

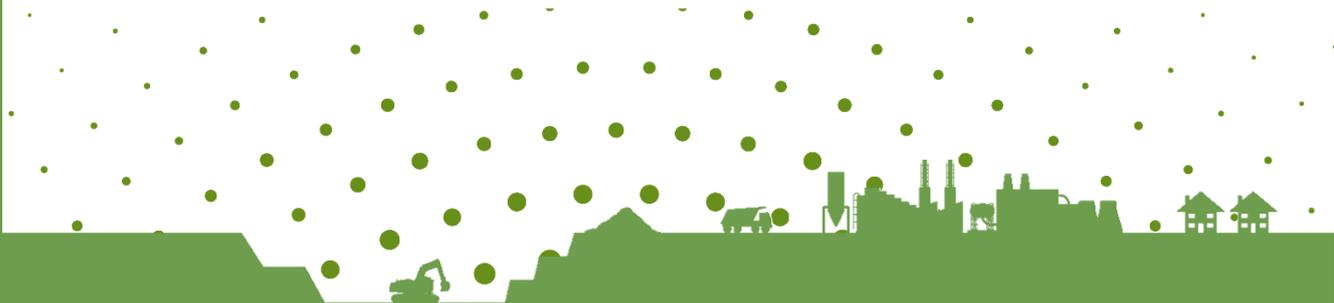


Air Quality Assessment

235 & 237 Broadway, Bexleyheath

November, 2023

Pagecolt Ltd



Document Control Sheet

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Report Prepared By

DustScanAQ
Unit 8 Nimrod
De Havilland Way
Witney
OX29 0YG
United Kingdom
Tel: + 44 (0) 1608 810110
E-mail: info@dustscan.co.uk

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Glossary of Terms

Term	Definition
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LBB	London Borough of Bexley
LNR	Local Nature Reserve
NAQS	National Air Quality Strategy
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NRMM	Non-road Mobile Machinery
PM	Particulate Matter
Ramsar Sites	Designated Wetland
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SPG	Supplementary Planning Guidance
SSSI	Sites of Special Scientific Interest
WHO	World Health Organisation

1 Introduction

Pagecolt Ltd (hereafter referred to as Pagecolt) are seeking planning permission for a development at 235 & 237 Broadway, Bexleyheath, DA6 7EL. Hereafter referred to as the 'proposed development', it comprises of the "*proposed demolition of existing buildings and redevelopment to provide commercial use (Use Class E) at ground floor with residential flats (Use Class C3) above over four floors, together with associated cycle and refuse storage and service area*".

The planning application will be determined by the London Borough of Bexley (LBB).

DustScanAQ (DS) have been instructed by Pagecolt to produce an Air Quality Assessment to support the planning application.

DS contacted LBB on 08/11/2023 to outline our proposed scope of assessment. Response from LBB was received on the same day where no objection to the proposed scope was made.

The potential air quality impacts arising as a result of the proposed development have been assessed using the latest planning guidance from Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)¹, Department for Environment, Food and Rural Affairs (Defra)².

1.1 Objectives

This report provides an assessment on the following key issues associated with the construction and operational phases of the proposed development:

- Nuisance, loss of amenity and health impacts associated with the construction phase of the proposed development on sensitive receptors;
- Characterisation of the baseline conditions at the site using monitored pollutant data from LBB and background concentrations from Defra background maps;
- Assessment of the suitability of the proposed development for the introduction of new residential receptors; and
- Propose mitigation measures where required.

¹ IAQM (2017): 'Land Use Planning and Development Control: Planning for Air Quality v1.2'.

² Defra (2022): 'Local Air Quality Management – Technical Guidance (TG22)'.

1.2 Proposed Development Location

The proposed development is situated within the jurisdiction of LBB at 235 & 237 Broadway, Bexleyheath, DA6 7EL. The location of the proposed development within Bexley is shown below in Figure 1.1.

As shown in Figure 1.2, the site is bounded to the north by Broadway and to the west by Albion Road. To the south of the site is Oaklands Car Park and to the east lie further commercial and residential units.

The proposed development is located within the Bexley Air Quality Management Area (AQMA), declared on 01/03/2007 for exceedance of the NO₂ annual mean objective and PM₁₀ annual and 24-hour mean objectives.

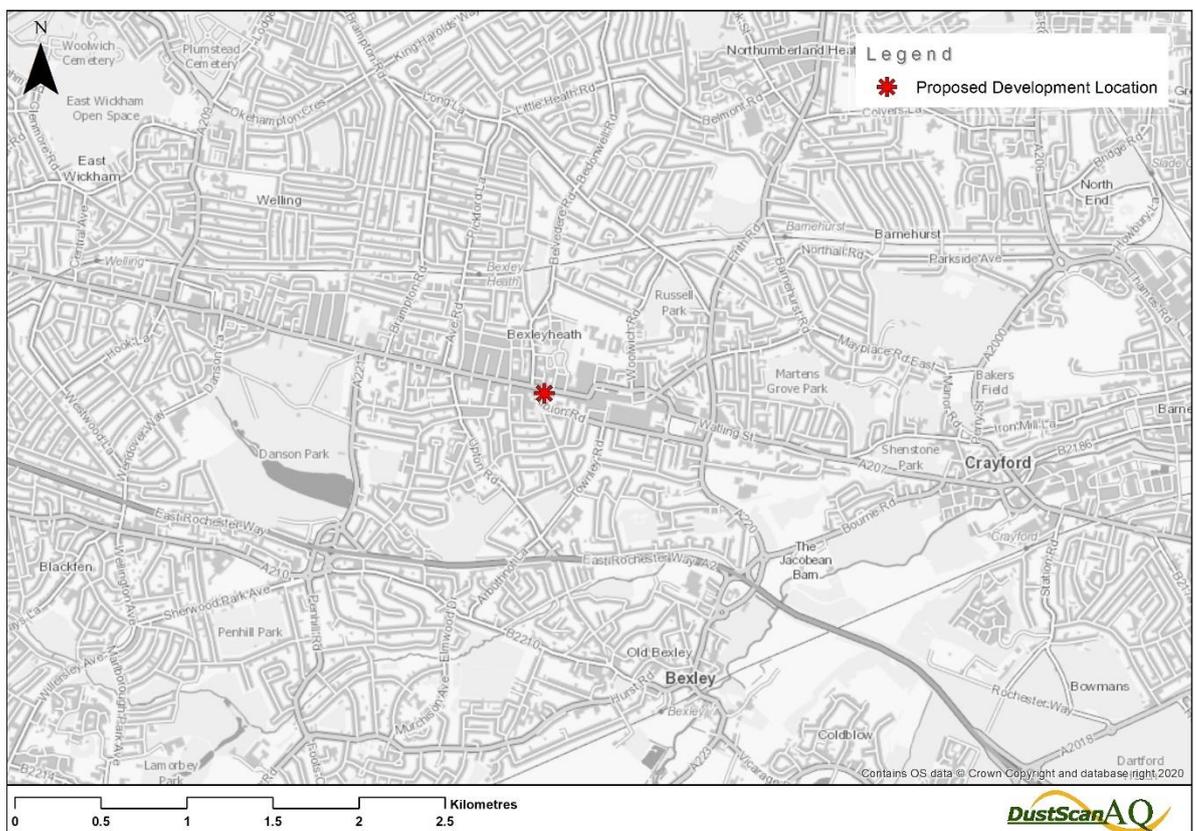


Figure 1.1: Proposed Development Site Location

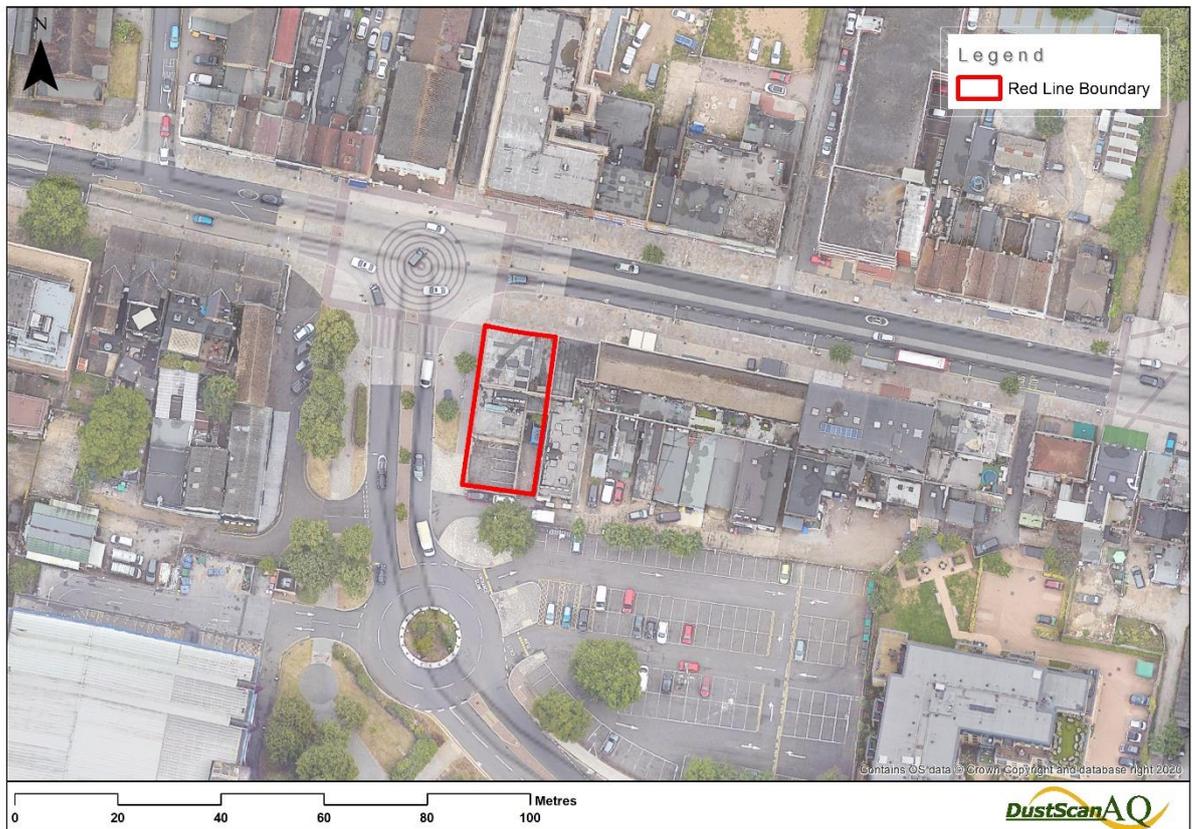


Figure 1.2: Proposed Development Site Location and Surroundings (Satellite Imagery: Google Earth 2022)

1.3 Key Pollutants

The key pollutant associated with the construction phase of the project will be ‘disamenity’ or ‘nuisance’ dust. Nitrogen dioxide (NO₂) and particulate matter (PM_{2.5} and PM₁₀) may also be associated with emissions from non-road mobile machinery (NRMM) and construction related traffic.

The key pollutants associated with the operational phase of the proposed development will be road traffic emissions including NO₂ and particulate matter (PM_{2.5} and PM₁₀). These pollutants are therefore considered as part of this assessment.

Further details of the key pollutants are presented below.

1.3.1 Nitrogen Dioxide (NO₂)

NO₂ and nitric oxide (NO) are collectively referred to as oxides of nitrogen (NO_x). During fuel combustion, atmospheric nitrogen combines with oxygen to form NO, which is not considered harmful. Through a chemical reaction with ozone (O₃), NO further combines with oxygen to create NO₂ which can be harmful to both human health and the environment. Human health implications arise as particles are capable of penetrating deep into the respiratory tract causing a number of adverse effects on the respiratory system. The

foremost sources of NO₂ in the UK are combustion activities, mainly road transport and power generation.

1.3.2 Particulate Matter

Particulate matter (PM) is a complex mixture of solid and liquid particles suspended in the air. PM can vary widely in size, shape and chemical composition. Particles are therefore generally classified by aerodynamic diameter size as: PM₁₀ (diameter of 10 microns (µm) or less); PM_{2.5} (diameter of 2.5 µm or less), also called fine particles; and PM_{0.1} (diameter of 0.1 µm or less), called ultrafine particles.

PM₁₀ is known to arise from a number of sources such as construction sites, road traffic movement, industrial and agricultural activities. When inhaled, PM₁₀ is likely to be deposited on surfaces of larger airways of the upper region of the lung and is associated with respiratory mortality, exacerbation of airway diseases and reduction of lung function. PM with an aerodynamic diameter of less than 10 µm have a greater impact on human health.

Due to its size, PM_{2.5} is able to accumulate more, stay in the air for longer and travel farther than PM₁₀³ making it a regional pollutant. A significant proportion of PM_{2.5} concentrations in a particular area originating from natural and transboundary contributions and emissions from neighbouring areas⁴. Local authorities therefore face challenges with the management of local PM_{2.5} concentrations. There is increasing pressure on governing bodies to reduce long-term average PM_{2.5} concentrations in light of emerging research, public awareness on air pollution and recent technical advancements in low-cost sensors for monitoring.

In 2019, the Global Burden of Disease estimated the global ambient PM_{2.5}-related deaths was over 4 million⁵. The Committee on the Medical Effects of Air Pollution (COMEAP) estimated 29,000 attributable deaths from PM_{2.5} occur a year in the UK⁶. The size and shape of PM_{2.5} means it is likely to travel into, and deposit on the surface of, deeper parts of the lung. A recent review, commissioned by Greater London Authority, highlighted the lifelong health impacts of air pollution and found no evidence to identify a threshold where PM_{2.5} did no harm⁷. Health effects associated with short- and long-term exposure of PM_{2.5} includes a range of respiratory and cardiovascular diseases, increased incidence of strokes, preterm births and lung cancer as well as increased risk of Alzheimer's, Parkinson's and other neurodegenerative diseases³. PM_{2.5} is generally associated with combustion and vehicle traffic and is more likely to be associated with the operational phase of the proposed development.

³ Thangavel, Park and Lee, (2022). 'Recent Insights into Particulate Matter (PM_{2.5})-Mediated Toxicity in Humans: An Overview'. Accessible at:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9223652/>

⁴ Department for Environment, Food and Rural Affairs. (2022), 'Air Quality PM_{2.5} targets: Detailed evidence report'.

⁵ Sang et al., (2022). 'The global burden of disease attributable to ambient fine particulate matter in 204 countries and territories, 1990 – 2019: A systemic analysis of the Global Burden of Disease Study 2019'. Accessible at:

<https://www.sciencedirect.com/science/article/pii/S0147651322004286?via%3Dihub#sec0060>

⁶ Committee on the Medical Effects of Air Pollutants, (2018). 'Associations of long-term average concentrations of nitrogen dioxide with mortality'

⁷ Imperial College London, (2023). 'Impacts of air pollution across the life course – evidence highlight note'

1.3.3 Disamenity Dust

'Dust' is generally regarded as particulate matter up to 75 µm in diameter and in an environmental context can be considered in two size categories; coarser dust (particles greater than 10 µm) and fine particulate matter (PM₁₀ and PM_{2.5}) as described above.

Coarser dust (particles greater than 10 µm) is generally regarded as 'disamenity dust' and can be associated with annoyance, although there are no official standards for dust annoyance⁸. Disamenity dust is more readily described than defined as it relates to the visual impact of short-lived dust clouds and the long-term soiling of surfaces.

Although it is a widespread environmental phenomenon, dust is also generated through many anthropogenic activities including materials handling, construction, demolition and vehicle use. Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended.

⁸ Note that the expression 'nuisance dust' refers here to 'generally visible particulate matter' rather than specifically and in a legal sense to statutory nuisance, as defined in Section 79 of the Environmental Protection Act 1990.

2 Legislation, Planning Policies and Guidance

2.1 Legislative Framework

2.1.1 International Legislation (European Union)

Whilst the UK has left the European Union (EU), it is relevant to understand the source of the current UK legislation. Following exit day on the 31st January 2020, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018⁹. The EU sets legally binding limit values for outdoor air pollutants to be met by EU countries by a given date. These limit values are based on the World Health Organisation (WHO) guidelines on outdoor air pollutants. These are legally binding and set out to protect human health and the environment by avoiding, preventing or reducing harmful air pollution effects.

Directive 2008/50/EC¹⁰ on ambient air quality and cleaner air for Europe entered into force in June 2008. This merged the existing 'Daughter' Directives^{11 12 13 14}(apart from the fourth Daughter Directive), maintaining existing air quality objectives set out by 'Daughter' Directives for:

- Sulphur dioxide (SO₂);
- Nitrogen dioxide (NO₂);
- Oxides of nitrogen (NO_x);
- Particulate matter (PM_{2.5} and PM₁₀);
- Lead (Pb);
- Benzene(C₆H₆);
- Carbon monoxide (CO); and
- Ozone (O₃).

Directive 2008/50/EC also includes related objectives, exposure concentration obligations and exposure reduction targets for PM_{2.5} (fine particles). The 'Daughter' Directives were based upon requirements set out in the first EU Ambient Air Quality Framework Directive 96/92/EEC¹⁵.

⁹ European Union. (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

¹⁰ European Union. (2008), 'Ambient air quality assessment management', Framework Directive 2008/50/EC.

¹¹ European Union. (1999), 'Ambient air quality assessment management', Framework Directive 1999/30/EC.

¹² European Union. (2000), 'Ambient air quality assessment management', Framework Directive 2000/3/EC.

¹³ European Union. (2002), 'Ambient air quality assessment management', Framework Directive 2002/3/EC.

¹⁴ European Union. (2004), 'Ambient air quality assessment management', Framework Directive 2004/107/EC.

¹⁵ European Union. (1996), 'Ambient air quality assessment management', Framework Directive 96/62/EC.

2.1.2 National Legislation (UK)

2.1.2.1 The Environment Act (1995)

The Environment Act 1995¹⁶ established the system of 'local air quality management' (LAQM) and the designation of Air Quality Management Areas (AQMA). Part IV of the 1995 Environmental Act and Part II of the Environment (Northern Ireland) Order 2002¹⁷ requires local authorities to designate AQMAs where legal objectives are not being achieved or are not likely to be achieved within the relevant period. Where an AQMA is designated, local authorities are also required to produce an 'Air Quality Action Plan' (AQAP) detailing the pollution reduction measures that need to be adopted to achieve the relevant air quality objectives within an AQMA.

The Environment Act 1995 requires the Government to produce a National Air Quality Strategy (NAQS) for the UK, outlining the air quality standards, objectives and measures for improving ambient air quality.

2.1.2.2 National Air Quality Strategy (UK)

Following the Environment Act 1995, the first Air Quality Strategy (AQS) was published in 1997¹⁸. A review of the AQS, Air Quality Strategy for England, Scotland, Wales and Northern Ireland, was published in 2007¹⁹, with a review yielding some minor changes in 2011. Each revision introduced strategies and regulations that consider measures for different pollutants by tightening existing objectives and also by introducing new ones to establish a common framework to protect human health and the environment by achieving ambient air quality improvements.

The AQS sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments.

The latest comprehensive review of the AQS for England was published in April 2023²⁰, since updated in August 2023. This revised strategy supersedes the Air Quality Strategy: Volume 1 in England.

¹⁶ Parliament of the United Kingdom. (1995), 'Environment Act'. King's Printer of Acts of Parliament

¹⁷ Northern Ireland Orders in Council. (2002), 'The Environment (Northern Ireland) Order', No. 3153. King's Printer of Acts of Parliament

¹⁸ Department for Environment Food and Rural Affairs. (1997), 'The United Kingdom National Air Quality Strategy', Cm 3587, Department for Environment Food and Rural Affairs.

¹⁹ Department for Environment Food and Rural Affairs. (2007), 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland', Cm 7169, Department for Environment Food and Rural Affairs.

²⁰ Department for Environment Food and Rural Affairs. (2023), 'Air Quality Strategy: Framework for local authority delivery'.

Accessible at: <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery>

The AQS sets out the framework to enable local authorities to contribute to long-term air quality goals, with a notable focus on the new PM_{2.5} targets outlined in the Environmental Targets (Fine Particulate Matter) (England) Regulations, published January 2023.

The new AQS outlines the interim targets for PM_{2.5} of an annual mean concentration of 12 µg/m³ and a population exposure reduction target of 22% to be achieved by January 2028, compared to a 2018 baseline.

2.1.2.3 Air Quality Standards (Amendment) Regulations (2016)

The 2008 EU ambient air quality directive, 2008/50/EC, was transposed into UK national legislation through the introduction of the Air Quality Standards (Amendment) Regulations 2016²¹. This also incorporated the fourth EU Daughter Directive (2004/107/EC). The Air Quality Limit Values from the EU directives are transposed as Air Quality Standards.

2.1.2.4 The Environment Act (2021)

Under the Environment Act 2021²², the Secretary of State must review the NAQS for England at least every five years, with a commitment for an initial review within 12 months of the measures coming into force (Section 2.1.2.2). The Environment Act 2021 also introduced a commitment to create a legally binding duty on government to reduce the concentration of fine particles (PM_{2.5}) in ambient air and to set a new long-term annual mean PM_{2.5} target to supersede the target set out within the Environment (Miscellaneous Amendments) (EU Exit) regulations 2020.

2.1.2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations (2023)

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023²³ came into force in January 2023. This includes a new annual mean concentration target of less than or equal to 10 µg/m³ for PM_{2.5} by 31st December 2040. There is also an exposure reduction target; the population exposure reduction target is at least a 35% reduction in population exposure by the end of 31st December 2040, compared to a three-year baseline period from 1st January 2016 to 31st December 2018. It is understood that central government is currently consulting on the implications and challenges of the new target in planning.

2.1.2.6 National Air Quality Objectives

A summary of the relevant Air Quality Objectives (AQOs), with consideration to the new Environmental Targets (Fine Particulate Matter) (England) Regulations (2023), and where they are applicable are presented in Table 2.1.

The AQO listed in Table 2.1 are only applicable at locations where a member of the public could be reasonably expected to spend the relevant averaging period. Further examples of this are presented in Table 2.2.

²¹ Statutory Instrument. (2016), 'The Air Quality Standards Regulations', No. 1184. King's Printer of Acts of Parliament.

²² Parliament of the United Kingdom. (2021), 'Environment Act'. King's Printer of Acts of Parliament

²³ Statutory Instrument. (2023), 'The Environmental Targets (Fine Particulate Matter) (England) Regulations', No. 96. King's Printer of Acts of Parliament.

Table 2.1: AQO relevant to the proposed development

Pollutant	Averaging Period	AQO ($\mu\text{g}/\text{m}^3$)	Exceedance Allowance	Percentile Equivalent
Nitrogen Dioxide (NO_2)	Annual	40	-	-
	1-hour	200	18 per annum	99.8 th
Particulate Matter (as PM_{10})	Annual	40	-	-
	24-hour	50	35 per annum	90.4 th
Particulate Matter (as $\text{PM}_{2.5}$)	Annual	10 ^a	-	-

(a) - The annual mean concentration target is that by the end of 31st December 2040 the annual mean level of $\text{PM}_{2.5}$ in ambient air must be equal to or less than $10 \mu\text{g}/\text{m}^3$ ("the target level").

Table 2.2: Examples of where the AQO should apply

Averaging period	Objectives should apply at	Objectives should not apply at
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24 Hour	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties ^(a) .	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1 Hour	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably have expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

2.1.2.7 Statutory Nuisance

It is recognised that the planning system presents a way of protecting amenity. However, in cases where planning conditions are not applicable to a development/installation, the requirements of the Environmental Protection Act 1990 still apply. Under Part III of the Environmental Protection Act 1990, local authorities have a statutory duty to investigate any complaints of:

- *“any premises in such a state as to be prejudicial to health or a nuisance*
- *smoke emitted from premises so as to be prejudicial to health or a nuisance*
- *fumes or gases emitted from premises so as to be prejudicial to health or a nuisance*
- *any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*
- *any accumulation or deposit which is prejudicial to health or a nuisance”*

Where the local authority establishes any one of these issues constitutes a statutory nuisance and believes it to be unreasonably interfering with the use or enjoyment of someone’s premises and/or is prejudicial to health, an abatement notice will be served on the person responsible for the offence or the owner / occupier. Failure to comply with the notice could lead to a prosecution. However, it is considered as a defence if the best practicable means to prevent or to counteract the effects of the nuisance are employed.

2.2 Planning Policy

2.2.1 National Policy

2.2.1.1 National Planning Policy Framework (2023)

The principle national planning policy framework in respect to the proposed development is the National Planning Policy Framework (NPPF)²⁴. This sets out the government’s planning policies for England and how they should be applied. The revised NPPF was published in September 2023 by the Department for Levelling Up, Housing and Communities (DLUHC).

The NPPF 2023 contains five paragraphs which are relevant to air quality.

Paragraph 105 states that:

“The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”

²⁴ National Planning Policy Framework. Accessible at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf

Paragraph 174 (e) states that:

“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 and water quality, taking into account relevant information such as river basin management plans.....”

Paragraph 185 includes

“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..”

Paragraph 186 states 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.”

Paragraph 188 states that:

“The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

2.2.1.2 National Planning Practice Guidance

The DLUHC (formerly the Department for Communities and Local Government) published a number of supporting web based resources of Planning Practice Guidance (PPG)²⁵ to supplement the NPPF. With respect to air quality the PPG²⁶ provides guidance on when air quality is relevant to a planning application. It states that:

²⁵ National Planning Practice Guidance web-based resource. Accessible at: <http://planningguidance.planningportal.gov.uk/>

²⁶ Paragraph: 005 Ref ID 32-005-20140306, revision date 01.11.2019

“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.”

The PPG also states that, when deciding whether air quality is relevant to a planning application, the applicant should consider whether the proposal will:

- *“Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield.....*
- *Introduce new point sources of air pollution.....,*
- *Expose people to harmful concentrations of air pollutants,*
- *Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.....,*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value.”*

2.2.1.3 Clean Air Strategy (2019)

The Clean Air Strategy²⁷ was published by the Department of Environment Food and Rural Affairs (DEFRA) in 2019 as part of the 25 Year Environment Plan. It also complements the Industrial Strategy and the Clean Growth Strategy. The Strategy sets out the action that is required across governments and society to meet the AQOs. Action includes new legislation to create a more coherent framework for action to tackle air pollution, underpinned by ‘England-wide powers’ to control major sources of air pollution and ‘local powers’ to take actions in areas with an air pollution problem. These will support the creation of Clean Air Zones (CAZs) to lower emissions from all sources of air pollution, back up with clear enforcement mechanisms.

2.2.2 Regional Policy

2.2.2.1 London Plan 2021

The new London Plan²⁸ of 2021 includes one policy that is specifically related to air quality: “Policy SI 1: Improving air quality”. Policy SI 1 states:

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

²⁷ Department of Environment Food and Rural Affairs. (2019) ‘Clean Air Strategy 2019’

²⁸ Greater London Authority, (2021). ‘The London Plan: The Spatial Development Strategy for Greater London’.

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

1) Development proposals should not:

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

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

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

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

- 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.*

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

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

Within the new London Plan several other policies also make reference to air quality. The relevant aspects of these policies which are pertinent to this proposed development are reproduced below.

“Policy D1: London’s form, character and capacity for growth” states:

“A Boroughs should undertake area assessments to define the characteristics, qualities and value of different places within the plan area to develop an understanding of different areas’ capacity for growth. Area assessments should cover the elements listed below:

.....

5) air quality and noise levels”

“Policy D3: Optimising site capacity through the design-led approach” states:

“A All development must make the best use of land by following a design-led approach that optimises the capacity of sites, including site allocations. Optimising site capacity means ensuring that development is of the most appropriate form and land use for the site. The design-led approach requires consideration of design options to determine the most appropriate form of development that responds to a site’s context and capacity for growth, and existing and planned supporting infrastructure capacity (as set out in Policy D2 Infrastructure requirements for sustainable densities), and that best delivers the requirements set out in Part D.

B Development proposals should:

....

9) help prevent or mitigate the impacts of noise and poor air quality”

“Policy SI3: Energy Infrastructure” states:

“D Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality.”

2.2.2.2 The Mayor of London Environment Strategy

The Mayor of London Environment Strategy²⁹, published on 31st May 2018, integrates every aspect of London’s environment into different categorised areas. The document includes several transport and non-transport related policy measures outlined in Chapter 4, highlighting the need for improvement in London’s air quality.

Policy 4.2 states:

- “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.”
- “Reduce emissions from non-road transport sources, including by phasing out fossil fuels.”

²⁹ Greater London Authority. (2018), ‘London Environment Strategy’.

Proposals for this policy include the phasing out of fossil fuels for private and public transport, as well as from freight vehicles, prioritising action on diesel fuels and implementing the switch to zero emission technologies. The reduction in emission from NRMM, construction and demolition sites, homes and workplaces and large-scale generators is proposed for this policy.

Policy 4.3 states:

- *“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.”*
- *“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.”*
- *“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.”*
- *“Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces.”*

Proposals for this policy include the switching of fleet vehicles to zero emission capability, implementation of local zero emission zones from 2020, ensure all new large-scale developments are ‘Air Quality Neutral’ and maintain Air Quality Neutral requirements for all developments. The reduction in emissions from wood and other solid fuel burning, using the planning system to reduce indoor exposure through design measures, preventing poor air quality entering the building and ensuring CO₂ and pollution targets are achieved are also proposals included for this policy.

2.2.2.3 The Mayor of London Transport Strategy

In March 2018 the Mayor of London published the Mayors Transport Strategy³⁰, setting out the Mayor’s policies and proposals, enabling transport in London to be reshaped over the next 20 years.

The key themes within the strategy are; healthy streets and healthy people, good public transport experiences, new homes and jobs.

Chapter 3, section C *“Improving air quality and the environment”* includes policies 6 and 7 which relate to transport and air quality.

Policy 6 states:

“The Mayor, through TfL and the boroughs, and working with stakeholders, will take action to reduce emissions – in particular diesel emissions – from vehicles on London’s streets, to improve air quality and support London reaching

³⁰ Greater London Authority. (2018), ‘Mayor’s Transport Strategy’.

compliance with UK and EU legal limits as soon as possible. Measures may include retrofitting vehicles with equipment to reduce emissions, promoting electrification, road charging, the imposition of parking charges/ levies, responsible procurement, the making of traffic restrictions/ regulations and local actions.”

Policy 7 states:

“The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to make London’s transport network zero emission by 2050, contributing towards the creation of a zero carbon city, and also to deliver further improvements in air quality to help meet tighter air quality standards, including achieving a health-based target of 10 µg/m³ for PM_{2.5} by 2030. London’s streets and transport infrastructure will be transformed to enable zero emission operation, and the switch to ultra-low and zero emission technologies will be supported and accelerated.”

2.2.3 Local Policy

2.2.3.1 London Borough of Bexley Adopted Local Plan

The LBB Local Plan³¹ was adopted in April 2023 and sets out strategic policies and framework for development within the borough until 2038. This new Local Plan replaces the Bexley Core Strategy and remaining extant policies of the Bexley Unitary Development Plan (UDP) and the UDP Proposals Map. Relating to air quality, the superseded Core Strategy contained policy ‘ENV41 Air quality’; this has been directly replaced by policy ‘SI 1 Improving air quality’ from the London Plan (Section 2.2.2.1).

The new Local Plan contains a number of policies with reference to air quality applicable to the proposed development.

Policy SP8: Green infrastructure including designated Green Belt states:

“Bexley’s green infrastructure, including open spaces and waterways will be protected, enhanced, restored and promoted as valuable resources to provide a healthy integrated network for the benefit of nature, people and the economy. Future development must support the delivery of a high-quality, well-connected and sustainable network of open spaces.”

Relating to air quality, Policy SP8 states the above will be achieved by:

‘...r. seeking opportunities to support the functions and drivers for green infrastructure, such as using good urban design to reduce air pollution, integrating green infrastructure into development where there are opportunities to mitigate poor air quality on a local scale.’

Policy SP10: Bexley’s transport network states:

³¹ London Borough of Bexley (2023), ‘Bexley Local Plan’

“The Council will work to achieve a comprehensive, high-quality, safe, integrated and sustainable transport system, which makes the most of existing and proposed transport infrastructure within the borough. The map of Bexley’s transport network, including locations of key transport project proposals, are set out in Figure 10. The Council seeks to ensure a much improved and expanded role for sustainable transport through the following actions...”

Relating to air quality, Policy SP10 states:

“...j. effectively maintaining and efficiently managing the existing highway network to reduce congestion and unnecessary delays, improve the environment, in particular air quality, and promote safety, health and wellbeing;...”

2.3 Guidance Documents

2.3.1 Local Air Quality Management Technical Guidance (2022)

The LAQM Technical Guidance 2022³² (TG22), published by the DEFRA in 2022, is designed to support local authorities in carrying out their duties under the Environment Act 1995, the Environment (Northern Ireland) Order 2002, and subsequent regulations. Any guidance or tools used in this assessment have been provided by LAQM.TG(22), in line with the Council’s own work on air quality following the guiding principles.

2.3.2 Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Planning Guidance

The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) published guidance for the consideration of air quality within land-use planning and development control processes in January 2017³³. In the absence of any statutory guidance on methodology, the IAQM/EPUK guidance is considered best practice and informs this assessment.

2.3.3 Greater London Authority Guidance

The Greater London Authority (GLA) have published a series of guidance documents for planning applications to adhere to.

2.3.3.1 The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance

The Supplementary Planning Guidance (SPG) aims to reduce emissions of dust, PM_{2.5} and PM₁₀ from construction and demolition activities in London. It also aims to manage emissions of NO_x by a new non-road mobile machinery ultra low emissions zone (ULEZ).

³² LAQM Technical Guidance 2022. Accessible at:

<https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

³³ The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) (2017) ‘Land-Use Planning & Development Control: Planning For Air Quality’. Accessible at:

<https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

The Control of Dust and Emissions During Construction and Demolition SPG³⁴, published July 2014, formed part of the Implementation Framework of the London Plan 2011³⁵. The SPG sets out the methodology for assessing the air quality impacts from construction and demolition as well as identifies good practice for mitigating and managing the impacts. The statutory SPG is considered best practice and therefore informs this assessment.

The approach of this SPG is based on the site evaluation process set out in the IAQM 2014 Guidance on the Assessment of Dust from Demolition and Construction³⁶, most recently updated in August 2023. As stated in the SPG, “*This guidance is periodically updated and, therefore, the latest version of the IAQM Guidance should be used.*”

2.3.3.2 London Plan Guidance: Air Quality Neutral

Policy SI 1 of the London Plan requires new developments to be Air Quality Neutral. To assist developers, boroughs and others involved in designing and planning new development, the London Plan Guidance (LPG) on Air Quality Neutral³⁷ has been prepared. The Air Quality Neutral LPG was published February 2023, formally replacing prior draft guidance.

The Air Quality Neutral LPG sets air quality benchmarks for all development, in order to ensure that their transport and building emissions do not worsen air quality in London. The guidance also outlines a simplified approach for minor developments.

2.3.3.3 London Plan Guidance: Air Quality Positive

The Air Quality Positive LPG³⁸ identifies and implements methods to push beyond compliance with the Air Quality Neutral LPG benchmarks and the minimum requirements of an air quality assessment. Air Quality Positive is applied at the plan-making stage of masterplans, such as SPGs, or for large-scale developments that are likely to be subject to an Environmental Impact Assessment.

³⁴ Greater London Authority. (2014), ‘The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance’

³⁵ Greater London Authority. (2011), chapters Accessible at:
<https://www.london.gov.uk/programmes-strategies/planning/london-plan/past-versions-and-alterations-london-plan/london-plan-2011>

³⁶ Institute of Air Quality Management. (2014) ‘Guidance on assessment of dust form demolition and construction’. Accessible at:
<https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

³⁷ Greater London Authority (2023), ‘London Plan Guidance: Air Quality Neutral’.

³⁸ Greater London Authority (2023), ‘London Plan Guidance: Air Quality Positive’.

3 Methodology

This section sets out the approach taken to assess the potential impacts on air quality during the construction and operational phases of the proposed development.

3.1 Scope of the Assessment

The assessment is based on the following scope of work presented in Table 3.1:

Table 3.1: Scope of Work

Scope	Consideration
Spatial	The assessment considers the impact of NO ₂ , PM ₁₀ and PM _{2.5} emissions from the local roads on the proposed development site.
Temporal	<p>The construction phase impacts resulting from the proposed development have been considered for the earliest anticipated construction year (2024).</p> <p>The operational phase impacts resulting from the proposed development have been considered for the earliest possible year of occupation (2025).</p>

3.2 Construction Phase

The proposed development has the potential to generate dust during the construction phase of the project. Although there are no standards (such as AQO) for dust disamenity or annoyance, various ‘customs and practice’ criteria have become established.

For the purposes of this assessment, IAQM’s 2023 Construction Dust Risk guidance³⁹ has been used to carry out a construction dust risk assessment. The IAQM guidance provides a methodology (Appendix B) to evaluate potential risk of dust generation for a development and the level of mitigation required. The impact of the development is described using one of the following three categories: ‘Low Risk’, ‘Medium Risk’ and ‘High Risk’. Based on the risk level, appropriate mitigation measures can be considered to minimise any risk of dust impacts from the construction phase.

3.3 Operational Phase

The IAQM and EPUK planning guidance (Appendix A) which informs this assessment contains indicative criteria on when to proceed to a Detailed Air Quality Assessment (AQA). The criteria relating to changes in traffic flow are as follows:

A change of LDV flows of:

- more than 100 AADT within or adjacent to an AQMA; and

³⁹ Institute of Air Quality Management (2023): ‘Guidance on the Assessment of Dust from Demolition and Construction’

- more than 500 AADT elsewhere.

A change of HDV flows of:

- more than 25 AADT within or adjacent to an AQMA; and
- more than 100 AADT elsewhere.

The proposed development is located within the Bexley AQMA and therefore the stricter criteria apply. The proposed development has no designated parking, therefore the indicative criteria will not be exceeded and a detailed assessment of transport emissions has been scoped out.

The proposed development will not use any central plant (CHP/boiler) with associated flue stacks. The assessment of operational point source emissions can therefore be scoped out.

4 Baseline Conditions

The following section sets out the baseline conditions in relation to air quality at the proposed development site. For the purpose of this assessment, data has been obtained from the LBB Air Quality Annual Status Report for 2022⁴⁰ and the Defra air quality resource website⁴¹.

4.1 Air Quality Management Areas (AQMAs)

There is one AQMA declared within the jurisdiction of LBB. The proposed development itself lies within the Bexley AQMA. The Bexley AQMA was declared on 1st March 2007 for exceedances of NO₂ and PM₁₀ under the following description:

“The whole borough of Bexley.”

4.2 LBB Non-Automatic (Diffusion Tube) Monitoring

LBB undertook no diffusion tube monitoring of NO₂ during 2022.

4.3 LBB Automatic Monitoring

LBB undertook automatic monitoring at ten locations throughout 2022, using both reference and indicative methods. The accuracy and precision of indicative methods are regarded as “*not as good as the reference methods*” in the LBB Annual Status Report.

LBB undertook automatic monitoring using reference methods at four sites during 2022. The closest of these, monitoring station BX1, is approximately 3.3 km northeast from the proposed development in a suburban background location. Monitor GB6 is located approximately 3.7 km southwest from the proposed development along the major road East Rochester Way (A2). GB6 is located in a kerbside location.

The locations of these automatic monitoring sites are illustrated in Figure 4.1 below.

Table 4.1 presents the monitored NO₂ annual mean concentrations recorded at these sites for the latest three-year period of available data.

Table 4.2 presents the monitored PM₁₀ annual mean concentrations recorded at these sites for the latest three-year period of available data.

Table 4.3 presents the monitored PM_{2.5} annual mean concentrations recorded at these sites for the latest three-year period of available data.

⁴⁰ London Borough of Bexley (2023). ‘London Borough of Bexley Air Quality Status Report for 2022’

⁴¹ Department for Environmental Food and Rural Affairs. Accessible at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

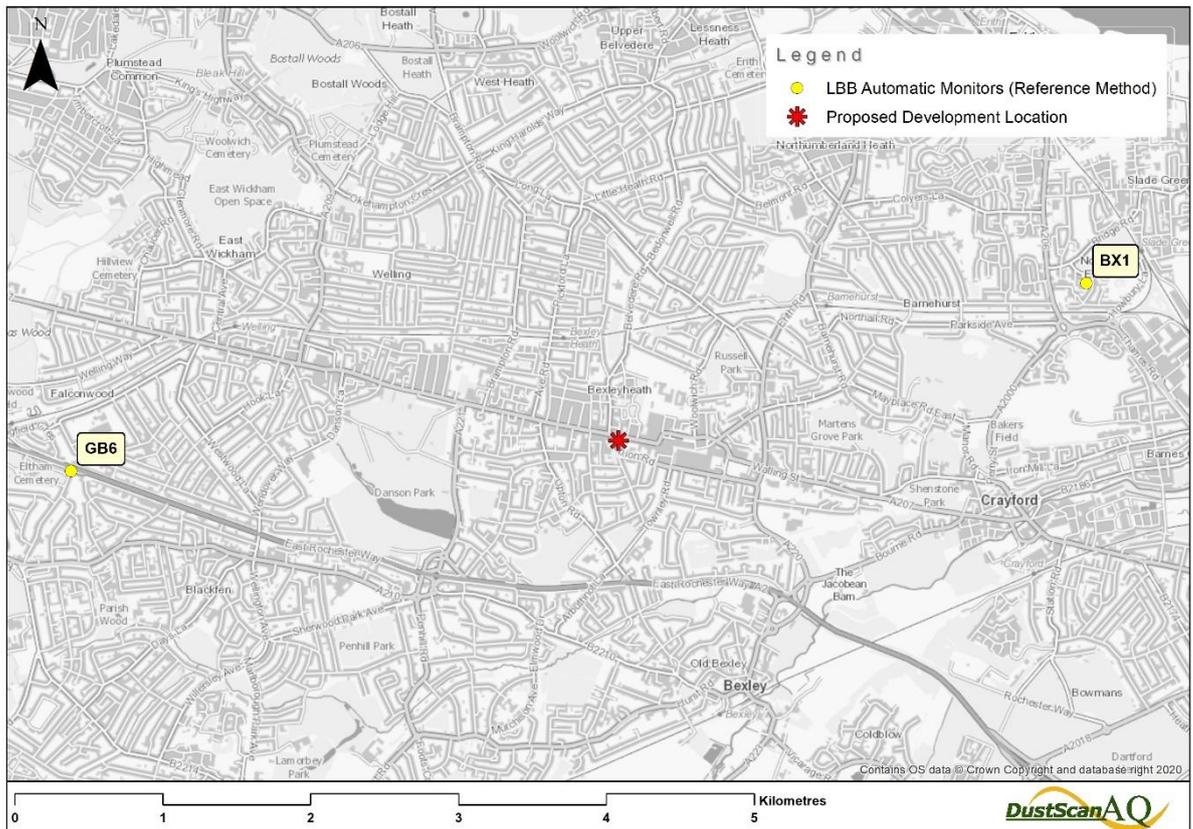


Figure 4.1: LBB Automatic Monitor Locations

Table 4.1: LBB Automatic Monitor NO₂ Annual Mean Concentrations

LBB Automatic Monitoring					
Site ID	Site Classification	Approximate Distance to Site (km)	Annual Mean NO ₂ Concentration (µg/m ³)		
			2020	2021	2022
BX1	Suburban background	3.3	18	19	18
GB6	Kerbside	3.7	28	27	22

Notes: Exceedance of the NO₂ annual mean AQO of 40 µg m⁻³ are shown in **bold**. The percentage data capture for the monitoring period is presented in parentheses.

NO₂ annual means in excess of 60 µg m⁻³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold** and underlined.

Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

A Local Site Operator visits monitoring sites every two weeks to conduct visual inspections and check site operation and to carry out zero/span calibration of the gas analysers.

Table 4.2: LBB Automatic Monitor PM₁₀ Annual Mean Concentrations

LBB Automatic Monitoring					
Site ID	Site Classification	Approximate Distance to Site (km)	Annual Mean PM ₁₀ Concentration (µg/m ³)		
			2020	2021	2022
BX1	Suburban background	3.3	13	14	15
GB6	Kerbside	3.7	18	19	17

PM₁₀ Monitoring Adjustment: No adjustment to PM concentrations was made.

Table 4.3: LBB Automatic Monitor PM_{2.5} Annual Mean Concentrations

Site ID	Site Classification	Approximate Distance to Site (km)	Annual Mean PM _{2.5} Concentration (µg/m ³)		
			2020	2021	2022
BX1	Suburban background	3.3	9	9	9
GB6	Kerbside	3.7	11	13	9

4.4 Defra Modelled Background Pollution Concentrations

Defra provides background pollution concentration estimates to assist local authorities in undertaking their 'Review and Assessment' work. This data is available to download from the Defra air quality resource website for NO_x, NO₂, PM₁₀ and PM_{2.5} for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2018 background data and future year projections are available for 2018 to 2030. The background dataset provides breakdown of pollution concentrations by different sources (both road and non-road sources).

Table 4.4 presents the predicted background concentrations for the latest year of available monitoring data (2022) from LBB and the earliest anticipated year of occupation (2025).

Table 4.4: Defra Projected Background Concentrations at Proposed Development

Year	Annual mean Concentration (µg/m ³)		
	NO ₂	PM ₁₀	PM _{2.5}
2022	17.8	16.3	11.1
2025	16.0	15.7	10.7

Note: Data presented within the table are derived from the following ordinance survey grid square: 548500, 175500.

4.5 Summary of Baseline Conditions

LBB has two automatic monitoring locations measured using reference methods within a 4 km radius of the proposed development. The closest monitor to the development, BX1, is approximately 3.3 km northeast. According to the 2022 ASR, BX1 is in a suburban background location. Based on satellite imagery, the monitor is located in the carpark of an Independent Living Centre, set back from Whitehall Lane by approximately 60 m. It is considered BX1 is in an environment not representative of emission conditions at 235 & 237 Broadway. BX1 is therefore deemed not representative of air quality at the proposed development.

Monitor GB6 is the next closest monitor, in a kerbside location, 1.0 m from the kerb located along East Rochester Way (A2). According to Road Traffic Statistics data by DfT, GB6 is located in area exposed to annual average daily flows (Count Point: 26102) over 7x greater than traffic flows on roads surrounding the proposed development (Count Points: 8664, 38745, 49794). It is therefore considered that GB6 is located in an area representative of worse air quality than at the proposed development. GB6 is considered further in this report as representing an air quality situation which is similar but poorer than the proposed development site, i.e. it is safe to assume that air quality at the proposed development will be better than that measured at GB6.

5 Potential Impacts

5.1 Construction Phase

The earliest construction year is likely to be 2024, subject to planning. The impacts from demolition, earthworks construction and trackout have all been considered. To assess the worst-case scenario, it has been assumed that all activities will be carried out for the duration of the construction period. Figure 5.1 shows the construction dust assessment study area based on the recommended distances by IAQM.

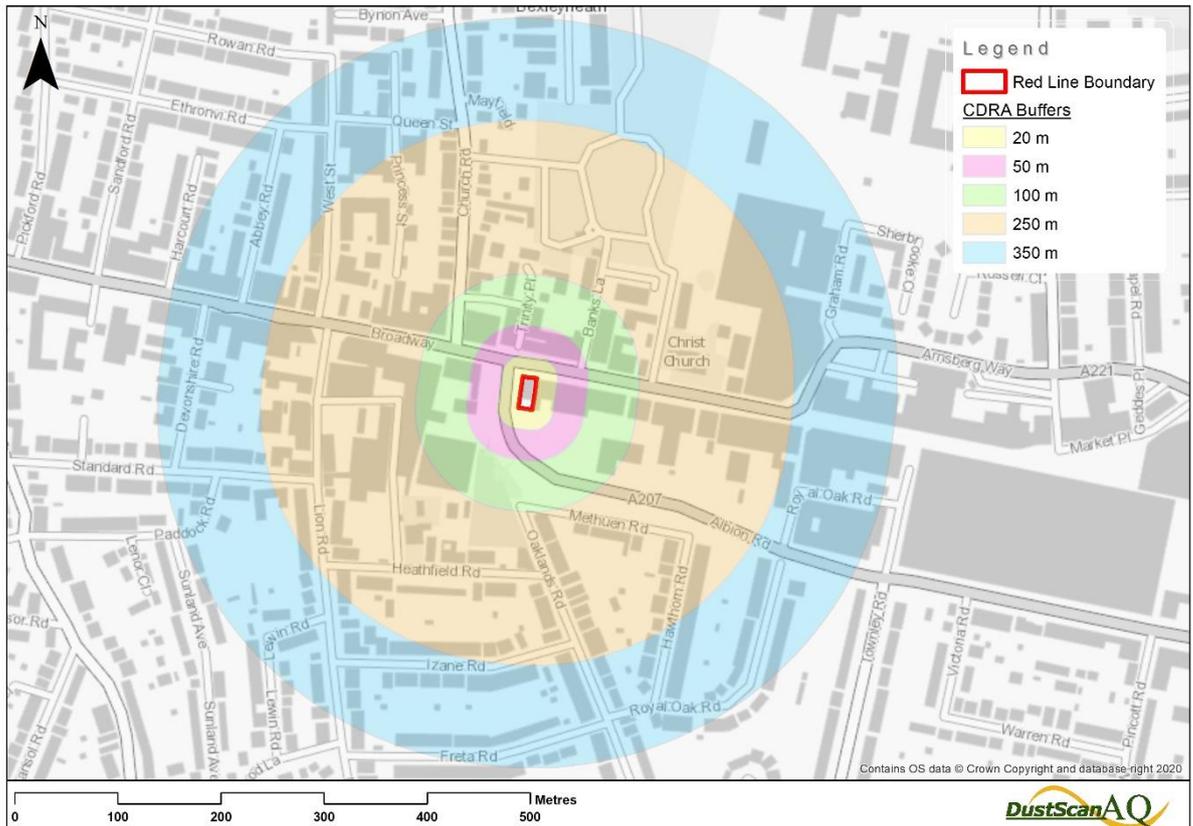


Figure 5.1: Construction Dust Risk Assessment Buffers

Magnitude and sensitivity descriptors that have been applied to assess the overall impact of the construction phase are presented in Appendix B.

The dust emission magnitude from demolition is expected to be ‘Small’, with a demolition volume less than 12,000 m³.

The dust emission magnitude for earthworks is expected to be ‘Small’, with the total site area approximately 449 m².

The dust emission magnitude from construction is expected to be ‘Small’, with a total construction volume less than 12,000 m³.

It is anticipated that the outward daily peak HGV movements will be fewer than 20 per day, therefore the dust emission magnitude for trackout has been assigned as ‘Small’.

There are no ecological receptors within 50 m of the site, therefore the risk of construction dust impacts on ecological receptors are considered to be negligible and are not considered further within the construction dust risk assessment.

Table 5.1: Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

It is considered that the residential receptors have a ‘High’ sensitivity to dust soiling and human health impacts. Table 5.2 presents the sensitivity of the surrounding area to effects caused by construction activities and is based on the criteria presented in Appendix B.

Table 5.2: Sensitivity of Study Area

Potential Impact	Sensitivity of the surrounding area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Medium
Human Health	Low	Low	Low	Low

The overall risk of dust soiling and human health impacts to high sensitivity receptors are presented in Table 5.3. The risk is based on the criteria presented in Appendix B.

Table 5.3: Summary of the Risk of Construction Dust Effects

Sensitivity of Area	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Low Risk	Low Risk	Negligible
Human Health	Negligible	Negligible	Negligible	Negligible

Based upon the above, the risk associated with dust soiling is no greater than ‘Low’.

With respect to human health impacts the risk is no greater than ‘Negligible’.

Mitigation measures appropriate for the proposed development have been presented in Appendix C.

Following the implementation of these mitigation measures, the impacts from the construction phase of the proposed development on dust soiling and human health are considered to be not significant.

5.2 Operational Phase

5.2.1 Residential Suitability

The proposed development is located at 235 & 237 Broadway, Bexleyheath, DA6 7EL, the surrounding setting of the proposed development is shown below in Figure 1.2. Further details of design plans of the development can be found in Appendix D.

Planning permission at the site of the proposed development was granted in January 2023 by LBB for a “Part one/part two storey rear extension and provision of two additional storeys to provide one commercial unit and 9 residential units comprising of 5x2 bed and 4x1 bed flats”.

As mentioned in Section 4.5, the monitor GB6 is considered representative of air quality worse than the site of the proposed development. Defra background concentrations for the grid square 548500, 175500 have also been used as an indication of likely NO₂, PM₁₀ and PM_{2.5} concentrations at the proposed development.

The annual mean NO₂ concentration at GB6 for the latest year of available data, 2022, was 22 µg/m³, 45% below the NO₂ annual mean objective of 40 µg/m³. The Defra modelled background concentrations for NO₂ for the same year (2022) and the earliest anticipated occupation year (2025) are likewise well below the AQO for NO₂.

Therefore, it is considered that the NO₂ concentration at the site of the proposed development will be comfortably below the long and short term AQO for NO₂.

The 2022 PM₁₀ annual mean concentration at GB6 was 17 µg/m³, comfortably below its respective AQO. For the earliest anticipated year of occupation, the Defra modelled background concentration is 15.7 µg/m³.

The 2022 PM_{2.5} annual mean concentration at GB6 was 9 µg/m³, close to the newly legislated target for PM_{2.5} of 10 µg/m³, to be achieved by a target date of 31st December 2040, but 25% below the new interim target of PM_{2.5} of 12 µg/m³, to be achieved by January 2028. The 2025 modelled PM_{2.5} background concentration is 10.7 µg/m³, exceeding the new 2040 target, but 10% below the interim target.

The Detailed Evidence produced⁴² by Defra as part of the consultation on the new targets details ways in which PM_{2.5} differs as a pollutant from NO₂ and PM₁₀. The Detailed Evidence includes:

“PM_{2.5} is a regional pollutant. A significant proportion of PM_{2.5} concentrations in a particular area is from natural and transboundary contributions and emissions from neighbouring areas. This means that local authorities can influence, but not completely control PM_{2.5} concentrations. Also, the impact of local action may not be directly seen on local concentrations but benefit the whole region/country. This would make it difficult to evaluate progress. It would be difficult to declare air quality management areas as high concentrations are

⁴² Department for Environment, Food and Rural Affairs. (2022), ‘Air Quality PM_{2.5} targets: Detailed evidence report’.

likely to spread over a large area, rather than a specific section of road, for example.

PM_{2.5} is from multiple sources. *Unlike NO₂ exceedances which generally occur close to busy roads due to emissions from road traffic, PM_{2.5} is generated from multiple sources and in multiple locations. This means it requires greater collaboration to address.”*

At this point in time, PM_{2.5} is being managed by national policy, and it is noted that “*PM_{2.5} is still not at present incorporated into LAQM Regulations, and therefore there is no statutory requirement to review and assess PM_{2.5} for LAQM purposes⁴³”* and whilst the guidance states that Local Authorities are expected to act to reduce concentrations of PM_{2.5} in their areas, there is no guidance on exposure reduction as such.

Evaluating both the modelled and measured concentrations of PM_{2.5}, it is considered that the PM_{2.5} concentration at the site of the proposed development will be below the interim target of PM_{2.5} by January 2028. The newly legislated PM_{2.5} target of 10 µg/m³ is generally exceeded across London, and is anticipated to be in compliance by 2040.

Therefore, based upon the above, it is considered that the site of the proposed development is suitable for the introduction of new residential receptors.

5.2.2 Air Quality Neutral

The new Air Quality Neutral London Plan⁴⁴ was published February 2023, which formally replaces the prior draft guidance.

The London Borough of Bexley requires all new developments to be at least air quality neutral; an Air Quality Neutral Assessment (AQNA) is therefore required for all planning applications. The published guidance states the following:

“There are two sets of benchmarks, which cover the two main sources of air pollution from new developments:

- *Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings*
- *Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development.*

A development must meet both benchmarks separately in order to be Air Quality Neutral. If one or both benchmarks are not met, appropriate mitigation or offsetting will be required (see section 5). As the benchmarks are based on evidence and are designed to be challenging but achievable, mitigation or offsetting provisions should be the exception.

⁴³ Paragraph 2.76 of Local Air Quality Management: Technical Guidance 2022: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

⁴⁴ Greater London Authority, (2023). ‘London Plan guidance: Air Quality Neutral’.

Calculations against the benchmarks should inform the design process. However, the final AQN Assessment itself can only be prepared once the energy and transport strategies for a development are suitably finalised or, where these strategies are not part of the application, development details are finalised for planning submission.”

Building Emissions

Section 3 of the guidance sets out the approach for calculating the Building Emission Benchmark (BEB). The client has confirmed that the development will be heated using air source heat pumps. Heat pumps are taken to have a NO_x emission rate of 0. Therefore, the proposed development is assumed to meet the BEB and is considered Air Quality Neutral with respect to building emissions.

Transport Emissions

Section 4 of the guidance sets out the approach for calculating the Transport Emission Benchmark (TEB). The guidance sets out the benchmark trip rates depending on land-use, number of units, and whether the development is in Central, Inner or Outer London.

The proposed development does not have any designated parking associated with it and therefore meets the maximum parking standards set out in policies T6 and T6.1 to T6.5 of the London Plan.

Conclusion

Based on the planning guidance and details of the proposed development set out above, the proposed development is considered to be Air Quality Neutral with respect to both building and transport emissions.

6 Mitigation Measures

Mitigation measures appropriate for the construction phase of the proposed development are presented in Appendix C.

The proposed development site is considered to be suitable for the introduction of residential receptors with no additional mitigation required.

The proposed development is to include roof mounted solar array for on-site renewable energy provision. The proposed development is also to provide cycle storage at the ground floor (see Appendix D for design plans).

The development is not expected to have a significant impact on local air quality from either building or transport emissions and therefore no further mitigation is proposed.

7 Conclusion

This report provides an assessment on the following key issues associated with the construction and operational phases of the proposed development at 235 & 237 Broadway, Bexleyheath, DA6 7EL:

- Nuisance, loss of amenity and health impacts associated with the construction phase of the proposed development on sensitive receptors;
- Characterisation of the baseline conditions at the site using monitored pollutant data from LBB and background concentrations from Defra background maps;
- Assessment of the suitability of the proposed development for the introduction of new residential receptors; and
- Propose mitigation measures where required.

An assessment of the construction and operational air quality impact has been undertaken for the proposed development.

A qualitative assessment of the construction phase activities has been carried out. The largest risk of these activities with respect to dust soiling from earthworks was considered to be 'Low', while that towards human health was considered to be 'Negligible'. Following proper implementation of the measures recommended in Appendix C, the impact of emissions during construction of the proposed development are likely to be 'Negligible' and therefore 'Not Significant'.

The annual mean and one hour mean NO₂ AQO are expected to be met at the proposed development for the anticipated earliest year of occupation. Likewise, the annual mean and 24-hour mean PM₁₀ AQO is expected to be met at the proposed development for the earliest year of occupation.

The newly legislated PM_{2.5} target is not expected to be met in London until towards 2040 and therefore is not expected to be met at the site of the proposed development until that time. PM_{2.5} is mainly a regional pollutant and is not currently required to be reported under LAQM. Whilst guidance states that Local Authorities are expected to act to reduce concentrations of PM_{2.5} in their areas, there is no guidance on exposure reduction as such.

Based upon the above, no further air quality mitigation measures are recommended.

It can therefore be concluded that the proposed development is not considered to conflict with national, regional and local planning guidance.

Appendix A: Operational Impact Assessment

Methodology

The EPUK & IAQM guidance refers to the Town and Country Planning (Development Management Procedure) Order (England) 2010 [(Wales) 2012] for a definition of a ‘major’ development when scoping assessments required for the planning process. Based on the guidance, a ‘major’ development is such development where:

- The number of dwellings is 10 or above;
- The residential development is carried out on a site of more than 0.5ha where the number of dwellings is unknown;
- The provision of more than 1,000 m² commercial floorspace; or,
- Development carried out on land of 1ha or more.

It is recommended that consideration should be given to reduce impacts from any ‘major’ developments by considering:

- The impact of existing sources in the local area on the proposed development; and
- The impacts of the proposed development on the local area.

The assessment process involves two stages where:

Stage 1 scope out the need for an air quality assessment and **Stage 2** provide guidance of determining the level of assessment required for a project.

Table A 1 below sets out the Stage 1 criteria to determine the need to assess impacts arising from small developments and **Table A 2** provides more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table A 1: Stage 1 Criteria to Proceed to Stage 2

Criteria to Proceed to Stage 2	
A	If any of the following apply: <ul style="list-style-type: none"> • 10 or more residential units of a site area of more than 0.5ha • More than 1,000m² of floor space for all other uses or a site area greater than 1ha
B	Coupled with any of the following: <ul style="list-style-type: none"> • The development has more than 10 parking spaces • The development will have a centralised energy facility or other centralised combustion process

Table A 2: Indicative Criteria for Requiring an Air Quality Assessment

The development will	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: <ul style="list-style-type: none"> - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: <ul style="list-style-type: none"> - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign 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.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: <ul style="list-style-type: none"> - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO _x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Appendix B: Construction Dust Risk Assessment Criteria

IAQM guidance framework on assessing the risk of dust proposes the construction phase should be split into phases dependent on their potential impacts, determining the risk for each individually. Therefore, this assessment has determined the risk of the four construction categories put forward by the IAQM guidance:

- Demolition;
- Earthworks;
- Construction; and
- Track out (transport of dust and dirt onto the public road network).

The IAQM guidance framework states that the risk of dust impacts from the four categories can be defined as 'negligible', 'low risk', 'medium risk' or 'high risk' depending upon the scale and nature of the construction activity and the sensitivity and proximity of receptors to the construction site boundary. This categorisation is used to put forward appropriate mitigation measures, reducing the level of effects from the dust impacts so they are not significant.

The assessment of dust impacts using the IAQM guidance considers three separate effects from dust:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to significant increase in exposure to PM₁₀.

Step 1 of the assessment is set out to screen for the requirement for a more detailed assessment for the proposed development. The screening criteria states:

A 'human receptor' within:

- 250 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

An 'ecological receptor' within:

- 50 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

Where there are no receptors and the level of risk is deemed ‘negligible’, there is no need for further assessment.

Step 2A of the assessment enables the overall dust emission magnitude (small, medium or large) from each dust source (demolition, earthworks, construction and trackout) to be identified in relation with the criteria outlined in Table B.1.

Table B.1: Dust emission magnitude

Source	Large	Medium	Small
Demolition	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.	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material, demolition activities 6 - 12 m above ground level.	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	Total site area >110,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.	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.	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 <4 m in height.
Construction	Total building volume >75,000 m ³ , on site concrete batching, sandblasting.	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber).
Track out	>50 HDV (>3.5t) outward movements ^a in any one day, ^b potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.	20-50 HDV (>3.5t) outward movements ^a in any one day, ^b moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	<20 HDV (>3.5t) outward movements ^a in any one day, ^b surface material with low potential for dust release, unpaved road length <50 m.
Notes: ^a Vehicle movement is a one-way journey. i.e. from A to B, and excludes the return journey. ^b HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.			

Step 2B allows for the sensitivity of the area (high, medium or low) to be assessed and takes into account 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 existing local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Receptor sensitivity has been based on the highest of any criteria being met thus, the assessment is considered as robust. The sensitivity of the area is further determined for dust soiling, human health and ecosystem effects by considering the criteria presented in Table B.2.

Table B.2: Magnitude of Receptor Sensitivity

Source	High	Medium	Low
Sensitivities of people to dust soiling effects	<ul style="list-style-type: none"> • 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. • Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms. 	<ul style="list-style-type: none"> • Users would expect^a to enjoy a reasonable level of amenity, but would not reasonably expect^a 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^a to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work. 	<ul style="list-style-type: none"> • The enjoyment of amenity would not reasonably be expected^a ; or • Property would not reasonably be expected^a to be diminished in appearance, aesthetics or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected^a to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks^b and roads.
Sensitivities of people to health effects of PM₁₀	<ul style="list-style-type: none"> • Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals maybe exposed for eight hours or more in a day).^c • Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the 	<ul style="list-style-type: none"> • Locations where the people exposed are workers^d, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM₁₀, as protection is 	<ul style="list-style-type: none"> • Locations where human exposure is transient^e . • Indicative examples include public footpaths, playing fields, parks and shopping streets.

Source	High	Medium	Low
	purposes of this assessment.	covered by Health and Safety at Work legislation.	
Sensitivities of receptors to ecological effects	<ul style="list-style-type: none"> • 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 such as vascular species included in the Red Data List For Great Britain.^f • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings. 	<ul style="list-style-type: none"> • 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. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features. 	<ul style="list-style-type: none"> • Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

Notes:

^a People's expectations will vary depending on the existing dust deposition in the area, see Section 4.2.

^b Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

^c This follows Defra guidance as set out in LAQM.TG (22).

^d Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM₁₀. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.

^e There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

^f Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

The final step, Step 2C allows for the risk of impacts to be defined. The dust emission magnitude derived in Step 2A is combined with the sensitivity of the area defined in step 2B to determine the risk of effects on:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to an increase in exposure to PM₁₀.

The criteria for each of the dust sources are presented in Table B.3 to Table B.6.

Table B.3: Demolition

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

Table B.4: Earthworks

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

Table B.5: Construction

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

Table B.6: Track out

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

Appendix C: Construction Phase Mitigation Measures

The mitigation measures set out below are from IAQM's 2023 guidance for construction dust and are appropriate for the mitigation of the risk determined. The points below can be formerly adopted into a construction dust management plan.

Mitigation Measures:

- 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 and dust 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 the action taken to resolve the situation is recorded in the log book.
- Plan site layout: machinery and dust causing activities should be located away from receptors.
- Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.
- Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials from site as soon as possible.
- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone.
- Ensure all non-road mobile machinery (NRMM) comply with the standards set within this guidance.
- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible.
- Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes 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).

- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).
- Use enclosed chutes, conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Reuse and recycle waste to reduce dust from waste materials.
- Avoid bonfires and burning of waste materials.
- 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.
- 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.

Appendix D : Proposed Development Design Plans

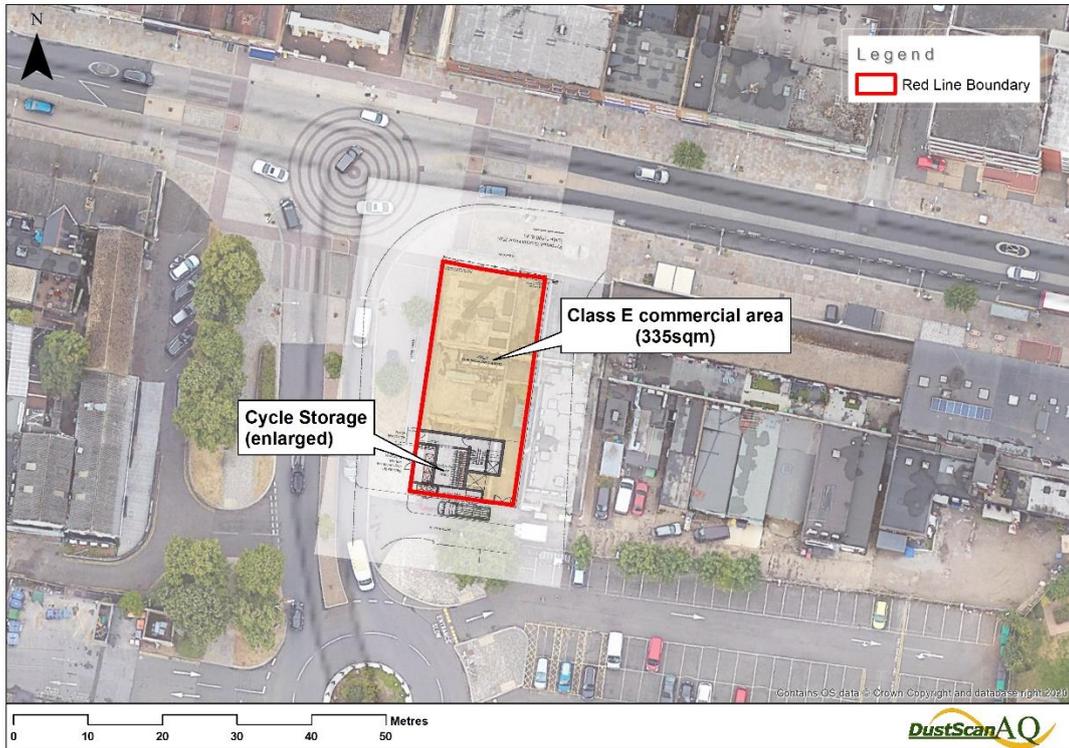


Figure D.7.1: Proposed Development Ground Floor Plan

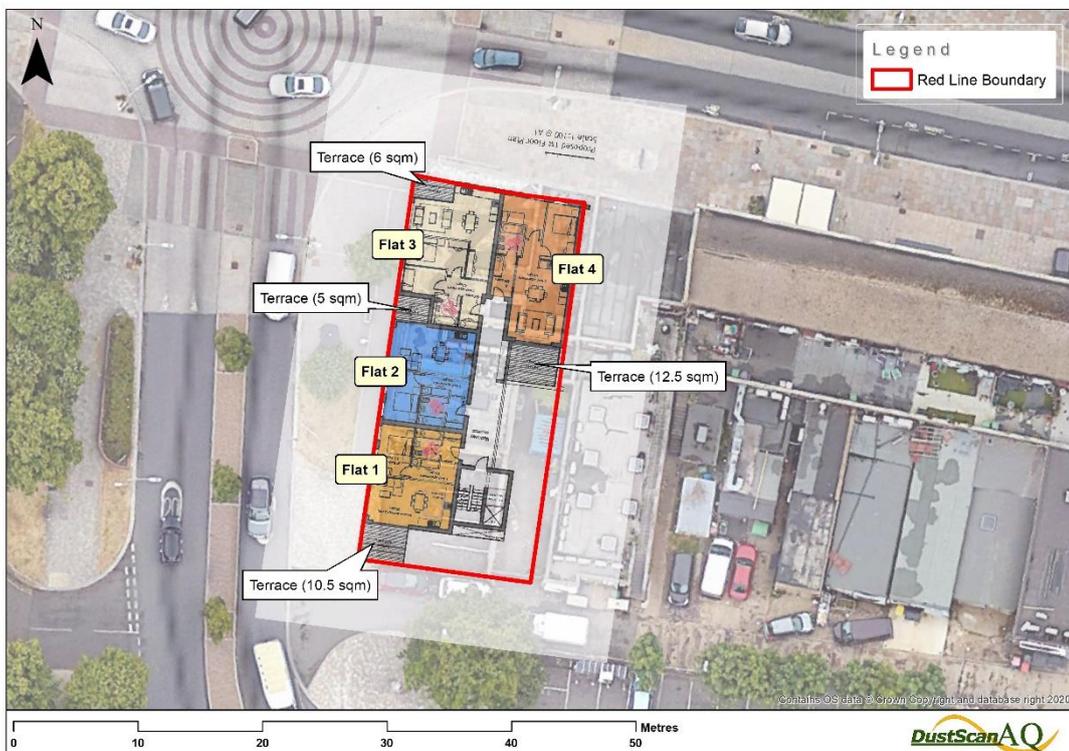


Figure D.7.2: Proposed Development First Floor Plans

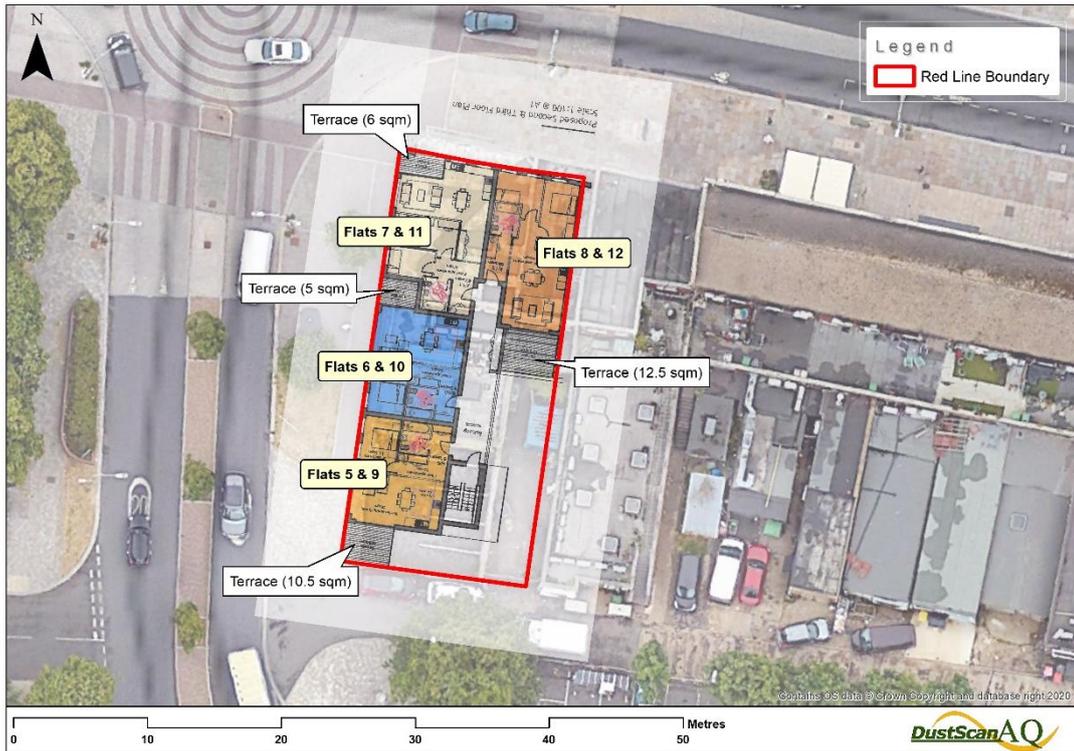


Figure D.7.3: Proposed Development Second and Third Floor Plans

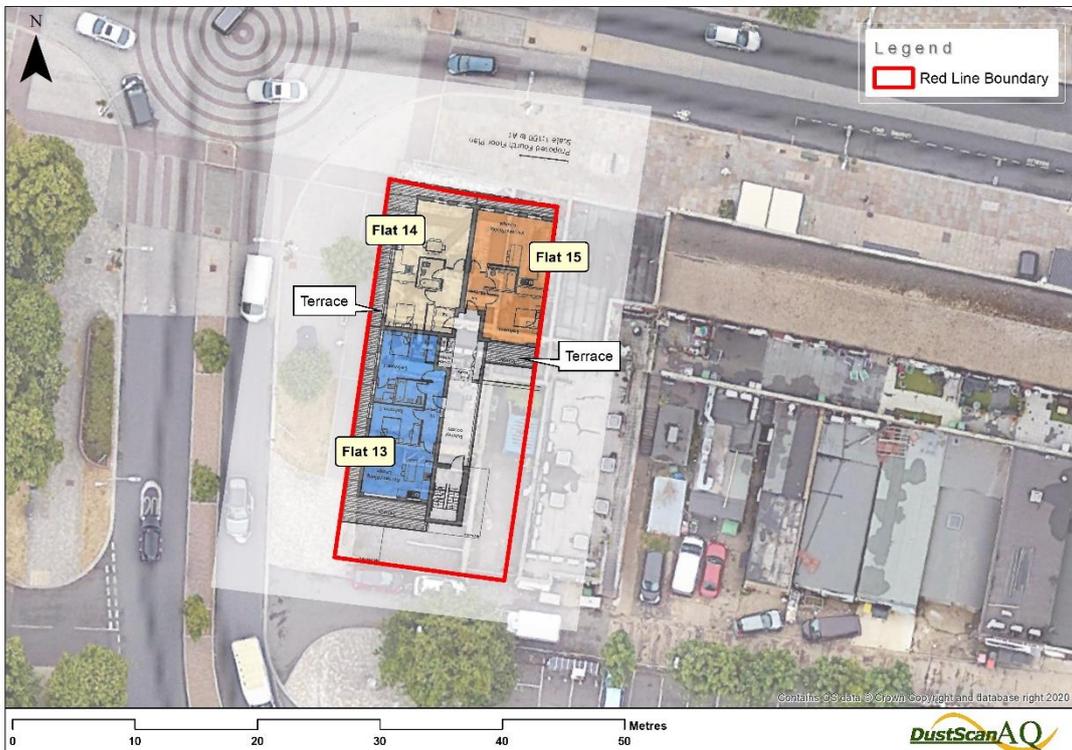


Figure D.7.4: Proposed Development Fourth Floor Plan