



AIR QUALITY ASSESSMENT

on behalf of

MORGAN SINDALL CONSTRUCTION

for

**PLOTS 9 AND 12, LECONFIELD INDUSTRIAL
ESTATE**

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Cover Note: October 2025

An air quality assessment for Plots 9 and 12 of Leconfield Industrial Estate was completed in February 2025 by Miller Goodall Ltd. Minor revisions have been made to the layout and extent of the buildings. However, these revisions do not impact the development trip generation or the overall conclusion of the construction dust risk assessment. The appointed transport consultant confirms there is no change to the trip generation previously modelled.

There have been no substantial changes in the air quality field to alter model data inputs or the model prediction outputs. The Emission Factor Toolkit was updated from version 12.1 to version 13.1; however, the changes observed in the new EFT would not be sufficient to alter the conclusions of this assessment, given that baseline and predicted modelled concentrations are well below the air quality objectives.

Consequently, the February 2025 air quality assessment is presented unchanged, as this represents a worst-case assessment. The following changes to the document have been made:

- Section 3 project description updated.
- Appendix A and C updated. These two figures show the red line boundary, which has been updated for this new submission.
- General administrative details: new job number, project title and date.

Summary

This air quality report has been prepared to accompany a planning application for a proposed commercial development at Plots 9 and 12 of the Leconfield Industrial Estate Masterplan. It assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.

Concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives at the proposed development site which is therefore considered suitable for commercial use with regards to air quality. Concentrations of PM_{2.5} are expected to be below the annual mean target.

The proposed development is not expected to have a significant impact on local air quality.

There is, therefore, no reason for this application to be refused on the grounds of air quality.

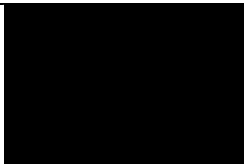
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Signed


17th October 2025

Signed


18th February 2025

Record of changes

Version	Date	Change	Initials
1	12 th February 2025	First issue	PW
2	18 th February 2025	Client document ref. added	PW
3	17th October 2025	Cover note added, update of Appendix A and C	PW

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1 Introduction

- 1.1 Miller Goodall Ltd has been instructed to prepare an air quality assessment to accompany a planning application for a proposed commercial development for Plots 9 and 12 of the Leconfield Industrial Estate Masterplan. The site lies within the administrative boundary of Cumberland Council (CC).
- 1.2 The report provides an assessment of the potential air quality impacts associated with the construction and operational phases of the proposed development. Existing air quality at and around the development is reviewed and the potential effect of the development on local air quality is undertaken following Defra¹ and EPUK and IAQM guidance².
- 1.3 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO₂) and fine particulates, normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM₁₀) and 2.5 micrometres (PM_{2.5}) since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and congested areas. This assessment has therefore focused on the impact of the proposed development on concentrations of NO₂, PM₁₀ and PM_{2.5}.

2 Site Description

- 2.1 The site is located in Cleator Moor, a small town in the western part of the Lake District. The site is located approximately 5 km to the south east of Whitehaven.
- 2.2 The site is located within the wider commercial redevelopment Masterplan known as Leconfield Industrial Estate. An outline planning application (Reference 4/22/2308/001) was prepared by Miller Goodall Ltd in 2022, for *"the redevelopment of an existing industrial estate, a new industrial extension on land to the north, an additional extension for hotel (c1) & student accommodation (siu generis) to the east comprising up to 44,350 square metres of new floorspace, proposed uses also include research & development, light industrial, general industrial, storage & distribution (class e(g), b2, b8 uses) with ancillary food/drink (class e(b)), education & new community facilities (class f1(a & e)) along with car parking, other infrastructure & full details of the accesses"*. The air quality assessment

¹ Department for the Environment Food and Rural Affairs (2022). Local Air Quality Management Technical Guidance Document LAQM.TG(22)

² EPUK and IAQM (January 2017) Land Use Planning and Development Control: Planning for Air Quality (v1.2)

indicated that there would be not significant effects from air quality.

- 2.3 This application is specifically for Plots 9 and 12, which are located in 'Area 1' of the outline Masterplan. Area 1 is located in the centre of the Masterplan. Plots 9 and 12 are located approximately 200 m north of B5295 (Leconfield Street) and located off the main existing access route through the industrial estate.
- 2.4 The land surrounding Plots 9 and 12 is part of the Masterplan, extending approximately 200 m in all directions. The nearest residential dwellings to Plots 9 and 12 are located approximately 200 m to the northeast (Sanderson Park) and 200 m south (Leconfield Street). Vehicles using the development will use the existing access, which travels south and exits onto Leconfield Street. Leconfield Street is bordered by residential dwellings in both directions, east and west, away from Leconfield.
- 2.5 The nearest Air Quality Management Area (AQMA) to the site is located approximately 54 km to the east of the site in Kendal. The site location is shown in **Appendix A**.

3 Proposed Development

- 3.1 The proposed development is for several commercial units at Plots 9 and 12 of the Leconfield Industrial Estate Masterplan.

4 Policy Context

4.1 National Planning Policy Framework

- 4.1.1 The National Planning Policy Framework^[3] advises at Paragraph 199 that development should be compliant with relevant objectives and limit values, opportunities to improve air quality should be included particularly at the design stage, and that new development should be consistent with existing air quality areas of concern and the local air quality action plans. The key theme of the policy is that existing areas of poor air quality (for example AQMA's or Clean Air Zones) should be not significantly worsened by a development scheme.

4.2 Planning Practice Guidance

³ Ministry of Housing, Communities and Local Government, 2024. National Planning Policy Framework

4.2.1 The Planning Practice Guidance (PPG)⁴, provides guidance on how planning can take account of the impact of new development on air quality. It provides advice on how assessments should be prepared, information sources to use, what impacts and issues should be predicted, and mitigation.

4.3 Air Quality Objectives

4.3.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance. This framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018⁵.

4.3.2 The relevant air quality standards and objectives are presented in **Table 1**.

Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management

Pollutant	Air Quality Objective	
	Concentration	Measured As
Nitrogen dioxide (NO ₂)	200 µg/m ³	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m ³	Annual mean
Particles (PM ₁₀)	50 µg/m ³	24-hour mean not to be exceeded more than 35 per year
	40 µg/m ³	Annual mean
Particles (PM _{2.5})	20 µg/m ³	Annual mean (target)

4.3.3 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as Air Quality Management Areas (AQMAs) and take action to work towards

⁴ Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (2018 to 2021) and Department for Levelling Up, Housing and Communities, *Planning Practice Guidance - Air Quality* 2019 [Air quality - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/air-quality)

⁵ UK Parliament (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

meeting the objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

- 4.3.4 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.
- 4.3.5 As the development is for commercial use, the air quality objectives do not apply¹.

5 Methodology

5.1 Data Sources

- 5.1.1 The air quality assessment has been undertaken and prepared with reference to information from several sources, as detailed in **Table 2**.

Table 2: Key Information Sources

Data Source	Reference
Cumberland Council (CC)	2023 Air Quality Annual Status Report
Institute of Air Quality Management (IAQM)	IAQM (2014) <i>Assessment of Dust from Demolition and Construction</i> (v1.1)
Department for Environment Food and Rural Affairs (Defra)	Defra (2022) <i>Local Air Quality Management Technical Guidance TG(22)</i>
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) <i>Land Use Planning and Development Control: Planning for Air Quality</i> (v1.2)
Ministry of Housing, Communities & Local Government	Planning Practice Guidance: Air Quality, November 2019 National Planning Policy Framework (NPPF), December 2024

Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps NOx to NO ₂ Calculator
Curtins	Traffic Data
Air Pollution Services	Meteorological data from St Bees Head No. 2 for the year 2023

5.2 Consultation

- 5.2.1 Miller Goodall Ltd prepared air quality assessments and modelling for the outline Masterplan and the application known as 'the Hub'. These applications covered the full site and larger trip generation and model scopes than the current submission. The methodologies for these were sent to the Environmental Health Department of CC⁶ by email on 1st November 2021. Subsequent reviews of the air quality reports conducted as part of the planning applications after this date did not identify any concerns.
- 5.2.2 We have used the modelling prepared in the earlier schemes for this development. The baseline and verification calculations have been updated to account for most recent monitoring data. This particular scheme is opening in 2027, and the amount of trip generation is overall smaller, than the previous assessments. These updates have been modelled, with the preparation of new 'Without' and 'With' Development scenarios and an impact assessment of air quality change.
- 5.2.3 As these works are a reduction on what has already been agreed previously, no further consultation has been undertaken. The air quality assessment has been prepared in accordance with the most recent legislation, guidance and best practice. Model verification has been undertaken to limit model uncertainty.

⁶ Email Miller Goodall Ltd. to CBC, 1st November 2021.

5.3 IAQM Construction Dust Assessment

5.3.1 The IAQM has produced guidance⁷ on the assessment of air quality impacts arising from dust associated with construction activities and provides a methodology by which to complete such assessments. The IAQM methodology provides a risk assessment structure to determine the likely impact of the development on nearby receptor locations and recommends mitigation measures that should be implemented to reduce any such impact. The methodology for the assessment is shown in **Appendix B**. The study area in relation to dust and the zones of interest used within the assessment (<20 m, 20 m – 50 m and 50 – 100 m from the site) are shown in **Appendix C**. The dust assessment informed the recommended mitigation outlined in **Appendix D**.

5.4 Road Traffic Emissions Assessment

Air Dispersion Model

5.4.1 The validated Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) v5.0.1.3 was used to assess the local air quality impact of development-generated vehicle exhaust emissions, on concentrations of NO₂, PM₁₀ and PM_{2.5} at existing receptors located adjacent to the assessed road network.

5.4.2 A qualitative comparison to the short-term air quality objectives has been undertaken as future commercial sensitive receptors at the site would not be exposed to the annual mean air quality objective.

Assessment Scenarios

5.4.3 The assessment considered the following scenarios:

- Scenario 1: 2023 base year and verification;
- Scenario 2: 2027 opening year 'without development'; and
- Scenario 3: 2027 opening year 'with development'.

Traffic Data

⁷ Institute of Air Quality Management, 2024. Guidance on the Assessment of dust from demolition and construction

- 5.4.4 The spatial scope for the assessment focused on those routes affected by the proposed development. The traffic data used in the assessment and a map of the road network modelled is provided in **Appendix E**.
- 5.4.5 One committed development is included in the traffic data, the Hub (Planning Ref. 4/22/2184/001). The Hub is also part of the wider Leconfield Industrial Estate Masterplan.
- 5.4.6 Vehicles within the study area have been modelled at posted speed limits apart from the approach to junctions where queuing traffic sections are included in the model at 20 kph where appropriate following Defra guidance.

Meteorological Data

- 5.4.7 Meteorological data for 2023 from the St Bees Head No. 2 recording station was used in the ADMS-Roads model. This is the most representative recording station for the development site.
- 5.4.8 The wind rose for 2023 from St Bees Head No. 2 recording station is provided in **Appendix E**. Dispersion values for the site and meteorological station have been used. The factors applied for surface roughness (m) and the minimum Monin-Obukhov length (m) are outlined in **Appendix E**.

Sensitive Receptors

- 5.4.9 Six existing sensitive receptor locations were selected based on their proximity to road links affected by the proposed development, where the potential effect of development-related traffic emissions on local air pollution would be most significant.
- 5.4.10 Predicted changes in NO₂, PM₁₀ and PM_{2.5} concentrations, as a result of development-generated traffic, were calculated at these locations. The ESR receptor locations are detailed in **Table 3** and shown in **Appendix A**.

Table 3: Existing Sensitive Receptor Locations

Receptor	Grid Ref	
ESR 1	301150	515607
ESR 2	301178	515557
ESR 3	301444	515405
ESR 4	301545	515313
ESR 5	301560	515323

Receptor	Grid Ref	
ESR 6	302027	515059

Conversion of NOx to NO₂

5.4.11 Oxides of nitrogen (NO_x) concentrations were predicted using the ADMS-Roads model. The modelled road contribution of NO_x at the identified receptor locations was then converted to NO₂ using the NO_x to NO₂ calculator (v9.1, 2024)⁸ following Defra guidance.

Emission Factors

5.4.12 Defra’s Emission Factor Toolkit (EFT)⁹ (V12.1, 2024) was used within the ADMS-Roads model to predict emissions from road vehicles for all scenarios.

Background Concentrations

5.4.13 The ADMS model requires the derivation of background pollutant concentration data that are factored to the year of assessment, to which the contributions from the assessed roads are added.

5.4.14 CC operates diffusion tube N3, an urban background air quality monitor. Background concentrations of NO_x NO₂ are used from this monitor and applied to all sensitive receptors.

5.4.15 Background concentrations of PM₁₀ and PM_{2.5} concentrations were obtained from the Defra LAQM support tools for the 1 km x 1 km grid squares covering the proposed development site and receptor locations for the years of assessment (2023 and 2027).

Model Verification

5.4.16 Model verification is the process of adjusting model outputs to improve the consistency of modelling results with respect to available monitored data.

⁸ [Background maps. Tools. Local Air Quality Management Support - Defra, UK](#)
⁹ [Emissions Factors Toolkit \(defra.gov.uk\)](#)

- 5.4.17 Verification has been undertaken for NO₂ using diffusion tube N5. This monitor is listed as urban background in the 2021 ASR, however, it is within 3 m of the B5295, which is the main route used by development traffic and also several ESRs in this study. In accordance with Defra LAQM.TG (22), it is considered to be a roadside classification for the purposes of this assessment; due to the monitor's proximity to the B5295. The location of N5 is shown in **Appendix A**.
- 5.4.18 The verification procedure and associated calculations are shown in **Appendix E**. A single verification factor has been derived and applied to all sensitive human and ecological receptors assessed. All modelled road NO_x concentrations have been adjusted by a factor of 2.3236.
- 5.4.19 There is no PM₁₀ or PM_{2.5} monitoring undertaken within the study area, therefore it was not possible to undertake verification for particulate matter concentrations.

Relevant Objectives

- 5.4.20 Pollutant concentration predictions for the student accommodation would be compared to both the annual mean and the short-term objectives.
- 5.4.21 As the development is for commercial use, the air quality objectives do not apply¹. However, a qualitative comparison to the Defra LAQM.TG(22) NO₂ 60 µg/m³ annual mean screening method has been undertaken for this assessment.

Assessment Significance Criteria

- 5.4.22 Guidance is provided by EPUK and IAQM² on criteria for determining the significance of a development's impact on local air quality. **Table 4** details the impact descriptors used for individual receptors in relation to annual mean pollutant concentrations. The overall significance of impacts was determined using professional judgement. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.

Table 4: Impact descriptors for individual receptors

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)*			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate

95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

*AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'

5.5 Ecological Assessment

- 5.5.1** Vehicles exiting the site eastwards on the B5295 (Leconfield Street) and then southwards on Trumpet Road will travel past The River Ehen Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The River Ehen designation is located approximately 20 m from the roadside of Trumpet Road, as shown in **Appendix A**.
- 5.5.2** Natural England's 'approach to advising competent authorities on the assessment of road traffic emissions under the Habitat Regulations' 2018 and IAQM 'A guide to the assessment of air quality impacts on designated nature conservation sites' 2020 both specify a relevant screening threshold for the assessment of air quality impacts to ecological habitats. The screening criteria indicates when a perceptible change may occur and further detailed assessment may be required. The criteria are 1,000 light-duty vehicle (LDV) AADT or 200 heavy-duty vehicle (HDV) AADT within 200 m of an ecological designation.
- 5.5.3** The assessment of air quality impacts to ecological habitats includes a requirement to assess the proposal in-isolation and in-combination. In-isolation is the development only traffic, whereas in-combination is the development traffic plus the cumulative development traffic. Both in-isolation and in-combination are compared to the vehicle generation criteria. If either methodology exceeds, then a detailed air quality assessment is likely to be required.
- 5.5.4** Curtins, the appointed transport consultant, has confirmed that the proposed development vehicle generation (in-isolation) does not exceed the vehicle criteria for LDV or HDV, as only 17 AADT is expected to travel along the B5295, east of Jacktrees Road. The trip generation arising from the Hub is also minimal (less than 100 AADT) and will not contribute to a combined adverse effect. In-combination does not exceed the vehicle criteria for LDV or HDV or require further assessment.
- 5.5.5** A detailed air quality assessment of vehicular emission impacts on the River Ehen SSSI and SAC does not require further assessment. Impacts are concluded to be screened out due to the criteria for assessment not being met.

6 Baseline Air Quality

6.1 Local Air Quality

- 6.1.1 Baseline air quality at the proposed development has been established by examining monitoring data produced by CC (formerly CC, provided in the 2021 Annual Status Report) and background concentration maps provided by Defra for the grid squares covering the proposed development.
- 6.1.2 There are no AQMAs in the former CBC administrative area and air quality is regarded as being very good, quoted as in the ASR. Cleator Moor resides in the Lake District and there are very few heavily trafficked pollutant sources in the western parts of the Lake District. Air pollution levels are expected to be low. The site location is shown in **Appendix A**.

6.2 Air Quality Monitoring

Nitrogen Dioxide (NO₂)

- 6.2.1 CC operates two air quality monitors near the site. Diffusion tube 'N5' is located approximately 560 m to the southeast of the site on Leconfield Street. The ASR states this monitor is an urban background classification, however, it is within 15 m of Leconfield Street. For the purposes of this assessment, it is considered to be a roadside classification and has been used in the verification procedure; as it is located within 15 m of a road (per the criteria for a roadside classification in LAQM.TG(22)) .
- 6.2.2 Diffusion tube 'N3' is located approximately 2.8 km to the northwest of the site and is an urban background monitor at the eastern outskirts of Whitehaven. Diffusion tube N5 is considered to be representative of the site conditions and ESRs. The results from the diffusion tube are shown in **Table 5** and the monitor locations are shown in **Appendix A**.

Table 5: Annual Mean NO₂ Concentrations Monitored by CC within the Study Area

Site ID	Location		Annual Mean NO ₂ Concentrations (µg/m ³)						
			2017	2018	2019	2020	2021	2022	2023
N3 (urban background)	299020	517245	8.2	8.6	7.3	6.0	6.2	5.7	5.1
N5 (roadside)	302260	514890	10.8	10.8	10.0	7.4	7.9	6.9	6.9
Annual Mean NO ₂ air quality objective							40 µg/m ³		

- 6.2.3 The monitoring results in **Table 5** indicate that annual mean concentrations of NO₂ were below the NO₂ annual mean objective at the identified monitoring sites during the period shown. No data was provided by CC for 2020 and 2021, although it is noted that results will have been affected by the Covid-19 pandemic in any case.
- 6.2.4 The results indicate that the short-term objective for NO₂ was unlikely to be exceeded at the identified monitoring sites as monitored annual mean concentrations were well below the indicative screening concentration of 60 µg/m³ during the period shown.

Particulate Matter (PM₁₀ & PM_{2.5})

- 6.2.5 CC does not undertake PM₁₀ or PM_{2.5} monitoring in the vicinity of the proposed development site, neither is there any nearby representative monitoring available.

6.3 Background Concentrations

- 6.3.1 NO₂ is taken from diffusion tube N3. **Appendix E** shows the calculations to derive the 2027 concentration, per the LAQM.TG(22) calculation procedure. This concentration is applied to all monitors and ESR.
- 6.3.2 Background concentrations of PM₁₀ and PM_{2.5} obtained from the 2021-based background concentration maps provided by Defra for the grid squares covering the proposed development and receptor locations¹⁰ are shown in **Table 6**.

Table 6: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site and Receptor Locations

Grid Square	Pollutant	2023	2027
		(µg/m³)	(µg/m³)
301500, 515500 (ESRs 1 – 5)	NO ₂	5.10	4.56
	PM ₁₀	8.49	8.24
	PM _{2.5}	4.59	4.36
302500, 515500 (ESR 6)	NO ₂	5.10	4.56
	PM ₁₀	7.38	7.16
	PM _{2.5}	4.23	4.03

¹⁰ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

7 Construction Dust Impact Assessment

7.1 Step 1 – Requirement for a Detailed Assessment

- 7.1.1 There are sensitive receptors located within 250m of the site boundary, therefore, a detailed assessment of the construction phase of the development has been undertaken. There are no ecological designations within 50m of the site boundary or 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s) which require assessment.

7.2 Step 2 – Assess the Risk of Dust Impacts

Step 2A Dust Emission Magnitude

- 7.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table B1** in **Appendix B**. The scale and nature of works onsite were considered to determine the potential dust emission magnitude for demolition, earthwork activities, construction and trackout activities.
- 7.2.2 Information to determine the classification has been estimated from the site plans, Google Earth and information provided by the Applicant. The dust emission magnitude is outlined in **Table 7**.

Table 7: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitudes	Justification for Sensitivity Classification
Demolition	Small	The total building volume to be demolished is less than 12,000 m³.
Earthworks	Small	the site area is less than 18,000 m².
Construction	Medium	total building volume estimated to be constructed is between 12,000 to 75,000 m³.
Trackout	Medium	there are likely to be 20 – 50 HDV outward movements in any one day

Step 2B Sensitivity of the Receptors to Dust Soiling and Health Effects

- 7.2.3 The development is setback into Leconfield Industrial Estate. The nearest sensitive receptors to earthworks and construction are located between 100 to 250 m from where these activities will be carried out. Dwellings are located within a distance of 20 m of the trackout route. In accordance

with the criteria in **Table B2** in **Appendix B** and the IAQM guidance, the sensitivity of human receptors is **high**.

Step 2B Sensitivity of the Area to Dust Soiling and Human Health Effects of PM₁₀

7.2.4 The sensitivity of the area for dust soiling and human health effects has been determined using the criteria detailed in **Table B3** and **Table B4** respectively in **Appendix B**.

7.2.5 The sensitivity of the area to dust soiling and human health for each activity is summarised in **Table 8**.

Table 8: Outcome of Defining the Sensitivity of the Area

Pollution	Activity	Sensitivity of the Surrounding Area	Justification for Sensitivity Classification
Dust Soiling	Demolition	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m from where demolition will occur
	Earthworks	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m of the site boundary
	Construction	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m of the site boundary
	Trackout	High	There are 10 – 100 highly sensitive residential receptors within 20 m of the trackout route, up to 200 m from the site exit
Human Health	Demolition	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m from where demolition will occur. Background pollutant concentrations are below 24 µg/m ³
	Earthworks	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m of the site boundary. Background pollutant concentrations are below 24 µg/m ³
	Construction	Low	There are 10 – 100 highly sensitive residential receptors within 100 to 250 m of the site boundary. Background pollutant concentrations are below 24 µg/m ³

Pollution	Activity	Sensitivity of the Surrounding Area	Justification for Sensitivity Classification
	Trackout	Low	There are 10 – 100 highly sensitive residential receptors within 20 m of the trackout route. Background pollutant concentrations are below 24 µg/m ³

Step 2C Risk of Impacts

7.2.6 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts determined using the criteria detailed in **Table B5** to **Table B8** in **Appendix B**.

7.2.7 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 9**. This risk applies to both Plots 9 and 12, as well as the works for Brannans Buildings. All works will fall under a dust management plan.

Table 9: Risk of Dust Impacts

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

7.3 Step 3 – Site-Specific Mitigation

7.3.1 Step 3 of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Mitigation measures specific to construction and trackout are proposed based on the risk classifications in **Table 9**. Recommended mitigation measures are shown in **Appendix D**.

7.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'medium risk' classification¹¹.

¹¹ For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for track-out, the general measures applicable to a high risk site should be applied.

7.4 Step 4 – Determine Significant Effects

7.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the mitigation measures, therefore, the residual impacts from the construction are considered to be not significant when considered following IAQM guidance.

8 Road Traffic Assessment

8.1 Baseline Assessment

- 8.1.1 The ADMS-Roads model was used to estimate contributions of vehicle exhaust emissions to annual NO₂, PM₁₀ and PM_{2.5} concentrations for the ‘baseline’ and ‘without development’ scenarios considered in the assessment.
- 8.1.2 The 24-hour AADT flows used in the assessment are detailed in **Appendix E. Table 10** details the results of the baseline assessment.

Table 10: Predicted Baseline NO₂, PM₁₀ and PM_{2.5} Annual Mean Concentrations (µg/m³) at Existing Sensitive Receptor Locations

Receptor	Receptor Height above Ground Level (m)	Scenario 1: Base Year (2023)			Scenario 2: Without Development (2027)		
		NO ₂ (µg/m³)	PM ₁₀ (µg/m³)	PM _{2.5} (µg/m³)	NO ₂ (µg/m³)	PM ₁₀ (µg/m³)	PM _{2.5} (µg/m³)
ESR 1	1.5	10.88	9.30	5.02	8.29	9.03	4.78
ESR 2	1.5	8.11	8.90	4.81	6.50	8.65	4.57
ESR 3	1.5	12.90	9.35	5.05	9.52	9.08	4.80
ESR 4	1.5	9.69	9.12	4.93	7.47	8.86	4.68
ESR 5	1.5	9.44	9.08	4.91	7.31	8.82	4.67
ESR 6	1.5	7.57	7.72	4.41	6.16	7.50	4.20
Annual Mean NO ₂ & PM ₁₀ Air Quality Objective						40 (µg/m³)	
Annual Mean PM _{2.5} Target Level Objective						25 (µg/m³)	

8.1.3 The baseline air quality assessment for the base year (2023) and opening year ‘without development’ (2027) scenarios indicate that concentrations of NO₂, and PM₁₀ are below the

respective annual mean air quality objectives and the PM_{2.5} annual mean target at all sensitive receptors assessed.

8.2 Impact Assessment

Existing Sensitive Receptors

8.2.1 Predicted NO₂, PM₁₀ and PM_{2.5} concentrations for the opening year (2027) 'with development' scenario at 15 ESR locations are detailed in **Table 11**, **Table 12** and **Table 13**. The predicted change in NO₂, PM₁₀ and PM_{2.5} concentrations at existing sensitive receptors between the 'without development' and 'with development' scenarios were compared to the significance criteria detailed in EPUK and IAQM guidance² and contained within **Table 4**.

Table 11: NO₂ Dispersion Modelling Results and Significance of Development for the Opening Year (2027) Scenario at Existing Receptor Locations

Receptor	Without Development µg/m ³	Concentration with Development µg/m ³	Impact µg/m ³	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR 1	8.29	8.43	0.14	21.08%	0.35%	Negligible
ESR 2	6.5	6.57	0.07	16.43%	0.18%	Negligible
ESR 3	9.52	9.72	0.20	24.30%	0.50%	Negligible
ESR 4	7.47	7.52	0.05	18.80%	0.13%	Negligible
ESR 5	7.31	7.36	0.05	18.40%	0.13%	Negligible
ESR 6	6.16	6.17	0.01	15.43%	0.02%	Negligible
Annual Mean NO ₂ Air Quality Objective					40 (µg/m ³)	

Table 12: PM₁₀ Dispersion Modelling Results and Significance of Development for the Opening Year (2027) Scenario at Existing Receptor Locations

Receptor	Without Development µg/m ³	Concentration with Development µg/m ³	Impact µg/m ³	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR 1	9.03	9.06	0.03	22.66%	0.08%	Negligible

Receptor	Without Development $\mu\text{g}/\text{m}^3$	Concentration with Development $\mu\text{g}/\text{m}^3$	Impact $\mu\text{g}/\text{m}^3$	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR 2	8.65	8.66	0.01	21.66%	0.02%	Negligible
ESR 3	9.08	9.11	0.03	22.78%	0.07%	Negligible
ESR 4	8.86	8.87	0.01	22.17%	0.02%	Negligible
ESR 5	8.82	8.83	0.01	22.08%	0.02%	Negligible
ESR 6	7.50	7.50	0.00	18.75%	0.00%	Negligible
Annual Mean PM ₁₀ Air Quality Objective					40 ($\mu\text{g}/\text{m}^3$)	

Table 13: PM_{2.5} Dispersion Modelling Results and Significance of Development for the Opening Year (2027) Scenario at Existing Receptor Locations

Receptor	Without Development $\mu\text{g}/\text{m}^3$	Concentration with Development $\mu\text{g}/\text{m}^3$	Impact $\mu\text{g}/\text{m}^3$	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR 1	4.78	4.79	0.01	23.96%	0.05%	Negligible
ESR 2	4.57	4.58	0.01	22.91%	0.05%	Negligible
ESR 3	4.80	4.82	0.02	24.08%	0.10%	Negligible
ESR 4	4.68	4.69	0.01	23.45%	0.05%	Negligible
ESR 5	4.67	4.67	0.00	23.36%	0.00%	Negligible
ESR 6	4.20	4.20	0.00	21.02%	0.00%	Negligible
Annual Mean PM _{2.5} Target Level Objective					20 ($\mu\text{g}/\text{m}^3$)	

8.2.2 The results of the ADMS-Roads modelling assessment for 2027 indicate that annual mean concentrations of NO₂ and PM₁₀ would be below the respective annual objectives as well as the PM_{2.5} annual mean target in 2027, at all existing sensitive receptor locations within the study area, for both 'with' and 'without' the development.

8.2.3 Predicted annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} are expected to have an increase of less than 0.5% at all existing sensitive receptors assessed. It is likely that concentrations predicted at individual receptor locations are also representative of worst-case exposure as they are close

to the main junctions used by development traffic. The proposed development is therefore predicted to have a **negligible** impact on concentrations of NO₂, PM₁₀ and PM_{2.5} in 2027.

8.2.4 The traffic flow revisions from the updated site layout are shown for context in **Appendix E**. These changes are not sufficient to alter the conclusions or results presented in this assessment.

Proposed Receptors

8.2.5 LAQM.TG(22) provides a qualitative screening approach to determine whether there is a risk of exceedance of the one-hour NO₂ air quality objective. If the ambient NO₂ annual mean concentration is above 60 µg/m³ there is a risk that the one-hour objective (200 µg/m³) may be exceeded.

8.2.6 The predicted NO₂ concentrations surrounding the development are all well below 60 µg/m³ and, therefore, when considered in light of guidance in LAQM.TG (22), the 1-hour mean objective is unlikely to be exceeded at the location of the commercial units.

8.2.7 The short term PM₁₀ objective is predicted to be met at the proposed receptor location with no exceedances of the daily mean objective of 50 µg/m³.

8.2.8 The site is therefore considered suitable for commercial use with regards to air quality.

9 Mitigation

9.1 The air quality assessment has predicted the site will not have a significant impact on local air quality. Mitigation in relation to vehicular emission impacts is not required. However, best practice measures should still be adopted where possible, these may include:

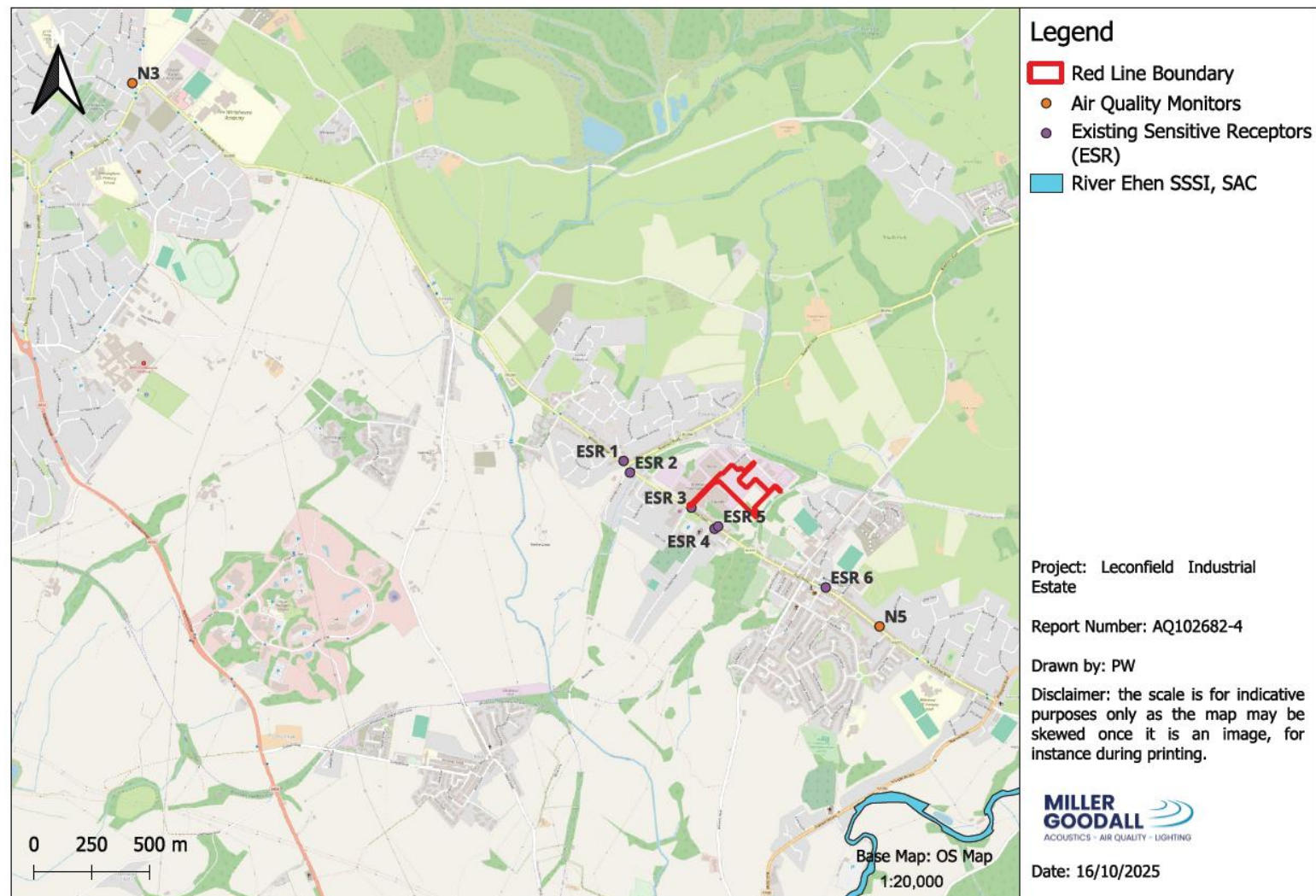
- Control of Construction Emissions. In this case, mitigation of construction dust will be achieved by the use of the mitigation measures outlined in **Appendix D**.
- Electric vehicle charging infrastructure or charge points. 20 chargers will be provided at the development.
- Cycle provisions.
- Travel Plan.

10 Summary of Impacts and Conclusion

- 10.1 This air quality report assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.
- 10.2 The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.
- 10.3 Concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives at the proposed development site, which is therefore considered suitable for commercial use with regards to air quality. Concentrations of PM_{2.5} are expected to be below the annual mean target.
- 10.4 The proposed development is not expected to have a significant impact on local air quality at existing sensitive receptors on the routes to be used by development traffic.
- 10.5 There is, therefore, no reason for this application to be refused on the grounds of air quality.

APPENDICES

Appendix A: Site Location, ESR and monitor positions



Appendix B: IAQM Dust Risk Assessment Methodology

The following section outlines criteria developed by the IAQM for the assessment of air quality impacts arising from construction and demolition activities⁷. The assessment procedure is divided into four steps and is summarised below:

Step 1: Screen the Need for a Detailed Assessment

An assessment will normally be required where there are human receptors within 250 m of the site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s). 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 250 m from the site entrance(s), are also identified at this stage. An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects will not be significant.

Step 2: Assess the Risk of Dust Impacts

In step two, a site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the IAQM (construction, demolition, earthworks and trackout). A site can be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

Step 2A: Define the Potential Dust Emission Magnitude

Dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium or Large. The IAQM guidance recommends that the dust emission magnitude is determined separately for demolition, earthworks, construction and trackout. **Table B1** describes the potential dust emission class criteria for each outlined activity.

Table B1: Criteria Used in the Determination of Dust Emission Magnitude

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <12,000 m ³ , construction materials with low potential for dust release.	Total building volume 12,000 m ³ – 75,000 m ³ , potential dusty construction material.	Total building volume >75,000 m ³ , potentially dusty construction material.
Earthworks	Total site area <18,000 m ² , soil type with large grain	Total site area 18,000 – 110,000 m ² , moderately dusty soil type	Total site area >110,000 m ² , potentially dusty soil type
Construction	Total building volume <12,000 m ³ .	Total building volume 12,000 – 75,000 m ³ .	Total building volume >75,000 m ³ .
Trackout	<20 outward HDV trips in any one day. Unpaved road length <50 m.	20–50 outward HDV trips in any one day. Unpaved road length 50–100 m.	>50 outward HDV trips in any one day. Unpaved road length >100 m.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM₁₀ concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

The criteria detailed in **Table B2** is used to determine the sensitivity of the receptor in relation to dust soiling, health effects and ecological effects.

Table B2: Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM ₁₀	Ecological Sites
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes	International or national designation <i>and</i> the features may be affected by dust soiling; or 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
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM ₁₀	Presence of an important plant species where dust sensitivity is uncertain or locations with a national designation with features that may be affected by dust deposition
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Local designation where features may be affected by dust deposition

Table B3 and **Table B4** are then used to define the sensitivity of the area to dust soiling and human health effects. **Table B5** is used to define the sensitivity of the area to ecological impacts. This should be derived for each of construction, demolition, earthworks and trackout.

Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property.

Receptor Sensitivity	Number of Receptors	Distance from Source (m)*			
		<20	<50	<100	<250
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

*distances considered are to the dust source

Table B4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentrations	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m ³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m ³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table B5: Sensitivity of the Area to Ecological Impacts^{a, b, c}

Receptor Sensitivity	Distance from Source (m) ^c	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

^a The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout and for each designated site. See STEP 2B, Box 8 and Box 9 of IAQM guidance.

^b Only the highest level of area sensitivity from the table needs to be considered.

^c For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site.

The sensitivity of the area is then summarised.

Step 2C Define the Risks of Impacts

The dust emission magnitude from **Table B1** and sensitivity of the area and receptors from **Table B2**, **Table B3**, **Table B4** and **Table B5** are combined, and the risk of impacts from each activity (demolition, earthworks, construction and trackout) before mitigation is applied, is determined using the criteria detailed in **Table B6** to **Table B9**.

Table B6: Risk of Dust Impacts – Demolition

Potential Impact Sensitivity of the 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 B7: Risk of Dust Impacts- Earthworks

Potential Sensitivity of the Area	Impact	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 B8: Risk of Dust Impacts- Construction

Potential Sensitivity of the Area	Impact	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 B9: Risk of Dust Impacts- Trackout

Potential Sensitivity of the Area	Impact	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

Step 3 Determine Site Specific Mitigation

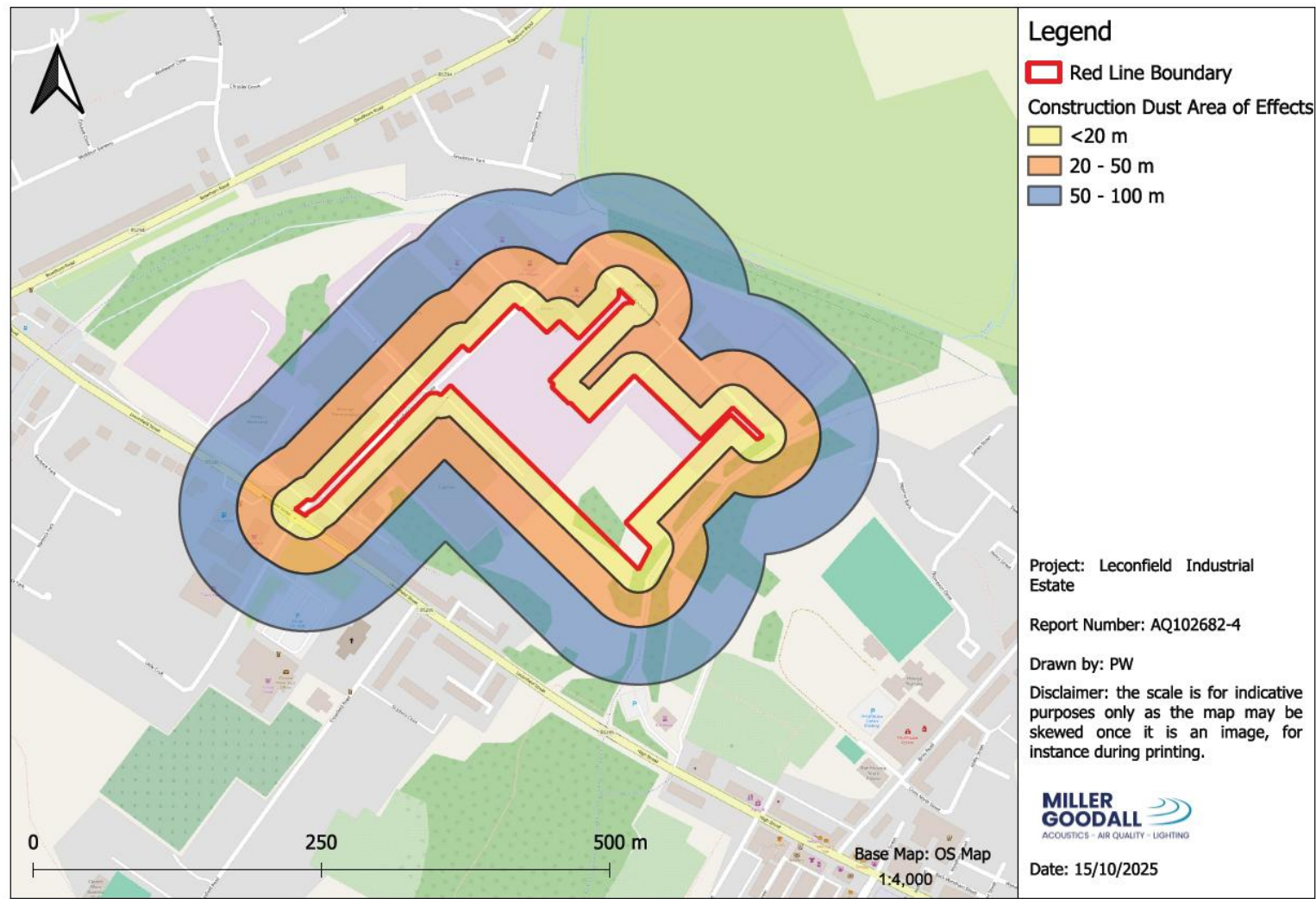
Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

Step 4 Determine Significance of Residual Effects

At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

Appendix C: Construction Dust Area of Effects



Appendix D: IAQM Dust Assessment Mitigation

xx Highly Recommended

x Desirable

Measures relevant for demolition, earthworks, construction and trackout

Mitigation Measure	Medium Risk
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	xx
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.	xx
Display the head or regional office contact information.	xx
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 in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, realtime PM ₁₀ continuous monitoring and/or visual inspections.	xx
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.	xx
Make the complaints log available to the local authority when asked.	xx
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	xx
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.	x
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	xx
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.	xx

Mitigation Measure	Medium Risk
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. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	xx
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.	xx
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	xx
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	xx
Avoid site runoff of water or mud.	xx
Keep site fencing, barriers and scaffolding clean using wet methods.	xx
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.	xx
Cover, seed or fence stockpiles to prevent wind whipping.	xx
Operating vehicle/machinery and sustainable travel	
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	xx
Ensure all vehicles switch off engines when stationary – no idling vehicles.	xx
Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	xx
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph 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).	x
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	x
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.	xx
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	xx

Mitigation Measure	Medium Risk
Use enclosed chutes and conveyors and covered skips.	xx
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	xx
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.	xx
Waste management	
Avoid bonfires and burning of waste materials.	xx

Measures specific to construction

Mitigation Measure	Low Risk
Avoid scabbling (roughening of concrete surfaces) if possible.	x
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.	x

Measures specific to trackout

Mitigation Measure	Medium Risk
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.	xx
Avoid dry sweeping of large areas.	xx
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	xx
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	xx

Mitigation Measure	Medium Risk
Record all inspections of haul routes and any subsequent action in a site log book.	xx
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned.	xx
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	xx
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.	xx
Access gates to be located at least 10 m from receptors where possible.	xx

Appendix E: Assessment and Model Inputs

This appendix outlines the inputs used in the road traffic emissions assessment.

Future Year Background Concentrations

Background concentrations of NO₂ for future year assessments (2027) have been determined using the following formula:

$$\text{Future Year Concentration} = \text{Base Year Concentration} \times \frac{\text{DEFRA Map Future Year Concentration}}{\text{DEFRA Map Base Year Concentration}}$$

Table E1 shows the predicted background concentrations derived from urban background air quality monitor 'N3'.

Table E1: Calculation of Diffusion Tube 'N3' Background NO₂ Concentrations

Year	Pollutant	2023 Monitored Concentration	Defra – 2023 NO ₂ Concentration	Defra – 2027 NO ₂ Concentration	Calculated NO ₂ Concentration
2023	NO ₂	5.10	4.02	–	5.10*
2027	NO ₂	–	–	3.59	4.56
*Monitored 2023 concentration					

Traffic Data

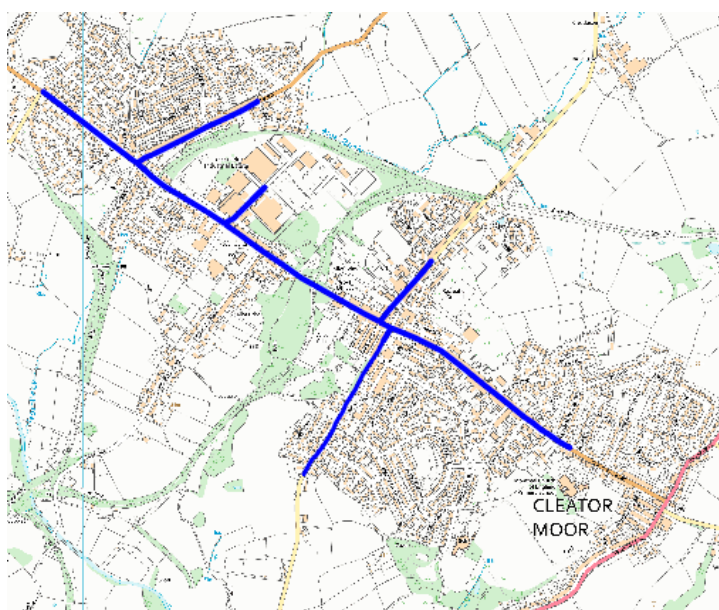
The ADMS-Roads model requires the inclusion of detailed road traffic data for the routes to be affected by the proposed development.

Traffic data has been provided as 24-hour Annual Average Daily Traffic (AADT) and heavy-duty vehicle percentages (HGV%). No average speed traffic survey information was available, therefore, posted speed limits have been utilised in the model. Areas of congestion, queuing and junction locations have been modelled at reduced speeds of 20 km/h.

The traffic data used in the assessment is detailed in **Table E2** and presented in **Figure E1**.

Table E2: Traffic Data used in the Assessment

Link Number	Road	Max Speed (km/h)	2023 Base Year/Verification		2027 Without Development		2027 With Development		Total AADT Change
			AADT LDV	AADT HDV	AADT LDV	AADT HDV	AADT LDV	AADT HDV	
1	B5295 (west of Bowthorn Road)	48	12,401	231	12,698	239	13,055	278	396
2	B5295 (east of Bowthorn Road)	48	12,769	199	13,074	209	13,477	253	447
3	B5295 (east of Site A Entrance)	48	11,559	435	11,841	444	11,944	455	114
4	Site A site access	48	1,003	27	1,027	28	1,534	83	562
5	B5295 (west of Birks Road)	48	11,610	213	11,890	218	11,993	230	114
6	Birks Road (north of B5295)	48	2,863	19	2,933	19	2,933	19	0
7	B5295 (east of Jacktrees Road)	48	5,038	107	5,160	109	5,175	111	17
8	Jacktrees Road	48	5,396	74	5,525	78	5,612	87	97
9	Birks Road (south of Site C Access)	48	1,793	22	1,836	23	1,877	28	46

Figure E1: Spatial Model Scope

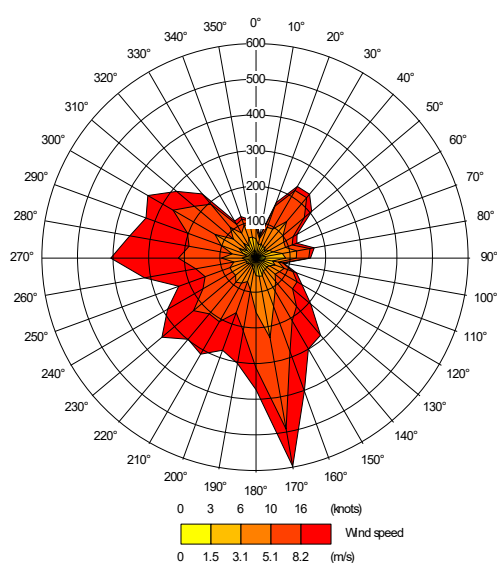
Meteorological Data

The air quality assessment includes the use of the 2023 St Bees Head No. 2 meteorological recording station.

The St Bees Head No. 2 recording station is located approximately 4.8 km to the west of the proposed development site and is considered to be the most representative of the site conditions in terms of altitude and distance.

The 2023 wind rose for St Bees Head No. 2 recording station is provided in **Figure E2**.

Figure E2: Wind Rose



Dispersion and Meteorological Site Characteristics

The air dispersion characteristics for the site and meteorological recording station differ, therefore, these have been adjusted accordingly within ADMS-Roads. **Table E3** details the adjustments made.

Table E3: Dispersion and Meteorological Site Characteristics

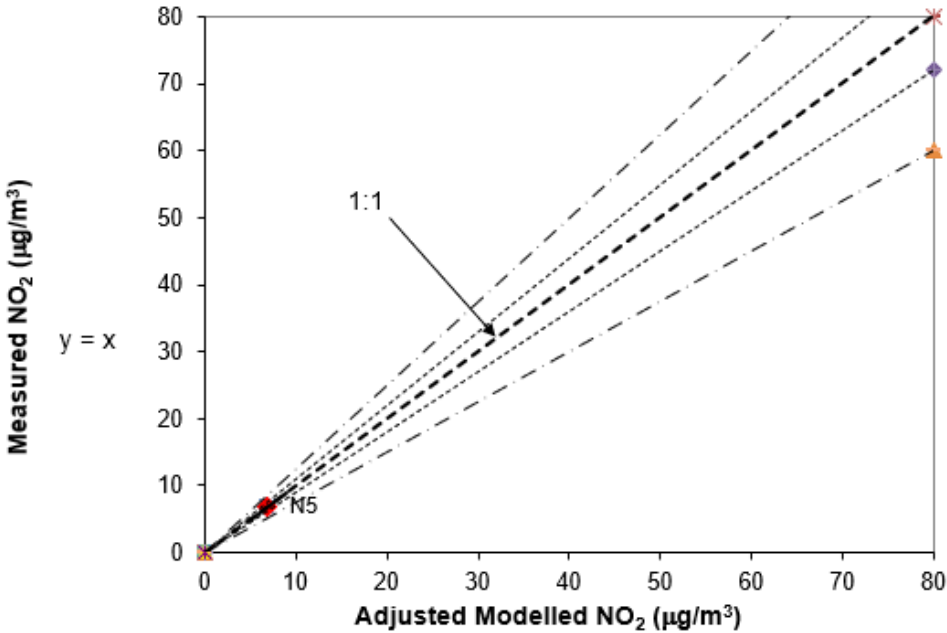
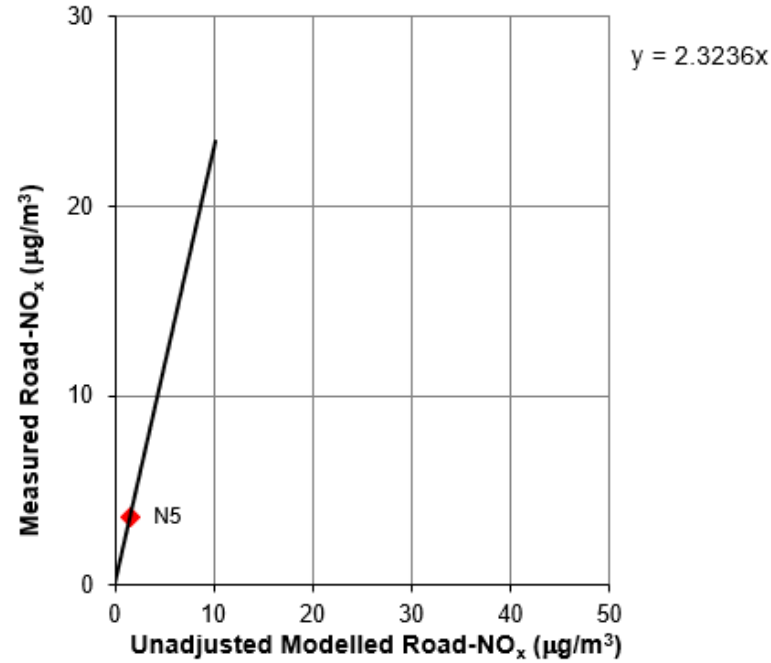
Parameter		Dispersion Site	Meteorological Site
Surface Roughness		0.5 m	0.2 m
Surface Albedo		0.23	0.23
Minimum	Monin-Obukhov	10 m	10 m
Length			
Priestley-Taylor Parameter		1	1

Model Verification

Model verification has been completed for NO₂. There is no PM₁₀ nor PM_{2.5} monitoring undertaken within the study area, therefore, it was not possible to undertake verification of PM₁₀ or PM_{2.5} concentrations. The verification procedure for the selected air quality monitors of this assessment is detailed in **Table E4**.

Table E4: NO₂ Model Verification Procedure

Monitor	2023 Monitored Total NO ₂	Monitored Road NO _x	2023 Background NO ₂	2023 Background NO _x	Monitored Road Contribution NO ₂ (total – background)	Modelled Road Contribution NO _x (excludes background)	Ratio of Monitored Road Contribution NO _x / Modelled Road Contribution NO _x	Adjustment Factor	Adjusted Road Contribution NO _x	Adjusted Modelled Total Nox (including background NO _x)	Modelled Total NO ₂ (based on empirical NO _x / NO ₂ relationship)	% Difference – [(modelled – monitored) / monitored] x 100
N5	6.90	3.63	5.10	6.33	1.80	1.56	2.3236	2.3236	3.63	9.96	6.9	0.00



Glossary of Terms

AADT Annual Average Daily Traffic flow

Air Quality Standard Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

Air Quality Objective Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

Annual Mean A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

- (a) in the case of lead, the mean of the daily levels for that year;
- (b) in the case of nitrogen dioxide, the mean of the hourly means for that year;
- (c) in the case of PM₁₀, the mean of the 24-hour means for that year.

Annoyance (Dust) Loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance.

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

AQS Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Background Concentrations The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

Construction Any activity involved with the provision of a new structure (or structures), its modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc.

Construction Impact Assessment An assessment of the impacts of demolition, earthworks, construction and trackout. In this Guidance, specifically the air quality impacts.

Defra Department for Environment, Food and Rural Affairs

Demolition Any activity involved with the removal of an existing structure (or structures). This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time.

Deposited Dust that is no longer in the air and which has settled onto a surface. Deposited dust is also sometimes called amenity dust or nuisance dust, with the term nuisance applied in the general sense rather than the specific legal definition.

DMP Dust Management Plan; a document that describes the site-specific methods to be used to control dust emissions.

Dust Solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. The terms dust and particulate matter (PM) are often used interchangeably, although in some contexts one term tends to be used in preference to the other. In this guidance the term 'dust' has been used to include the particles that give rise to soiling, and to other human health and ecological effects. Note: this is different to the definition given in BS 6069, where dust refers to particles up to 75 µm in diameter.

Earthworks Covers the processes of soil-stripping, ground-levelling, excavation and landscaping.

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or mortality due to exposure to PM₁₀ or PM_{2.5} or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

EPUK Environmental Protection UK

HDV Heavy Duty Vehicle

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

LAQM Local Air Quality Management

LDV Light Duty Vehicle

Mg/m³ Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m³ means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

NO₂ Nitrogen Dioxide

NO_x A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO₂)

NPPF National Planning Policy Framework

Nuisance The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and use of his land.

Public nuisance, arising from an act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

PM_{2.5} The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM_{2.5}, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

PM₁₀ The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM₁₀, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

Running Annual Mean A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

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.

