GLOBAL AIR QUALITY

Heathrow Garden Centre, Sipson

Air Quality Assessment

Bidwells LLP

January 2024

Contents

1 Introduction

Global Air Quality has been commissioned by Bidwells LLP to undertake an assessment of the potential impact on local air quality of the proposed development at Heathrow Garden Centre, Sipson Road, Sipson. The site lies within the administrative area of the London Borough of Hillingdon (LBH).

The scheme comprises the development of a Centre of Excellence for Electric Airside Support Vehicles, consisting of a service building with 7no. service bays and 1no. storage bay, with associated hardstanding, parking, a wash bay, plant, solar PVs, landscaping and drainage.

The Site is on the northern edge of Sipson, close to junction 4 of the M4 motorway. There are residential properties adjacent to the southern boundary of the Site and commercial uses (restaurant and hotel) to the north. The Site is bound to the west by Sipson Road and the M4 lies to the east. The location of the proposed development and site layout are presented in Figure 1.1 and Figure 1.2, respectively.

The proposed development falls within the LBH Air Quality Management Area (AQMA) which covers approximately two-thirds of the borough (south of the A40) and was designated in 2003 due to measured exceedances of the long-term air quality objective for nitrogen dioxide (NO_2). The primary source of NO_2 in the borough is road traffic.

The potential impact of the proposed development on local air quality during the construction and operational phases has been assessed. The type, source and significance of potential impacts are identified and the measures that should be employed to minimise these impacts are described.

Figure 1.1: Location of the Proposed Development Site

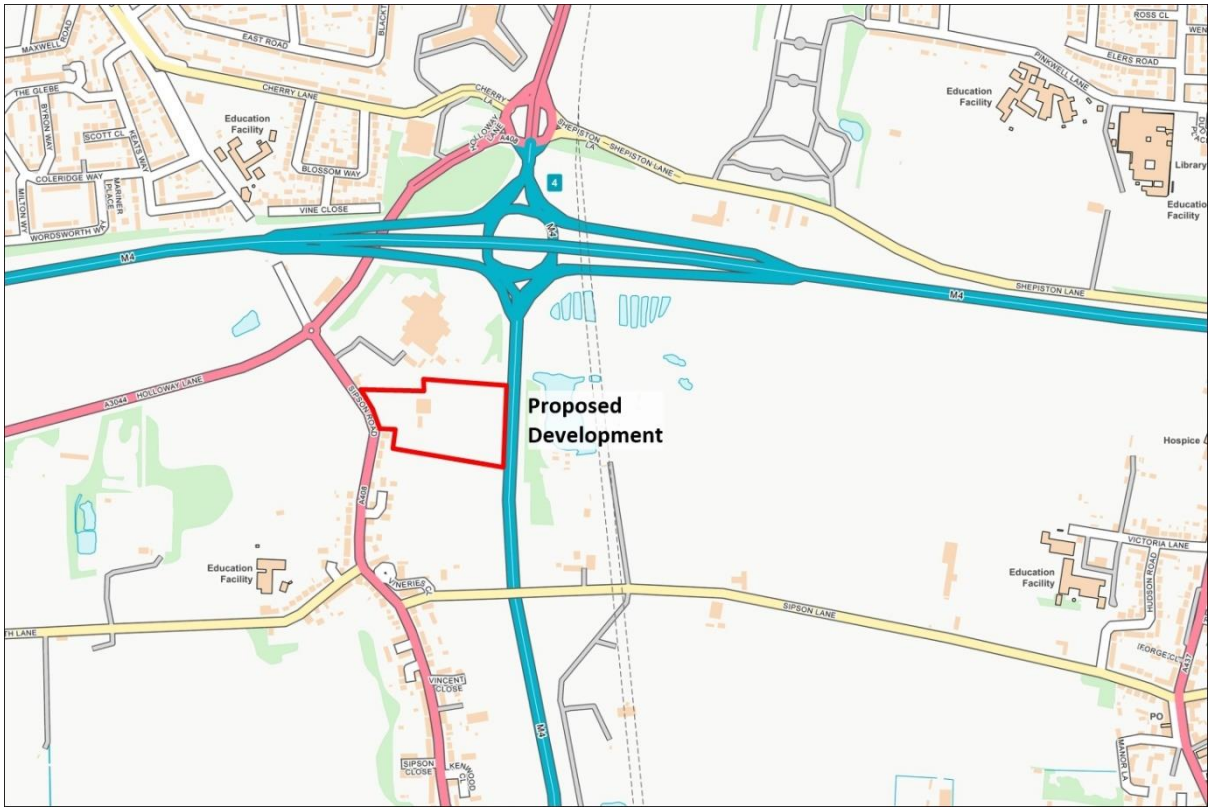


Figure 1.2: Proposed Site Layout

2 Policy Context

2.1 National Legislation

2.1.1. Air Quality Standards and Objectives

The assessment of potential air quality impacts associated with the proposed development has been evaluated with respect to the current air quality standards and objectives for the protection of human health, as set out in the Air Quality Regulations 2010[1] and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[2].

In the context of the proposed development, the pollutants of concern are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$), which in an urban environment are primarily associated with road traffic emissions.

It is widely accepted that there is no safe level for $PM_{2.5}$ and on this basis The Environment Act (2021) required the Air Quality Regulations to be updated to include a more stringent long-term air quality target. On 31st January 2023, the Government published an Environmental Improvement Plan[3], which includes an Annual Mean Concentration Target (AMCT) of 10 µg/m^3, to be achieved by the end of 2040. The Plan also includes an interim target of 12 µg/m^3, to be achieved by the end of January 2028. The 10 µg/m^3 target for $PM_{2.5}$ has been adopted into UK law via the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[4].

A summary of the air quality standards for NO_2, PM_{10} and $PM_{2.5}$, that are applicable in England, are presented in Table 2.1.

Table 2.1: Air Quality Standards for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Averaging Period	Limit Value	Date by which limit value is to be met
NO_2	1-hour	200 µg/m^3, not to be exceeded more than 18 times per calendar year (a)	
	Calendar year	40 µg/m^3	
PM_{10}	24-hour	50 µg/m^3, not to be exceeded more than 35 times per calendar year (b)	
	Calendar year	40 µg/m^3	
$PM_{2.5}$	Calendar year	20 µg/m^3	2020
	Calendar year	12 µg/m^3 (interim target)	31st January 2028
	Calendar year	10 µg/m^3 (target)	31st December 2040

[1] The Air Quality Standards Regulations 2010, Statutory Instrument 2010 No. 1001
[2] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument 2020 No. 000
[3] Environmental Improvement Plan 2023, Defra, January 2023
[4] Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, Statutory Instrument 2023 No. 96

2.1.2. Local Air Quality Management

The framework for local air quality management (LAQM) in the UK was introduced by the Environment Act 1995[5]. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or limit values. Where an exceedance is identified, the local authority is obliged to declare an AQMA prepare an Air Quality Action Plan (AQAP) setting out measures to improve air quality and achieve compliance with the objective(s). The LAQM delivery framework for local authorities in England is set out in Defra's 2023 Air Quality Strategy[6].

The core guidance document for use by persons involved in LAQM or considering the impacts of a development with the potential to affect air quality as covered by LAQM, is the LAQM Technical Guidance LAQM.TG22[7].

2.1.3. The National Planning Policy Framework

The National Planning Policy Framework NPPF[8] sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF states that "*planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas'. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan*".

2.1.4. The Planning Practice Guidance

8.11 The Planning Practice Guidance (PPG)[9], outlines the principles upon which the planning process can take account of air quality impacts associated with new developments. It outlines the role of Local Plans in promoting sustainability and providing limitations on development in areas of poor air quality. An emphasis is placed on consultation with the planning authority to determine whether there are any local issues with the potential to affect the scope of an air quality assessment. Typical air quality mitigation measures are outlined highlighting the use of planning conditions and funding obligations to off-set any significant impacts.

[5] Part IV of the Environment Act 1995.
[6] Air Quality Strategy Framework for local authority delivery, Defra, April 2023
[7] Local Air Quality Management Technical Guidance (TG22), August 2022
[8] Department for Communities and Local Government, National Planning Policy Framework, August 2023
[9] Ministry of Housing, Communities & Local Government, Planning Practice Guidance: Air Quality, November 2019.

2.2 Regional Policy

2.2.1. The London Plan

Policy SI1 (Improving Air Quality) of the London Plan[10] sets out the Greater London Authority's (GLA) commitment to improving air quality and public health and states:

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

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

1. Development proposals should not:

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

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

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

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

a) Development proposals must be at least air quality neutral.

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

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

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, which do not demonstrate that design measures have been used to minimise exposure should be refused.

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:

[10] The London Plan 2021, The Spatial Development Strategy for Greater London, Greater London Authority, March 2021.

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."

The following London Plan Guidance (LPG) documents have been utilised in the assessment:

- Air Quality Neutral (AQN) guidance[11]; and
- The Control of Dust and Emissions during Construction and Demolition SPG[12].

2.2.2. London Environment Strategy

Chapter 4 of the London Environment Strategy[13] outlines the Greater London Authority's (GLA) commitment to improving air quality in London. The strategy aims plan to significantly reduce NO_2 and particulate (PM_{10}, $PM_{2.5}$ and black carbon) concentrations through a number of key objectives and policies:

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

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

Objective 4.2 achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action from London boroughs, government and other partners.

[11] London Plan Guidance Air Quality Neutral, GLA, February 2023
[12] The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance, GLA, July 2014
[13] London Environment Strategy, GLA, May 2018

- Policy 4.2.1 Reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport.

- Policy 4.2.2 Reduce emissions from non-road transport sources, including by phasing out fossil fuels.

- Policy 4.2.3 Reduce emissions from non-transport sources, including by phasing out fossil fuels.

- Policy 4.2.4 The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality.

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

Objective 4.3 establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting World Health Organization health-based guidelines for air quality.

- Policy 4.3.1 The Mayor will establish new targets for $PM_{2.5}$ and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners.

- Policy 4.3.2 The Mayor will encourage the take up of ultra-low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines.

- Policy 4.3.3 Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality.

- Policy 4.3.4 Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces.

With regard to Policy 4.3.1, the Mayor of London has set a target for compliance with the now superseded WHO guideline value[14] for $PM_{2.5}$ of 10 µg/m^3 by 2030. However, recent modelling[15] suggests that due to the transboundary nature of $PM_{2.5}$, compliance in London is unlikely to be achieved without additional measures at national, European and international level.

2.2.3. Greater London Authority Air Quality Focus Areas

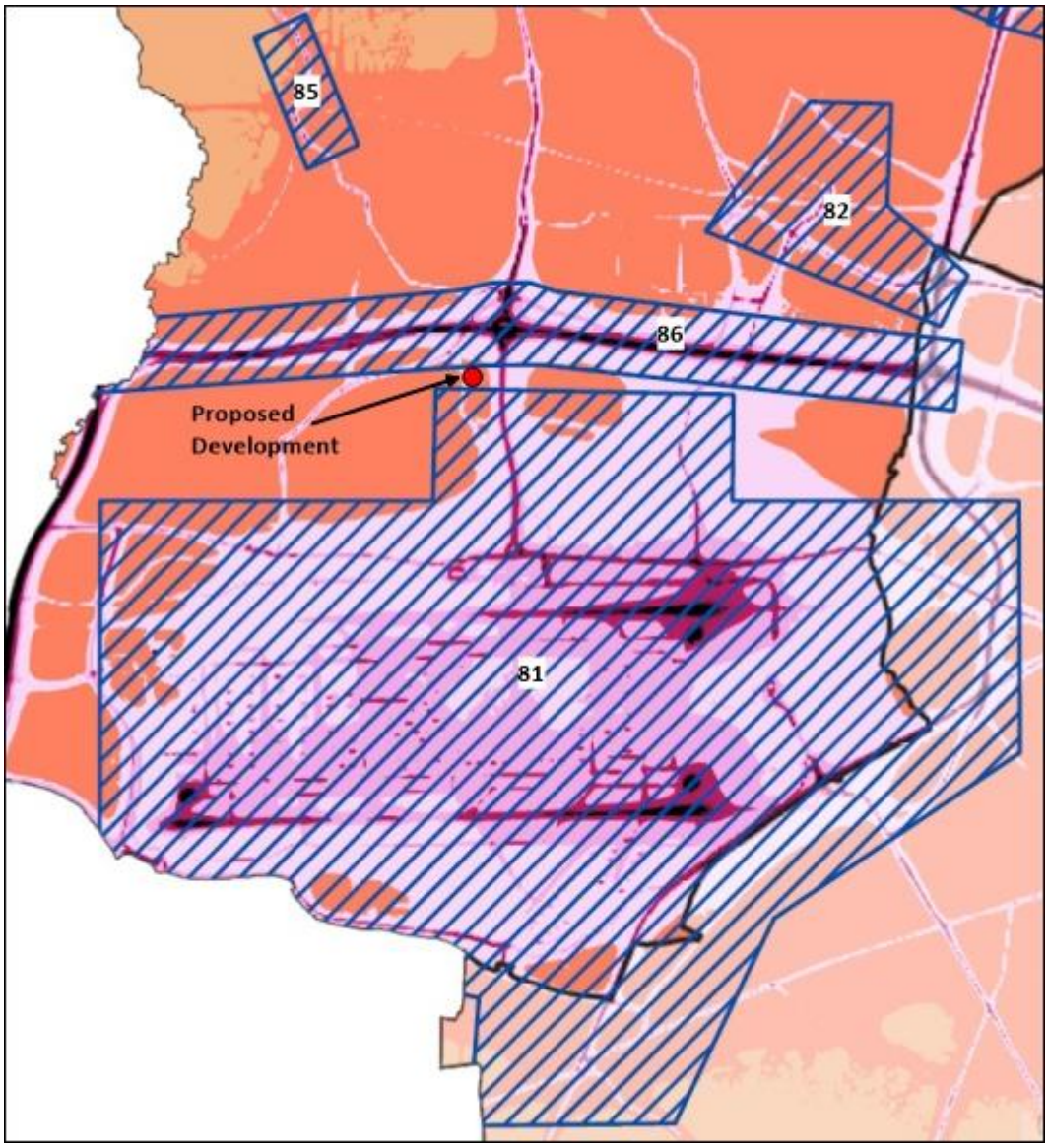
Air Quality Focus Areas (AQFA) have been identified by the GLA where there is high human exposure in locations where the annual mean air quality objective for NO_2 is exceeded. The purpose of the

[14] Air Quality Guidelines Global Update 2005, World Health Organisation
[15] $PM_{2.5}$ in London: Roadmap to meeting World Health Organization guidelines by 2030, GLA, October 2019

Focus Areas is to allow local authorities to target actions to improve air quality where it is most needed and to inform the planning process with regard to the air quality impact of new developments.

The proposed development is located between AQFA's 81 'Heathrow Area' and 86 'M4 Focus Area' (see traffic associated with the development will travel through the designated areas.

Figure 2.1: Location of Development Relative to Air Quality Focus Areas



2.3 Local Policy

2.3.1. Hillingdon Local Plan

The Hillingdon Local Plan: Part 2[16] sets out strategic objectives and policies for development in the Borough. Policy DMEI 14 relates specifically to air quality and states that:

A. *"Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.*

B. *Development proposals should, as a minimum:*

i) be at least air quality neutral.

ii) include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and

iii) actively contribute towards the continued improvement of air quality, especially within the Air Quality Management Area."

In addition, policy DMEI 1 (Living Walls and Roofs and on-site Vegetation) states that: "*Major development in Air Quality Management Areas must provide onsite provision of living roofs and/or walls. A suitable offsite contribution may be required where onsite provision is not appropriate*".

2.3.2. Hillingdon Air Quality Action Plan

LBH's Air Quality Action Plan (AQAP)[17] outlines the Council's commitment to improving air quality in the Borough, including prioritising the following actions:

- Leading by example by reducing emissions from the Council's vehicle fleet and buildings.
- Reducing public exposure and improving air quality around schools.
- Implementation of improvement strategies in the AQ Focus Areas.
- Ensure the integration of the 'Health Streets' approach in relevant council work programmes.
- Ensure the planning system supports the achievement of air quality improvements in relation to new developments.
- Raise awareness via targeted campaigns.

The effectiveness of the AQAP is evaluated though the Council's air quality monitoring programme and reported annually in accordance with the requirements of Defra.

[16] London Borough of Hillingdon Local Plan: Part 2 Development Management Policies – Adopted Version 2020
[17] Air Quality Action Plan 2019 - 2024, London Borough of Hillingdon, May 2019

3 Methodology

3.1 Scope

The scope of the assessment is as follows:

- A review of local air quality monitoring data and Defra background pollutant maps to determine the existing baseline at the site;
- An assessment of potential construction phase impacts, including construction traffic emissions, dust generated by on-site activities and re-suspended dust from HGV movements on the local road network (trackout);
- An assessment of potential operational phase impacts, including traffic generated by the proposed development and building-related emissions;
- An assessment of potential exposure of future occupants to poor air quality; and
- An air quality neutral assessment.

Details of the assessment methodology are provided below.

3.2 Construction Dust

The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the GLA's SPG[12].

A detailed assessment of dust impacts is required where there are human receptors within:

- 350m of the site boundary ; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

For ecological receptors, the screening criteria are:

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

The IAQM methodology allows the potential risk of dust soiling and human health effects to be determined, based on the sensitivity of nearby receptors (human and ecological) and the anticipated magnitude of the dust emission due to:

- demolition;

- earthworks;
- construction; and
- track-out[18].

The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Construction Environmental Management Plan (CEMP) or Dust Management Plan (DMP) for the proposed development.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

A full description of the GLA's construction dust methodology is provided in Appendix A.

3.3 Construction Traffic

Detailed information relating to construction traffic associated with the proposed development is not currently available, however based on the scale of the development, the temporary additional traffic is unlikely to be significant compared with the existing traffic flows in the area.

The impact of vehicular emissions of NO_2, PM_{10} and $PM_{2.5}$ from construction traffic, is anticipated to be negligible.

3.4 Operational Traffic

The Environmental Protection UK (EPUK)/ IAQM planning guidance[19], states that for developments that are close to or within an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is an increase in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is an increase in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or
- There is a change in the road re-alignment by more than 5m; and/or

[18] Re-suspended dust from HGV movements

[19] Land-use Planning and Development Control: Planning for Air Quality, Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land use planning and development control process, v1.2 January 2017

- A new junction is introduced, which will significantly alter vehicle speeds.

In the context of these criteria, LGV and HGV refer to vehicles below and above 3.5 tonnes, respectively.

The proposed development trip generation is 67 AADT, of which 9 AADT will be HGV's. The distribution of the trips on the local road network is presented in Table 3.1

Table 3.1: Distribution of Operational Trips

Road Link	LGV AADT	HGV AADT	Detailed Assessment Required?
A408 Sipson Road N of Site Access	53	9	×
A408 Sipson Road S of Site Access	5	0	×
A3044 Holloway Lane W of Sipson Road	17	5	×
A408 Holloway Lane E of Sipson Road / Hatch Lane	36	4	×
A4 Bath Road W of Hatch Lane	17	5	×
A4 Bath Road W of M4	5	0	×

Based on the EPUK/IAQM screening criteria, a detailed assessment is not required and the **impact of the additional vehicle emissions on local air quality is expected to be negligible**.

3.5 Exposure Assessment

A qualitative review of local air quality monitoring data has been undertaken to determine whether occupants of the proposed development will be exposed to pollutant concentrations above the air quality standards for the protection of health. The proposed development is a commercial scheme and therefore there will be no relevant long-term exposure to poor air quality at the Site. Potential exposure has therefore been evaluated with respect to the short-term air quality standards for NO_2 and PM_{10} only.

3.6 Building-Related Emissions

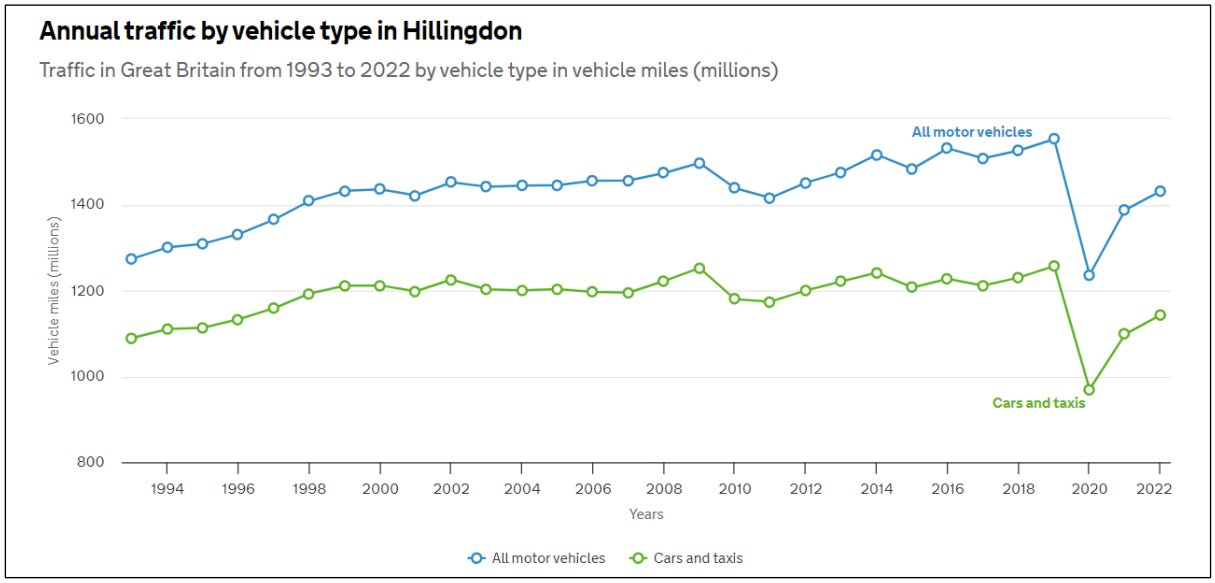
The energy strategy for the proposed development is 100% electric. **There will be no building-related combustion emissions associated with the site and therefore no impact on local air quality**.

4 Baseline Air Quality and Exposure Assessment

A review of pollutant concentrations measured in the Sipson area has been undertaken to determine whether users of the proposed development will be exposed to concentrations of NO_2 or PM_{10} above the short-term air quality standards for the protection of health.

During the pandemic there was a significant reduction in traffic movements within the Borough, leading to a decline in measured pollutant concentrations (particularly NO_2) in many locations. Automatic traffic counts undertaken in 2022 indicate that daily vehicle movements remain slightly below pre-pandemic (2019) levels in the borough (see Figure 4.1). Further data is required to understand whether the lower traffic levels will persist and therefore a pre-pandemic baseline (2019) has been used to assess potential exposure at the Site.

Figure 4.1: Traffic Levels in Hillingdon



https://roadtraffic.dft.gov.uk/local-authorities/66

4.1 Air Quality Monitoring Data

Ambient air quality is currently measured automatically at eleven locations in the Borough. Details of the monitoring sites that are considered relevant to the assessment are presented in Table 4.1. The locations of the monitoring sites relative to the proposed development are shown in Figure 4.2.

Table 4.1: Automatic Monitoring Sites (µg/m^3)

Site ID	Location	Type	Grid reference	Pollutants monitored	Location Relative to Proposed Development
HIL	London Hillingdon	Urban Background	506951, 178605	NO_2	400 m northwest
LHR2	London Heathrow	Airport	508600, 176800	NO_2, PM_{10}	1.9 km southeast
HRL	London Harlington	Roadside	508295, 177800	NO_2, PM_{10}	930 m east-southeast
SIPS	Hillingdon Sipson	Urban Background	507325, 177282	NO_2	880 m south

A summary of NO_2 and PM_{10} concentrations measured at these locations between 2015 and 2019 is presented in Table 4.2. Exceedances of the air quality standards are highlighted in bold.

Table 4.2: Automatic Monitoring Data (µg/m^3)

Site ID	Type	2015	2016	2017	2018	2019
Annual Mean NO_2 Concentrations (µg/m^3)						
HIL	Urban Background	**52**	**52**	**53**	**46**	**45**
LHR2	Airport	**44**	**47**	**48**	**43**	**42**
HRL	Roadside	32	34	32	30	31
SIPS	Urban Background	32	34	32	30	31
Number of 1-Hour Means > 200 µg/m^3						
HIL	Urban Background	1	2	0	0	0
LHR2	Airport	2	8	12	0	1
HRL	Roadside	0	0	0	0	0
SIPS	Urban Background	3	0	0	0	0
Annual Mean PM_{10} Concentrations (µg/m^3)						
LHR2	Airport	13	15	15	14	13
HRL	Roadside	16	15	15	15	15
Number of 24-Hour Means > 50 µg/m^3						
LHR2	Airport	3	3	7	1	6
HRL	Roadside	3	5	3	1	6

The data indicates that, whilst the annual mean air quality standard for NO_2 of 40 µg/m^3 is consistently exceeded at the airport (LHR2) and the urban background site near the M4 (HIL), the number of hourly means above 200 µg/m^3 was well below the 18 allowable per year. At the Harlington (HRL) and Sipson (SIPS) sites, which are considered more representative of the proposed development site, the annual mean concentrations over the five-year period were well below the standard and no short-term exceedances have been measured since 2016.

The measured annual mean PM_{10} concentrations in the area are well below the air quality standard of 40 µg/m^3. The 24-hour mean air quality standard for PM_{10} was exceeded a maximum of 7 times a year, well below the 35 allowable.

LBH also monitor ambient NO_2 concentrations via an extensive network of diffusion tubes. Details of the monitoring sites in closest proximity to the proposed development are presented in Table 4.3. The diffusion tube locations are shown in Figure 4.2.

A summary of annual mean NO_2 concentrations measured between 2015 and 2019 are presented in Table 4.4. The data have been adjusted for laboratory bias using nationally derived factors[20]; full details of this procedure are contained within LBH's ASR for 2019[21].

Table 4.3: Diffusion Tube Monitoring Sites (µg/m^3)

Site ID	Location	Type	Grid Reference	Distance to Kerb of Nearest Road
HILL01	AURN Site, Keats Way, West Drayton	Urban Background	506926, 178614	30 m from M4
HILL10	Brendan Close, Harlington	Roadside	508414, 177125	1 m
HILL40	Sipson Close/ Sipson Road	Roadside	507316, 177576	4 m
HILL41	A4 junction with Sipson Way	Roadside	507369, 176966	2 m
HD59	Bomber Close, Sipson	Roadside	507296, 177323	1 m

Table 4.4: Annual Mean Nitrogen Dioxide Concentrations Measured by Diffusion Tube (µg/m^3)

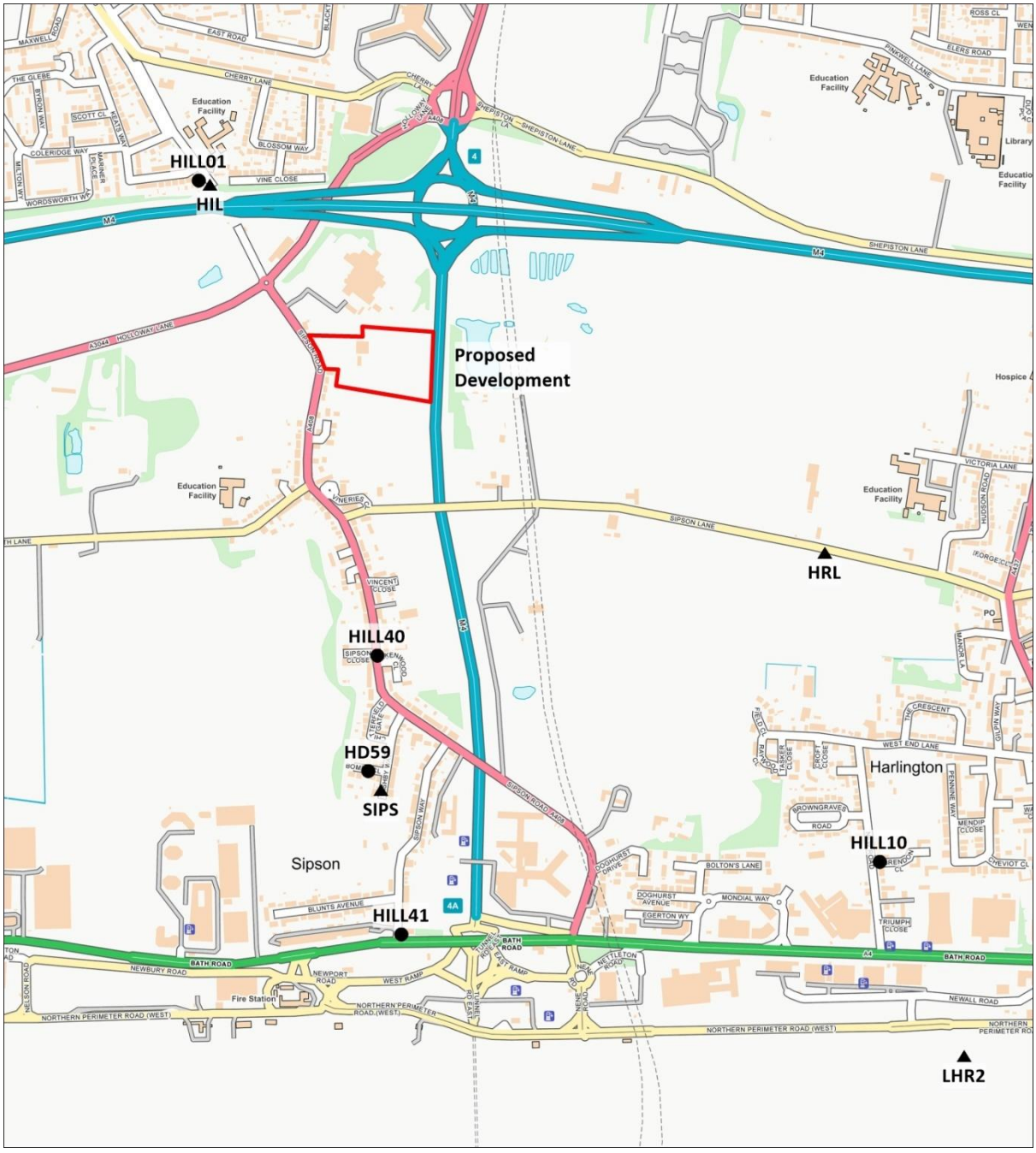
Site ID	2015	2016	2017	2018	2019
HILL01	**41.1**	34.3	**45.3**	**42**	38.6
HILL10	37.2	34.2	**47.5**	39.6	39.7
HILL40	-	-	-	-	35.5
HILL41	-	-	-	-	**48.7**
HD59	29.1	30.3	32.6	32.9	27.7

The data indicate that exceedances of the annual mean air quality standards are likely at locations close to main roads in the area. However, concentrations measured at HILL40, which is likely to be most representative of the proposed development, were below 40 µg/m^3 in 2019.

Diffusion tubes are not able to measure short-term NO_2 concentrations, however measurements across the UK[22] have shown that an exceedance of the 1-hour objective is unlikely where the annual mean concentration is less than 60 µg/m^3. The concentrations measured at all of the diffusion tube locations are well below this level and therefore it is unlikely that the short-term objective is exceeded in the area.

[20] https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
[21] Annual Air Quality Status Report for 2019, London Borough of Hillingdon, May 2020
[22] D Laxen and B Marner: Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites, July 2003.

Figure 4.2: Monitoring Site Locations



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4.2 Potential Exposure

The proposed development is a commercial scheme and therefore there will be no relevant long-term exposure on-site. Roadside NO_2 concentrations in the Sipson area are well below 60 µg/m^3 and therefore the risk of an exceedance of the short-term (1-hour mean) air quality standard at the site is negligible.

Particulate concentrations measured at the automatic monitoring stations in the area (HRL and LHR2) indicate that the risk of an exceedance of the short-term (24-hour mean) PM_{10} standard at the Site is also negligible.

Due to increasing stringent Government Policy relating to vehicle emissions and the continued uptake of electric and low emission vehicles, future pollutant concentrations in the area are unlikely to significantly exceed current levels. On this basis, **the proposed development will not introduce new exposure to poor air quality.**

5 Construction Dust Impact Assessment

5.1 Sensitivity of the Area

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the construction area and existing PM_{10} concentrations (i.e., the potential for additional dust to result in an exceedance of the short or long-term air quality objectives).

A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in Table 5.1. The access road from Sipson Road will be retained and the construction area will be at least 30 m from the nearest residential properties and hotel buildings.

Despite the relatively close proximity of Sipson Quarry, based on the locally measured PM_{10} concentrations (see Table 4.2), the existing PM_{10} concentrations at receptors near the Site are expected to be below 24 µg/m^3, the lowest threshold in the guidance for assessing potential impacts on human health.

There are no dust sensitive habitat sites within 50m of the Site; therefore, impacts on ecology have not been considered in the assessment.

The overall sensitivity of the area around the proposed development to health and dust soiling impacts is assessed as 'low'.

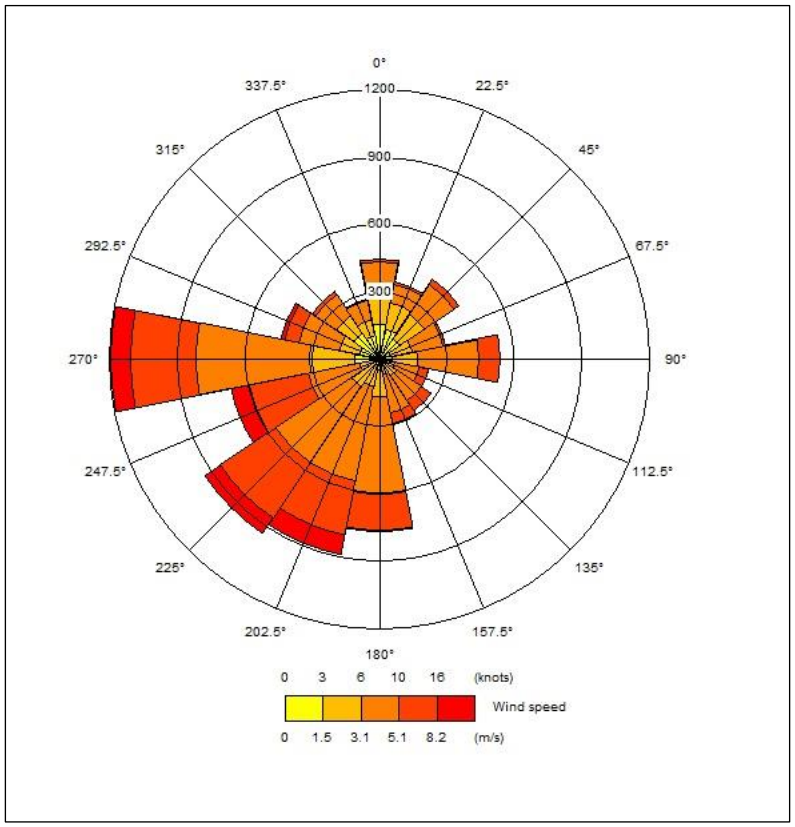
Table 5.1: Evaluation of the Sensitivity of the Area to Dust Impacts

Receptor	**Distance from Construction Area**	**Number of Receptors**	**Sensitivity to Health Impacts**		**Sensitivity to Dust Soiling Impacts**	
			Receptor	**Area**	**Receptor**	**Area**
Residential Properties	< 20 m	0	High	Low	High	Low
	< 50 m	<10		Low		Low
	<100 m	<10		Low		Low
Public House/ Restaurant	< 100 m	10 - 50	Medium	Low	Medium	Low
Hotel	< 50 m	10 - 50	Medium	Low	Medium	Low
	<100 m	>100		Low		Low

The precise behaviour of the dust, its residence time in the atmosphere and the distance it may travel before being deposited will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

A wind rose for Heathrow meteorological station is presented in Figure 5.1, which shows that the prevailing wind is from the west and southwest, therefore receptors to the east and northeast of the site are most likely to experience dust impacts during the construction phase.

Figure 5.1: Windrose for Heathrow Meteorological Station



5.2 Dust Emission Magnitude

The magnitude of the likely dust emission from demolition, earthworks, construction and trackout is presented in Table 5.2.

Table 5.2: Evaluation of Dust Emission Magnitude

Source	IAQM Criteria	Proposed Development	Dust Emission Magnitude
Demolition	Total building volume	<5,000 m^3	Small
	Potentially dusty material?	Brick, concrete	Medium
	On-site crushing and screening?	Yes	Large
	Maximum height of demolition activities above ground-level	5 m	Small
Overall Emission Magnitude for Demolition Demolition of the main building on site will generate minimal dust (primarily steel and glass). The brick barn is <1,000 m^3, therefore a 'Medium' dust emission magnitude is considered appropriate.			**Medium**
Earthworks	Earthworks area	<5,000 m^2	Medium
	Soil type	Clay and gravel	Large
	Number of heavy earth moving vehicles active at any one time	<5	Medium
	Maximum bund height	< 8m	Medium
	Total material moved	<2,500 tonnes	Small
Overall Emission Magnitude for Earthworks			**Large**
Construction	Approx. volume of buildings to be constructed	Approx. 10,000 m^3	Small
	Dusty construction materials	Concrete	Medium
	Will concrete batching be undertaken on site?	No	-
	Will sandblasting be undertaken on site?	No	-
Overall Emission Magnitude for Construction			**Medium**
Trackout	Number of outward HGV movements in any one day	<10	Small
	Dusty surface material?	n/a	Small
	Unpaved road length (m)	0 m	Small
Overall Emission Magnitude for Trackout There will be minimal access over unmade ground.			**Small**

5.3 Risk of Dust Impacts Prior to Mitigation

A summary of the potential risk of dust impacts, based on the low sensitivity of the local area to human health impacts and dust soiling impacts, is presented in Table 5.3.

Table 5.3: Risk of Dust Impacts Prior to Mitigation

Source	Emission Magnitude	Human Health Risk	Dust Soiling Risk
Demolition	Medium	Low	Low
Earthworks	Large	Low	Low
Construction	Medium	Low	Low
Trackout	Small	Low	Negligible

Recommended dust mitigation measures are presented in Section 7.

6 Air Quality Neutral Assessment

An air quality neutral assessment has been undertaken in accordance with the London Plan Air Quality Neutral Guidance[23].

Benchmarks have been developed for buildings and transport-related emissions, which are dependent on the location of the site and the proposed land-use. Developers are required to calculate building-related emissions and the annual trip generation associated with the development for comparison with the benchmarks. Where the benchmarks are exceeded, damage costs associated with the excess emissions are calculated, which may be off-set through appropriate mitigation measures or a financial contribution.

6.1 Transport Emissions

The Transport Emission Benchmarks (TEB) only estimates "*car or light van trips undertaken directly by the development occupiers (residents, businesses etc and their staff / customers)*" and doesn't include 'operational' trips.

The proposed development is expected to generate 39 private vehicle trips (staff commute) on the local road network per day. The benchmarked trip rate, using the TEB for 'industrial' uses in Outer London, is shown in 6.1.

Table 6.1: Benchmarked Trip Rate

	GIA (m^2)	TEB (trips/m^2/yr)	Trip Rate (trips/yr)
Benchmarked	1,367	6.5	8,886

The annual trip generation for the proposed development is 14,235, which is above the benchmarked trip rate. **The proposed development is therefore not Air Quality Neutral with respect to transport related emissions.**

6.2 Building Emissions

The energy strategy for the proposed development is 100% electric (ASHP, PV and VRF). **The proposed development is therefore Air Quality Neutral with respect to building-related emissions.**

[23] London Plan Guidance Air Quality Neutral, GLA, February 2023

7 Mitigation

7.1 Construction Phase

The risk of impacts, prior to mitigation has been assessed as 'low', during demolition, earthworks and construction, and 'negligible' from trackout.

In accordance with the GLA guidance, the 'highly recommended' mitigation measures detailed in Table 8.1 should be included in CEMP and implemented on site. The 'desirable' measures should also be considered for inclusion.

The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

Table 8.1: Risk of Dust Impacts Prior to Mitigation

Area	Measure	Highly Recommended	Desirable
Site management	Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary.	✓	
	Display the head or regional office contact information.	✓	
	Record and respond to all dust and air quality pollutant emissions complaints.	✓	
	Make a complaints log available to the local authority when asked.	✓	
	Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.	✓	
	Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.	✓	
	Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and 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 dust activities or the site boundary that are, at least, as high as any stockpiles on site.	✓	
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.		✓
	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.		✓
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 correct 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 possible.	✓	
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	✓	
	Ensure vehicles arriving and leaving the site are securely covered to prevent escape of materials during transport.	✓	
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 mitigation (using recycled water where possible).	✓	
	Use enclosed chutes, conveyors and covered skips.	✓	
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	✓	
Waste management	Reuse and recycle waste to reduce dust from waste materials	✓	
	Avoid bonfires and burning of waste materials.	✓	
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).		✓

	Ensure water suppression is used during demolition operations.	✓	
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	✓	
	Bag and remove any biological debris or damp down such material before demolition.	✓	
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		✓

7.2 Operational Phase

The proposed development has been designed to encourage sustainable transport and includes cycle storage, in accordance with the requirements of the London Plan.

Local air quality monitoring data indicates that existing pollutant concentrations at the proposed development are well within the short-term air quality standards for the protection of health. Since ongoing improvements to air quality are expected with the expansion of the ULEZ and the increased uptake of low emission vehicles, future pollutant concentrations at the proposed development are anticipated to remain within the air quality standards. On-site mitigation is therefore not required to protect future occupants from poor air quality.

8 Summary and Conclusions

An air quality impact assessment has been carried out to assess both construction and operational impacts associated with the proposed development.

An assessment of the potential impacts during the construction phase has been carried out in accordance with the GLA Construction Dust guidance; this has shown that releases of dust and PM_{10} are likely to occur during site activities. The risk of dust soiling and health impacts at neighbouring properties has been assessed as low. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM_{10} releases will be effectively minimised, and **the residual dust impacts are expected to be negligible**.

Traffic generated by the site during the construction phase will be minimal and will not significantly affect local air quality. During the operational phase the proposed development is expected to generate 67 vehicle movements per day. In accordance with the IAQM/EPUK screening criteria **the impact of the additional traffic emissions on local air quality is expected to be negligible**.

A review of local air quality monitoring data has been undertaken to determine whether future users of the proposed development will be exposed to poor air quality. The proposed development is a commercial scheme and therefore there will be no long-term exposure. The measured NO_2 and PM_{10} concentrations in the area are well below the short-term air quality standards and therefore **the proposed development will not introduce new exposure to poor air quality**.

Based on the results of the assessment, air quality is not considered a constraint to the development of the site, as proposed.

Appendix A – GLA Construction Dust Methodology

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Table A1: Receptor Sensitivity

Sensitivity	Human Health	Dust Soiling	Ecological
High	• Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM_{10} [i] • Examples include residential dwellings, hospitals, schools and residential care homes.	• Regular exposure • High level of amenity expected. • Appearance, aesthetics or value of the property would be affected by dust soiling. • Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	• Nationally or Internationally designated site with dust sensitive features [ii] • Locations with vascular species [iii]
Medium	• Locations where workers are exposed over a time period relevant to the air quality objectives for PM_{10} [i] • Examples include office and shop workers [iv]	• Short-term exposure • Moderate level of amenity expected • Possible diminished appearance or aesthetics of property due to dust soiling • Examples include parks and places of work	• Nationally designated site with dust sensitive features [ii] • Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	• Transient human exposure • Examples include public footpaths, playing fields, parks and shopping streets	• Transient exposure • Enjoyment of amenity not expected. • Appearance and aesthetics of property unaffected • Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	• Locally designated site with dust sensitive features [iv]

i. In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day.
ii. Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).
iii. Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.
iv. Does not include workers exposure to PM10 as protection is covered by Health and Safety at Work legislation.
v. Except commercially sensitive horticulture.

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM_{10} concentrations in the area.

Tables A2 and A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Sensitivity of Area	**Number of Receptors**	**Distance from the Source**			
		<20m	**<50m**	**<100m**	**<350m**
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3: Sensitivity of the Area to Health Impacts from Dust

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

Table A4: Sensitivity of the Area to Ecological Impacts from Dust

Receptor Sensitivity	Distance from the Source	
	<20m	<50m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Table A5: Dust Emission Magnitude Criteria

Dust Source	Large	Medium	Small
Demolition	• Total building volume >50,000m^3 • Potentially dusty material (e.g., concrete) • Onsite crushing and screening • Demolition activities >20m above ground level.	• Total building volume 20,000 - 50,000m^3 • Potentially dusty material • Demolition activities 10 - 20m above ground level.	• Total building volume <20,000m^3 • Construction material with low potential for dust release • Demolition activities <10m above ground level • Demolition during wetter months

Earthworks	• Total site area >10,000m^2 • Potentially dusty soil type (e.g., clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8m in height • Total material moved >100,000 tonnes	• Total site area 2,500 - 10,000m^2 • Moderately dusty soil type (e.g., silt) • 10 heavy earth moving vehicles active at any one time • Formation of bunds 4 - 8m in height • Total material moved 20,000 - 100,000 tonnes	• Total site area <2,500m^2 • Soil type with large grain size (e.g., sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height • Total material moved <20,000 tonnes • Earthworks during wetter months
Construction	• Total building volume >100,000m^3 • On site concrete batching • Sandblasting	• Total building volume 25,000 - 100,000m^3 • Potentially dusty construction material (e.g., concrete) • On site concrete batching	• Total building volume <25,000m^3 • Material with low potential for dust release (e.g., metal cladding or timber)
Trackout	• >50 HGV movements in any one day [i] • Potentially dusty surface material (e.g., high clay content) • Unpaved road length >100m	• 10 - 50 HGV movements in any one day [i] • Moderately dusty surface material (e.g., silt) • Unpaved road length 50 - 100m	• <10 HGV movements in any one day [i] • Surface material with low potential for dust release • Unpaved road length <50m

i. HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes.

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6, A7 and A8.

Table A6: Risk of Dust Impacts from Demolition, Earthworks and Construction

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

Table A7: Risk of Dust Impacts from Earthworks and Construction

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

Table A8: Risk of Dust Impacts from Trackout

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