Air Quality Assessment

Camden High Street, London

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Executive Summary

Redmore Environmental Ltd was commissioned by Abbee Limited to undertake an Air Quality Assessment in support of a residential development at 59 - 61 Camden High Street, London.

The development may lead to the exposure of future occupants to elevated pollutant levels, as well as adverse impacts at sensitive locations. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and assess potential effects associated with the scheme.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of construction and trackout activities. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

During the operational phase of the development there is the potential for exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken in order to predict concentrations across the proposed development site as a result of emissions from the highway network. Results were subsequently verified using local monitoring data.

The dispersion modelling assessment indicated that predicted pollution levels were below the relevant criteria across the development. The site is therefore considered suitable for the proposed end-use from an air quality perspective.

There is also the potential for air quality impacts as a result of traffic exhaust emissions associated with vehicles travelling to and from the site. These were assessed using standard screening criteria. As the development has no associated parking, road vehicle exhaust emissions impacts were not predicted to be significant.

Potential emissions from the development were assessed in order to determine compliance with the air quality neutral requirements of the London Plan. The building energy strategy includes the use of electric boilers which do not produce direct emissions to atmosphere. Additionally, there is no parking associated with the development. As such, the proposals are considered air quality neutral.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposals.

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Abbee Limited to undertake an Air Quality Assessment in support of a residential development at 59 - 61 Camden High Street, London.

1.1.2 The development may lead to the exposure of future occupants to elevated pollutant levels, as well as adverse impacts at sensitive locations. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and assess potential effects associated with the scheme.

1.2 Site Location and Context

1.2.1 The site is located at 59 - 61 Camden High Street, London, at approximate National Grid Reference (NGR): 529091, 183536. Reference should be made to Figure 1 for a site location plan.

1.2.2 The proposals comprise construction of a second floor rear extension and conversion of the existing property to provide eight residential units.

1.2.3 An Air Quality Management Area (AQMA) has been declared by the London Borough of Camden (LBoC) due to exceedences of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2) and 24-hour mean AQO for particulate matter with an aerodynamic diameter of less than 10µm (PM_{10}). The development is located within the AQMA. As such, there is the potential for exposure of future residents to poor air quality and adverse impacts in this sensitive area as a result of the construction and operational phases of the proposals. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use and define any requirement for mitigation. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- NO_2;
- Sulphur dioxide;
- Lead;
- PM_{10};
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Target values have also been provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007[1]. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 Table 1 presents the AQOs and AQLV for pollutants considered within this assessment.

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Table 1 Air Quality Objectives / Limit Values

Pollutant	Air Quality Objective/ Limit Values	
	Concentration (µg/m^3)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	20	Annual mean

2.1.5 Table 2 summarises the advice provided in the Greater London Authority (GLA) guidance[2] on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools (including all of playgrounds), hospitals (and their grounds), care homes (and their grounds) etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term

[2] London Local Air Quality Management (TG19), Technical Guidance 2019 (LLAQM.TG (2019)), GLA, 2019.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

2.2.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Dust

2.3.1 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of

the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[3] (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievements of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives including the following of relevance to air quality:

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

2.4.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> "Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> […]
>
> preventing new and existing development from contributing to, or 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 […]"

[3] NPPF, Ministry of Housing, Communities and Local Government, 2021.

2.4.4 The NPPF specifically recognises air quality as part of delivering sustainable development and 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."

2.4.5 The implications of the NPPF have been considered throughout this assessment.

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice Guidance[4] (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

[4] https://www.gov.uk/guidance/air-quality--3.

2.5.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.6 Local Planning Policy

The London Plan

2.6.1 The London Plan 2021[5] is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth. Review of this document indicated the following of relevance to this report:

> "Policy SI 1 - Improving Air Quality
>
> 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 exceedence of legal limits
> c) create unacceptable risk of high levels of exposure to poor air quality.
> 2. In order to meet the requirements of 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.

[5] The London Plan March 2021, GLA, 2021.

c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1.
d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people, should demonstrate that design measures have been used to minimise exposure.

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

2.6.2 The requirements of this policy have been considered throughout this Air Quality Assessment.

Sustainable Design and Construction Supplementary Planning Guidance

2.6.3 The Sustainable Design and Construction Supplementary Planning Guidance (SPG)[6] was published by the GLA in April 2014. The document aims to support developers, local planning authorities and neighbourhoods to achieve sustainable development, as well as providing guidance on to how to achieve the London Plan objectives effectively.

2.6.4 The document provides guidance on the following key areas when undertaking an Air Quality Assessment:

- Assessment requirements;
- Construction and demolition;
- Design and occupation;
- Air Quality Neutral policy for buildings and transport, and,
- Emissions standards for combustion plant.

2.6.5 These were taken into consideration during the undertaking of this assessment.

Local Plan

2.6.6 LBoC adopted the Local Plan[7] on 3rd July 2017. This provides the basis for planning decisions and development in the borough, covering the period from 2016 to 2031. A review of the Local Plan indicated the following policy of relevance to this report:

> "Policy CC4 Air Quality
>
> The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.
>
> The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality.

6 Sustainable Design and Construction SPG, GLA, 2014.

7 Local Plan, LBoC, 2017.

Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan."

2.6.7 The Camden Planning Guidance (CPG) Air Quality[8] document has been produced to support the policies of the Camden Local Plan[9].

2.6.8 The implications of the above policies were taken into consideration throughout the undertaking of the assessment.

[8] CPG Air Quality, LBoC, 2021

[9] Local Plan, LBoC, 2017.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The development may lead to the exposure of future residents to poor air quality, as well as adverse impacts at sensitive locations. These issues were assessed in accordance with CPG[10], as shown in the following methodology.

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Mayor of London's 'The Control of Dust and Emissions during Construction and Demolition SPG'[11].

3.2.2 Activities on the proposed construction site have been divided into two types to reflect their different potential impacts. These are:

- Construction; and,
- Trackout.

3.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to PM_{10}.

3.2.4 The assessment steps are detailed below.

[10] CPG Air Quality, LBoC, 2021

[11] The Control of Dust and Emissions During Construction and Demolition SPG, The Mayor of London, 2014.

Step 1

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to Step 2.

3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

Step 2

3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

3.2.9 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Construction	• Total building volume greater than 100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Duty Vehicle (HDV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m

Magnitude	Activity	Criteria
Medium	Construction	• Total building volume 25,000m^3 to 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 10 to 50 HDV trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 10 HDV trips per day • Surface material with low potential for dust release • Unpaved road length less than 50m

3.2.13 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 4.

Table 4 Construction Dust - Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect high levels of amenity • High aesthetic or value property • People expected to be present continuously for extended periods of time • Locations where members of the public are exposed over a time period relevant to the AQO for PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	• Locally designated site e.g. Local Nature Reserve

3.2.14 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and,
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

3.2.15 These factors were considered in the undertaking of this assessment.

3.2.16 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 5.

Table 5 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

3.2.17 Table 6 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 6 Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low	Low
	Less than 24µg/m^3	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low	Low

3.2.18 Table 7 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 7 Construction Dust - Sensitivity of the Area to Ecological Impacts

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

3.2.19 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

3.2.20 Table 8 outlines the risk category from construction activities.

Table 8 Construction Dust - Dust Risk Category from Construction Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

3.2.21 Table 9 outlines the risk category from trackout activities.

Table 9 Construction Dust - Dust Risk Category from Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

Step 3

3.2.22 Step 3 requires the identification of site specific mitigation measures within the Mayor of London's guidance[12] to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

3.2.23 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

12 The Control of Dust and Emissions During Construction and Demolition SPG, The Mayor of London, 2014.

3.2.24 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. The Mayor of London's guidance suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

3.3 Operational Phase Assessment

Potential Future Exposure

3.3.1 The proposal has the potential to expose future residents to poor air quality. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the development site, detailed dispersion modelling was undertaken. Reference should be made to Appendix 1 for a full description of the assessment input data.

3.3.2 The results of the assessment were compared against the Air Pollution Exposure Criteria (APEC) contained within the London Councils Air Quality and Planning Guidance[13]. These are outlined in Table 10 and allow determination of the significance of predicted pollution levels and associated exposure.

Table 10 Future Exposure Assessment Criteria

Category	Applicable Range		Recommendation
	Annual Mean NO_2, PM_{10} or $PM_{2.5}$	24-hour PM_{10}	
APEC - A	Below 5% of the annual mean AQO or AQLV	> 1-day less than AQO	No air quality grounds for refusal; however, mitigation of any emissions should be considered
APEC - B	Between 5% below or above the annual mean AQO or AQLV	Between 1-day above or below AQO	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised

13 London Councils Air Quality and Planning Guidance, London Councils, 2007.

Category	Applicable Range		Recommendation
	Annual Mean NO_2, PM_{10} or $PM_{2.5}$	24-hour PM_{10}	
APEC - C	Above 5% of the annual mean AQO or AQLV	> 1-day more than AQO	Refusal on air quality grounds should be anticipated, unless the LA has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures

3.3.3 It should be noted that a significant area of London would fall under APEC - C due to high NO_2 concentrations throughout the city. As such, a presumption against planning consent in these locations may result in large areas of land becoming undevelopable and prevent urban regeneration. The inclusion of suitable mitigation measures to protect future site users is therefore considered a suitable way to progress sustainable schemes in these locations and has been considered within this assessment.

Potential Development Impacts

3.3.4 The development has the potential to increase concentrations of NO_2, PM_{10} and $PM_{2.5}$ as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. A screening assessment was therefore undertaken using the criteria contained within the Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality'[14] guidance to determine the potential for trips generated by the development to affect local air quality.

3.3.5 The following criteria are provided to help establish when an assessment of potential road traffic impacts on the local area is likely to be considered necessary:

- A change of Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or more than 500 AADT elsewhere;
- A change of HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;

14 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

- Realignment of roads where the change is 5m or more and the road is within an AQMA; or,
- Introduction of a new junction or removal of an existing junction near to relevant receptors.

3.3.6 Should these criteria not be met, then the IAQM guidance[15] considers air quality impacts associated with a scheme to be **not significant** and no further assessment is required.

3.3.7 Should screening of the relevant data indicate that any of the above criteria are met, then potential impacts at sensitive receptor locations can be assessed by calculating the change in pollutant concentrations as a result of the proposed development. The significance of predicted impacts can then be determined in accordance with the methodology outlined in the IAQM guidance[16].

[15] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

[16] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

4.0 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

4.2 Local Air Quality Management

4.2.1 As required by the Environment Act (1995), LBoC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2 and 24-hour mean concentrations of PM_{10} are above the relevant AQOs within the borough. As such, one AQMA has been declared. This is described as follows:

"An area encompassing the entire borough of Camden."

4.2.2 The development is located within the AQMA. As such, there is the potential for the exposure of future residents to poor air quality, as well as vehicles travelling to and from the site to increase pollution levels in this sensitive area. These factors have therefore been considered in the assessment.

4.2.3 LBoC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by LBoC throughout their area of jurisdiction. Recent NO_2 results recorded in the vicinity of the development are shown in Table 11. Exceedences of the relevant AQO are shown in **bold**.

Table 11 Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m³)		
		2018	2019	2020
CA23	Camden Road	**55.57**	**52.49**	**43.21**

4.3.2 As shown in Table 11, annual mean NO_2 concentrations were above the AQO at the CA23 monitor in recent years. As this site is located at a roadside location within an AQMA, elevated levels would be expected. Reference should be made to Figure 2 for a map of the survey position.

4.3.3 Pollutant concentrations recorded at the monitor during 2020 are lower than during 2019 due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The result should therefore be viewed with caution.

4.3.4 LBoC do not undertake monitoring of PM_{10} and $PM_{2.5}$ concentrations within the vicinity of the site.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 529500, 183500. Data for this location was downloaded from the DEFRA website[17] for the purpose of this assessment and is summarised in Table 12.

Table 12 Background Pollutant Concentrations

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2019	2022	2024
NO_2	32.55	28.90	27.52
PM_{10}	19.92	18.92	18.49
$PM_{2.5}$	12.73	12.10	11.80

17 https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

4.4.2 As shown in Table 12, predicted background concentrations are below the relevant AQOs and AQLV at the development site.

4.5 Sensitive Receptors

4.5.1 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. Receptors sensitive to potential dust impacts during construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 13.

Table 13 Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	More than 100	0
Up to 100	More than 100	-
Up to 350	More than 100	-

4.5.2 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access. These are summarised in Table 14.

Table 14 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	More than 100	0
Up to 50	More than 100	0

4.5.3 There are no ecological receptors within 50m of the development boundary or the access route within 500m of the site entrance. As such, ecological impacts have not been assessed further within this report.

4.5.4 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 15.

Table 15 Additional Area Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
Whether there is any history of dust generating activities in the area	The baseline review indicated a number of developments within 700m of the site have recently been constructed. As such, it is possible that there has been a history of dust generation in the area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal indicated a number of applications have been submitted within 700m of the site. It is therefore possible that there will be concurrent dust generation should these schemes be granted consent and the construction phase overlap with the proposed development
Pre-existing screening between the source and the receptors	Trees and hedging are located along the western site boundary. These may act as a barrier between emission sources and receptors should they be retained during the construction phase
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in Figure 3, the predominant wind bearing at the site is from the south-west. As such, receptors to the north-east of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is possible that it will extend over one year
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

4.5.5 Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because the identified receptors included residential properties.

4.5.6 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 16.

Table 16 Sensitivity of the Surrounding Area to Potential Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area	
	Construction	Trackout
Dust Soiling	High	High
Human Health	Low	Medium

5.0 ASSESSMENT

5.1 Introduction

5.1.1 The proposals have the potential to expose future occupants to elevated pollution levels, as well as cause air quality impacts as a result of the construction and operation of the development. These factors are assessed in the following Sections.

5.2 Construction Phase Assessment

Step 1

5.2.1 The undertaking of activities such as cutting, construction and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2

Construction

5.2.4 The total proposed building volume is estimated to be less than 25,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **small**.

5.2.5 Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 8, the development is considered to be a **low** risk site for dust soiling as a result of construction activities.

5.2.6 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 8, the development is considered to be a **negligible** risk site for human health impacts as a result of construction activities.

Trackout

5.2.7 Based on the total site area and existing hard standing provision, it is anticipated that the unpaved road length will be less than 50m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **small**.

5.2.8 Table 16 indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for dust soiling as a result of trackout activities.

5.2.9 Table 16 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 9, the development is considered to be a **negligible** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

5.2.10 A summary of the risk from each dust generating activity is provided in Table 17.

Table 17 Summary of Potential Unmitigated Dust Risks During Construction

Potential Impact	Risk	
	Construction	Trackout
Dust Soiling	Low	Low
Human Health	Negligible	Negligible

5.2.11 As indicated in Table 17, the potential risk of dust soiling is **low** from construction and trackout. The potential risk of human health impacts is **negligible** from construction and trackout.

5.2.12 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each

sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.

Step 3

5.2.13 The Mayor of London's guidance[18] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 18.

Table 18 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Site management	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. • Display the head or regional office contact information • Record and respond to all dust and air quality pollutant emissions complaints • Make the complaints log available to the LA when asked • Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request • Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust are being carried out, and during prolonged dry or windy conditions • Record any exceptional incidents, either on or off the site, and the action taken to resolve the situation is recorded in the log book
Preparing and maintaining the site	• Plan site layout: machinery and dust causing activities should be located away from receptors • Erect solid screens or barriers around dusty activities or the site • Avoid site runoff of water or mud • Keep site fencing, barriers and scaffolding clean using wet methods • Remove materials from site as soon as possible

[18] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

Issue	Control Measure
Operating vehicle/machinery and sustainable travel	• Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone • Ensure all Non-Road Mobile Machinery comply with the relevant standards • Ensure all vehicles switch off engines when stationary - no idling vehicles • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible) • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate
Waste management	• Reuse and recycle waste to reduce dust from waste materials • Avoid bonfires and burning of waste materials
Construction	• Avoid scabbling (roughening of concrete surfaces) if possible • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out
Trackout	• Regularly use a water-assisted dust sweeper on access and local roads, as necessary • Ensure vehicles entering and leaving site are covered to prevent escape of materials

Step 4

5.2.14 Assuming the relevant mitigation measures outlined in Table 18 are implemented, the residual impacts from all dust generating activities are predicted to be **not significant**, in accordance with the Mayor of London's guidance[19].

5.3 Operational Phase Assessment

Potential Future Exposure

5.3.1 The proposed development has the potential to expose future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described

[19] The Control of Dust and Emissions During Construction and Demolition SPG, The Mayor of London, 2014.

in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 4 to 7 for graphical representations of predicted pollutant concentrations.

5.3.2 Predicted concentrations above 5% of the annual mean AQO and AQLV are shown in blue on the contour plots. These relate to areas defined as APEC - C within the London Councils Air Quality and Planning Guidance[20]. Predicted concentrations between 5% below and 5% above the AQO and AQLV are shown in green. These relate to areas defined as APEC - B within the guidance. Predicted concentrations below 5% of the annual mean AQO and AQLV are shown in white on the contour plots. These relate to areas defined as APEC - A within the guidance.

5.3.3 As shown in Figure 4, annual mean NO_2 concentrations were predicted to be below the AQO of 40µg/m^3 at all locations across the development. The maximum level at the site boundary was 35.62µg/m^3, which is classified as APEC - A in accordance London Councils Air Quality and Planning Guidance[21].

5.3.4 As shown in Figure 5, annual mean PM_{10} concentrations were predicted to be below the AQO of 40µg/m^3 at all locations across the development. The maximum level at the site boundary was 21.21µg/m^3, which is classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[22].

5.3.5 As shown in Figure 6, the total number of days with PM_{10} concentrations above 50µg/m^3 was predicted to be below the permitted number of 35 at all locations across the development. The maximum number of days at the site boundary was 5, which is classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[23].

5.3.6 As shown in Figure 7, annual mean $PM_{2.5}$ concentrations were predicted to be below the AQLV of 20µg/m^3 at all locations across the development. The maximum level at the site

20 London Councils Air Quality and Planning Guidance, London Councils, 2007.

21 London Councils Air Quality and Planning Guidance, London Councils, 2007.

22 London Councils Air Quality and Planning Guidance, London Councils, 2007.

23 London Councils Air Quality and Planning Guidance, London Councils, 2007.

boundary was 13.46µg/m^3, which is classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[24].

5.3.7 Based on the assessment results, the site is classified as APEC - A. As such, it is considered suitable for the proposed end-use from an air quality perspective without the inclusion of mitigation.

Potential Development Impacts

5.3.8 Any vehicle movements associated with the proposals will generate exhaust emissions on the local and regional road networks. However, no parking provision is included as part of the scheme and the development is classified as 'car free'. As such, the development is unlikely to result in an increase in traffic generation on the local road network.

5.3.9 Based on the provided information, the proposals are not predicted to result in an increase of LDV flows of more than 100 AADT on any individual road link, include significant highway realignment or the introduction of a junction and there will not be a requirement for more than 25 HDV deliveries per day. As such, potential air quality impacts associated with operational phase road vehicle exhaust emissions are predicted to be **not significant**, in accordance with the IAQM screening criteria shown in Section 3.3

5.4 Camden Planning Guidance Air Quality

5.4.1 LBoC have produced the CPG Air Quality[25] document to support the policies in the Local Plan[26]. The guidance provides a methodology for determining the required level of assessment for developments and associated mitigation measures.

5.4.2 The first step is to determine the level of assessment required based on the criteria outlined in Table 19.

[24] London Councils Air Quality and Planning Guidance, London Councils, 2007.

[25] CPG Air Quality, LBoC, 2021.

[26] Local Plan, LBoC, 2017.

Table 19 Assessment Requirement Criteria

Criteria	Comment
Development scale	The development was classified as a **minor** site as the proposals are for fewer than 10 residential dwellings
Development within an area of poor air quality	As shown in Section 5.3, concentrations were predicted to be below 38µg/m^3 at all locations across the development. As such, the site is not considered to be within an area of poor air quality
Development introduces new sensitive receptors	The scheme comprises residential units, new sensitive receptors will therefore be introduced
Development results in air quality impacts	The development will not result in air quality impacts as the development is classified as 'car-free' and will not introduce any new combustion sources

5.4.3 In accordance with the information in Table 19, a detailed assessment is not required. However, in order to determine the potential for exposure of new residents to poor air quality dispersion modelling has been undertaken. This indicated that exposure of future residents to poor air quality is not predicted and the scheme is classified as APEC - A. As such, the site is considered suitable for the proposed end-use without the inclusion of mitigation.

6.0 AIR QUALITY NEUTRAL ASSESSMENT

6.1.1 The London Plan[27] requires that all developments are 'air quality neutral' to ensure proposals do not lead to further deterioration of existing poor air quality. In order to support the policy, guidance[28] has been produced on behalf of the GLA. The document provides a methodology for determining potential emissions from a development and benchmark values for comparison purposes. Where the benchmark is exceeded then action is required, either locally or by way of off-setting.

6.1.2 Potential emissions from the development were considered in the context of the guidance[29]. This indicated the proposals are air quality neutral for the following reasons:

- Heating and hot water for the development will be provided by electric boilers. These do not produce any direct atmospheric emissions;
- The proposals do not include any combustion sources, such as gas boilers or Combined Heat and Power units; and,
- No parking provision is included as part of the scheme and the development is classified as 'car free'.

6.1.3 Based on the above factors, the development is considered to be air quality neutral.

27 The London Plan - The Spatial Development Strategy for Greater London, GLA, 2021.

28 Air Quality Neutral Planning Support Update: GLA 80371, Air Quality Consultants and Environ, 2014.

29 Air Quality Neutral Planning Support Update: GLA 80371, Air Quality Consultants and Environ, 2014.

7.0 CONCLUSION

7.1.1 Redmore Environmental Ltd was commissioned by Abbee Limited to undertake an Air Quality Assessment in support of a residential development at 155 Drummond Street, London.

7.1.2 The development may lead to the exposure of future occupants to elevated pollutant levels, as well as adverse impacts at sensitive locations. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and assess potential impacts associated with the scheme.

7.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the Mayor of London's methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by construction and trackout activities was predicted to be **not significant**.

7.1.4 The proposal has the potential to expose future residents to elevated pollution levels. Dispersion modelling was therefore undertaken using ADMS-Roads in order to predict concentrations as a result of emissions from the local highway network. Results were subsequently verified using local monitoring data.

7.1.5 The results of the dispersion modelling assessment indicated that predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ concentrations were categorised as APEC - A in accordance with the London Councils Air Quality and Planning Guidance. As such, the site is considered suitable for the proposed end-use from an air quality perspective.

7.1.6 Potential impacts during the operational phase of the proposed development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. These were assessed against the screening criteria provided within the IAQM guidance. As the development has no associated parking and is classified as 'car free', road vehicle exhaust emissions impacts were predicted to be **not significant**.

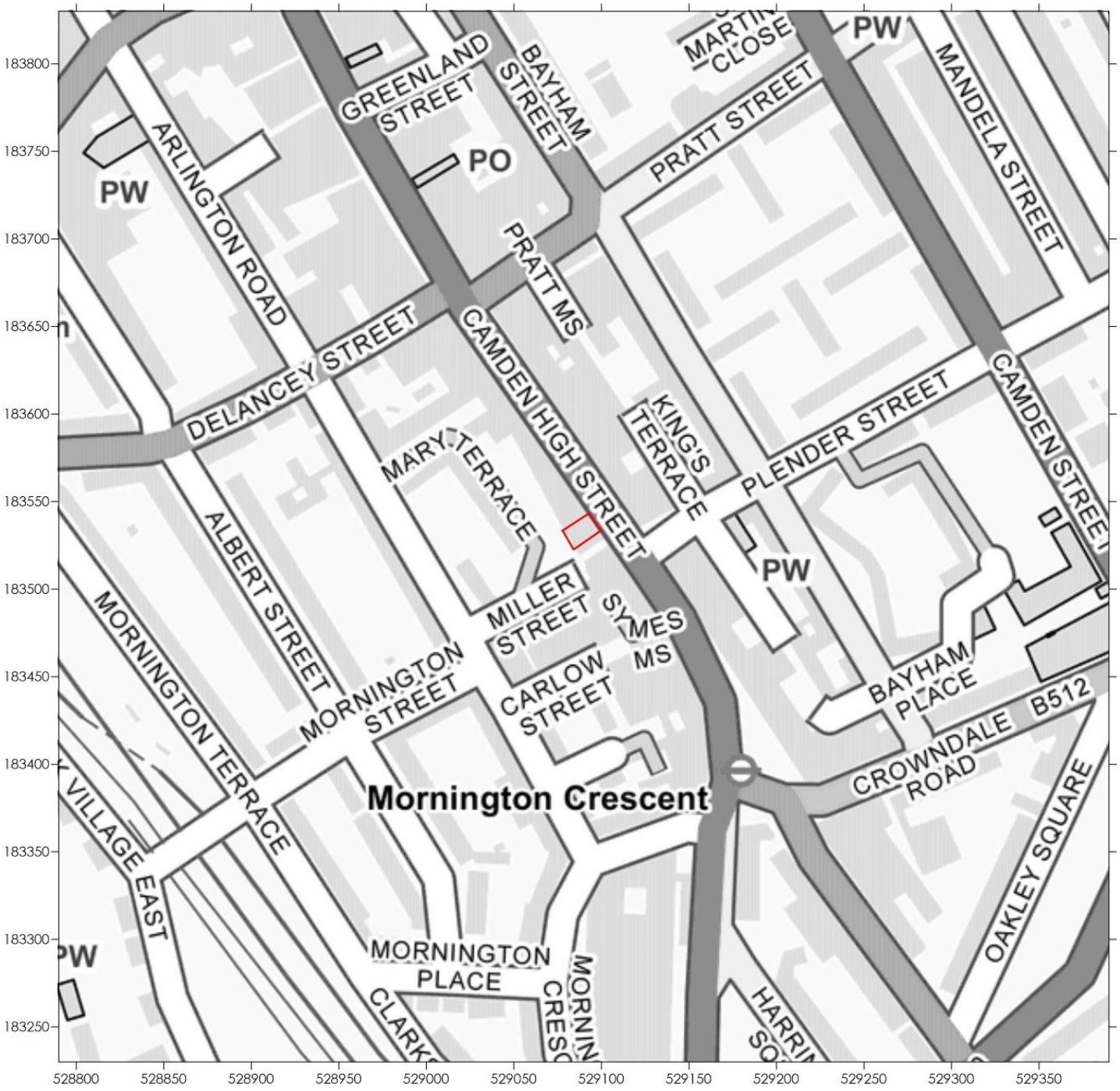
7.1.7 Potential emissions from the development were assessed in order to determine compliance with the air quality neutral requirements of the London Plan. The building energy strategy includes the use of electric boilers which do not produce direct emissions to atmosphere. Additionally, there is no parking associated with the development. As such, the proposals are considered air quality neutral.

7.1.8 Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposals.

8.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
APEC	Air Pollution Exposure Criteria
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
CPG	Camden Planning Guidance
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emissions Factor Toolkit
GLA	Greater London Authority
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBoC	London Borough of Camden
LDV	Light Duty Vehicle
LGV	Light Goods Vehicle
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
SP	Slow Phase
SPG	Supplementary Planning Guidance
z_0	Roughness length

Figures



Legend

Site Boundary

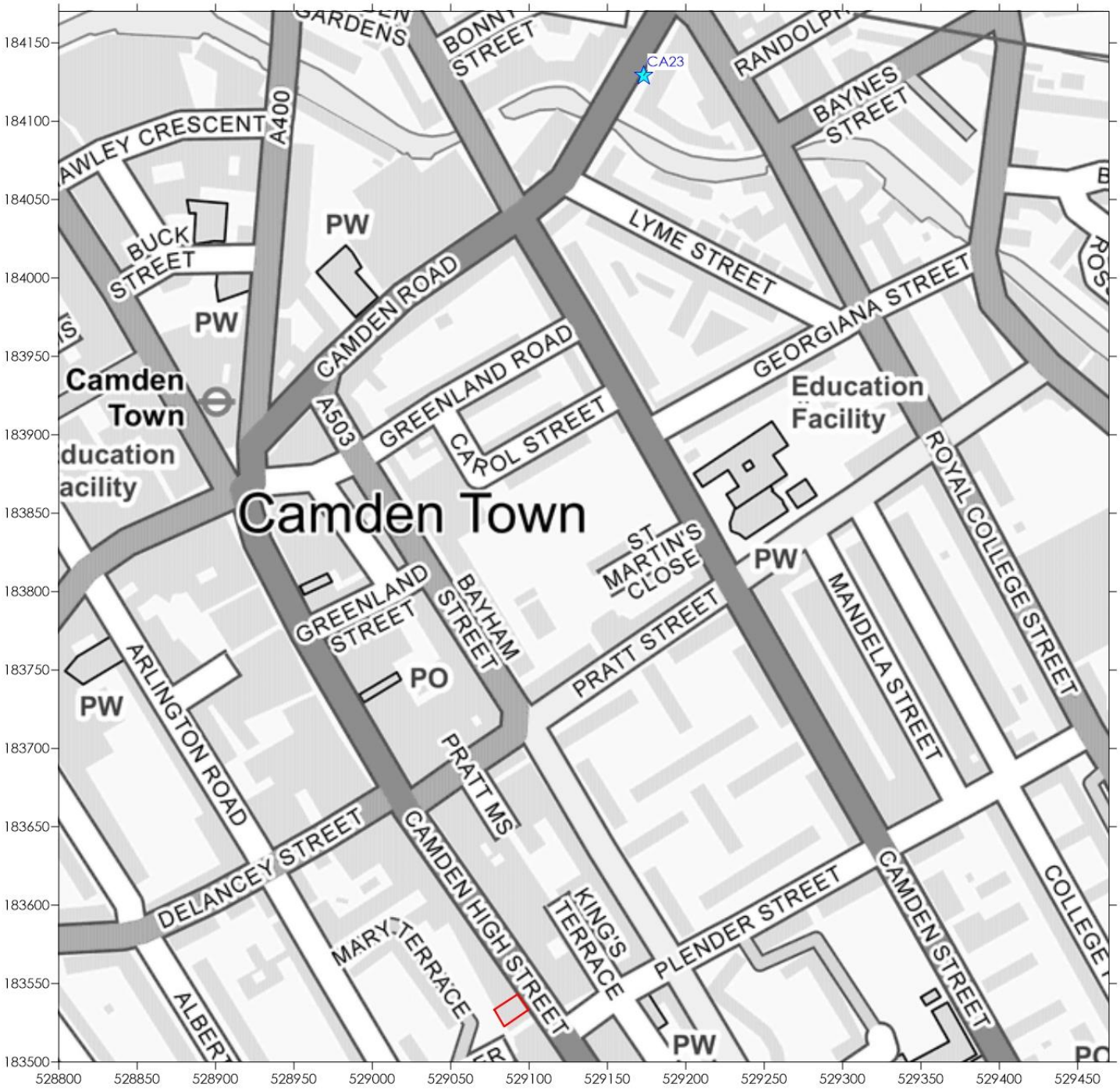
Title
Figure 1 - Site Location Plan

Project
Air Quality Assessment
Camden High Street, London

Project Reference
5387

Client
Abbee Limited

Redmore environmental
www.red-env.co.uk | 0161 7060075



Legend

Site Boundary

Monitor

Title
Figure 2 - Monitoring Locations

Project
Air Quality Assessment
Camden High Street, London

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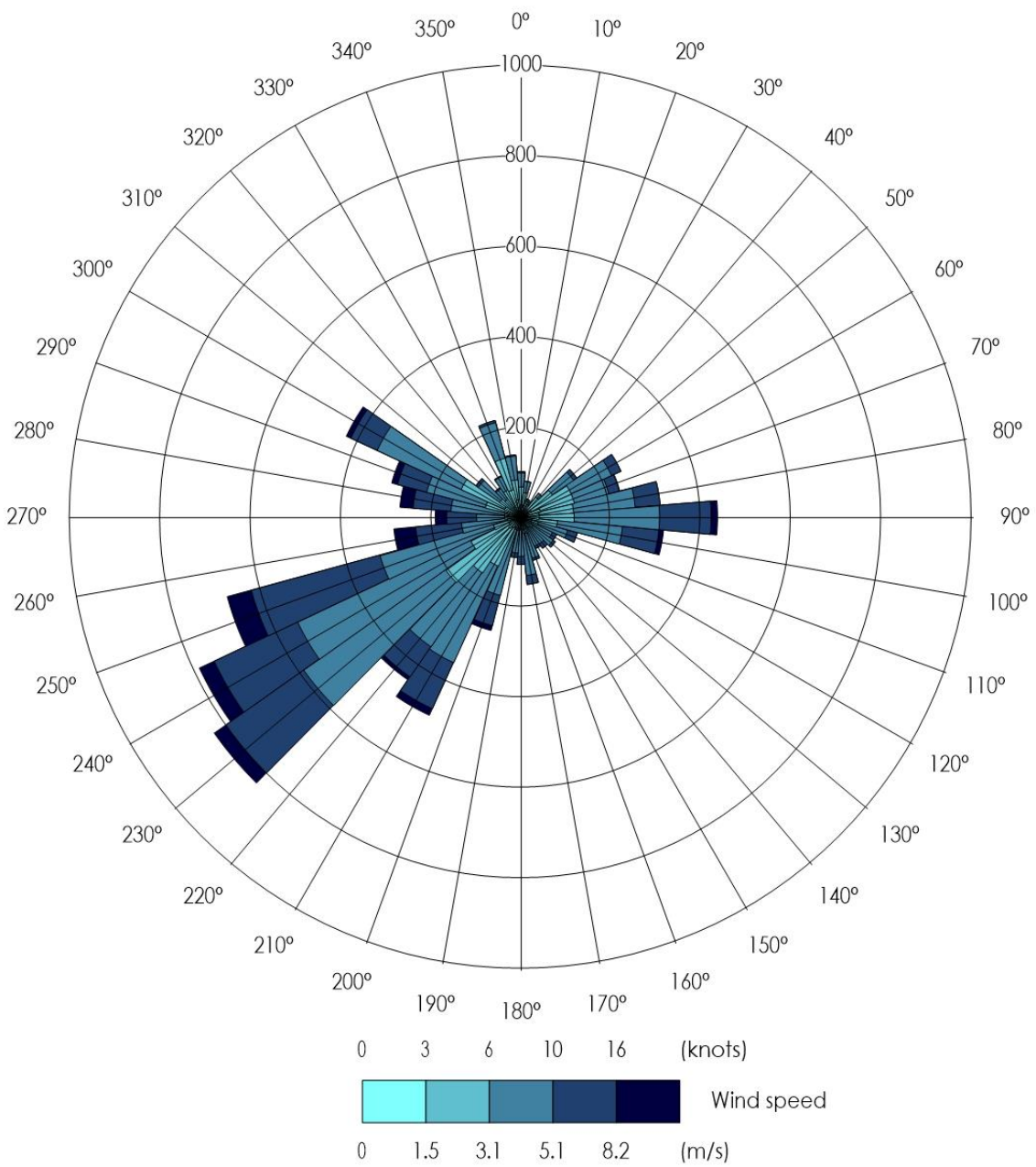

Legend

Title
Figure 3 - Wind Rose of 2019
London City Airport
Meteorological Data

Project
Air Quality Assessment
Camden High Street, London

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Legend

Site Boundary

Annual Mean NO_2 Concentrations ($\mu g/m^3$)

40 — APEC - B

38

APEC - A

36

Title
Figure 4 - Predicted Annual Mean NO_2 concentrations ($\mu g/m^3$)

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Site Boundary

Annual Mean PM_{10} Concentrations ($\mu g/m^3$)

23
22
21
20

APEC - A

Title
Figure 5 - Predicted Annual Mean PM_{10} concentrations ($\mu g/m^3$)

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Legend

Site Boundary

Number of Days with PM_{10} Concentrations Greater than 50µg/m³

APEC - A

Title

Figure 6 - Predicted Number of Days with PM_{10} Concentrations Greater than 50µg/m³ (Days)

Project

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Site Boundary

Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

15
14.5
14
13.5
13

APEC - A

Title
Figure 7 - Predicted Annual Mean $PM_{2.5}$ concentrations (µg/m³)

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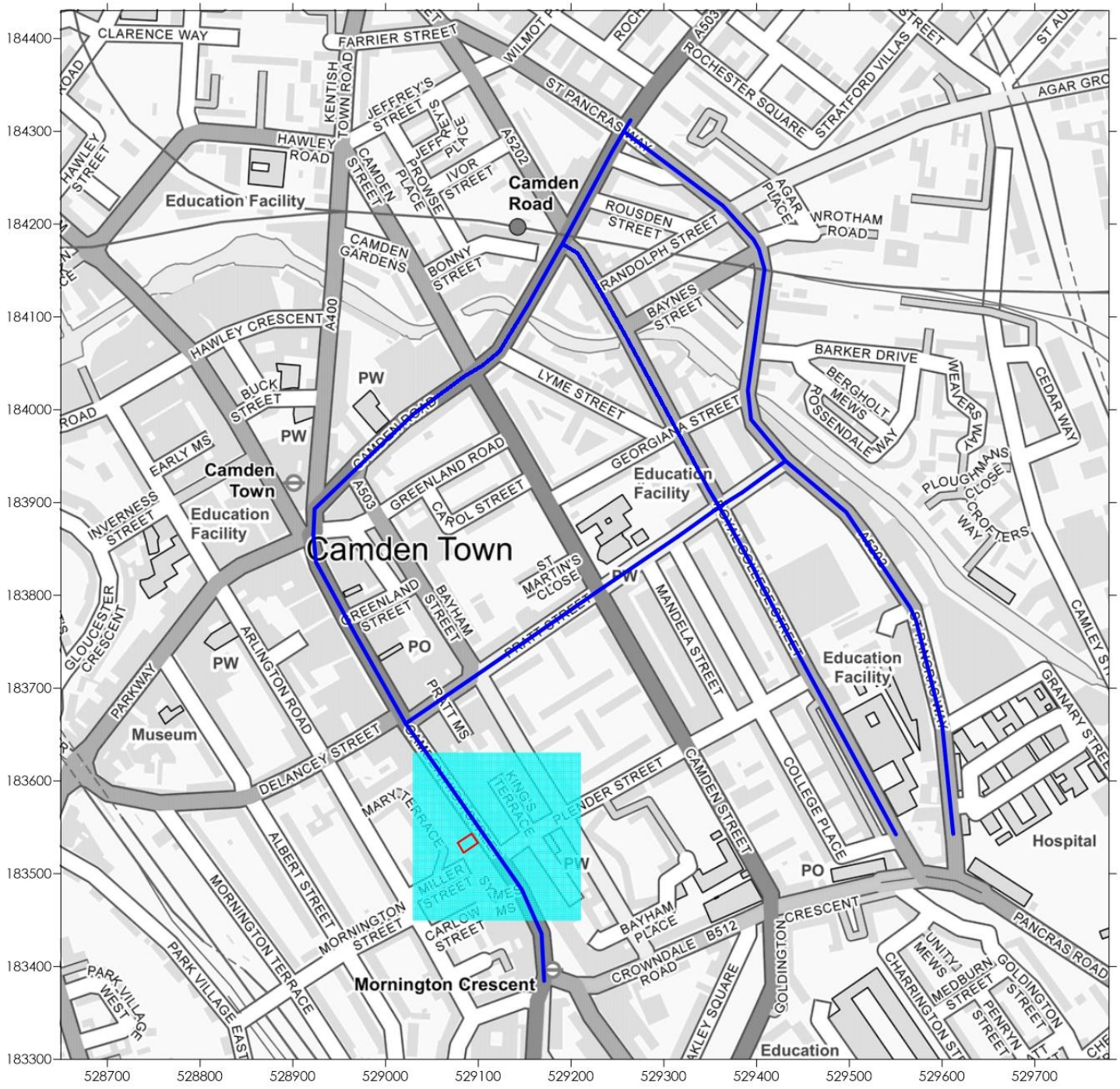

Legend

Site Boundary

Road Link

Output Grid

Title
Figure 8 - ADMS-Roads Inputs

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Air Quality Assessment
Camden High Street, London

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Appendix 1 - Assessment Input Data

Introduction

The proposed development has the potential to expose future residents to poor air quality. In order to assess pollutant concentrations across the site, detailed dispersion modelling was undertaken in accordance with the following methodology.

Modelling was undertaken for 2019 to allow verification against recent monitoring results and 2024 to represent likely conditions in the opening year of the scheme.

Dispersion Model

Dispersion modelling was undertaken in order to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site using the ADMS-Roads dispersion model (version 5.0.0.1). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

Additional options can also be selected with the ADMS-Roads interface to take account of the site specific characteristics that may affect model output, such as canyons.

The relevant inputs are detailed in the following Sections.

Assessment Area

Ambient concentrations were predicted over the area NGR: 529030, 183450 to 529210, 183630. One Cartesian grid was included within the model to produce data suitable for contour plotting using the Surfer software package.

It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.

Reference should be made to Figure 8 for a graphical representation of the assessment grid extents.

Traffic Flow Data

Traffic data for use in the assessment, including 24-hour AADT flows and fleet composition, was obtained from the London Atmospheric Emissions Inventory (LAEI). The LAEI was produced by the GLA and provides traffic flows throughout London for a number of scenarios. It should be noted that the LAEI is referenced in GLA guidance[30] as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

The baseline traffic data was converted to the opening year of the development utilising a factor obtained from TEMPro (Version 7.2). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards. A summary of the traffic data is provided in Table A1.1.

Table A1.1 Traffic Data

Link		24-hour AADT Flow		Road Width (m)	Average Vehicle Speed (km/h)
		2019	2024		
L1	Royal College Street	10,456	11,137	6.1	35

30 London Local Air Quality Management (LLAQM)), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

Link		24-hour AADT Flow		Road Width (m)	Average Vehicle Speed (km/h)
		2019	2024		
L2	Royal College Street, Canyon 1	10,456	11,137	7.8	35
L3	Royal College Street, Canyon 2	10,456	11,137	7.8	35
L4	Royal College Street, Canyon 3	10,456	11,137	7.3	35
L5	Royal College Street	10,456	11,137	6.1	35
L6	Royal College Street, Canyon 4	10,456	11,137	5.5	35
L7	Royal College Street, Canyon 5	10,456	11,137	4.3	35
L8	Royal College Street	10,456	11,137	5.4	35
L9	Royal College Street, Slow Phase (SP)	14,065	14,981	6.8	20
L10	A503 Camden Road	15,633	16,651	14.1	20
L11	A503 Camden Road, Canyon 6	15,633	16,651	13.4	20
L12	A503 Camden Road	27,452	29,239	13.4	20
L13	A503 Camden Road, Canyon 7	27,452	29,239	11.9	20
L14	A503 Camden Road, SP	27,452	29,239	14.3	20
L15	A503 Camden Road	27,452	29,239	10.6	20
L16	Pratt Street, SP	1,110	1,182	7.1	20
L17	Pratt Street, Canyon 8	1,110	1,182	8	20
L18	Pratt Street	5,531	5,891	10.5	20
L19	Pratt Street, Canyon 9	5,531	5,891	6.2	20
L20	Pratt Street	5,531	5,891	8.5	35
L21	A5202 St Pancras Way	9,474	10,091	5.1	35
L22	Camden High Street	12,513	13,328	12.2	25
L23	Camden High Street, Canyon 10	5,245	5,586	11.6	25

Fleet composition data as a proportion of total flows on each link for cars, taxis, Light Goods Vehicles (LGV), Heavy Goods Vehicles (HGV), buses and coaches and motorcycles are summarised in Table A1.2.

Table A1.2 Fleet Composition Data

Link	Proportion of Fleet (%)						
	Car	Taxi	LGV	Rigid HGV	Artic HGV	Bus and Coach	Motorcycle
L1	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L2	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L3	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L4	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L5	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L6	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L7	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L8	43.7	22.0	0.4	0.5	1.9	1.2	30.3
L9	38.9	21.0	0.3	1.1	7.5	2.4	28.9
L10	38.9	20.1	0.3	1.5	8.4	3.1	27.7
L11	38.9	20.1	0.3	1.5	8.4	3.1	27.7
L12	34.2	22.5	0.3	2.1	5.7	4.3	31.0
L13	34.2	22.5	0.3	2.1	5.7	4.3	31.0
L14	34.2	22.5	0.3	2.1	5.7	4.3	31.0
L15	34.2	22.5	0.3	2.1	5.7	4.3	31.0
L16	63.2	15.4	0.1	0.0	0.0	0.1	21.2
L17	63.2	15.4	0.1	0.0	0.0	0.1	21.2
L18	56.4	18.0	0.3	0.1	0.0	0.4	24.8
L19	56.4	18.0	0.3	0.1	0.0	0.4	24.8
L20	56.4	18.0	0.3	0.1	0.0	0.4	24.8
L21	51.2	18.8	0.3	1.1	0.5	2.3	25.9
L22	56.9	7.2	11.1	5.2	1.1	14.8	3.7
L23	52.7	3.9	7.1	0.0	0.0	32.9	3.4

Reference should be made to Figure 8 for a graphical representation of the road link locations.

Canyons

Where buildings or walls surround roads, pollutant dispersion patterns are altered which can lead to high pollutant concentrations. These street canyons can significantly influence air quality along a road and therefore it is important to take consideration their effects when undertaking dispersion modelling.

The release of ADMS-Roads version 4.0.1.0 in December 2015 incorporated a number of new features including an advanced street canyon module, which have been retained in version 5.0.0.1. Advanced street canyon modelling allows a number of parameters to be included in the dispersion model in order to predict pollutant dispersion patterns which better reflect air flow within complex urban geometries.

Canyons have five principal effects on dispersion which can influence pollutant concentrations. These are:

- Pollutants are channelled along street canyons;
- Pollutants are dispersed across street canyons by circulating flow at road height;
- Pollutants are trapped in recirculation regions;
- Pollutants leave the canyon through gaps between buildings - as if there was no canyon; and,
- Pollutants leave the canyon from the canyon top.

The combined modelling of these effects will result in concentration patterns unique to each canyon. The parameters used in the assessment are outlined in A1.3. It should be noted that where buildings are only present on one side of the road, parameters were purposely included at 0m.

Table A1.3 Canyons

Link	Parameters (m)					
	Canyon Width to Left	Average Height of Buildings to Left	Building Length Left	Canyon Width Right	Average Height of Buildings to Right	Building Length Right
L2	11.1	8.0	76.6	8.0	7.0	76.6

Link	Parameters (m)					
	Canyon Width to Left	Average Height of Buildings to Left	Building Length Left	Canyon Width Right	Average Height of Buildings to Right	Building Length Right
L3	12.0	8.0	13.0	0.0	0.0	0.0
L4	11.0	8.0	68.1	6.5	6.0	47.9
L6	8.2	6.0	12.2	7.6	6.0	12.2
L7	8.2	6.0	18.5	7.5	6.0	25.5
L11	14.2	16.0	65.8	14.0	12.0	49.4
L13	14.7	8.0	46.5	12.1	20.0	46.5
L17	7.5	8.0	19.2	7.7	6.0	19.2
L19	7.4	8.0	46.5	8.5	6.0	46.5
L23	8.1	9.0	307.0	11.0	10.0	292.0

A choice of two modes is provided for use in the advanced canyon module. Standard mode assumes that each road is part of a continuous network of roads with similar canyon properties. Network mode analyses the road network to determine transport of pollutants between adjoining street canyons, allows for varying concentrations along the canyon and accounts for transport of pollutants out of the end of a canyon. Network mode is considered most accurate for detailed local analysis and as such was selected for use in the model.

Emission Factors

The emission factors were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from London City Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). London City Airport is located at NGR: 542739, 180487, which is approximately 13.6km south-east of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 1m was used to describe the modelling extents. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'cities, woodlands'.

A z_0 of 0.1m was used to describe the meteorological site. This is considered appropriate for the morphology of the area due to the large expanse of surrounding flat land use, such as runways, grassland and open water, and is suggested within ADMS-Roads as being suitable for 'agricultural areas max'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 100m was used to describe both the modelling extents and meteorological site. This is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'large conurbations >1 million'.

Background Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the development site, as shown in Table 12.

It is noted that the GLA have released background concentration maps with a spatial resolution of 20m for 2013, 2020, 2025 and 2030. However, as the modelling area is considerably greater than 20m, and values were not available for the verification or opening years, this data was not considered appropriate for use in the assessment

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations were converted to NO_2 concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance[31] and GLA guidance[32].

Short Term PM_{10} Concentrations

The number of days with PM_{10} concentrations greater than 50µg/m^3 was calculated based on predicted annual mean concentrations and the methodology outlined within DEFRA guidance[33] and GLA guidance[34].

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

31 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

32 London Local Air Quality Management (LLAQM)), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

33 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

34 London Local Air Quality Management (LLAQM)), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

For the purpose of the assessment, model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets[35], which states:

> "If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year."

Monitoring of NO_2 concentrations was undertaken at one location within the vicinity of roads included within the model during 2019. The results were obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance[36]. The monitored annual mean NO_2 concentration and calculated road NO_x concentration is summarised in Table A1.4.

Table A1.4 NO_x Verification - Monitoring Result

Monitoring Location		Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_x Concentration ($\mu g/m^3$)
CA23	Camden Road	52.49	48.85

The annual mean road NO_x concentration predicted from the dispersion model and the road NO_x concentration calculated from the monitoring result is summarised in Table A1.5.

Table A1.5 NO_x Verification - Modelling Result

Monitoring Location		Calculated Road NO_x Concentration ($\mu g/m^3$)	Modelled Road NO_x Concentration ($\mu g/m^3$)
CA23	Camden Road	48.85	34.92

The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated that a verification factor of 1.3990 was required to be applied to all NO_x modelling results.

Monitoring of PM_{10} and $PM_{2.5}$ concentrations is not undertaken within the assessment extents. The

35 Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.

36 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance[37].

[37] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

Appendix 2 - Curricula Vitae

EMILY PEARS-RYDING

Principal Air Quality Consultant

BSc (Hons), MIAQM, AMIEnvSc

Tel: 0161 706 0075 | Email: emily.pears-ryding@red-env.co.uk

KEY EXPERIENCE:

Emily is a Principal Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Assessment of construction dust impacts from a range of development sizes.
- Assessment of fugitive dust impacts from a range of mineral extraction developments.
- Assessment of petrol stations to address benzene concentrations and their impact on adjacent developments.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Station Road, West Drayton

Air Quality Assessment for a change of use from office units to a hotel in an Air Quality Management Area (AQMA). Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions and an adjacent petrol station. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{10} and NO_2 concentrations across the site. Results revealed that pollution levels were below the air quality standards across the development. A qualitative assessment of benzene emissions took place to assess the potential effects of the petrol station. A screening process indicated that due to the change of use of the existing building into a hotel, future occupants would not be exposed for periods long enough to affect human health.

Holloway Lane, Harmondsworth

Air Quality Assessment in support of a mineral extraction site located within an AQMA. The proposals involved a processing and concrete plant which had the potential to cause air quality impacts as a result of fugitive dust emissions. An assessment was undertaken and revealed that the use of good practice control measures would provide suitable mitigation for the development.

Dulcote Quarry, Wells

Air Quality Assessment for the redevelopment of Dulcote Quarry to provide a Food Manufacturing Campus. An assessment of road traffic emissions, fugitive dust emissions and odour was undertaken. Impacts of road traffic emissions and fugitive dust on sensitive receptors were negligible at all locations. The risk of potential odour effects was also determined to be negligible.

Queens Road, London

Air Quality and Odour Assessments in support of residential development in an AQMA. Dispersion modelling took place at several different heights reflective of residential units within the development. Predicted concentrations of NO_2 were found to exceed air quality criteria from ground to second floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Anerley Road, Penge

Air Quality Assessment for a residential scheme located in an AQMA. Due to the location of the site at the foot of a hill, detailed calculations took place to take account of the gradient which would increase the amount of emissions produced by road traffic. Results revealed that NO_2 concentrations exceeded air quality criteria across part of the development fronting Anerley Road. Mechanical ventilation was specified in the appropriate units within the development as a form of mitigation.

The Crescent, Salford

Air Quality Assessment for the redevelopment of the former Salford Police Headquarters to residential properties. Using sensitive receptors, located in areas where increased road traffic may affect NO_2 concentrations, a comparison was made between overall concentrations with and without the development in place. Results revealed pollutant concentrations were below the relevant standards across the site and impacts associated with the development were not significant.

IMOGEN BARTLETT

Graduate Air Quality Consultant

BSc (Hons), GradIEMA

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KEY EXPERIENCE:

Imo is a Graduate Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Assessment of construction dust impacts from a range of development sizes.
- Measurement and assessment of indoor air quality in support of BREEAM accreditation. She has conducted Total Volatile Organic Compound (TVOC) and formaldehyde monitoring at numerous commercial developments throughout the UK in pursuit of the relevant credit specified under BREEAM category Hea 02 'Indoor Air Quality'.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.

SELECT PROJECTS SUMMARY:

Cavendish Road, London

Air Quality Assessment in support of a residential-led development comprising 23-unit part-five/part-six storey block of flats located in an Air Quality Management Area (AQMA). The development had the potential to expose future occupants to poor air quality and cause impacts at sensitive locations. Detailed dispersion modelling and a construction dust assessment indicated air quality factors were not a constraint to the development.

Civic Way, Ellesmere Port

Indoor Air Quality Monitoring in support of the construction of a new Public Services Hub. The scheme was registered to pursue certification through the BREEAM 2018 standard. As such, Indoor Air Quality Monitoring was undertaken at seven locations to determine conditions within the building and identify any issues. The results indicated concentrations of formaldehyde were below the BREEAM criteria at all positions. Additional measures were recommended as TVOC concentrations exceeded the BREEAM criteria at all sampling locations.

Crowland Street, Sefton

Air Quality Assessment and Mitigation Measures report in relation to a residential development on land off Crowland Street, Sefton. The proposals had the potential to cause impacts at sensitive locations, as well as expose future occupants to any existing air quality issues. As such, an assessment was undertaken in order to determine baseline conditions, assess any potential constraints to development and identify any further work required to support a planning application for the site.

Union Terrace, Aberdeen

Air Quality Assessment in support of proposed residential development comprising 85 residential dwellings, as well as provision of 33 car parking spaces. The development had the potential to cause impacts at sensitive locations and expose future residents to poor air quality. This assessment considered the number of potential routes that any trips could be distributed upon and predicted the proposals impact to be not significant. The distance from the AQMA, distance from major pollution sources, background concentrations and local monitoring data was assessed to ensure the site was suitable for the proposed use from an air quality perspective.

Victoria Road, Birmingham

Air Quality Assessment in support of a residential development comprising the erection of a three-storey building containing 40 apartments. This development was located just outside the boundary of the Birmingham Clean Air Zone (CAZ). ADMS-Roads dispersion modelling was undertaken to determine the exposure of future residents to elevated pollutant concentrations. The results indicated that concentration were below the relevant AQOs or AQLV.

ANNA TOTTERDILL

Air Quality Consultant

MChem (Hons), PhD

KEY EXPERIENCE:

Anna is an Environmental Consultant with specialist experience in the air quality and odour sectors. Her key capabilities include:

- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS Roads at human and ecological receptors. Studies have included the evaluation of road traffic emissions at sensitive locations across large spatial extents.
- Construction dust impact assessments on a variety of project types.
- Production of Dust Management Plans to control potential emissions and associated impacts during construction of large scale developments
- Production of Air Quality Assessments in accordance with DEFRA methodologies for a range of residential, commercial and industrial sectors.
- Completion of Air Quality Neutral Assessments in accordance with the requirements of the London Plan
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Monitoring of baseline air quality conditions using a variety of methods.
- Assessment of potential odour impacts associated with hot food preparation and associated identification of suitable mitigation in accordance with DEFRA guidance.

SELECT PROJECTS SUMMARY:

Industrial

Edinburgh Airport - Air Quality Assessment and diffusion tube survey.

HS2, Phase 2b - Detailed dispersion modelling across the affected road network spanning two community areas. This included model verification, processing and review of results.

A27, Arundel - Air quality assessment for a highways improvement scheme which included a comprehensive review of the area for dispersion modelling to assist in predicting air quality impacts.

Arlington Works, Twickenham – Background study for an oil recycling plant.

Leeds Public Transport Improvement Scheme - A public consultation document regarding a series of public transport improvement schemes across Leeds.

AQUIND Interconnector - A dust management plan and a preliminary EIA chapter for a Nationally Significant Infrastructure Project involving an electrical grid connection from France to the UK.

A1(M) Junctions 6 – 8 - Air quality assessment for a highways improvement scheme which included detailed dispersion modelling and a comprehensive review of data to predict air quality impacts.

A229 Loose Road Corridor, Maidstone - Air quality assessment for highways improvement scheme.

A1, Birtley to Coalhouse - Roads improvement scheme involving detailed dispersion modelling.

Ensemble, Heathrow Airport – BREEAM assessment for a warehouse complex with offices.

Residential

Clatterbridge Hospital, Wirral - Air quality assessment incorporating sensitive ecological receptors.

Stockport Interchange, Stockport - impact assessment as well as a construction dust assessment as part of an air quality assessment for a mixed commercial and residential development in Stockport.

The Boundary, London - A full air quality assessment for a hotel/ residential development in London was carried out. This included detailed dispersion modelling, a PCM compliance assessment and baseline assessment covering multiple local authorities.

Northbank West, Wirral Waters - Air quality assessment for a residential development over two sites.

Farthingloe and Western Heights, Dover - Air quality assessment for a large-scale residential development.

Shenfield, Brentwood - Constraints report for a residential development with circa 100 homes.

Renshaw Hall, Liverpool - Screening assessment for the conversion of an existing site to student accommodation.

Commercial and Retail

High Street, Abingdon - Odour impact assessment for a proposed restaurant.

Salford Central GPU Building, Salford - A baseline assessment for an office block.