18,067	12.3	17,729	12.5	17,746	12.5
Rye Lane (north of Hanover Park)	671	86.8	671	86.8	671	86.8
Rye Lane (south of Hanover Park)	1,466	88.5	1,301	99.1	1,301	99.1
Peckham Hill Street	11,393	8.6	10,761	9.1	10,761	9.1
Marmont Road	3,267	1.1	3,267	1.1	3,267	1.1
Peckham Bus Station road	527	71.3	357	98.9	357	98.9
Staffordshire Street	148	4.9	148	4.9	148	4.9
Meeting House Lane	2,966	6.1	2,865	6.2	2,865	6.2
Clayton Road (north of Hanover Park)	15,567	13.8	13,576	15.8	13,643	16.1
Clayton Road (south of Hanover Park)	11,792	1.8	10,493	2.0	10,493	2.0
Hanover Park (west of junction with Clayton Road)	11,790	13.9	8,555	19.2	8,622	19.6
Mckerrell Road	226	0.0	271	2.8	271	2.8
Cicely Road	436	4.0	436	4.0	436	4.0
Cerice Road	1,052	1.1	1,052	1.1	1,052	1.1
East site access road	8,847	0.7	2,388	0.5	2,388	0.5
West site access road	222	10.8	163	22.5	197	30.7

A6.4 Figure A6.1 shows the road network included within the model, along with the speed at which each link was modelled.

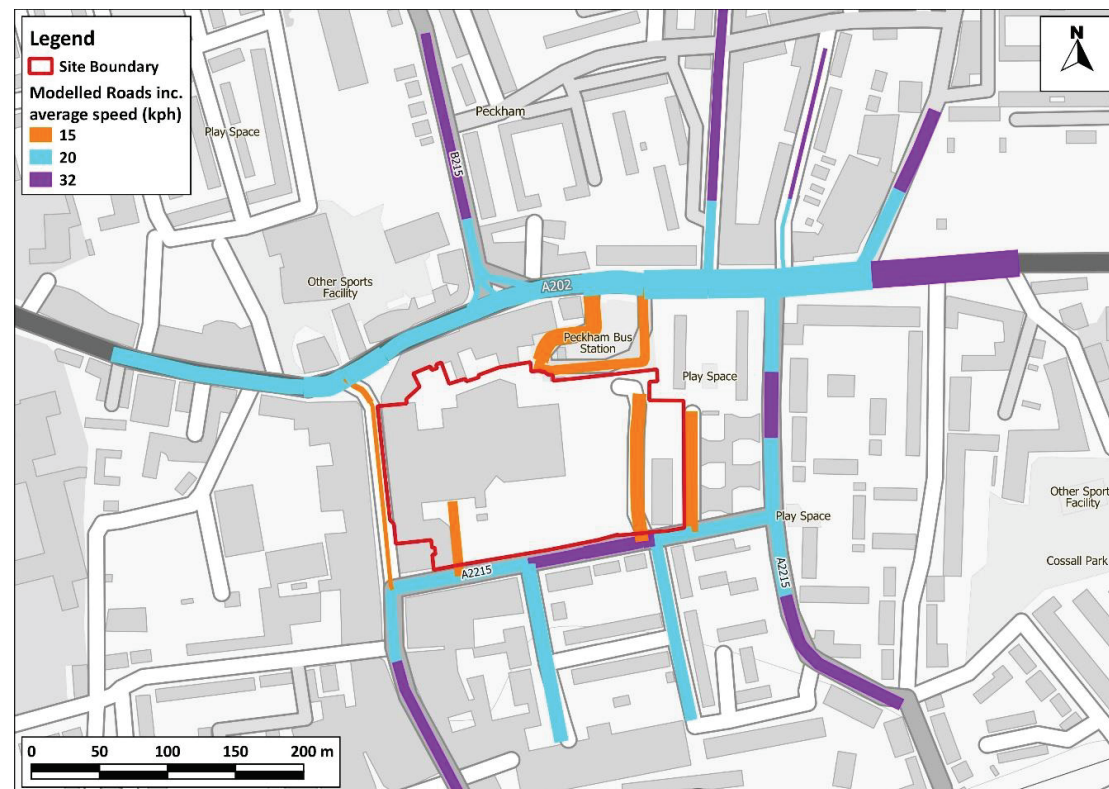


Figure A6.1: Modelled Road Network & Speed

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A6.5 For the purposes of modelling, it has been assumed that sections of Peckham High Street, Rye Lane and Hanover Park are within canyons formed by the existing buildings. These roads have a number of canyon-like features, which reduce dispersion of traffic emissions, and can lead to concentrations of pollutants being higher here than they would be in areas with greater dispersion. They have, therefore, been modelled as street canyons using ADMS-Roads' advanced canyon module, with appropriate input parameters determined from plans and local mapping. The advanced canyon module has been used along with the urban canopy flow module, the input data for which have been published by Cambridge Environmental Research Consultants (CERC, 2016), who developed the ADMS models. The modelled canyons are shown in Figure A6.2.

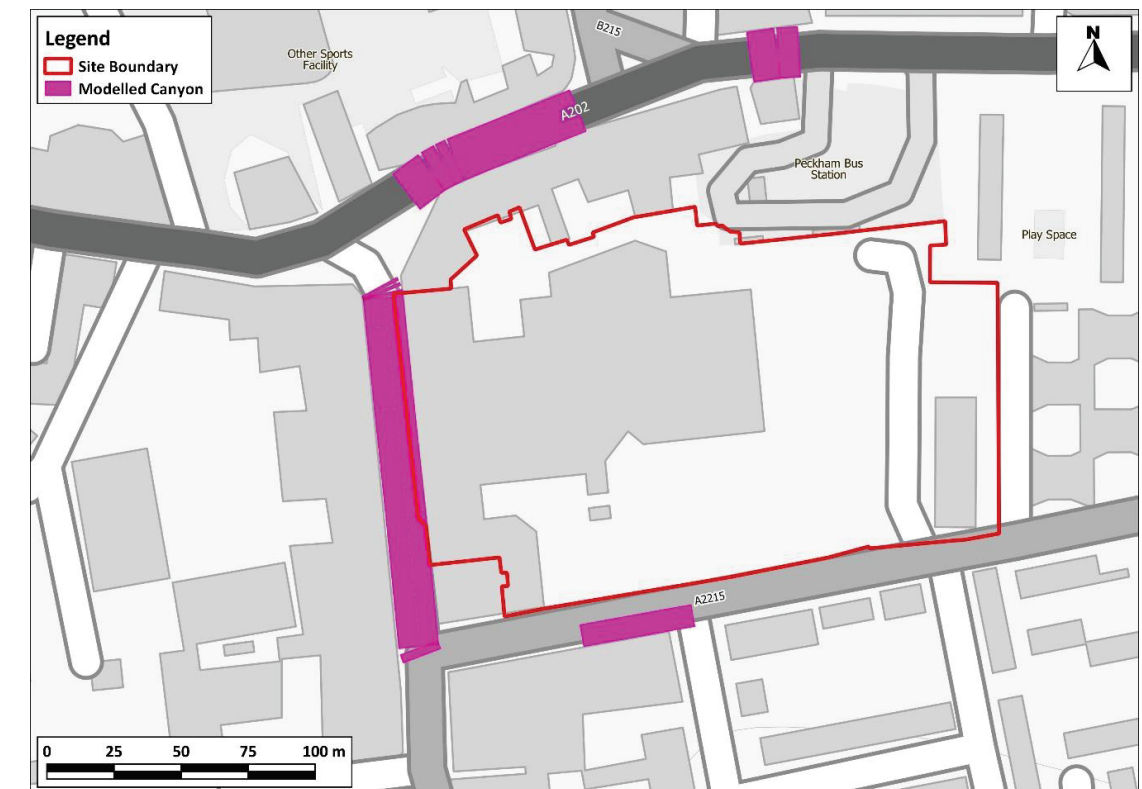


Figure A6.2: Modelled Canyons

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A6.6 Hourly sequential meteorological data in sectors of 10 degrees from London City for 2022 have been used in the model. The London City meteorological monitoring station is located at London City Airport, approximately 10 km to the northeast of the proposed development. Both the application site and the London City meteorological monitoring station are located in the Greater London Area where they will be influenced by the effects of inland meteorology over urban topography. The topography of the model domain is similar to that around the meteorological monitoring station and measurements from this site are considered to provide the most robust basis to predict meteorology within the model domain. A wind rose for the site for the year 2022 is provided in Figure A6.3. Raw data were provided by the Met Office and processed by AQC for use in ADMS.

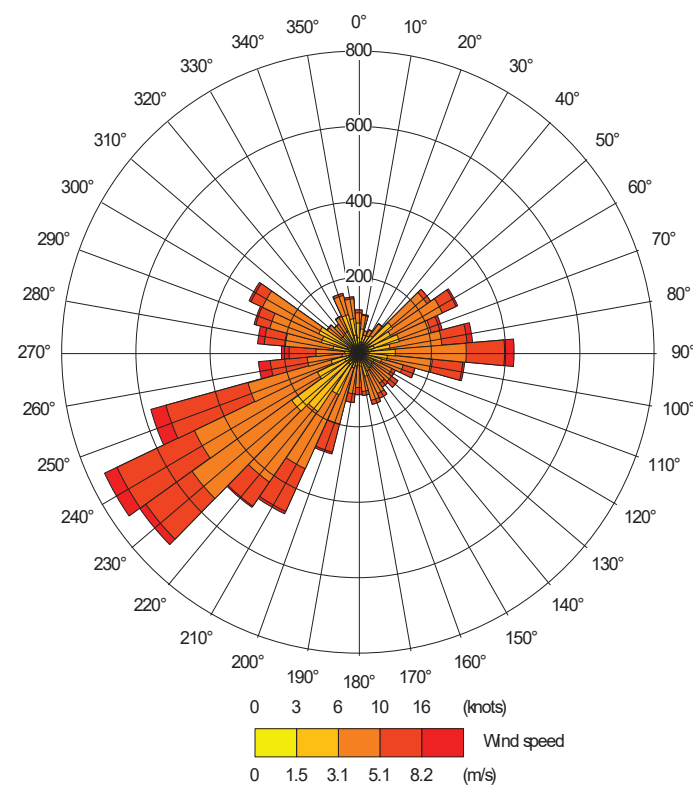


Figure A6.3: Wind Rose

Model Verification

Nitrogen Dioxide

- A6.7 Evidence collected over many years has shown that, in most urban areas, dispersion modelling relying upon Defra’s EFT has tended to systematically under-predict roadside nitrogen dioxide concentrations. To account for this, it is necessary to adjust the model against local measurements. The model has been run to predict annual mean nitrogen dioxide concentrations during 2022 at the SDT93 diffusion tube monitoring station deployed by Southwark Council, as well as at the DT1, DT5 and DT6 diffusion tube monitoring sites, from AQC’s monitoring survey. These sites have been selected because they are considered to be the most representative of conditions at the proposed development and are within the study area.
- A6.8 Most nitrogen dioxide (NO₂) is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions of nitrogen oxides (NO_x = NO + NO₂).
- A6.9 The model output of road-NO_x (i.e., the component of total NO_x coming from road traffic) has been compared with the ‘measured’ road-NO_x. Measured road-NO_x has been calculated from the

measured NO₂ concentrations and the predicted background NO₂ concentration using the NO_x from NO₂ calculator (Version 8.1) available on the Defra LAQM Support website (Defra, 2024b).

- A6.10 The unadjusted model has under predicted the road-NO_x contribution; this is a common experience with this and most other road traffic emissions dispersion models. An adjustment factor has been determined as the slope of the best-fit line between the ‘measured’ road contribution and the model derived road contribution, forced through zero (Figure A6.4). The calculated adjustment factor of 6.44 has been applied to the modelled road-NO_x concentration for each receptor to provide adjusted modelled road-NO_x concentrations. The adjustment factor is higher in this case than is typical because the %HDVs includes a high proportion of buses than is accounted for in the EFT.
- A6.11 The total nitrogen dioxide concentrations have then been determined by combining the adjusted modelled road-NO_x concentrations with the predicted background NO₂ concentration within the NO_x to NO₂ calculator. Figure A6.5 compares final adjusted modelled total NO₂ at each of the monitoring sites to measured total NO₂ and shows a close agreement.

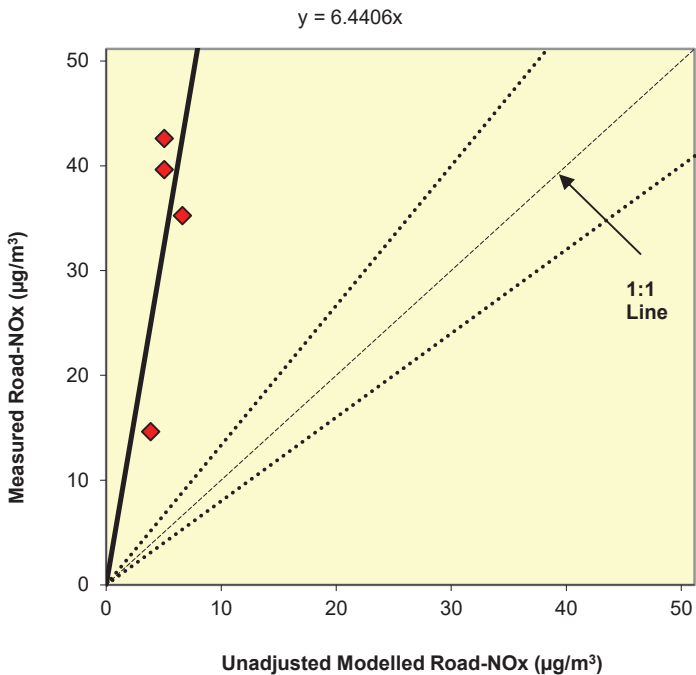


Figure A6.4: Comparison of Measured Road NO_x to Unadjusted Modelled Road NO_x Concentrations. The dashed lines show ± 25%.

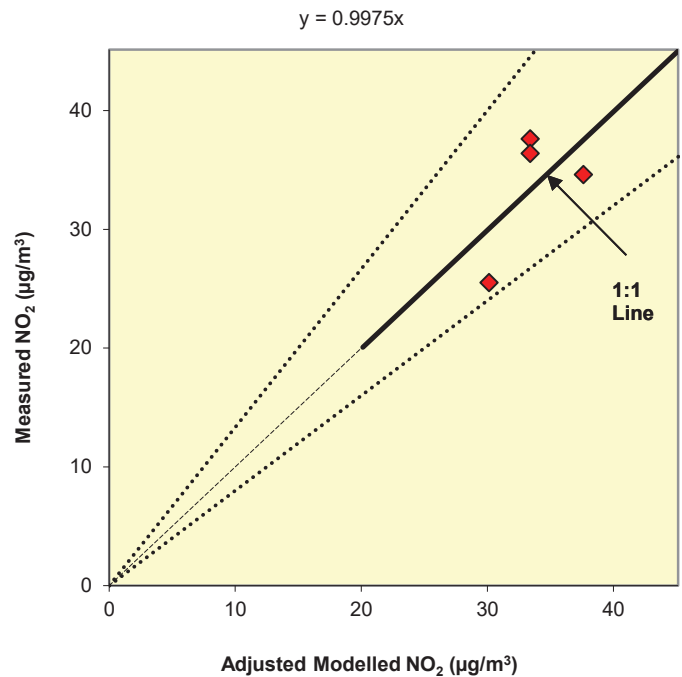


Figure A6.5: Comparison of Measured Total NO₂ to Final Adjusted Modelled Total NO₂ Concentrations. The dashed lines show $\pm 25\%$.

PM₁₀ and PM_{2.5}

- A6.12 The approach described above for NO_x and nitrogen dioxide determines the road increment of concentrations by subtracting the predicted local background from the roadside measurements. This works well for NO_x because the differences between roadside and background concentrations typically represent a large proportion of the total measured value. The same is not true for PM₁₀ and PM_{2.5} concentrations, which are dominated by non-road emissions, even at the roadside. In practice, the influence of a local road on concentrations can often be smaller than the uncertainty in the mapped background concentration. As an example of this, 31% of all roadside and kerbside sites in London which measured PM_{2.5} in 2019 with >75% data capture, recorded an annual mean concentration lower than the equivalent Defra mapped background value. Using measured background concentrations does not provide any significant benefit, owing largely to the spatial resolution of available measurements, but also because of measurement uncertainty. For example, hourly-mean PM_{2.5} concentrations measured at roadside sites are often lower than those measured at nearby urban background sites, while concentrations at urban background sites are often lower than those measured at rural sites.
- A6.13 For these reasons, it is not appropriate to calculate the annual mean road-increment to PM₁₀ and PM_{2.5} concentrations by subtracting either the mapped background or a local measured background concentration. This, in turn, means that the approach to model adjustment which is described for NO_x and NO₂ is not appropriate for PM₁₀ and PM_{2.5}. Historically, many studies have derived a model

adjustment factor for NO_x and applied this to PM₁₀ and PM_{2.5}. This is also not appropriate, since there is no reason to expect the same bias in emissions of NO_x, PM₁₀ and PM_{2.5}.

- A6.14 While there is very strong evidence that EFT-based models have consistently under-predicted road-NO_x concentrations in urban areas, there is no equivalent evidence for PM₁₀ and PM_{2.5}. There is currently no strong basis for applying any adjustment to the model outputs. Predicted concentrations of PM₁₀ and PM_{2.5} have thus not been adjusted.

Post-processing

- A6.15 The model predicts road-NO_x concentrations at each receptor location. These concentrations have been adjusted using the adjustment factor set out above, which, along with the background NO₂, has been processed through the NO_x to NO₂ calculator available on the Defra LAQM Support website (Defra, 2024a). The traffic mix within the calculator has been set to “All London traffic”, which is considered suitable for the study area. The calculator predicts the component of NO₂ based on the adjusted road-NO_x and the background NO₂.

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A7 Air Quality Positive Statement

Introduction

- A7.1 The proposed development involves the:
- “Demolition of existing buildings and phased redevelopment to provide a replacement supermarket and associated basement car parking *Use Class E(a)); flexible retail, leisure (including drinking establishment), and commercial accommodation (Use Class E/Sui Generis); dwellings (Use Class C3); landscaping; and associated works.”*
- A7.2 The proposed development will include only 11 blue-badge car parking spaces for the residential units and will utilise an all-electric energy strategy for the provision of heating and hot water (Air Source Heat Pumps (ASHP) and Water Source Heat Pumps (WSHPs), alongside photo-voltaic panels (PV)). It will also include two life-safety generators and two diesel water sprinklers (referred to as ‘the plant’) to be used only in emergencies.

Constraints and Opportunities

- A7.3 The air quality objectives apply at the residential units and at the retail spaces within the proposed development; however, retail represents relevant exposure to the 1-hour nitrogen dioxide objective only. Predicted concentrations presented within **ES Volume 1, Chapter 8: Air Quality** indicate that the annual mean and 1-hour mean objective will be met at worst-case locations within the proposed development. The proposed development will lead to a significant decrease in the development-generated traffic once operational along the local road network; the predicted impacts at the existing sensitive receptors, taking account the road traffic emissions, are all negligible and the annual mean concentrations are below the relevant objectives both with and without the proposed development.
- A7.4 The Site itself is in a well-connected location for public transport providing a wide range of transport services, including buses and London Underground and national rail services.
- A7.5 Table A7.1 details the measures that have been adopted within the design of the proposed development.

Table A7.1: Measures Adopted

Measure	Summary of the Measure	Reason for Undertaking Measure	Expected Benefits	Assessment and Reporting			How Will This Measure be Secured?
				Methods	Quantitative	Qualitative	
Building Emissions							
Energy Strategy	The energy strategy is all electric (ASHPs, WSHPs and PVs). Highly energy efficient building fabric will be utilised to reduce carbon emissions and energy demand through good practice design measures.	The Energy Strategy sets out the rationale for the measures.	The selected option will meet the carbon emission targets set by the London Plan. Reduced NOx emissions.	Energy Assessment	N	Y	Secured through the Energy Strategy.
Testing and maintenance of emergency diesel generators	The exhaust stack is located in a suitable area with good dispersion.	To reduce the impacts of emissions from the testing of the emergency diesel generator.	Non-significant effects on future and existing receptors.	Air quality assessment concludes that the effects will be ‘not significant’.	N	Y	Location of plant to be secured through approved plans and details of the plant to be secured through the Energy Strategy.
Transport Emissions							
Pedestrian and Cycle Access	The proposed development will provide cycle and pedestrian access and include cycle parking that meets the requirements of Policy T5 of the London Plan. Showers, lockers and changing facilities will also be provided.	To encourage users and residents to travel using sustainable modes of transport.	Reduced emissions associated with increased walking and cycling, in particular for short journeys.	Framework Travel Plan	N	Y	Transport infrastructure secured by approved plans or conditions.
Car Parking	The proposed development will be ‘car-free’ when considering the residential aspect of the	To facilitate a move towards car free lifestyle and	The lack of car parking provision will reduce the number of	Framework Travel Plan	N	Y	Transport infrastructure secured by

	development. This will discourage the use of private cars and encourage the use of existing public transport options.	promote the future use of local public transport provisions.	private car trips during the operation of the proposed development and therefore vehicle tailpipe emissions.				approved plans or conditions
Travel Plan	The site achieves a PTAL score of 6a/6b (very good access to public transport). A Travel Plan will be produced to encourage alternatives to vehicle use.	Reduced reliance on private transport modes.	Reducing internal combustion engine vehicle trips will lead to a reduction in emissions.	Transport Assessment and associated Travel Plans	Y	Y	Approved Transport Assessment
EV Charging	EV charging to be compliant with the London Plan Policy T6, a minimum of 20% of all spaces allocated for the Morrissons will have provision for active Electric Vehicle (EV) charging, with all remaining spaces having passive provision.	To promote the use of EV use in line with the London Plan.	Increased availability of suitable charging infrastructure will incentivise EV use which will help to reduce tailpipe emissions from road traffic in the future.	Transport Assessment	N	Y	Transport infrastructure secured by approved plans or conditions.

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A8 Construction Mitigation

A8.1 Table A8.1 presents a set of best-practice measures from the GLA guidance (GLA, 2014) that should be incorporated into the specification for the works. These measures should be written into a Dust Management Plan. 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 Dust Management Plan.

Table A8.1: 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		✓
Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes		✓
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		✓
Provide showers and ensure a change of shoes and clothes are required before going off-site to reduce transport of dust	✓	
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 not 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		✓
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)		✓
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		✓
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);		✓
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits;		✓
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		✓

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A9 Preliminary Air Quality Assessment



Preliminary Air Quality Assessment:
Aylesham Shopping Centre, Southwark

February 2023



Experts in air quality management & assessment



Document Control

Client	Trium Environmental Consulting LLP	Principal Contact	Jennifer Tester
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Job Number	J10/12795A/10
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Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J10/12795A/10/1/F1	3 February 2023	Final	Penny Wilson (Associate Director)

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Companies House Registration No: 2814570

1 Introduction

1.1 This report provides a preliminary air quality assessment, as required by the Greater London Authority's (GLA's) London Plan (GLA, 2021a), for the proposed development at the Aylesham Shopping Centre in the London Borough of Southwark (LBS) (hereafter referred to as the 'proposed development'). The proposed development site comprises the existing shopping centre, a Morrisons and its associated petrol station, and a car park.

1.2 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*".

1.3 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 to pollution and improves air quality.

1.4 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. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).

1.5 The UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2022a). Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is above this level.

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 for nitrogen dioxide and particulate matter (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 nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets and bus stations which are not fully enclosed.

- 1.7 Defra has also set objectives and targets for concentrations of PM_{2.5}. The objective for PM_{2.5} is not set in regulations and there is no requirement for local authorities to meet it. Because this objective is not set in regulations, it is not formally defined. It was originally set as an annual mean concentration of 25 mg/m³ but, following changes to the limit value for PM_{2.5} through the EU Exit Regulations 2020, a value of 20 mg/m³ is now commonly used.
- 1.8 Defra has also recently published a draft Statutory Instrument to set two new targets for PM_{2.5} concentrations in England. One target will be to achieve PM_{2.5} concentration of 10 µg/m³ by 2040. This will be accompanied by a second target to reduce overall population exposure to PM_{2.5}, which will be assessed by national government using its own measurements. These targets have been defined on the basis that Government is satisfied that they can be met. However, Defra recognises that the nature of PM_{2.5} concentrations, which are dominated by the long-range transport of emissions, means that only coordinated national-level action can allow the targets to be achieved. Furthermore, the difficulty of predicting PM_{2.5} concentrations in 2040 (AQEG, 2021) usually prevents any meaningful individual local-scale assessment. As such, the targets will provide metrics against which central Government can assess its own progress. There is no expectation that individual local authorities will use them to assess compliance, or that they will be used explicitly within development-control decisions. Defra's focus for local authorities is on reducing emissions which will help to drive national-level improvements, rather than addressing PM_{2.5} concentrations in their own area. Similarly, in terms of planning decisions, it is most sensible to focus on optimising development to reduce emissions and exposure.
- 1.9 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010)¹. The limit values for nitrogen dioxide, PM₁₀ and PM_{2.5} are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one. 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).

¹ As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

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

Table 1: Air Quality Criteria for Nitrogen Dioxide (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

^a The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

- 1.11 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 the World Health Organisation (WHO) in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy (GLA, 2018) considers the 2005 guideline of 10 µg/m³. The guideline is not currently in UK regulations and there is no explicit requirement to assess against it.

2 Baseline Air Quality

- 2.1 The proposed development is located within the Air Quality Management Area (AQMA) declared by Southwark Council for exceedances of the annual mean nitrogen dioxide and 24-hour PM₁₀ objectives. The proposed development is also located within one of the GLA's Air Quality Focus Areas (Peckham Town Centre), as shown in Figure 1; these are locations with high levels of human exposure where the annual mean limit value for nitrogen dioxide is exceeded. The dominant source of emissions in such areas is road traffic.
- 2.2 Peckham Bus Station is adjacent to the proposed development site, emissions from which could potentially influence air quality for future occupants and are difficult to replicate in air quality models. As a result, an on-site air quality monitoring survey has been carried out to inform this Preliminary Air Quality Assessment and the results are discussed below.

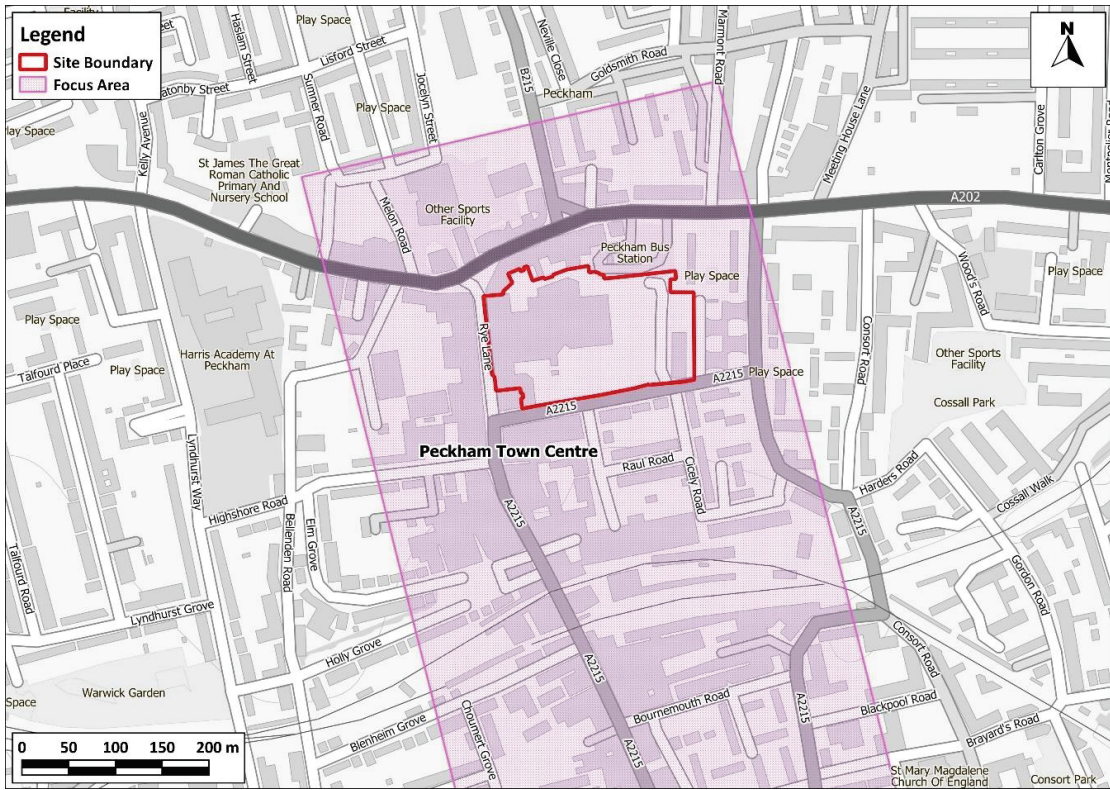


Figure 1: Proposed Development and Focus Area

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

Local Air Quality Monitoring

2.4 Southwark Council currently operates six automatic monitoring stations within its area, with monitoring station SWK 5 being the closest to the proposed development, located approximately 1 km to the northeast. Southwark Council also operates a network of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko International Ltd (using the 20% TEA in water method), with five diffusion tube monitoring sites located within 1 km of the proposed development.

2.5 Annual mean results from these monitoring sites for the years 2015 to 2021 are summarised in Table 2, while results relating to the 1-hour mean objective are summarised in Table 3. The locations of the diffusion tubes are shown in Figure 2. The monitoring data have been taken from Southwark Council’s 2021 Annual Status Report (Southwark Council, 2022).

Table 2: Summary of Annual Mean NO₂ Monitoring (2015-2019) (µg/m³) ^{a, b}

Site ID	Site Type	Location	2015	2016	2017	2018	2019	2020	2021
SWK5	Roadside	Old Kent Road	45.0	53.0	42.0	41.0	35.0	25.0	29.0
SDT6	Kerbside	Adjacent to 168 Queens Road	49.7	45.1	63.1	38.0	36.1	35.0	28.4
SDT7	Kerbside	Adjacent to 167A Rye Lane	52.5	45.9	46.4	34.9	31.6	20.7	21.0
SDT93	Roadside	Lamppost 9 adjacent to 14 Hanover Park	-	-	58.4	53.3	37.8	30.7	33.1
SDT105	Kerbside	Lamppost adjacent to Oliver Goldsmith School entrance Southampton Way	-	-	44.2	39.8	35.6	24.7	29.9
SDT132	Kerbside	Lamppost 2732/01 adjacent to 117-125 Rye Lane	-	-	-	-	33.0	21.5	23.9
Objective			40						

^a Exceedances of the objectives are shown in **bold**.

^b Exceedances of the 60 µg/m³ proxy value, indicating a potential exceedance of the 1-hour mean nitrogen dioxide objective, are shown in **bold and underlined**.

Table 3: Number of Hours With NO₂ Concentrations Above 200 µg/m³

Site No.	Site Type	Location	2015	2016	2017	2018	2019	2020	2021
SWK5	Roadside	Old Kent Road	1	1	0	0	0	0	0
Objective			18						

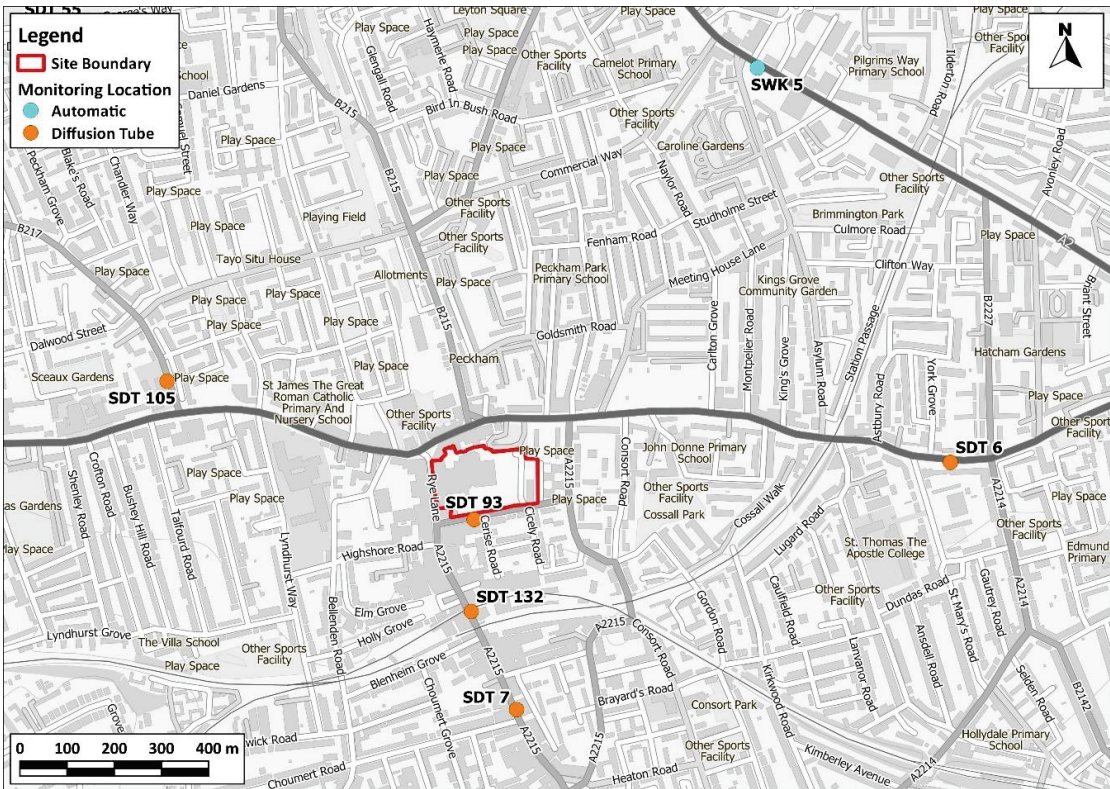


Figure 2: Southwark Council Monitoring Locations and the Application Site Boundary

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- 2.6 The results presented in Table 2 show exceedances of the annual mean nitrogen dioxide objective between 2015 and 2018 at the majority of the monitoring sites; concentrations at all diffusion tube monitoring sites have remained below the objective since 2019. Overall, there is a downward trend in measured annual mean nitrogen dioxide concentrations over the monitoring period presented.
- 2.7 Regarding the 1-hour mean nitrogen dioxide objective, only diffusion tube monitoring site SDT6 measured an exceedance of the 60 µg/m³, in 2017, indicating a potential exceedance of the 1-hour mean objective. However, the 1-hour mean objective was not exceeded in more recent years nor at the automatic monitoring station, as seen in Table 3.

- 2.8 Although results for 2020 and 2021 are presented for completeness, they should be treated with caution; reduced vehicle activity brought about by the Covid-19 pandemic has generally resulted in reduced pollutant concentrations.
- 2.9 The SWK5 roadside automatic monitoring station, located approximately 1 km northeast of the proposed development, is the closest station which measures PM₁₀ and PM_{2.5} concentrations. Annual mean results for the years 2015 to 2021 are summarised in Table 4, while results relating to the daily mean objective are summarised in Table 5.

Table 4: Summary of Annual Mean PM₁₀ and PM_{2.5} Monitoring (2015-2021) (µg/m³)

Site ID	Site Type	Location	2015	2016	2017	2018	2019	2020	2021
PM ₁₀									
SWK5	Roadside	Old Kent Road	21	24	22	22	24	22	21
Objective			40						
PM _{2.5}									
SWK5	Roadside	Old Kent Road	-	-	-	-	-	10	9
Objective/GLA target			20/10 ^a						

^a The 20 µg/m³ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m³ is the GLA target for annual mean PM_{2.5}; again, there is no requirement for local authorities to meet this.

Table 5: Number of Days With PM₁₀ Concentrations Above 50 µg/m³

Site ID	Site Type	Location	2015	2016	2017	2018	2019	2020	2021
SWK5	Roadside	Old Kent Road	4	18	19	8	2	11	8
Objective			35						

- 2.10 As shown in Table 4 and Table 5, measured concentrations of PM₁₀ and PM_{2.5} have remained below their respective objectives.
- 2.11 In addition to the locally measured concentrations discussed above, estimated background concentrations at the proposed development have been determined using Defra's 2018-based background maps (Defra, 2022b); these cover the whole of the UK on a 1x1 k grid. The background annual mean nitrogen dioxide maps for 2019 have been calibrated against concurrent measurements from Inner London monitoring sites (AQC, 2020). Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted.
- 2.12 The estimated background pollutant concentrations at the proposed development are set out in are set out in Table 6 for the years 2019 (to align with the most recent year of monitoring data available by Southwark Council unaffected by the Covid-19 pandemic) and 2023 (the current year).

Table 6: Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2023 ($\mu\text{g}/\text{m}^3$)

Year	NO ₂	PM ₁₀	PM _{2.5}
2019	21.9	19.4	12.7
2023	18.6	18.3	11.9
Objective / GLA target	40	40	20/10 ^a

^a The 20 $\mu\text{g}/\text{m}^3$ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 $\mu\text{g}/\text{m}^3$ is the GLA target for annual mean PM_{2.5}; again, there is no requirement for local authorities to meet this.

2.13 The background concentrations are well below the respective objectives; however, the background annual mean PM_{2.5} concentrations exceed the GLA target value of 10 $\mu\text{g}/\text{m}^3$. It should be noted, however, that exceedances of the target value are very common, particularly within Greater London, and their nationwide achievement is very unlikely to be possible before 2030 (Defra, 2019).

On-Site Nitrogen Dioxide Monitoring

2.14 In addition to the local monitoring data presented in the previous section, nitrogen dioxide monitoring was undertaken at six locations in the vicinity of the proposed development, with one monitoring site (DT5) co-located with the diffusion tube monitoring site (SDT93). Monitoring was carried out using passive diffusion tubes prepared and analysed by Gradko, using 20% TEA in water. The monitoring was undertaken over three periods of approximately one month each, from 22nd August 2022 to 30th November 2022. Further details of the monitoring campaign and results processing are provided in the Air Quality Monitoring Report (AQC, 2023).

2.15 A description of the diffusion tube locations is provided in Table 7 and the locations of the tubes is shown in Figure 3.

Table 7: Description of Diffusion Tube Monitoring Locations

Site ID	Location	Distance from Kerb	Height ^a
DT1	Pipe on the corner of The Aylesham Centre east of Rye Lane	5.0 m	2.7 m
DT2	Camera pole adjacent Peckham Bus Station (Stop H)	3.5 m	2.7 m
DT3	Lamppost west of Peckham Bus Station (Stop E)	4.5 m	3.2 m
DT4	No entry sign east of Conduit Road	4.5 m	3.0 m
DT5	Lamppost at 14 Hanover Park	0.5 m	2.3 m
DT6	20 mph sign at 44 Hanover Park	0.5 m	2.9 m

^a Each tube was installed at its respective location, at a height where air flow would not be disturbed or blocked by any existing signage or street-furniture. In addition, tube DT5 was installed at the same height as the Council's tube (SDT93).

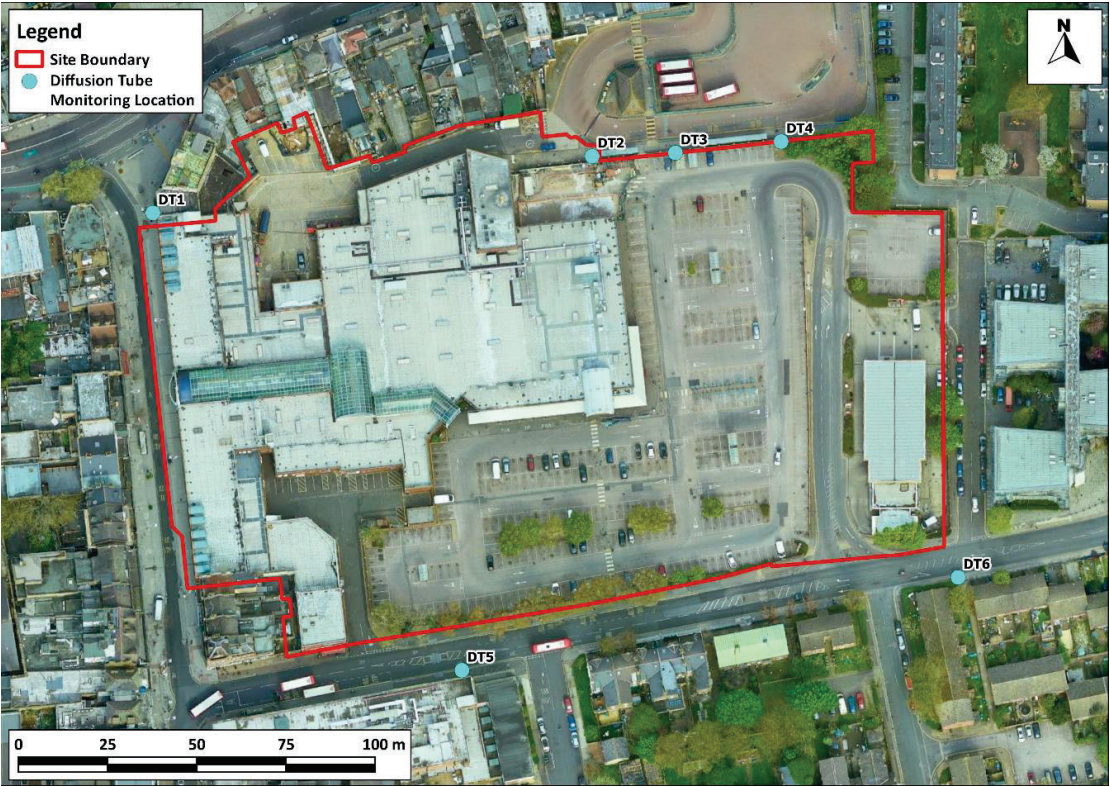


Figure 3: Diffusion Tube Monitoring Locations

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2.16 The fully adjusted 2022 annual mean equivalent nitrogen dioxide concentrations measured at the six sites in the vicinity of the proposed development are shown in Table 8.

Table 8: Diffusion Tube Monitoring Results – 2022 Annual Mean Equivalent

Site ID	Location	Annual Mean NO ₂ Concentration ($\mu\text{g}/\text{m}^3$)
DT1	Pipe on the corner of The Aylesham Centre east of Rye Lane	29.6
DT2	Camera pole adjacent Peckham Bus Station (Stop H)	30.5
DT3	Lamppost west of Peckham Bus Station (Stop E)	33.3
DT4	Lamppost east of Peckham Bus Station (Stop E)	33.8
DT5	Lamppost at 14 Hanover Park	43.8
DT6	20 mph sign at 44 Hanover Park	40.2

2.17 As shown in Table 8, exceedances of the annual mean nitrogen dioxide were measured at the DT5 and DT6 monitoring sites, and all other locations were below the objective. Sites DT5 and DT6 are

- both located within 0.5 m of the kerbside of the busy Hanover Park, and as such concentrations are expected to be higher, compared to the other four sites.
- 2.18 As mentioned in Paragraph 2.14, diffusion tube monitoring site DT5 was co-located with LBS's diffusion tube SDT93. In 2019, SDT93 measured a concentration of 37.8 $\mu\text{g}/\text{m}^3$, compared to site DT5 which measured a concentration of 43.8 $\mu\text{g}/\text{m}^3$ in 2022. However, during 2019 Rye Lane (to the west of Hanover Park) was closed to all motor traffic, except deliveries, due to ongoing road work. As such, there was a reduced number of vehicles using Hanover Park, which led to a significant decrease in concentrations being measured at site SDT93 in 2019.
- 2.19 Diffusion tube monitoring sites DT2, DT3 and DT4 are all located within 4.5 m of Peckham Bus Station; concentrations at these sites were all below the air quality objective.

3 LAEI Mapped Concentrations

- 3.1 Modelled annual mean nitrogen dioxide concentrations presented in the London Atmospheric Emissions Inventory (LAEI) database (GLA, 2021b) in the vicinity of the proposed development are shown in Figure 4. The maximum modelled annual mean concentration in 2019 within the proposed development site boundary (located in the northwest corner of the site) is 36.1 $\mu\text{g}/\text{m}^3$, which is below the annual mean objective. The maximum modelled 2019 annual mean PM_{10} and $\text{PM}_{2.5}$ concentrations within the site boundary are 20.2 $\mu\text{g}/\text{m}^3$ and 11.9 $\mu\text{g}/\text{m}^3$, respectively, well below the relevant objectives but above the GLA $\text{PM}_{2.5}$ target.

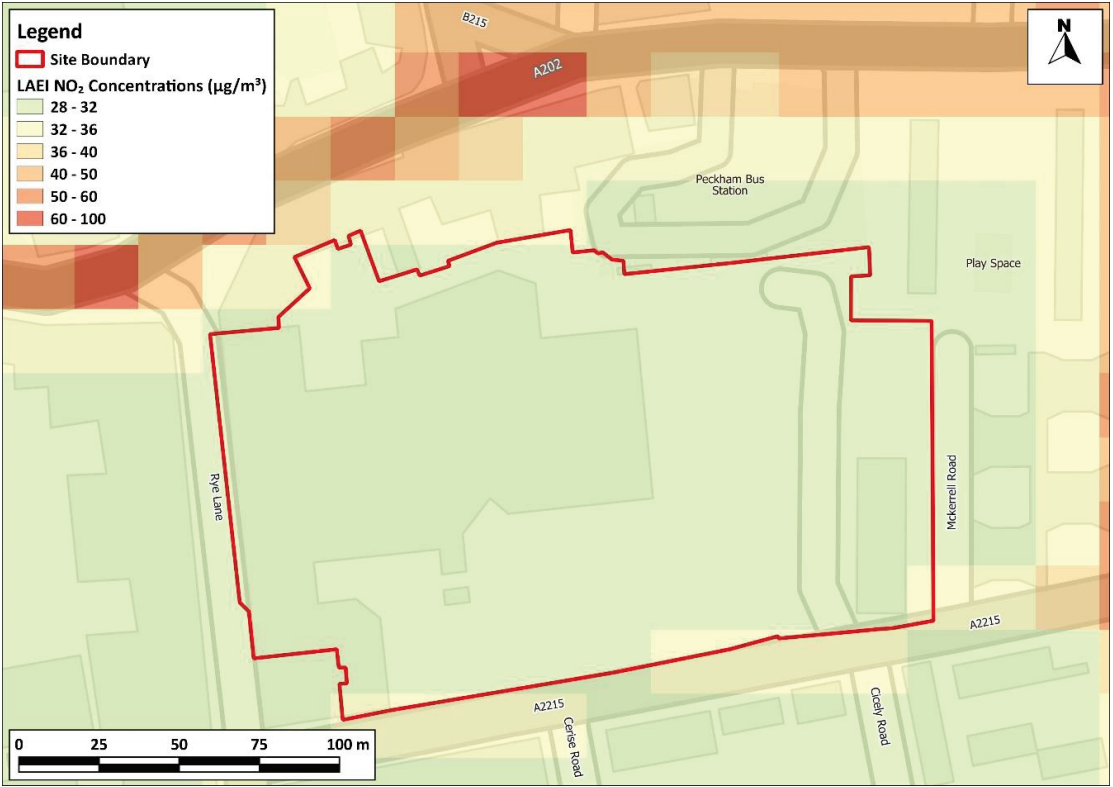


Figure 4: LAEI modelled 2019 NO₂ concentrations.

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4 Proposed Development Emissions

- 4.1 The application site currently comprises the existing Aylesham Shopping Centre, a Morrisons and its associated petrol station and car park.
- 4.2 The number of vehicle movements generated as a result of the operation of the proposed development is currently unknown; however, it will be considered in the context of the screening criteria (25 Heavy Duty Vehicles (HDVs) and 100 Light Duty Vehicles (LDVs)) provided in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017). Should the proposed development lead to an increase in vehicle movements that exceeds the screening criteria, then detailed dispersion modelling of road traffic emissions will be undertaken to determine the impact of these emissions upon existing residential properties in the surrounding area and on the proposed development itself. If the development-generated traffic flows are below these criteria, then a detailed assessment of air quality impacts can be screened out and considered to be 'not significant'.

- 4.3 It is likely that the proposed development will be provided with heat and hot water via a connection to the existing South East London Combined Heat and Power (SELCHP) network; as such, there will be no associated point-source emissions. However, if the proposed development does include centralised energy plant (e.g., CHP plant / large gas-fired boilers) and/or diesel-fired backup generators, their emissions will be assessed to determine the impact upon sensitive properties in the surrounding area, as well as upon future residents and users of the proposed development itself, and to determine the need for any mitigation by design (such as the specifications for the plant, the location of the flues and the proposed testing and maintenance regime).

5 Site Suitability

- 5.1 The application site is bounded by Peckham Bus Station, commercial and residential properties to the north, Mckerell Road and residential properties to the east, Hanover Park, commercial and residential properties to the south and Rye Lane and commercial units to the west.
- 5.2 The residential units within the proposed development represent locations of relevant exposure to the annual mean and 24-hour mean air quality objectives.
- 5.3 As shown in Table 2, measured annual mean nitrogen dioxide concentrations at roadside monitoring site SDT93, located on the opposite side of Hanover Park to the proposed development, have remained below the respective objective since 2019. As mentioned, however, Hanover Park experienced a reduced traffic volume in 2019 due to ongoing road works on Rye Lane, which led to a significant decrease in measured concentrations. In contrast, diffusion tube monitoring sites DT5 and DT6, from the three-month monitoring survey undertaken in 2022, both measured an exceedance of the objective, at 43.8 $\mu\text{g}/\text{m}^3$ and 40.2 $\mu\text{g}/\text{m}^3$ respectively. Both sites are located within 0.5 m of the kerbside of Hanover Park, and the closest proposed façade to Hanover Park is approximately 4 m away; concentrations at the building facades are, therefore, anticipated to be lower than those measured at the monitoring sites.
- 5.4 Since the proposed development buildings are anticipated to be located further away from the bus station than diffusion tubes DT2, DT3 and DT4, at which measured concentrations were below the objectives, it is considered unlikely that there will be any exceedances of the objectives at the facades of the development buildings overlooking Peckham Bus Station.
- 5.5 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 Low Emission Zone (LEZ) and Ultra Low Emission Zone (ULEZ), and the implementation of the London Environment Strategy (GLA, 2018). Air quality is expected to continue to improve into the future and concentrations at the proposed development site are expected to be below the objectives by the anticipated opening year.

Best practice design measures are set out in Section 6 to mitigate the impacts of emissions from road traffic on future residents and users of the proposed development.

6 Air Quality Design Principles

- 6.1 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:
- Alternatives to the use of the diesel generators for emergency power provision should be considered to reduce or avoid associated emissions (i.e., through connection to a second sub-station, for example);
 - If diesel generators are unavoidable, the exhaust should be located at the highest point within the proposed development (i.e., at the highest roof level) to ensure adequate dispersion and minimise the impact of emissions upon surrounding sensitive properties, as well as minimising the impact upon the proposed development itself;
 - Increasing the set-back distance of proposed buildings from the adjacent roads (in particular Hanover Park) and bus station as far as 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 any energy plant or generator flues);
 - Maximise access to public transport options, prioritisation of cycle parking, as well as cycle and walking routes to minimise private car trips to and from the site;
 - Provision of cycle storage facilities at locations which are easy to access and are close to cycle routes both within and outside the proposed development, and showers / changing facilities for commercial uses to enable staff to cycle to work;
 - Incorporating the Healthy Streets Approach into the scheme to reduce the need to travel, or to promote sustainable transport opportunities; and
 - Electric vehicle charging provision in line with the London Plan requirements.

7 Conclusions

- 7.1 The proposed development is located within an AQMA and is also located within one of the GLA's air quality Focus Areas.

- 7.2 Baseline conditions show that pollutant concentrations at long-term monitoring sites in the local area have remained below the objectives since 2019. However, results from the three-month monitoring survey, undertaken by AQC in 2022, showed two exceedances of the annual mean nitrogen dioxide objective within 0.5 m of Hanover Park. Concentrations are expected to reduce in future years through the implementation of more stringent vehicle emission standards, reduced background pollutant concentrations and the uptake of zero emission vehicles within the fleet.
- 7.3 The trip generation of the proposed development is currently unknown; once available, it will be compared with the screening criteria provided in the EPUK/IAQM guidance. Further assessment of road traffic emissions will be undertaken if the screening criteria are exceeded, to determine the air quality impacts upon sensitive land-uses in the surrounding area, including within the proposed development itself, using detailed dispersion modelling.
- 7.4 It is anticipated that the proposed development will be provided with heat and hot water via a connection to the SLECHP network and as such there will be no associated point-source emissions. However, it is currently unknown whether centralised energy plant and/or diesel-fired backup generators will be incorporated within the proposed development. If such plant are proposed, their emissions will be assessed to determine the impacts upon sensitive existing receptors and upon future residents and users of the proposed development.
- 7.5 The information on baseline conditions indicates that the air quality objectives will be met at the proposed building facades within the development, although there is a risk of the annual mean nitrogen dioxide objective being exceeded with 1-2 m of Hanover Park. 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.

8 References

AQC (2020) *Calibrating Defra's 2018-based Background NOx and NO2 Maps against 2019 Measurements*, Available: <https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=163e7362-578e-4a4c-8feb-0006f1531ff1>.

AQC (2023) *Air Quality Monitoring Report: Aylesham Shopping Centre, Southwark*.

AQEG (2021) *Modelling of future PM2.5 in support of the Defra air quality target setting process*, [Online], Available: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2107150951_Modelling_PM25_workshop_summary_15_03_21.pdf.

Defra (2019) *Clean Air Strategy 2019*, Available: <https://www.gov.uk/government/publications/clean-air-strategy-2019>.

Defra (2022a) *Review & Assessment: Technical Guidance LAQM.TG22 August 2022 Version*, [Online], Available: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>.

Defra (2022b) *Local Air Quality Management (LAQM) Support Website*, Available: <http://laqm.defra.gov.uk/>.

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

GLA (2018) *London Environment Strategy*, Available: <https://www.london.gov.uk/what-we-do/environment/london-environment-strategy>.

GLA (2019) 'London Local Air Quality Management Technical Guidance 2019', no. https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf.

GLA (2021a) *The London Plan: The Spatial Development Strategy for London*, Available: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf.

GLA (2021b) *London Atmospheric Emissions Inventory (LAEI) 2019*, Available: <https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019>.

Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: <http://iaqm.co.uk/guidance/>.

Southwark Council (2022) *Air Quality Annual Status - Report for 2021*.

The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043 (2002), HMSO, Available: <https://www.legislation.gov.uk/uksi/2002/3043/contents/made>.

The Air Quality (England) Regulations 2000 Statutory Instrument 928 (2000), HMSO, Available: <http://www.legislation.gov.uk/uksi/2000/928/contents/made>.

The Air Quality Standards Regulations 2010 Statutory Instrument 1001 (2010), HMSO.

The European Parliament and the Council of the European Union (2008) *Directive 2008/50/EC of the European Parliament and of the Council.*

9 Glossary

AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
ASR	Annual Status Report
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
LBS	London Borough of Southwark
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
WHO	World Health Organisation

10 Appendices

A1 Professional Experience..... 19

A1 Professional Experience

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Ms Wilson is an Associate Director with AQC, with more than 20 years’ relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including odours. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning applications. She has provided expert evidence to a number of Public Inquiries and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

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Mr Chousos is a Consultant with AQC, having joined in May 2019. Prior to joining AQC, he completed an MSc in Air Pollution Management and Control at the University of Birmingham, specialising in air pollution control technologies and management, and data processing using R. He also holds a degree in Environmental Geoscience from the University of Cardiff, where he undertook a year in industry working in the field of photo-catalytic technology. He is now gaining experience in the field of air quality monitoring and assessment.

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A10 References

CERC (2016) *London Urban Canopy Data*, Available: <http://www.cerc.co.uk/IJARSG2016>.

Clean Air Act 1993 (1993), HMSO, Available: <http://www.legislation.gov.uk/ukpga/1993/11/contents>.

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

Defra (2017) *Air quality plan for nitrogen dioxide (NO₂) in the UK*, Available: <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>.

Defra (2018a) *Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations*, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746100/air-quality-no2-plan-supplement.pdf.

Defra (2018b) *A Green Future: Our 25 Year Plan to Improve the Environment*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf.

Defra (2019) *Clean Air Strategy 2019*, Available: <https://www.gov.uk/government/publications/clean-air-strategy-2019>.

Defra (2023a) *Air Quality Strategy: Framework for Local Authority Delivery*, [Online], Available: <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery>.

Defra (2023b) *Environmental Improvement Plan 2023*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf.

Defra (2024a) *Local Air Quality Management (LAQM) Support Website*, Available: <http://laqm.defra.gov.uk/>.

Defra (2024b) *Local Air Quality Management (LAQM) Support Website*, Available: <http://laqm.defra.gov.uk/>.

DfT (2018) *The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy*.

DfT (2023) *DfT Road traffic statistics (TRA03)*, Available: <https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra>.

Environment Act 2021 (2021).

Environmental Protection Act 1990 (1990), Available: <http://www.legislation.gov.uk/ukpga/1990/43/contents>.

GLA (2014) *The Control of Dust and Emissions from Construction and Demolition SPG*, Available: <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/control-dust-and>.

GLA (2018a) *London Environment Strategy*, Available: <https://www.london.gov.uk/what-we-do/environment/london-environment-strategy>.

GLA (2018b) *Mayor's Transport Strategy*, Available: <https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf>.

GLA (2021) *The London Plan: The Spatial Development Strategy for London*, Available: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf.

GLA (2023) *London Plan Guidance - Air Quality Neutral*, Available: <https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance>.

HM Government (2021a) *Ventilation - Approved Document F*, [Online], Available: <https://www.gov.uk/government/publications/ventilation-approved-document-f>.

HM Government (2021b) *Infrastructure for the charging of electric vehicles - Approved Document S*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057375/AD_S.pdf.

IAQM (2024) *Guidance on the Assessment of Dust from Demolition and Construction v2.2*, Available: <http://iaqm.co.uk/guidance/>.

London Borough of Southwark (2009) *Sustainable design and construction*.

London Borough of Southwark (2016) *Technical Guidance for Demolition and Construction*.

London Borough of Southwark (2017) *Technical Guidance on Air Quality*.

London Borough of Southwark (2019a) 'Movement Plan: Setting a Direction for Transport'.

London Borough of Southwark (2019b) 'Southwark's Local Implementation Plan 3'.

London Borough of Southwark (2022a) *The Southwark Plan 2019 - 2036*.

London Borough of Southwark (2023a) *Air Quality Management Area Order*, [Online], Available: <https://www.southwark.gov.uk/assets/attach/169720/Air-Quality-Management-Area-Order-sealed-24-January-2023.pdf>.

London Borough of Southwark (2023b) *Southwark Air Quality Action Plan 2023-2027*, [Online], Available: <https://www.southwark.gov.uk/assets/attach/169719/Southwark-Air-Quality-Action-Plan-2023-to-2027.pdf>.

Ministry of Housing, Communities & Local Government (2019) *Planning Practice Guidance*, Available: <https://www.gov.uk/government/collections/planning-practice-guidance>.

Ministry of Housing, Communities & Local Government (2022) *The Building Regulations 2010 Schedule 1*, 201022141st edition, Available:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/899279/Single_stitched_together_pdf_of_all_ADs__Jun20_.pdf.

Ministry of Housing, Communities & Local Government (2023) *National Planning Policy Framework*, [Online], Available:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf.

Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: <http://iaqm.co.uk/guidance/>.

Technical Guidance Note D1 (Dispersion) (1993), HMSO.

The Environmental Permitting (England and Wales) (Amendment) Regulations 2018 Statutory Instrument 110 (2018), HMSO, Available:
http://www.legislation.gov.uk/uksi/2018/110/pdfs/ukxi_20180110_en.pdf.

The European Parliament and the Council of the European Union (1997) *Directive 97/68/EC of the European Parliament and of the Council*, Available: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31997L0068>.

The European Parliament and the Council of the European Union (2015) *Directive 2015/2193/EU of the European Parliament and of the Council*, Available: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015L2193>.

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A11 Air Quality Monitoring Report (February 2023)



**Air Quality Monitoring
Report:**
Aylesham Shopping
Centre, Southwark

February 2023



Experts in air quality
management & assessment

Document Control

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1 Introduction

- 1.1 This report provides the results of a three-month nitrogen dioxide (NO₂) monitoring programme carried out in the vicinity of the proposed residential-led development at the Aylesham Shopping Centre in Southwark.
- 1.2 The proposed development is located adjacent to Peckham Bus Station, which has a high turnover of buses arriving and departing the station daily. Emissions from the buses can pose an issue for the air quality that future residents will experience and modelling the impacts of bus stations can be unrepresentative of real life conditions. As such, it was agreed that a three-month nitrogen dioxide monitoring programme be undertaken to better inform the results of the assessment and the likely air quality conditions experienced by future residents.
- 1.3 This report has been prepared taking into account all relevant local and national guidance and regulations.

2 Assessment Criteria

- 2.1 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).
- 2.2 The objectives for nitrogen dioxide were to have been achieved by 2005 and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2022).
- 2.3 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 objective for nitrogen dioxide is 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 1-hour mean objective applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets and bus stations which are not fully enclosed.
- 2.4 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³

3 Study-specific Monitoring

Diffusion Tube Locations

3.1 Nitrogen dioxide monitoring was undertaken at six locations in the vicinity of the proposed development, with one monitoring site (DT5) co-located with a diffusion tube monitoring site (SDT93), operated by the London Borough of Southwark (LBS). Monitoring was carried out using passive diffusion tubes prepared and analysed by Gradko, using 20% triethanolamine (TEA) in water. The monitoring was undertaken over three periods of approximately one month each, from 22nd August 2022 to 30th November 2022. A description of the diffusion tube locations is provided in Table 2 and the locations of the tubes is shown in Figure 1.

Table 2: Description of Diffusion Tube Monitoring Locations

Site ID	Location	Distance from Kerb	Height ^a
DT1	Pipe on the corner of The Aylesham Centre east of Rye Lane	5.0 m	2.7 m
DT2	Camera pole adjacent Peckham Bus Station (Stop H)	3.5 m	2.7 m
DT3	Lamppost west of Peckham Bus Station (Stop E)	4.5 m	3.2 m
DT4	No entry sign east of Conduit Road	4.5 m	3.0 m
DT5	Lamppost at 14 Hanover Park (adjacent to SDT93)	0.5 m	2.3 m
DT6	20 mph sign at 44 Hanover Park	0.5 m	2.9 m

^a Each tube was installed at its respective location, at a height where air flow would not be disturbed or blocked by any existing signage or street-furniture. In addition, tube DT5 was installed at the same height as the Council's tube (SDT93).

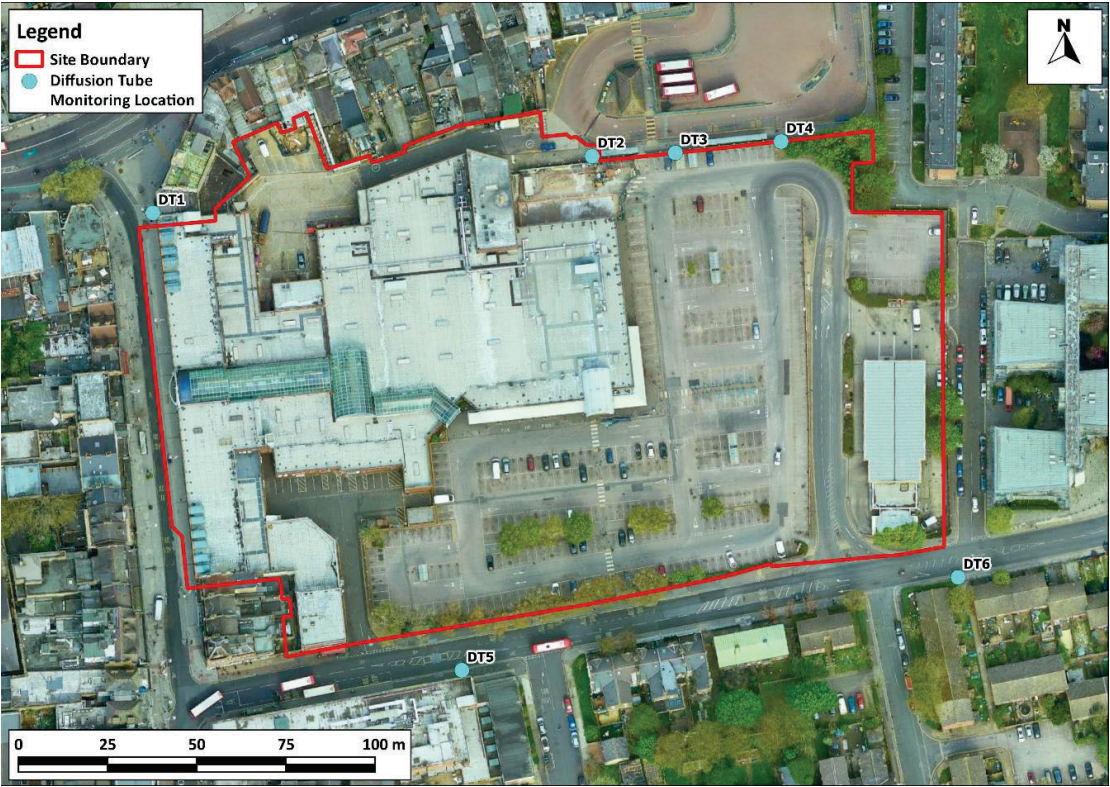


Figure 1: Diffusion Tube Monitoring Locations

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Bias-adjustment and Annualisation

3.2 The nitrogen dioxide diffusion tube monitoring has been undertaken for a period of three months; however, the key air quality objective with respect to nitrogen dioxide is an annual mean objective. Nitrogen dioxide concentrations vary seasonally and are typically higher in winter months than summer months. It is therefore necessary to undertake a correction known as 'annualisation' in order to adjust the three-month period mean into an equivalent annual mean. The three months of diffusion tube data have thus been adjusted to represent a 2022 annual mean following guidance in LAQM.TG (22) (Defra, 2022).

3.3 The Defra method involves the use of a number of nearby automatic background nitrogen dioxide monitoring stations to calculate a ratio between the annual mean nitrogen dioxide concentration and the period mean nitrogen dioxide concentration, where the annual mean is the 2022 annual average, and the period mean is for the period of 22nd August to 30th November 2022. This ratio has then been applied to the raw, three-month period mean diffusion tube monitoring results for 2022 in order to represent an equivalent annual mean concentration at each monitoring site (see Appendix A2 for further information).

- 3.4 The concentration of nitrogen dioxide absorbed by each diffusion tube will be dependent on the time period the diffusion tube was exposed to the air. The raw data for each diffusion tube have therefore been weighted according to the number of days in the specific period of time during which each tube was exposed. This allows accurate analysis of period mean results from tubes which were exposed for varying time periods.
- 3.5 Diffusion tubes are also known to show systematic bias in relation to automatic (reference) monitors, and it is therefore necessary to carry out a correction known as 'bias adjustment'. The annualised nitrogen dioxide concentrations have thus been bias-adjusted using the national bias-adjustment factor for 2021¹ (0.84) for the relevant diffusion tube type from Defra's national bias-adjustment spreadsheet (v 09/22). This is directly in-line with LBS's approach for adjustment of its diffusion tube results since LBS applied the same national bias adjustment factor (Southwark Council, 2022).

¹ 2022 factor not available at time of analysis

4 Results

- 4.1 The fully adjusted 2022 annual mean equivalent nitrogen dioxide concentrations measured at the six sites in the vicinity of the proposed development are shown in Table 3.

Table 3: Diffusion Tube Monitoring Results – 2022 Annual Mean Equivalent

Site ID	Location	Annual Mean NO ₂ Concentration (µg/m ³)
DT1	Pipe on the corner of The Aylesham Centre east of Rye Lane	29.6
DT2	Camera pole adjacent Peckham Bus Station (Stop H)	30.5
DT3	Lamppost west of Peckham Bus Station (Stop E)	33.3
DT4	Lamppost east of Peckham Bus Station (Stop E)	33.8
DT5	Lamppost at 14 Hanover Park (adjacent to SDT93)	43.8
DT6	20 mph sign at 44 Hanover Park	40.2

- 4.2 As shown in Table 3, exceedances of the annual mean nitrogen dioxide objective were measured at the DT5 and DT6 monitoring sites, and all other locations were below the objective. Sites DT5 and DT6 are both located within 0.5 m from the kerbside of the busy Hanover Park, and as such concentrations are expected to be higher, compared to the other four sites.
- 4.3 As mentioned in Paragraph 3.1, diffusion tube monitoring site DT5 was co-located with LBS's diffusion tube SDT93. 2022 monitoring data for SDT93 had not been published at the time of writing, so a direct comparison between the results cannot be made. In 2019, SDT93 measured a concentration of 37.8 µg/m³, compared to site DT5 which measured a concentration of 43.8 µg/m³ in 2022. However, during 2019, Rye Lane (to the west of Hanover Park) was closed to all motor traffic, except deliveries, due to ongoing road work. As such, there was a reduced number of vehicles using Hanover Park, which led to a significant decrease in concentrations being measured at site SDT93 in 2019.
- 4.4 Diffusion tube monitoring sites DT2, DT3 and DT4 are all located within 4.5 m of Peckham Bus Station; concentrations at these sites were all below the air quality objective. Since the proposed development buildings are anticipated to be located further away from the bus station, it is considered unlikely that there will be any exceedances of the objectives at the facades of the development buildings overlooking Peckham Bus Station.

5 Conclusions

- 5.1 A three-month nitrogen dioxide monitoring programme has been carried out in the vicinity of the proposed residential-led development at Aylesham Shopping Centre in Southwark. The monitoring was set up to give a better understanding of air quality at the proposed development site, taking account of emissions from the Peckham Bus Station.
- 5.2 The results of the monitoring survey show that measured annual mean nitrogen dioxide concentrations are below the objective value of 40 µg/m³ at all locations adjacent to Peckham Bus Station, with exceedances only measured at a kerbside locations on Hanover Park.
- 5.3 The presented results represent conditions in 2022; concentrations are expected to decline in future years as a result of local and national measures, such as the Government's Road to Zero Strategy (DfT, 2018) which will see the phasing-out of sales of new petrol and diesel cars and vans over the next decade, and therefore concentrations are expected to be lower than the measurements presented by the first year of occupation. Future residents of the proposed development are thus expected to experience acceptable air quality.

6 References

- Defra (2022) *Review & Assessment: Technical Guidance LAQM.TG22 August 2022 Version*, [Online], Available: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>.
- DfT (2018) *The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy*.
- GLA (2019) 'London Local Air Quality Management Technical Guidance 2019', no. https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf.
- Southwark Council (2022) *Annual Status Report for 2021*.
- The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043* (2002), HMSO, Available: <https://www.legislation.gov.uk/uksi/2002/3043/contents/made>.
- The Air Quality (England) Regulations 2000 Statutory Instrument 928* (2000), HMSO, Available: <http://www.legislation.gov.uk/uksi/2000/928/contents/made>.

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A1 Raw Diffusion Tube Results

A1.1 Raw monthly diffusion tube data and the monitoring periods are presented in Table A1.1.

Table A1.1: Raw Monthly Diffusion Tube Data for 22nd August 2022 to 30th November 2022 (µg/m³)

Site ID	22/08/22 to 30/09/22	30/09/22 to 01/11/22	01/11/22 to 30/11/22	Weighted Period Mean	Bias Adjusted Mean ^a
DT1	32.7	30.8	31.6	31.8	26.7
DT2	33.0	32.0	33.2	32.7	27.5
DT3	39.3	32.1	35.0	35.8	30.0
DT4	38.9	34.4	34.6	36.2	30.4
DT5	42.6	49.4	50.2	47.0	39.5
DT6	45.4	42.4	41.0	43.2	36.3

^a See Paragraph 3.2

A2 Adjustment of Short-Term Data to Annual Mean

- A2.1 The 2022 monitoring data presented in this report do not represent a full calendar year. Therefore, in accordance with the guidance set out in Boxes 7.10 to 7.12 of LAQM.TG (22), the data have been adjusted to an annual mean, based on the ratio of concentrations during the short-term monitoring period (3 months; August 2022 to November 2022) to those over the 2022 calendar year at four background sites operated as part of the Automatic Urban and Rural Network (AURN) where long-term data are available.
- A2.2 The annual mean NO₂ concentrations and the period means for each of the four monitoring sites from which adjustment factors have been calculated are presented in Table A2.1, along with the Overall Factors.

Table A2.1: Data used to Adjust Short-term Monitoring Data to an Annual Mean Equivalent

Period Mean Concentration (µg/m³)	London Bloomsbury	London Hillingdon	Rochester Stoke	Southend-on-Sea	Overall Factor
2022	24.0	27.5	11.4	15.2	-
August 2022 to November 2022	21.3	28.6	9.5	13.3	-
Adjustment Factor	1.1	1.0	1.2	1.2	1.1