



AIR QUALITY ASSESSMENT

on behalf of

CAPITAL & CENTRIC (ATOMIC) LIMITED AND HIGH PEAK BOROUGH COUNCIL

for

REVITALISING BUXTON

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Summary

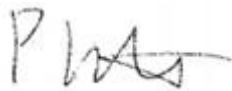
This air quality report has been prepared to accompany the Revitalising Buxton planning application for a mixed-use development located on the land south of Station Road, Buxton Town Centre. It assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

The assessment of dust soiling and human health impacts during the demolition and 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 demolition and construction phases 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 its intended use with regard 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 effect on local air quality.

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

Prepared By	Melody Horan	Reviewed By	Philip Walton
Signed		Signed	
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Version	Date		Change	Initials
1	31 October 2025		First issue	MH
2	16 January 2026	Update to proposed receptors due to changes in the site layout		MH
3	23 February 2026		Update to Section 3	MH

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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 mixed-use development located on the land south of Station Road, Buxton Town Centre. The site lies within the administrative boundary of High Peak Borough Council (HPBC).
- 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 Buxton Town Centre and currently consists of Spring Gardens Shopping Centre and its associated car park, as well as Winster Place.
- 2.2 Station Road runs along the northern site boundary, beyond which are Buxton Station, Devonshire Place retirement home and commercial premises. Bridge Street is to the east of the proposed development site, with commercial premises located beyond. Spring Gardens and commercial premises are located to the south of the proposed development site. Commercial dwellings, some with flats on the upper floors, are located to the west of the proposed development site.
- 2.3 The site is not located in an Air Quality Management Area (AQMA). The nearest AQMA is approximately 110 m to the east of the site, along Fairfield Road (A6) and Spring Gardens (A53). The site location and AQMA are shown in **Appendix A**.

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)

3 Proposed Development

- 3.1 Repurposing of part of the existing Spring Gardens Shopping Centre, including partial demolition, and new development to create a series of development blocks to deliver residential units (Use Class C3) and commercial floorspace (to include flexibility for Use Classes E – commercial, F1 – learning and non-residential institutions, and Sui Generis – drinking establishments), new public realm and landscaping to include public squares and residential courtyards, new car parking and associated works.
- 3.2 An overview of the development is as follows:
- Partial demolition of the existing shopping centre.
 - Construction of 11 individual buildings (Blocks 1-11), comprising residential units and mixed-use / commercial space.
 - Landscaped public squares and private courtyards.
 - car parking spaces.
 - Associated development, including new substations and tree removal.
 - Works to Grade II listed Winster Place (to be subject of a separate listed building consent application but to form part of the wider masterplan assessment/reports).

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 AQMAs or Clean Air Zones) should be not significantly worsened by a development scheme.

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

4.2 Planning Practice Guidance

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 2018^[5].

4.3.2 The relevant air quality standards and objectives⁶ 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 times per year
	40 µg/m ³	Annual mean
Particles (PM _{2.5})	20 µg/m ³	Annual mean (target)
	10 µg/m ³	Annual mean (target) (to be

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>

⁶ UK Parliament (2020): <https://www.legislation.gov.uk/uksi/2020/1313/made>

Pollutant	Air Quality Objective	
	Concentration	Measured As
		achieved by 2040)

- 4.3.3 Pollutant standards relate to ambient pollutant concentrations in air, set based on medical and scientific evidence of how each pollutant affects human health. Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as AQMAs and take action to work towards 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 mixed-use and consists of residential and commercial use. The annual mean and short-term air quality objectives apply to residential dwellings¹. The annual mean air quality objectives do not apply to commercial units; however, the short-term objectives still apply¹.

4.4 Local Planning Policy

- 4.4.1 The Derbyshire Minerals and Waste Development Framework has been reviewed. There are no relevant air quality considerations in this documentation for the proposed development site.
- 4.4.2 Policy EQ 10 of the High Peak Local Plan (2016)⁷ states:

“The Council will protect people and the environment from unsafe, unhealthy and polluted environments. This will be achieved by:

- Ensuring developments avoid potential adverse effects and only permitting developments that are deemed (individually or cumulatively) to result in the following types of pollution if any remaining potential adverse effects are mitigated to an acceptable level by other environmental controls or measures included in the proposals. This may be achieved by*

⁷ High Peak Borough Council (2016) High Peak Local Plan Adopted

the imposition of planning conditions or through a planning obligation. The Council will not permit any proposal that has an adverse effect on a European site:

- *Air pollution (including odours or particulate emissions)...* ”

4.4.3 The High Peak Local Plan was issued before the three current HPBC AQMAs were declared. Regarding air quality, paragraph 5.86 of the Pollution Control and Unstable Land section of the High Peak Local Plan states:

“Air quality is generally good. The High Peak Local Plan area has no Air Quality Management Areas. Transport Assessments required to accompany relevant proposals under Policy CF6 should include consideration of the impact of proposals on air quality”.

4.4.4 This air quality assessment considers the impact of the proposal on local air quality and sensitive receptors as well as the suitability of the site for its intended use.

4.5 HPBC Air Quality Action Plan (AQAP)

4.5.1 At the time of issuing this air quality assessment, the Air Quality Action Plans for High Peak Borough Council’s designated AQMAs remain unavailable, as they are currently under review.

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
High Peak Borough Council (HPBC)	HPBC (2025) <i>High Peak Borough Council Annual Status Report 2025</i>
	HPBC (2023) <i>High Peak Borough Council Annual Status Report 2023</i>

Data Source	Reference
	High Peak Borough Council (2016) High Peak Local Plan Adopted
Institute of Air Quality Management (IAQM)	IAQM "Guidance on the assessment of dust from demolition and construction" v2.2 2024
Department for Environment Food and Rural Affairs (Defra)	Defra <i>Local Air Quality Management Technical Guidance TG(22), updated 2022</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 (v1.2)</i>
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
SK Transport Planning Ltd	Traffic Data
Enviro Data Services	Meteorological data from Leek Thorncliffe for the year 2024

5.2 Consultation

5.2.1 The proposed air quality assessment methodology was provided to Dr. Daniel McCrory (Principal Pollution Officer) of HPBC⁸ for their review.

⁸ Email Miller Goodall Ltd. to HPBC, 23 July 2025. Email HPBC to Miller Goodall Ltd., 23 July 2025.

5.2.2 It was agreed that both a construction phase assessment and a detailed assessment of road traffic emissions across the site would be undertaken for the development. The types of assessments to be undertaken, meteorological data to be used, assessment roads, approach to verification and baseline data sources were also agreed upon and are detailed in the following sections.

5.3 IAQM Construction Dust Assessment

5.3.1 The IAQM has produced guidance⁹ on the assessment of air quality impacts arising from dust associated with construction and demolition 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 Extra) v5.1 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 and at proposed sensitive receptors at locations in the development footprint where residential occupation is proposed.

Assessment Scenarios

5.4.2 The assessment considered the following scenarios:

- Scenario 1: 2024 – base year and verification;
- Scenario 2: 2029 – opening year ‘without development’; and
- Scenario 3: 2029 – opening year ‘with development’.

⁹ Institution of Air Quality Management, 2024. Guidance on the assessment of dust from demolition and construction” v2.2

Traffic Data

- 5.4.3 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 is provided in **Appendix E**. Details on the committed developments considered within the traffic data are also provided in **Appendix E**.
- 5.4.4 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 5 to 20 kph where appropriate following Defra guidance.
- 5.4.5 LAQM.TG(22) recommends temporal variations to be considered within air quality modelling. Therefore, a 7-day profile based on the Department for Transport's statistics was used within the model.

Car Park

- 5.4.6 The proposed two-storey car park has been modelled in the 'with development' scenario. Each level of the structure is enclosed on three sides and covered by a ceiling, with one side, the south side, remaining open to facilitate natural ventilation. In addition to passive airflow, the car park will incorporate a continuously operating mechanical ventilation system. The system's air outlet is positioned at the highest roof level, above the height of surrounding proposed and existing buildings, to promote effective dispersion of exhaust emissions.
- 5.4.7 To simulate the dispersion of vehicle emissions through the open side of the car park, both levels have been modelled using multiple point sources positioned along the open façade. The ground floor, which occupies a larger footprint than the mezzanine level, includes 16 point sources, while the mezzanine level includes 8 point sources. The emissions are calculated for the total car park and then evenly distributed to each point source. The point sources are equally placed across the open façade. The coordinates of the point sources are provided in **Table E.2** of **Appendix E**.
- 5.4.8 Cold start emissions were calculated using the latest National Atmospheric Emissions Inventory (NAEI) cold start emission factors, alongside the NAEI projected fleet composition for 2029. For conservative assessment purposes, the car park fleet split assumes all vehicles are either petrol or diesel, with no electric vehicles.

Meteorological Data

5.4.9 Meteorological data for 2024 from the Leek Thorncliffe recording station was used in the ADMS-Roads model. This is the most representative recording station for the development site.

5.4.10 The wind rose for 2024 from Leek Thorncliffe 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

5.4.11 Eight existing sensitive receptor (ESR) 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.

5.4.12 A ground-floor residential unit is modelled at a height of 1.5 m, which is the typical human exposure height used in dispersion modelling. ESR1, ESR5 and ESR6 are situated within first-floor flats, with no residential occupancy at ground level. Therefore, their receptor heights reflect elevated positioning. ESR2 is located within a flat which is slightly below the level of the adjacent road; a conservative height of 0 m has been modelled at this receptor. ESR3 is positioned on an embankment adjacent to an elevated section of the road. Consequently, both the embankment and road elevation have been considered in determining the appropriate receptor height for this location. Whilst ESR3 shows an elevated height, it is relative to the adjacent road height. The ESR receptor heights are detailed in **Table 3**.

5.4.13 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	Receptor Height above Ground Level (m)	Grid Ref	
ESR1	5	405824.28	373648.06
ESR2	0	405815.97	373660.31
ESR3	8.18	405975.19	373736.47
ESR4	1.5	406209.06	373742.38
ESR5	5	406267.81	373614.03

Receptor	Receptor Height above Ground Level (m)	Grid Ref
ESR6	5	406331.25 373597.06
ESR7	1.5	406358.53 373603.72
ESR8	1.5	406389.09 373625.38

5.4.14 There are 13 proposed sensitive receptor (PSR) locations within the development site that were considered within the assessment. The proposed development is mixed-use; the proposed site layout has been utilised to select proposed residential units as the PSR locations.

5.4.15 The proposed development includes blocks with residential units at ground level, as well as blocks where residential occupancy begins above the ground floor. Residential units located above the second floor have not been assessed, as concentrations of primary pollutants, such as NO₂, decrease as the distance from the source increases. Therefore, if predicted pollutant concentrations on the ground and first-floor levels are below the relevant air quality objectives, then the upper floor levels are expected to also be exposed to concentrations below the relevant air quality objectives.

5.4.16 The development site is subject to varying topography. As a result, PSR heights for dispersion modelling cannot be uniformly assigned a set height for ground-, first- and second-floor residential units. Instead, receptor elevations have been determined through a detailed review of the site's elevation drawings to ensure accurate representation of exposure levels across the development. Similar interventions have also been applied to the surrounding road network heights. The model datum level is 0 m; therefore, any height inclusions need to be proportional to this base height. The PSR receptor heights are detailed in **Table 4**.

5.4.17 NO₂, PM₁₀ and PM_{2.5} concentrations were calculated at these locations to determine whether future site users may be exposed to elevated pollutant levels. PSRs were selected at worst-case positions closest to the main sources of pollution affecting the site. The PSR locations are presented in **Table 4** and **Appendix A**.

Table 4: Proposed Sensitive Receptor Locations

Receptor	Receptor Height above Ground Level (m)	Grid Ref
PSR1	5.73	406093.59 373716.62
PSR2	2.21	406148.59 373701.25
PSR3	1.5	406181.28 373675.81
PSR4	7.3	405950.31 373703.66

Receptor	Receptor Height above Ground Level (m)	Grid Ref	
PSR5	7.49	405955.97	373690.41
PSR6	7.49	405965.66	373687.19
PSR7	6.49	405984.94	373684.12
PSR8	6.49	405985.62	373674.09
PSR9	6.5	406100.66	373635.03
PSR10	6.89	405926.19	373620.88
PSR11	5.49	406003.06	373683.34
PSR12	10.95	406012.28	373706.25
PSR13	10.95	406028.97	373701.88

Conversion of NO_x to NO₂

5.4.18 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)¹⁰ following Defra guidance.

Emission Factors

5.4.19 Defra's Emission Factor Toolkit (EFT)¹¹ (V13.1, 2025) was used within the ADMS-Roads model to predict emissions from road vehicles for all scenarios.

Background Concentrations

5.4.20 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.

5.4.21 There are no background monitoring locations in the vicinity of the proposed development and receptor locations, therefore background NO_x, NO₂, 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 (2024 and 2029).

¹⁰ [Background maps. Tools. Local Air Quality Management Support – Defra, UK](#)

¹¹ Department for Food, Environment and Rural Affairs, 2024. Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/>

Model Verification

- 5.4.22 Model verification is the process of adjusting model outputs to improve the consistency of modelling results with respect to available monitored data.
- 5.4.23 Verification has been undertaken for NO₂. The verification procedure considers diffusion tubes HP64 and HP65, which are located within the study area. The locations of these air quality monitoring sites are shown in **Appendix A**, and the results are provided in **Section 6.2**.
- 5.4.24 The verification procedure and associated calculations are shown in **Appendix E**. A single verification factor has been derived and applied to all sensitive receptors assessed. All modelled road NO_x concentrations have been adjusted by a factor of 1.2827.
- 5.4.25 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

- 5.4.26 The proposed development is mixed-use. Both the annual mean and the short-term objectives apply to residential units. The annual mean objectives do not apply to places of work. The NO₂ hourly objective applies to commercial units. The annual mean and short-term objectives apply to the ESR and PSRs.

Assessment Significance Criteria

- 5.4.27 Guidance is provided by EPUK and IAQM² on criteria for determining the significance of a development's impact on local air quality. **Table 5** 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 5: 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 Impact of the Proposed Development on Ecological Sites

5.5.1 There are various designated ecological sites surrounding Buxton. As detailed in **Table E.1** of **Appendix E**, the proposed development will not introduce over 1000 AADT or 200 AADT HDV on any roads. Therefore, in accordance with IAQM guidance¹², the proposed development is not expected to have a significant impact on any ecological receptors. Consequently, ecological receptors have not been considered further within this report.

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 HPBC, provided in the 2025 Air Quality Annual Status Report (ASR), and background concentration maps provided by Defra for the grid squares covering the proposed development.

¹² IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites

6.1.2 The HPBC AQMA No 3, Fairfield, was declared in 2023 on the basis of annual average levels of NO₂. The site location and its relationship to the AQMA are shown in **Appendix A**.

6.2 Air Quality Monitoring

Nitrogen Dioxide (NO₂)

- 6.2.1 HPBC monitors NO₂ via an automatic monitoring station and diffusion tubes. The automatic monitoring station is approximately 19 km northeast of the proposed development site. Consequently, it is not representative of conditions at the proposed development site.
- 6.2.2 There are three diffusion tube sites within the study area. The results from these diffusion tubes are shown in **Table 6** and the monitor locations are shown in **Appendix A**.

Table 6: Annual Mean NO₂ Concentrations Monitored by HPBC within the Study Area

Site ID (classification)	Location		Annual Mean NO ₂ Concentrations (µg/m ³)						
			2019	2020	2021	2022	2023	2024	
HP41A, HP41B (roadside)	406405	373760	44.4	34.1	35.4	36.8	40.4	34.2	
HP64 (roadside)	406314	373597	-	-	-	27.1	26.1	23.6	
HP65 (roadside)	406341	373595	-	-	-	26.2	24.3	22.1	
Annual Mean NO ₂ air quality objective						40 µg/m ³			

- 6.2.3 The monitoring results in **Table 6** indicate that annual mean concentrations of NO₂ were above the NO₂ annual mean objective at HP41A, HP41B in 2019 and 2023. Monitoring began in 2022 at HP64 and HP65. In 2022 and 2023, the annual mean concentrations of NO₂ were below the NO₂ annual mean objective at HP64 and HP65.
- 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 As stated in the 2025 ASR, two new continuous Zephyr® indicative ambient air quality monitors, one in AQMA 2: Dinting Vale (Glossop) and one in AQMA 3: Fairfield Road (Buxton) were installed in December 2024. The Zephyr air quality monitors will include PM₁₀ and PM_{2.5} monitoring. Currently, there is no PM₁₀ or PM_{2.5} monitoring available.

6.2.6 The HPBC 2023 Air Quality Annual Status Report includes a technical note for a detailed modelling study of the declared AQMA and the Fairfield area of concern, which is now an AQMA. This technical note provides the results of the baseline 2019 study for PM₁₀ and PM_{2.5} concentrations along Fairfield Road. The assessment considered 15 existing receptors along Fairfield Road, which were all predicted to be exposed to PM₁₀ and PM_{2.5} concentrations below the air quality objective limit of 40 µg/m³ and 20 µg/m³, respectively.

6.3 Background Concentrations

6.3.1 There are no background monitoring locations in the vicinity of the proposed development site or at any nearby relevant receptor locations.

6.3.2 Background concentrations of NO₂, 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 locations¹³ are shown in **Table 7**.

Table 7: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site and Receptor Locations

Grid Square	Pollutant	2024	2029
		(µg/m ³)	(µg/m ³)
405500, 373500 (ESRs 1 -3, PSRs 4 – 8, PSR10)	NO ₂	6.79	5.77
	PM ₁₀	11.46	11.10
	PM _{2.5}	6.28	5.96
406500, 373500 (HP64, HP65, ESRs 4 – 8, PSRs 1 – 3, PSR9)	NO ₂	7.09	5.99
	PM ₁₀	12.08	11.73
	PM _{2.5}	6.48	6.17

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

¹³ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>

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 8**.

Table 8: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitudes	Justification for Sensitivity Classification
Demolition	Medium	The total building volume to be demolished is between 12,000 m³ – 75,000 m³.
Earthworks	Medium	the site area is between 18,000 m² – 110,000 m².
Construction	Large	total building volume estimated to be constructed is greater than 75,000 m³.
Trackout	Medium	there are likely to be between 20 to 50 HDV outward movements in any one day.

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

- 7.2.3 Dwellings are located within a distance of 20 m from demolition, earthworks and construction, and 20 m of road edges used by traffic associated with the site construction. In accordance with the criteria in **Table B2** in **Appendix B** and the IAQM guidance, the sensitivity of human receptors is **high**.
- 7.2.4 Devonshire Place is a retirement home comprising 70 apartments and is within 20 m of the proposed development site at its closest point. The proposed development site is within Buxton town centre, where many buildings along Spring Gardens and The Quadrant contain residential flats above ground-floor retail units. Therefore, a conservative estimate of the number of highly sensitive receptors has been applied in determining the sensitivity of the area.

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

- 7.2.5 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**.
- 7.2.6 The sensitivity of the area to dust soiling and human health for each activity is summarised in **Table 9**.

Table 9: Outcome of Defining the Sensitivity of the Area

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

Step 2C Risk of Impacts

- 7.2.7 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts have been determined using the criteria detailed in **Table B5 to Table B8** in **Appendix B**.
- 7.2.8 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 10**.

Table 10: Risk of Dust Impacts

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

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 earthworks, construction and trackout are proposed based on the risk classifications in **Table 10**. 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 ‘high risk’ classification (in this instance the site is classified as “high” risk due to construction)¹⁴.

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.

¹⁴ 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 demolition and track-out, the general measures applicable to a high risk site should be applied.

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 11** details the results of the baseline assessment.

Table 11: 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 (2024)			Scenario 2: Without Development (2029)		
		NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
ESR1	5	10.96	11.95	6.55	8.62	11.60	6.23
ESR2	0	19.13	12.79	7.02	14.50	12.44	6.68
ESR3	8.18	8.05	11.71	6.41	6.59	11.36	6.10
ESR4	1.5	11.36	12.63	6.78	8.92	12.28	6.46
ESR5	5	12.44	12.68	6.82	9.74	12.33	6.49
ESR6	5	13.22	12.76	6.86	10.27	12.41	6.53
ESR7	1.5	24.51	14.09	7.59	18.71	13.70	7.22
ESR8	1.5	17.13	13.84	7.44	12.76	13.48	7.09
Annual Mean NO ₂ & PM ₁₀ Air Quality Objective						40 (µg/m ³)	
Annual Mean PM _{2.5} Target Level Objective						20 (µg/m ³)	

- 8.1.3 The baseline air quality assessment for the base year (2024) and opening year 'without development' (2029) 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 (2029) ‘with development’ scenario at eight ESR locations are detailed in **Table 12**, **Table 13** and **Table 14**. 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 5**.

Table 12: NO₂ Dispersion Modelling Results and Significance of Development for the Opening Year (2029) Scenario at Existing Receptor Locations

Receptor	Without Development µg/m³	Concentration with Development µg/m³	Impact µg/m³	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR1	8.62	8.63	0.01	21.58%	0.03%	Negligible Adverse
ESR2	14.5	14.46	-0.04	36.15%	-0.10%	Negligible Beneficial
ESR3	6.59	6.7	0.11	16.75%	0.28%	Negligible Adverse
ESR4	8.92	8.9	-0.02	22.25%	-0.05%	Negligible Beneficial
ESR5	9.74	9.73	-0.01	24.33%	-0.02%	Negligible Beneficial
ESR6	10.27	10.28	0.01	25.70%	0.02%	Negligible Adverse
ESR7	18.71	18.73	0.02	46.83%	0.05%	Negligible Adverse
ESR8	12.76	12.77	0.01	31.93%	0.02%	Negligible Adverse
Annual Mean NO ₂ Air Quality Objective						40 (µg/m³)

Table 13: PM₁₀ Dispersion Modelling Results and Significance of Development for the Opening Year (2029) Scenario at Existing Receptor Locations

Receptor	Without Development µg/m³	Concentration with Development µg/m³	Impact µg/m³	% of AQAL with Development	% Change relative to AQAL	Impact Descriptor
ESR1	11.60	11.60	0.00	28.99%	0.00%	No Change to 2 d.p.*

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
ESR2	12.44	12.42	-0.02	31.04%	-0.05%	Negligible Beneficial
ESR3	11.36	11.37	0.01	28.43%	0.02%	Negligible Adverse
ESR4	12.28	12.27	-0.01	30.67%	-0.02%	Negligible Beneficial
ESR5	12.33	12.32	-0.01	30.81%	-0.02%	Negligible Beneficial
ESR6	12.41	12.41	0.00	31.01%	0.00%	No Change to 2 d.p.*
ESR7	13.70	13.71	0.01	34.26%	0.03%	Negligible Adverse
ESR8	13.48	13.48	0.00	33.71%	0.00%	No Change to 2 d.p.*
Annual Mean PM₁₀ Air Quality Objective					40 ($\mu\text{g}/\text{m}^3$)	

*d.p. = decimal point

Table 14: PM_{2.5} Dispersion Modelling Results and Significance of Development for the Opening Year (2029) 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
ESR1	6.23	6.22	-0.01	31.12%	-0.05%	Negligible Beneficial
ESR2	6.68	6.66	-0.02	33.32%	-0.10%	Negligible Beneficial
ESR3	6.10	6.10	0.00	30.48%	0.00%	No Change to 2 d.p.*
ESR4	6.46	6.45	-0.01	32.26%	-0.05%	Negligible Beneficial
ESR5	6.49	6.48	-0.01	32.42%	-0.05%	Negligible Beneficial
No	6.53	6.53	0.00	32.64%	0.00%	No Change to 2 d.p.*
ESR7	7.22	7.22	0.00	36.11%	0.00%	No Change to 2 d.p.*
ESR8	7.09	7.10	0.01	35.48%	0.05%	Negligible Adverse
Annual Mean PM_{2.5} Target Level Objective					20 ($\mu\text{g}/\text{m}^3$)	
Annual Mean PM_{2.5} Target Level Objective (to be achieved by 2040)					10 $\mu\text{g}/\text{m}^3$	

*d.p. = decimal point

8.2.2 The results of the ADMS-Roads modelling assessment for 2029 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 targets in 2029, 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 2029.

8.2.4 Several receptors are anticipated to experience a beneficial impact rather than an adverse one, due to a projected reduction in traffic volumes along specific road links as a result of the proposed development.

Proposed Sensitive Receptors

8.2.5 NO₂, PM₁₀, and PM_{2.5} concentrations have been predicted at 13 PSR locations. 13 PSRs have been selected at locations closest to the main sources of pollution affecting the site.

8.2.6 The results of the air quality assessment are shown in **Table 15**. Proposed sensitive receptor locations are shown in **Appendix A**.

Table 15: Air Quality Concentrations at Proposed Sensitive Receptors

Proposed Sensitive Receptor	Receptor Height above Ground Level (m)	2029 With Development – Pollutant Concentrations		
		NO ₂ Concentration with Development µg/m ³	PM ₁₀ Concentration with Development µg/m ³	PM _{2.5} Concentration with Development µg/m ³
PSR1	5.73	7.47	12.10	6.36
PSR2	2.21	11.86	12.58	6.62
PSR3	1.5	15.23	13.05	6.87
PSR4	7.3	7.18	11.53	6.18
PSR5	7.49	7.09	11.42	6.10
PSR6	7.49	7.22	11.42	6.09
PSR7	6.49	7.76	11.47	6.09
PSR8	6.49	8.49	11.53	6.08
PSR9	6.5	6.86	11.91	6.26

Proposed Sensitive Receptor	Receptor Height above Ground Level (m)	2029 With Development – Pollutant Concentrations		
		NO ₂ Concentration with Development µg/m ³	PM ₁₀ Concentration with Development µg/m ³	PM _{2.5} Concentration with Development µg/m ³
PSR10	6.89	6.66	11.33	6.08
PSR11	5.49	8.08	12.10	6.30
PSR12	10.95	6.86	11.92	6.25
PSR13	10.95	6.86	11.91	6.25

8.2.7 The results of the dispersion modelling assessment indicate that annual mean concentrations of NO₂ and PM₁₀ would be below the annual mean objectives at proposed residential receptors in 2029 once the development is operational.

8.2.8 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.

8.2.9 The predicted NO₂ concentrations 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.

8.2.10 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.

8.2.11 The site is therefore considered suitable for its intended use with regard to air quality.

9 Summary of Impacts and Conclusion

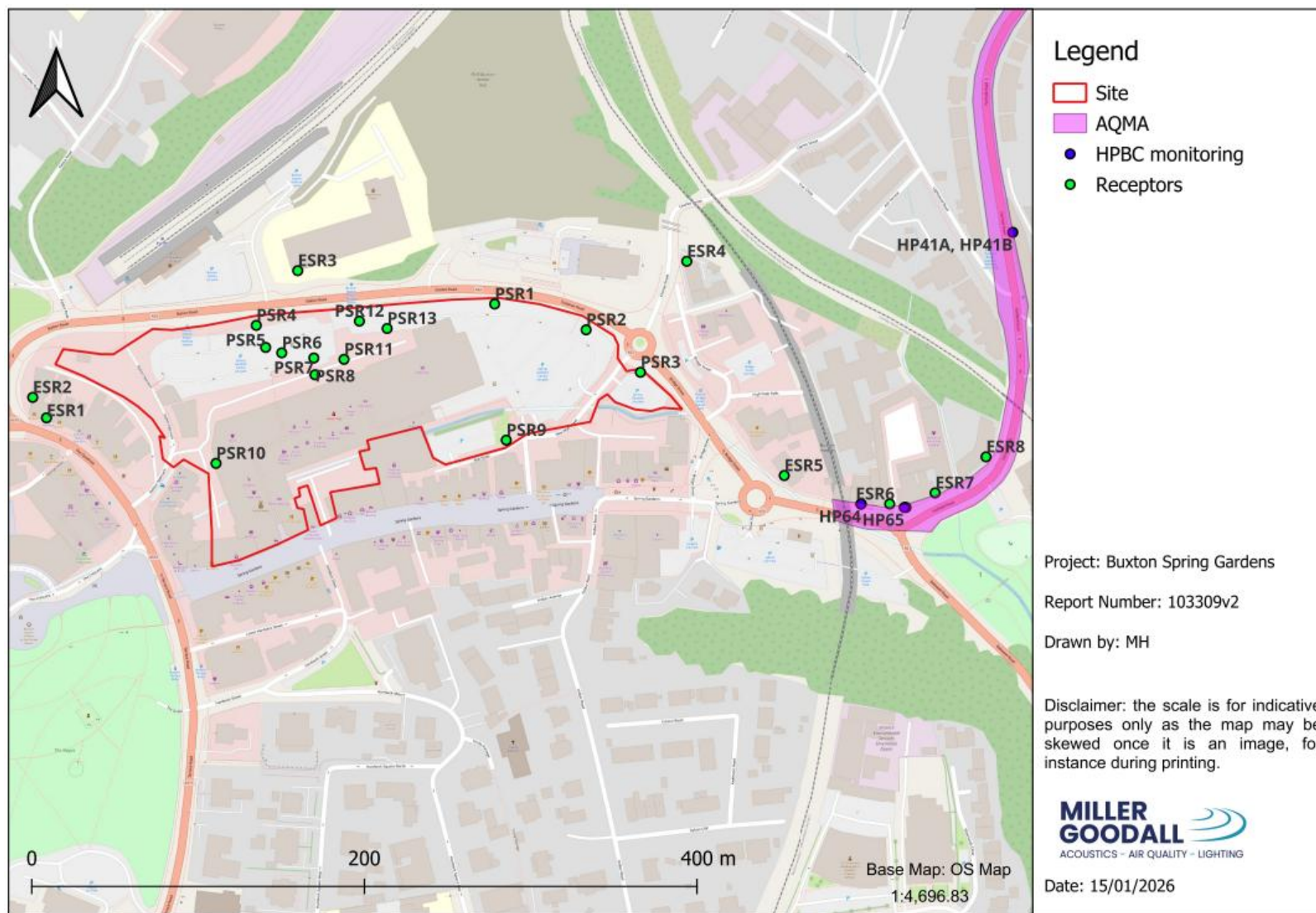
9.1 This air quality report assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

9.2 The assessment of dust soiling and human health impacts during the demolition and 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 demolition and construction phase are not significant.

- 9.3 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 its intended use with regard to air quality. Concentrations of PM_{2.5} are expected to be below the annual mean target.
- 9.4 The proposed development is not expected to have a significant effect on local air quality.
- 9.5 There is, therefore, no reason for this application to be refused on the grounds of air quality.

APPENDICES

Appendix A: Location of site, AQMA, HPBC monitoring and receptors



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 activities⁹. 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

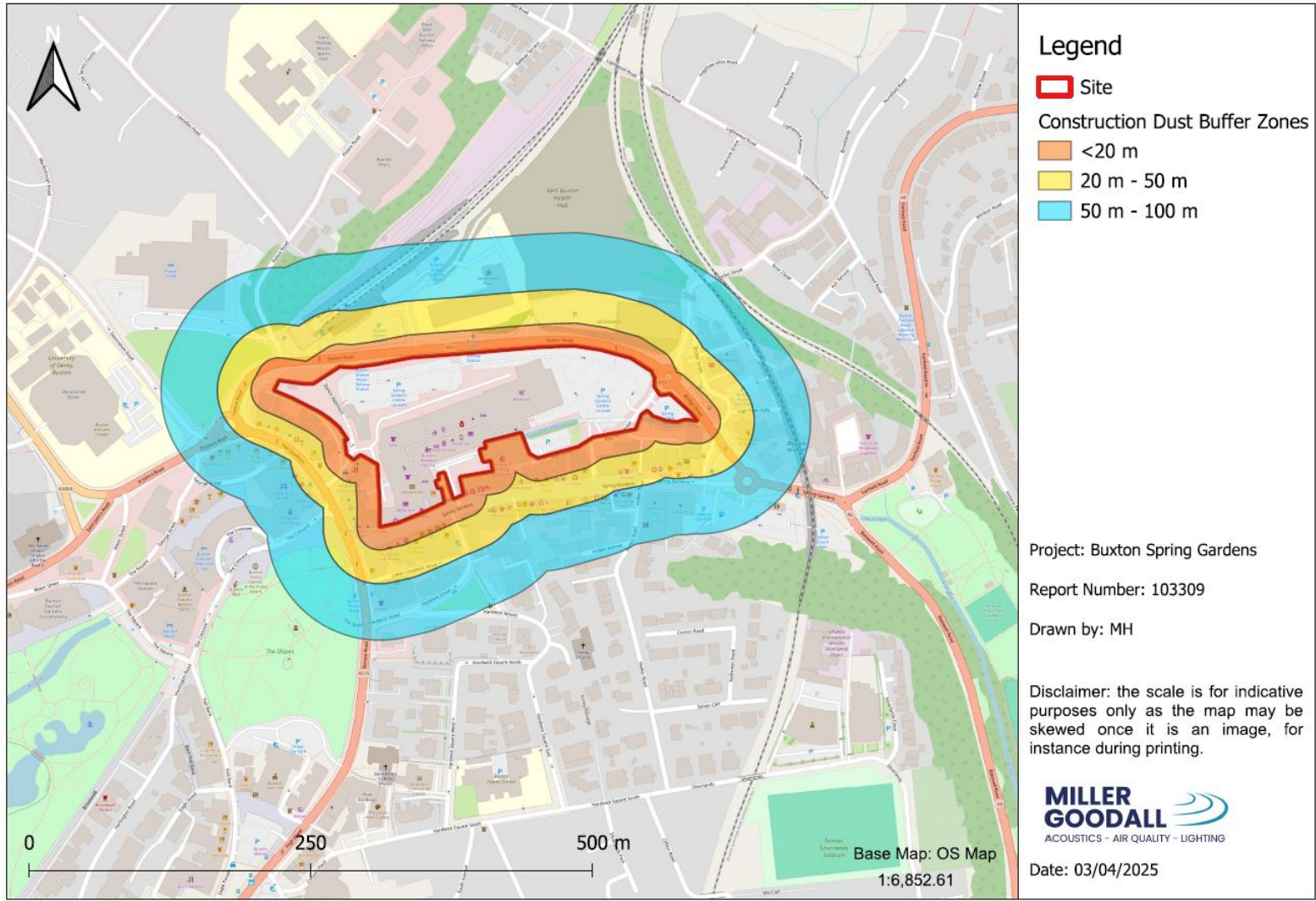
Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

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 Buffer Zones



Appendix D: IAQM Dust Assessment Mitigation

xx Highly Recommended

x Desirable

Measures relevant for demolition, earthworks, construction and trackout

Mitigation Measure	High 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
Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	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.	xx
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

Mitigation Measure	High Risk
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
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).	xx
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	xx
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	xx
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

Mitigation Measure	High Risk
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	xx
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 demolition

Mitigation Measure	Medium Risk
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	x
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	xx
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	xx
Bag and remove any biological debris or damp down such material before demolition.	xx

Measures specific to earthworks

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

Measures specific to construction

Mitigation Measure	High Risk
Avoid scabbling (roughening of concrete surfaces) if possible.	xx
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.	xx
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.	xx
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	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
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 bowsers 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.

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 for the study area 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 were utilised in the model. Areas of congestion, queuing and junction locations have been modelled at reduced speeds of 5 to 20 km/h.

Following review of aerial imagery, LiDAR digital surface model and Street View® of the study area, it was concluded that additional modelling for street canyons and gradients above 2.5% ^[1] was required.

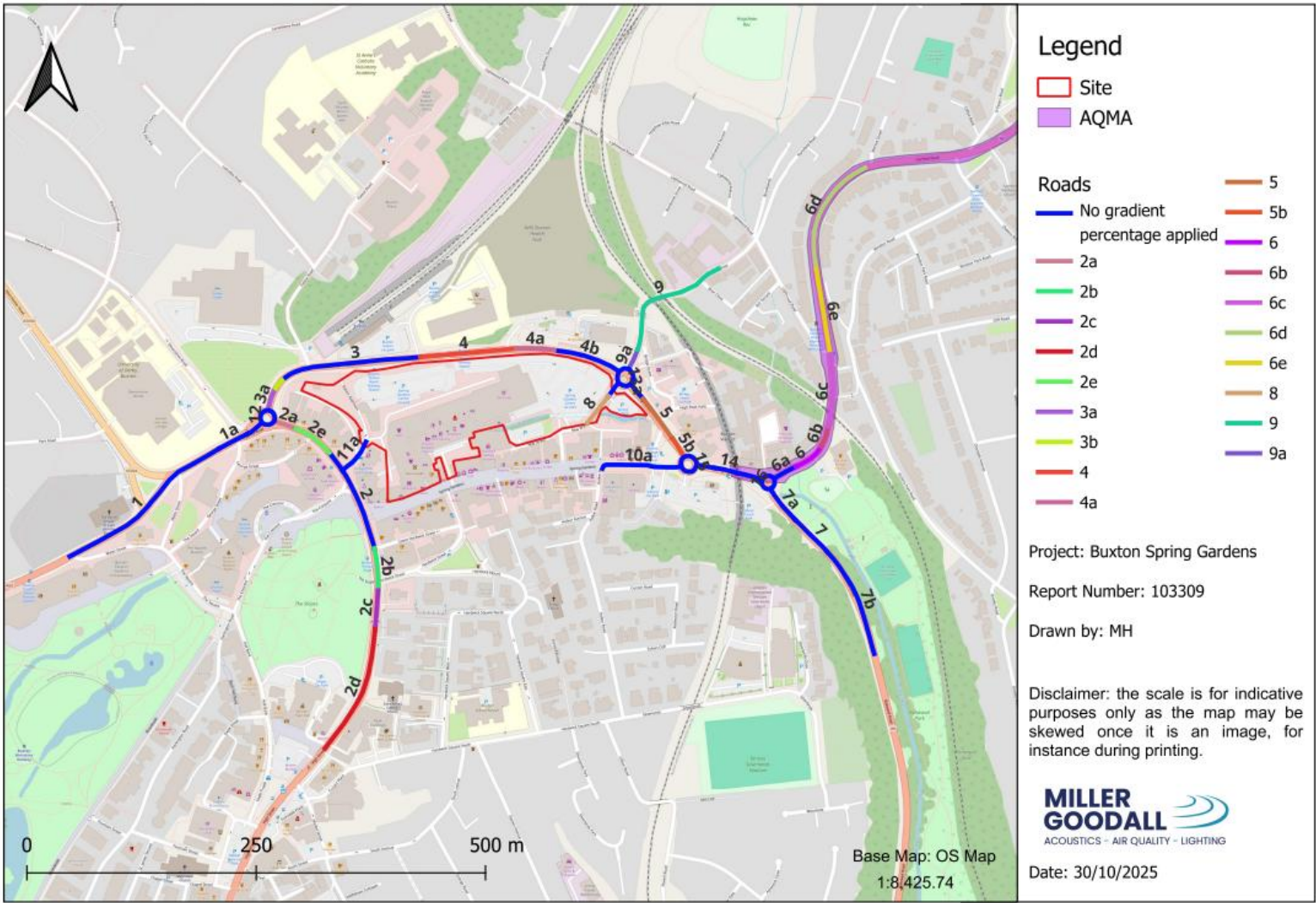
The traffic data used in the assessment is detailed in **Table E1** and presented in **Figure E1**.

Table E1: Traffic Data used in the Assessment

Link Number	Road	Maximum Speed (km/h)	2024 Base Year		2029 Without Development		2029 With Development		Total Development AADT Change
			AADT LDV	AADT HDV	AADT LDV	AADT HDV	AADT LDV	AADT HDV	
1	St Johns Road	48	11,231	569	13,284	612	13,033	614	-249
2	Terrace Road	48	10,260	756	10,878	805	10,700	805	-177
3	Station Road W (PR)	48	12,252	807	14,335	865	13,906	868	-426
4	Station Road E (McD)	48	12,252	807	14,198	870	14,381	873	186
5	Bridge Street	32	12,252	807	14,182	870	13,887	873	-293
6	Fairfield Road	48	20,747	1,387	22,758	1,487	22,911	1,488	154
7	Bakewell Road	32	11,861	727	13,258	773	13,038	773	-220
8	New Wye Street	5	4,373	4	4,373	4	112	7	-4,258
9	Charles Street	48	1,956	6	2,059	7	2,059	7	0
10	Spring Gardens	5	2,466	6	2,623	7	2,623	7	0
11	Station Approach	5	141	8	139	8	136	12	0
12	Roundabout A53 and A515	5	11,248	711	12,832	761	12,546	763	-284
13	Roundabout A53, Charles Street and New Wye Street	5	12,252	807	14,190	870	14,134	873	-53
14	Spring Garden A53	16	14,953	974	16,733	1,043	16,612	1,045	-120

Link Number	Road	Maximum Speed (km/h)	2024 Base Year		2029 Without Development		2029 With Development		Total Development AADT Change
			AADT LDV	AADT HDV	AADT LDV	AADT HDV	AADT LDV	AADT HDV	
15	Roundabout Bridge Street and Spring Gardens	5	9,891	596	11,179	640	11,040	641	-137
16	Roundabout Spring Gardens, Fairfield Road and Bakewell Road	5	15,854	1,029	17,583	1,101	17,520	1,102	-62

Figure E1: Spatial Model Scope



Car Park

The car park has 1764 LDV AADT associated with the ground floor and 1100 LDV AADT associated with the mezzanine level. The two levels of the car park were modelled via point sources. This approach was chosen due to the structural configuration of the car park, which is enclosed on three sides and covered by a ceiling, with one open façade allowing for natural ventilation.

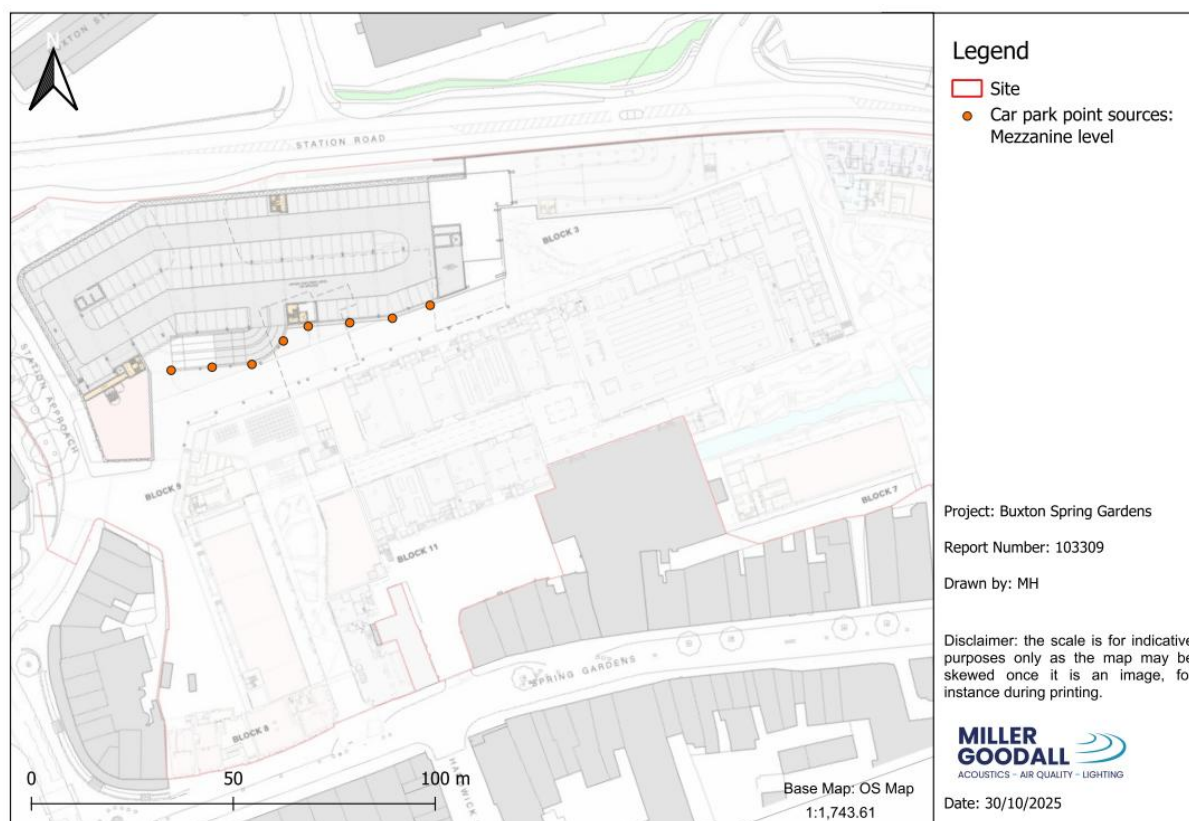
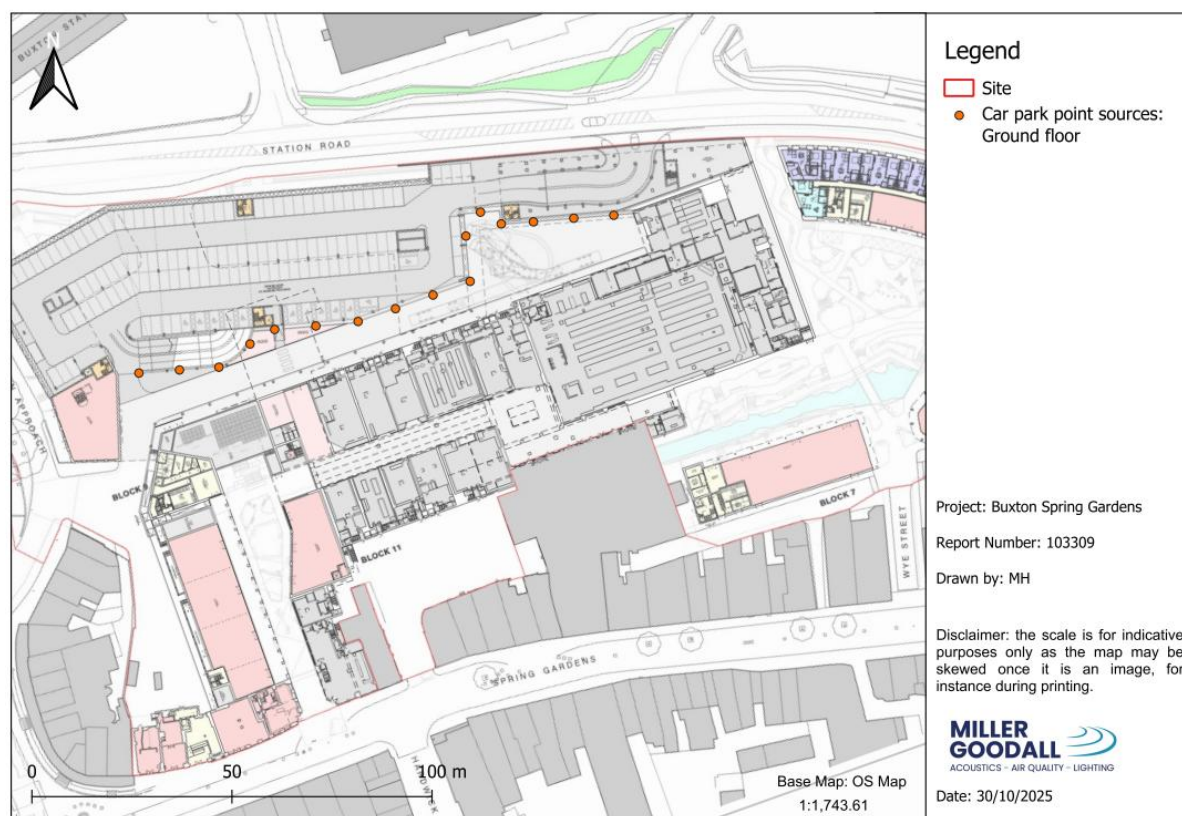
In addition to passive airflow, the car park will incorporate a continuously operating mechanical ventilation system. The system's air outlet is positioned at roof level, above the height of surrounding proposed buildings, to promote effective dispersion of exhaust emissions. Given its elevated position, and good dispersion characteristics, the ventilation outlet was excluded from the dispersion modelling assessment. It is not expected to have a significant impact on local air quality.

The partial enclosure restricts the free dispersion of pollutants, necessitating a more detailed and physically representative modelling approach. Point sources were positioned along the open side of each level to simulate the directional release of exhaust gases exiting the structure. This method enables the dispersion model to account for the influence of structural constraints on airflow and pollutant behaviour, ensuring a more accurate assessment of air quality impacts in the surrounding environment. The point source locations are detailed in **Table E2** and shown in **Figure E2**.

The presence of buildings close to emission sources can significantly affect the dispersion of pollutants by leading to downwash. This occurs when a building distorts the wind flow, creating zones of increased turbulence. Increased turbulence causes the plume to be drawn to the ground earlier than otherwise would be the case if unobstructed dispersion into the atmosphere occurred. To account for the influence of nearby structures on pollutant dispersion, the ADMS building effects module has been activated, and nearby buildings have been included in the model.

Table E2: Point Source Locations

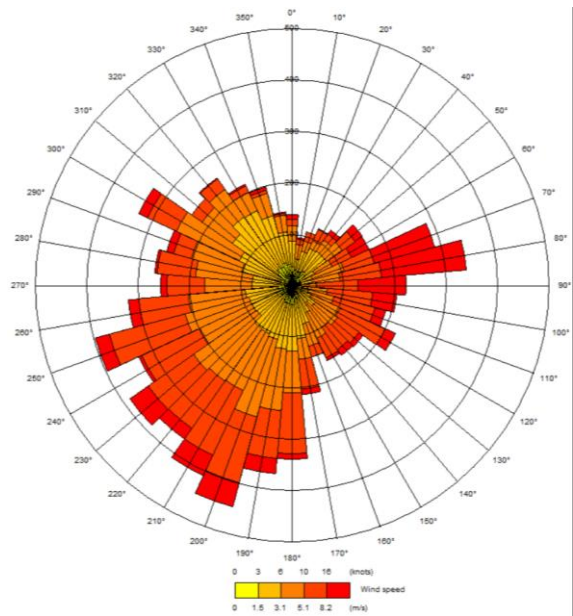
Point Source	Level	Grid Ref	
Lvl00_1	Ground Floor	405922.07	373660.63
Lvl00_2	Ground Floor	405932.19	373661.42
Lvl00_3	Ground Floor	405942.06	373662.12
Lvl00_4	Ground Floor	405949.83	373667.92
Lvl00_5	Ground Floor	405955.97	373671.55
Lvl00_6	Ground Floor	405966.27	373672.42
Lvl00_7	Ground Floor	405976.82	373673.56
Lvl00_8	Ground Floor	405986.16	373676.76
Lvl00_9	Ground Floor	405995.54	373680.16
Lvl00_10	Ground Floor	406004.80	373683.58
Lvl00_11	Ground Floor	406040.68	373700.11
Lvl00_12	Ground Floor	406030.69	373699.37
Lvl00_13	Ground Floor	406020.61	373698.45
Lvl00_14	Ground Floor	406012.56	373697.92
Lvl00_15	Ground Floor	406007.37	373700.85
Lvl00_16	Ground Floor	406003.74	373694.89
Lvl01_1	Mezzanine Level	405922.07	373660.63
Lvl01_2	Mezzanine Level	405932.19	373661.42
Lvl01_3	Mezzanine Level	405942.06	373662.12
Lvl01_4	Mezzanine Level	405949.83	373667.92
Lvl01_5	Mezzanine Level	405955.97	373671.55
Lvl01_6	Mezzanine Level	405966.27	373672.42
Lvl01_7	Mezzanine Level	405976.82	373673.56
Lvl01_8	Mezzanine Level	405986.16	373676.76

Figure E2: Car Park Point Sources

Meteorological Data

The air quality assessment includes the use of the 2024 Leek Thorncliffe meteorological recording station. The recording station is located approximately 14.8 km to the southwest of the proposed development site and is considered to be the most representative of the site conditions in terms of altitude and distance. The 2024 wind rose is provided in **Figure E3**.

Figure E3: 2024 Wind Rose for Leek Thorncliffe



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 Length	10 m	10 m
Priestley–Taylor Parameter	1	1

Gradients

Gradients above a 2.5% slope have been identified in the spatial model scope and have been included in the model. The slope was calculated by applying the arctangent (ATAN) function to the elevation difference between the highest and lowest elevations along the link, obtained from Google Earth elevation data, divided by the link length. The gradients and link reference locations included in the air quality model are shown in **Table E4** and **Figure E1**.

Table E4: Link Number and Gradient Percentage Applied

Link Number Reference*	Gradient Percentage (%)
2a	5.11%
2b	6.94%
2c	7.97%
2d	7.46%
2e	4.25%
3a	6.90%
3b	6.63%
4	4.33%
4a	3.74%
5	2.63%
5b	2.52%
6	3.76%
6b	4.31%
6c	5.89%
6d	6.73%
6e	5.20%
8	3.50%
9a	5.13%
*See Table E2 for link number reference. Identifier after the link number is internal reference system i.e. sections along the road	

Elevated Roads

In dispersion modelling, relative elevation between emission sources and receptors is a critical factor influencing pollutant dispersion. As Station Road is situated at a higher elevation than the ground floor of the proposed development site, it has been modelled as an elevated road within the dispersion model to accurately reflect its position and potential impact on local air quality.

The road height and link reference locations included in the air quality model are shown in **Table E5** and **Figure E1**.

Table E5: Link Number and Road Height Applied

Link Number Reference*	Elevation of road (m)
3	5.76
4	4.68
4a	2.11
*See Table E2 for link number reference. Identifier after the link number is internal reference system i.e. sections along the road	

Street Canyon

Road links with characteristics of a street canyon have been identified in the spatial model scope. LAQM.TG(22) defines street canyons as:

"This is especially the case in so called "street canyons", where buildings on both sides of the road can lead to the formation of vortices and recirculation of air flow that can trap pollutants and restrict dispersion (often termed as the "canyon effect"). Although street canyons can generally be defined as narrow streets where the height of buildings on both sides of the road is greater than the road width, there are numerous example whereby broader streets may also be considered as street canyons where buildings result in reduced dispersion and elevated concentrations (which may be demonstrated by monitoring data)."

Road link 6d had a street canyon applied to it. This link can be identified in **Figure E1**.

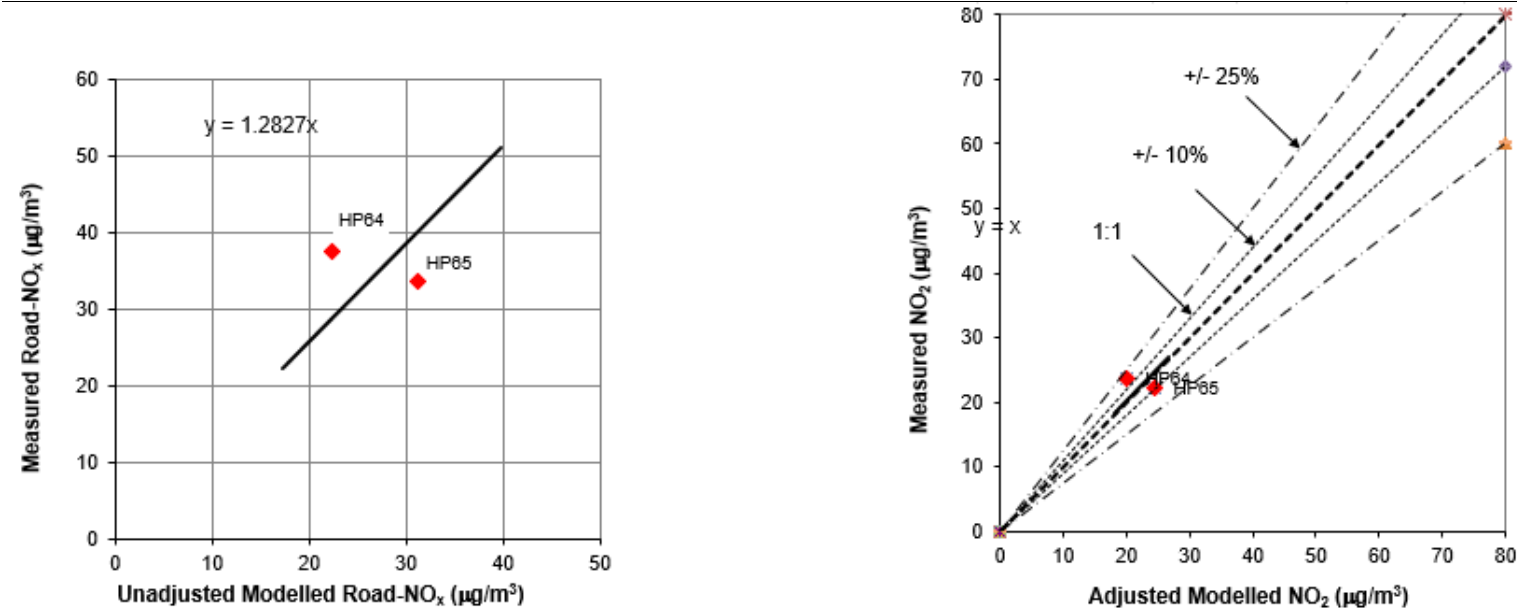
Model Verification

Model verification has been completed for NO₂. There are no representative PM₁₀ or PM_{2.5} air quality monitors available for model verification. The verification procedure for the selected air

quality monitors of this assessment is detailed in **Table E6**. The air quality monitor position can be seen on the drawing in **Appendix A**.

Table E6: NO₂ Model Verification Procedure

Monitor	2024 Monitored Total NO ₂	Monitored Road NO _x	2024 Background NO ₂	2024 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
HP64	23.60	37.53	7.09	9.03	16.51	22.35	1.6793	1.2827	28.67	37.70	20.08	-14.92
HP65	22.10	33.68	7.09	9.03	15.01	31.21	1.0793		40.03	49.06	24.55	11.09



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

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

IAQM Institute of Air Quality Management

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

µg/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.

