Wates Development Ltd

Proposed Residential Development, at Land West of Shoreham Road, Small Dole

Air Quality Assessment

Report No: 446192-01 (00)

MARCH 2025

RSK GENERAL NOTES

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Author	Dr Aastha Dhingra Senior Air Quality Consultant	**Technical reviewer**	Dr Srinivas Srimath Director, Air Quality
Signature	[redacted]	Signature	[redacted]
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Abbreviations

AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Standard
ASR	Annual Status Report
CHP	Combined Heat and Power
CO_2	Carbon Dioxide
CO	Carbon Monoxide
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EC	European Commission
EPUK	Environmental Protection UK
EU	European Union
HDC	Horsham District Council
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
NAQS	National Air Quality Strategy
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
O_3	Ozone
$PM_{2.5}$	Particulate matter of size fraction approximating to <2.5µm diameter
PM_{10}	Particulate matter of size fraction approximating to <10µm diameter
RSK	RSK Environment Limited
VOC	Volatile Organic Compounds

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1 INTRODUCTION

1.1 Background

RSK Environment Ltd (RSK) was commissioned to undertake an air quality assessment of the potential air quality impacts to support an outline planning application for construction of 45 units located at Land West of Shoreham Road, Small Dole, BN5 9YH. The size of the site is approximately 5.453 Ha / 13.474 acres. Figure 1.1 shows the 'redline boundary' of the proposed site.

The approximate centre of the site is 521326 , 113123 (British National Grid). The site is located within the administrative area of Horsham District Council (HDC).

The site is bound to the north by residential development; to the east by Henfield road, to the south by open field and some residences and to the west by residential development.

This report presents the findings of an assessment of existing/baseline air quality conditions, potential air quality impacts during the construction and operational phase of the proposed development.

Figure 1.1: Proposed Development Site Location

2 LEGISLATION, PLANNING POLICY & GUIDANCE

2.1 Key Legislation

2.1.1 Air Quality Strategy

UK air quality policy is published under the umbrella of the Environment Act 1995, Part IV and specifically Section 80, the National Air Quality Strategy. The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air, published in July 2007 sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2020.

The Clean Air Strategy 2019 supersedes the policies outlined in the 2007 strategy and aims to have a more joined-up approach, outlining actions the Government plans to take to reduce emissions from transport, homes, agriculture and industry. However, the air quality objectives remain as previously detailed within the 2007 strategy.

2.1.2 Air Quality Standards

Directive 2008/50/EC was translated into UK law in 2010 via the Air Quality Standards Regulations 2010. The air quality standards (AQSs) in the United Kingdom are derived from European Commission (EC) directives and are adopted into the Air Quality Standards Regulations (Northern Ireland) 2010. The relevant[1] AQS for England and Wales to protect human health are summarised in Table 2.1.

Table 2.1: Air Quality Standards (AQSs) Relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit ($\mu g/m^3$)
Nitrogen dioxide (NO_2)	1 calendar year	-	40
	1 hour	18	200
Fine particles (PM_{10})	1 calendar year	-	40
	24 hours	35	50
Fine particles ($PM_{2.5}$)	1 calendar year	-	20

2.1.3 The Environment Act, 1995

These objectives are to be used in the review and assessment of air quality by local authorities under Section 82 of the Environment Act (1995). If exceedances are measured or predicted through the review and assessment process, the local authority must declare an Air Quality Management Area (AQMA) under Section 83 of the Act, and produce an Air Quality Action Plan (AQAP) to outline how air quality is to be improved.

[1] Relevance, in this case, is defined by the scope of the assessment.

2.1.4 The Environment Act, 2021

The Environment Act (2021) amends the Environment Act (1995) to reinforce the local air quality management (LAQM) framework, in order to encourage cooperation at the local level and broaden the range of organisations that play a role in improving local air quality. Part 1 of The Environment Act requires targets to be set for fine particulate matter $PM_{2.5}$, and these were introduced in The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, as follows:

- $PM_{2.5}$ concentration interim target, annual mean of 12µg/m^3 by 2028;
- $PM_{2.5}$ exposure reduction interim target of 22% reduction compared to 2018 by 2028;
- $PM_{2.5}$ concentration binding target of annual mean of 10µg/m^3 by 2040;
- $PM_{2.5}$ exposure reduction binding target of 35% reduction compared to 2018 by 2040.

2.2 Planning Policy

The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the proposed development, be a material consideration in the determination of planning applications.

2.2.1 National Planning Policy Framework

In December 2024, the revised National Planning Policy Framework (NPPF) was published, superseding the previous September 2023 and December 2023 NPPF with immediate effect. The NPPF includes a presumption in favour of sustainable development.

Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent '*new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.*'

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

2.2.2 Local Planning Policy

Horsham District Local Plan 2023 – 2040 Draft, (December 2023)

The Horsham District Local Plan 2023-2040 has been prepared as the main planning document for Horsham District, outside the South Downs National Park (SDNP). The aim of the plan is to help bring forward the environmental, social and economic needs for the land in Horsham District that is outside the South Downs National Park. The policies for managing developments are laid out in the Local Plan for which includes CDC policies relating to air quality.

Strategic Policy 12: Air Quality includes the following:

The Council recognises the direct effects air quality has on public health, natural habitats and biodiversity, including its contribution to climate change, and the importance of the management of air quality. Taking into account any relevant Planning Guidance Documents and / or policies within this Plan, proposals will be required to:

1. Adhere to the Air Quality and Emissions Mitigation Guidance for Sussex (2021), or any future updates, to identify if an Air Quality Impact Assessment and / or an Emissions Mitigation Statement is required;

2. Contribute to the implementation of local Air Quality Action Plans, and not conflict with the set objectives;

3. Minimise traffic generation and congestion through access to sustainable transport modes, maximising the provision for cycling and pedestrian facilities;

4. Encourage the use of cleaner transport fuels, including through the provision of electric car charging points.

5. Take into account habitats or biodiversity designations that are sensitive to air quality changes, including ancient woodland. Habitats identified as sensitive to such changes, including proposals within 7km of The Mens, will require a relevant impact assessment and appropriate mitigation measures to be put in place.

6. Mitigate the impact on the amenities of users of the site and surrounding land to an appropriate level, during both construction and operation where development creates or results in pollution including particulates, dust, smoke, pollutant gases or odour, as outlined in the Air Quality and Emissions Mitigation Guidance for Sussex (2021), or any future updates; and

7. Ensure that the cumulative impact of all relevant permitted and allocated developments, including associated traffic impacts, is appropriately assessed.

Horsham District Planning Framework (November, 2015)

Policy 24- Strategic Policy: Environmental Protection includes the following:

The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution and ensure that they:

1. Address land contamination by promoting the appropriate re-use of sites and requiring the delivery of appropriate remediation;

2. Are appropriate to their location, taking account of ground conditions and land instability;

3. Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevents contaminated run-off to surface water sewers;

4. Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;

5. Contribute to the implementation of local Air Quality Action Plans and do not conflict with its objectives;

6. Maintain or reduce the number of people exposed to poor air quality including odour. Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality; and

7. Ensure that the cumulative impact of all relevant committed developments is appropriately assessed.

2.3 Best Practice Guidance

2.3.1 Guidance on the Assessment of Dust from Demolition and Construction

The Institute of Air Quality Management (IAQM) published a guidance document (IAQM, 2024) on the assessment of construction phase impacts (herein the 'IAQM construction dust guidance'). The guidance was produced to provide advice to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measure appropriate to the level of risk identified.

2.3.2 Local Air Quality Management Review and Assessment Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their air quality review and assessment work. This guidance, referred to in this document as the Local Air Quality Management Technical Guidance (Defra, 2022) ('LAQM TG.22').

2.3.3 Land-Use Planning & Development Control: Planning for Air Quality

Environmental Protection UK's (EPUK) and the IAQM jointly published a revised version of the guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' in 2017 (herein the 'EPUK-IAQM guidance') to facilitate consideration of air quality within local development control processes. It provides a framework for air quality considerations, promoting a consistent approach to the treatment of air quality issues within development control decisions.

The guidance includes methods for undertaken an air quality assessment and an approach for assessing the significance of effects. The guidance note is widely accepted as an appropriate reference method for this purpose.

2.3.4 Interim Planning Guidance on the consideration of the Environment Act $PM_{2.5}$ targets in planning decisions (2024)

Defra is developing guidance for applicants and Planning Authorities in England to demonstrate that they have appropriately considered the $PM_{2.5}$ targets when making planning applications and planning decisions.

The following questions are designed to be used as prompts to support the interim process, but applicants are welcome to consider measures in addition to those listed below:

1. How has exposure to $PM_{2.5}$ been considered when selecting the development site?

Applicants are advised to consider the following in their application:

- Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these,
- Site proximity to pollution sources and the impact of these on users of the development,
- Exposure and emissions during both construction and in-use.

2. What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of $PM_{2.5}$ and its precursors?

Applicants are advised to explain (with evidence where possible) why each measure was implemented. Or, if no mitigation measures have been implemented, why this was not proposed. Actions can refer to, but are not limited to, the following:

- Site layout,
- The development's design,
- Technology used in the construction or installed for use in the development,
- Construction and future use of the development.

2.3.5 Air Quality and Emissions Mitigation Guidance for Sussex (2021)

HDC is a participating member of Sussex-air partnership, which has developed a guidance document for developers on how to assess and mitigate the air quality impacts from development and transport-related emissions.

3 ASSESSMENT SCOPE

3.1 Overall Approach

The approach taken for assessing the potential air quality impacts of the proposed development may be summarised as follows:

- Baseline characterisation of local air quality;
- Qualitative impact assessment of the construction phase of the development using the 2024 IAQM guidance;
- Qualitative assessment of the operational phase of the development, with reference to the 2017 EPUK-IAQM guidance;
- Emission mitigation assessment and
- Recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

3.2 Baseline Characterisation

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources.

A desk-based study has been undertaken including a review of monitoring data available from HDC, and estimated background data from the LAQM Support website maintained by Defra. Consideration has also been given to potential sources of air pollution and the presence of AQMAs.

3.3 Construction Phase Assessment

3.3.1 Construction Dust and Particulate Matter

Construction works for the proposed development have the potential to lead to the release of fugitive dust and particulate matter. An assessment of the likely significant effects of construction phase dust and particulate matter at sensitive receptors has therefore been undertaken following the IAQM's construction dust guidance.

Three separate dust impacts were considered:

- Disamenity to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

In order to assess the potential impacts of construction, activities are divided into four types:

- Demolition;
- Earthworks;
- Construction; and

- Trackout[2].

The risk of dust and PM_{10} arising to cause disamenity and/or health or ecological impacts was based on an assessment of likely emissions magnitude and the sensitivity of the surrounding environment. The risk category may be different for each of the four 'construction' activities.

Appendix A sets out the construction dust assessment methodology in detail as per IAQM construction dust guidance. Once the level of risk has been determined, then site specific mitigation proportionate to the level of risk can be identified (as detailed in Appendix B).

The Magic Map application available online by Defra was used to identify statutory ecological receptors near the proposed development site area.

3.3.2 Emissions to Air from Construction Traffic and Plant

Exhaust emissions from construction phase vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the proposed development site and in the vicinity of the proposed development site itself. A qualitative impact assessment has been undertaken based on professional judgement and considering the following factors:

- The likely duration of the construction phase;
- The potential number and type of construction traffic and plant that could be required; and
- The number and proximity of sensitive receptors to the proposed development site and along the likely construction vehicle routes.

3.4 Operational Phase Impact Assessment

3.4.1 Emissions to Air from Operational Phase Traffic

The EPUK-IAQM guidance provides indicative criteria for when an air quality assessment is required, if none of the criteria are exceeded, it is considered unlikely that there will be any significant impacts on air quality during the operational phase. A screening level assessment against these criteria has been undertaken in Section 5 of this report.

3.4.2 Emissions to Air from Operational Phase Combustion Plant

It is understood that no significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Energy required for heating and hot water are proposed to be supplied by air source heat pumps or exhaust air source heat pumps. Therefore, this report has not considered emission related to energy generation any further.

[2] Trackout is defined as the transport of dust and dirt from the construction / demolition sites onto public road network, where it may be deposited and then re-suspended by vehicles using the network.

3.4.3 Exposure of Future Occupants to Air Pollution

The potential exposure of future users of the proposed development has been considered by reviewing the baseline conditions (Section 4) and the locations of sensitive receptors within the proposed development, as well as considering the EPUK-IAQM guidance.

4 BASELINE AIR QUALITY CHARACTERISATION

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources. Baseline air quality data employed in this study have been obtained from monitoring stations maintained by HDC, and the LAQM Support website operated by the Department for Environment, Food and Rural Affairs (Defra).

4.1 Emissions Sources and Key Air Pollutants

The application site is located in an area where the main source of air pollution is likely to be vehicle emissions on the surrounding roads.

The principal pollutants relevant to this assessment are considered to be NO_2, PM_{10} and $PM_{2.5}$, generally regarded as the most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions.

4.2 Presence of AQMAs

The site is located within the jurisdiction of Horsham District Council (HDC). The proposed development site is within the jurisdiction of Horsham District Council (HDC). The Council has declared 2 areas in their jurisdiction as Air Quality Management Areas (AQMAs) in Storrington and Cowfold, declared for nitrogen dioxide (NO2). The proposed development site is not located in any of the AQMAs.

4.3 Local Authority Air Quality Monitoring Data

According to the HDC's 2024 Air Quality Annual Status Report, it is understood that HDC undertook monitoring at three automatic monitoring station and a network of 49 NO_2 diffusion tubes in 2023.

There are two diffusion tube monitoring locations within 5km of the application site. Table 4.1 presents the annual mean NO_2 concentrations at this location for 2019-2023. These data show there were no exceedances of the annual mean air quality objective for NO_2. The automatic monitoring locations are over 9km away from the proposed scheme and therefore, cannot be considered representative of the proposed scheme.

Table 4.1: Monitoring Results at the Non-Automatic Monitoring Locations within 2kms of the Proposed Development Site

Site Name	Site Type	Distance (km)	Grid (x)	Grid (y)	Annual Mean NO_2 Concentration (µg/m³)				
					2019	2020	2021	2022	2023
Henfield 1n	Roadside	2.8	521492	115907	22.2	19.9	20.9	18.2	18.2
Steyning 4N	Kerbside	4.2	517642	111169	20.1	16.2	19.0	18.5	18.2
Air Quality Strategy (AQS) Objective					**40**				

4.4 LAQM Background Data

In addition to the local monitoring data, estimated background air quality data available from the Local Air Quality Management (LAQM) website operated by Defra, may also be used to establish likely background air quality conditions at the proposed development site.

This website provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1km² grid basis. Table 4.3 reproduces estimated annual average background concentrations for the grid square containing the proposed development site for years from 2024 to 2025.

No exceedances of the NO_2, PM_{10} or $PM_{2.5}$ AQSs are predicted. As background concentrations are predicted to fall with time, background concentrations in future years would not be expected to exceed their respective annual mean standards.

Table 4.3: Estimated Background Annual Average NO_2, PM_{10} and $PM_{2.5}$ Concentrations at Proposed Development Site (from 2021 base map)

Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the LAQM Website (µg/m³)		
	Annual Average NO_2	Annual Average PM_{10}	Annual Average $PM_{2.5}$
2024	8.2	10.0	6.1
2025	8.0	9.9	6.0
2026	7.8	9.8	5.9
AQS	**40**	**40**	**20**

Notes: Presented concentrations for 1km² grid centred on 521500 , 113500; approximate centre of development site is 521326 , 113123.

4.5 Air Quality at the Proposed Development Site

Based on the local monitoring data and estimated background concentrations from Defra, the annual mean NO_2, PM_{10} and $PM_{2.5}$ air quality objectives are considered unlikely to be exceeded at the site.

The EPUK-IAQM 2017 guidance indicates that the annual mean PM_{10} concentrations tend to be greater than ~31µg/m³ for an exceedance of the daily mean PM_{10} AQS to be likely. LAQM TG.22 indicates that the annual mean NO_2 concentrations tend to be greater than 60µg/m³ for an exceedance of the hourly mean NO_2 AQS to be likely.

Based on the monitoring data available and the estimated background concentrations of NO_2 and PM_{10}, it is considered unlikely that short-term NO_2 and PM_{10} AQSs would be exceeded at or in close proximity to the proposed development site.

Overall, exceedances of any of the relevant AQSs are not anticipated, and air quality is considered likely to be good at the proposed development site.

5 ASSESSMENT OF IMPACTS

5.1 Construction Phase

Atmospheric emissions from construction activities will depend on a combination of the potential for emissions (the type of activity and prevailing conditions) and the effectiveness of control measures. In general terms, there are two sources of emissions that will need to be controlled to minimise the potential for adverse environmental effects:

- Exhaust emissions from site plant, equipment and vehicles; and
- Fugitive dust emissions from site activities.

5.1.1 Exhaust Emissions from Plant and Vehicles

The operation of vehicles and equipment powered by internal combustion engines results in the emission of exhaust gases containing the pollutants NO_x, PM_{10}, volatile organic compounds (VOCs) and carbon monoxide (CO). The quantities emitted depend on factors such as engine type, service history, pattern of usage and fuel composition.

Construction traffic will comprise haulage/construction vehicles and vehicles used for workers' trips to and from the application site. The greatest impact on air quality due to emission from construction phase vehicles will be in areas adjacent to the application site access and nearby road network.

The transport consultants have confirmed that it is estimated that there will be 93 AADT traffic expected to be generated during the construction phase including 30 HDV (including plants) outward movements per day, which is considered unlikely to cause a significant impact on local air quality, in accordance with the IAQM guidance.

The operation of site equipment and machinery will result in emissions to atmosphere of exhaust gases, but with suitable controls and site management such emissions are unlikely to be significant (as per LAQM.TG.22).

5.1.2 Fugitive Dust Emissions

Fugitive dust emissions arising from construction activities are likely to be variable in nature and will depend upon the type and extent of the activity, soil type and moisture content, road surface conditions and weather conditions. Periods of dry weather combined with higher than average wind speeds have the potential to generate more dust.

The construction activities anticipated as part of the proposed development that are often the most significant potential sources of fugitive dust emissions are:

- Demolition activities;
- Earthworks comprising of levelling, construction of foundations, haulage, tipping, stockpiling, landscaping and tree removal;
- Construction of proposed development and hard landscaped areas; and,
- Trackout, involving the movement of vehicles over surfaces where muddy materials have been transferred off-site (for example, on to public highways).

Fugitive dust arising from construction and demolition activities is mainly of a particle size greater than the PM_{10} fraction (that which can potentially impact upon human health). However, it is noted that demolition and construction activities may contribute to local PM_{10} concentrations. Appropriate dust control measures can be highly effective for controlling emissions from potentially dust generating activities identified above, and adverse effects can be greatly reduced or eliminated.

See Appendix A for further explanation of the tendency of dust to remain airborne.

5.1.3 Potential Dust Emission Magnitude

With reference to the IAQM guidance criteria outlined in Appendix A, the dust emissions magnitude for demolition, earthworks, construction and trackout activities are summarised in Tables 5.1, 5.2 and 5.3. Risk categories for the four construction activities are summarised in Table 5.4. There are no existing structures at the proposed site, therefore there will be no demolition activities to be undertaken at the site and thus, demolition has not been further assessed.

Worst-case assumptions have been made, where information is not currently available, for a conservative assessment.

Table 5.2: Summary of Dust Emissions Magnitude of Earthworks Activities (Before mitigation)

Earthworks Criteria	Dust Emissions Class	Evaluation of the Effects
Total site area	Medium	18,000-110,000 m^2
Height of Stockpiles	Medium	3-6m (expected height)
Earth moving vehicles at any one time	Small	<5 vehicles
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.3: Summary of Dust Emissions Magnitude of Construction Activities (Before mitigation)

Construction Criteria	Dust Emissions Class	Evaluation of the Effects
Total building volume	Medium	12,000-75,000 m^3
On-site concrete batching or sandblasting proposed	Small	It is anticipated that on-site concrete batching or sandblasting are not proposed
Dust potential of construction materials	Medium	Yes
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.4: Summary of Dust Emissions Magnitude of Trackout Activities (Before mitigation)

Trackout Criteria	Dust Emissions Class	Evaluation of the Effects
Number of HDV>3.5t per day	Medium	30 HDVs including plants are anticipated
Surface type of the site	Medium	Haulage is unlikely to take place on unsurfaced roads

Trackout Criteria	Dust Emissions Class	Evaluation of the Effects
Length of unpaved road	Medium	50 m
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.4: Summary of Dust Emission Magnitude of the Site (Before mitigation)

Construction Activities	Dust Emissions Class
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.4 Sensitivity of the Area

As per the IAQM Guidance, the sensitivity of the area takes into account a number of factors, including:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Consideration is given to human and ecological receptors, distances are calculated from the construction site boundary and the trackout route proposed.

Figures 5.1 and 5.2 show maps indicating the earthworks/construction and trackout buffers, respectively, for identifying the sensitivity of the area. Table 5.6 presents the determined sensitivity of the area. Construction activities are relevant up to 250m from the proposed development site boundary whereas trackout activities are only considered relevant up to 50m from the edge of the road, as per the IAQM guidance. Only 20m and 50m buffers have been included for trackout for this reason.

No designated ecological receptors have been identified within 50m of the application site boundary or 50m of the anticipated trackout route used by construction vehicles on the public highway, up to 250 m from the site entrance(s), therefore following the IAQM guidance ecological receptors have been screened out of the assessment and are not considered further.

Figure 5.1: Earthworks/Construction Activities Buffer Map

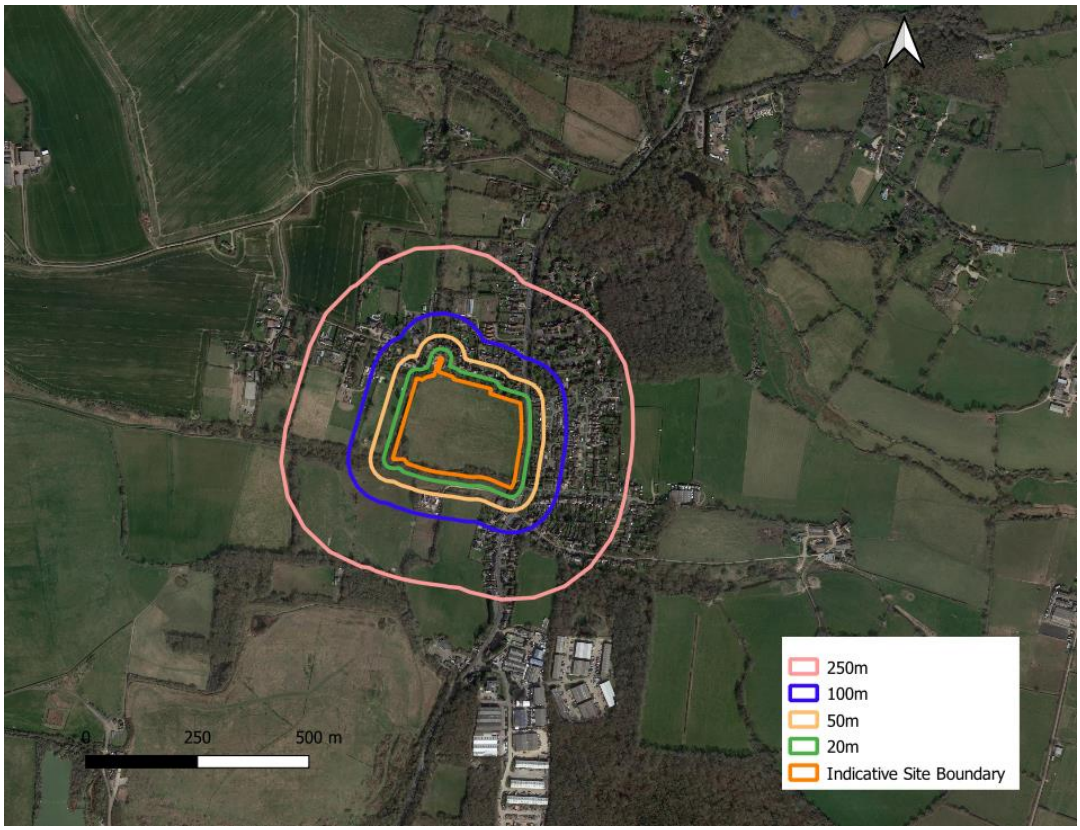

Figure 5.2: Trackout Activities Buffer Map

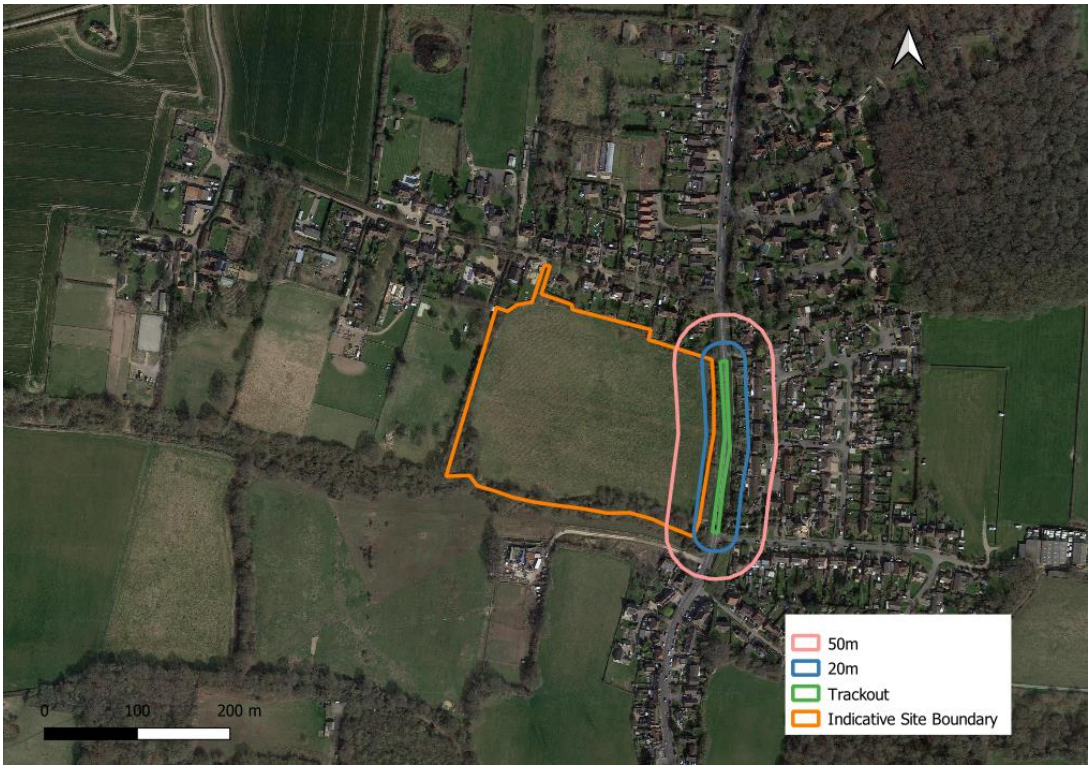

Table 5.6: Sensitivity of the Area

Potential Impact		Sensitivity of the surrounding area		
		Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	High	High	High
	Number of receptors	10-100	10-100	10-100
	Distance from the source	<20m	<20m	<20m
	Sensitivity of the area	**High**	**High**	**High**
Human health	Receptor sensitivity	High	High	High
	Annual mean PM_{10} concentration	<24µg/m^3	<24µg/m^3	<24µg/m^3
	Number of receptors	10-100	10-100	10-100
	Distance from the source	<20m	<20m	<20m
	Sensitivity of the area	**Low**	**Low**	**Low**
Ecological	Receptor sensitivity	N/A		

5.1.5 Risk of Impacts

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts of construction activities before mitigation; these are evaluated based on risk categories of each activity in Appendix A. The risk of dust impacts from construction activities is identified in Table 5.7.

Site specific mitigation measures to reduce construction phase impacts are defined based on this assessment in Section 6 and Appendix B.

Table 5.7: Summary of the Dust Risk from Construction Activities

Potential Impact	Dust Risk Impact		
	Earthworks	Construction	Trackout
Dust soiling	Medium Risk	Medium Risk	Medium Risk
Human health	Low Risk	Low Risk	Low Risk
Ecological	N/A		

5.2 Operational Phase

5.2.1 Emissions to Air from Operational Phase

No significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Energy required for heating and hot water are proposed to be supplied by on air source heat pumps to all houses and exhaust air heat pumps to the apartments.

The principal operational phase air quality impact is likely to be associated with traffic emissions as a result of any changes in traffic flows or flow composition the development may bring.

Table 5.7 presents the EPUK-IAQM 2017 guidance screening criteria for when an air quality assessment might be required.

Based on the traffic data provided by the transport consultant, i-transport, it is understood that the proposed development is expected to generate additional 262 annual average daily traffic (AADT) of light duty vehicles (LDVs). None of the screening criteria in the IAQM are triggered. Based on the above and considering the low background pollutant concentrations (as shown in Tables 4.3), it is considered unlikely that the development will have a significant impact on local air quality, and further assessment of the operational phase traffic is not considered to be required.

Table 5.7: Air Quality Screening Criteria from EPUK-IAQM 2017 Guidance

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment	Is the Indicative Criteria Exceeded?
Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors.	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.	**Criterion not exceeded.** The proposed development is expected to generate additional 262 AADT of LDVs, below the screening criterion of 500 AADT.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	**Criterion not exceeded.** The proposed development is not expected to generate significant additional HDVs once operational. Only 4 additional AADT are anticipated.
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA	**Criterion not exceeded.** Road realignment is not proposed.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.	**Criterion not exceeded.** New junction and new traffic system are not proposed.
Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	**Criterion not exceeded.** None proposed.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).	**Criterion not exceeded.** The underground car park is not proposed.
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.	Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. - In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.	**Criterion not exceeded.** None proposed at the time of writing this report.

6 Emission Mitigation Assessment

An emissions assessment has been carried out as per Air quality and emissions mitigation guidance for Sussex (2021) to determine the appropriate level of mitigation required to help avoid, minimise and/or off-set the impact on air quality; enable an evidence-based and proportionate approach.

In accordance with the Defra Air Quality Damage Cost Guidance (January 2023), a damage cost calculation has been undertaken using the 'air quality damage cost appraisal toolkit' (available on https://www.gov.uk/government/publications/assess-the-impact-of-air-quality).

Due to the nature of the development, road traffic is expected to be the main source of air pollutants once the development is operational. The principal pollutants relevant to this assessment are therefore considered to be nitrogen oxides (NOx) and particulate matter (PM), which are generally regarded as the most significant air pollutants released by vehicular combustion processes. Therefore, the damage cost calculation has been undertaken for both NOx and PM.

Based on the traffic data provided by the Transport Consultant, the total trip generation by the proposed development in an average 24-hour period is 262 AADT. The emission calculation has assumed a 10km average trip length and 50km/h vehicle speed as per the 'Land use planning & development control: planning for air quality' guidance (Environmental Protection UK and Institute of Air Quality Management, 2017).

In accordance with the Defra guidance, PM_{10} emissions must be 'adjusted' to $PM_{2.5}$ emissions, in order to monetise these emissions. The damage cost calculation considers an 'appraisal period' of 5 years (including the development opening year and four subsequent years). A start year of 2027 has been assumed, because this is the anticipated opening year of the proposed development.

The following tools were used for the damage cost calculation:

- Defra '*Emission Factors Toolkit v12.1*' (available online at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/); and
- Defra 'Air quality appraisal: damage cost toolkit' (available online at: https://www.gov.uk/government/publications/assess-the-impact-of-air-quality).

Step 1: Quantify change in emissions for NO_x and $PM_{2.5}$

- **Pollutants: NOx and $PM_{2.5}$** – road traffic is expected to be the main source of air pollutants once the development is operational. The principal pollutants relevant to this assessment are therefore considered to be nitrogen oxides (NO_x) and particulate matter (PM), which are generally regarded as the most significant air pollutant released by vehicular combustion processes. $PM_{2.5}$ has been used for PM in line with the Defra Air Quality Appraisal guidance.

- **Road Type: Rural (not London)**
- **Traffic Flow: 262 Annual Average Daily Trips (AADT) for Light Duty Vehicles (LDVs)** – data provided by project Transport Consultants
- **Cars only** (that is, 0% HGV)
- **Average speed: 50 kph** (in accordance with Sussex-air 2021 guidance)
- **Trip length used: 10km**
- **Years: 2027-2031** - 2027 is the anticipated opening year of the development. 5 years of emissions, in line with the Sussex-air guidance, have then been used up to 2031.

Table 6.1 presents the EFT output with the emissions converted from kg/yr to tonnes/yr.

Table 6.1: Converted EFT output

Emissions (tonnes/yr)					
	2029	2030	2031	2032	2033
NO_x	0.137	0.119	0.102	0.087	0.074
$PM_{2.5}$	0.0167	0.0166	0.0165	0.0164	0.0163

Step 2: Calculate damage costs for NO_x and $PM_{2.5}$

The Defra Damage Cost Appraisal Toolkit (updated February 2023) was used with the following input:

- Start year: 2027
- End year: 2031
- Price Based Year: 2024
- Number of Pollutants: 2 (NO_x and $PM_{2.5}$)
- Source: Road transport

Table 6.2 presents the damage cost calculation outputs.

Table 6.2 Damage Cost Appraisal Toolkit Output

Output from Damage Cost Appraisal Toolkit						
	2027	2028	2029	2030	2031	Total
Central Value NO_x	£708	£605	£512	£430	£361	**£2,616**
Central Value $PM_{2.5}$	£564	£550	£538	£527	£517	**£2,696**
Total Central Value Costs						**£5,312**

The damage cost calculation is considered to provide a basis for quantifying the financial commitment required for offsetting potential development-generated emissions. The calculated central damage cost value over a five-year period is £5,312, which can be used to fund onsite mitigation measures or to contribute to off-site mitigation measures.

It is recommended that the allocation of funds should be discussed and agreed with HDC, and the extent of the total money for Air Quality mitigation should be equal to/greater than the value determined by the damage cost calculation (i.e. £5,312).

It is noted from the transport statement for the project that following mitigation measures are proposed and indicative costs are also given, where available and it is much greater than the value determined by the damage cost calculation (i.e. **£5,312**). The total cost estimate for mitigation associated with sustainable travel, as identified in Section 7.2 is **£181,750.**

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7 MITIGATION MEASURES

7.1 Construction Phase Mitigation

The dust emitting activities outlined in Section 5.1 can be effectively controlled by appropriate dust control measures and any adverse affects can be greatly reduced or eliminated.

The dust risk categories identified have been used to recommend mitigation methods. These should be translated into a dust management plan (DMP, which may be as part of a Construction Environmental Management Plan (CEMP)) for the construction phase should be prepared and agreed with the Local Authority to ensure that the potential for adverse environmental effects on local receptors is minimised. The DMP should include *inter alia*, measures for controlling dust and general pollution from site construction operations and include details of any monitoring scheme, if appropriate. Controls should be applied throughout the construction period to ensure that emissions are mitigated.

The traffic effects of the proposed development during the construction phase will be limited to a relatively short period and will be along traffic routes employed by haulage/construction vehicles and workers. Any effects on air quality will be temporary i.e. during the construction period only, and can be suitably controlled by the employment of mitigation measures appropriate to the development project.

During construction, emissions of particulate matter (PM_{10} and $PM_{2.5}$), and NOx/NO_2 from Non-road mobile machinery (NRMM) can affect local air quality. Following measures are recommended in accordance with the TG22 to minimise the emissions:

- Ensure all equipment complies with the appropriate NRMM standards;
- Where feasible, ensure further abatement plant is installed on NRMM equipment, e.g. Diesel Particulate Filters (DPFs);
- Ensure all vehicles switch off engines when stationary – no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible; and
- Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (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).

With implementation of the proposed construction phase mitigation measures (detailed in Appendix B), the residual impacts are considered to be negligible.

7.2 Operational Phase Mitigation

The assessment predicted that the operational phase of the proposed development is not expected to have a significant effect on local air quality.

And based on monitoring data and predicted background concentrations, future users of the proposed development are not expected to be exposed to poor air quality.

However, the following mitigation measures during the operational phase are suggested in the travel plan in accordance with the Air quality and emissions mitigation guidance for Sussex (2021):

- Travel Plan –There are a number of costed initiatives as well as the need for a Travel Plan Coordinator to be appointed to implement measures with the Travel Plan (e.g. provision of information, initiatives, travel welcome pack etc). The cost of the mitigation is estimated to be c. **£25,000**.
- Travel Vouchers - £150 sustainable travel voucher are proposed to be provided to the initial occupants of each residential dwelling. This is the preferred amount by West Sussex County Council (WSCC). As a maximum, the total cost is estimated to be **£6,750**.
- Access arrangement and associated footways / crossing – this includes a 2.0m footway either side of the access with a pedestrian crossing with dropped kerbs and tactile paving. The estimated cost associated to this is **£39,000**.
- Pedestrian connection to the south of the site – 2.0m footway provided on the western side of Henfield Road which ties into the existing footway and provides a direct southwards connection to the bus stops and local facilities. The estimated cost associated to this is **£108,000**.
- Pedestrian crossing - A pedestrian crossing with dropped kerbs and tactile paving provided at the New Hall Lane junction to the north. The estimated cost associated to this is **£3,000**
- Total estimated amount, as above is **£181,750.**

7.3 $PM_{2.5}$ Targets

When considering the new $PM_{2.5}$ targets set out in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, as referenced in section 2.1.4, the following has been taken into account:

Baseline Air Quality at the Site: As explained in the section 4 above, based on the local monitoring data and estimated background concentrations from DEFRA, the annual mean NO_2, PM_{10} and $PM_{2.5}$ air quality objectives are considered unlikely to be exceeded at the site. Overall, exceedances of any of the relevant AQSs (long-term and short-term) are not anticipated, and air quality is considered likely to be good at the proposed development site.

Site proximity to pollution sources and the impact of these on users of the development: No significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Energy required for heating and hot water are proposed to be supplied by air source heat pumps to all houses and exhaust air heat pumps to the apartments (as such, no direct emissions will be

produced). The application site is located in an area where the main source of air pollution is likely to be vehicle emissions on the surrounding roads, i.e., no significant sources of industrial emissions. As such, the scheme has been designed to place residents away from the Henfield road as practically possible.

Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these: Construction activities are relevant up to 250m from the proposed development site boundary whereas trackout activities are only considered relevant up to 50m from the edge of the road, as per the IAQM guidance. The construction dust risk assessment has been undertaken accordingly considering the sensitive receptors in the vicinity of the proposed development to assess the dust soiling and health impacts of PM_{10} and $PM_{2.5}$ (refer Section 5.1). As such, a suitable mitigation will be undertaken to reduce the exposure to $PM_{2.5}$. Furthermore, as detailed above, there will be no significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Operational mitigation will also be employed to reduce the $PM_{2.5}$ concentrations at nearby receptors from road traffic emissions.

Exposure and emissions during both construction and in-use: The exposure to $PM_{2.5}$ has been considered when selecting the development site. This involves considering the following:

As mentioned above, considering the existing air quality (review of local monitoring data and DEFRA background), construction dust risk assessment and qualitative screening assessment for the operational phase, it is considered that the existing and proposed receptors are not expected to be exposed to the poor air quality including elevated $PM_{2.5}$ levels.

Furthermore, as already detailed, the site is not near any large emitters, does not have its own combustion sources and has been designed to place residents away from the roads as practically possible. When considering the baseline (already described), air quality exposure to residents has been considered.

7.4 Residual Impacts

With the implementation of the proposed construction and operational phase mitigation measures (detailed in **Section 7.1, 7.2 and Appendix B**), the residual impacts are considered to be **negligible**.

8 CONCLUSIONS

An air quality assessment for the proposed construction of 45 dwellings located at Land at Small Dole Near Henfield, BN5 9YH has been undertaken with reference to existing air quality in the area and relevant air quality legislation, policy and guidance.

A review of baseline air quality conditions, including local monitoring data, and consideration of the location of the sensitive receptors within the application site, found that the future site users of the proposed development are unlikely to be exposed to poor ambient air quality.

An assessment of construction phase impacts has been undertaken following the IAQM construction dust guidance. Mitigation measures are recommended to reduce the risk of dust and particulate matter being generated and re-suspended. With implementation of the appropriate measures, no significant impacts are anticipated during the construction phase.

A qualitative assessment of the operational impacts has been undertaken by comparing the traffic data of the development against the screening criteria outlined in the EPUK-IAQM guidance. Based on the traffic data provided by the transport consultant, it is considered unlikely that the development will have a significant impact on local air quality once operational.

No significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Energy required for heating and hot water are proposed to be supplied by on air source heat pumps to all houses and exhaust air heat pumps to the apartments.

An emission mitigation assessment was undertaken and the damage cost was calculated. The calculated central damage cost value over a five-year period is £5,312, which can be used to fund onsite mitigation measures or to contribute to off-site mitigation measures. It is noted from the transport statement for the project that mitigation measures are proposed as detailed in Section 7.2 and indicative costs are also given and it is much greater than the value determined by the damage cost calculation (i.e. £5,312).

Therefore, the overall air quality impact of the development is considered to be ‘not significant’.

Based on the results of the assessment, it is judged that with appropriate mitigation, the proposed development complies with relevant national and local planning policies and that there are no air quality constraints.

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APPENDIX A
CONSTRUCTION DUST ASSESSMENT METHODOLOGY

This appendix contains the construction dust assessment methodology used in the assessment.

To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based upon the IAQM construction dust guidance. The assessment follows the steps recommended in the guidance.

Step 1: Screen the requirement for assessment

The first step is to screen out the requirement for a construction dust assessment, this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

- a 'human receptor' within:
  - 250m of the boundary of the site; or
  - 50m of the route used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- an 'ecological receptor':
  - 50m of the boundary of the site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total building volume >75,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level;
- **Medium**: Total building volume 12,000m^3 – 75,000m^3, potentially dusty construction material, demolition activities 6m – 12m above ground level; and
- **Small**: Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total site area >110,000m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height;
- **Medium**: Total site area 18,000 – 110,000m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 6m in height; and

- **Small**: Total site area < 18,000m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height.

Construction

The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: Total building volume >75,000m^3, on site concrete batching, sandblasting;
- **Medium**: Total building volume 12,000 – 75,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small**: Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium**: 20 – 50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and
- **Small**: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site-specific factors, such as whether here are natural shelters such as trees, to reduce the risk of wind-blown dust.

Table A1 has been used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table A1: Sensitivity of the Area Surrounding the Site

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	• Users can reasonably expect enjoyment of a high level of amenity. • The appearance, aesthetics or value of their property would be diminished by soiling. • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day) • Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• Locations with an international or national designation *and* the designated features may be affected by dust soiling. • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • Examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home. • The appearance, aesthetics or value of their property could be diminished by soiling. • The 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. • Examples include parks and places of work.	• Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. • Locations with a national designation where the features may be affected by dust deposition. • Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
Low	• The enjoyment of amenity would not reasonably be expected. • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations with a local designation where the features may be affected by dust deposition. • Example is a local Nature Reserve with dust sensitive features.

Based on the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. **Tables A2** to **A4** indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the IAQM construction dust guidance, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table A2: Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distances from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3: Sensitivity of the area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
	24-28μg/m³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 μg/m³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32μg/m³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32μg/m³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28μg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 μg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the area to Ecological Impacts

Receptor Sensitivity	Distances from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Defining the Risk of Impacts

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. **Tables A5** to **A7** indicate the method used to assign the level of risk for each construction activity.

Table A5: Risk of Dust Impacts from Demolition

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

Table A6: Risk of Dust Impacts from Earthworks/Construction

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

Table A7: Risk of Dust Impacts from Trackout

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

APPENDIX B
SITE-SPECIFIC MITIGATION MEASURES

Site-specific mitigation measures are divided into general measures, applicable to all sites and measures specific to demolition, earthworks, construction and trackout. Depending on the level of risk assigned to each site, different mitigation is assigned. The method of assigning mitigation measures as detailed in the IAQM guidance has been used.

For those mitigation measures that are general, the highest risk has been applied. In this case, the '**Medium risk**' site mitigation measures have been applied, as determined by the dust risk assessment in Section 5. There are two categories of mitigation measure – 'highly recommended' and 'desirable', which are indicated according to the dust risk level identified in Table 5.7. Desirable measures are presented in *italics*.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.

Dust Management

- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/ or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site and the action taken to resolve the situation in the log book.

Monitoring

- *Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log 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 100 m of site boundary, with cleaning to be provided if necessary.*
- Carry out regular site inspections to monitor compliance with the dust management plan, record inspection results, and make an inspection log available to the local authority when asked.

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.

Preparing and maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is 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 as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- *Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (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).*
- *Implement a Travel plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).*

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 or burning of waste material.

Specific to Earthworks

- *Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.*
- *Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.*
- *Only remove the cover in small areas during work and not all at once.*

Specific to Construction

- *Avoid scabbling (roughening of concrete surfaces) if possible.*
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- *Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.*
- *For similar supplies of fine powder material ensure bags are sealed after use and stored appropriately to prevent dust.*

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 continuously in use.
- Avoid any 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.
- Install hard surfaced haul routes, 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 10 m from receptors where possible.