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AIR QUALITY ASSESSMENT

**152 – 154 UXBRIDGE ROAD
HAYES
UB4 0JH**

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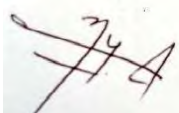
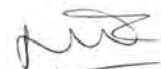
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152-154 UXBRIDGE ROAD, UXBRIDGE UB4 0JH

AIR QUALITY ASSESSMENT

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1 INTRODUCTION

1.1.1 By instruction from Reports 4 Planning, NoiseAir Limited was commissioned to undertake an Air Quality Assessment (AQA) in support of a mixed-use development at 152-154 Uxbridge Road, Uxbridge UB4 0JH.

1.1.2 The proposals may result in exposure of future residents to poor air quality. As such, an AQA was undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and identify any constraints to the allocation.

1.2 Site Location and Context

1.2.1 The site is located at 152-154 Uxbridge Road, Uxbridge, London at approximate National Grid Reference (NGR): 511412, 180805. **Figure 1** details the location of the site.



Figure 1: Site Location

- 1.2.2 The proposal comprises of the demolition of part of the existing parade building and the erection of a 3-storey attached building comprising a retail unit on the ground floor fronting onto Uxbridge Road and a total of nine residential units above and to the rear fronting onto Brookside Road. The ground floor comprises a retail unit of 220 m² area with servicing and car parking behind with a 2-bedroom, 4-person unit to the rear. The floors above would each comprise 2 x 2 bedroom, 4 person and 2 x 3 bedroom, 5 person units with private balcony/amenity space. The roof comprises of two separate communal amenity areas, each 103 m² in area. The proposed site layout is shown in **Figure 2**.



Figure 2: The site layout (Ground floor)

- 1.2.1 The proposed development lies within the jurisdiction of London Borough of Hillingdon (LBH). The site is located at Uxbridge Road (A4020), close to a busy junction of Springfield Road and Brookside Road, bounded by shops, residential properties, commercial and industrial units. The proposed site is situated approximately 1.5 km from a railway to the south, and approximately 5 km from Heathrow Airport to the southwest.
- 1.2.2 There is the potential for elevated pollutant levels at the site and associated exposure of proposed residents to poor air quality. An Air Quality Assessment has therefore been undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and identify any constraints to the allocation.

2 LEGISLATION AND POLICY

2.1 Legislation

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

- Nitrogen dioxide (NO₂);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- Particulate matter with an aerodynamic diameter of less than 2.5µm;
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values have also been provided for several additional pollutants.

2.1.3 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

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

Table 1: Air Quality Objectives		
Pollutant	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

2.1.5 **Table 2** summarises the advice provided in DEFRA guidance² on where the AQOs for pollutants considered within this report apply.

¹ The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

² Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Table 2: Examples of Where the Air Quality Objectives Apply		
Pollutant	Objective Should Apply At	Objective Should Not Apply At
Annual Mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour Mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

2.2 Local Air Quality Management

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

2.3 Dust

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

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

- 2.3.2 Enforcement of the Act in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists or is likely to happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4 National Planning Policy Framework (NPPF)

- 2.4.1 The revised National Planning Policy Framework³ was published in February 2019 and having been revised several times since, with the latest published in 2021. NPPF sets out the Government's Planning policies for England and how these are expected to be applied.

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

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

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

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

³ NPPF, Ministry of Housing, Communities and Local Government, 2019.

[...]

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

[...]"

- 2.4.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clear 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 an Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

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

2.5 Planning Practice Guidance

- 2.5.1 The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?

⁴ <https://www.gov.uk/guidance/air-quality--3>.

5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

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

2.6 Local Planning Policy

The London Plan

2.6.1 According to The Greater London Authority's (GLA's) policy, the Mayor of London is required to publish and review a Spatial Development Strategy (SDS), which is known as the London Plan. The London Plan 2021⁵ is the overall strategic plan for London's growth in a sustainable way which runs from 2019 to 2041. It sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. It has been stated that:

"The London Plan is legally part of each of London's Local Planning Authorities' Development Plan and must be taken into account when planning decisions are taken in any part of Greater London."

2.6.2 The GLA has published supplementary planning guidance (SPG) on the Control of Dust and Emissions from Construction and Demolition⁶ to reduce pollutants emissions including dust, PM₁₀ and PM_{2.5} from construction and demolition activities in London, and to reduce NO_x emissions from construction and demolition machinery. The SPG outlines guidance on methodology for assessing the air quality impacts of construction and demolition in London and determine the mitigation measures that will need to be applied to protect human health and the environment.

2.6.3 The London Local Plan identified the following core policy of relevance to air quality:

"Policy SI 1 Improving air quality

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

⁵ Mayor of London: The London Plan: The Spatial Development Strategy For Greater London, March 2021
⁶ The Control of Dust and Emissions from Construction and Demolition, SPG, July 2014

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*

[...]

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:

[...]

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

Sustainable Design and Construction Supplementary Planning Guidance

2.6.4 The Sustainable Design and Construction Supplementary Planning Guidance (SPG)⁵ was published by the GLA in April 2014. The document aims to support developers, local planning authorities and neighbourhoods to achieve sustainable development, as well as providing guidance on how to achieve the London Plan objectives effectively.

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

- Assessment requirements;
- Construction and demolition;
- Design and occupation;

-
- Air Quality Neutral policy for buildings and transport, and,
 - Emissions standards for combustion plant.

2.6.6 These key areas were taken into consideration during the undertaking of this assessment.

London Borough of Hillingdon

2.6.7 The Hillingdon Local Plan: Part 17 was adopted in November 2012, and is the key strategic planning document for Hillingdon, setting out a long-term spatial vision, and a set of strategic objectives and policies for the future development in the borough for a period extending from 2012 to 2026.

2.6.8 The Development Management Policies document forms part of Hillingdon's Local Plan Part 2⁸ and was adopted in January 2020, it sets out detailed policies that will form the basis of the council's decisions on individual planning applications.

2.6.9 A review of the Local Plan identified the following policy of relevance to the assessment

"Policy BE1: Built Environment

The Council will require all new development to improve and maintain the quality of the built environment in order to create successful and sustainable neighbourhoods, where people enjoy living and working and that serve the long-term needs of all residents. All new developments should:

[...]

10. Maximise the opportunities for all new homes to contribute to tackling and adapting to climate change and reducing emissions of local air quality pollutants. The Council will require all new development to achieve reductions in carbon dioxide emission in line with the London Plan targets through energy efficient design and effective use of low and zero carbon technologies. Where the required reduction from on-site renewable energy is not feasible within major developments, contributions off-site will be sought. The Council will seek to merge a suite of sustainable design goals, such as the use of SUDS, water efficiency, lifetime homes, and energy efficiency into a requirement measured against the Code for Sustainable Homes and BREEAM. These will be set out within the Hillingdon Local Plan: Part 2- Development Management Policies Local

⁷ A vision for 2026, Local Plan: Part 1-Strategic Policies, Adopted November 2012

⁸ London Borough of Hillingdon, Local Plan: Part 2- Development Management Policies, Adopted 16 January 2020

Development Document (LDD). All developments should be designed to make the most efficient use of natural resources whilst safeguarding historic assets, their settings and local amenity and include sustainable design and construction techniques to increase the re-use and recycling of construction, demolition and excavation waste and reduce the amount disposed to landfill; 7. Minimise the use of natural resources and contribute to a reduction in carbon emissions by re-using existing resources, maximising energy efficiency, minimising water use, and reducing the production of waste, including through sustainable construction methods. Encourage renewable energy/fuel production whilst ensuring that adverse impacts are addressed, including on landscape, wildlife, heritage assets and amenity.

[...]

“Policy EM1: Climate Change Adaptation and Mitigation

The Council will ensure that climate change mitigation is addressed at every stage of the development process by:

[...]

5. Promoting the use of decentralised energy within large scale development whilst improving local air quality levels.

6. Targeting areas with high carbon emissions for additional reductions through low carbon strategies. These strategies will also have an objective to minimise other pollutants that impact on local air quality. Targeting areas of poor air quality for additional emissions reductions.

[...]

“Policy EM8: Land, Water, Air and Noise

Air Quality All development should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors. All major development within the Air Quality Management Area (AQMA) should demonstrate air quality neutrality (no worsening of impacts) where appropriate; actively contribute to the promotion of sustainable transport measures such as vehicle charging points and the increased provision for vehicles with cleaner transport fuels; deliver increased planting through soft landscaping and living walls and roofs; and provide a management plan for ensuring air quality impacts can be kept to a minimum. The Council seeks to reduce the levels of

pollutants referred to in the Government's National Air Quality Strategy and will have regard to the Mayor's Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Actions plans, in particular where Air Quality Management Areas have been designated. The Council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major development in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements."

"Policy DMEI 14: Air Quality

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 improvement of air quality, especially within the Air Quality Management Area."

Air Quality Focus Areas

- 2.6.10 According to the London Atmospheric Emissions Inventory (LAEI), 2016, there are 187 Air Quality Focus Areas across London where the EU annual limit value for NO₂ was exceeded and there was high human exposure. They are also areas where the GLA and Transport for London (TfL) will focus actions to improve air quality. The proposed development is located within the Ossie Garvin Air Quality Focus Area.

Air Quality and Planning Guidance⁹

- 2.6.11 This guidance is aimed at developers, their consultants and local authorities. It provides technical advice on how to deal with planning applications that could have an impact on air quality. This guidance has been produced by the APPLE (Air Pollution Planning and the

⁹ London Councils; Air Quality and Planning Guidance: Revised version- January 2007.

Local Environment) working group, helps to reduce exposure to air pollution across the whole of London.

- 2.6.12 The air quality impact assessments have to be undertaken to the satisfaction of the local authority, by including all required information and mitigation measures as outlined by Air Quality and Planning Guidance.

Air Quality Action Plan (AQAP)

- 2.6.13 Local authorities are required to periodically review and assess the current and future quality of air in their areas. Where it is determined that an air quality objective is not likely to be met, the authority must designate an Air Quality Management Area (AQMA) and produce an Air Quality Action Plan (AQAP).

- 2.6.14 The objectives of the Hillingdon AQAP¹⁰ are to:

- a) improve the areas of poorer air quality as soon as possible.*
- b) to continue to improve air quality across the borough and reduce public exposure to air pollution, especially for vulnerable groups within our communities such as the young, the old and those already suffering with associated respiratory illnesses.*

- 2.6.15 The actions and measures included in the AQAP have been developed along a series of 25 actions under the following 'Themes':

- *Monitoring and other core statutory duties*
- *Emissions from developments & buildings*
- *Public health and awareness raising*
- *Delivery servicing and freight*
- *Borough fleet actions*
- *Localised solutions*
- *Cleaner transport*

- 2.6.16 The above policies and guidance have been considered as appropriate throughout the undertaking of the assessment.

¹⁰ The London Borough of Hillingdon; Air Quality Action Plan, 2019-2024- May 2019

3 BASELINE

3.1 Introduction

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

3.2 Local Air Quality Management

- 3.2.1 As required by the Environment Act (1995), LBH has undertaken Review and Assessment of air quality within their area of jurisdiction. According to the Annual Status Report (ASR)¹¹ the annual mean concentrations of NO₂ were above the AQO in parts of the borough. As such, an AQMA was declared in Hillingdon in 2003 which covers the southern half of the Borough. The proposed development site falls within the AQMA.
- 3.2.2 The recent ASR has indicated a slight improvement in annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} over the last 10 years due to actions taken by Hillingdon through its Air Quality Action Plan (AQAP), actions by the Greater London Authority (GLA), and legislation at UK and European levels to reduce emissions.

3.3 Air Quality Monitoring

- 3.3.1 Monitoring of pollutant concentrations is undertaken by LBH throughout their area of jurisdiction. A review of recent ASR, 2020 indicates that LBH has operated 11 automatic and 55 non-automatic monitoring sites during 2019.
- 3.3.2 Recent NO₂ results recorded by automatic monitoring stations are shown in **Table 3**. The station is situated approximately 2 km from the site. Exceedance shown in **Bold**.

Table 3: Automatic monitoring results - NO ₂					
Monitoring Site		Road Type	Monitored NO ₂ Concentration (µg/m ³)		
			2017	2018	2019
HILL5	Hillingdon Hayes	Roadside	47.0	43.0	37.5

- 3.3.3 The recent NO₂ results recorded by non- automatic monitoring sites in the vicinity of the development are provided in **Table 4**.

Table 4: Non-automatic monitoring results - NO ₂		
Monitoring Site	Road Type	Monitored NO ₂ Concentration (µg/m ³)

¹¹ ASR, London Borough of Hillingdon, May 2020

Table 4: Non-automatic monitoring results - NO₂

			2017	2018	2019
HILL17	9 Silverdale Gardens, Hayes	Background	32.7	31.0	31.6
HILL27	Botwell House RC Primary School	Roadside	33.8	32.5	33.2
HILL31	On white lamp-post	Background	-	-	32.5
HD208	Side of 50 St. Christopher's Drive	Background	27.3	30.8	26.5
HD209	29 Pendula Drive, Hayes Lamp	Background	32.1	29.0	24.1
HILL07	Harold Avenue	Roadside	43.3	37.7	36.9

3.3.4 As shown in **Table 4**, annual mean NO₂ concentrations were below the AQO of 40 µg/m³ at all monitoring stations (aside from Harold Avenue in 2017) during recent years.

3.3.5 **Figure 3** details the monitoring locations.

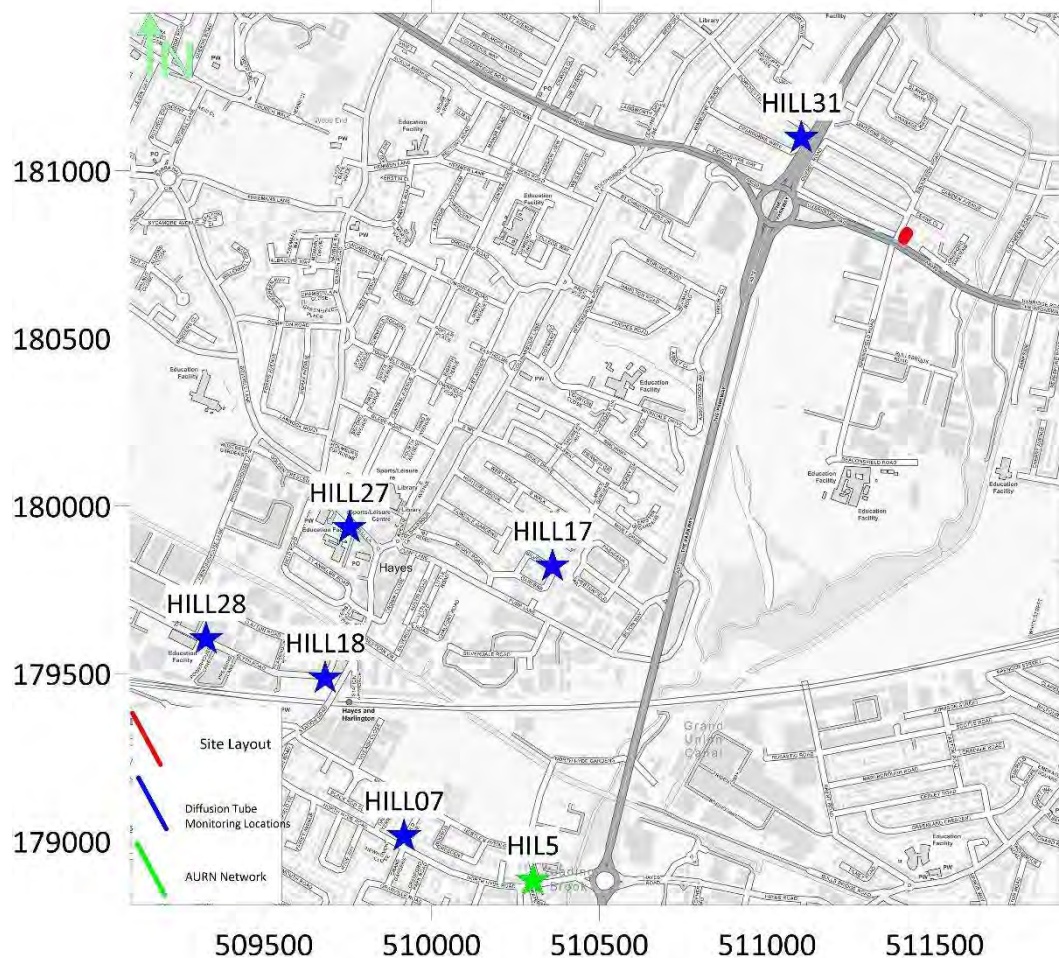


Figure 3: Automatic and Non-Automatic Monitoring Locations

3.4 Background Pollutant Concentrations

- 3.4.1 Predictions of background pollutant concentrations on a 1 km-by-1 km basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed site is located in grid square 511500, 180500. Data for this location was downloaded from the DEFRA website¹² and is summarised in **Table 5**.

Table 5: Background Pollutant Concentrations			
Pollutant	Predicted Background Pollutant Concentration (µg/m ³)		
	2019	2021	2023
NO ₂	24.89	22.74	21.29
PM ₁₀	17.96	17.34	16.96

- 3.4.2 As shown in **Table 5**, predicted background NO₂ and PM₁₀ concentrations are below the relevant AQOs at the site. This indicates that in future years Air Quality within these grids is likely to improve and is unlikely to give rise to exhaustive emission levels above the limit value of 40 µg/m³.

¹² <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

4 METHODOLOGY

4.1 Introduction

- 4.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phase, as well as expose future residents to elevated pollution levels. These issues have been assessed in accordance with the following methodology agreed with the Environmental Health Officer (EHO) at LBH via email.

4.2 Construction Phase Assessment

- 4.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'¹³.
- 4.2.2 Activities on the proposed construction site have been divided into four types to reflect their potential impacts. These are:
- Demolition.
 - Earthworks.
 - Construction; and,
 - Trackout.
- 4.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:
- Annoyance due to dust soiling.
 - Harm to ecological receptors; and,
 - The risk of health effects due to a significant increase in exposure to PM₁₀.
- 4.2.4 The assessment steps are detailed below.

Step 1

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

¹³ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

ecological receptors be identified within 50 m of the site or the construction vehicle route up to 500 m from the site entrance, then the assessment also proceeds to Step 2.

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

Step 2

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

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

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

- 4.2.9 Step 2A defines the potential magnitude of dust emission throughout the construction phase. The relevant criteria are summarised in **Table 6**.

Table 6: Construction Dust - Magnitude of Emission		
Magnitude	Activity	Criteria
Large	Demolition	Total volume of building to be demolished greater than 50,000 m ³ . Potentially dusty material (e.g., concrete). On-site crushing and screening. Demolition activities more than 20m about ground level.
	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). More than 10 heavy earth moving vehicles active at any one time. Formation of bunds greater than 8m in height. More than 100,000 tonnes of material moved.
	Construction	Total building volume greater than 100,000 m ³ . On site concrete batching. Sandblasting.
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day. Potentially dusty surface material (e.g., high clay content). Unpaved road length greater than 10 0m.
Medium	Demolition	Total volume of building to be demolished between 20,000 m ³ and 50,000 m ³ . Potentially dusty construction material. Demolition activities 10m to 20m above ground level.

Table 6: Construction Dust - Magnitude of Emission		
Magnitude	Activity	Criteria
	Earthworks	Total site area 2,500m ² to 10,000 m 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.
	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 100 m.
Small	Demolition	Total volume of building to be demolished less than 20,000 m ³ . Construction material with low potential for dust release (e.g., metal cladding or timber). Demolition activities less than 10m above ground and during wetter months.
	Earthworks	Total site area less than 2,500 m 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 25,000 m 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 50 m.

4.2.10 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in **Table 7**.

Table 7: Examples of Factors Defining Sensitivity of an Area		
Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	Users expect high levels of amenity. High aesthetic or value property. People expected to be present continuously for extended periods of time. Locations where members of the public are exposed over a time period relevant to the AQO for PM ₁₀ . e.g., residential properties, hospitals, schools and residential care homes.	Internationally or nationally designated site e.g., Special Area of Conservation.

Table 7: Examples of Factors Defining Sensitivity of an Area		
Receptor 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, shopping streets, playing fields, farmland, short term car parks and roads.	Locally designated site e.g., Local Nature Reserve.

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

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

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

4.2.13 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in **Table 8**.

Table 8: Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

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

4.2.14 **Table 9** outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 9: Construction Dust - Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Background Annual Mean PM ₁₀ Conc.	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 350
High	Greater than 32 µg/m ³	More than 1	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 – 32 µg/m ³	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24 µg/m ³	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32 µg/m ³	More than 100	High	Medium	Low	Low
		10 - 100	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 – 32 µg/m ³	More than 100	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	Less than 24 µg/m ³	More than 100	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	More than 1	High	Medium	Low	Low

4.2.15 **Table 10** outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 10: Construction Dust - Sensitivity of the Area to Ecological Impacts		
Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

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

4.2.17 **Table 11** outlines the risk category from demolition activities.

Table 11: Dust Risk Category from Demolition Activities			
Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Low	Low	Negligible

4.2.18 **Table 12** outlines the risk category from earthworks and construction activities.

Table 12: Dust Risk Category from Earthworks and Construction Activities			
Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

4.2.19 **Table 13** outlines the risk category from trackout activities.

Table 13: Dust Risk Category from Trackout Activities			
Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

Step 3

- 4.2.20 Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance¹⁴ 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

- 4.2.21 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 impact will normally be **not significant**.

4.3 Operational Phase Assessment

Potential Future Exposure

- 4.3.1 The development has the potential to expose future residents to any existing air quality issues. Dispersion modelling was therefore undertaken in order to predict NO₂ and PM₁₀ concentrations across the site using the ADMS-Roads dispersion model (version 5.0.0.1).
- 4.3.2 ADMS-Roads were developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.
- 4.3.3 The model required input data that details the following parameters:
- Assessment area;
 - Traffic flow data;
 - Vehicle emission factors;
 - Spatial co-ordinates of emissions;
 - Street width;
 - Meteorological data;
 - Roughness length (z₀); and,
 - Monin-Obukhov length.

¹⁴ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

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

5 IMPACT EVALUATION

5.1 Introduction

- 5.1.1 There is the potential for air quality impacts as a result of fugitive dust emissions during construction and exhaust emissions from vehicles travelling to and from the site during operation. These are assessed in the following Sections.

5.2 Construction Phase

- 5.2.1 The undertaking of activities such as demolition, 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 roads and highway surfaces.
- 5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 5.2.3 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 350 m from the development boundary as illustrated in **Figure 4** and are summarised in **Table 14**.

Table 14: Demolition, Earthworks and Construction Dust Sensitive Receptors		
Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10- 100	0
Up to 50	More than 100	0
Up to 100	More than 100	-
Up to 350	More than 100	-

- 5.2.4 Receptors sensitive to potential dust impacts from the trackout activities were identified from a desk-top study of the area for up to 50 m from the road network and within 500 m of the site access. These are summarised in **Table 15**.

Table 15: Trackout Dust Sensitive Receptors		
Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	More than 100	0

Table 15: Trackout Dust Sensitive Receptors

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

5.2.5 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.

5.2.6 **Figure 4** illustrates the buffer zones for Construction Phase Activities.

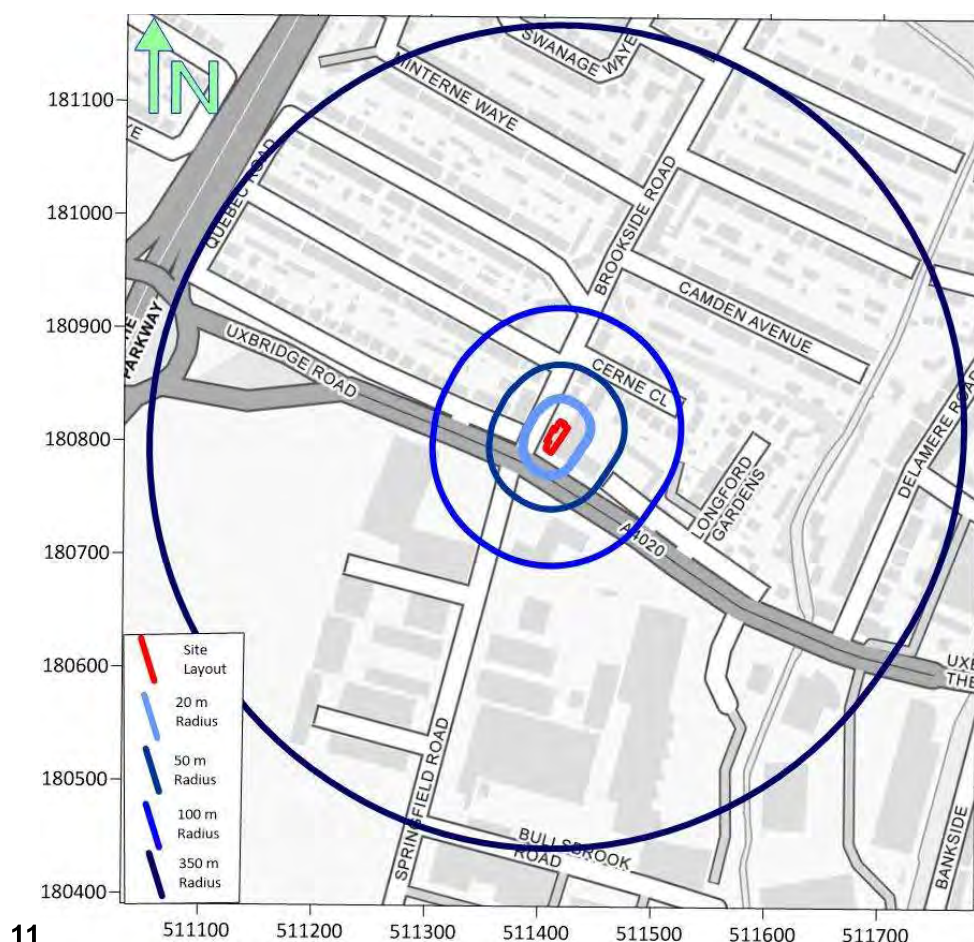


Figure 4: Buffer zones for Construction Phase Activities

5.2.7 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in **Table 16**.

Table 16: Additional Area Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
Whether there is any history of dust generating activities in the area.	The desk top study indicates dust generating activities in the local area.