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# B&Q Cricklewood
# ES Volume I

## Chapter 8: Air Quality Assessment

Montreaux Cricklewood Developments Ltd

July 2020

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# 8. Air Quality

## 8.1. Introduction

8.1.1. This chapter of the Environmental Statement (ES) reports the findings of an assessment of the likely significant effects on air quality as a result of the proposed 'B&Q Cricklewood' development (hereafter referred to as the 'Proposed Development') in the London Borough of Barnet (LBB).

8.1.2. The potential for effect interactions on a single receptor (Type 1 effects) are discussed in *Chapter 17: Effect Interactions*. Combined cumulative air quality effects (Type 2 effects) of the Proposed Development with other development schemes are discussed at the end of this chapter.

8.1.3. This assessment, ES chapter and *ES Volume III Appendix 8-1: Dust Risk Assessment* has been produced by AECOM Infrastructure and Environment Ltd.

## 8.2. Legislation and Planning Policy Context

### National Legislation

8.2.1. The Clean Air for Europe (CAFE) ([1]) programme revisited the management of air quality within the EU and replaced much of the existing air quality legislation with a single legal act, Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe ([2]). This Directive repealed and replaced the EU Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management and its associated Daughter Directives 1999/30/EC ([3]), 2000/69/EC ([4]), 2002/3/EC ([5]), (relating to limit values for ambient air pollutants) and the Council Decision 97/101/EC ([6]) which established a reciprocal exchange of information and data within Member States.

8.2.2. Directive 2008/50/EC is currently transcribed into UK legislation by the Air Quality Standards Regulations 2010 ([7]), which came into force on 11th June 2010. This sets binding limit values or objectives on pollutants with the aim of avoiding, preventing or reducing harmful effects on human health and on the environment as a whole.

### UK Air Quality Strategy

8.2.3. The National Air Quality Strategy ([8]) (AQS) was initially published in 1997, under the requirements of the Environment Act 1995 ([9]). The most recent revision of the Strategy (2007) ([10]) sets objective values for key pollutants as a tool to help local authorities manage local air quality improvements in accordance

[1] European Union, 2001; Clean Air for Europe (CAFE) Programme: Towards a Thematic Strategy for Air Quality. Available at: https://www.eea.europa.eu/themes/air/links/research-projects/clean-air-for-europe-programme-cafe

[2] Council of the European Union, 2008; Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe. Available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32008L0050

[3] Council of European Communities (1999). First Daughter Directive on Limit Values for Sulphur Dioxide, Nitrogen Dioxide and Oxides of Nitrogen, Particulate Matter and Lead in Ambient Air, 1999/30/EC. Available at: http://eur-lex.europa.eu/legal content/EN/TXT/?uri=CELEX:31999L0030

[4] Council of European Communities, 2000; Second Daughter Directive on Limit Values for Benzene and Carbon Monoxide in Ambient Air, 2000/69/EC. Available at: http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32000L0069

[5] Council of European Communities, 2002; Third Daughter Directive on Ozone in Ambient Air, 2002/3/EC. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0003

[6] Council of the European Union, 1997; Directive 97/101/EC: Council Decision of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31997D0101

[7] H.M. Government, 2016; Air Quality Standards Regulations 2010. Available at: http://www.legislation.gov.uk/uksi/2010/1001/contents/made

[8] H.M. Government, 1997; National Air Quality Strategy

[9] H.M. Government, 1995; The Environment Act. Available at: https://www.legislation.gov.uk/ukpga/1995/25/contents

[10] Department for Environment, Food and Rural Affairs, 2007; The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 1. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf

with the EU Air Quality Framework Directive. Some of these objective values have subsequently been laid out within the Air Quality (England) Regulations 2000 ([11]).

8.2.4. The air quality objective values referred to below have been outlined in legislation solely for the purposes of Local Air Quality Management (LAQM). Under the LAQM regime, the local authority has a duty to carry out regular assessments of air quality against the objective values and if it is unlikely that the objective values will be met in the given timescale, they must designate an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) with the aim of achieving the objective values. The boundary of an AQMA is set by the governing local authority to define the geographical area that is to be subject to the management measures to be set out in a subsequent action plan. Consequently, it is not unusual for the boundary of an AQMA to include within it, relevant locations where air quality is not at risk of exceeding an air quality objective.

8.2.5. The UK's national air quality objective values for the pollutants of relevance to this assessment are displayed in Table 8-1:

**Table 8-1: UK AQS Objectives**

| Pollutant | Averaging Period | Value | Maximum Permitted Exceedances |
|---|---|---|---|
| Nitrogen Dioxide ($NO_2$) | Annual Mean | 40 µg/m$^3$ | None |
| | Hourly Mean | 200 µg/m$^3$ | 18 times per year |
| Particulate Matter ($PM_{10}$) | Annual Mean | 40 µg/m$^3$ | None |
| | 24 Hour Mean | 50 µg/m$^3$ | 35 times per year |
| Fine Particulate Matter ($PM_{2.5}$) | Annual Mean | 25 µg/m$^3$ | None |

## National Clean Air Strategy

8.2.6. In 2019, the UK Government released its much-anticipated Clean Air Strategy 2019 ([12]), part of its 25 Year Environment Plan. The Strategy places greater emphasis on improving air quality in the UK than has been seen before and outlines how it aims to achieve this (including the development of new enabling legislation).

8.2.7. Air quality management focus in recent years has primarily related to one pollutant, $NO_2$, and its principal source in the UK, road traffic. However, the 2019 Strategy broadens the focus to other areas, including domestic emissions from wood burning stoves and from agriculture. This shift in emphasis is part of a goal to reduce the levels of fine particulate matter ($PM_{2.5}$) in the air to below the World Health Organisation guideline level; far lower than the current EU limit value.

## National Planning Policy

### National Planning Policy Framework (2019)

8.2.8. The revised National Planning Policy Framework (NPPF) ([13]) was published in February 2019 and sets out the Government's planning policies for England and how these are expected to be applied. This NPPF supersedes the previous NPPF published in March 2012. Policies and objectives which are of particular relevance to local air quality are summarised below:

[11] The Air Quality (England) Regulations, 2000; Available at: http://www.legislation.gov.uk/uksi/2000/928/contents/made
[12] Department for Environment, Food and Rural Affairs, 2019; UK Clean Air Strategy 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
[13] Ministry of Housing, Communities & Local Government, 2019; National Planning Policy Framework Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

8.2.9. Paragraph 103 of the NPPF states that:

*"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."*

8.2.10. Air quality is considered as an important element of the natural environment. On conserving and enhancing the natural environment, Paragraph 170 states that:

*"Planning policies and decisions should contribute to and enhance the natural and local environment by:*

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

8.2.11. Air quality in the UK has been managed through the LAQM regime using national objectives. The effect of a proposed development on the achievement of such policies and plans may be a material consideration by planning authorities when making decisions for individual planning applications. Paragraph 181 of the NPPF states that:

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

8.2.12. The different roles of a planning authority and a pollution control authority are addressed by the NPPF in paragraph 183:

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

### National Planning Practice Guidance

8.2.13. In March 2014, the Department for Communities and Local Government released its Planning Practice Guidance (PPG) ([14]) web-based resource to support the NPPF. The PPG was updated on 24th July 2018 with specific reference to air quality ([15]). The PPG states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit. Concerns also arise where development is likely to adversely affect the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife). In addition, dust can also be a planning concern, for example, due to the effect on local amenity.

8.2.14. When deciding whether air quality is relevant to a planning application the PPG states that a number of factors should be taken into consideration including if the development will:

- *"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the*

[14] Ministry of Housing, Communities & Local Government, 2014; Planning Practice Guidance Available at: https://www.gov.uk/government/collections/planning-practice-guidance
[15] Ministry of Housing, Communities & Local Government, 2019; Planning Practice Guidance Air Quality Available at: https://www.gov.uk/guidance/air-quality--3

*development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*

- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*
- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

8.2.15. On how detailed an air quality assessment needs to be, the PPG states:

*"Assessments need to be proportionate to the nature and scale of the development proposed and the potential impacts (taking into account existing ai quality conditions), and because of this are likely to be locationally specific. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is commissioned…. 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 the new development is appropriate for its location and unacceptable risks are prevented."*

### A Green Future: Our 25 Year Plan to Improve the Environment

8.2.16. The 25 Year Environment Plan, published in January 2018, sets out the actions the UK Government will take to help the natural world regain and retain good health ([16]). This references several actions that are being taken to improve air quality, most notably the publication of the Clean Air Strategy referenced earlier and tighter controls on Medium Combustion Plant. Focus also centres on the 'Future of Mobility', in the establishment of flexible regulatory framework to encourage new modes of transport, and the encouragement of opportunities to move toward zero emission transport.

8.2.17. The 25 Year Environment Plan reinforces the demand for high environmental standards for all new builds. Resilient buildings and infrastructure will more readily adapt to a changing climate, and by extension have a lesser impact on local air quality.

## Regional Planning Policy

### The Mayor's London Plan, Spatial Development Strategy for London (March 2016)

8.2.18. The Mayor's London Plan represents a spatial development strategy for Greater London ([17]). It is the overall strategic plan for London, and it sets out a fully integrated economic, environmental, transport and social framework for the development of the capital to 2031. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the London Plan and its policies guide decisions on planning applications by councils and the Mayor.

8.2.19. Policy 7.14 Improving Air Quality states:

*"Development proposals should:*

[16] H.M. Government, 2018; A Green Future: Our 25 Year Plan to Improve the Environment Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

[17] The Mayor of London, 2016; The London Plan. The Spatial Development Strategy for London Consolidated with Alterations since 2011 Available at: https://www.london.gov.uk/sites/default/files/the_london_plan_malp_final_for_web_0606_0.pdf

*a) minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans*

*b) promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition'*

*c) be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs)).*

*d) ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches*

*e) where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified".*

8.2.20. Policy 5.7 Renewable Energy states that

*"all renewable energy systems should be located and designed to […] avoid any adverse impacts on air quality".*

8.2.21. Policy 6.13 Parking states that:

*"in locations with high public transport accessibility, car-free developments should be promoted (while still providing for disabled people)."*

### The London Plan – Intend to Publish Version (December 2019)

8.2.22. The London Plan – Intend to Publish Version December 2019' ([18]) runs from 2019 to 2041. It considers air quality in the following policies:

8.2.23. The Sustainable Infrastructure 1 (SI1) 'Improving Air Quality' Policy states:

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

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*

[18] Greater London Authority, 2019; The London Plan – Intend to Publish version, December 2019 Available at: https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/intend-publish-london-plan-2019

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

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

*a) How proposals have considered ways to maximise benefits to local air quality, and*

*b) 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."*

8.2.24. Policy D3 'Optimising site capacity through the design-led approach' states that:

*"Development proposals should:*

*9) help prevent or mitigate the impacts of noise and poor air quality."*

8.2.25. One of the amendments to the original publication in the latest draft refers to the Mayor's commitment to making London's air quality the best of any major world city; supported by targets of ultimately achieving more stringent than the current legally binding ambient air quality standards published by the World Health Organisation. The new London Plan is expected to be adopted in 2020.

### London Environment Strategy (2018)

8.2.26. Chapter 4 of this document relates to air quality ([19]). This chapter of the Strategy sets the ambitious target for London to have the best air quality of any major world city by 2050 and goes one step further than the previous Strategy by requiring developments to be 'air quality positive'. To date, however, the required underpinning guidance outlining the method of assessment and the effective approaches to be taken to ensure that larger developments are 'air quality positive', has not been published. Therefore, the minimum requirement must remain for proposed developments to be air quality neutral, until such time as this guidance is available.

### London Local Air Quality Management Policy Guidance (2019)

8.2.27. The London Local Air Quality Management (LLAQM) is Part IV of the 1995 Act, which sets out the London authorities' LAQM functions, together with the Mayor's responsibilities and statutory guidance form the Secretary of State for the Environment, Food and Rural Affairs. The Policy Guidance ([20]) and the accompanying Technical Guidance LLAQM.TG(19) ([21]) are the documents to which the boroughs must have regard.

8.2.28. The purpose of the LLAQM system is to put in place a framework that gives confidence to boroughs, the Mayor, and the Secretary of State that they are properly fulfilling their Part IV duties.

[19] Greater London Authority (2018), Mayor of London – London Environment Strategy, May 2018 Available at: https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf
[20] London Local Air Quality Management Technical Guidance (2019) Available at: https://www.london.gov.uk/sites/default/files/llaqm_policy_guidance_2019.pdf
[21] London Local Air Quality Management Policy Guidance (2019) https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf

## Local Planning Policy

### London Borough of Barnet Local Plan - Core Strategy (2012)

8.2.29. Policy CS13: Ensuring the efficient use of natural resources from LBB's Core Strategy Development Plan (DPD) ([22]), 2012 states that Barnet will:

*"Improve air and noise quality by requiring Air Quality Assessments and Noise Impact Assessments from development in Line with Barnet's SPD on Sustainable design and Construction."*

### London Borough of Barnet Draft Local Plan (Reg 18) Preferred Approach Consultation (2020)

8.2.30. The LBB are currently in the process of reviewing and updating the borough's adopted Local Plan documents, and recently published its Draft Local Plan[23] (Regulation 18 document) for public consultation. The consultation period took place between 27 January – 16 March 2020, with the Regulation 19 (i.e. Publication of Local Plan for making representations on soundness issues (NPPF para 35) document scheduled for publication in Winter 2021. Adoption of the revised Draft/New Local Plan is not expected until Spring 2022.

8.2.31. The Draft Local Plan identifies the following air quality requirements for new developments:

- Where development could potentially contribute to a worsening of local air quality an air quality assessment will be required;
- Developers are to design their schemes so that they meet the Air Quality Neutral emission benchmarks for Buildings and Transport as set out in Appendix 5 and appendix 6 of the Mayor of London's Sustainable De-sign and Construction SPG;
- Developers shall select plant that meets the standards for emissions form combined heat and power and bio-mass plants set out in Appendix 7 of the Mayor of Lon-don's Sustainable Design and Construction SPG;
- Proposals may be required to demonstrate how the development is designed to reduce people's exposure to air pollutants to acceptable levels through an air quality assessment;
- Restaurants or other odour emitting premises will be required to locate air extracts appropriately to avoid nuisance to neighbouring occupiers;
- Developers should comply with the minimum standards on construction dust management that are detailed in the Mayor of London's Control of Dust and Emissions During Construction and Demolition SPG providing an Air Quality and Dust Risk Assessment and where necessary an Air Quality and Dust Management Plan; and
- Non-Road Mobile Machinery used on construction sites should meet Stage IIIA of EU Directive 97/68/EC and its subsequent amendments as a minimum. Details should be registered at www.nrmm.london/register.

8.2.32. By virtue of being at an early stage in the adoption process, the Draft Local Plan is considered to be of very limited weight and is not a material consideration within this EIA.

[22] Barnet London Borough Council, 2012; Barnet's Local Plan (Core Strategy) Development Plan Document Available at: https://barnet.moderngov.co.uk/documents/s4852/APPENDIX%20B%20-%20Core%20Strategy%20Adoption%20Version%202nd%20July.pdf
[23] LBB, 2020; Draft Local Plan for Public Consultation – Regulation 18 Document

### London Borough of Barnet Local Plan – Development Management Policies (2012)

8.2.33. Policy DM04: Environmental considerations for development from the Development Management Policies (DPD) ([24]) states that:

*"C. i. Where there is a localised source of air pollution, buildings should be designed and sited to reduce exposure to air pollutants.*

*C. ii. Development proposals will ensure that development is not contributing to poor air quality and provide air quality assessments where appropriate."*

### London Borough of Barnet Local Plan – SPD: Sustainable Design and Construction (2016)

8.2.34. The SPD ([25]) focus on the design standards required for different scales of development as well as the performance standards of buildings. The SPD captures changes on space standards as well as new standards that address accessibility, security, energy, noise and water conservation.

8.2.35. LBB has outlined two air quality principles aimed at managing air quality within their jurisdiction. These are outlined below:

*"Location – Ensure that development type suits development site. In areas of poor air quality, for example next to some major roads, it may not be appropriate to build residential accommodation or schools or other types of development (so called sensitive receptors) where people, in particular vulnerable people, will spend a substantial amount of time in the accommodation and thereby be exposed to continuous high levels of air pollutants. If there is no other potential use for a site, then the design will be required to prevent exposure to air pollutants both within buildings and in accessible outdoor areas proximate to buildings.*

*Siting and design – Ensure that where there is a localised and proximate source of air pollution, buildings are designed and sited to reduce exposure to air pollutants. Buildings themselves can be used as barriers between sources of air pollution and those areas where people will linger in the outside environment, such as private, communal or public gardens and public realm. New or existing trees and planting may also help provide a barrier. Buildings should be actively ventilated allowing air to be drawn from the less polluted side of the building (where a balance needs to be achieved between air quality and energy consumption required for active ventilation). Consideration should also be given to ensuring that buildings façades, which face directly onto a pollution source, are sealed."*

### Cricklewood, Brent Cross and West Hendon Regeneration Area Development Framework SPG (2009)

8.2.36. The Supplementary Planning Guidance (SPG) identified that the prime environmental constraints are contamination, noise and air pollution. Given the level of infrastructure on or around the regeneration area, including the busy highway network, certain areas experience high levels of noise pollution and air quality. These issues will inform the location of new development and the distribution of land uses.

8.2.37. Chapter 6 of the SPG states that:

*"Due to the proximity of the heavy road infrastructure, properties should be designed in such a way as to minimise any noise and air quality impacts from the road and positioned in such a way as to create a high quality central courtyard space."*

[24] Barnet London Borough Council, 2012; Barnet's Local Plan (Development Management Policies) Development Plan Document Available at: https://www.barnet.gov.uk/sites/default/files/assets/citizenportal/documents/planningconservationandbuildingcontrol/PlanningPolicy/LocalPlan/DPD/Barnet27sLocalPlanDevelopmentManagementPoliciesplanning.pdf

[25] Barnet London Borough Council, 2016; Local Plan SPD: Sustainable Design and Construction Available at: https://www.barnet.gov.uk/sites/default/files/assets/citizenportal/documents/planningconservationandbuildingcontrol/PlanningPolicy/SPD/appendix2draftSustainableDesignandConstructionoct2016.pdf

### Other Relevant Policy, Standards and Guidance

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

8.2.38. In April 2014, the Mayor of London published a revised Sustainable Design and Construction – Supplementary Planning Guidance (SPG) ([26]). This document provides guidance to councils, developers and consultants on implementation of relevant policies contained in the London Plan and the Mayor's Air Quality Strategy in order to reduce emissions of dust and nitrogen oxides from demolition and construction activities in London.

8.2.39. Chapter 4 of the SPG sets out the methodology to undertake a dust risk assessment, and Chapter 5 presents dust and emissions control measures to apply in order to control/reduce emissions from construction sites

#### Institute of Air Quality Management (IAQM) Land Use Planning & Development Control (2017)

8.2.40. This guidance ([27]) has been produced to ensure that air quality is adequately considered in the land use planning and development control processes by relevant officers within local authorities, developers, and consultants involved in the preparation of development proposals and planning applications. This document is best practice guidance and has no formal or legal status.

#### IAQM Guidance on the Assessment of Dust from Demolition and Construction (2014)

8.2.41. The document provides guidance for developers, their consultants and environmental health practitioners on how to undertake a construction impact assessment (including demolition and earthworks).

8.2.42. As advised in the Greater London Authority's The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (SPG) which states:

*"The approach outlined below is based on the site evaluation process set out in the Supplementary planning guidance on the control of dust and emissions during construction and demolition, which is based on the IAQM's 2014 Guidance on the Assessment of dust from demolition and construction."*

## 8.3. Assessment Methodology

8.3.1. This section of this ES chapter presents the following:

- Information sources that have been consulted throughout the preparation of this chapter;
- Details of consultation undertaken with respect to air quality;
- The methodology behind the assessment of Air Quality effects, including the criteria for the determination of sensitivity of receptor and magnitude of change from the existing of 'baseline' condition;
- An explanation as to how the identification and assessment of potential air quality effects has been reached; and
- The significance criteria and terminology for the assessment of air quality residual effects.

8.3.2. The following sources of information that define the Proposed Development have been reviewed and form the basis of the assessment of likely significant effects on air quality:

- Parameter Plans as presented in *ES Volume I Chapter 5: The Proposed Development*;

[26] Mayor of London - Sustainable Design and Construction – Supplementary Planning Guidance (SPG) (2014) Available at: https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Sustainable%20Design%20%26%20Construction%20SPG.pdf

[27] Institute of Air Quality Management (IAQM) Land Use Planning & Development Control (2017) Available at: http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

- Area schedules;
- Transport Statement;
- Traffic data and information provided by Transport Consultant, Entran (June 2020);
- Defra's interactive monitoring network map ([28]);
- Defra's LAQM 1km x 1km grid background pollutant maps ([29]);
- Defra's MAGIC Interactive Ecological Map ([30]);
- Environment Agency's Pollution Inventory Data ([31]);
- LBB's local air quality reports and monitoring data.

8.3.3. For the Construction Phase, the impact of fugitive emissions of particulate matter from the construction activities has been assessed qualitatively.

8.3.4. During the Proposed Development's operation, consideration has been made of the potential for emissions form vehicles and roof plant. Regarding emissions from vehicles, it is anticipated that there will be a reduction of traffic from the changes of land use when compared to the existing land use. Therefore, there will be no worsening impact from the operational traffic and this has been scoped out for further assessment. An assessment of the potential exposure of new occupants to poor air quality (Site Suitability) has however been undertaken.

8.3.5. The Proposed Development will be powered by an all-electric system, consisting of air source heat pumps and photovoltaic (PV) panels. Therefore, the air quality impacts associated with emissions from roof plant are anticipated to be negligible and scoped out for further assessment.

8.3.6. The evaluation of Site Suitability in terms of air quality was undertaken quantitatively using detailed dispersion modelling.

## Methodology for Determining Baseline Conditions and Sensitive Receptors

8.3.7. The construction impact assessment undertaken to consider the sensitive receptors within 350m of the site boundary. The impact declines with distance from the site, and it is only necessary to consider track-out impact up to 50 m from the edge of the road.

8.3.8. As described in the IAQM Guidance on the Assessment of Dust from Demolition and Construction (Ref 33), a receptor sensitive to dust is defined as:

*"a location that may be affected by dust emissions during demolition and construction. Human receptors include locations where people spend time and where property may be impacted by dust. Ecological receptors are habitats that might be sensitive to dust." When assessing the impact of dust emissions generated during demolition and construction works, receptors are defined as the nearest potentially sensitive receptor to the boundary of the site in each direction. These receptors have the potential to experience impacts of greater magnitude due to emissions of particulate matter generated by the works, when compared with other more distant receptors, or less sensitive receptors. Moreover, receptors located within 50m of routes to be used by demolition and construction vehicles might be impacted by dust originating from the track-out of material onto the road, and as such have been considered in this assessment."*

8.3.9. There are a number of receptors that are sensitive to dust in the immediate vicinity of the Proposed Development or along construction traffic routes which include the existing residential areas in all directions around the Proposed Development including Cricklewood Lane and Cricklewood Broadway.

8.3.10. The Mayor of London (Ref 26) and IAQM (Ref 33) guidance provides criteria in order to determine the sensitivity of the area to dust soiling effects and the sensitivity of people to health effects of $PM_{10}$. In

[28] Defra's interactive monitoring network map Available at: https://uk-air.defra.gov.uk/interactive-map
[29] Defra's LAQM 1km x 1km grid background pollutant maps Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017
[30] Defra's MAGIC Interactive Ecological Map Available at: https://magic.defra.gov.uk/
[31] Environment Agency's Pollution Inventory Data Available at: https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory

terms of sensitivity of the receptors, residential properties located in proximity of the Proposed Development are considered as high sensitivity receptors for both amenity and health effects. All other potential receptors (commercial and offices) in the study area can be considered as medium sensitivity receptors for amenity and health effects.

8.3.11. Taking into account the proximity of sensitive receptors to the Proposed Development, and existing $PM_{10}$ concentrations in the study area, the study area is considered to be of in a range between high and medium sensitivity to dust soiling effects on people and property, and human health.

8.3.12. The identification of potential ecologically sensitive receptors has been undertaken in line with current guidance (Ref 33). There are no ecological receptors (nationally or internationally designated sites) within 50 m of the site boundary, within 50 m from a route used by construction vehicles on the public highway or up to 500 m from the site entrance. Therefore, the risk of ecological receptor sites in terms of dust impacts is not considered further in this assessment.

8.3.13. For operation, the emissions from traffic and energy plant associated from the Proposed Development are considered to be negligible. Therefore, no existing receptors are considered for the assessment. However, the future residents and the users of the Proposed Development will be considered as sensitive receptors for Site Suitability and exposure.

8.3.14. A review of existing baseline air quality has been undertaken using information presented within the "LBB Air Quality Annual Status Report 2018" ([32]). Defra's background maps (Ref 29) have also been considered in this assessment.

## Methodology for Determining Demolition and Construction Effects

### Construction Phase Fugitive Emissions of Particulate Matter

8.3.15. Fugitive emissions (i.e. emissions which are not associated with a single fixed release point) of airborne particulate matter are readily produced through the action of abrasive forces on materials and, therefore, a wide range of construction activities have the potential to generate this type of emission.

8.3.16. Particulate matter in air is made up of particulates of a variety of sizes, and the concept of a 'size fraction' is used to describe particulates with sizes in a defined range. These definitions are based on the collection efficiency of specific sampling methods and each of the size fractions is especially associated with different types of impacts. In this assessment the term 'dust' is used to mean particulate matter in the size fraction 1 µm (micrometre) to 75 µm in diameter, as defined in BS 6069:1994 (Ref 33). The size fraction called '$PM_{10}$' is composed of material with an aerodynamic diameter of less than 10 µm and overlaps with the size fraction for dust.

8.3.17. Air quality objectives for $PM_{10}$ have been set for the protection of human health and the term $PM_{10}$ is only used in this assessment when referring to the potential impact of emissions of particulate matter from demolition and construction activities on human health receptors. The short-term, 24-hour mean objective for airborne concentrations of $PM_{10}$ is the appropriate air quality Strategy Objective for assessing the potential impact on health of short-term fugitive emissions from construction sites.

8.3.18. Dust impacts are considered in terms of the change in airborne concentration and the change in the rate of deposition of dust onto surfaces. The IAQM adopts a broad definition of dust that includes the potential for changes in airborne concentration, changes in deposition rates and the risk to human health and public amenity when considering the significance of effects from emissions of fugitive particulate matter. In this assessment, specific reference is made to the impacts associated with specific size fractions (dust, $PM_{10}$), before considering the overall effect on receptors using an approach that is consistent with the IAQM's guidance ([33]).

8.3.19. The nature of the impact varies between different types of receptor. In general, receptors associated with higher baseline dust deposition rates are less sensitive to impacts, such as farms, light and heavy industry or outdoor storage facilities. In comparison some hi-technology industries or food processing plants operate under clean air conditions and increased airborne particulate matter concentrations may have an increased economic cost associated with the extraction of more material by plant air filtration units. In this assessment change in 24-hour mean $PM_{10}$ concentrations has been considered. The types

[32] LBB Air Quality Annual Status Report 2018 Available at: https://www.barnet.gov.uk/sites/default/files/asr_barnet_2018_v2.pdf
[33] IAQM/EPUK (2014) Guidance on the assessment of dust from demolition and construction v1.1. Available at: https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf

of receptor which are sensitive to this impact, and as such have been considered for inclusion in this assessment, include residential properties, hotels, schools, and hospitals and clinics.

### Construction Phase Non-Road Mobile Machinery Emissions (NRMM)

8.3.20. Emissions from construction NRMM would have the potential to increase $NO_2$ and $PM_{10}$ concentrations locally when in use on the construction site associated with the Proposed Development. Experience of assessing the exhaust emissions from on-site plant (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.

8.3.21. Emissions from NRMM would be temporary and localised and would be controlled via the application of the NRMM standards and through best practice mitigation measures. For that reason, Construction Phase NRMM emissions should not be significant and, therefore, these emissions have not been modelled or considered any further in this assessment.

### Construction Phase Road Traffic Emissions

8.3.22. The Institute of Air Quality Management (IAQM) refer to their Guidance on the assessment of dust from construction for how to undertake a Construction Phase assessment. This sets out that criteria to scope in or out construction traffic from requiring assessment can be based on IAQM/EPUK (Ref 33), which is:

*"Large, long-term construction sites that would generate large HGV flows (>200 per day) over a period of a year or more."*

8.3.23. It is not expected that a site of this size would introduce a construction traffic movement exceeding the above stated criteria. Therefore, Construction Phase road traffic emissions are not considered further in this assessment.

### Assessment Methodology

8.3.24. A qualitative assessment has been undertaken to assess the significance of any effects on sensitive receptors associated with the Construction Phase.

8.3.25. The assessment is based on IAQM/EPUK guidance and considers potential sources of emissions on the basis of the main activity groupings:

- Demolition (which is scoped out of this assessment as there is none occurring);
- Construction;
- Earthworks; and
- Track-out (e.g. the transfer of dust-making materials from the Site boundary onto the local road network).

8.3.26. For each activity group the following steps are applied with respect to identifying the potential effects, before coming to an overall conclusion about the significance of the effects predicted:

- Identify the nature, duration and the location of activities being carried out;
- Establish the likelihood of significant effects occurring as a result of these activities;
- Review the proposed or embedded mitigation against good site practice;
- Identify additional mitigation measures, where necessary, to reduce the risk of a significant adverse effect occurring at sensitive receptors; and
- Summarise the overall effect of the works with respect fugitive emissions of particulate matter and then report the significance of the effects.

8.3.27. The emphasis of the regulation and control of refurbishment and construction dust should be the adoption of good working practices as standard. Good practice is a process that is informed by the assessment, which seeks to avoid the potential for adverse effects. This approach assumes that this environmental management, beyond those mitigation measures inherent in the proposed design, will be implemented during works to ensure potential significant adverse effects do not occur.

8.3.28. It has been assumed that good site practices will be employed on-site when assessing potential dust impacts. This good site practices will be brought forward in accordance with a Construction Environmental Management Plan (CEMP) which will be secured by an appropriately worded planning condition or obligation.

## Methodology for Site Suitability

8.3.29. Site Suitability was assessed using dispersion modelling. The model parameters and data inputs are described in the sections below.

### Model Parameters

8.3.30. The dispersion model input data and model conditions are provided in Table 8-5.

### Traffic Data and Road Traffic Emission Factors

8.3.31. The dispersion model ADMS-Roads calculates concentrations of pollutants emitted from vehicles using the following parameters:

- Traffic volume: The number of vehicles travelling a length of road in a given time will affect the subsequent emissions and dispersion of pollutants;
- Fleet composition: The proportion of Heavy Duty Vehicles (HDVs) (e.g. Heavy Goods Vehicles and buses) to Light Duty Vehicles (LDVs) (e.g. cars and Light Goods Vehicles) will affect the mass emissions of pollutants; and
- Fleet velocity: The speed of the fleet affects the mass emissions of pollutants.

Traffic Data Inputs are provided in Table 8-6 and Table 8-10.

8.3.32. Emission factors have been sourced from the Emissions Factors Toolkit (EFT) Version 9.0 ([34]).

### Meteorological Data

8.3.33. One year (2019) of hourly sequential observation data from Heathrow Airport meteorological station has been used in this assessment. The station is located approximately 20 km southwest of the Site boundary and experiences meteorological conditions that are considered to be representative of those experienced near the Proposed Development. A windrose of the meteorological dataset if show in Figure 8-1.

### Background Data

8.3.34. Background concentrations of $NO_2$ and $PM_{10}$ have been sourced from Defra background maps (Ref 29) for years 2019 and 2026 where relevant, as presented in Table 8-4 and Table 8-9.

### Road Traffic Emissions $NO_x$ to $NO_2$ Conversion

8.3.35. For road traffic emissions, a '$NO_x$ to $NO_2$' conversion spreadsheet ([35]) is made available by Defra as a tool to calculate the road $NO_2$ contribution from modelled road $NO_x$ contributions. The tool comes in the form of a Microsoft Excel spreadsheet and uses Borough specific data to calculate annual mean concentrations of $NO_2$ from dispersion model output values of annual mean concentrations of $NO_x$. The most recent release of this tool (v7.1, released in April 2019) was used to calculate the total $NO_2$ concentrations at receptors from the modelled road $NO_x$ contribution and associated background concentration.

### Model Adjustment

8.3.36. Model adjustment was undertaken using monitoring data for site PBN20, immediately adjacent to the Site on Cricklewood Lane. This data was projected to 2019 using linear regression. Projection of the monitoring data was undertaken as at the time of the assessment; data was not available for 2019 to match the Base Year and Meteorological Year. The 2019 projected monitored result is considered worst-case as it anticipates a 2.8 $\mu g/m^3$ increase over the 2018 measurement.

[34] Defra's Emissions Factors Toolkit (EFT) Version 9.0 Available at: https://laqm.defra.gov.uk/documents/EFT2019_v9.0.xlsb
[35] Defra's $NO_x$ to $NO_2$ spreadsheet Available at: https://laqm.defra.gov.uk/documents/EFT2019_v9.0.xlsb

8.3.37. The model adjustment factor was calculated to be 1.67, which was applied to modelled road $NO_x$ concentrations (and $PM_{10}$ in the absence of appropriate monitoring data) for this assessment. Details of this comparison can be found in Table 8-8.

## Significance Criteria

### Construction Phase Effects

8.3.38. The primary aim of the Air Quality Dust Risk Assessment is to identify the appropriate site-specific mitigation measures that must be adopted to ensure there will be no significant effect on local amenity, public health or ecological sites. In this particular Dust Risk Assessment, the nearest ecological receptor (Westbere Copse Local Nature Site - 800m south of the Site) has been scoped out because it is outside of the 350m zone of effect from the construction area.

8.3.39. The scale of the risk of adverse effects occurring due to each type of construction activity, with mitigation in place is described using the terms high, medium and low risk. The basis for the choice of description is set out for each activity, comprising earthworks, construction and track-out, and is consistent with the IAQM's Guidance on the Assessment of Dust from Demolition and Construction (Ref 33).

8.3.40. Construction dust impacts generally occur when high risk dust generating activities are undertaken that coincide with adverse meteorological conditions. Therefore, even without mitigation, any impact would be limited to events that are infrequent and short-term in nature.

8.3.41. Experience in the UK is that good site practice is capable of mitigating the impact of fugitive emissions of particulate matter effectively, so that in all but the most exceptional circumstances, effects at sensitive receptors can be controlled to ensure that effects unlikely to be significant.

## Consultation

8.3.42. Consultation was undertaken with respect of the EIA scoping process. The approach to the assessment of air quality effects was set out in the AECOM EIA Scoping Report submitted to LBB in December 2019. LBB issued their EIA Scoping Opinion in February 2020. Table 8-2 Comments raised in the LBB EIA Scoping Opinion summarises key comments raised by consultees of relevance to this assessment and how the assessment has responded to them.

**Table 8-2 Comments raised in the LBB EIA Scoping Opinion**

| Comments Raised | Response Provided in the ES/Planning Application |
|---|---|
| The full details relating to the baseline, assessment methodology and the parameters of the proposed assessment have been reviewed by the LPA, including Environmental Health officers, and the LPA can confirm that the proposed scope of the chapter is considered to be acceptable and that the topic should be SCOPED IN to the ES. The LPA would draw the applicant's attention to the specific comments received from Environmental Health officers which are included within this report at Appendix 1.<br><br>"I have read the EIA Scoping Report by AECOM Infrastructure & Environment UK Ltd dated December 2019. I am satisfied with the proposals in relation to air quality, ground conditions and contamination, noise and vibration." | The topic of air quality has been scoped into the ES. |

## Limitations and Assumptions

8.3.43. The assessment of the Proposed Development has adopted the following limitations and assumptions:

- Traffic data used in the assessment has been provided for a selection of roads surrounding the Proposed Development by the ENTEC (transport consultant) (see Table 8-6 and Table 8-10).

- The road model was verified by application of correction factor based on the comparison of modelled road $NO_x$ contributions to predicted monitored road $NO_x$ contributions from a single diffusion tube monitoring site around the Proposed Development; and
- Construction Phase assessment has been based on the currently available information supplied by the Applicant.

## 8.4. Baseline Conditions

### Pollutant Concentrations

8.4.1. The Proposed Development is located in LBB and the baseline assessment includes a brief review and summary of the LBB's LAQM Annual Status Report (ASR).

8.4.2. LBB has declared a Borough wide AQMA for exceedances of the annual mean $NO_2$, 1-hour mean $NO_2$ and 24-hour mean $PM_{10}$ objective threshold. The AQAP 2003-2016 was published and adopted in 2003, which set out measures to improve air quality in the AQMA. An updated AQAP, Air Quality Action Plan 2017-2022 concluded that road transport emissions are the major source of air pollution in the Borough. The ASR for 2018 (2019) demonstrated that there has been a reduction in annual mean $NO_2$ concentration in the Borough. However, there were several sites continue to exceed the annual mean objective, including a site at Cricklewood Lane.

8.4.3. Table 8-3 shows recent concentrations measured at monitoring site PBN20 have been generally declining.

**Table 8-3: Measured Annual Mean 2012 – 2018**

| Site ID | Location | X,Y | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|
| PBN20 | Cricklewood Lane | 523885, 185764 | 54.3 | 57.1 | 62.3 | 54.6 | 55.3 | - | 43.1 |

### Background Concentrations

8.4.4. Defra background maps indicate that background pollutant concentrations around the Proposed Development are below the respective annual mean objective threshold for $NO_2$ and $PM_{10}$ (see Table 8-4). It is anticipated that they should also improve over time due to the expected reduction in emissions from all emission sources.

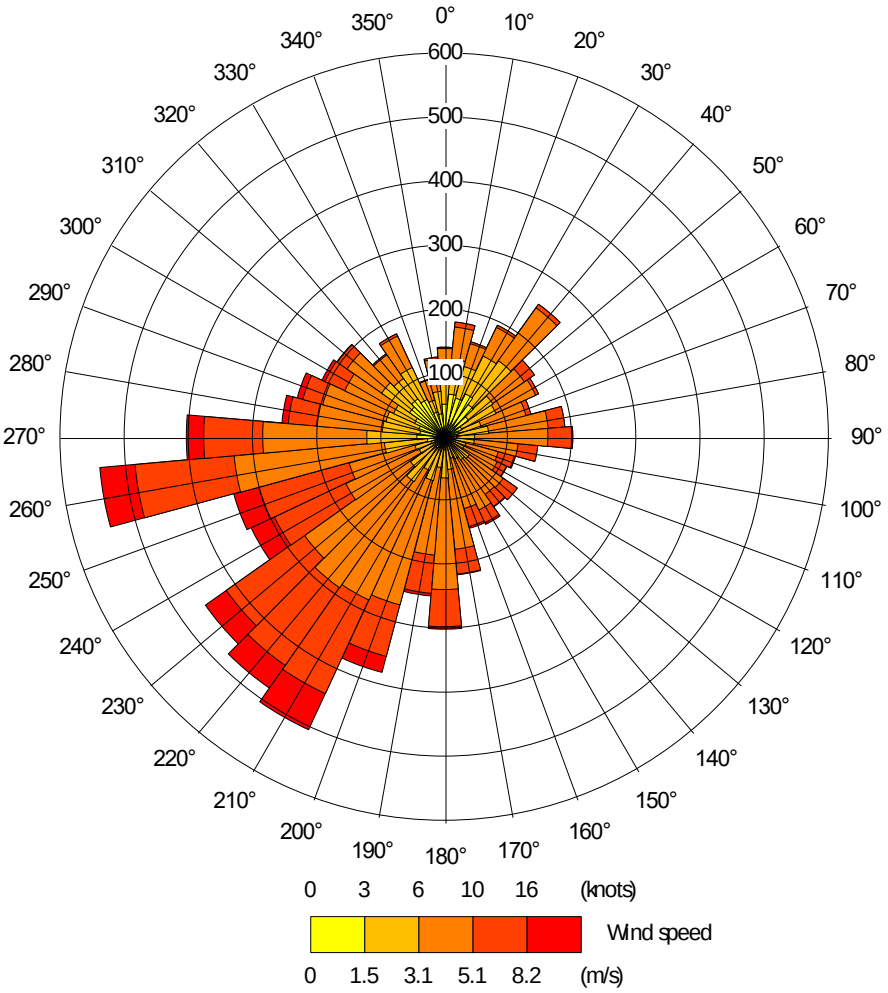
**Table 8-4: Defra 2019 Background Concentrations**

| Grid Square (X,Y) | Pollutant | 2019 Annual Mean Concentration (µg/m$^3$) |
|---|---|---|
| 523500, 185500 | $NO_2$ | 24.4 |
| | $PM_{10}$ | 17.2 |

### Meteorological Conditions

8.4.5. Hourly wind speeds and directions measured at Heathrow Airport in 2019 are shown in Figure 8-1.

**Figure 8-1 Heathrow Airport Windrose (2019)**




8.4.6. Figure 8-1 shows the dominant wind direction at Heathrow Airport to be from the southwest in 2019.

## Dispersion Model Inputs

8.4.7. Input parameters used in the dispersion model are shown in Table 8-5.

**Table 8-5: Dispersion Model Inputs**

| Parameter | Value |
|---|---|
| Surface Roughness (m) at Dispersion Site | 1.5 (Large Urban Areas) |
| Surface Roughness (m) at Meteorological Station | 0.005 (Short Grass) |
| Monin-Obukov length (m) at Dispersion Site and Meteorological Station | 100 (Large Conurbations <1 million) |

8.4.8. Baseline traffic data input to the dispersion model is shown in Table 8-6.

**Table 8-6: Baseline Traffic Data Input**

| Link Name | Speed (kph) | Annual Average Hourly Traffic (AAHT) | |
|---|---|---|---|
| | | LDV | HDV |
| A. Site north access | 17.4 | 79 | 7 |
| B. Site south access | 21.3 | 102 | 2 |
| C1. Cricklewood Lane (W) | 36.2 | 503 | 87 |
| C2. Cricklewood Lane (E) | 36.2 | 503 | 87 |
| D. Cricklewood Broadway south | 36.8 | 819 | 86 |
| E. Chichele Road | 33.3 | 412 | 59 |
| F1. Cricklewood Broadway north1 | 37.3 | 840 | 183 |
| F2. Cricklewood Broadway north2 | 37.3 | 840 | 183 |
| G. Depot Approach | 33.4 | 62 | 10 |

## Predicted Future Baseline Pollutant Concentrations

8.4.9. Using the linear regression, annual mean $NO_2$ concentrations measured at monitoring site PBN20 have been projected to 2019 and 2026 shown in Figure 8-2 and Table 8-7.

**Figure 8-2 LBB Monitoring Projection**

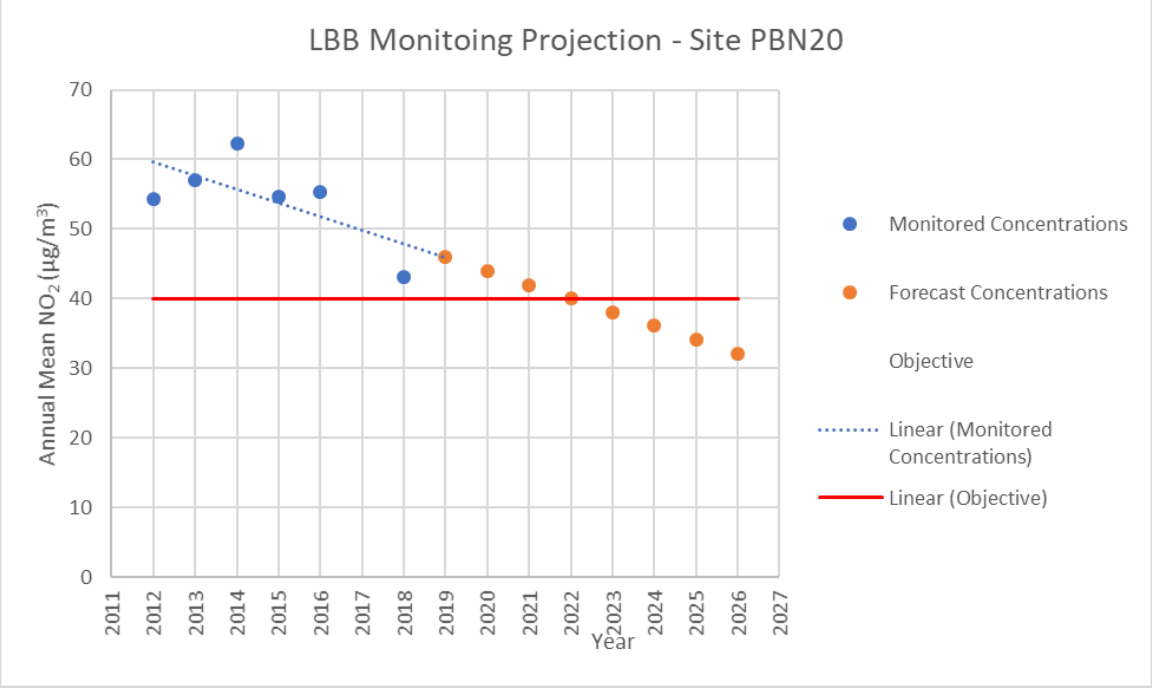


**Table 8-7: LBB Monitoring Projection**

| Site ID | Location | X Y | Annual Mean $NO_2$ Concentration Measured ($\mu g/m^3$) | | |
|---|---|---|---|---|---|
| | | | Actual 2018 | Projected 2019 | Projected 2026 |
| PBN20 | Cricklewood Lane | 523885, 185764 | 43.1 | 45.9 | 32.2 |

8.4.10. Annual mean $NO_2$ concentrations projected to 2019 (for comparison with modelled results) and 2026 for consideration of potential Opening Year conditions indicate that while exceedances are expected to still occur in 2019, by 2026 concentrations are expected to drop below the air quality objective threshold.

### Model Adjustment

8.4.11. Table 8-8 shows the calculated adjustment factor applied to model predictions of annual mean $NO_x$-road and annual mean $PM_{10}$-road concentrations.

**Table 8-8: 2019 Model Adjustment – PBN20 Height 6m**

| 2019 Monitored Total $NO_2$ | 2019 Background $NO_2$ | 2019 Monitored $NO_x$-Road | 2019 Modelled $NO_x$-Road | 2019 Adjustment Factor |
|---|---|---|---|---|
| 45.9 | 24.4 | 51.7 | 30.9 | 1.67 |

### Predicted Future Baseline Background Concentrations

8.4.12. Defra background maps indicate that future baseline background pollutant concentrations around the Proposed Development are likely to remain below the respective annual mean objective threshold for $NO_2$ and $PM_{10}$ in 2026 (see Table 8-9).

**Table 8-9: Defra Background Concentrations**

| Grid Square (X,Y) | Pollutant | 2026 Annual Mean Concentration ($\mu g/m^3$) |
|---|---|---|
| 523500, 185500 | $NO_2$ | 19.0 |
| | $PM_{10}$ | 16.1 |

## 8.5. Environmental Design and Management

8.5.1. Certain elements of the Proposed Development have been planned to avoid, prevent or reduce potential environmental impacts, some of which have an influence on local air quality. These committed mitigation measures relate primarily to the Construction Phase and are outlined below.

### Construction Phase

8.5.2. The recommended level of mitigation during the Construction Phase is based on the Dust Risk Assessment presented in *ES Volume III Appendix 8-1: Dust Risk Assessment*. These include measures addressing:

- Site Management;
- Preparing and Maintaining the Site;
- Operating vehicles / Machinery and Sustainable Travel;
- Operations;

- Waste Management; and
- Measures specific to Demolition, Earthworks and Trackout.

8.5.3. Based on IAQM guidance and criteria, the findings of the risk assessment have identified the Site as being high risk.

8.5.4. Consistent with the guidance, standard mitigation measures for sites that are deemed high risk would be incorporated within the CEMP to be developed by the contractor to either avoid or reduce dust impacts. Compliance with the CEMP shall be secured by way of an appropriately worded planning condition or obligation. The mitigation measures to be incorporated into construction working practices to reduce the likelihood of significant adverse dust effects from the construction works are presented in *ES Volume III Appendix 8-1: Dust Risk Assessment*. The measures proposed are consistent with those outlined in IAQM guidance.

8.5.5. The IAQM guidance states that the aim should be to prevent significant effects on receptors through the use of effective mitigation, which is likely to be achieved through appropriate management. The IAQM guidance concludes that, subject to the identification and adoption of effective mitigation and management controls, the residual dust effects during demolition and construction could be determined to be 'not significant'.

### Operational Phase

8.5.6. The Proposed Development incorporated good principles of design with regard to minimising emissions and the reduction of impacts on local air quality:

- Effective spatial planning – the new dwellings are located in an area where well connected to public transports, and local workplace, schools, shopping and leisure facilities are readily available, which will reduce the need to travel by car.
- Provision of cycling parking facilities to encourage sustainable transport.
- Building design and layout – open space area and commercial facilities situated between the road sources to minimising exposure to future occupants.
- Provision of all-electric powered space heating and cooling with the Development.

## 8.6. Assessment of Effects and Significance

### Effects During Demolition and Construction

8.6.1. An Air Quality Dust Risk Assessment has been undertaken based on currently available information concerning Construction Phase activities, in accordance with IAQM guidance (Ref 33). Based on this document, the potential impacts considered are:

- Effects on amenity and property as a result of changes in the rate of deposition of dust and particulate matter onto surfaces and other property; and
- Likely changes in 24-hour mean $PM_{10}$ concentrations that might increase the risk of exposure to $PM_{10}$ at levels in excess of the 24-hour $PM_{10}$ air quality objective.

8.6.2. The Proposed Development has been divided into three Phases with Development Parcel A and B located in Phase 1, Development Parcel C in Phase 2, and Development Parcel D in Phase 3, which will be built out separately. Although the IAQM guidance recommended that the assessment should be assessed separately, the core construction activities of the three phases are overlapping for July 2022 to January 2025.

8.6.3. Construction impacts are considered to be short-term, temporary and only likely to occur only during working hours.

8.6.4. Based on the Defra background maps, the $PM_{10}$ concentration in the study area is 17.2 $\mu g/m^3$.

8.6.5. In accordance with the IAQM guidance, there are estimated to be in the range of 10 – 100 high sensitivity receptors within 20 m of the construction site boundary and greater than 100 high sensitivity receptors within 20m of the routes likely to be used by construction vehicles. The sensitivity of the area with respect to dust soiling is therefore assessed as high, and in terms of human health impacts is low.

### Phase 1 Earthworks

8.6.6. The total amount of material moved is estimated to be over 10,000 $m^3$ which means that the potential dust emission magnitude for the earthworks will be large.

8.6.7. Combining the assumed large dust emissions magnitude and high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and high risk for dust soiling.

### Phase 1 Construction

8.6.8. Dust emissions during construction can give rise to periods of elevated dust deposition and $PM_{10}$ concentrations. These periods are generally short-lived changes over a few hours or days but may occur throughout the Construction Phase.

8.6.9. The total construction building volume is estimated to be above 100,000 $m^3$. Additionally, piling is expected to taking place on-site. Therefore, the potential dust emission magnitude for construction is assessed as large.

8.6.10. Combining the large dust emission magnitude with the high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and medium risk for dust soiling.

### Phase 1 Track-out of Material

8.6.11. Over 10,000 $m^3$ of material would need to be imported to the Site over the course of 8 weeks (40 days). Average weekday HDV movements would be 74 outward HDV movements. Based on this assumption the potential dust emission magnitude for track-out is assessed as medium.

8.6.12. The large dust emission magnitude combined with the high sensitivity of the area to human health impacts and property and amenity effects results in the risk of dust impacts due to track-out of material being classified as low risk for human health and low risk for dust soiling.

### Phase 2 Earthworks

8.6.13. The total amount of material moved is estimated to be over 10,000 $m^3$ which means that the potential dust emission magnitude for the earthworks will be large.

8.6.14. Combining the assumed large dust emissions magnitude and high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and medium risk for dust soiling.

### Phase 2 Construction

8.6.15. Dust emissions during construction can give rise to periods of elevated dust deposition and $PM_{10}$ concentrations. These periods are generally short-lived changes over a few hours or days but may occur throughout the Construction Phase.

8.6.16. The total construction building volume is estimated to be above 100,000 $m^3$. Additionally, piling is expected to taking place on-site. Therefore, the potential dust emission magnitude for construction is assessed as large.

8.6.17. Combining the large dust emission magnitude with the high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and medium risk for dust soiling.

### Phase 2 Track-out of Material

8.6.18. Over 10,000 $m^3$ of material would need to be imported to the Site over the course of 8 weeks (40 days). Average weekday HDV movements would be 74 outward HDV movements. Based on this assumption the potential dust emission magnitude for track-out is assessed as large.

8.6.19. The large dust emission magnitude combined with the high sensitivity of the area to human health impacts and property and amenity effects results in the risk of dust impacts due to track-out of material being classified as low risk for human health and low risk for dust soiling.

### Phase 3 Earthworks

8.6.20. The total amount of material moved is estimated to be over 10,000 $m^3$ which means that the potential dust emission magnitude for the earthworks will be large.

8.6.21. Combining the assumed large dust emissions magnitude and high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and medium risk for dust soiling.

### Phase 3 Construction

8.6.22. Dust emissions during construction can give rise to periods of elevated dust deposition and $PM_{10}$ concentrations. These periods are generally short-lived changes over a few hours or days but may occur throughout the Construction Phase.

8.6.23. The total construction building volume is estimated to be above 100,000 $m^3$. Additionally, piling is expected to taking place on-site. Therefore, the potential dust emission magnitude for construction is assessed as large.

8.6.24. Combining the large dust emission magnitude with the high sensitivity of the area to human health impacts and property and amenity effects with the low $PM_{10}$ background concentration results in the risk of dust impacts due to earthworks being classified as low risk for human health and high risk for dust soiling.

### Phase 3 Track-out of Material

8.6.25. Over 10,000 $m^3$ of material would need to be imported to the Site boundary over the course of 8 weeks (40 days). Average weekday HDV movements would be 74 outward HDV movements. Based on this assumption the potential dust emission magnitude for track-out is assessed as large.

8.6.26. The large dust emission magnitude combined with the high sensitivity of the area to human health impacts and property and amenity effects results in the risk of dust impacts due to track-out of material being classified as low risk for human health and low risk for dust soiling.

### Mitigation Measures Required

8.6.27. A number of mitigation measures could be implemented on the Site boundary to either avoid or reduce potential effects to neighbouring receptors. Due to the high risk of dust impacts during demolition as determined above, it is recommended that the high level of mitigation is applied on the Site boundary as discussed in Section 7.5 of this ES chapter. Details of the measures required are set out in *ES Volume III Appendix 8-1: Dust Risk Assessment*.

8.6.28. The adoption and effective implementation of these mitigation measures should ensure that the residual impacts on property amenity and human health associated with Construction Phase activities are not significant.

### Overall Significance

8.6.29. With the implementation of mitigation measures appropriate for high risk sites such as this, the risk of potential effects on sensitive receptors (property and amenity; human health) would be minimised or prevented, and the resultant impacts would be not significant.

## Effects once Complete and Operational

### Long-Term Traffic Emission – Exposure Impact at Proposed Development

8.6.30. With Development (and cumulative schemes) traffic data input to the dispersion model is shown in Table 8-10.

**Table 8-10: With Development (and Cumulative Schemes)Traffic Data Input (2026)**

| Link Name | Speed (kph) | Annual Average Hourly Traffic (AAHT) | |
|---|---|---|---|
| | | LDV[36] | HDV[37] |
| A. Site north access | 17.4 | 0 | 0 |
| B. Site south access | 21.3 | 0 | 0 |
| C1. Cricklewood Lane (W) | 36.2 | 485 | 85 |
| C2. Cricklewood Lane (E) | 36.2 | 485 | 85 |
| D. Cricklewood Broadway south | 36.8 | 863 | 58 |
| E. Chichele Road | 33.3 | 298 | 181 |
| F1. Cricklewood Broadway north1 | 37.3 | 882 | 184 |
| F2. Cricklewood Broadway north2 | 37.3 | 1,078 | 3 |
| G. Depot Approach | 33.4 | 46 | 7 |

8.6.31. Table 8-11 shows predictions of annual mean $NO_2$ and $PM_{10}$ concentrations made at the PBN20 monitoring site in 2026, modelled at adjusted to a breathing height of 1.5m to represent ground-level exposure.

**Table 8-11: Predicted Pollutant Concentrations at PBN20 Height 1.5m**

| Location | Annual Mean $NO_2$ ($\mu g/m^3$) | Annual Mean $PM_{10}$ ($\mu g/m^3$) |
|---|---|---|
| PBN20 Monitoring Site (1.5m) | 30.5 | 20.9 |

8.6.32. Predicted concentrations at PBN20 monitoring site are well below relevant air quality objective thresholds. As this location represents a worst-case in terms of exposure of the Proposed Development, it can be concluded that future occupants at the Proposed Development are unlikely to be exposed to exceedances.

8.6.33. The Site is therefore considered suitable for its proposed use if occupants of the Proposed Development are unlikely to be exposed to pollutants above air quality objective concentrations (see Table 8 1).

### Air Quality Neutral

8.6.34. As the Proposed Development has incorporated good principles of design with regard to minimising emissions and the reduction of impacts on local air quality, specifically the provision of all-electric powered space heating and cooling, there will be no building emissions in the context of Air Quality Neutral calculations.

[36] Light Duty Vehicles – include cars, taxis and light vans
[37] Heavy Duty Vehicles – include Articulated and Rigid Lorries, Buses, and Coaches

8.6.35. While the Proposed Development will reduce the number of trips associated with the current use of the Site, the Air Quality Neutral guidance requires the actual number of trips generated to be compares to benchmark trip rates for the land-sue types proposed.

8.6.36. For the calculation of the transport benchmark, it is assumed there will be up to 1,100 residential units and up to 1,200 $m^2$ of flexible commercial use (assumed to be Offices B1). The Air Quality Neutral Transport Benchmark is show in Table 8-12

**Table 8-12: Air Quality Neutral Transport Benchmark**

| Land-Use | Number of Trips per annum | Total Proposed Units | Total Trips per annum |
|---|---|---|---|
| Office (B1) | 4 per $m^2$ | 1,200 $m^2$ | 4,800 |
| Residential (C3) | 407 per dwelling | 1,100 dwellings | 447,700 |
| | | **Total Trips per Annum** | 452,500 |
| | | **AADT** | 1,239 |

***Sources:***

- AQC and Environ (2014) Air Quality Neutral Planning Support Update: GLA 80371
- 20200618 Cricklewood AADT_AAWT.xlsx from Entran Ltd
- 10965 Cricklewood Lane - Approx. Area Schedule and Dwelling Numbers from EPR Architects

8.6.37. As set out in the Transport Assessment, the Proposed Development could generate up to 995 trips per day. As this is approximately 20% less than the calculated Transport Benchmark, the Proposed Development is considered to be Air Quality Neutral and no additional Mitigation measures are required.

## 8.7. Additional Mitigation and Monitoring Measures

### Mitigation During Demolition and Construction

8.7.1. No additional mitigation measures are recommended during construction beyond those identified in *ES Volume III Appendix 8-1: Dust Risk Assessment*.

### Mitigation once the Proposed Development is Operational

8.7.2. The overall predicted effects from road traffic emissions during the Operational Phase of the Proposed Development on sensitive receptors are considered to be not significant, and no additional mitigation is required. No exceedances of the air quality objective are caused by the Proposed Development. The predictions indicate that the Proposed Development would not result in new public exposure to elevated annual concentrations of $NO_2$ or $PM_{10}$ at the proposed receptors locations and it has been predicted that the short-term $NO_2$ objective will unlikely be exceeded, at the amenity areas of the Proposed Development.

## 8.8. Residual Effects and Conclusions

8.8.1. In general, construction activities have the potential to generate fugitive dust emissions as a result of construction or track-out of material. For the Proposed Development, the emission of any airborne particulate matter generated by these activities will be controlled using on-site management practices. Overall, the effect of fugitive emissions of particulate matter (dust and $PM_{10}$) from the proposed construction works with mitigation included is considered to be not significant with respect to potential effects on human health and amenity.

8.8.2. The assessment has identified that at future receptors, the effect of impacts on local air quality are negligible for $NO_2$ and $PM_{10}$ concentrations. Therefore, the overall effect of the Proposed Development on local air quality is defined as not significant.

### Table 8-13: Air Quality Summary of Potential Effects

| Description of Effect | Sensitivity of Receptor | Nature Of Effect/Geographic Scale | Magnitude of Impact | Initial Classification Of Effect (With Embedded Mitigation) | Additional Mitigation | Residual Effect Significance |
|---|---|---|---|---|---|---|
| **Demolition and Construction** | | | | | | |
| Increase in dust emissions, impacting on amenity and human health | High | Temporary, Medium Term and Local | Medium to Large | Not significant | Not required | **Not significant** |
| **Complete and Occupied** | | | | | | |
| Increased concentrations of $NO_2$ and $PM_{10}$ from road traffic, impacting on existing receptors | High | Local | Negligible | Not significant | Not required | **Not significant** |
| Introduction of new exposure receptors to poor local air quality | High | Local | Negligible | Not significant | Not required | **Not significant** |

## 8.9. Statement of Effect Significance

8.9.1. Provided that the mitigation measures outlined in ES Volume III Appendix 8-1: Dust Risk Assessment are successfully implemented, residual significant effects on local air quality are not expected as a result of the Proposed Development.

## 8.10. Cumulative Effects Assessment

### Demolition and Construction

8.10.1. With appropriate mitigation measures in place there should be no significant cumulative Construction Phase effects, as there would be no discernible effects from the construction site associated with the Proposed Development.

#### Residual Effects

8.10.2. No residual effects with the application of standard mitigation measures.

### Complete and Operational

8.10.3. Air Quality Assessments are inherently cumulative as the traffic data includes all committed developments in the future baseline and, therefore, the With Development (and cumulative scenario). There are no significant cumulative air quality effects predicted.

#### Residual Effects

8.10.4. There will be no residual effects with the Proposed Development during the operational phase.