# Air Quality Assessment:
## Independence House, Richmond-upon-Thames

November 2023

Experts in air quality management & assessment

## Document Control

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| **Client** | William Grant and Sons Distillers Limited | **Principal Contact** | Steven Pirks (Wimshurst Pelleriti) |

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| **Report Prepared By:** | Dr Frances Marshall |

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**Air Quality Consultants Ltd**
**23 Coldharbour Road, Bristol BS6 7JT Tel: 0117 974 1086**
**24 Greville Street, Farringdon, London, EC1N 8SS Tel: 020 3873 4780**
**aqc@aqconsultants.co.uk**

Registered Office: 23 Coldharbour Road, Bristol BS6 7JT
Companies House Registration No: 2814570

## Executive Summary

The air quality impacts associated with the proposed redevelopment of Independence House on Lower Mortlake Road in the London Borough of Richmond-upon-Thames have been assessed. The proposals are for the change of use, extension and refurbishment of the site, from a four-storey office building with basement car parking, to 21 residential units, associated amenity and storage and five car parking spaces.

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

The assessment has demonstrated that future occupants of the proposed development will experience acceptable air quality conditions in the opening year, with pollutant concentrations below the air quality objectives.

The proposed development will result in a net reduction in vehicle trips on the local road network and heat and hot water will be provided via an all-electric system; there will, therefore, be no significant air quality effects on the local area.

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

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

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# 1 Introduction

1.1 This report describes the potential air quality impacts associated with the proposed redevelopment of Independence House on Lower Mortlake Road in the London Borough of Richmond-upon-Thames (LBRT). The proposals are for the change of use, extension and refurbishment of the site, from a four-storey office building with basement car parking, to 21 residential units, associated amenity and storage and five car parking spaces.

1.2 The proposed development lies within a borough-wide Air Quality Management Area (AQMA) declared by LBRT for exceedances of the annual mean nitrogen dioxide ($NO_2$) objective and annual mean and 24-hour mean $PM_{10}$ objectives. The nearest Greater London Authority (GLA) air quality Focus Area[1], covering Richmond Town Centre, is 300 m west of the application site. The location and setting of the proposed development are shown in Figure 1, along with the Focus Area and nearest air quality monitoring site operated by LBRT.

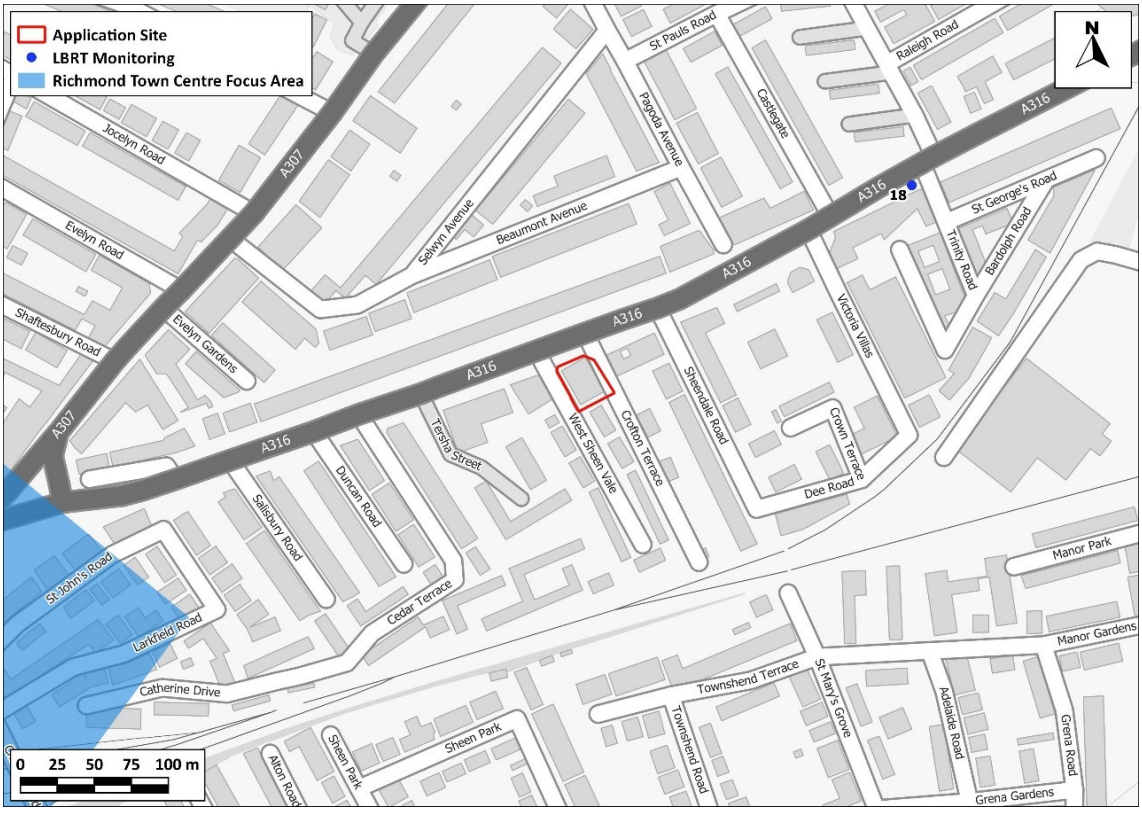


**Figure 1: Proposed Development Setting in the Context of Air Quality**



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

1.3 The proposed development will introduce new residential exposure into an area of potentially poor air quality; thus, an assessment is required to determine the air quality conditions that future residents will experience. The proposed development will also lead to changes in vehicle flows on local roads, which may impact on air quality at existing residential properties along the affected road network. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide and fine particulate matter ($PM_{10}$ and $PM_{2.5}$).

1.4 The new homes within the proposed development will be provided with heat and hot water by Exhaust Air Heat Pumps (EAHPs), which do not have any associated emissions to air; therefore, there will be no centralised combustion plant and thus no significant point sources of emissions within the proposed development.

1.5 The GLA's London Plan (GLA, 2021) requires new developments to be air quality neutral. The air quality neutrality of the proposed development has been assessed following the methodology provided in the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023).

1.6 The GLA has also released Supplementary Planning Guidance (SPG) on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014). The SPG outlines a risk assessment approach for construction dust assessment and helps determine the mitigation measures that will need to be applied. A construction dust assessment has been undertaken and the appropriate mitigation has been set out.

1.7 This report describes existing local air quality conditions in 2022 and those in the earliest possible year of occupation (2025). The assessment of construction dust impacts focuses on the anticipated duration of the works.

1.8 This report has been prepared taking into account all relevant local and national guidance and regulations, and follows a methodology agreed with LBRT.

# 2 Policy Context

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

## Air Quality Strategy 2007

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

## Air Quality Strategy 2023

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

## Clean Air Strategy 2019

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

## Reducing Emissions from Road Transport: Road to Zero Strategy

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

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

2.6 The paper sets out a number of measures by which Government will support this transition but is clear that Government expects this transition to be industry and consumer led. If these ambitions are realised then road traffic-related NOx 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

2.7 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the Government to account and ensuring compliance with these targets.

2.8 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of $PM_{2.5}$. These targets are described in Paragraph 3.5.

## Environmental Improvement Plan 2023

2.9 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018b). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.

2.10 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of $PM_{2.5}$. These targets, which are described in more detail in Paragraph 3.5, include the long-term targets in the Statutory Instrument described in Paragraph 2.8, and interim targets to be achieved by 2028.

2.11 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

## Planning Policy

### *National Policies*

2.12 The National Planning Policy Framework (NPPF) (2023a) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable

development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

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

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

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

2.14 Paragraph 185 states:

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

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

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

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

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

2.17 Regarding plan-making, the PPG states:

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

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

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

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

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

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

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

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

### *London-Specific Policies*

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

#### The London Plan

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

*"Development proposals should not:*

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

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

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

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

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

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

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

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

*d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure".*

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

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

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

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

2.27 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"*[2].

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

### London Environment Strategy

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

### Mayor's Transport Strategy

2.30 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".*

[2] The London Plan was developed based on a World Health Organisation guideline for $PM_{2.5}$ of 10 µg/m$^3$ (see Paragraph 2.29).

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

2.31 The GLA's SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014) outlines a risk assessment based approach to considering the potential for dust generation from a construction site, and sets out what mitigation measures should be implemented to minimise the risk of construction dust impacts, dependent on the outcomes of the risk assessment.

2.32 This guidance is largely based on the Institute of Air Quality Management's (IAQM's) guidance (IAQM, 2016), and it states that "*the latest version of the IAQM Guidance should be used*"[3].

### Air Quality Focus Areas

2.33 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.

2.34 The nearest air quality Focus Area covers Richmond Town Centre and is approximately 300 m from the application site.

## *Local Transport Plan*

2.35 The LBRT Third Local Implementation Plan (LIP3) (London Borough of Richmond upon Thames, 2019a) sets out a programme of measures and schemes to implement the Mayor's Transport Strategy within the borough. It aims to achieve nine outcomes through the adoption of 14 over-arching objectives, with 57 objectives linked to specific outcomes. These include to:

*"Reduce the environmental impacts and pollution levels due to transport, and encourage improvements in air quality, particularly near schools, town centres, along major roads and areas that already exceed acceptable air quality standards."*

2.36 Three LIP3 projects and programmes link to the Mayor's Transport Strategy outcomes. These are:

- *"Electric vehicle charge points*
- *Air quality infrastructure and monitoring (air quality monitoring, green walls, air filters, etc)*
- *Air quality revenue (campaigns, awareness, behaviour change, focused on schools and town centres)".*

[3] The IAQM issued revised guidance in August 2023, however the guidance includes a number of errors and inconsistencies. Based on discussions with the IAQM, a corrected version of the guidance is anticipated shortly. To avoid being subject to these errors, this assessment has been based on the 2016 version.

### *Local Policies*

2.37 The LBRT Local Plan was adopted in July 2018 (London Borough of Richmond upon Thames, 2018). One of the strategic objectives within this plan is to:

*"Reduce or mitigate environmental impacts and pollution levels (such as air, noise, light, odour, fumes, water and soil) and encourage improvements in air quality, particularly along major roads and areas that already exceed acceptable air quality standards."*

2.38 More specifically, Policy LP 10 concerns local environmental impacts, pollution and land contamination. In terms of air quality, Policy LP 10 states:

*"The Council promotes good air quality design and new technologies. Developers should secure at least 'Emissions Neutral' development. To consider the impact of introducing new developments in areas already subject to poor air quality, the following will be required:*

1. *An air quality impact assessment, including where necessary, modelled data;*
2. *Mitigation measures to reduce the development's impact upon air quality, including the type of equipment installed, thermal insulation and ducting abatement technology;*
3. *Measures to protect the occupiers of new developments from existing sources;*
4. *Strict mitigation for developments to be used by sensitive receptors such as schools, hospitals and care homes in areas of existing poor air quality; this also applies to proposals close to developments used by sensitive receptors."*

2.39 LBRT is currently working on a new Local Plan; consultation on the Draft Local Plan took place between June and July 2023. The Draft Local Plan (London Borough of Richmond upon Thames, 2023a) includes Policy 53: Local Environmental Impacts, which states in relation to air quality:

*"D. The Council promotes good air quality design and new technologies. All developments must comply with the new London Plan 2021 Policy SI1 Improving Air Quality.*

*E. Major developments and large-scale development subject to an Environmental Impact Assessment (EIA) are required to achieve "Air Quality Positive".*

*F. All developments must be at least "Air Quality Neutral". Proposals that would materially increase exceedances of local air pollutants will be resisted unless the development mitigates this impact through physical measures and/or financial contributions to implement proposals in Richmond's Local Air Quality Management Plan.*

*G. To consider the impact of introducing new developments in areas already subject to poor air quality, the following will be required:*

*1. an air quality impact assessment, including where necessary modelled data; this also applies to change of use to residential at street level;*

*2. mitigation measures to reduce the development's impact upon air quality, including the type of equipment installed, thermal insulation and ducting abatement technology;*

*3. measures to protect the occupiers of new developments from existing sources;*

*4. strict mitigation for developments to be used by sensitive receptors such as schools, hospitals and care homes in areas of existing poor air quality; this also applies to proposals close to developments used by sensitive receptors;*

*5. mitigation measures to reduce the impact of transport from the development upon air quality, including support for active travel, electric vehicles and car club membership.*

*H. The Council will require financial contributions towards off-site air quality measures where a proposed development is not air quality neutral, or mitigation measures do not reduce the impact upon poor air quality. Specific guidance for air quality in new developments is set out in the Council's Air Quality SPD (2020)."*

### Air Quality SPD

2.40 The LBRT Air Quality SPD was adopted in June 2022 and aims to provide a consistent approach to new development (London Borough of Richmond upon Thames, 2020a). It provides advice on:

- *"the implementation of Policy LP 10, Part B. Air Quality* [of the LBRT Local Plan];
- *designing new developments to minimise the effects on the local community as well as avoiding introducing new exposure in areas of poor air quality;*
- *the assessment of air quality impacts of development; and*
- *appropriate mitigation measures."*

2.41 The SPD has been considered in this assessment.

### Sustainable Construction Checklist Guidance Document SPD

2.42 The LBRT Sustainable Construction Checklist Guidance Document SPD (London Borough of Richmond upon Thames, 2020b) was adopted in June 2020, and forms a mandatory part of the planning application for residential developments providing one or more new dwellings, or 100 $m^2$ or more floor space for non-residential developments. It provides a list of relevant policies relating to energy use and pollution, including pollution during the construction process, and incorporates policies outlined in the adopted Local Plan.

2.43 Section 2 of the SPD states the following in relation to electric vehicle charging points:

*"The London Plan requires 20% of parking space to have active provision for electric vehicle charging and 80% passive provision. The Council's ambition is that charging facilities are provided in such a way as to enable direct access to charging facilities for all vehicles. Consequently, the Council supports development making provision for 100% active electric vehicle parking. This does however not mean that every parking space where parking is shared communally needs to be equipped with a charging point, as one fast or rapid charging point may cater for many vehicles. Applicants will need to demonstrate that their development would be able to operate satisfactorily in the future expectation of all vehicles being electrically powered."*

### Construction Code of Practice

2.44 The LBRT Construction Code of Practice was adopted in January 2022 and details measures that should be employed by construction sites in order to minimise environmental disturbance to sensitive receptors such as local residents, schools, hospitals and businesses (London Borough of Richmond upon Thames, 2022).

2.45 The measures detailed in the document are based upon those outlined in the GLA's guidance on the *Control of Dust and Emissions during Construction and Demolition SPG* (GLA, 2014).

## Building Standards

2.46 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 work[4], to ensure adequate ventilation is provided to building occupants.

2.47 Approved Document F (HM Government, 2021a), which accompanies the Building Regulations, explains that care should be taken to minimise entry of external air pollutants. Specific steps should be taken to manage ventilation intakes where the building is near to a significant source of emissions, or if local ambient concentrations exceed values set in the Air Quality Standards Regulations 2010 (see Paragraph 3.10, later). These steps include maximising the distance between emission source and air intake, considering likely dispersion patterns, and considering the timing of pollution releases when designing the ventilation system.

2.48 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.

[4] 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.

2.49 Compliance with the Building Regulations is not required for planning approval, but it is assumed that the Regulations will be complied with in the completed development.

## Air Quality Action Plans

### *National Air Quality Plan*

2.50 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).

2.51 There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

### *Local Air Quality Action Plan*

2.52 LBRT declared a borough-wide AQMA in 2000 for exceedances of the annual mean nitrogen dioxide objective and the annual mean and 24-hour mean $PM_{10}$ objectives.

2.53 LBRT's most recent Air Quality Action Plan was published in 2020 for the period up to 2025 (London Borough of Richmond upon Thames, 2019b) and focuses on the following five priorities:

- *"Monitoring of air quality"* – to maintain, and possibly enhance as new technologies materialise, the monitoring network, as well as encouraging and supporting citizen science initiatives;
- *"Changing our environment"* – to encourage sustainable and active transport and promote electric vehicle uptake.
- *"Changing behaviour"* – including campaigns and initiatives and improving communication.
- *"Tackling pollution"* – such as anti-idling initiatives, dealing with bonfires and regulating demolition and construction activities.
- *"Protecting our schools"* – including continuously assessing the impact of air quality on schools.

2.54 The Place-based Strategy for Richmond set out in the Draft Local Plan (London Borough of Richmond upon Thames, 2023a) sets out LBRT's ambition to pilot a CAZ within Richmond Town Centre, approximately 500 m from the application site. LBRT is currently considering wider plans, which may go above and beyond a CAZ (London Borough of Richmond upon Thames, 2023b), which will be progressed over the coming years.

# 3 Assessment Criteria

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

3.2 The 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 $PM_{10}$ are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for $PM_{10}$ is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

3.3 The UK-wide objectives for nitrogen dioxide and $PM_{10}$ 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 mean nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m$^3$ (Defra, 2022). Measurements have also shown that the 24-hour mean $PM_{10}$ objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m$^3$ (Defra, 2022).

3.4 For $PM_{2.5}$, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see Paragraph 3.10), originally set at 25 µg/m$^3$ and currently set at 20 µg/m$^3$.

3.5 Defra has also recently set two new targets, and two new interim targets, for $PM_{2.5}$ concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m$^3$ by the end of 2040, with the interim target being a value of 12 µg/m$^3$ by the start of 2028[5]. The second set of targets relate to reducing overall population exposure to $PM_{2.5}$. By the end of 2040, overall population exposure to $PM_{2.5}$ should be

[5] Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m$^3$ would not exceed the 10 µg/m$^3$ target.

reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

3.6 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, as explained in Paragraph 2.11, all four new targets provide metrics against which central Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing $PM_{2.5}$ concentrations against the targets.

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

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

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

3.9 As explained in Paragraph 2.29, the GLA has set a target to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m$^3$ by 2030. This target was derived from an air quality guideline set by WHO in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy (GLA, 2018a) considers the 2005 guideline of 10 µg/m$^3$. While there is no explicit requirement to assess against the GLA target of 10 µg/m$^3$, it has nevertheless been included within this assessment.

3.10 European Union (EU) Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, $PM_{10}$ and $PM_{2.5}$, and is implemented in UK law through the Air Quality Standards Regulations (2010)[6]. The limit values for nitrogen dioxide and $PM_{10}$ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

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

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

**Table 1: Air Quality Criteria for Nitrogen Dioxide, $PM_{10}$ and $PM_{2.5}$**

| Pollutant | Time Period | Value |
|---|---|---|
| **Nitrogen Dioxide** | 1-hour Mean | 200 µg/m$^3$ not to be exceeded more than 18 times a year |
| | Annual Mean | 40 µg/m$^3$ |
| **$PM_{10}$** | 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] |
| | | 10 µg/m$^3$ by 2030 |

[a] There is no numerical $PM_{2.5}$ objective for local authorities (see Paragraph 3.4). Convention is to assess against the UK limit value which is currently 20 µg/m$^3$.

## Construction Dust Criteria

3.12 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM (2016) has been used (the GLA's SPG (GLA, 2014) recommends that the assessment be based on the latest version of the IAQM guidance[3]). Full details of this approach are provided in Appendix A2.

## Screening Criteria

3.13 Environmental Protection UK (EPUK) and the IAQM recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality effects. The approach, as described in Appendix A3, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m$^2$ of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

3.14 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix A3) inside an AQMA are a change in flows of more than 25 Heavy Duty Vehicles (HDVs) or 100 Light Duty Vehicles (LDVs) per day. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that *"the criteria provided are precautionary and should be treated as indicative"*, and *"it may be appropriate to amend them on the basis of professional judgement"*.

# 4 Assessment Approach

## Consultation

4.1 The assessment follows a methodology agreed with LBRT via email correspondence between Carol Lee (Principal Environmental Health Pollution Practitioner within the Regulatory Services Partnership between London Boroughs of Richmond upon Thames, Merton and Wandsworth) and Frances Marshall (AQC) on18th October 2023. Specifically, the following key points were agreed:

- since the proposals do not include any centralised combustion sources and results in a net reduction in vehicle trips on the local road network, a qualitative assessment of the impacts of the development on the local area will be provided;
- the suitability of the site for residential development will be assessed qualitatively, taking account local air quality monitoring data and trends in the data;
- a construction dust risk assessment will be provided; and
- the 'air quality neutrality' of the development will be assessed. Since there are no combustion sources, the building emissions do not require calculation, but the transport calculation will be included.

4.2 The Environmental Health Pollution Practitioner also advised the following measures in relation to transport:

- All car parking bays should have at least 20% active, with the remainder passive, electric vehicle charging points;
- cycle parking must fully comply with the London Plan 2021 standards;
- a robust travel plan encouraging the use of sustainable transport will be required; and
- a car club bay is encouraged, however since the development is for fewer than 25 dwellings, is not a requirement.

## Existing Conditions

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

- industrial sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2023d);
- local sources have been identified through examination of LBRT's Air Quality Review and Assessment reports;
- information on existing air quality has been obtained by collating the results of monitoring carried out by LBRT (2023b); and

- whether or not there are any exceedances of the annual mean limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2020; 2023e), as well as from any nearby Automatic Urban and Rural Network (AURN) monitoring sites (which operate to the required data quality standards). These are the maps used by the UK Government, together with the AURN results, to identify and report exceedances of the limit value. The national maps of roadside $PM_{10}$ and $PM_{2.5}$ concentrations (Defra, 2023e), which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

## Construction Impacts

4.4 The construction dust assessment considers the potential for impacts within 350 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014), which is based on that provided by IAQM (2016)[3]. This follows a sequence of steps:

- Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required.
- Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation.
- Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant effects.

4.5 Appendix A2 explains the approach in more detail.

## Road Traffic Impacts of the Proposed Development

4.6 Road traffic impacts of the proposed development have been considered by screening the development traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.13 and detailed further in Appendix A3 Where impacts can be screened out there is no need to progress to a more detailed assessment, as has been the case for this development.

## Impacts of Road Traffic on Future Residents of the Proposed Development

4.7 The impacts of nitrogen dioxide, $PM_{10}$ and $PM_{2.5}$ concentrations on new residents of the development have been assessed qualitatively. The assessment considers air quality conditions within the site taking account of local air quality monitoring data and the trends evident in the data, and proximity to the A316.

4.8 The assessment examines air quality conditions in 2022 and assumes these are representative of air quality conditions at the time the development is occupied in 2025; this assumption is considered to be worst-case as it is expected that nitrogen dioxide, $PM_{10}$ and $PM_{2.5}$ concentrations will decline in future years.

## Assessment of Significance

### *Construction Dust Significance*

4.9 Guidance from IAQM (2016) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version of the guidance upon which the assessment methodology set out in the GLA guidance (GLA, 2014) is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used)[3]. The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

### *Operational Significance*

4.10 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and the IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used.

4.11 The overall significance of the air quality impacts is determined using professional judgement; the experience of the consultants preparing the report is set out in Appendix A4. Full details of the EPUK/IAQM approach are provided in Appendix A3.

## 'Air Quality Neutral'

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

4.13 Since there are no combustion sources, it is not necessary to calculate the building emissions associated with the proposals. Appendix A5 sets out the benchmark trip rates from the guidance. The approach has been to calculate the annual car trips generated by the development and to compare them with these benchmarks.

# 5 Baseline Conditions

## Relevant Features

5.1 The application site is located adjacent to Lower Mortlake Road (A316), between Richmond and Kew. The site is bounded by Lower Mortlake Road to the north, Crofton Terrace to the east, residential properties to the south, and West Sheen Vale to the west. The site is currently occupied by an existing office building with 21 car parking spaces in the basement.

5.2 The proposed development is located within the borough-wide AQMA and 300 m from the Richmond Town Centre air quality Focus Area, as highlighted in Figure 1.

## Industrial Sources

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

## Local Air Quality Monitoring

5.4 LBRT operates three automatic monitoring stations within its area, two of which measure concentrations of nitrogen dioxide; however, these are both over 4 km from the application site.

5.5 LBRT also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko (using the 50% TEA in acetone method). These include six within 1 km of the application site, one of which (Site 18) is located on the A316, 260 m from the application site.

5.6 Annual mean results for the years 2016 to 2022[7] are summarised in Table 2, while the monitoring locations are shown in Figure 2. Exceedances of the objectives are shown in bold, whilst exceedances of 60 µg/m$^3$, indicating the potential for an exceedance of the 1-hour mean objective, are shown in bold underline. The monitoring data have been taken from LBRT's 2022 Annual Status Report (London Borough of Richmond upon Thames, 2023b).

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

**Table 2: Summary of Annual Mean $NO_2$ Monitoring (µg/m$^3$) [a]**

| Site No. | Site Type | Location | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|
| **18** | Kerbside | Lower Mortlake Road, Richmond | **56** | **58** | **46** | **46** | **41** | 39 | 30 |
| **19** | Kerbside | Kew Road, Kew | **49** | **49** | **42** | 37 | 30 | 28 | 21 |
| **26** | Roadside | URRW, Sheen | 40 | 40 | 36 | 34 | 32 | 33 | 28 |
| **27** | Roadside | Queens Road, Richmond | **43** | **41** | 37 | 32 | 21 | 23 | 18 |
| **42** | Roadside | The Quadrant / Kew Road, Richmond | **82** | **89** | **72** | **62** | **60** | **54** | **41** |
| **44** | Kerbside | Sheen Road, Richmond | **42** | **41** | 40 | 37 | 33 | 32 | 29 |
| **Objective** | | | **40** | | | | | | |

[a] Exceedances of the objectives are shown in bold. Exceedances of 60 µg/m$^3$ are shown in bold underline.

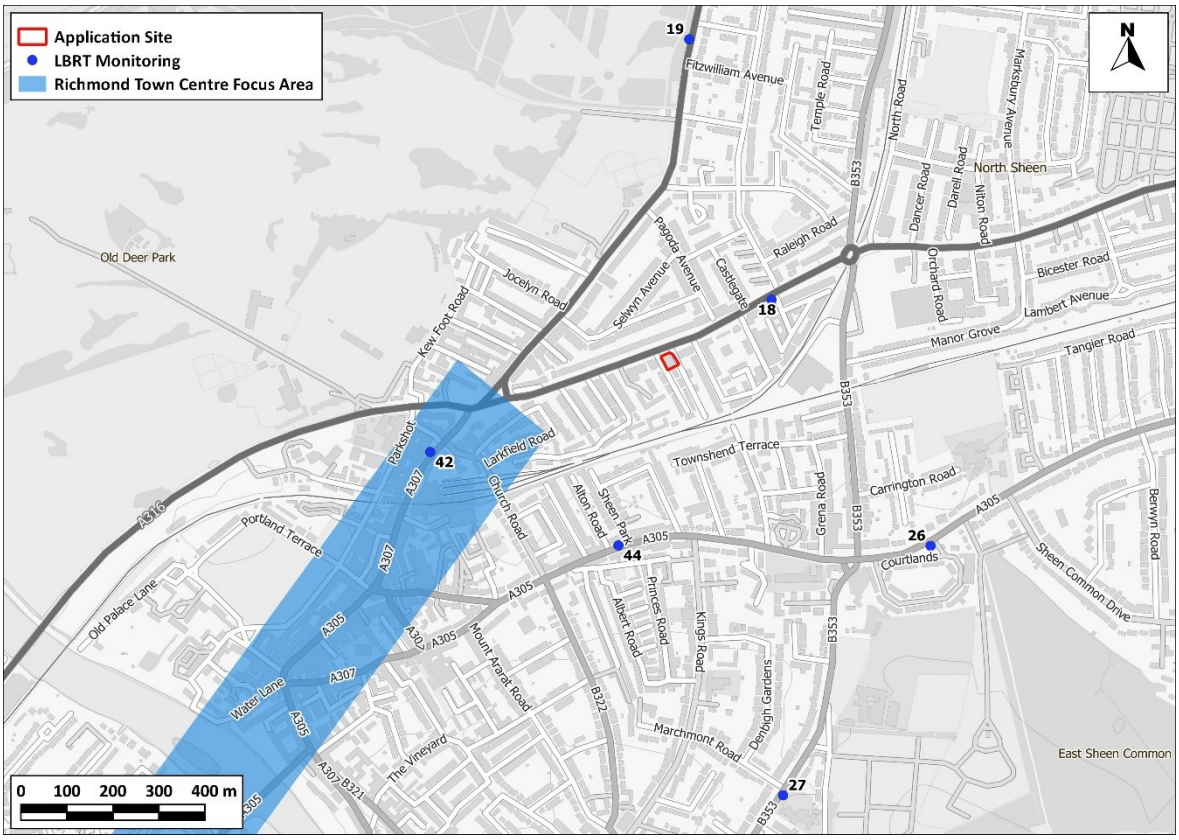


**Figure 2: Monitoring Locations**



5.7 Exceedances of the annual mean objective have been consistently measured at Site 42, a roadside site on Kew Road; as shown in Figure 2, the site is also located within the Focus Area. Exceedances

were also regularly measured at Site 18 up to 2021. In 2022, only Site 42 measured an exceedance of the annual mean objective.

5.8 Measured concentrations in 2022 were also well below 60 µg/m$^3$, indicating an exceedance of the 1-hour mean objective is unlikely at any of the monitoring sites; this is consistent with measurements at the automatic monitoring sites, which showed no exceedances of the objective level (200 µg/m$^3$) in any hour in 2022 (London Borough of Richmond upon Thames, 2023b).

5.9 At all monitoring sites, there is a clear trend of improving air quality conditions, as shown in Figure 3; this is consistent with data across the whole of LBRT (2023b).

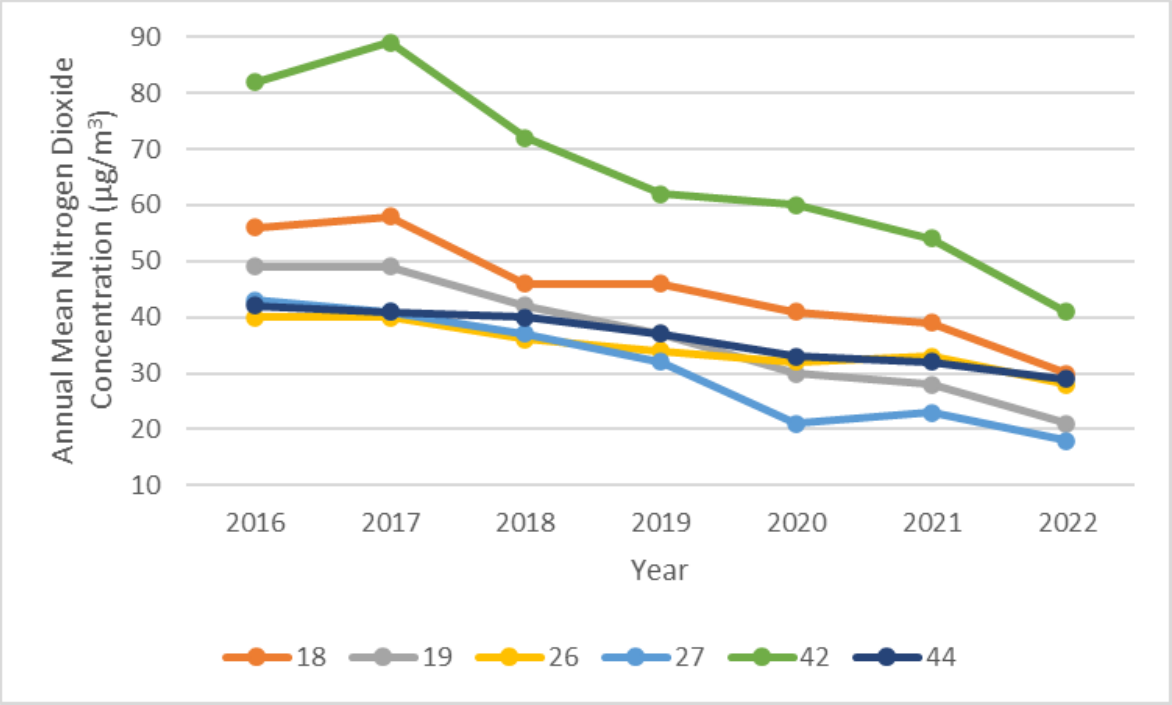


**Figure 3: Trend in Annual Mean Nitrogen Dioxide Monitoring Data**

5.10 Concentrations of $PM_{10}$ are measured at two of the automatic monitors, as well as at the AURN site in Teddington. Measured annual mean concentrations have consistently been well below the objective; the maximum concentration in 2022 at any of the sites was 15 µg/m$^3$. No exceedances of the 24-hour mean objective were measured at any site in 2022.

5.11 The AURN site in Teddington also measures concentrations of $PM_{2.5}$; concentrations have been consistently well below the objective since monitoring commenced in 2017. In 2022, the measured concentration (9 µg/m$^3$) was also below the GLA's target value of 10 µg/m$^3$.

## Exceedances of Limit Value

5.12 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean nitrogen dioxide limit value (Defra, 2023f). Furthermore, Defra's

roadside annual mean nitrogen dioxide concentrations (Defra, 2023e), which are used to identify and report exceedances of the limit value, identify exceedances of this limit value in 2019 along many roads in London, including the A316 adjacent to the proposed development. The Greater London Urban Area has thus been reported as exceeding the limit value for annual mean nitrogen dioxide concentrations.

5.13 Defra's predicted concentrations for 2025 (Defra, 2020) do not, however, identify any exceedances within 1 km of the application site. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.

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

# 6 Construction Phase Impact Assessment

## Construction Traffic

6.1 The number of HDVs accessing the site is unknown, however, given the scale and duration of the works, as well as the location and size of the application site, it is considered unlikely that the construction works will generate a significant volume of vehicles on the local network for a prolonged period of time. Site preparation and construction is anticipated to take between one year and 18 months; as such, any vehicle movements generated during this period will be temporary.

6.2 It is, therefore, not considered necessary to assess the impacts of traffic emissions during the construction phase and it can be concluded that the proposed development will not have a significant effect on local roadside air quality during construction.

## On-Site Exhaust Emissions

6.3 The IAQM guidance (2016) states:

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

6.4 The extent of the construction works is relatively small, thus the number of NRMM able to operate at any one time will be limited. In line with the GLA's Control of Dust and Emissions During Construction and Demolition SPG, and as described in Appendix A6, NRMM are expected to comply with emissions standards. Additionally, there will be no idling when vehicles are not in use, and machinery will be located away from sensitive receptors as far as possible.

6.5 It is judged that there is no risk of significant effects at existing receptors from on-site machinery emissions.

## Construction Dust and Particulate Matter Emissions

6.6 The construction works will give rise to a risk of dust impacts during demolition and construction. Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see Appendix A2), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

### *Potential Dust Emission Magnitude*

#### Demolition

6.7 The existing building has already been stripped of internal finishes and mechanical equipment, and the proposals seek to retain most of the building envelope and concrete structure. Demolition activities are, therefore, limited to the existing mansard roofs and the masonry external wall of the rear annex. The demolition works will take approximately two months to complete and will not involve any crushing or screening equipment.

6.8 Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for demolition is considered to be *small.*

#### Earthworks

6.9 There is no requirement for earthworks on site.

#### Construction

6.10 Construction will take between 10 months and one year and will involve the erection of a lightweight steel frame to maximise the building footprint; the main construction materials are proposed to be steel, timber, terracotta, glazing and reclaimed brickwork. There will be no piling, concrete batching or sand blasting taking place during the construction phase.

6.11 Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for construction is considered to be *small*.

#### Trackout

6.12 Vehicles will use the existing highway (Lower Mortlake Road, Crofton Terrace and West Sheen Vale), and there is no off-road access to the site. Subsequently, no dust or dirt will be tracked out, and dust from trackout is not considered further.

6.13 Table 3 summarises the dust emission magnitude for the proposed development.

**Table 3: Summary of Dust Emission Magnitude**

| Source | Dust Emission Magnitude |
|---|---|
| **Demolition** | Small |
| **Earthworks** | N/A |
| **Construction** | Small |
| **Trackout** | N/A |

### *Sensitivity of the Area*

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

6.15 The IAQM guidance, upon which the GLA's guidance is based, explains that residential properties are 'high' sensitivity receptors to dust soiling (Table A2.2 in Appendix A2). Residential properties are also classified as being of 'high' sensitivity to human health effects.

6.16 There are approximately 20 residential properties within 20 m of the site, mostly located in the adjacent apartment blocks (Eminence House and The Vetro) on the neighbouring roads, whilst there are many more within 50 m, including on Lower Mortlake Road (see Figure 4).


**Figure 4: 20 m and 50 m Distance Bands around Site Boundary**



#### Sensitivity of the Area to Effects from Dust Soiling

6.17 Using the information set out in Paragraph 6.16 and Figure 4 alongside the matrix set out in Table A2.3 in Appendix A2, the area surrounding the onsite works is of 'high' sensitivity to dust soiling.

### Sensitivity of the Area to any Human Health Effects

6.18 The matrix in Table A2.4 in Appendix A2 requires information on the baseline annual mean $PM_{10}$ concentration in the area. As set out in Paragraph 5.10, the maximum concentration measured across LBRT in 2022 was 15 µg/m$^3$.

6.19 Using the information set out in Paragraphs 6.15 and Figure 4 alongside the matrix in Table A2.4 in Appendix A2, the area surrounding the onsite works is of 'low' sensitivity to human health effects.

### Sensitivity of the Area to any Ecological Effects

6.20 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary, thus ecological impacts will not be considered further.

### Summary of the Area Sensitivity

6.21 Table 4 summarises the sensitivity of the area around the proposed construction works.

**Table 4: Summary of the Area Sensitivity**

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

## *Risk and Significance*

6.22 The dust emission magnitudes in Table 3 have been combined with the sensitivities of the area in Table 4 using the matrix in Table A2.6 in Appendix A2, in order to assign a risk category to each activity. The resulting risk categories for the two construction activities, without mitigation, are set out in Table 5. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 9 (Step 3 of the assessment procedure).

**Table 5: Summary of Risk of Impacts Without Mitigation**

| Source | Dust Soiling | Human Health |
|---|---|---|
| **Demolition** | Medium Risk | Negligible |
| **Construction** | Low Risk | Negligible |

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

# 7 Operational Phase Impact Assessment

## Impacts at Existing Receptors

7.1 The site is currently used as an office building and has 21 car parking spaces at basement level; the proposals will reduce the number of parking spaces to five. In addition, the transport consultants, Kronen Limited, have advised that the residential uses will generate fewer trips than the existing office use.

7.2 As such, it is anticipated that there will be a net reduction in vehicle trips on the local road network, and there is no requirement for a detailed assessment of road traffic impacts at existing receptors. It can be concluded that the proposed development will have a negligible impact on local roadside air quality.

## Impacts of Road Traffic Emissions on Future Residents of the Development

7.3 The measured annual mean nitrogen dioxide concentration at the kerbside monitoring site adjacent to Lower Mortlake Road (Site 18) in 2022 was 30 µg/m$^3$ (see Table 2). This monitoring site is, however, opposite a landscaped area where vehicle emissions will be able to disperse; contrastingly, the proposed development is located opposite a row of terraced two-storey houses. Concentrations of nitrogen dioxide at the proposed development therefore have the potential to be marginally higher than those measured at Site 18.

7.4 In 2022, there were three exceedances of the objective measured across the whole of LBRT's administrative area, two of which (Sites 42 and Rut 02) were in the Richmond Town Centre Focus Area and are in a similar urban setting to the proposed development. Site 42 measured 41 µg/m$^3$, whilst Rut 02 measured 43 µg/m$^3$. These monitors are 0.7 m from the kerb of the A305/A307; the new residential units within the proposed development will be set back from the kerb by at least 8 m.

7.5 Defra has issued a fall-off with distance calculator (Defra, 2023c) to estimate concentrations at user-defined distances from the roadside, based on local monitoring and background concentrations. The fall-off curve is presented in Figure 5, and uses the following details:

- a distance of 0.7 m for the distance between the kerb and the monitoring site;
- a distance of 8.0 m for the distance between the proposed development and Lower Mortlake Road;
- a background concentration of 18.0 µg/m$^3$ in 2022, taken from Defra's background maps (Defra, 2023g); and
- the measured annual mean $NO_2$ concentration at the Rut 02 monitoring site in 2022 (43.0 µg/m$^3$), which is the higher of the two sites.

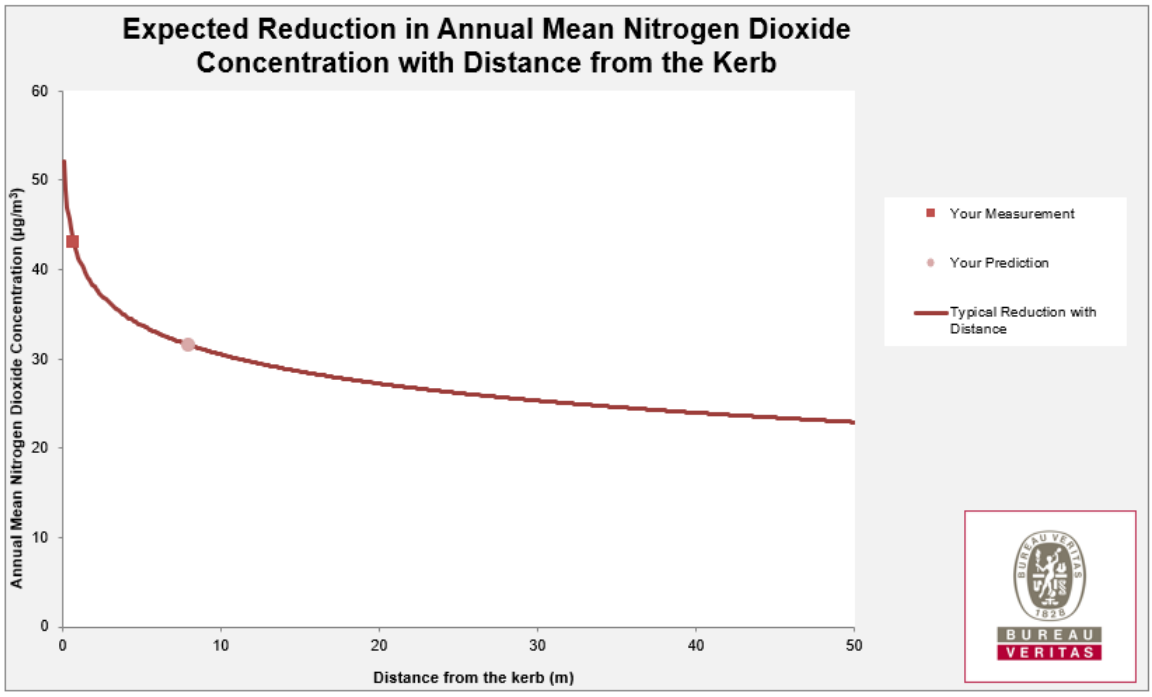


**Figure 5: Graphical Representation of Fall-off with Distance**

7.6 The predicted annual mean concentration is 31.5 µg/m$^3$ from Figure 5, which is well below the objective. As such, there is considered to be no risk of an exceedance of the annual mean nitrogen dioxide objective at the proposed development.

7.7 As shown in Figure 3, there is a clear downward trend in measured nitrogen dioxide concentrations at roadside monitors close to the application site. It is anticipated that roadside concentrations across LBRT will continue to reduce by the time that the development is operational in 2025, further assisted by national and London-wide measures, including the promotion of the uptake of low and zero emission vehicles and the recent expansion of the ULEZ to cover LBRT.

7.8 Since nitrogen dioxide annual mean concentrations are well below 60 µg/m$^3$, and there have been no exceedances of the hourly air quality objective at the automatic monitors, an exceedance of the short-term objective is also therefore highly unlikely (see Paragraph 3.3) at the proposed development.

7.9 In terms of $PM_{10}$, monitoring at the automatic monitors has demonstrated that concentrations are consistently well below the respective objectives (see Paragraph 5.10), whilst measured annual mean concentrations of $PM_{2.5}$ at the AURN site in Teddington are well below the current objective, and below the GLA's target value of 10 µg/m$^3$.

7.10 It is judged that future residents will experience acceptable air quality conditions in the opening year.

## Significance of Operational Air Quality Effects

7.11 The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in Appendix A3, and takes account of the assessment that:

- pollutant concentrations within the proposed development will all be below the objectives and GLA target value for $PM_{2.5}$, thus future residents will experience acceptable air quality;
- the proposed development will result in a net reduction in traffic generated by the site, compared to the existing office use, and will thus have a negligible impact on local air quality conditions; and
- the proposed development does not incorporate any on-site combustion plant for the provision of energy.

# 8 'Air Quality Neutral'

8.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant effects on human health (this has been assessed separately in the previous section).

8.2 The air quality neutral assessment has been undertaken using the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023).

## Building Emissions

8.3 The proposed development does not include any combustion plant for the routine provision of electricity, heating or hot water and will thus have no direct building emissions. The proposed development is, therefore, better than air quality neutral in terms of building emissions.

## Road Transport Emissions

8.4 Kronen Limited has advised that each parking space within the proposed development could generate up to four movements per day, resulting in a total of 7,300 car trips per year from the residential units. These values are set out in Table 6.

8.5 Appendix A5 provides the Benchmark Trip Rates for each land use category based on the number of dwellings. Table 6 shows calculation of the benchmark for this development, based on the number of proposed dwellings provided by Wimshurst Pelleriti for an outer London development.

8.6 The total development trip rate is less than the benchmark. The proposed development is thus air quality neutral in terms of transport emissions.

**Table 6: Calculation of Transport Benchmarks for the Development [a]**

| Use Class | Dwellings | Benchmark | | Annual Trips from Development |
|---|---|---|---|---|
| | | trips/dwelling/yr | Trips/yr | |
| **Residential [b]** | 21 | 447 | 9,387 | 7,300 |

[a] Each trip is 1-way (i.e., a return journey would be two trips). Considers car trips only.

## Summary

8.7 The number of annual trips associated with the proposed development is below the benchmark. The proposed development therefore complies with the requirement that all new developments in London should be at least air quality neutral.

# 9 Mitigation

## Preliminary Air Quality Assessment measures

9.1 Paragraph 9.1.5 of the London Plan explains that, for major developments, a preliminary assessment should be carried out to inform the design process. It further explains that 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; and*
- *Appropriate design measures that could be implemented to ensure that development reduces exposure and improves air quality."*

9.2 The most significant sources of pollution in the area and constraints imposed on the site by air quality and appropriate land uses for the site have been considered in Sections 5 and 7, respectively. With respect to appropriate design measures to reduce exposure and improve air quality, a number of measures were incorporated within the design of the proposed development at the early stages including:

- Reducing the number of car parking spaces, resulting in a net reduction in traffic movements compared to the existing office use;
- 100% active electric vehicle charging points; and
- using renewable energy sources and air source heat pumps to provide heat and power to the proposed development instead of on-site combustion (e.g. boilers, Combined Heat and Power (CHP) units or emergency generators).

## Recommended Mitigation

### *Construction Impacts*

9.3 Measures to mitigate dust emissions will be required during the construction phase of the development in order to minimise effects upon nearby sensitive receptors.

9.4 The site has been identified as a *Medium* Risk site during demolition and *Low* Risk site during construction, as set out in Table 5. The GLA's SPG on *The Control of Dust and Emissions During Construction and Demolition* (GLA, 2014) describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on what monitoring should be undertaken during the construction phase. This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment

and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A6.

9.5 The mitigation measures should be written into a Dust Management Plan (DMP). The DMP may be integrated into a Code of Construction Practice or the Construction Environmental Management Plan and may require monitoring. The GLA's guidance suggests that, for a Medium Risk site, automatic monitoring of particulate matter (as $PM_{10}$) will be required. It also states that, on certain sites, it may be appropriate to determine the existing (baseline) pollution levels before work begins. However, the guidance is clear that the Local Authority should advise as to the appropriate air quality monitoring procedure and timescale on a case-by-case basis.

9.6 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.

### *Road Traffic Impacts*

9.7 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'; it will neither introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant effect on local air quality. It is, therefore, not considered appropriate to propose mitigation measures for this development.

9.8 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).

9.9 Policy T6.1 of the London Plan (GLA, 2021) requires at least 20% of all car parking spaces within residential developments to have active electric vehicle charging facilities, with passive provision for all remaining spaces. The proposed development goes beyond the minimum requirement, and will incorporate active charging into all spaces. This will assist in minimising the impacts of the development, as identified in Section 7, as the uptake of electric vehicles increases.

### *Air Quality Neutral*

9.10 The proposed development complies with the requirement that all new developments in London should be at least air quality neutral. There is, therefore, no requirement for mitigation or offsetting.

# 10 Residual Impacts and Effects

## Construction

10.1 The IAQM guidance, on which the GLA's guidance is based, is clear that, with appropriate mitigation in place, the residual effects will normally be 'not significant'. The mitigation measures set out in Section 9 and Appendix A6 are based on the GLA guidance. With these measures in place and effectively implemented, the residual effects are judged to be 'not significant'.

10.2 The IAQM guidance does, however, recognise that, even with a rigorous DMP in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. During these events, short-term dust annoyance may occur, however, the scale of this would not normally be considered sufficient to change the conclusion that overall, the effects will be 'not significant'.

## Road Traffic Impacts

10.3 The residual impacts will be the same as those identified in Section 7. The overall effects of the proposed development will be 'not significant'.

# 11 Conclusions

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

## Construction Impacts

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

## Operational Impacts

11.3 Air quality conditions for future residents of the proposed development have been shown to be acceptable, with concentrations below the air quality objectives and GLA target value for $PM_{2.5}$ throughout the site.

11.4 The proposed development does not incorporate any on-site combustion plant for the provision of energy and will lead to a reduction in vehicle trips compared to the existing uses at the site; as such, it will have a negligible impact on local air quality.

11.5 Overall, the air quality effect is concluded to be 'not significant' and thus no mitigation is required.

## Air Quality Neutral

11.6 The annual trips generated by the proposed development are below the benchmark, whilst there will be no building emissions. The proposed development therefore complies with the requirement that all new developments in London should be at least air quality neutral.

## Policy Implications

11.7 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 185 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents. It is also consistent with Paragraph 186, as it will not affect compliance with relevant limit values or national objectives.

11.8 The proposed development is compliant with Policy SI 1 of the London Plan in the following ways:

- it will not create unacceptable risk of high levels of exposure to poor air quality;

- it will not cause any exceedances of legal air quality limits;
- it will not create new exposure to poor air quality; and
- it is air quality neutral.

11.9 The proposed development is consistent with Policy LP 10 since an air quality impact assessment has been carried out, whilst it is also consistent with Policy 53 of the Draft Local Plan, since, as set out in Paragraph 11.8, it complies with Policy SI 1 of the London Plan, is air quality neutral, and has prepared an impact assessment to consider the impact of new residential development in the area.

11.10 In preparing the assessment, consideration has been given to LBRT's SPD, whilst the design of the proposed development has taken into account the Sustainable Construction SPD, in that electric vehicle charging points have been included as part of the scheme.

# 12 References

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 (2020) *2020 NO2 projections data (2018 reference year)*, Available: https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data.

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.

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 (2023c) *NO2 Fall-off with Distance Calculator (Version 4.2)*, [Online], Available: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-falloff/.

Defra (2023d) *UK Pollutant Release and Transfer Register*, Available: http://prtr.defra.gov.uk/map-search.

Defra (2023e) *UK Ambient Air Quality Interactive Map*, Available: https://uk-air.defra.gov.uk/data/gis-mapping.

Defra (2023f) *Defra AURN Archive*, Available: https://uk-air.defra.gov.uk/interactive-map?network=aurn.

Defra (2023g) *Local Air Quality Management (LAQM) Support Website*, Available: http://laqm.defra.gov.uk/.

Department for Levelling Up, Housing and and Communities (2023a) *National Planning Policy Framework*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf.

Department for Levelling Up, Housing and Communities (2023b) 'Planning Newsletter'.

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

Environment Act 2021 (2021).

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 (2019) 'London Local Air Quality Management Technical Guidance 2019', no. https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.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 (2016) *Guidance on the Assessment of Dust from Demolition and Construction v1.1*, Available: http://iaqm.co.uk/guidance/.

London Borough of Richmond upon Thames (2018) 'Local Plan', Available: https://www.richmond.gov.uk/media/15935/adopted_local_plan_interim.pdf.

London Borough of Richmond upon Thames (2019a) 'Local Implementation Plan', Available: https://www.richmond.gov.uk/media/17448/third_local_implementation_plan.pdf.

London Borough of Richmond upon Thames (2019b) *Air Quality Action Plan 2019-2024*, [Online].

London Borough of Richmond upon Thames (2020a) 'Air Quality Supplementary Planning Document', Available: https://www.richmond.gov.uk/media/19206/air-quality-spd-june-2020.pdf [2023].

London Borough of Richmond upon Thames (2020b) *Supplementary Planning Document - Sustainable Construction Checklist Guidance Document*, [Online], Available: https://www.richmond.gov.uk/media/19181/sustainable_construction_checklist_guidance_spd.pdf.

London Borough of Richmond upon Thames (2022) 'Construction Code of Practice'.

London Borough of Richmond upon Thames (2023a) 'Richmond Local Plan - The Best for our Borough: Draft for Consultation'.

London Borough of Richmond upon Thames (2023b) 'Air Quality Annual Status Report for 2022'.

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.

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/.

*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, Available: http://www.legislation.gov.uk/uksi/2010/1001/pdfs/uksi_20101001_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 (2008) *Directive 2008/50/EC of the European Parliament and of the Council*, Available: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0050.

# 13 Glossary

| | |
|---|---|
| **AADT** | Annual Average Daily Traffic |
| **AQC** | Air Quality Consultants |
| **AQMA** | Air Quality Management Area |
| **AURN** | Automatic Urban and Rural Network |
| **BEB** | Building Emissions Benchmark |
| **CAZ** | Clean Air Zone |
| **Defra** | Department for Environment, Food and Rural Affairs |
| **DfT** | Department for Transport |
| **DMP** | Dust Management Plan |
| **EFT** | Emission Factor Toolkit |
| **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 |
| **GIA** | Gross Internal Floor Area |
| **GLA** | Greater London Authority |
| **HDV** | Heavy Duty Vehicles (> 3.5 tonnes) |
| **HGV** | Heavy Goods Vehicle |
| **HMSO** | Her Majesty's Stationery Office |
| **IAQM** | Institute of Air Quality Management |
| **JAQU** | Joint Air Quality Unit |
| **kph** | Kilometres Per hour |
| **LAQM** | Local Air Quality Management |
| **LBRT** | London Borough of Richmond-upon-Thames |
| **LDV** | Light Duty Vehicles (<3.5 tonnes) |

| | |
|---|---|
| **LEZ** | Low Emission Zone |
| **LGV** | Light Goods Vehicle |
| **µg/m$^3$** | Micrograms per cubic metre |
| **NO** | Nitric oxide |
| **$NO_2$** | Nitrogen dioxide |
| **NOx** | Nitrogen oxides (taken to be $NO_2$ + NO) |
| **NPPF** | National Planning Policy Framework |
| **NRMM** | Non-road Mobile Machinery |
| **OEP** | Office for Environmental Protection |
| **Objectives** | A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides |
| **OLEV** | Office for Low Emission Vehicles |
| **PHV** | Private Hire Vehicle |
| **$PM_{10}$** | 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 |
| **RDE** | Real Driving Emissions |
| **SPG** | Supplementary Planning Guidance |
| **SPD** | Supplementary Planning Document |
| **Standards** | A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal |
| **TEA** | Triethanolamine – used to absorb nitrogen dioxide |
| **TfL** | Transport for London |
| **TRAVL** | Trip Rate Assessment Valid for London |
| **ULEZ** | Ultra Low Emission Zone |
| **WHO** | World Health Organisation |
| **ZEC** | Zero Emission Capable |

# 14 Appendices

# A1 London-Specific Policies and Measures

## London Plan

### *Design-led Approach*

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

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

### *Development Plans*

A1.2 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*

A1.3 The London Plan sets out expectations around the consideration of air quality in the design of all major developments:

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

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

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

### *Electric Vehicle Charging*

A1.4 To support the uptake of zero tailpipe emission vehicles, Policy T6.1 of the London Plan states:

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

## London Environment Strategy

A1.5 The air quality chapter of the London Environment Strategy sets out three main objectives, each of which is supported by sub-policies and proposals. The Objectives and their sub-policies are set out below:

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

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

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

- *Policy 4.2.1 Reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport*
- *Policy 4.2.2 Reduce emissions from non-road transport sources, including by phasing out fossil fuels*
- *Policy 4.2.3 Reduce emissions from non-transport sources, including by phasing out fossil fuels*
- *Policy 4.2.4 The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality*

- *Policy 4.2.5 The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence based steps to improve air quality*

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

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

A1.6 While the policies targeting transport sources are significant, there are less obvious ones that will also require significant change. In particular, the aim to phase out fossil-fuels from building heating and cooling and from NRMM will demand a dramatic transition.

## Low Emission Zone (LEZ)

A1.7 The LEZ was implemented as a key measure to improve air quality in Greater London. It entails charges for vehicles entering Greater London not meeting certain emissions criteria, and affects diesel-engined lorries, buses, coaches, large vans, minibuses and other specialist vehicles derived from lorries and vans. Since 1 March 2021, a standard of Euro VI has applied for HGVs, buses and coaches, while a standard of Euro 3 has applied for large vans, minibuses and other specialist diesel vehicles since 2012.

## Ultra Low Emission Zone (ULEZ)

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

## Other Measures

A1.9 Since 2018, all taxis presented for licencing for the first time had to be zero emission capable (ZEC). This means they must be able to travel a certain distance in a mode which produces no air pollutants, and all private hire vehicles (PHVs) presented for licensing for the first time had to meet Euro 6 emissions standards. Since January 2020, all newly manufactured PHVs presented for licensing for the first time had to be ZEC (with a minimum zero emission range of 10 miles). The Mayor's aim is that the entire taxi and PHV fleet will be made up of ZEC vehicles by 2033.

A1.10 The Mayor has also proposed to make sure that TfL leads by example by cleaning up its bus fleet, implementing the following measures:

- TfL will procure only hybrid or zero emission double-decker buses from 2018;
- a commitment to providing 3,100 double decker hybrid buses by 2019 and 300 zero emission single-deck buses in central London by 2020;
- introducing 12 Low Emission Bus Zones by 2020;
- investing £50m in Bus Priority Schemes across London to reduce engine idling; and
- retrofitting older buses to reduce emissions (selective catalytic reduction technology has already been fitted to 1,800 buses, cutting their NOx emissions by around 88%).

# A2 Construction Dust Assessment Procedure

A2.1 The criteria developed by IAQM (2016)[3], upon which the GLA's guidance is based, divide the activities on construction sites into four types to reflect their different potential impacts. These are:

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

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

## STEP 1: Screen the Need for a Detailed Assessment

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

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

## STEP 2: Assess the Risk of Dust Impacts

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

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

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

### *Step 2A – Define the Potential Dust Emission Magnitude*

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

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

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

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

### *Step 2B – Define the Sensitivity of the Area*

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

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of $PM_{10}$, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

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

### *Step 2C – Define the Risk of Impacts*

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

## STEP 3: Determine Site-specific Mitigation Requirements

A2.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance has been used as the basis for the requirements set out in Appendix A6.

## STEP 4: Determine Significant Effects

A2.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.

A2.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

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

| Class | Principles | Examples |
|---|---|---|
| **Sensitivities of People to Dust Soiling Effects** | | |
| **High** | users can reasonably expect enjoyment of a high level of amenity; or<br>the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land | dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms |
| **Medium** | users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or<br>the appearance, aesthetics or value of their property could be diminished by soiling; or<br>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<br>there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or<br>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 horticulture), footpaths, short term car parks and roads |
| **Sensitivities of People to the Health Effects of $PM_{10}$** | | |
| **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<br>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<br>locations with a national designation where the features may be affected by dust deposition | Sites of Special Scientific Interest with dust sensitive features |
| **Low** | locations with a local designation where the features may be affected by dust deposition | Local Nature Reserves with dust sensitive features |

**Table A2.3: Sensitivity of the Area to Dust Soiling Effects on People and Property [8]**

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

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

**Table A2.4: Sensitivity of the Area to Human Health Effects [8]**

| Receptor Sensitivity | Annual Mean $PM_{10}$ | Number of Receptors | Distance from the Source (m) | | | | |
|---|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <200 | <350 |
| High | >32 µg/m³ | >100 | High | High | High | Medium | Low |
| | | 10-100 | High | High | Medium | Low | Low |
| | | 1-10 | High | Medium | Low | Low | Low |
| | 28-32 µg/m³ | >100 | High | High | Medium | Low | Low |
| | | 10-100 | High | Medium | Low | Low | Low |
| | | 1-10 | High | Medium | Low | Low | Low |
| | 24-28 µg/m³ | >100 | High | Medium | Low | Low | Low |
| | | 10-100 | High | Medium | Low | Low | Low |
| | | 1-10 | Medium | Low | Low | Low | Low |
| | <24 µg/m³ | >100 | Medium | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| Medium | >32 µg/m³ | >10 | High | Medium | Low | Low | Low |
| | | 1-10 | Medium | Low | Low | Low | Low |
| | 28-32 µg/m³ | >10 | Medium | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| | 24-28 µg/m³ | >10 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| | <24 µg/m³ | >10 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| Low | - | >1 | Low | Low | Low | Low | Low |

**Table A2.5: Sensitivity of the Area to Ecological Effects [8]**

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

**Table A2.6: Defining the Risk of Dust Impacts**

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

# A3 EPUK & IAQM Planning for Air Quality Guidance

A3.1 The guidance issued by EPUK and 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

A3.2 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".*

A3.3 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 $m^2$ of commercial floorspace;
- are carried out on land of 1 ha or more.

A3.4 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 $m^2$ 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 mgNOx/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 mgNOx/$Nm^3$;
    - Compression ignition engine: 400 mgNOx/$Nm^3$;
    - Gas turbine: 50 mgNOx/$Nm^3$.
- 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 mgNOx/$Nm^3$ and 25 mgPM/$Nm^3$.

A3.5 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".*

A3.6 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*

A3.7 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 $m^2$ of floor space for all other uses or a site area greater than 1 ha.

A3.8 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.

A3.9 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.

A3.10 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.

A3.11 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

*"Typically, any combustion plant where the single or combined NOx 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. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NOx gas boiler or a 30kW CHP unit operating at <95mg/Nm$^3$.*

*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".*

A3.12 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".*

A3.13 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".*

A3.14 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 report.

## Assessment of Significance

A3.15 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.

A3.16 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.

A3.17 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.

A3.18 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 A4.

# A4 Professional Experience

## Dr Clare Beattie, BSc (Hons) MSc PhD CSci MIEnvSc MIAQM

Dr Beattie is a Technical Director with AQC, with more than 20 years' relevant experience. She has been involved in air quality management and assessment, and policy formulation in both an academic and consultancy environment. She has prepared air quality review and assessment reports, strategies and action plans for local authorities and has developed guidance documents on air quality management on behalf of central government, local government and NGOs. She has led on the air quality inputs into Clean Air Zone feasibility studies and has provided support to local authorities on the integration of air quality considerations into Local Transport Plans and planning policy processes. Dr Beattie has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has carried out numerous assessments for new residential and commercial developments, including the negotiation of mitigation measures where relevant. She has also acted as an expert witness for both residential and commercial developments. She has carried out BREEAM assessments covering air quality for new developments. Dr Beattie has also managed contracts on behalf of Defra in relation to allocating funding for the implementation of air quality improvement measures. She is a Member of the Institute of Air Quality Management, Institution of Environmental Sciences and is a Chartered Scientist.

## Dr Frances Marshall, MSci PhD MIEnvSc MIAQM

Dr Marshall is a Principal Consultant with AQC with ten years' relevant experience. Prior to joining AQC, she spent four years carrying out postgraduate research into atmospheric aerosols at the University of Bristol. Dr Marshall has experience preparing air quality assessments for a range of projects, including residential and commercial developments, road traffic schemes, energy centres, energy from waste schemes and numerous power generation schemes. She has experience in producing air quality assessments for EIA schemes, and has also assessed the impacts of Local Plans on designated ecological areas, prepared Annual Status Reports for Local Authorities, and undertaken diffusion tube monitoring studies. She is a Member of both the Institute of Air Quality Management and the Institution of Environmental Sciences.

# A5 'Air Quality Neutral'

A5.1 The GLA's London Plan Guidance: Air Quality Neutral (GLA, 2023) provides an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building's energy use and vehicle trips against defined benchmarks for buildings and transport in London.

A5.2 The Benchmark Trip Rates are set out in Table A5.1. The average trip length and average emission per vehicle are required if there is a need to calculate offset payments. The values given by GLA are set out in Table A5.2 and Table A5.3 respectively.

**Table A5.1: Benchmark Trip Rates**

| Land Use | Annual trips per | Benchmark Trip Rates | | |
|---|---|---|---|---|
| | | Central Activities Zone (CAZ) | Inner London (excluding CAZ) | Outer London |
| **Residential (including student accommodation and large-scale purpose-built shared living development)** | dwelling | 68 | 114 | 447 |
| **Office / Light Industrial** | $m^2$ (GIA) | 2 | 1 | 16 |
| **Retail (Superstore)** | $m^2$ (GIA) | 39 | 73 | 216 |
| **Retail (Convenience)** | $m^2$ (GIA) | 18 | 139 | 274 |
| **Restaurant / Café** | $m^2$ (GIA) | 64 | 137 | 170 |
| **Drinking establishments** | $m^2$ (GIA) | 0.8 | 8 | N/A |
| **Hot food takeaway** | $m^2$ (GIA) | N/A | 32.4 | 590 |
| **Industrial** | $m^2$ (GIA) | N/A | 5.6 | 6.5 |
| **Storage and distribution** | $m^2$ (GIA) | N/A | 5.5 | 6.5 |
| **Hotels** | $m^2$ (GIA) | 1 | 1.4 | 6.9 |
| **Care homes and hospitals** | $m^2$ (GIA) | N/A | 1.1 | 19.5 |
| **Schools, nurseries, doctors' surgeries, other non-residential institutions** | $m^2$ (GIA) | 0.1 | 30.3 | 44.4 |
| **Assembly and leisure** | $m^2$ (GIA) | 3.6 | 10.5 | 47.2 |

**Table A5.2: Emission factors per vehicle-km**

| Pollutant | Emission factors (g/veh-km) | | |
|---|---|---|---|
| | Central Activities Zone (CAZ) | Inner London [a] (excluding CAZ) | Outer London [a] |
| **NOx** | 0.48 | 0.39 | 0.35 |
| **$PM_{2.5}$** | 0.036 | 0.032 | 0.028 |

[a] Inner London and Outer London as defined in the London Plan (GLA, 2021).

**Table A5.3: Average Distance Travelled by Car per Trip**

| Land use | Distance (km) | | |
|---|---|---|---|
| | Central Activity Zone | Inner | Outer |
| **Residential** | 4.2 | 3.4 | 11.4 |
| **Office** | 3.0 | 7.2 | 10.8 |
| **Retail** | 9.2 | 5.5 | 5.4 |

# A6 Construction Mitigation

A6.1 Table A6.1 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 A6.1: Best-Practice Mitigation Measures Recommended for the Works**

| Measure | Desirable | Highly Recommended |
|---|---|---|
| **Site Management** | | |
| Develop and implement a stakeholder communications plan that includes community engagement before work commences on site | | ✓ |
| Develop a Dust Management Plan (DMP) | | ✓ |
| Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary | | ✓ |
| Display the head or regional office contact information | | ✓ |
| Record and respond to all dust and air quality pollutant emissions complaints | | ✓ |
| Make a complaints log available to the local authority when asked | | ✓ |
| Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the Local Authority when asked | | ✓ |
| Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions are being carried out and during prolonged dry or windy conditions | | ✓ |
| Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and ensure that the action taken to resolve the situation is recorded in the log book | | ✓ |
| **Preparing and Maintaining the Site** | | |
| Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible | | ✓ |
| Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site | | ✓ |
| Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period | | ✓ |
| Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution | ✓ | |
| Avoid site runoff of water or mud | | ✓ |
| Keep site fencing, barriers and scaffolding clean using wet methods | | ✓ |

| | | |
|---|---|---|
| Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below | | ✓ |
| Cover, seed, or fence stockpiles to prevent wind whipping | | ✓ |
| Carry out regular dust soiling checks of buildings within 100 m of site boundary and provide cleaning if necessary | ✓ | |
| Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly | | ✓ |
| Agree monitoring locations with the Local Authority | | ✓ |
| Where possible, commence baseline monitoring at least three months before work begins | | ✓ |
| **Operating Vehicle/Machinery and Sustainable Travel** | | |
| Ensure all on-road vehicles comply with the requirements of the London 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 | | ✓ |
| 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 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 | ✓ | |