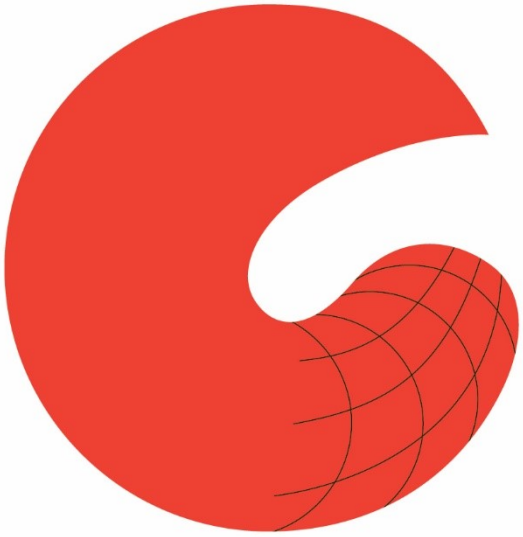

create
CONSULTING
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31 DALEHAM GARDENS, LONDON
Air Quality Assessment

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Air Quality Assessment

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Date: September 2023

31 DALEHAM GARDENS, LONDON
Air Quality Assessment

31 DALEHAM GARDENS, LONDON
AIR QUALITY ASSESSMENT

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Appendices

A Construction Phase Assessment Methodology
B Operational Phase Assessment Methodology

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

Summary

1.1 Create Consulting Engineers Ltd was instructed by Altair Ltd to undertake an Air Quality Assessment (AQA) in support of a residential development at 31 Daleham Gardens, London, NW3 5BU.

1.2 The development includes erection of a six storey building to provide 14 residential units, cycle storage, and landscaping.

1.3 The proposed opening year of this development is summer 2025. The site lies within the jurisdiction of the London Borough of Camden (LBC). The site location is shown in Figure 1.1.

Assessment Scope

1.4 This report considers potential air quality impacts associated with both the construction and operation of the development. Likely changes to air quality in the area, as a result of the proposed development, have been considered in relation to the UK Air Quality Objectives (AQO) and EU Air Quality Standards. Also, where required, the air quality assessment considers mitigation measures to reduce the effect of the proposed development upon local air quality.

1.5 In terms of the construction impacts, the development proposal will have the potential to generate dust, Particulate Matter (PM_{10}), and o Nitrogen Oxides (NO_X) during the construction phase. These impacts are assessed in accordance with the Mayor of London's *(MOL SPG) 'The Control Of Dust And Emissions During Construction And Demolition' Supplementary Planning Guidance*, and Institute of Air Quality Management (IAQM's) *Guidance on the assessment of dust from demolition and construction* (2014).

1.6 The development site is located within an Air Quality Management Area (AQMA) where concentrations of traffic-related pollutants, PM_{10} and NO_2 are breaching the national AQOs. Therefore, this assessment considers the exposure of future residents to ambient air quality. Where required, the assessment proposes mitigation measures to reduce the impact of poor air quality on future residents.

1.7 The proposed development will use Air Source Heat Pumps (ASHPs) on the roof to serve 4 of the apartments. The remaining 10 apartments will be served by exhaust air heat pumps. There are no gas systems, or systems with combustion processes being proposed.

Figure 1.1: Location of the Development Site

2.0 LEGISLATION AND POLICY CONTEXT

The Air Quality Strategy

2.1 The Environment Act 1995 placed a responsibility on the UK Government to prepare an Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland. The most recent version of the strategy (2007) sets out the current UK framework for air quality management and includes a number of AQOs for specific pollutants.

2.2 The 1995 Act also requires that Local Authorities "review and assess" air quality in their areas, following a prescribed timetable. The Review and Assessment process is intended to locate and spatially define areas where the UK AQOs are not being met. In such instances, the Local Authority is required to declare an AQMA, carry out a Further Assessment of air quality, and develop an Air Quality Action Plan (AQAP), which should include measures to improve air quality so that the objectives may be achieved in the future. The timetables and methodologies for carrying out Review and Assessment studies are prescribed in Defra Technical Guidance – Local Air Quality Management Technical Guidance (LAQM.TG, 2016) and London specific LAQM.TG (16).

2.3 Table 2.1 lists the objectives relevant to this assessment that are included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purposes of LAQM.

Pollutant	Air Quality Objective	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3	24-hour mean not to be exceeded more than 35 times per year
	40 µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	25 µg/m^3	Annual mean

Table 2.1: Air Quality Objectives (England)

2.4 The National Planning Policy Framework (NPPF), 2021 paragraph 186 notes 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.

2.5 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.

2.6 The National Planning Practise Guidance (NPPG) (Reference ID: 32-008-20140306), states that air quality assessments and resulting mitigation measures must be location specific and proportionate to the nature/ scale of development proposed and the level of concern about air quality.

Dust

2.7 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."*

2.8 Enforcement of the Act, in regard to nuisance, is currently under the administration 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). Enforcement can insist that there be no dust beyond the boundary of the works. 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 practice measures.

Clean Air Strategy

2.9 The UK government released its Clean Air Strategy In 2019 as part of its 25 Year Environment Plan. The Strategy sets out the comprehensive action that is considered to be required from across all parts of government and society.

2.10 The primary focus of air quality management has primarily been related to NO_2 and its principal source in the UK, road traffic. The 2019 Strategy aims to broaden the focus to other areas, including actions on clean growth, emissions from domestic wood burning stoves, industry and agriculture.

Local Planning Policy

The London Plan (2021)

2.11 Policy SI 1 of the Publication London Plan, 'improving air quality', contains additional guidance for air quality in relation to planning decisions.

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

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

1) Development proposals should not:
a) lead to further deterioration of existing poor air quality;
b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits;
c) create unacceptable risk of high levels of exposure to poor air quality.

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

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

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

1) how proposals have considered ways to maximise benefits to local air quality, and
2) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.

D In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road

Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

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

London Environment Strategy

2.12 The most recent London Environment Strategy which replaced Mayor's Air Quality Strategy (MAQS) for London was published in August 2017. The overarching aim of the Strategy is to reduce pollution concentrations and tackle the most urgent environmental challenges facing our city, as well as safeguard London's environment over the longer term. We need to ensure that London is greener, cleaner and ready for the future. The Strategy commits to the continuation of measures identified in the 2010 MAQS and sets out a series of additional measures.

Policy 4.1.1 *Make sure that London and its communities, particularly the most disadvantaged and those in priority locations, are empowered to reduce their exposure to poor air quality;*
Policy 4.1.2 *Improve the understanding of air quality health impacts to better target policies and action;*
Policy 4.2.3 *Reduce emissions from non-transport sources, including by phasing out fossil fuels;*
Policy 4.2.4 *The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality;*
Policy 4.2.5 *The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence-based steps to improve air quality;*
Policy 4.3.2 *The Mayor will encourage the take up of ultra-low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines;*
Policy 4.3.3 *Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality.*

Local Planning Policy

Camden Local Plan 2017

2.13 London Borough of Camden (LBC) Local Plan 2017 covers the period 2016-2031 and sets out the Council's planning policies for the borough.

"Policy CC4, provides LBB's 'Air Quality' strategy:

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

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 an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan."

Camden Planning Guidance: Air Quality

2.14 CPG provides the following criteria for air quality assessments:

Major applications where occupants will be exposed to poor air quality (along a busy road, diesel railway lines or in a generally congested area);

- *development that has potential to significantly change road traffic on a busy road;*
- *the development has more than 75 new residences;*
- *commercial developments with a floorspace of 2,500 sqm or more;*
- *developments that include biomass boilers or CHP (combined heat and power) and connections to existing decentralised energy networks (whereby the increased capacity is not already covered by an existing AQA);*
- *substantial earthworks or demolition; and*
- *development that introduces sensitive uses into an area of poor air quality.*

2.15 Table 2.2 indicates the triggers when air quality needs to be assessed as part of a planning application.

Criteria met →				→ Assessments required		
Scale	***Area of poor air quality[1]***	***Scheme brings sensitive receptors***	***Scheme brings air quality impacts [2]***	***Air Quality Assessment type***	***Air Quality Neutral***	***Construction and Demolition Impacts***
Major	Yes	Yes	Yes	Detailed	Required	Required
			No			
		No	Yes	Detailed		
			No	Basic		
	No	Yes	Yes	Detailed		
			No	Basic		
		No	Yes	Detailed		
			No	Basic		
Minor	Yes	Yes	Yes	Detailed	*Not required*	*[3]May be required*
			No	Basic		
		No	Yes	Basic		
			No	*Not required*		
	No	Yes	Yes	Detailed		
			No	*Not required*		
		No	Yes	Basic		
			No	*Not required*		

Notes:

1 *Area of poor air quality - an area with NO_2 or PM_{10} concentrations within 5% below the air quality objective, 38µg/m³ (micrograms per cubic metre).*

2 *Air quality impacts - Produces changes in emissions from building sources, small industrial processes (including generators for emergency backup power, Short Term Operating Reserve and similar), or vehicle movements. (STOR power generators are those used intermittently to supply intensive amounts of electricity to the grid at short notice)*

3 *An assessment for demolition and construction impacts may be required for certain minor applications, such as basements.*

Table 2.2: Air Quality Assessment Triggers

Camden Clean Air Strategy 2019 – 2034

2.16 The Clean Air Strategy sets out Camden's long-term vision for improving air quality and protecting public health from the effects of air pollution.

2.17 The long-term strategic commitments for improving air quality in Camden are:

- *Camden's air quality program, its strategies, action plans, projects and policies will be guided by the defining principles;*
- *Camden Council will commit to achieving the most stringent evidence-based air quality targets available, in as short a timeframe as possible – currently the World Health Organisation (WHO) 2021 guidelines;*
- *Camden's work to improve air quality will be empirical, data-led and evidence-based;*
- *We will ensure the Camden's air quality and climate programmes are interlinked;*
- *We will measure and report on changes in air quality (resulting from our actions or otherwise) with transparency and openness;*
- *We will not be afraid to deviate from the norm and to push beyond statutory obligations or legal limits if these do not go far enough in protecting public health; and*

- *Camden will adopt a participatory approach in developing our action plans, strategies and other programmes of work to improve air quality.*

2.18 The LBC seek to achieve the updated WHO's air quality guidelines throughout the borough by 2034 at the latest for annual mean pollutant concentrations:

- NO_2: 10 µg/m^3 by 2034
- PM_{10}: 15 µg/m^3 by 2030
- $PM_{2.5}$: 5 µg/m^3 by 2034

2.19 Additionally, LBC have set interim targets for the pollutants to measure ongoing progress as below with limits representing annual mean pollutant concentrations:

- NO_2: 30 µg/m^3 by 2026 and 20 µg/m^3 by 2030
- PM_{10}: 20 µg/m^3 by 2026
- $PM_{2.5}$: 10 µg/m^3 by 2030

Camden Clean Air Action Plan 2023 - 2026

2.20 Camden's AQAP details the following priorities in relation to new developments.

Priority 1 'Construction and Development' i

- *Reducing emissions from non-road mobile machinery (NRMM);*
- *Reduce emissions from construction generators;*
- *Reduce emissions from construction and demolition processes; and*
- *Reduce emissions from road vehicles servicing construction sites.*

Priority 2 'Buildings'

- Reduce emissions from building heating systems*;*
- *Reduce emissions from backup diesel generators ; and*
- *Reduce emissions from wood burning.*

Key Guidance Documents

Mayor of London Supplementary Planning Guidance: The Control of Dust and Emission During Construction and Demolition 2014 (MOL SPG)

2.21 This SPG seeks to reduce emissions of dust, PM_{10} and $PM_{2.5}$ from construction and demolition activities in London. This assessment evaluates the impact of dust soils and human health impacts during the demolition, earthworks, construction and trackout activities. The methodology is replicated in Appendix A of this report.

Land Use Planning and Development Control: Planning for Air Quality (EPUK-IAQM, 2017)

2.22 This guidance includes a method for screening the requirement for an air quality impact assessment and whether a detailed assessment is required. The methodology is reproduced in Appendix B of this report.

Local Air Quality Management Technical Guidance (DEFRA, 2022)

2.23 Within this guidance, Table 1.1 contains examples where air quality objectives should apply. Annual mean objectives for NO_2, PM_{10} and $PM_{2.5}$ should apply to should be applied at locations where members of the public might be regularly exposed, including building façades of residential properties, school, hospitals and care homes.

2.24 The following impacts should be assessed with the consideration of cumulative effects from other planned or proposed developments within the area:

- Impact of the proposed development upon the local air quality; and
- The impact of local air quality on the receptors using the development.

3.0 BASELINE CONDITIONS

3.1 Baseline data was gathered from the following sources:

- LBC 2020 Air Quality Annual Status Report;
- DEFRA's UK AIR Website;
- LAEI's 2016 Modelling and Focus Map; and
- Defra's National Air Quality Background Maps 2018.

Local Air Quality Management

3.2 As required by the Environment Act (1995), LBC has undertaken a review and assessment of air quality within their administrative area. This process concluded that the following concentrations are above their relevant AQOs:

- Annual mean NO_2 concentrations; and
- 24-hour mean PM_{10} concentrations.

3.3 An AQMA has been declared as Camden AQMA encompassing "*The whole borough.*"

3.4 The site is located within the Camden AQMA and, as a result, there is the potential for the development to introduce future site users to elevated concentrations of NO_2 and PM_{10}.

Air Quality Monitoring Data

Automatic Monitoring Locations

3.5 Monitored data was taken from LBC's 2021 Air Quality ASR. Concentrations measured in 2020 and 2021 should be perceived with caution due to the COVID-19 pandemic where lockdown would have disrupted usual traffic patterns in the UK. These concentrations are likely to be lower than expected in an ordinary year.

3.6 LBC operated five continuous automatic monitoring stations throughout the administrative boundary in 2020. CD1 is the closest monitoring station, located approximately 680 m south of the site. Recent data for CD1 is depicted in Table 3.1.

Site ID	Site Name	Site Type	NGR		Air Pollutant	Measure-ment	Annual Mean Concentrations (µg/m³)				
			X	Y			2017	2018	2019	2020	2021
CD1	Swiss Cottage (Finchley Road)	Kerbside	526629	184391	NO_2	Annual	**53**	**54**	**43**	33	**44**
					NO_2	1-Hourly Exceed-ances	1	2	1	0	0
					PM_{10}	Annual	20	21	19	16	16
					PM_{10}	24-Hour Exceed-ances	8	4	8	3	0
					$PM_{2.5}$	Annual	16	11	11	10	9

Table 3.1: NO_2 and PM_{10} Automatic Monitor Results

3.7 Table 3.1 indicates that there have been exceedances of annual NO_2 concentrations at CD1 in recent years. CD1 has not exceeded the 1-hourly NO_2 objective of 200 µg/m³.

3.8 CD1 has not exceeded any of the AQO for PM_{10} or $PM_{2.5}$ AQOs in recent years.

3.9 CD1 is located at a busy junction between the A41 and Finchley Road, surrounded by commercial and retail establishments, so it does not representative of the development site. As such, the pollutants concentrations at the development site are likely to be significantly lower than those at CD1.

Non-Automatic Monitoring Locations

3.10 LBC had 33 passive monitoring stations (diffusion tubes) active within the borough in 2020. Table 3.2 shows the recent NO_2 concentrations recorded by non-automatic monitoring stations in the vicinity of the site.

Site ID	Site Name	NGR		Site Type	Annual Mean NO_2 Concentrations (µg/m³)				
		X	Y		2017	2018	2019	2020	2021
CA17	47 Fitzjohn's Road	526547	185125	Roadside	**66.27**	**48.13**	**43.51**	34.47	29.95
CA7	Frognal Way	526213	185519	Urban Background	29.64	22.12	23.34	18.68	15.35
CA15	Swiss Cottage	526633	184392	Kerbside	-	**62.3**	**50.89**	-	-
CA25A	Emmanuel Primary School	525362	185255	Roadside	-	-	38.75	31.8	29.72

Notes:

*Exceedances of the Annual NO_2 AQO are highlighted in **bold**.*

*Annual NO_2 means in excess of 60 µg/m³, indicating a potential exceedance of the NO_2 hourly mean AQO are highlighted in **bold and underlined**.*

Table 3.2: NO_2 Diffusion Tube Monitoring

3.11 Table 3.2 shows that there have been exceedances of the annual NO_2 AQO at Site ID's CA17 and CA15 in 2017 to 2019. There were exceedances above 60 µg/m³ for CA17 in 2017 and

CA15 in 2018 that are likely to cause exceedances of the 1-hourly objective in accordance with LAQM.TG22.

3.12 It is important to note that the monitoring sites, CA17 and CA15 are not indicative of the development site. CA15 is located near CD1 at a busy junction between the A41 and Finchley Road. CA17 is located near St Mary's Primary School, Hampstead, where there are likely to be high traffic levels in the mornings and evenings.

3.13 The most indicative monitoring location is Site ID CA7, as it is located in a background location similar to the proposed development.

Air Quality Modelling

3.14 The Greater London Authority (GLA) has produced air quality modelling maps in 2016, showing NO_2, PM_{10} and $PM_{2.5}$ concentrations across London. These maps are based upon emissions data collected through the 2016 London Atmospheric Emission Inventory (LAEI).

3.15 The map provided as Figure 3.1 indicates that the site is located in an area where the annual mean NO_2 concentrations are between 70 and 75 µg/m^3 within the immediate surrounding area. Therefore, the annual mean AQO may be exceeded. The site location is marked in white.

3.16 The map provided as Figure 3.2 indicates that the site is located in an area where the annual mean PM_{10} concentrations are between 22 and 25 µg/m^3 within the immediate surrounding area and therefore below the annual mean AOQ. The site location is marked in white.

3.17 The map provided as Figure 3.3 indicates that the site is located in an area where the annual mean $PM_{2.5}$ concentrations are between 12 and 14 µg/m^3 within the immediate surrounding area and therefore below the annual mean AQO. The site location is marked in white.

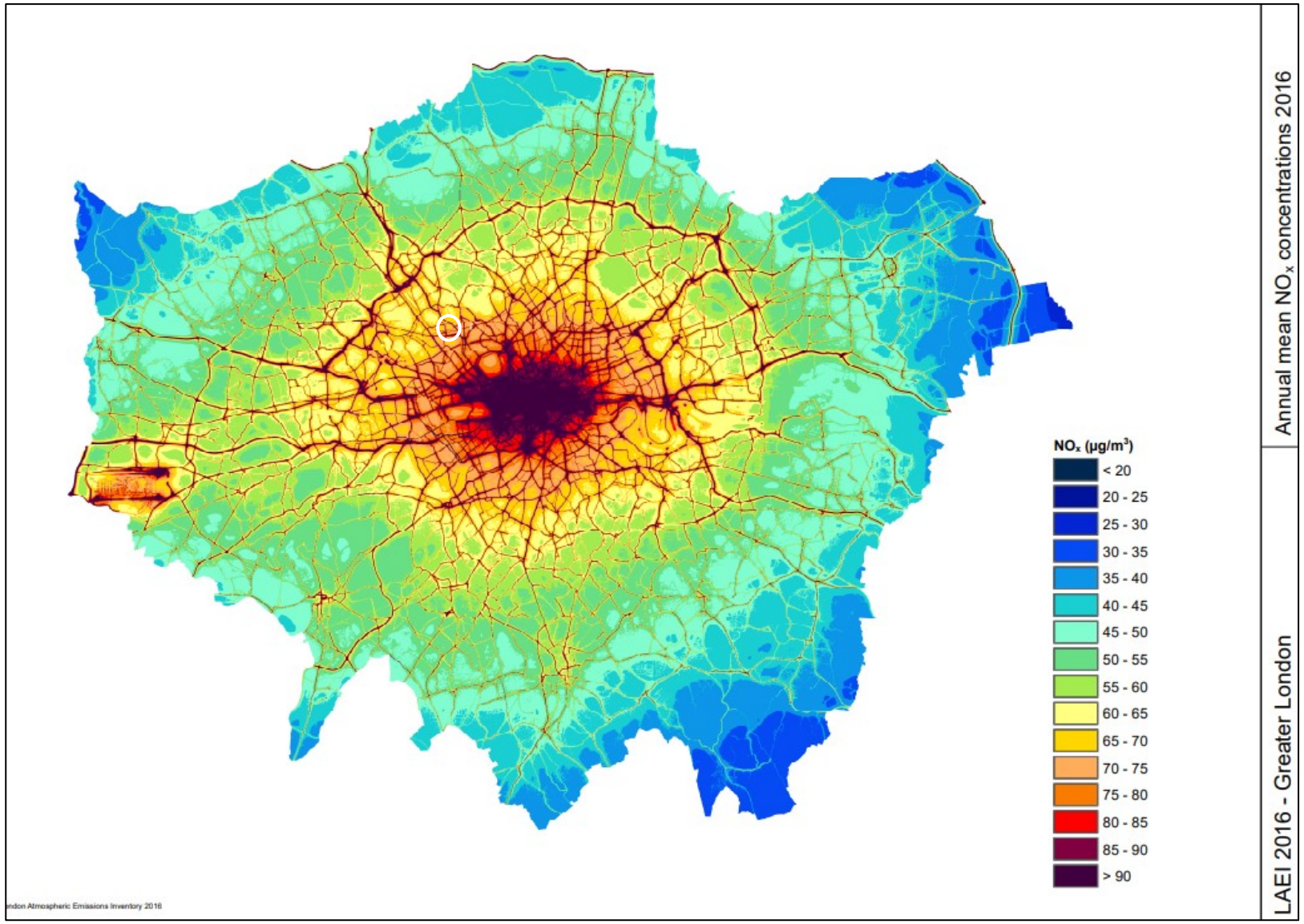

Figure 3.1: Modelled 2016 Annual Mean NO_2

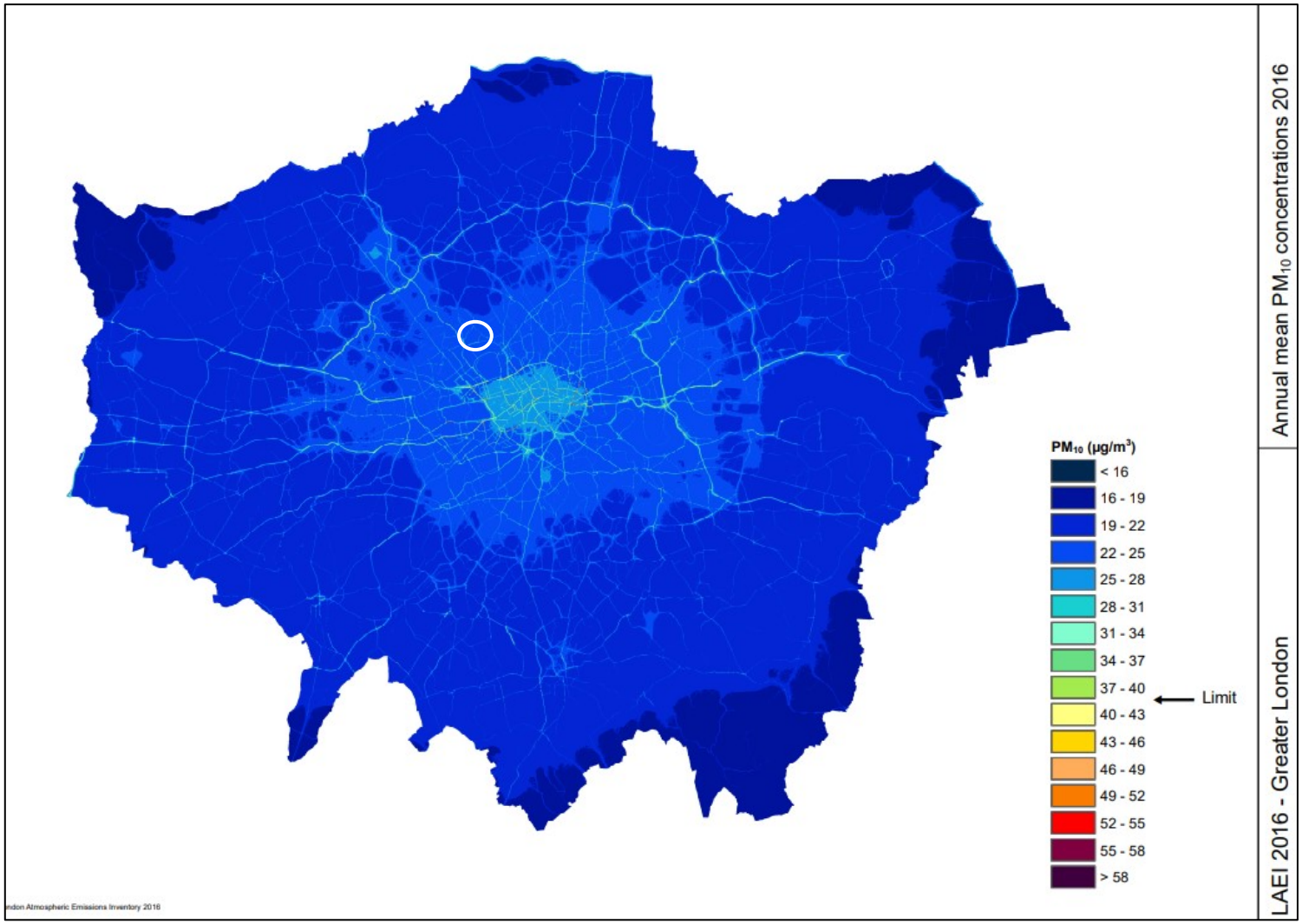

Figure 3.2: Modelled 2016 Annual Mean PM_{10}

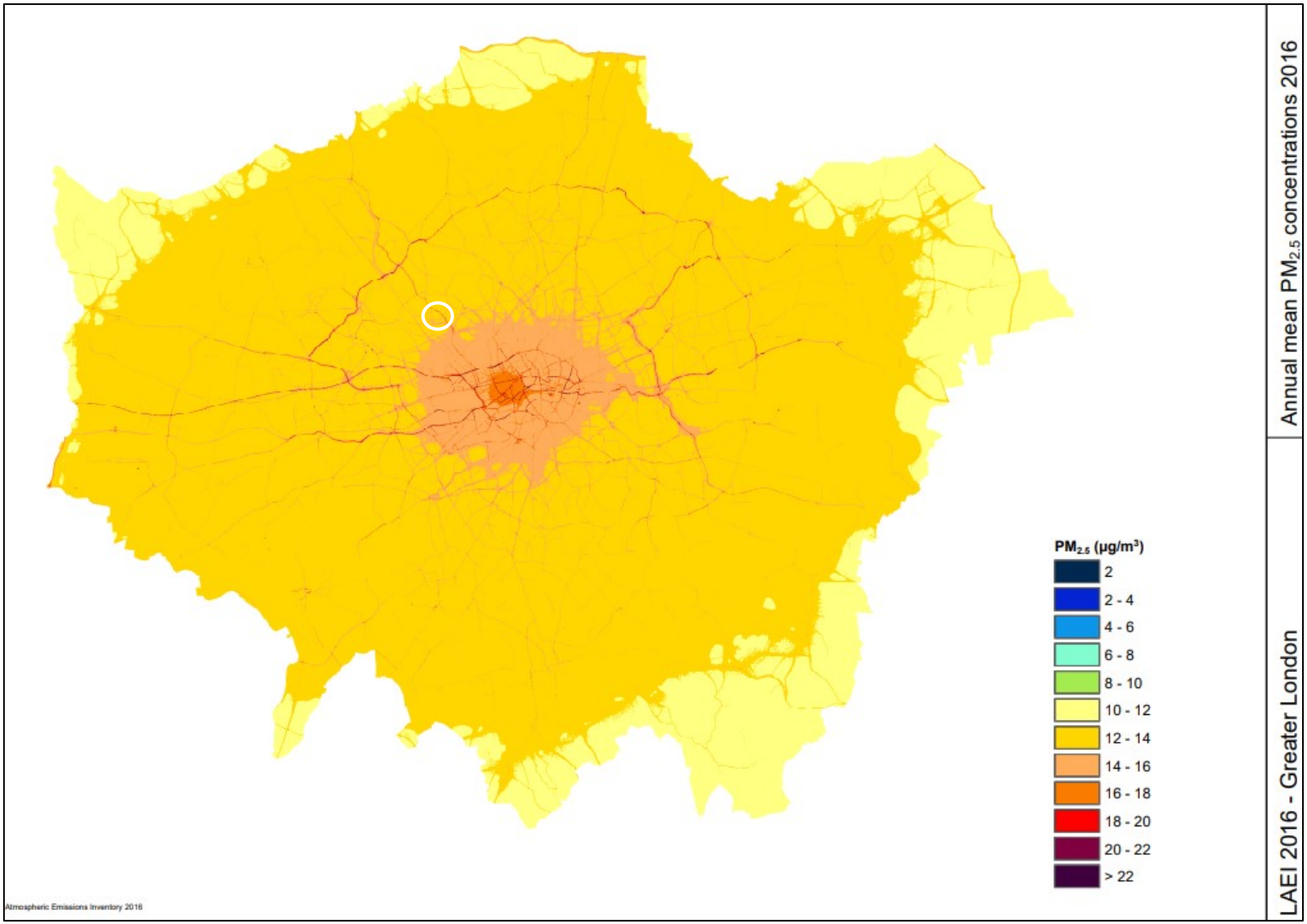

Figure 3.3: Modelled 2016 Annual Mean $PM_{2.5}$

Mapped Background Pollution

3.18 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.

3.19 The proposed development site is located in grid square NGR: 526500, 185500. Data for this location was downloaded from the DEFRA website for the purpose of this assessment and is summarised in Table 3.3. The background levels have been shown for:

- 2019, the baseline year;
- 2025, opening year.

Pollutant	Predicted Background Concentration (µg/m^3)	
	2019	**2025**
NO_2	26.27	21.64
NO_x	40.44	31.93
PM_{10}	17.85	16.34
$PM_{2.5}$	11.67	10.66

Notes:

- *Exceedances of Annual Air Quality Objectives are highlighted in **bold**.*

Table 3.3: Background levels for 2019 and 2025

3.20 As shown in Table 4.3, background concentrations do not exceed the relevant AQOs in any of the years depicted above. Concentrations shown a decline over the years and are all background concentrations are predicted to be below the relevant AQOs in 2025.

3.21 The predicted background NO_2 concentrations are significantly lower than all the monitoring locations (apart from CA7) presented in Table 3.1 and Table 3.2, and the LAEI's modelled 2016 concentrations at the proposed site. However, the measured background concentrations are similar to those recorded by CA7, and therefore shows that predicted background concentrations are similar to those expected on site.

3.22 The predicted background PM_{10} and $PM_{2.5}$ concentrations are slightly lower than CD1 monitored concentrations and LAEI's modelled 2016 concentrations at the proposed site. It would be expected that DEFRA predicted background PM_{10} and $PM_{2.5}$ concentrations would be similar to those expected on site.

Air Quality Focus Area

3.23 The GLA has identified 187 Air Quality Focus Areas (AQFAs) within London. These are locations where the annual mean NO_2 concentrations breach the national AQO and where human exposure to air pollution is high. AQFAs are tools to help London Boroughs to target action in the most problematic areas.

3.24 Five of these AQFAs are located within the LBC. These are:

- Kilburn Town Centre;
- Swiss Cottage from South Hamstead to Finchley Road Station;
- Camden High Street from Mornington Crescent to Chalk Farm and Camden Road;
- Marylebone Road from Marble Arch/Euston/King's Cross Junction; and
- Holborn High Street and Southampton Row Junction.

3.25 Figure 3.4 shows the development site in relation to AQFAs, where the development site is highlighted in black. In this case, the development site is located approximately 400 m east of *Swiss Cottage from South Hamstead to Finchley Road Station* AQFA.

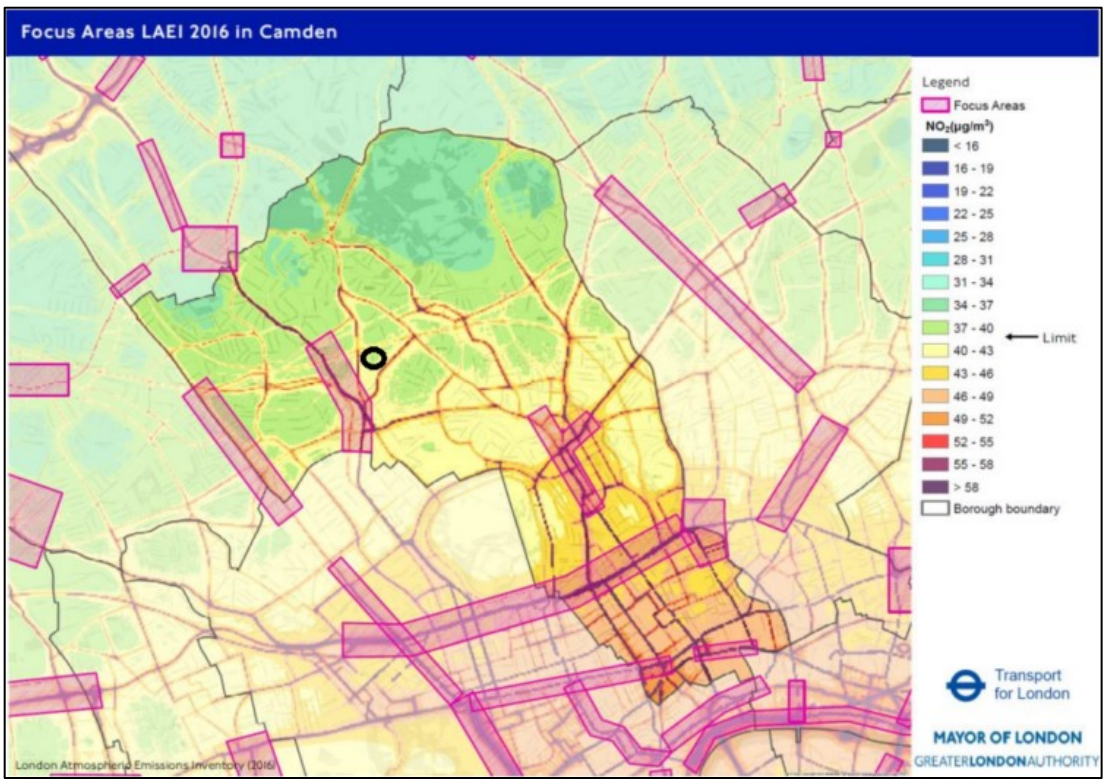

Figure 3.4: LBB Air Quality Focus Area 2016 in Relation to the Development Site

4.0 CONSTRUCTION PHASE ASSESSMENT

4.1 There is the potential for air quality impacts as a result of the construction and operation of the proposed development.

4.2 The MOL SPG assessment methodology has been used to determine the potential dust emission magnitude for construction activities. #

Construction Phase Sensitive Receptors

4.3 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for construction dust impacts in the following Sections.

4.4 Based on the criteria shown in Table A2 in Appendix A, the sensitivity of the receiving environment to potential dust impacts was considered to be **high**. This was because of residential properties nearby the development site.

4.5 Ecological receptors were analysed using Magic Maps website which provides authoritative geographic information about the natural environment from across government. This application is managed by Natural England.

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

4.7 The wind direction is predominantly south westerly. As such, receptors located to the northeast of the site would be most affected by dust emissions.

4.8 Receptors sensitive to potential dust impacts during construction activities were identified from a desk-top study of the area up to 350 m from the development boundary. These are summarised in Table 4.1.

Distance from Site Boundary (m)	Approximate Number of Human Receptors
Less than 20	1-10
Less than 50	10-100
Less than 100	10-100
Less than 350	More than 100

Table 4.1: Earthworks and Construction Dust Sensitive Receptors

4.9 Reference should be made to Figure 4.1 for a graphical representation of construction dust buffer zones.

4.10 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50 m from the road network within 500 m of the site access route. These are summarised in Table 4.2.

4.11 The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. However, it was assumed that construction traffic would access the site from the north or South of Daleham Gardens, to ensure the maximum potential trackout distance was considered.

Distance from Site Access Route (m)	Approximate Number of Residential Receptors
Less than 20	10 - 100
Less than 50	More than 100

Table 4.2: Trackout Dust Sensitive Receptors

4.12 Reference should be made to Figure 4.2 for a graphical representation of trackout dust buffer zones.

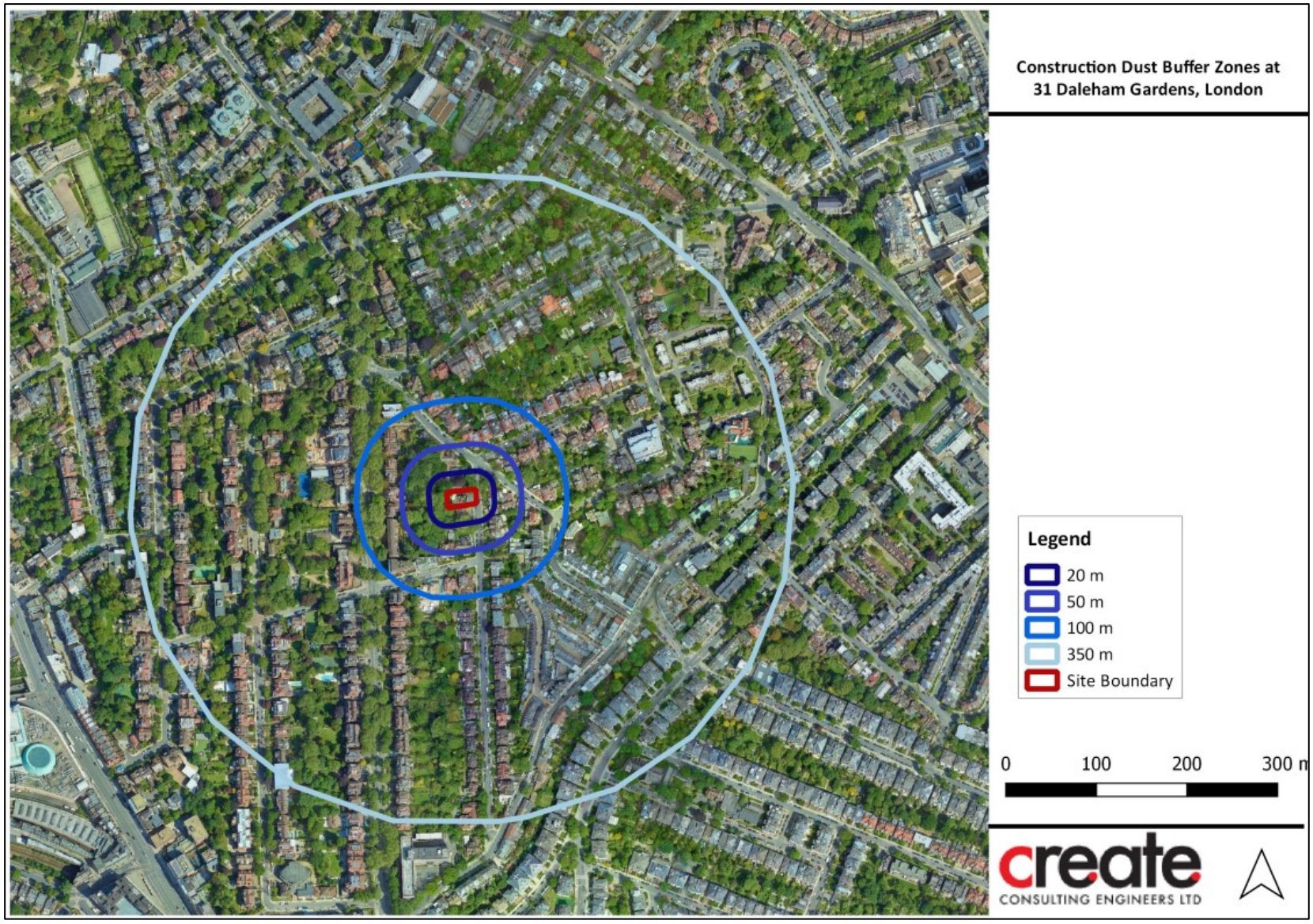

Figure 4.1: Construction Dust Buffer Zones

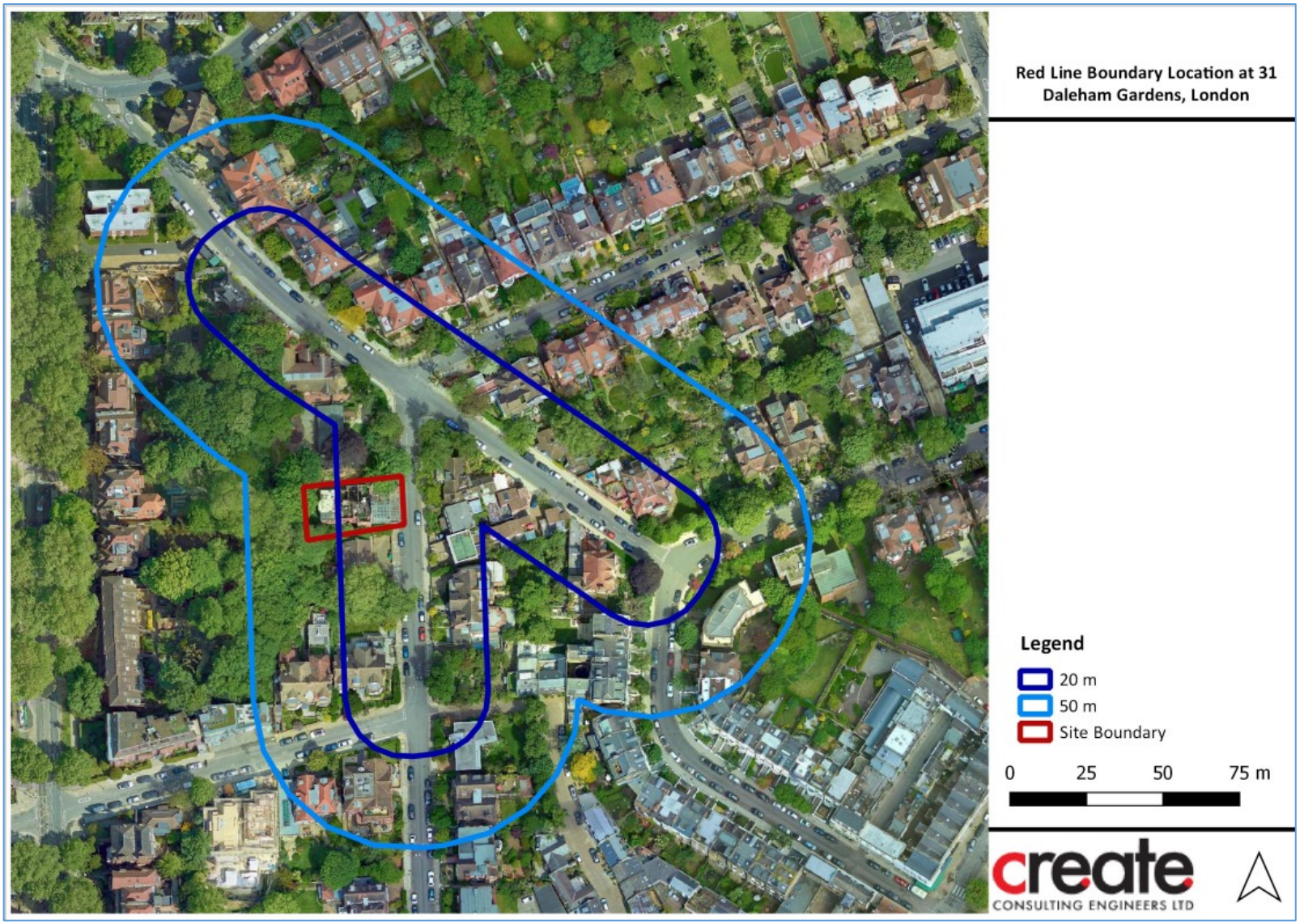

Figure 4.2: Trackout Dust Buffer Zones

4.13 Table 4.3 shows the sensitivities of the surrounding area in relation to dust soiling and human health for each of the construction activities.

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

Table 4.3: Sensitivity of the Surrounding Area to Potential Dust Impacts

Construction Phase Assessment

4.14 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching 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 road and highway surfaces.

4.15 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.

4.16 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. These have been assessed in line with the sensitive receptor locations risks.

Assessment of Potential Dust Emission Magnitude

Demolition

4.17 The existing building has already been demolished, therefore, dust emissions from demolition activities have not been further considered in this assessment.

Earthworks

4.18 Earthworks will primarily involve excavating material, haulage, as well as site levelling and landscaping. The British Geological Survey website informs that the soil type beneath the site is Sedimentary bedrock consisting of of clay, silt and sand. The total area of the site is less than 2,500 m^2.

4.19 Due to the size of the site area, it is expected there will be less than 5 HGVs active at any one time. Material moved is likely to be less than 20,000 tonnes.

4.20 In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from earthworks is therefore **large**. This is because of potentially dusty soil type (clay).

Construction

4.21 The construction of total volume of building on the site is likely to be less than 25,000 m^3. Concreate batching and sandblasting are not expected to take place onsite during the construction works, and therefore has been included in this assessment. A mixture of materials are to be used to erect the dwellings. In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from construction works is therefore **small**.

Trackout

4.22 Trackout activities will include vehicles accessing and leaving the site. Unpaved road is expected to be less than 50 m with low potential for dust release.

4.23 Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment, however it is expected that there will be less than 10 per day, based on the size of the site. In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from trackout is therefore **small**.

Summary of the Risk of Dust Effects

4.24 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. Table 4.4 provides a summary of the risk of impacts for the proposed development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	**Construction**	**Trackout**
Dust Soiling	High	Low	Low
Human Health	Low	Negligible	Negligible

Table 4.4: Summary of Potential Unmitigated Dust Risks

4.25 As indicated in Table 4.4, the highest risk for dust generating activities during earthworks is a **high** risk level. The highest risk for dust generating activities during construction and trackout activities is a **low** risk level. The overall dusk risk level is classed as a high risk for all non-specified activities not listed in Table 4.4.

4.26 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.

Dust mitigation measures

4.27 The MOL SPG provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development site as summarised in Table 4.5.

4.28 The mitigation measures can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

4.29 Assuming the relevant mitigation measures outlined in Table 4.5 are implemented, the residual effect from all dust generating activities is predicted to be not significant, in accordance with the MOL SPG guidance.

Issue	Control Measure
Site Management	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Develop a DMP. • 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 information. • Record and respond to all dust and air quality pollutant emissions complaints. • Make the complaints log available to the local authority when asked. • Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook. • Hold regular liaisons meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimalised.

Issue	Control Measure
Preparing and Maintaining the Site	• Plan site layout: machinery and dust causing activities are located away from receptors. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period. • Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials from site as soon as possible. • Cover, seed or fence stockpiles to prevent wind whipping. • Carry out regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary. • Provide showers and ensure a change of shoes and clothes are required before going off-sit to reduce transport of dust. • Agree monitoring locations with the Local Authority. • Where possible, commence baseline monitoring a least three months before phase begins. • Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.
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 (NRMM) comply with the standards set within this guidance. • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible. • Impose and signpost a maximum-speed-limit of 10mph on surfaced hauled routes and work areas. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel.

Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation (using recycled water where possible). • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Reuse and recycle waste to reduce dust from waste materials. • Avoid bonfires and burning of waste materials.
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil. • Only remove secure covers in small areas during work and not all at once.
Construction	• Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

Issue	Control Measure
Trackout	• Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Record all inspections of haul routes and any subsequent action in a site logbook. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10 m from receptors where possible. • Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.

Table 4.5: Fugitive Dust Mitigation Measures

5.0 OPERATIIONAL PHASE ASSESSMENT

Impact Assessment

5.1 An impact assessment has been undertaken in accordance with EPUK-IAQM guidance to understand the affect that the development will have upon air quality within the surrounding area.

Stage 1 Criteria

5.2 The first stage of the air quality impact assessment is to investigate the Stage 1 criteria, depicted in Table B1 of this report.

5.3 The proposal is to erect 14 residential units, however, the total area of the development is less than 0.5 ha, there are no car parking spaces, and there will be no centralised energy facility or other centralised combustion processes.

5.4 Therefore, stage 2 screening criteria has not been applied. the air quality impacts associated with the proposed development are considered **negligible** and no further assessment is required.

Exposure Assessment

5.5 As noted in Section 3, monitoring locations, CA7 and DEFRA background concentrations are expected to be representative of the proposed development site.

5.6 The observed NO_2 concentrations at CA7 monitoring location, and DEFRA background concentrations were below the annual mean NO_2 AQO in recent years. It is likely that the NO_2 concentrations will also be below the relevant AQO at the proposed development.

5.7 LAEI air quality modelling maps and DEFRA's predicted background PM_{10} and $PM_{2.5}$ concentrations were below the annual mean NO_2 AQO in recent years. It is likely that the concentrations will also be below the relevant AQO at the proposed development.

5.8 Based on the assessment results, exposure of future residents to exceedances of the AQO is not considered likely. Therefore, the site is suitable for the proposed residents from an air quality perspective.. However, as the development is located within the AQMA, to protect future site users from poor air quality.

6.0 AIR QUALITY NEUTRAL ASSESSMENT

6.1 The London Plan Policy SI 1 requires development proposals within Greater London to be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (e.g., developments situated within an AQMA). A method for assessing this is outlined in the *Air Quality Neutral London Plan Guidance*.

6.2 The Guidance sets out Building Emissions Benchmarks (BEB) based upon the Gross Internal Area (GIA m^2) and on-site emissions of NO_X (gNO_X/m^2/annum). Developments that do not exceed these benchmarks will be considered to avoid any increase in NO_x emissions and be air quality neutral. BEB for NOx for all land use classes are presented in Table 6.1.

Land Use*	Individual Gas Boilers	Gas Boiler Network	CHP + Gas Boiler Network	Heat Pumps + Gas Boiler Network
Residential (including student accommodation and large-scale purpose-built shared living development)	3.5	5.7	7.8	5.7
Retail	0.53	0.97	4.31	0.97
Restaurants and bars	1.76	3.23	14.34	3.23
Offices	1.43	2.62	11.68	2.62
Industrial	1.07	1.95	8.73	1.95
Storage and distribution	0.55	1.01	4.50	1.01
Hotel	9.47	15.42	38.16	15.42
Care homes and hospitals	9.15	14.90	36.86	14.90
Schools, nurseries, doctors' surgeries, other non-residential institutions	0.90	1.66	7.39	1.66
Assembly and leisure	2.62	4.84	21.53	4.84

Table 6.1: Building Emissions Benchmark NO_X Emission Rates (gNO_X/m^2/annum)

6.3 The Guidance sets out Transport Emissions Benchmarks (TEB) based upon the number of trips per floorspace (GIA m^2) over the year (trips/m^2/year) for non-residential use, or the anticipated number of trips per dwelling over the year (trips/dwelling/year) for residential use. Benchmark Trip Rates are based on data from Trip Rate Assessment Valid for London (TRAVL) and are defined for different land uses and different areas of London. The TEB are presented in Table 6.2.

Land Use*	Benchmark Trip Rates		
	Central Activities Zone (CAZ)	Inner London (excluding CAZ)	Outer London
Residential (including student accommodation and large-scale purpose-built shared living development)	68	114	447
Office / Light Industrial	2	1	16
Retail (Superstore)	39	73	216
Retail (Convenience)	18	139	274
Restaurant / Café	64	137	170
Drinking establishments	0.8	8	N/A
Hot food takeaway	N/A	32.4	590
Industrial	N/A	3.9	16.3
Storage and distribution	N/A	1.4	5.8
Hotels	1	1.4	6.9
Care homes and hospitals	N/A	1.1	19.5
Schools, nurseries, doctors' surgeries, other non-residential institutions	0.1	30.3	44.4
Assembly and leisure	3.6	10.5	47.2

Table 6.2: Transport Emissions Benchmarks Emissions for Different Land Use Classes

Building Emissions Assessment

6.4 The proposed development is wholly based on air source heat pumps and exhaust air heat pumps. There are no gas systems, or systems with combustion processes being proposed. Therefore, development will not include any NO_x or PM_{10} emissions. Therefore, they have not been considered further in this assessment.

Transport Emissions Assessment

6.5 It is understood that the proposed development is 'car free', and It is expected that all trips associated with the development will be conducted by public transportation. The appointed Transport Consultant has confirmed that *'vehicle flows associated with deliveries, refuse vehicle collection and car/taxi drop-offs.'*

6.6 Transport Planning Practice Ltd, the assigned Transport Consultant for the project has confirmed that the proposed development will generate six LDV and 2 HGV movements per day. These movements will be from deliveries, refuse vehicle collection and car/taxi drop-offs.

6.7 The TEB only estimates car or light van trips generated by the development occupiers. These trips are likely to be generated by residents, customers or employees. The TEB does not include trips generated by deliveries and servicing, taxis or heavy vehicle movements from non-occupiers. Assessment of these trips have been captured in the wider air quality impact assessment within this report (Section 5).

6.8 Therefore, based on this information, no personal transport will be created by the development and no include any NO_x or PM_{10} emissions will be produced from this. Therefore, they have not been considered further in this assessment.

Summary

6.9 The development and transport emissions assessment have been screened out. As a result, the development is air quality neutral and therefore there is no need for additional mitigation measures or a financial contribution to offset the potential air quality impacts.

7.0 BEST PRACTICE MEASURES

Construction Phase

7.1 The MOL SPG provides a number of potential mitigation measures to reduce impacts from the construction phase. As a low risk of dust impacts from earthworks, construction, and trackout activities was identified, mitigation measures are required. These have been adapted for the development site as summarised in Section 4.

7.2 These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan if required by LBC.

Operational Phase

7.3 The anticipated operational effects stated in Section 5 have been identified as **negligible**, and therefore, there is no requirement to mitigate the anticipated operational effects of the development.

7.4 However, the IAQM Planning Guidance recommends that minimum best practice techniques for all developments. Therefore, this would be implemented for the development.

7.5 Potential best practice mitigation options are listed below. It is acknowledged that this is not an exhaustive list but sets out a range of mitigation measures which could be implemented at the reserved matters stage of the development:

- A Welcome Pack available to all site users and as a booklet, containing information and incentives to encourage the use of sustainable transport modes from new occupiers; and
- Car club provision within the Development or support given to local car club/Electric vehicle car clubs.

7.6 If the above measures are implemented, this will further reduce the potential impacts associated with the Development.

8.0 CONCLUSIONS

8.1 Create Consulting Engineers Ltd was instructed by Altair Ltd to undertake AQA in support of a residential development at 31 Daleham Gardens, London, NW3 5BU.

8.2 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 MOL SPG methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated earthworks, construction and trackout activities was predicted to be **negligible.**

8.3 During the operational phase of the development there is 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 against the screening criteria provided within the EPUK-IAQM guidance. This proposal consists of the construction of 14 residential units; however, the total area of the development is less than 0.5 ha, there will be no parking spaces, and there will be no centralised energy facility or other centralised combustion processes. As such, the air quality impacts associated with the proposed development are considered **negligible** and no further assessment is required.

8.4 The potential exposure of future occupants to exceedances of the AQOs were assessed based on local monitoring results and background pollutant level predictions. This indicated that concentrations of **NO_2 and PM_{10} are likely to be below the relevant AQOs** at the proposed development site. As such, the site is considered suitable for the proposed use from an air quality perspective.

8.5 An Air Quality Neutral Assessment was undertaken to understand the Building Emissions and Transport Emissions of the proposed development. The proposed development is based on ASHP's and exhaust air heat pumps. In terms of Transport Emissions, the development is car free and vehicle movements will be from deliveries, refuse vehicle collection and car/taxi drop-offs.

8.6 Based on this information, the development and transport emissions assessment have been screened out. As a result, the development is **air quality neutral** and therefore there is no need for additional mitigation measures or a financial contribution to offset the potential air quality impacts.

8.7 Based on the assessment results and implementation of best practice techniques as detailed in the assessment, **air quality is not considered a constraint to planning consent** for the proposed development.

9.0 DISCLAIMER

9.1 Create Consulting disclaims any responsibility to the Client, Altair Ltd and others in respect of any matters outside the scope of this report.

9.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Altair Ltd. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Altair Ltd.

9.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

10.0 REFERENCES

10.1 *Camden Clean Air Action Plan 2023-2026.* London Borough of Camden (2022).

10.2 *Camden Clean Air Strategy 2019-2034.* London Borough of Camden (2022).

10.3 *Camden Local Plan.* London Borough of Camden (2017).

10.4 *Camden Planning Guidance: Air Quality*. London Borough of Camden (2021).

10.5 *Guidance on Land-Use Planning and Development Control: Planning for Air Quality*. EPUK & IAQM, Moorcroft, Barrowcliffe. et al (2017)

10.6 *Guidance on the assessment of dust from demolition and construction, version 1.1*. IAQM, Holman et al (2014)

10.7 *London Environment Strategy, May 2018*. Mayor of London, Greater London Authority (2018)

10.8 *National Planning Policy Framework*. Ministry of Housing, Communities and Local Government (2021)

10.9 *London Borough Camden Air Quality Annual Status Report for 2021*. London Borough of Camden

10.10 *Sustainable Design and Construction Supplementary Planning Guidance*. Mayor of London, Greater London Authority (2014)

10.11 *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1)*. Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2007)

10.12 *The Control of Dust and Emissions from Construction and Demolition: Supplementary Planning Guidance*. Mayor of London, Greater London Authority (2014)

10.13 *The London Plan, March 2021*. Mayor of London, Greater London Authority (2021)

APPENDICES

APPENDIX A

Construction Phase Assessment Methodology

Construction Phase Assessment

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 Supplementary Guidance (MOL SPG), 2014, "The Control of Dust and Emissions from Construction and Demolition; Supplementary Planning Guidance."

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

- Demolition;
- Earthworks;
- Construction; and,
- Trackout.

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} and $PM_{2.5}$.

The assessment steps are detailed below.

Step 1

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

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

Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to 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 defined as low, medium or high sensitivity (Step 2B).

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table A1.

Magnitude	Activity	Criteria
Large	Demolition	• Total volume of building to be demolished 50,000m3, or • Potential dusty construction material (e.g concrete), or • Onsite crushing and screening • Demolition activities more than 20m above ground
	Earthworks	• Total site area greater than 10,000m^2, • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), or • More than 10 heavy earth moving vehicles active at any one time, or • Formation of bunds greater than 8m in height; • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3, or • 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
Medium	Demolition	• Total volume of building to be demolished 20,000m3 – 50,000m3, or • Potential dusty construction material, or • Demolition activities 10-20m above ground level
	Earthworks	• Total site area 2,500m^2 to 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes

Magnitude	Activity	Criteria
	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	Demolition	• Total volume of building to be demolished less than 20,000m3, or • construction material with low potential for dust release (e.g metal cladding, or timber), or • Demolition activities less than 10jm above ground level during wetter months
	Earthworks	• Total site area less than 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	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

Table A1: Construction Dust Magnitude

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table A2.

Sensitivity	Examples	
	Human Receptors	**Ecological Receptors**
High	• Users expect of 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

Sensitivity	Examples	
	Human Receptors	**Ecological Receptors**
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
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, playing fields, farmland, footpaths, short term car park and roads	• Locally designated site e.g. Local Nature Reserve

Table A2: Examples of Factors Defining Sensitivity of an Area

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

- 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 the 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.

These factors were considered in the undertaking of this Assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table A3.

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
	1 - 10	Medium	Low	Low	Low

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

Table A3: Area Sensitivity to Dust Soiling Effects on People and Property

Table A4 outlines the sensitivity of the area to human health impacts.

Receptor Sensitivity	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	-	More than 10	High	Medium	Low	Low	Low
	-	1 - 10	Medium	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the area to Human Health Impacts

Table A5 outlines the 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

Table A5: Area Sensitivity to Ecological Impacts

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts. Table A6 outlines the risk category from demolition works.

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

Table A6: Dust Category from Demolition works

Table A7 outlines the risk category from earthworks and construction activities.

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

Table A7: Dust Category from Earthworks

Table A8 outlines the risk category from earthworks and construction activities.

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

Table A8: Dust Category from Construction

Table A9 outlines the risk category from Trackout.

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

Table A9: Dust Risk Category from Trackout

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance 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

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'. This has been described as negligible within this report to provide continuity between assessment terminologies.

The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

APPENDIX B

Operational Phase Assessment Methodology

This section details the methodology and criteria used to screen the operational phase of the development in conjunction with EPUK-IAQM guidance.

Operational Phase Assessment

The proposed development includes sensitive land uses. As such, the proposed development has the potential to introduce the poor quality of air in the area and worsen the current local air quality.

Criteria has been used; based upon the guidance provided within the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance 'Land-Use Planning and Development Control: Planning for Air Quality.

A screening assessment has been undertaken to understand whether a simple or detailed assessment is required. A simple assessment relies on published information, without the quantification of impacts. A detailed assessment is completed with the aid of dispersion modelling to predict the concentrations at the development site and surrounding area.

Stage 1 Criteria

Initially the development is screened against stage 1 criteria as shown in Table B1.

Criteria to Proceed to Stage 2
If any of the following apply: 10 or more residential units or a site area of more than 0.5ha more than 1,000 m2 of floor space for all other uses or a site area greater than 1ha
Coupled with any of the following: the development has more than 10 parking spaces the development will have a centralised energy facility or other centralised combustion process

Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

Table B1: Stage 1 Criteria

If the development contains any of the criteria shown in Row A of Table B1, in combination with any parameter of Row B, a Stage 2 screening assessment is required.

Stage 2 Criteria

Table B2 shows the screening criteria used to trigger an air quality assessment (Stage 2). Exceeding this criterion does not automatically lead to the requirement of a detailed assessment. If none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect.

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g., traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. **NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.**	Typically, any combustion plant where the single or combined NO_X emission rate is less than 5 mg/sec* is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
	receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

NOTES: As a guide, the 5 mg/s criterion equates to a 450 kW ultra low NOx gas boiler or a 30 kW CHP unit operating at <95 mg/Nm3. Users of this guidance should quantify the NOX mass emission rate from the proposed plant, based on manufacturers' specifications and operational conditions.

Table B2: Indicative Criteria for Requiring an Air Quality Assessment