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Central Midlands Estates Limited

LAND OFF WORKHOUSE LANE, BURBAGE

Air Quality Assessment



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Air Quality Assessment

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CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. LEGISLATION, POLICY & GUIDANCE	3
2.1. EUROPEAN & NATIONAL LEGISLATION	3
2.2. LOCAL AIR QUALITY MANAGEMENT	3
2.3. RELEVANT UK AIR QUALITY OBJECTIVES & EU LIMIT VALUES	4
2.4. RELEVANT PLANNING POLICY CONTEXT	5
3. ASSESSMENT METHODOLOGY	8
3.1. KEY DATA & RESOURCES	8
3.2. LOCAL AUTHORITY CONSULTATION	8
3.3. BASELINE AIR QUALITY REVIEW	9
3.4. CONSTRUCTION PHASE ASSESSMENT	9
3.5. OPERATIONAL PHASE ASSESSMENT	10
3.6. SENSITIVE RECEPTORS	10
3.7. SIGNIFICANCE CRITERIA	11
4. BASELINE AIR QUALITY REVIEW	13
4.1. REVIEW & ASSESSMENT OF AIR QUALITY	13
4.2. LOCAL EMISSION SOURCES	13
4.3. BACKGROUND AIR QUALITY DATA	13
4.4. AIR QUALITY MONITORING DATA	13
4.5. SUMMARY	14
5. ASSESSMENT OF IMPACTS	15
5.1. CONSTRUCTION PHASE	15

5.2.	OPERATION PHASE	17
6.	MITIGATION & RESIDUAL EFFECTS	20
6.1.	CONSTRUCTION PHASE	20
6.2.	OPERATIONAL PHASE	23
7.	CONCLUSIONS	24

TABLES

Table 1 – National (England) Air Quality Objectives/EU Limit Values	4
Table 2 – Key Data and Resources	8
Table 3 – Background Concentrations ($\mu\text{g}/\text{m}^3$)	13
Table 4 – HBBC NO ₂ Annual Mean Diffusion Tube Data ($\mu\text{g}/\text{m}^3$)	13
Table 5 - Potential Dust Emission Magnitude	16
Table 6 - Sensitivity of the Study Area	16
Table 7 - Summary Dust Risk Table to Define Site Specific Mitigation	17
Table 8 – Trip Generation for the Proposed Development	17

FIGURES

Figure 1 – Site Location and Local Authority Monitoring	25
Figure 2 – Construction Phase Assessment Buffers	26
Figure 3 – Traffic Links	27

APPENDICES

APPENDIX A - GLOSSARY

APPENDIX B - IAQM CONSTRUCTION ASSESSMENT METHODOLOGY

EXECUTIVE SUMMARY

WSP was commissioned by Central Midlands Estates Limited to undertake an air quality assessment to support the planning application for the proposed residential development located off Workhouse Lane, Burbage. The proposals include the construction of a maximum of 40 residential dwellings.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases, the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed.

The assessment of construction phase impacts associated with fugitive dust and particulate matter (PM₁₀ and PM_{2.5}) emissions has been undertaken with reference to the relevant Institute of Air Quality Management (IAQM) guidance. This identified that there is a **Medium Risk** of dust soiling impacts and a **Low Risk** of adverse health impacts caused by increases in particulate matter concentrations due to construction activities. Through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases on local air quality is considered to be **not significant**.

A qualitative assessment of the potential air quality impacts associated with traffic generated by the operational phase of the Proposed Development has been completed with reference to published methodologies and technical guidance provided by the Department for Environment, Food and Rural Affairs and the IAQM.

For the operational phase, the Proposed Development generated vehicle flows have been assessed against IAQM guidance criteria for the completion of a detailed local air quality assessment. The generated flows were found to be lower than the criteria which infers that local air quality impacts from the Proposed Development will be negligible. Given the relatively low pollution concentrations at and near to the Proposed Development, the potential effect of road vehicle exhaust emissions on local air quality will be **not significant**.

Based on the assessment results, the development proposals comply with national and local policy, in particular HBBC Core Strategy⁵ Spatial Objectives 9, 10 and 12. As such, in terms of air quality and there are unlikely to be air quality constraints relating to the Proposed Development during both the construction and operational phases. The **Application Site is suitable for the proposed residential land use within the context of local air quality**.

1. INTRODUCTION

- 1.1.1. WSP was commissioned by Central Midlands Estate Limited to carry out an assessment of the potential air quality impacts arising from a proposed residential development, located off Workhouse Lane, Burbage (hereafter referred to as the 'Proposed Development').
- 1.1.2. The Proposed Development lies within the administrative boundary of Hinckley & Bosworth Borough Council (HBBC) and is bordered to the north by residential dwellings and to the south, east and west by open fields.
- 1.1.3. The Proposed Development involves the construction of up to 40 residential dwellings. A site location plan is shown in **Figure 1**.
- 1.1.4. This report presents the approach and outcomes of the air quality assessment relating to both the construction and operational phases of the Proposed Development.
- 1.1.5. This report is supported by two technical appendices:
 - Appendix A – Glossary of Terms; and
 - Appendix B – IAQM Construction Assessment Methodology.

2. LEGISLATION, POLICY & GUIDANCE

2.1. EUROPEAN & NATIONAL LEGISLATION

EUROPEAN AMBIENT AIR QUALITY DIRECTIVE 2008

- 2.1.1. The 2008 Ambient Air Quality Directive (2008/50/EC)¹ is the primary driver for managing and improving air quality for each member state of the European Union (EU). The Directive sets legally binding limit values for concentrations in ambient (outdoor) air of pollutants that can impact public health, including nitrogen dioxide (NO₂) and fine particulates (PM₁₀, PM_{2.5}).
- 2.1.2. EU limit values are set for individual pollutants and comprise a concentration value, an averaging time over which it is to be measured, the number of allowed exceedances per year (if any), and a date by which it must be achieved. Some pollutants (e.g. PM₁₀) have more than one limit value covering different averaging times.

AIR QUALITY STANDARDS REGULATIONS (ENGLAND) 2016

- 2.1.3. The EU Directive was transposed into English law via the Air Quality Standards Regulations 2010, as amended in 2016². Equivalent regulations exist in the other devolved administrations; Scotland, Wales and Northern Ireland.
- 2.1.4. The responsibility for meeting the prescribed air quality limit values is devolved to the national administrations. In England, the Secretary of State for Environment, Food, and Rural Affairs has responsibility for adhering to the limit values, whilst the Department for Environment, Food and Rural Affairs (Defra) co-ordinate the assessment of compliance with limit values and development of Air Quality Plans for the UK (last updated in 2017).

2.2. LOCAL AIR QUALITY MANAGEMENT

- 2.2.1. Under the Environment Act 1995, the UK Government and the devolved administrations are required to prepare and publish a national Air Quality Strategy. The most recent version of the Strategy was published in 2007³ and establishes the UK's air quality standards and Objectives, in addition to providing guidance, where needed, on air quality action planning at national, regional and local scales.
- 2.2.2. Air quality standards are concentrations recorded over a given averaging period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and the environment. An Objective is the target date on which exceedances of a standard must not exceed a prescribed number.

¹ European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe

² Her majesty's Stationary Office (HMSO) (2016) The Air Quality Standards (Amendment) Regulations 2016 - Statutory Instrument 2016 No. 1184

³ Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

- 2.2.3. Local authorities in England are required to review air quality within their jurisdiction, under Part IV of the Environment Act 1995, and designate air quality management areas (AQMA) where air quality standards are not being met and/or where air quality improvement is needed. Local authorities are then required to work towards achieving the national Air Quality Strategy Objectives and standards as prescribed in the Air Quality Standards Regulations 2016.
- 2.2.4. An air quality action plan must be established by the local authority outlining the measures to improve air quality within the designated AQMA. The purpose of these action plans is to contribute to the achievement of air quality limit values at the local level.

2.3. RELEVANT UK AIR QUALITY OBJECTIVES & EU LIMIT VALUES

- 2.3.1. The national air quality Objectives and EU limit values for which the UK must comply, for traffic-related pollutants NO₂, PM₁₀, and PM_{2.5}, are presented in **Table 1**.
- 2.3.2. The respective UK Objective and EU limit value concentration standards and averaging periods are numerically identical for each pollutant, based on air quality standards set for the protection of human health.

Table 1 – National (England) Air Quality Objectives/EU Limit Values

Pollutant	Applies to	Objective	Measured as	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO ₂)	UK	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005	200 µg/m ³ not to be exceeded more than 18 times a year	01.01.2010
	UK	40 µg/m ³	annual mean	31.12.2005	40 µg/m ³	01.01.2010
Particulate Matter (PM ₁₀) (gravimetric) ^A	UK (except Scotland)	40 µg/m ³	annual mean	31.12.2004	40 µg/m	01.01.2005
	UK (except Scotland)	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004	50 µg/m ³ not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter (PM _{2.5})	UK (except Scotland)	25 µg/m ³	annual mean	2020	Target value 25 µg/m ³	2010

ENVIRONMENTAL PROTECTION ACT 1990 – CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

- 2.3.3. Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

“Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”; and
“Any accumulation or deposit which is prejudicial to health or a nuisance”

- 2.3.4. Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

- 2.3.5. There are no statutory limit values for dust deposition above which ‘nuisance’ is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

2.4. RELEVANT PLANNING POLICY CONTEXT

NATIONAL PLANNING POLICY FRAMEWORK

- 2.4.1. The Government’s overall planning policies for England are described in the National Planning Policy Framework⁴. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

“... meeting the needs of the present without compromising the ability of future generations to meet their own needs.”

- 2.4.2. One of the three overarching Objectives of the NPPF is that planning should *“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. In relation to air quality, the following paragraphs in the document are relevant:

- Paragraph 54, which states *“Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.”*
- Paragraph 103, which states *“Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.”*
- Paragraph 170, which states *“Planning policies and decisions should contribute to and enhance the natural and local environment by: ...e) preventing new and existing development from*

⁴ Ministry of Housing, Communities and Local Government (2018). National Planning Policy Framework.

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, taking into account relevant information such as river basin management plans.”

- Paragraph 180, which states *“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”*
- Paragraph 181, which states *“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.”*
- Paragraph 183, which states *“The focus of planning policies and decisions should be on whether Proposed Development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”*

LOCAL PLANNING POLICY

HBBC Core Strategy

- 2.4.4. The Hinckley & Bosworth Core Strategy⁵ is the boroughs current primary planning document. Paragraph 3.30 of the Core Strategy states that: *“Pollution of air or water is not a major issue for Hinckley & Bosworth compared to some other areas.”* As such, the Core Strategy does not contain any air quality specific qualities. However, the Core Strategy does contain some more general environmental policies which are detailed below:

“Spatial Objective 9: Identity, Distinctiveness and Quality of Design

To ensure development contributes to the local distinctiveness of the borough, and enhances both settlement identity and the environment through the quality of sustainable design. Design and other measures will be used to develop strong community identities and neighbourhood pride.”

⁵ Hinckley & Bosworth Borough Council. Core Strategy, adopted December 2009

“Spatial Objective 10: Natural Environment and Cultural Assets

To deliver a linked network of green infrastructure, enhancing and protecting the borough’s distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development.”

“Spatial Objective 12: Climate Change and Resource Efficiency

To minimise the impacts of climate change by promoting the prudent use of resources through sustainable patterns of development, investment in green infrastructure, minimising the use of resources and energy, increasing reuse and recycling of natural resources, increasing the use of renewable energy technologies and minimising pollution, including greenhouse gas emissions.”

3. ASSESSMENT METHODOLOGY

3.1. KEY DATA & RESOURCES

- 3.1.1. This section provides details of the data and information supplied for the purposes of undertaking the air quality assessment and describes the adopted methodology for assessing and appraising the potential air quality impacts associated with the Proposed Development.
- 3.1.2. An index of the key data and resources used within the assessment is presented in **Table 2**.

Table 2 – Key Data and Resources

Data/Resource	Summary	Source/Reference
Annual Mean NO ₂ monitoring data	Data obtained for the study area required to facilitate baseline air quality review	HBBC 2018 <i>Air Quality Annual Status Report</i> ⁶
Defra national background pollutant mapping data (base year 2017)	Background 1km x 1 km grid pollutant data obtained for the respective grid squares encompassing the study area	Annual mean data sourced from Defra: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017
Baseline and future years traffic data for all model scenarios	Traffic data provided in appropriate format	Data supplied by project transport consultant (RPS Group) (see Section 5.2)
LAQM Technical Air Quality Guidance	Guidance document, including information on dispersion modelling and model verification / adjustment	Defra (2016) <i>Local Air Quality Management Technical Guidance TG16</i> ⁷
Land Use Planning & Development Control Guidance	Guidance provided by the Institute of Air Quality Management (IAQM) that includes air quality impact descriptor criteria	Document published by IAQM (2017) <i>Land-Use Planning & Development Control: Planning for Air Quality</i> ⁸

3.2. LOCAL AUTHORITY CONSULTATION

- 3.2.1. Consultation⁹ with the HBBC Environmental Health Officer (EHO) was carried out in August 2019 via email correspondence, in which the scope and methodology of the assessment were discussed and agreed.

⁶ Hinckley & Bosworth Borough Council (2018) 2018 Air Quality Annual Status Report, June 2018

⁷ Defra (2016) Local Air Quality Management Technical Guidance LAQM.TG16

⁸ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality

⁹ Email correspondence with HBBC's EHO Giles Rawdon. 16/08/2019

3.3. BASELINE AIR QUALITY REVIEW

- 3.3.1. The 2018 Air Quality Annual Status Report (ASR)⁶ published by HBBC was reviewed to establish baseline air quality conditions within the vicinity of the Proposed Development. This review included the identification of air pollutant monitoring locations near to the Proposed Development and the associated reported levels for the previous five years (2013 – 2017).
- 3.3.2. Background NO₂, PM₁₀ and PM_{2.5} pollutant concentrations corresponding to the 1km² grid squares covering the associated link roads and identified sensitive receptor locations were obtained from Defra's published national pollutant mapping data for use in the air quality assessment.

3.4. CONSTRUCTION PHASE ASSESSMENT

- 3.4.1. Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited close to the source of emission. Dust, therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.
- 3.4.2. The smaller particles of dust (less than 10 µm in aerodynamic diameter) are known as particulate matter (PM₁₀) and represent only a small proportion of total dust released; this includes a finer fraction, known as PM_{2.5} (with an aerodynamic diameter less than 2.5µm). As these particles are at the smaller end of the size range of dust particles, they remain suspended in the atmosphere for a longer period of time than the larger dust particles and can therefore be transported by wind over a wider area. PM₁₀ and PM_{2.5} are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health.
- 3.4.3. However, it is worth noting that, according to the IAQM construction guidance¹⁰, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. PM_{2.5-10}) with just 10-15% expected to comprise PM_{2.5}. The IAQM guidance¹⁰ therefore focusses on PM₁₀ for the purposes of assessment.
- 3.4.4. An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM₁₀ during the construction phase has been undertaken using the relevant assessment methodology published by the IAQM; the available information for the Proposed Development provided by the Client and Project Team; and professional judgement.
- 3.4.5. The IAQM methodology¹⁰ assesses the risk of potential dust and PM₁₀ impacts from four main sources: demolition; earthworks; general construction activities and track-out. It considers the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase

¹⁰ Institute of Air Quality Management (IAQM) (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction

in dust and PM₁₀ levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts.

- 3.4.6. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology¹⁰ is provided in **Appendix B**.
- 3.4.7. During the construction phase of the Proposed Development, there will be additional construction vehicle movements along the road network. However, the frequency of these movements will be temporary and intermittent relative to existing flows on the local road network.
- 3.4.8. Data relating to the number, type and routing of construction vehicles and non-road mobile machinery (NRMM) were not available at the time of assessment, therefore professional judgement was used to qualitatively assess potential local air quality effects associated with emissions from construction vehicles and NRMM.

3.5. OPERATIONAL PHASE ASSESSMENT

- 3.5.1. Potential local air quality impacts associated with the operation of the Proposed Development will predominantly relate to changes in vehicle flows, and thus pollutant emissions, on the local road network, particularly where sensitive receptors (e.g. residential properties) are located adjacent.
- 3.5.2. With respect to potential impacts on local air quality associated with vehicle emissions generated by a new development, the EPUK/IAQM guidance⁸ stipulates a set of criteria that can be used to inform the need for a detailed air quality assessment to be undertaken. These include specific criteria relating to the change in vehicle movements for developments that are not located within an AQMA, such as the Proposed Development site:
 - A change of Light-Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) movements; and/or
 - A change of Heavy-Duty Vehicle (HDV) flows of more than 100 AADT movements.
- 3.5.3. Given the scale of the Proposed Development (maximum 40 residential dwellings) it is expected that the total generated AADT will be below these criteria. As such, it was decided that a dispersion modelling assessment was not required, and a qualitative assessment would be carried out. This approach was agreed with the local council⁹.
- 3.5.4. Further discussions on traffic data are presented in **Section 5.2**. Traffic data was provided by the project transport consultant (RPS Group).

3.6. SENSITIVE RECEPTORS

- 3.6.1. Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development.
- 3.6.2. These will include locations sensitive to an increase in dust deposition and PM₁₀ exposure as a result of on-site construction activities, and locations sensitive to exposure to pollutants emitted from the exhausts of construction and operational vehicles associated with the Proposed Development.

CONSTRUCTION PHASE

- 3.6.3. The IAQM¹⁰ construction phase air quality assessment focusses on the following sensitive locations:

- 'human receptors' within 350 m of the site boundary, or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s); and/or,
- 'ecological receptors' within 50 m of the site boundary, or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

3.6.4. It is within these distances that the impacts of dust soiling and increased particulate matter in ambient air will have the greatest impact on local air quality at sensitive receptors. There were no ecologically sensitive locations identified within 50 m of the Proposed Development boundary or within 50 m of roads used by construction vehicles. Thus these locations were scoped out of the assessment.

OPERATIONAL PHASE

- 3.6.5. Locations that are sensitive to pollutants emitted from vehicles on the local road network will include places where members of the public are likely to be regularly present over the period of time prescribed in the AQS. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 15-minute mean or hourly mean) may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as daily mean or annual mean) may be more appropriate.
- 3.6.6. For the Proposed Development, the potentially sensitive receptor locations will be those residential properties located adjacent to local roads used to access the Proposed Development such as Britannia Road and Workhouse Lane.
- 3.6.7. For ecological receptors, the impact of vehicle emissions at designated sites (SSSIs, SPAs, SACs, Ramsar) within 200 m of an affected road link should be considered within the air quality assessment, as stipulated by guidance¹¹ presented in the Design Manual for Roads and Bridges (DMRB). There are no designated sites within 200 m of the Proposed Development and this was therefore scoped out of the assessment.

3.7. SIGNIFICANCE CRITERIA

CONSTRUCTION PHASE ASSESSMENT

- 3.7.1. The IAQM assessment methodology¹⁰ recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity once appropriate mitigation measures are established. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.
- 3.7.2. For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Proposed Development on local concentrations of NO₂ and particulate matter, the significance of residual effects has been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance⁸.

¹¹ DMRB Volume 11, Section 3, Part 1, HA 207/07, Air Quality. May 2007

OPERATIONAL PHASE ASSESSMENT

- 3.7.3. The EPUK/IAQM Planning Guidance⁸ recommends using impact descriptors to describe the predicted quantitative air quality effects of additional emissions from traffic generated by the Proposed Development.
- 3.7.4. Given a qualitative approach was taken in the operational phase assessment, the EPUK/IAQM guidance⁸ on impact descriptors is not applicable and professional judgement has been applied to determine overall significance of the Proposed Development operation on local air quality.

4. BASELINE AIR QUALITY REVIEW

4.1. REVIEW & ASSESSMENT OF AIR QUALITY

- 4.1.1. HBBC has not designated any Air Quality Management Areas (AQMAs) within their administrative area as a consequence of their local air quality review and assessment work.

4.2. LOCAL EMISSION SOURCES

- 4.2.1. The Proposed Development is located in an area where air quality is mainly influenced by exhaust gas emissions from vehicles using the local road network and the M69 motorway (located approximately 285m south of the Proposed Development).

4.3. BACKGROUND AIR QUALITY DATA

- 4.3.1. Background pollutant concentrations for NO₂, PM₁₀ and PM_{2.5} were obtained from Defra's national background maps for the 1 km x 1 km grid square encompassing the Proposed Development.
- 4.3.2. Data were obtained for the current/baseline year (2019, and anticipated opening year (2024) as summarised in **Table 3**. All of the annual mean background concentrations are well below the relevant Objectives.

Table 3 – Background Concentrations (µg/m³)

Grid Square (centre on O.S. Grid Reference)	NO ₂ (µg/m ³)		PM ₁₀ (µg/m ³)		PM _{2.5} (µg/m ³)	
	2019	2024	2019	2024	2019	2024
444500, 291500	14.6	11.8	15.4	14.6	9.8	9.2
Annual Mean Objective	40 µg/m ³				25 µg/m ³	

4.4. AIR QUALITY MONITORING DATA

LOCAL AUTHORITY MONITORING

- 4.4.1. HBBC does not undertake any continuous automatic monitoring in its jurisdiction. However, the local authority carries out passive diffusion tube monitoring of NO₂ at various locations throughout the borough. Annual mean concentrations of NO₂ for the sites that are located within 3 km of the Proposed Development between 2015 and 2017 are provided in **Table 4**. The locations are illustrated in **Figure 1**.

Table 4 – HBBC NO₂ Annual Mean Diffusion Tube Data (µg/m³)

Site ID	Site Location	Site Type	Distance from Proposed	Annual Mean NO ₂ Concentration

			Development (km)	2015	2016	2017
2	1 Rufford Close	Suburban	1.3	-	28.3	32.2
6	207 Rugby Road	Suburban	1.9	-	22.6	21.6
7	66 London Road	Suburban	2.0	-	24.4	23.6
16	171 Rugby Road	Suburban	2.3	-	26.3	27.6
15	93 Rugby Road	Urban Centre	2.5	-	35.9	35.1
1	Trinity Lane	Urban Centre	2.6	25.9	25.0	21.6

- 4.4.2. The data in **Table 4** show that the Objective for annual mean NO₂ was not exceeded at any monitoring locations identified within 3 km of the Proposed Development between 2015 and 2017.
- 4.4.3. Monitoring site 2 is located closest to the Application Site. The most recent results (2017) from this site report an annual mean NO₂ concentration below the annual mean objective by 19%. However, this site is located near to an A road, unlike the Application Site which is located in a more rural location near minor roads. As such, concentrations at the Application Site are predicted to be lower than those recorded at Site 2.

4.5. SUMMARY

- 4.5.1. The Proposed Development is not located in an AQMA. Monitoring data from **Table 4** indicates that NO₂ concentrations from diffusion tube sites closest to the Proposed Development are all below the annual mean objective.
- 4.5.2. The council does not undertake any PM₁₀ or PM_{2.5} monitoring, however Defra's background pollutant data (**Table 3**) show that concentrations are expected to remain well below their respective annual mean objectives.
- 4.5.3. Overall, existing local air quality at and in proximity to the Proposed Development is considered to be good.

5. ASSESSMENT OF IMPACTS

5.1. CONSTRUCTION PHASE

DUST AND PM₁₀ ARISING FROM ON-SITE ACTIVITIES

- 5.1.1. Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:
- Site clearance and preparation;
 - Preparation of temporary access/egress to the Application Site and haulage routes;
 - Earthworks;
 - Materials handling, storage, stockpiling, spillage and disposal;
 - Movement of vehicles and construction traffic within the Application Site;
 - Use of crushing and screening equipment/plant;
 - Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
 - Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
 - Internal and external finishing and refurbishment; and
 - Site landscaping after completion.
- 5.1.2. The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

ASSESSMENT OF POTENTIAL DUST EMISSION MAGNITUDE

- 5.1.3. The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

- 5.1.4. No demolition activities will occur at the Application Site as part of the construction phase of the Proposed Development. Therefore, consideration of the impact of this source on dust soiling and ambient PM₁₀ is not required.

Earthworks

- 5.1.5. The total area of the Proposed Development is more than 10,000m² however; the total material that will be moved and the amount of earth moving vehicles on site are not yet known. In the absence of detailed information, the dust emission magnitude is conservatively determined based on the size of the Proposed Development only. Therefore, the potential dust emission magnitude is considered to be **large** for earthwork activities.

Construction

- 5.1.6. The total volume of buildings to be constructed on the Application Site will be between the IAQM range of 25,000m³ and 100,000m³ with potentially dusty construction materials being used. Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.

Trackout

- 5.1.7. Information on the number of HDVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. It has been assumed that given the size of the development area there are likely to be between 10 and 50 HDV outward movements in any one day. Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.
- 5.1.8. **Table 5** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	-
Earthworks	Large
Construction Activities	Medium
Trackout	Medium

ASSESSMENT OF SENSITIVITY OF THE STUDY AREA

- 5.1.9. The prevailing wind direction is from the south and southwest. Therefore, receptors located to the north and north-east of the Proposed Development are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase. The land to the northeast and east of the Proposed Development is primarily occupied by residential dwellings.
- 5.1.10. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. There are less than ten high sensitive receptors (residential dwellings) within 20 m of the site boundary. The receptors located within 20m of the Site boundary are primarily located on Frezenberg Close.
- 5.1.11. The areas that are most sensitive to construction dust deposition are highlighted in **Figure 2** which depicts 20 m, 50 m, 100 m and 350 m distance bands (buffer zones) around the Proposed Development.
- 5.1.12. Taking the above into account and following the IAQM assessment methodology¹⁰, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 6**.

Table 6 - Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium	Medium	Medium

Human Health	N/A	Low	Low	Low
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RISK OF IMPACTS

- 5.1.13. The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 7** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 7 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	-	Medium	Medium	Low
Human Health	-	Low	Low	Low

CONSTRUCTION VEHICLES & PLANT

- 5.1.14. The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via Britannia Road/Workhouse Lane. Due to the size of the Proposed Development and nature of construction works; construction traffic volumes will be low within the context of existing traffic flows on these roads.
- 5.1.15. Existing background levels of relevant pollutants (NO₂, PM₁₀ and PM_{2.5}, see **Table 3**) are predicted to be well under the respective annual mean Objectives.
- 5.1.16. Therefore, based on the available information and professional judgement, the local air quality impact associated with emissions from construction vehicles and plant are expected to be **negligible**.

5.2. OPERATION PHASE

IMPACTS OF OPERATIONAL PHASE TRAFFIC EMISSIONS ON LOCAL AIR QUALITY

- 5.2.1. The traffic data relating to local roads associated with the Proposed Development are shown in **Table 8** and **Figure 3**.

Table 8 – Trip Generation for the Proposed Development

ID	Road Link	2019 Baseline		2024 Without Development		2024 With Development		Change in Flows	
		AADT	HDV%	AADT	HDV%	AADT	HDV%	LDV	HDV
1	Coventry Road west of J/W Britannia Road	4,389	1.3%	4,684	1.3%	4,823	1.3%	139	0

2	Windsor Street east of J/W Britannia Road	5,116	1.0%	5,460	1.0%	5,508	1.0%	48	0
3	Windsor Street west of J/W B578	4,299	1.2%	4,587	1.2%	4,587	1.2%	0	0
4	B578 north of J/W Windsor Street	7,983	1.1%	8,520	1.1%	8,829	1.0%	309	0
5	B578 south of J/W Windsor Street	7,549	1.2%	8,053	1.2%	8,362	1.2%	309	0
6	B578 south of Britannia Road	6,433	0.4%	6,866	0.4%	6,944	0.4%	78	0

5.2.2. The Proposed Development is expected to result in an increase of 309 AADT (all LDV) on the B578 (links 4 & 5), equating to a 3.5 - 3.7% increase in total traffic flows on the B578 in 2024. This area is located outside of an AQMA and as such the LDV increase falls below the thresholds given in the EPUK/IAQM⁸ guidance for which a detailed air quality assessment is required (see **Section 3.5**). The Proposed Development is not expected to lead to any increases in HDV flows on the local road network.

5.2.3. Existing and future traffic flows for Britannia Road and Workhouse Lane are not available, however, the trip generation on these roads is expected to be similar to the increases on the B578 (links 4 and 5). Given the relatively good air quality at and in proximity to the Proposed Development (**Section 4**) and the expected low traffic impacts on the local road network, the local air quality impacts associated with the operation of the Proposed Development on existing sensitive receptors on Britannia Road, Workhouse Lane and the wider road network are expected to be **negligible**.

EXPOSURE OF FUTURE RESIDENTS TO POOR AIR QUALITY

5.2.4. Development of the Application Site for residential use will introduce new sensitive receptors to the local area. As noted in **Paragraph 4.1**, the Application Site does not lie in an existing AQMA, therefore air quality concentrations at the Application Site are expected to be below the air quality objectives.

5.2.5. As summarised in **Table 3**, estimated background concentrations from Defra indicate that concentrations of NO₂, PM₁₀ and PM_{2.5} relevant to the Application Site are well below the respective air quality objective levels.

5.2.6. The main influence on pollutant concentrations within the Application Site will be emissions from road traffic operating on the local road network. The closest road to the Application Site is Workhouse Lane; however, this is a minor road and, as such, emissions from vehicles using this road are expected to be relatively small. The closest major road to the Application Site is the M69

motorway, which is located around 285m to the south of the Application Site. Guidance¹¹ provided within DMRB states that the influence of road traffic emissions on local pollutant concentrations reduces rapidly as the distance from the road increases. This guidance states the greatest reduction is usually experienced within the initial 50 m of the source with the influence becoming negligible beyond 200 metres. As such, the overall impact of the M69 on air quality within the Application Site is considered to be **negligible**.

- 5.2.7. Taking all of the above into account, it is considered unlikely that pollutant concentrations within the Application Site would exceed the relevant AQS objective levels and as such the Site is considered suitable for residential land use.

6. MITIGATION & RESIDUAL EFFECTS

6.1. CONSTRUCTION PHASE

MITIGATION

- 6.1.1. Based on the construction phase air quality assessment results, there is a **medium risk** of dust impacts occurring at identified sensitive receptors throughout the construction phase. Appropriate mitigation is required to further prevent or minimise the release of dust entering the atmosphere and/or being deposited on nearby receptors. Particular attention should be paid to operations that unavoidably take place in the immediate vicinity of sensitive receptors.
- 6.1.2. The following recommended mitigation measures are typical for a development of this nature and are consistent with IAQM guidance¹⁰.

General Communication

- A stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented.
- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

General Dust Management

- A Dust Management Plan (DMP), which may include measures to control other emissions, in addition to the dust and PM₁₀ mitigation measures given in this report, should be developed and implemented, and approved by the Local Authority.

Site Management

- All dust and air quality complaints should be recorded and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the local authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on- or offsite should be recorded, and then the action taken to resolve the situation recorded in the log book.

Monitoring

- Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
- Regular site inspections to monitor compliance with the DMP should be carried out, inspection results recorded, and an inspection log made available to the local authority when asked.
- The frequency of site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and maintaining the site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, 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 that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover appropriately.
- Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- A maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas should be imposed (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Application Site and the surroundings.

- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

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

- 6.1.3. Detailed mitigation measures to control construction traffic should be discussed with HBBC to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

RESIDUAL EFFECTS

- 6.1.4. The residual effects of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above, combined with good site practice, are expected to be **not significant**.

- 6.1.5. The residual effects of emissions to air from construction vehicles and plant on local air quality is expected to be **not significant**.

6.2. OPERATIONAL PHASE

MITIGATION

- 6.2.1. The change in pollutant concentrations attributable to traffic emissions associated with the operation phase of the Proposed Development (i.e. impacts on local air quality) are **negligible** (themselves not warranting the need for mitigation) and will have **no significant effect**.
- 6.2.2. Although no specific operational phase mitigation is required, the EPUK/IAQM⁸ planning guidance suggests the following good practice measure which should be considered:
- Provision of at least 1 Electric Vehicle (EV) “fast charge” point per 10 residential dwellings

RESIDUAL EFFECTS

- 6.2.3. Although there are no material local air quality impacts associated with the Proposed Development, the implementation of the above mitigation measures would provide additional benefit with respect to reducing vehicle emissions associated with the Proposed Development. Overall, the effect of the Proposed Development on local air quality is expected to be **not significant**.

7. CONCLUSIONS

- 7.1.1. This report presents the outcomes of a qualitative air quality impact assessment for a proposed residential development off Workhouse Lane, Burbage. The assessment has considered potential local air quality impacts associated with both the construction phase and operational phase of the Proposed Development.
- 7.1.2. A review of baseline air quality information and monitoring data at and near to the Proposed Development concluded that existing levels of NO₂, PM₁₀, and PM_{2.5} are not likely to be in exceedance of the respective air quality Objectives. The Proposed Development is not located within or near to an AQMA and, overall, local air quality is considered to be good.
- 7.1.3. A qualitative assessment of the potential impacts on local air quality from construction activities has been completed for this phase of the Proposed Development with reference to the IAQM construction methodology¹⁰. This identified that there is a **Medium Risk** of dust soiling impacts and a **Low Risk** of impact to human health at identified sensitive receptors with respect to changes in particulate matter (PM₁₀) concentrations due to construction activities. Through good site practice and the implementation of suitable mitigation measures, the impacts of dust and particulate matter releases on local air quality will be **not significant**.
- 7.1.4. In terms of the operational phase, in accordance with IAQM/EPUK guidance⁸, the Proposed Development will not generate significant vehicle flows. Given the existing good air quality at and near to the Proposed Development, the impact of the Proposed Development operation on local air quality will be **not significant**.
- 7.1.5. The Proposed Development complies with national and local policy, in particular HBBC Core Strategy⁵ Spatial Objectives 9, 10 and 12. As such, in terms of air quality and there are unlikely to be constraints on development during the construction and operational phases. The **Application Site is suitable for the proposed residential land use within the context of local air quality**.

Figure 1 – Site Location and Local Authority Monitoring

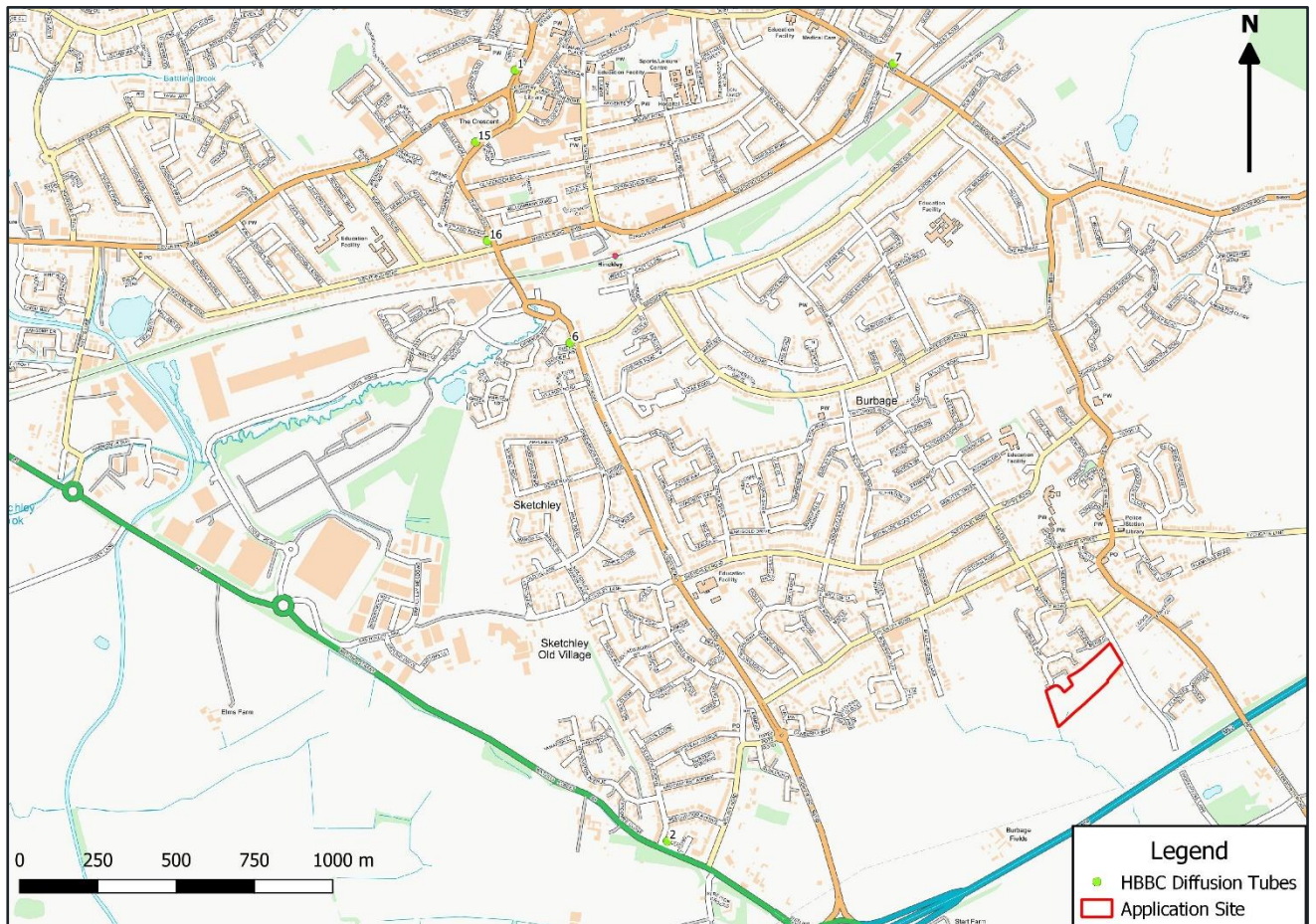


Figure 2 – Construction Phase Assessment Buffers

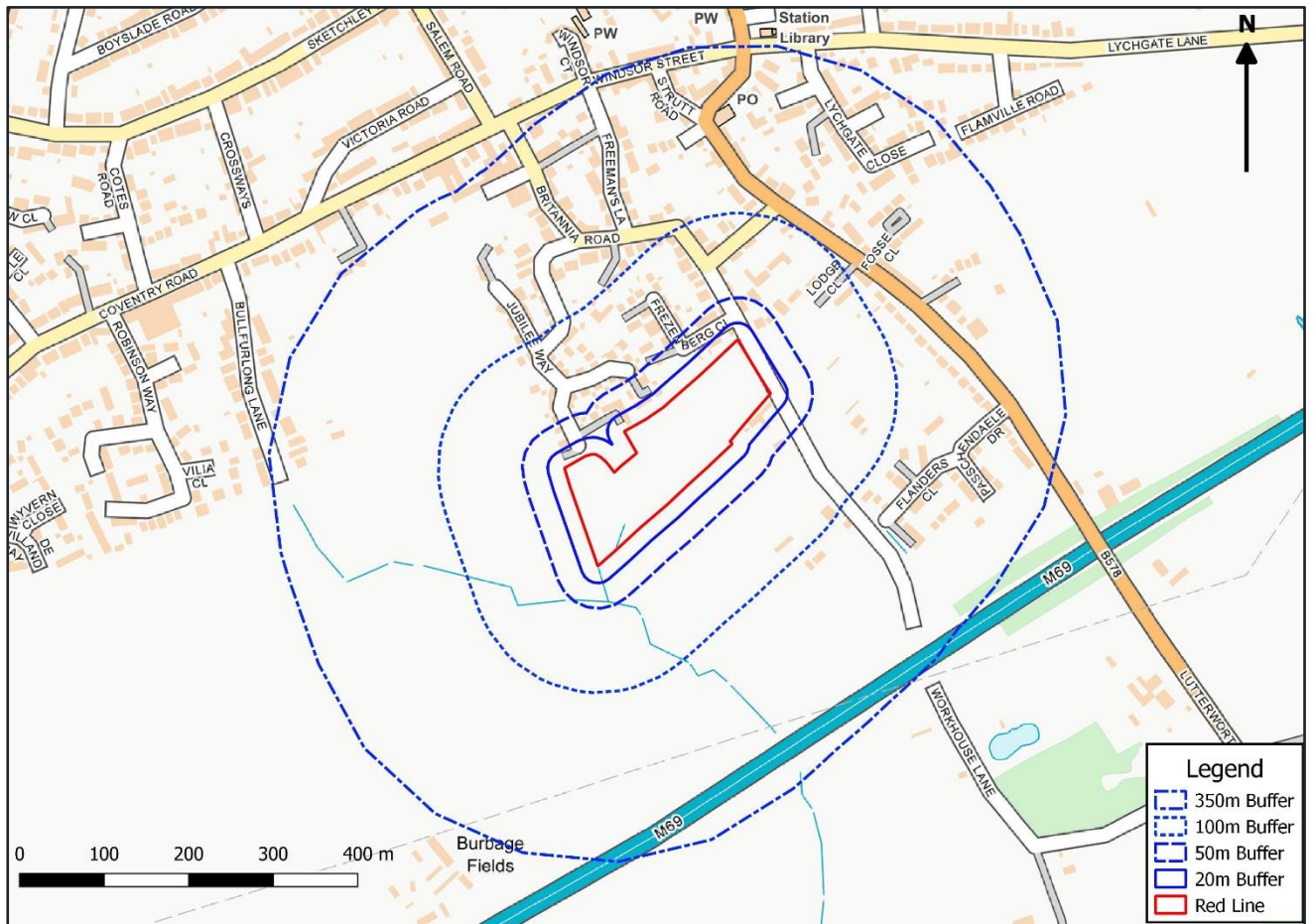
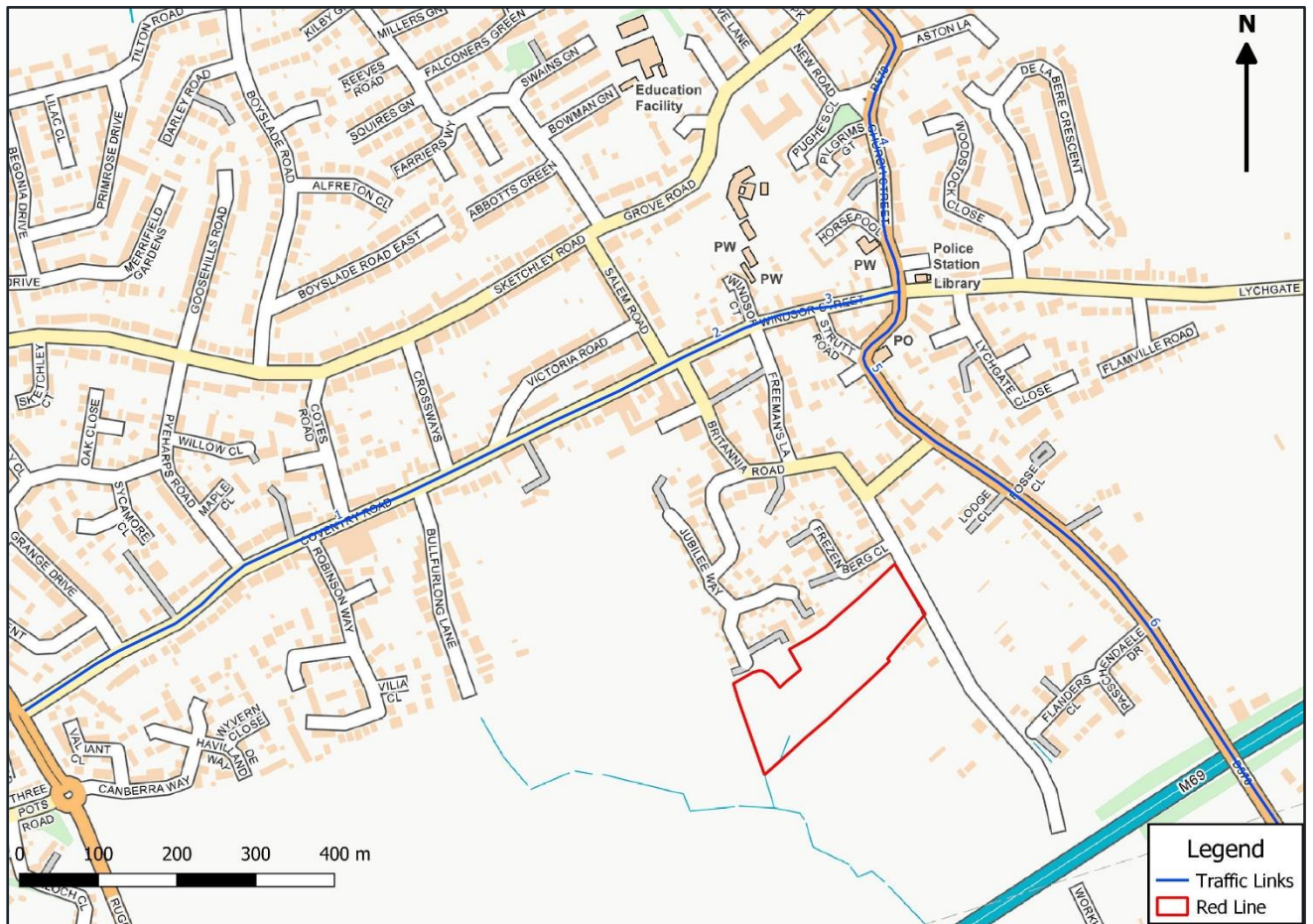


Figure 3 – Traffic Links



Appendix A

GLOSSARY

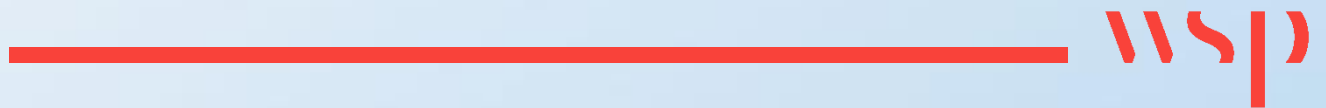


Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
Conservative	Tending to over-predict the impact rather than under-predict.
Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
Minor roads	Non A roads of Motorways.
NO ₂	Nitrogen dioxide.
NO _x	Nitrogen oxides.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.

Term	Definition
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
$\mu\text{g}/\text{m}^3$ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of $1\mu\text{g}/\text{m}^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY



STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- ‘Human receptors’ within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- ‘Ecological receptors’ within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is “negligible”.

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table 2A: Examples of Human Receptor Sensitivity to Construction Phase Impacts

Dust Emission Magnitude	Activity
Large	Demolition >50,000m ³ building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m ² site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m ³ building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	Demolition 20,000 - 50,000m ³ building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m ² site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved
	Construction 25,000 - 100,000m ³ building volume, dusty material e.g. concrete, on site concrete batching

Dust Emission Magnitude	Activity
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads
Small	Demolition <20,000m ³ building demolished, non-dusty material (e.g metal cladding), <10m above ground level, work during wetter months
	Earthworks <2,500m ² site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m ³ , non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 2Ba: Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
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 2Bb: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration (µg/m ³)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
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 2Bc: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Sources (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2C: Risk of Dust Impacts

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible



STEP 3 –SITE SPECIFIC MITIGATION

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.



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