



Ashley Road Depot

Air Quality Assessment

May 2023



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1 INTRODUCTION

1.1 Scope

NRG Consulting has been commissioned to undertake a detailed air quality assessment based on the potential impacts of existing and future traffic levels on a new residential development located at Ashley Road Depot, within the London Borough of Haringey (LBH). Pollutants modelled as part of this assessment are nitrogen oxides (NOx) and particulate matter (PM10).

The impacts of vehicle emissions have been assessed using the techniques detailed within Volume 11, Section 3 of the Design Manual for Roads and Bridges (DMRB)¹ and the London Local Air Quality Management Technical Guidance (LLAQM.TG(19))². The impact of road traffic emissions will be assessed using the ADMS-Roads air dispersion model. This model has been devised by Cambridge Environmental Research Consultants (CERC) and is described as a “comprehensive tool for investigating air pollution problems due to small networks of roads”.

It should be noted that the short-term impacts of NO2 and PM10 emissions have not been modelled as dispersion models are inevitably poor at predicting short-term peaks in pollutant concentrations, which are highly variable from year to year, and from site to site. Notwithstanding this, general assumptions have been made about short term concentrations based on the modelled annual mean concentrations.

The scheme benefits from Planning Permission under reference: *HGY/2022/0752* with the description of development:

Erection of 272 homes including 50% socially rented homes extending 4-13 storeys, 174sqm of flexible Use Class E floorspace along with a new vehicular access to the site, car parking and two pedestrian north south routes. The proposal also includes both private and public hard and soft landscaping throughout the site.

This report has been written to discharge Planning Condition 31 which states:

31) An updated Air Quality Assessment, including an Air Quality Neutral report, shall be submitted to the Local Planning Authority for its written approval prior to the commencement of above ground works for the development hereby approved. Once approved the development shall be completed in accordance with the approved details.

Reason: To Comply with the GLA Sustainable Design and Construction SPG

Overall, this report illustrates that the site falls within APEC Category A and there is no need for Building or Transport Mitigation and therefore based on the updated assessment, that Planning Condition 31 can be discharged.

This Air Quality Assessment (AQA) supersedes the previously issued AQA for the same scheme. This has been superseded as the previous AQA used less up-to-date data and did not use the London Planning Guidance methodology for its Air Quality Neutral component.

¹ Design Manual for Roads and Bridges, Sustainability & Environment Appraisal LA 105 Air Quality – November 2019

² <https://laqm.defra.gov.uk/air-quality/guidance/technical-guidance/>

2. POLLUTANTS & LEGISLATION

2.1 Pollutant Overview

In most urban areas of the UK, traffic generated pollutants have become the most common pollutants. These are nitrogen dioxide (NO₂), fine particulates (PM₁₀), carbon monoxide (CO), 1,3-butadiene and benzene, as well as carbon dioxide (CO₂). This air quality assessment focuses on NO₂ and PM₁₀, as these pollutants are least likely to meet their Air Quality Strategy objectives near roads. Table 1 provides an overview of NO₂ and PM₁₀.

Table 1 – Overview of NO₂ and PM₁₀

Pollutant	Properties	Anthropogenic Sources	Natural Sources	Potential Effects
Particles (PM ₁₀)	Tiny particulates of solid or liquid nature suspended in the air	Road transport; Power generation plants; Production processes e.g. windblown dust	Soil erosion; Volcanoes; Forest fires; Sea salt crystals	Asthma; Lung cancer; Cardiovascular problems
Nitrogen Dioxide (NO ₂)	Reddish-brown coloured gas with a distinct odour	Road transport; Power generation plants; Fossil fuels – extraction & distribution; Petroleum refining	No natural sources, although nitric oxide (NO) can form in soils	Pulmonary oedema; Various environmental impacts e.g. acid rain

2.2 Air Quality Strategy

The UK Government and the devolved administrations published the latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland on 17 July 2007³. The Strategy provides an over-arching strategic framework for air quality management in the UK.

With regards to this assessment, the Air Quality Strategy contains national air quality standards and objectives established by the Government to protect human health. The objectives for nitrogen dioxide and particulates (PM₁₀ and PM_{2.5}) have been set, along with seven other pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, PAHs, sulphur dioxide and ozone). Those which are limit values required by EU Daughter Directives on Air Quality have been transposed into UK law through the Air Quality Standards Regulations 2016⁴ which came into force on 31st December 2016. Table 2 provides the UK Air Quality Objectives for NO₂ and PM₁₀.

³ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland, July 2007

⁴ <https://www.legislation.gov.uk/ukxi/2016/1184/contents/made>

Table 2 – UK Air Quality Objectives for Nitrogen Dioxide and Particulate Matter

Pollutant	Objective	Concentration measured as
Particles (PM10)	50µg/m ³ not to be exceeded more than 35 times a year	24 hour mean
	40µg/m ³	Annual mean
Particles (PM2.5)	25µg/m ³ (except Scotland)	Annual Mean
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1 hour mean
	40µg/m ³	Annual mean

Objectives for PM2.5 were also introduced by the UK Government and the Devolved Administrations in 2010. However, these are not included in Regulations as the Air Quality Strategy has adopted an “exposure reduction” approach for PM2.5 in order to seek a more efficient way of achieving further reductions in the health effects of air pollution by providing a driver to improve air quality everywhere in the UK rather than just in a small number of localised hotspot areas. As defined in Table 4, background PM2.5 concentrations are well below the limit value of 25.0 µg/m³. As such, no further consideration has been given to PM2.5 within this assessment.

2.3 Clean Air Strategy

The Clean Air Strategy⁵ was published in January 2019 and sets out the comprehensive action that is required from across all parts of government and society to tackle all sources of air pollution. New legislation will create a stronger and more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms.

2.4 London Local Air Quality Management (LLAQM)

At the core of LLAQM delivery are three pollutant objectives; these are: nitrogen dioxide (NO₂), particulate matter (PM10) and sulphur dioxide (SO₂). All current Air Quality Management Areas (AQMA) across the UK are declared for one or more of these pollutants, with NO₂ accounting for the majority. In Greater London, AQMA are declared for NO₂ and PM10 in equal proportions. It is a statutory requirement for local authorities to regularly review and assess air quality in their area and take action to improve air quality when objectives set out in regulation cannot be met.

2.5 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁶

The Environment EU Exit Regulations (2020) is an amendment to the Air Quality Standards Regulations (2010) which reduces the threshold for PM2.5 from 25 µg/m³ to 20 µg/m³.

⁵ Clean Air Strategy 2019, Department for Environment, Food and Rural Affairs, January 2019

⁶ <https://www.legislation.gov.uk/ukxi/2020/1313>

2.6 Environment Act 2021

The Environmental Act (2021)⁷ is a bill to make provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes.

The Act will aim to clean up the country's air, restore natural habitats, increase biodiversity, reduce waste and make better use of our resources. This includes the setting of new legally binding long-term targets to improve air quality and reduce fine particulate (PM2.5) emissions by October 2022

2.7 A guide to the assessment of air quality impacts on designated nature conservation sites (May 2020) Version 1.1 (IAQM).

The principal purpose of this document is to set out a procedure for air quality specialists to follow when evaluating the impacts of airborne pollution at designated sites. Whilst an air quality specialist may be able to conclude that there are no likely significant effects using established thresholds, they will not generally be able to assess the effects of the air pollution on the integrity of the designated site.

Road transport emissions near to designated sites are often the result of many projects and plans located some distance from the site. It is normal in an air quality assessment to include traffic growth estimates using the Department of Transport's TEMPRO36 growth factors or from a strategic transport model that explicitly includes traffic from other projects and/or plans.

A quantitative air quality assessment is required if European Sites are within 200 m of affected roads. Within this context, the distance of the affected road from the designated site is an important consideration. Air pollution levels fall sharply within the first few tens of metres from a road before reducing more slowly with distance. The air quality impact of a given change in traffic on a designated site where the relevant habitat/species is 100 m from a road will be very different to one that abuts the road.

MAGIC website or similar online resources from the relevant SNCO. If local sites are to be assessed, details can be obtained by consulting the Environment Agency or local biodiversity records office who may charge a nominal fee for this service. Sufficient time should be allowed to obtain this data.

A quantitative air quality assessment is required if European Sites are within 200 m of affected roads.

Based on this guidance, and using the tool provided by DEFRA (Magic⁸) there are no European or UK Designations (Statutory – NNRs, Areas of Outstanding Natural Beauty, Ramsar Sites, SSSIs, SACs, SPAs) within 200m of the site.

⁷ <https://www.legislation.gov.uk/ukpga/2021/30/enacted>

⁸ <https://magic.defra.gov.uk/MagicMap.aspx>

2.8 The Conservation of Habitats and Species Regulations (2019).

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SI 2019/579 are in force from Implementation Period (IP) completion day. These regulations make changes to the three existing instruments which transpose Directive 92/43/EEC, (the Habitats Directive) and Directive 79/409/EEC, (the Birds Directive) so that they continue to work upon the UK's exit from the EU. The existing instruments are:

- the Conservation of Habitats and Species Regulations 2017, SI 2017/1012
- the Conservation of Offshore Marine Habitats and Species Regulations 2017, SI 2017/1013, and
- the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001, SI 2001/1754

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SI 2019/579 also amend section 27 of the Wildlife and Countryside Act 1981 to ensure existing protections continue. References throughout the regulations are amended to a UK only context. Sites designated under the Habitats Directive and the Birds Directive previously contributed to the EU's Natura 2000 network.

3 PLANNING POLICY & GUIDANCE

3.1 National Planning Policy & Guidance

3.1.1 National Planning Policy Framework

On a national level, air quality can be a material consideration in planning decisions. The updated National Planning Policy Framework (NPPF) for England, updated in July 2021, is considered a key part of the Governments reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

Paragraph 103 within the NPPF states that the “The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”.

It goes on to state in paragraph 181 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”.

3.1.2 Land-Use Planning & Development Control

In January 2017, Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) produced guidance to ensure that air quality is adequately considered in the land-use planning and development control processes⁹.

The guidance document is particularly applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments, especially those within urban areas where air quality is poorer. It is also relevant to other forms of development where a proposal could affect local air quality and for which no other guidance exists.

⁹ Land-Use Planning & Development Control: Planning for Air Quality. Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. EPUK & IAQM. January 2017

3.1.3 Planning Practice Guidance – Air Quality

In November 2019 the UK Government provided updated guidance¹⁰ on how planning can take account of the impact of new development on air quality.

All development plans can influence air quality in a number of ways, for example through what development is proposed and where, and the provision made for sustainable transport. Consideration of air quality issues at the plan-making stage can ensure a strategic approach to air quality and help secure net improvements in overall air quality where possible.

This planning Practice Guidance also provides routes to the sources used throughout this report, including but not limited to:

- the UK Air Information Resource (UK-AIR), which contains information on historic and current air quality across the UK, including a GIS portal of Defra's national assessment against relevant Limit Values and air quality management areas;
- air quality management area records and modelled background pollution concentrations;
- the Clean Air Strategy sets out actions for dealing with 5 major sources of air pollution. A detailed National Air Pollution Control Programme was published by the Department for Environment, Food and Rural Affairs in April 2019.

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

Where air quality is a relevant consideration the local planning authority may need to establish: the 'baseline' local air quality, including what would happen to air quality in the absence of the development; whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and whether occupiers or users of the development could experience poor living conditions or health due to poor air quality.

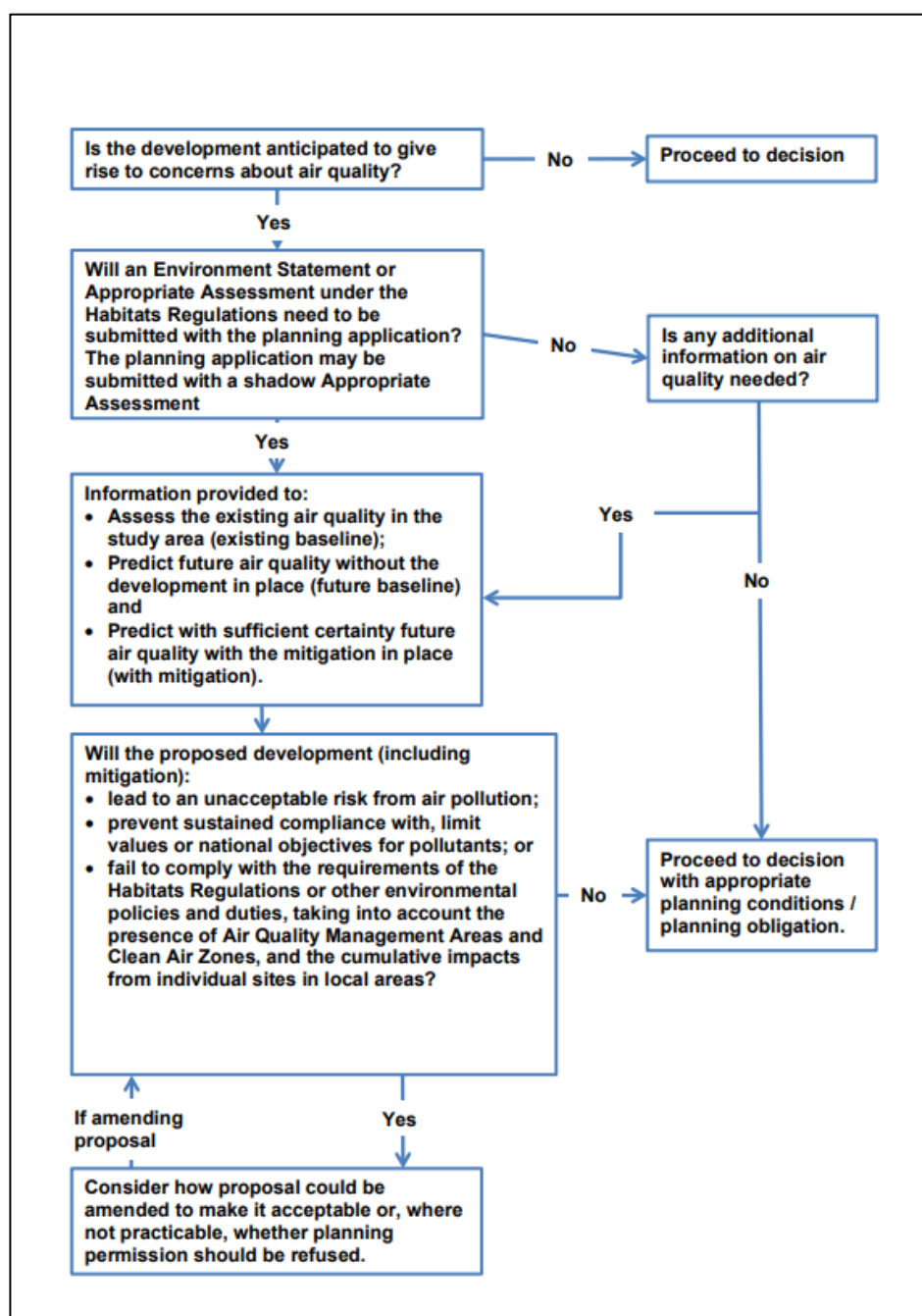
The steps a local planning authority might take in considering air quality are set out in the flow diagram across.

¹⁰ <https://www.gov.uk/guidance/air-quality--3>

3.2 Regional Planning Policy

3.2.1 The Mayor's Air Quality Strategy

In October 2010, the Mayor's Air Quality Strategy¹¹ was released. The strategy sets out a framework for delivering improvements to London's air quality and includes measures aimed at reducing emissions from transport, homes, offices and new developments, as well as raising awareness of air quality issues and its impact on health.



3.2.2 London Plan 2021 & London Planning Guidance

¹¹ Clearing the Air: The Mayor's Air Quality Strategy. October 2010

The London Plan Guidance (LPG)¹² and London Plan information for undertaking Air Quality Assessments (AQA) has been used as primary methodology guidance for this report. The LPG has been primarily used to aid in the Air Quality Neutral Assessment (AQNA) within this AQA., this is by new draft Air Quality Neutral Guidance. In March 2021, the new London Plan was published by the Greater London Authority¹³. The London Plan provides an overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years. The Plan brings together the geographic and locational aspects of the Mayor's other strategies, including a range of environmental issues such as climate change (adaptation and mitigation), air quality, noise and waste.

Policy SI1 relates specifically to air quality and states the following:

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

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

1) Development proposals should not:

a) lead to further deterioration of existing poor air quality

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

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

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

a) development proposals must be at least Air Quality Neutral

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

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

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

12 https://www.london.gov.uk/sites/default/files/air_quality_neutral_lpg_-_consultation_draft_0.pdf

13 <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/publication-london-plan>

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

1) how proposals have considered ways to maximise benefits to local air quality, and

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

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

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

3.2.3 Sustainable Design and Construction SPG

The Greater London Authority (GLA) released the “Sustainable Design and Construction” SPG in July 2014¹⁴. The SPG aims to support developers, local planning authorities and neighbourhoods to achieve sustainable development. It provides guidance on to how to achieve the London Plan objectives effectively, supporting the Mayor’s aims for growth, including the delivery of housing and infrastructure.

3.3 London Borough of Haringey Local Plan¹⁵

The whole of the borough of Haringey is an Air Quality Management Area (AQMA) for the pollutants of NO₂ (Nitrogen Dioxide) and PM₁₀ particulates which are the most prominent air pollutants). The dominant source of NO₂ and PM₁₀ emissions in Haringey is road transport with a variety of other sources contributing emissions. This has implications for air quality, which is being addressed through the measures outlined in the Council’s Air Quality Action Plan.

To manage air quality within the borough by travel planning, promotion of walking, cycling and public transport. To promote the use of more sustainable modes of transport.

3.3.2 London Borough of Haringey Development Management Document¹⁶

Policy DM23: Environmental Protection Air Quality

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

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

¹⁴ Sustainable Design and Construction SPG. Greater London Authority, July 2014

¹⁵ https://www.haringey.gov.uk/sites/haringeygovuk/files/haringey_local_plan_strategic_policies_-_march_2013_intro_ch_1.pdf

¹⁶ https://www.haringey.gov.uk/sites/haringeygovuk/files/final_haringey_dmp_dtp_online.pdf

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

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

C Where necessary, adequate mitigation must be provided.

Air Quality

Poor air quality is a public health issue that is linked to the development of chronic diseases. National planning policy and guidance seeks to promote sustainable communities and sets out that local authorities should consider how to manage air quality in their area, such as by ensuring that new development contributes to reducing or mitigating air pollution and the population's exposure to it.

The whole of Haringey is a designated Air Quality Management Area (AQMA) for the pollutants nitrogen dioxide (NO₂) and particulate matter (PM₁₀). Haringey's Air Quality Progress Report (2012) sets out evidence which confirms the need to maintain the AQMA designation. The Council's Air Quality Action Plan (2011) identifies actions and mitigating measures necessary to help meet national air quality objectives for NO₂, PM₁₀ and other pollutants. It reflects the Government's Air Quality Strategy as well as the Mayor's Air Quality Strategy.

As Haringey is an AQMA it is expected that proposals for new development will consider air quality in the design, construction and operation of the development over its lifetime. This includes consideration of adverse impacts on potential site occupiers as well on the wider local area. Some types of uses are very sensitive to air pollution (such as schools, hospitals and residential uses, particularly those for elderly people) and this should be considered by developers in the site selection process. In line with London Plan Policy 7.14, the Council expects that all development should be at least 'air quality neutral'.

3.4 London Borough of Haringey Air Quality Annual Status Report for 2021¹⁷

This report provides a detailed overview of air quality in the London Borough of Haringey during 2021. With reference to this AQA and AQNA, this Air Quality Annual Status Report has been used for model verification.

¹⁷ https://www.haringey.gov.uk/sites/haringeygovuk/files/air_quality_annual_status_report_for_2021.pdf

4 ASSESSMENT METHODOLOGY

4.1 Operational Phase (Traffic Emissions)

4.1.1 Modelled Scenarios

Three scenarios have been modelled as part of this assessment. These are as follows:

- Scenario 1 (2022) – existing levels of air quality / model verification; and
- Scenario 2 (2027) – future impact of traffic emissions on the proposed development (or ‘do nothing’)
- Scenario 3 (2027 – Do Something (DS)) – future impact of emissions because of proposed development

4.1.2 ADMS-Roads

Modelling the impact of traffic emissions on the proposed development will be undertaken using the latest version of the ADMS-Roads model¹⁸. ADMS-Roads is significantly more advanced than that of most other air dispersion models in that it incorporates the latest understanding of the boundary layer structure and goes beyond the simplistic Pasquill- Gifford stability categories method with explicit calculation of important parameters. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions.

4.1.3 Emission Factors

Defra and the Devolved Administrations have provided an updated Emission Factors Toolkit (Version 11) which incorporates updated NOx emissions factors and vehicle fleet information¹⁹. These emission factors have been integrated into the latest ADMS-Roads modelling software.

The modelled emission factors do not take account of any potential improvements in local air quality as a result of the proposed tightening of emissions within the London Low Emission Zone (LEZ) in October 2020 or the extension of the Ultra-Low Emission Zone (ULEZ) in October 2021. As such, the predicted concentrations in 2025 are worst case.

4.1.4 Traffic Data

Baseline traffic flows along the local roads are available from the Department for Transport (DfT)²⁰. Baseline data has been projected to 2022 and 2027. Projection of traffic data has been undertaken using growth factors specific to the London Borough of Haringey, obtained from TEMPro²¹. The projected flow rates are provided in Table 3. It is assumed that the percentage HDV and speed will remain unchanged in future years.

The modelled speeds have been derived from the London Atmospheric Emissions Inventory (LAEI)²², specifically for major road networks and local roads.

¹⁸ Model Version: 5.0.0.1 Interface Version 5.0.0.5313 (16/02/2020)

¹⁹ <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>

²⁰ <http://www.dft.gov.uk/traffic-counts/>

²¹ TEMPro (Trip End Model Presentation Program) version 7, Department for Transport

²² LAEI (2019), Greater London Authority

Table 3 – Annual Average Daily Traffic Flows, Percentage HDV and Speeds for Modelled Roads and Verified Locations

Link Name	AADT 2022	AADT 2027	AADT 2027 - DS	HDV (%)	Speed (kph)
90173 - A1055	36342	38396	39240	4.07	20
46188 - A10	21801	23033	23880	3.12	20
73616 - A503	12126	12811	13656	3.01	20
7473 - A1010	20807	21982	22824	2.90	20
90189 - A503	14686	15516	16344	2.84	20
6639 - A109	15451	16324	17160	0.98	20
47094 - A406	87384	92328	93168	5.30	20

4.1.5 Street Canyons

A street canyon may be defined as a relatively narrow street with buildings on both sides, where the height of the buildings is generally greater than the width of the road. Street canyons may result in elevated pollutant concentrations from road traffic emissions due to a reduced likelihood of the pollutants becoming dispersed in the atmosphere. Street canyons have not been modelled as part of this assessment.

4.2 Background Concentrations

Background NO_x, NO₂ and PM₁₀ concentrations have been obtained from Defra²³. These 1 km x 1 km grid resolution maps are derived from a base year of 2021 (for NO_x, NO₂, PM₁₀ and PM_{2.5} only), Background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} derived from Defra are provided in Table 4.

Table 4 – Background NO_x, NO₂, PM₁₀ and PM_{2.5} Concentrations

Location	Pollutant	2021
Proposed Development	NO ₂	21.40
	NO _x	30.71
	PM ₁₀	15.73
	PM _{2.5}	8.95

4.3 Surface Roughness

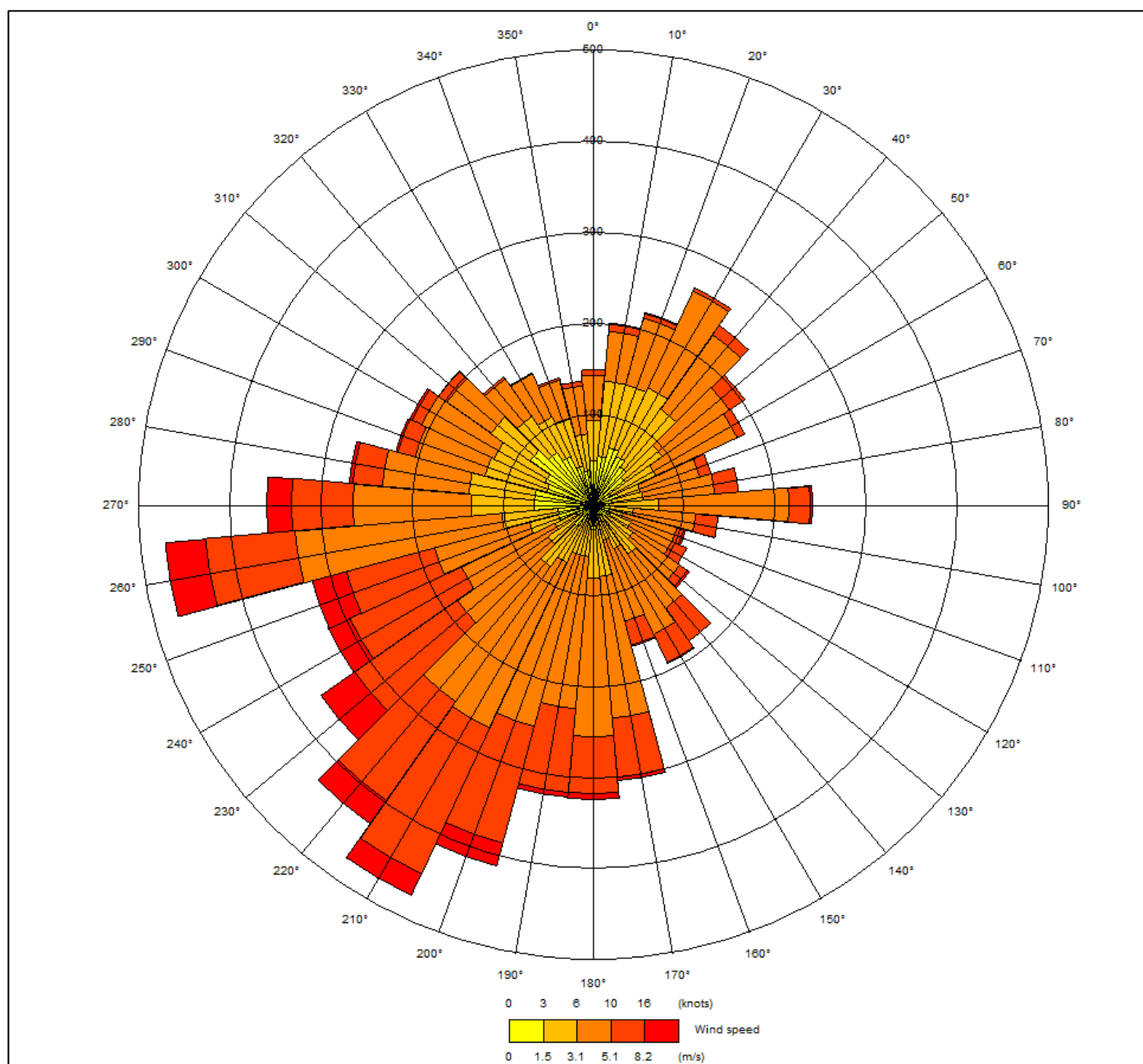
A surface roughness of 1.5 metre has been used in the model. This value is provided by ADMS- Roads as a typical roughness length for large urban areas. This value has been used across the modelled domain.

²³ <https://uk-air.defra.gov.uk/data/gis-mapping/>

4.4 Meteorological Data

Hourly sequential meteorological data from Heathrow Airport meteorological station has been used. Wind speed and direction data from the Heathrow Airport meteorological station has been plotted as a wind rose in Figure 1.

Figure 1 – Wind Speed and Direction Data, Heathrow Airport (2022)



4.5 Model Output

4.5.1 NO_x/NO₂ Relationship

Following recent evidence that shows the proportion of primary NO₂ in vehicle exhaust has increased²⁴. As such, a new (version 8.1) NO_x to NO₂ calculator has been devised²⁵. This new calculator has been used to determine NO₂ concentrations for this assessment, based on predicted NO_x concentrations using ADMS-Roads. Converted NO₂ concentrations are initially compared to local monitoring data in order to verify the model output. If the model performance is considered unacceptable then the NO_x concentrations are adjusted before conversion to NO₂.

4.5.2 Predicted Short Term Concentrations

As discussed in the introduction, it has not been possible to model the short-term impacts of NO₂ and PM₁₀. Research undertaken in 2003²⁶ has indicated that the hourly NO₂ objective is unlikely to be exceeded at a roadside location where the annual mean NO₂ concentration is less than 60 µg/m³. For PM₁₀, a relationship between the annual mean and the number of 24-hour mean exceedances has been devised and is as follows:

- No. 24-hour mean exceedances = $-18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$

This relationship has been applied to the modelled annual mean concentrations in order to estimate the number of 24-hourly exceedances.

4.5.3 Model Verification

The Council undertakes monitoring of NO₂ at the automatic monitoring station within Haringey. This is the monitoring site to the proposed development. Monitored concentrations from this site have been used for the purposes of model verification during the baseline year (2021). The location of this verification site is provided in Table 5.

Table 5 – Modelled Verification Locations

Monitoring ID	Location
Haringey Roadside	Lordship Lane
HR30	Earlsmead Primary School, N17
HR36	Holy Trinity CE School, Tottenham

²⁴ Trends in Primary Nitrogen Dioxide in the UK, Air Quality Expert Group, 2007

²⁵ https://laqm.defra.gov.uk/documents/Updated_NOx_from_NO2_Calculator_fno2_v8.1.pdf; <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>.

²⁶ Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003

4.5.4 Receptor Locations

In order to assess the potential impact of the traffic emissions from the local road network, a number of receptors have been identified representing the different facades of the proposed development. The location of these receptors, together with their height above ground level is provided in Table 6 and represented in Figure 2.

Proposed receptors above the second floor have not been modelled as predicted concentrations at the lower floors will provide a worst-case assessment, this is due to the dispersion of air polluting particles as elevation increases.

Table 6 – Modelled Receptor Locations

AQA ID	Height (m)	Description
R1 – R1.1 – R1.2	1.5, 4.5, 7.5,	Ground Floor, First Floor, Second Floor,
R2 – R2.1 – R2.2		
R3 – R3.1 – R3.2		
R4 – R4.1 – R4.2		

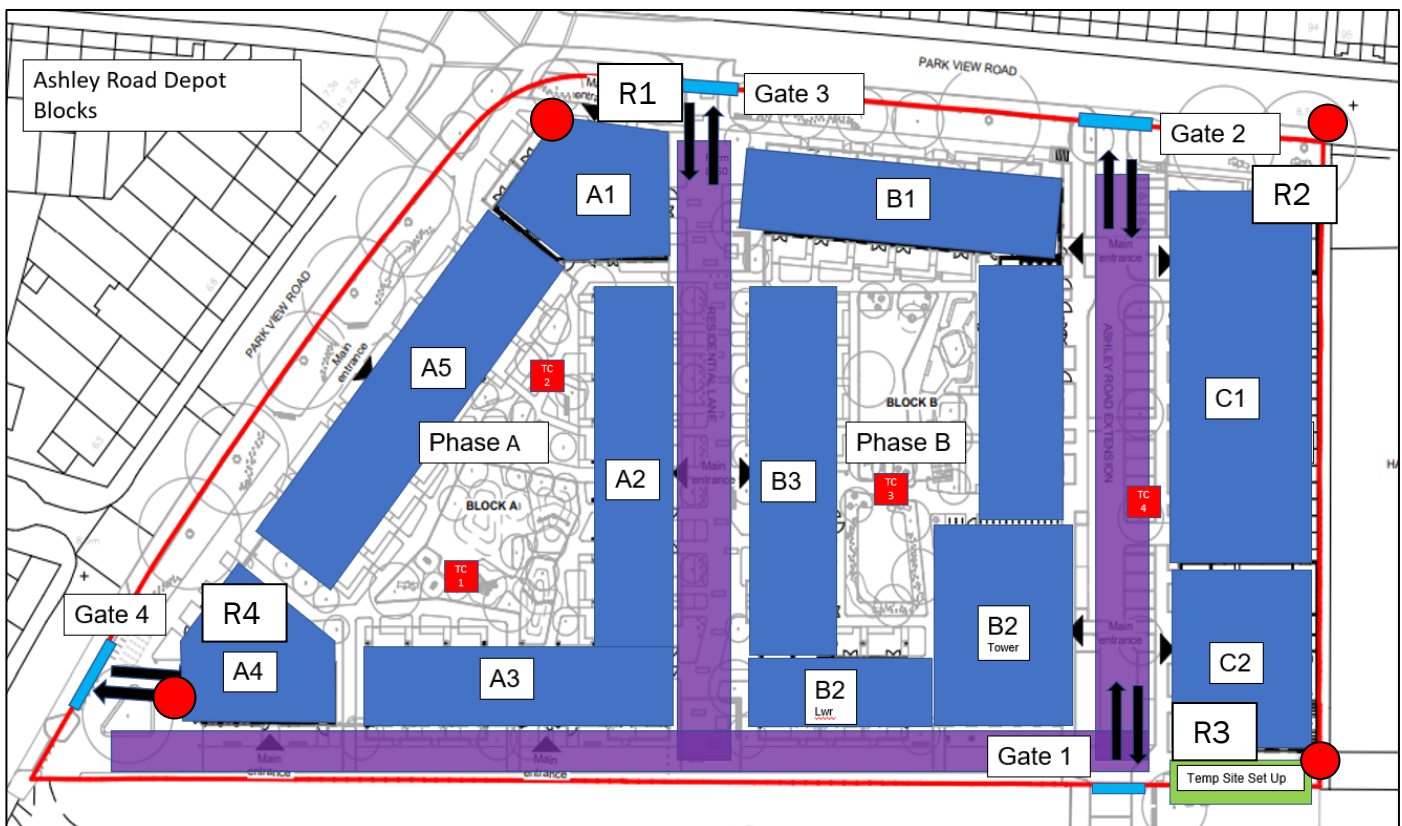


Figure 2 - Modelled (Proposed) Receptor Locations

Locations marked in red are modelled receptor positions within development. Where applicable receptors are projected vertically. For this development this begins at the first floor, and then is projected at each successive floor.

4.8 Operational Phase

The significance of emissions will be determined by comparing the predicted results to the Air Pollution Exposure Criteria (APEC) detailed in the Air Quality and Planning Guidance written by the London Air Pollution Planning and the Local Environment (APPLE) working group²⁷. The Air Pollution Exposure Criteria is considered appropriate to describe the significance of the impacts predicted, together with an indication as to the level of mitigation required in order for the development to be approved. The APEC table is provided below.

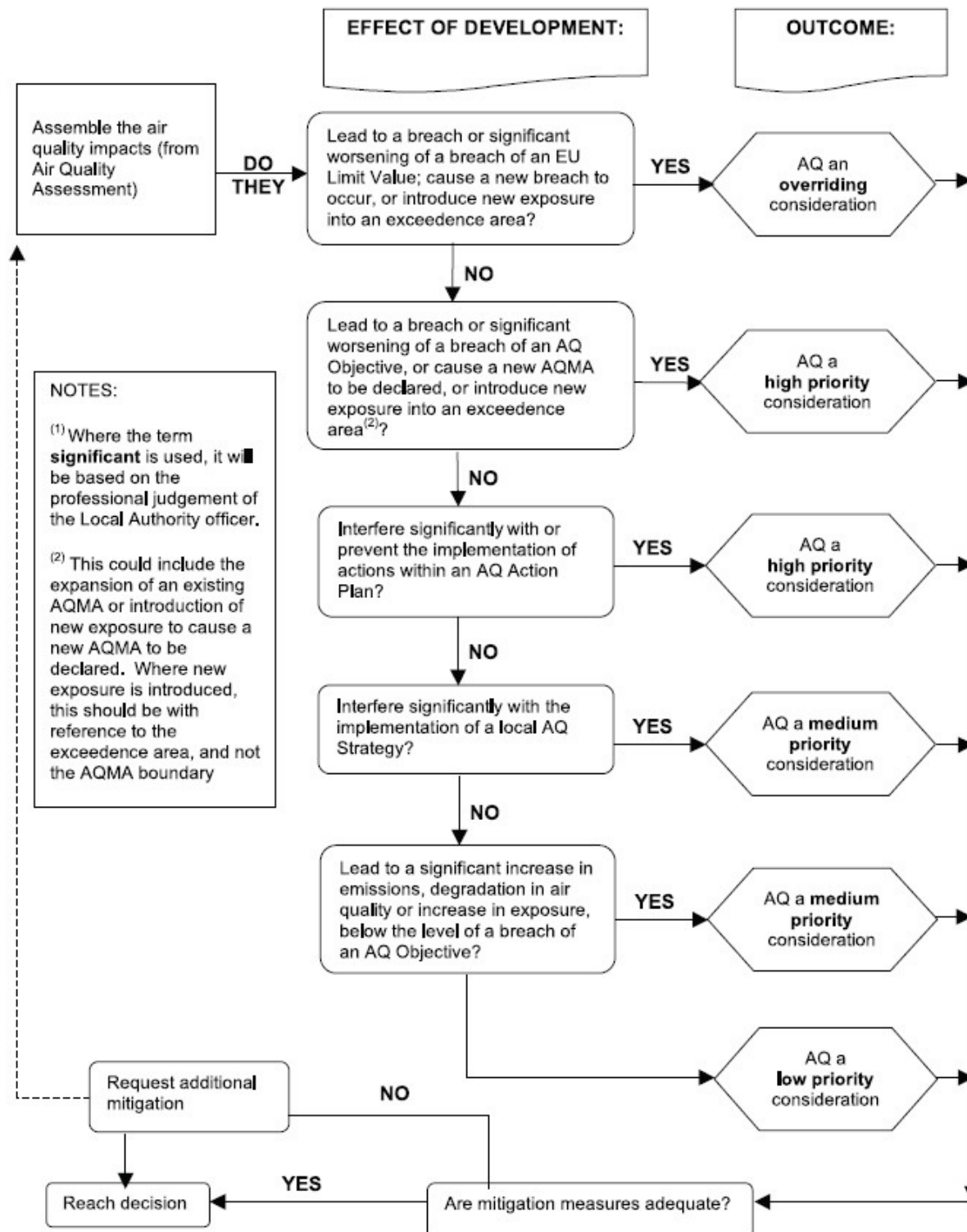
Table 7 – Air Pollution Exposure Criteria (APEC)

APEC Category	NO ₂	PM ₁₀	Recommendations
A	>5% below national annual mean objective	>5% below national annual mean objective >1-day less than national 24-hour objective	No air quality grounds for refusal; however, mitigation of any emissions should be considered.
B	Between 5% below or above national annual mean objective	Between 5% above or below national annual mean objective Between 1-day above or below national 24-hour objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered
C	>5% above national annual mean objective	>5% above national annual mean objective >1-day more than national 24-hour objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated

Furthermore, the guidance released by Environmental Protection UK also provides steps for a Local Authority to follow in order to assess the significance of air quality impacts of a development proposal. This procedure, shown in Figure 3, has also been applied to the modelled results.

²⁷ Air Quality and Planning Guidance, written by the London Air Pollution Planning and the Local Environment (APPLE) working group, January 2007

Figure 3 - Assessing the Significance of Air Quality Impacts of a Development Proposal



5 AIR QUALITY ASSESSMENT

5.1 Impact of Vehicle Emissions

5.1.1 Model Verification

Using the guidance provided within the London Local Air Quality Management Technical Guidance TG(19), the modelled output has been verified against the monitoring data obtained from the site listed in Table 5. The following tables provide a summary of the model verification process for NO_x/NO₂ concentrations.

Table 8 – Comparison of Modelled and Monitored NO₂ Concentrations (µg/m³), 2021

Verification Location	Modelled Concentration	Monitored Concentration	Difference [(modelled - monitored)/monitored] x100
HR	4.1	9.78	-81.8%
HR30	2.89	9.1	-103.6%
HR36	3.97	8.1	-68%

As described in the Technical Guidance (LLAQM.TG19), in order to provide more confidence in the model predictions and the decisions based on these, the majority of results should be within $\pm 25\%$ (ideally $\pm 10\%$) of the monitored concentrations. Based on the outcomes of Table 8 the model and results require adjustment. This has been isolated to a factor of **1.8447** (1.85) based on the average difference between the modelled and monitored results.

5.1.3 Nitrogen Dioxide

Predicted annual mean concentrations for NO₂ in **2022** and **2027** are provided in Table 9. As mentioned in Section 4 NO₂ concentrations have been calculated from the predicted NO_x concentrations using the latest NO_x-NO₂ conversion spreadsheet available from the Air Quality Archive.

Table 9 – Predicted NO₂ Concentrations, Annual Mean (µg/m³)

Receptor ID	2022			DM 2027			DS 2027		
	GF	1 st	2 nd	GF	1 st	2 nd	GF	1 st	2 nd
R1 – R1.1 – R1.2	22.41	22.41	22.40	22.47	22.47	22.45	22.51	22.49	22.49
R2 – R2.1 – R2.2	22.84	23.54	23.37	22.93	23.67	23.48	22.97	23.72	23.52
R3 – R3.1 – R3.2	23.61	23.52	23.34	23.74	23.65	23.45	23.80	23.69	23.50
R4 – R4.1 – R4.2	22.40	22.38	22.38	22.45	22.45	22.43	22.47	22.47	22.45
Objective	40.0								

The ADMS predictions for annual mean NO₂ concentrations in 2022 and 2027 indicate that the annual mean objective (40 µg/m³) would not be breached at all of the facades of the location, up to the modelled 2nd floor and would therefore not be breached any higher than this.

Nitrogen dioxide also has an hourly objective of 200 µg/m³ not to be exceeded more than 18 times in one year. However, the hourly mean concentration has not been calculated directly by ADMS Roads. This is as a result of an evaluation of continuous monitoring data from across the UK that revealed that the relationship between the annual mean and hourly mean NO₂ concentrations was very weak. Nonetheless, research undertaken in 2003²⁸ has indicated that the hourly NO₂ objective is unlikely to be exceeded at a roadside location where the annual mean NO₂ concentration is less than 60 µg/m³. Given that predicted NO₂ concentrations in 2022 and 2027 are below 60 µg/m³ at all modelled receptors the likelihood of the short-term objective for NO₂ being exceeded is considered low.

²⁸ Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003

5.1.4 Particulate Matter (PM10)

Predicted annual mean concentrations for PM10 in 2022 and 2027 are provided in Table 10.

Table 10 – Predicted PM10 Concentrations, Annual Mean ($\mu\text{g}/\text{m}^3$)

Receptor ID	2022			DM 2027			DS 2027		
	GF	1 st	2 nd	GF	1 st	2 nd	GF	1 st	2 nd
R1 – R1.1 – R1.2	15.93	15.93	15.93	15.94	15.94	15.94	15.95	15.95	15.94
R2 – R2.1 – R2.2	16.02	16.16	16.12	16.04	16.19	16.15	16.04	16.20	16.16
R3 – R3.1 – R3.2	16.18	16.15	16.12	16.20	16.18	16.14	16.21	16.19	16.15
R4 – R4.1 – R4.2	15.93	15.93	15.92	15.94	15.94	15.93	15.94	15.94	15.94
Objective	40.0								

The ADMS predictions for annual mean PM10 concentrations in 2022 and 2027 indicate that the annual mean objective ($40 \mu\text{g}/\text{m}^3$) would be achieved at all the modelled receptor locations.

The maximum number of days when PM10 concentrations are more than $50 \mu\text{g}/\text{m}^3$ is 0, less than the 35 exceedances allowed in the regulations.

6. AIR QUALITY NEUTRAL ASSESSMENT

6.1 Introduction

Being “air quality neutral” assesses a development’s energy and transport impacts to ensure that new developments do not lead to further deterioration of existing poor air quality by heating choices or increasing traffic flow to an extent that would create air pollution issues to local residents.

This air quality neutral assessment has followed the methodology outlined in the London Planning Guidance²⁹ as this provides up to date guidance on assessing a development’s Air Quality Neutral status. Within these documents, benchmarks have been provided in relation to building and transport emissions, together with a methodology for calculating the building and transport related emissions for a particular development.

6.2 Building Emissions

The Building Emissions Benchmarks (BEBs) for the land use category applicable to residential properties are provided in Table 11. Emissions of PM10 and PM2.5 have not been considered as oil and/or solid fuel are not proposed to be used at the development. The development will be using Electric Heating and therefore will have an overall NOx and PM10 local contribution of zero. This is because these systems do not produce local NOx or PM10 emissions.

Table 11 – Building Emissions Benchmarks (BEBs)

Land Use Class	NOx (gNOx/m ² /annum)
C3 (Residential)	3.5
E (Retail)	0.53

Using the method described within the London Plan Guidance, the site-specific benchmarked emissions have been calculated using the emission rate in Table 11. These are summarised in Table 12.

Table 12 – Calculation of Benchmarked NOx Emissions Using Building Emissions

Land Use	M ²	Building Emissions Benchmarks (gNOx/m ² /annum)	Benchmarked Emissions (gNOx/annum)
C3	21,312	3.5	74,592
E	174	0.53	92.22

²⁹ https://www.london.gov.uk/sites/default/files/air_quality_neutral_lpg_-_consultation_draft_0.pdf

Table 13 – Calculation of Total Building NOx Emissions

Land Use	Estimated Gas Usage (MWh/annum)	NOx Emission Rate (mg / KWh)	Total Building Emissions (mg/annum)
C3 + A1	0	40	0

Based on the comparison between the total building emissions and Building Emissions Benchmarks (see Table 14) the proposed development meets the air quality neutral requirements, and no mitigation is required.

Table 14 – Comparison of Total Building NOx Emissions and Building Emissions Benchmarks

Total Benchmarked Emissions (gNOx/annum)	Total Building Emissions (mg/annum)	Difference
0	74,685	-74,685

6.3 Transport Emissions

The Transport Emissions Benchmarks (TEBs) are calculated by multiplying the relevant tip rate (by location) by the number of residential properties.

In terms of parking numbers, across the site there are currently 75 staff car parking spaces and 75 parking spaces for refuse collection vehicles.

A total of 42 car parking spaces (0.15 spaces per dwelling) are proposed for the residential development.

Based on this data above, there will be a decrease in parking across the Site of 108 spaces from the existing provision for the depot, which includes the removal of 75 HGV spaces, therefore there will be no transport related emissions directly associated with the development and the development passes TEBs by default.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this report relating to the experienced Air Quality for the new development it is considered that Air Quality does not present a constraint for development.

7.1 Impact of Vehicle Emissions

The predicted concentrations of PM10 in all modelled years are below the relevant objectives. Predicted concentrations at all the modelled receptors fall within APEC Category A, which states that there are “no air quality [PM10] grounds for refusal, however, mitigation of any emissions should be considered”.

The ADMS predictions for annual mean NO2 concentrations in 2022 and 2027 indicate that the annual mean concentration would not be exceeded along any of the façades of the new development. Predicted concentrations at these receptors fall within APEC Category A.

7.2 Building Mitigation

Based on the results of this assessment there is no need to consider building mitigation.

7.3 Air Quality Neutral Assessment

The air quality neutral assessment has concluded that the proposed development with proposed electric heating will meet building emission benchmarks, in line with London Planning Guidance.

The air quality neutral assessment has concluded that the proposed development will Transport Emission Benchmarks by default.

This updated Air Quality and Air Quality Neutral Assessment therefore complies with Planning Condition 31.

