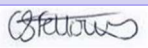
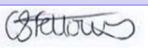
haze environmental

Old School House, Ardwick

Strive Academy

Air Quality Assessment February 2026

DOCUMENT CONTROL

Issue/Revision	First Issue	Revision 1	Revision 2	Revision 3
Status	Draft	Final		
Date	February 2026	February 2026		
Prepared By	Chloe Fellows	Chloe Fellows		
Signature				
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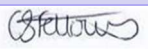
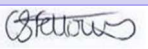
Signature				
Project Number	0155	0155		
Report Number	001	001		
File Reference	155 Old School House	155 Old School House		

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1. INTRODUCTION

1.1. BACKGROUND

1.1.1. Haze Environmental Ltd has been instructed by Strive Academy to conduct an Air Quality Assessment in support of the proposed planning application for the proposed change of use from former photographic studio (Use Class E) to independent special educational needs (SEN) school (Use Class F1) and associated minor works including installation of cycle parking and bin store located along Thirsk Street, Ardwick (hereafter referred to as the 'Proposed Development', 'Site' or 'Application Site').

1.2. SITE SETTING

1.2.1. The Application Site is located at an approximate National Grid Reference (NGR): 385201, 397359. The Proposed Development falls within the Manchester City Council (MCC) administrative boundary, part of the Greater Manchester Combined Authority (GMCA), and is located within the designated Air Quality Management Area (AQMA), which has been declared for exceedances of the nitrogen dioxide (NO_2) annual mean objective.

1.2.2. Principal sources of air pollution in the vicinity of the Site are likely to include emissions from local roads, including the A635 Mancunian Way and the A6 Ardwick Green South (the nearest 'A' Roads to the Site, located 50m and 130m to the north and south respectively). Given the proximity of these 'A' roads, they may have an influence on local air quality.

1.2.3. Reference should be made to Figure 1.1 for a map of the Site and its surrounding area.

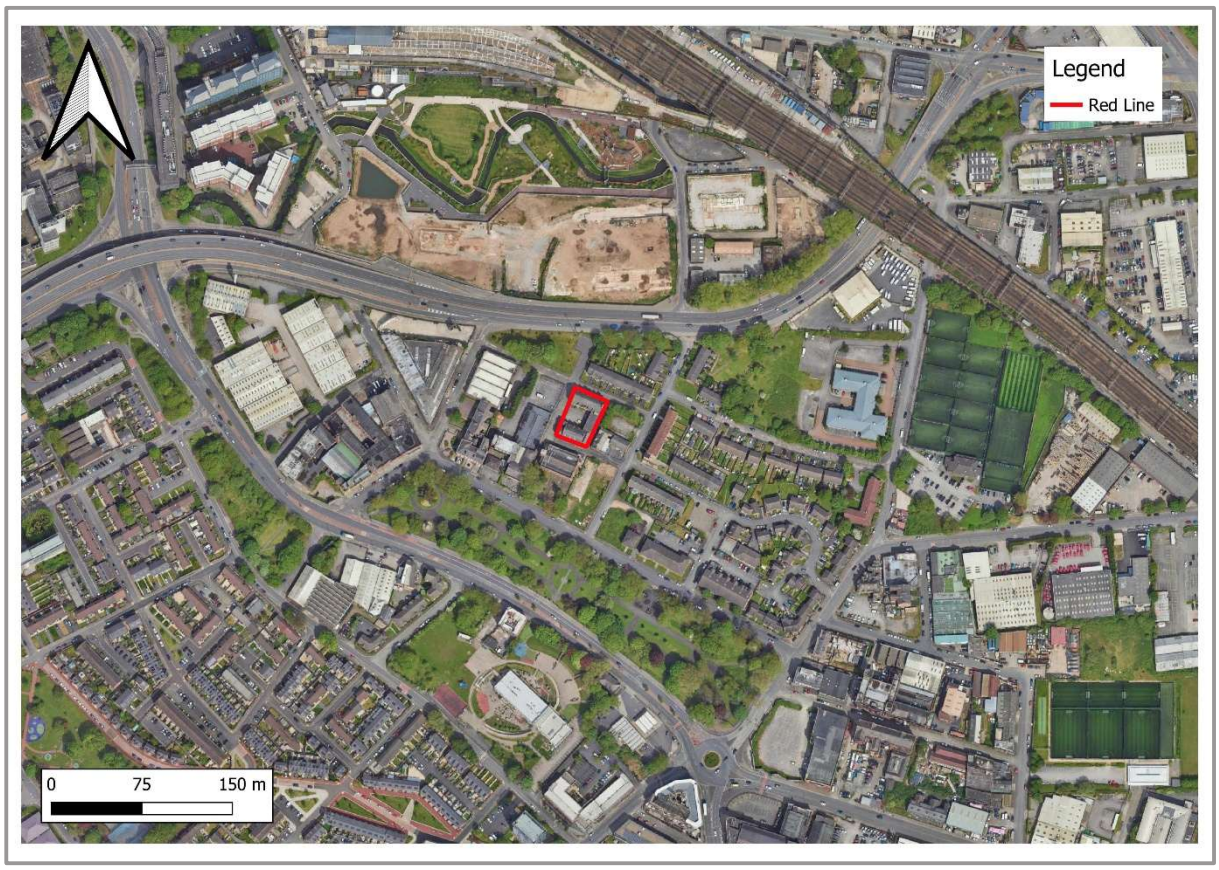


Figure 1.1 – Site Red Line Boundary

1.3. DEVELOPMENT PROPOSALS

1.3.1. The Proposed Development comprises the change of use from former photographic studio (Use Class E) to independent special educational needs (SEN) school (Use Class F1) and associated minor works including installation of cycle parking and bin store. There are no physical alterations to the building/site apart from removing boards from the lower ground windows and installing cycle parking (ten spaces to be provided). Drop off/pick up for under-16s will be by taxi, which will be staggered to avoid queuing (a maximum of 10 taxis are expected at the Site each morning and afternoon. There will be no staff parking on site, with off-site provision provided for seven spaces at the nearby Power League, however staff will be incentivised to take public transport.

1.3.2. During the construction phase, there is potential for temporary, localised effects on air quality associated with dust and particulate matter generation. A qualitative construction phase dust assessment has therefore been undertaken in accordance with relevant industry guidance, proportionate to the scale and nature of the works.

1.3.3. Due to the size of the proposals, the Proposed Development is not anticipated to give rise to a significant increase in vehicle movements on the local road network. As such, the operational

phase of the development is not expected to result in significant adverse effects on local air quality, and a detailed assessment of development-related traffic emissions is not considered necessary.

1.3.4. This Air Quality Assessment has been undertaken to evaluate both the suitability of the Site for the proposed special educational needs (SEN) school use and the potential air quality effects arising from the Proposed Development. The report sets out the assessment methodology and presents the findings in accordance with relevant guidance. A glossary of technical terms is provided in Appendix A for reference.

2. LEGISLATION, POLICY & GUIDANCE

2.1. AIR QUALITY LEGISLATION & POLICY

UK AIR QUALITY STRATEGY

2.1.1. The Environment Act 1995 required the Government to produce a national Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS)[1] for the UK setting out air quality standards, objectives, and measures for improving ambient air quality. The AQS sets out the Government's policy on air quality within the UK. In addition, the AQS sets out air quality objectives and policy options to further improve air quality in the UK and provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union legislation and international commitments.

2.1.2. Under the Environment Act 2021, the Secretary of State must review the Strategy for England at least every five years, with a commitment for an initial review within 12 months of the measures coming into force.

2.1.3. The AQS sets standards and objectives for the following nine key air pollutants to protect health, vegetation and ecosystems:

- benzene (C_6H_6);
- 1,3 butadiene (C_4H_6);
- carbon monoxide (CO);
- lead (Pb);
- nitrogen dioxide (NO_2);
- particulate matter (PM_{10} and $PM_{2.5}$);
- sulphur dioxide (SO_2);
- ozone (O_3); and
- polycyclic aromatic hydrocarbons (PAHs).

2.1.4. The standards and objectives for the pollutants considered in this assessment are shown in Table 2.1.

[1] Department for Environment, Food & Rural Affairs (2007 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Pollutant	Air Quality Objective	
	Concentration (µg/m^3)	Averaging Period
NO_2	40	Annual Mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual Mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	20	Annual Mean

Table 2.1 Air Quality Objectives

2.1.5. The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regard to current scientific knowledge about the effects of each pollutant on health and the environment.

2.1.6. The air quality objectives are policy-based targets set by the Government, which consider economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

2.1.7. For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.1.8. Under Part 1 of the updated Environment Act 2021[2], the Government were required to set legally binding environmental targets for England including air quality, as well as set an additional target for $PM_{2.5}$, as this is considered to be the air pollutant of greatest harm to human health. Two new air quality targets relating to $PM_{2.5}$ have been enforced under secondary legislation. The new air quality targets are:

[2] Environment Act 2021 – Part 1 Environmental Governance

- Annual Mean Concentration Target ('concentration target') - a maximum concentration of 10µg/m^3 to be met across England by 2040; and
- Population Exposure Reduction Target ('exposure target') - a 35% reduction in population exposure by 2040 (compared to a base year of 2018).

2.1.9. An interim target is detailed in the Government's Environmental Improvement Plan 2023 of 12µg/m^3 to be met by the end of January 2028.

WORLD HEALTH ORGANISATION (WHO) GUIDELINES AND INTERIM TARGETS

2.1.10. The WHO released updated Global Air Quality Guidelines (AQGs)[3] in September 2021, recommending new, more stringent air quality levels to protect human health. It is important to note that the UK standards should still take precedence over the WHO guidelines, as the UK standards were developed based on the latest understanding of sources and exposure in the UK. This framework for assessing impacts is deemed suitable for this assessment, as it provides a method for identifying where mitigation is required and helping schemes consider how best to improve air quality.

AIR QUALITY REGULATIONS

2.1.11. Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[4] and the Air Quality (England) (Amendment) Regulations 2002[5] for the purpose of Local Air Quality Management (LAQM).

2.1.12. These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

"...the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present..."

2.1.13. The Air Quality Standards Regulations 2010[6] transpose the European Union Ambient Air Quality Directive (2008/50/EC)[7] into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$

[3] WHO (2021) Global Air Quality Guidelines

[4] The Air Quality (England) Regulations 2000, UK Statutory Instruments 2000 No.928

[5] The Air Quality (England) (Amendment) Regulations 2002, UK Statutory Instruments 2002 No. 3043

[6] The Air Quality Standards Regulations 2010, UK Statutory Instruments 2010 No. 1001

[7] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

and NO_2. The annual mean limit values for NO_2 and PM_{10} are the same concentration levels as the relevant AQS objectives (40 µg/m^3) and the annual mean limit value for $PM_{2.5}$ was a concentration of 20µg/m^3, which has subsequently been reduced as part of the updated Environment Act 2021.

CLEAN AIR STRATEGY

2.1.14. The Department for Environment, Food and Rural Affairs (DEFRA) published the Government's Clean Air Strategy in 2019[8] setting out measures which aim to reduce emissions from all sources of air pollution, making air healthier to breathe, protecting nature and boosting the economy. The Strategy also proposes tough new goals to cut public exposure to airborne particulate matter, as per the recommendation made by the WHO.

2.1.15. Furthermore, the Strategy confirms that the Government will set new legislation to:

'create a stronger and a more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanism.'

2.1.16. New enforcement powers will also be given at a national and local level, across all sectors of society.

DUST LEGISLATION

2.1.17. Section 79 of Part III of the Environmental Protection Act (1990)[9] gives the following definitions of statutory nuisance relevant to dust and particles:

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

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

[8] Defra (2019) Clean Air Strategy 2019

[9] Environmental Protection Act (1990) – Part III

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

2.1.20. Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.2. GUIDANCE

LOCAL AIR QUALITY MANAGEMENT

2.2.1. Under Section 82 (Part IV), Local Authorities (LAs) are required to periodically review, assess and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

2.2.2. DEFRA has published technical guidance for use by local authorities in their review and assessment work[10]. This guidance, referred to in this document as LAQM.TG(22), has been used where appropriate in the assessment presented herein.

LAND-USE PLANNING & DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

2.2.3. Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[11] that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and the possible mitigation measures that may be implemented to minimise these impacts.

[10] Defra (2018) Part IV The Environment Act 1995 as amended by the Environment Act 2021 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG(22)

[11] Environmental Protection UK and Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality.

$PM_{2.5}$ TARGETS: INTERIM PLANNING GUIDANCE

2.2.4. In October 2024, Defra released interim planning guidance[12] for addressing $PM_{2.5}$ targets under the Environmental Targets Regulations 2023, aiming for a maximum annual mean concentration of 10µg/m^3 by 2040 and a 35% reduction in population exposure. The guidance advises developers and local planning authorities to incorporate these targets into planning by considering site proximity to vulnerable populations, pollution sources, and $PM_{2.5}$ exposure during construction and operation. It encourages mitigation measures such as thoughtful site design and technological solutions to minimise emissions. Developers must demonstrate how they address these factors, and LPAs should assess cumulative impacts of multiple developments on regional $PM_{2.5}$ levels, with further detailed guidance expected.

NATIONAL PLANNING PRACTICE GUIDANCE – AIR QUALITY

2.2.5. This guidance[13] provides several guiding principles on how the planning process can take into account the impact of new development on air quality and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated.

2.2.6. It also provides information on how air quality is considered by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning and in individual cases where air quality is a consideration in a planning decision.

2.2.7. The guidance shows that where air quality issues are considered at the plan-making stage, a strategic approach to air quality can be taken, which will help to secure net improvements in overall air quality. Opportunities should also be considered to improve air quality or mitigate impacts, such as through traffic and travel management and green infrastructure provision and enhancement.

2.2.8. This guidance was reviewed, and the relevant guidance was considered as necessary throughout the undertaking of this assessment.

2.3. RELEVANT PLANNING POLICY CONTEXT

NATIONAL PLANNING POLICY FRAMEWORK

[12] Defra (2024). $PM_{2.5}$ Targets: Interim Planning Guidance.

[13] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (November 2019). National Planning Practice Guidance – Air Quality

2.3.1. The Government's overall planning policies for England are described in the National Planning Policy Framework[14]. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

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

2.3.2. One of the three overarching objectives of the NPPF is that planning should 'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

2.3.3. In relation to air quality, the following paragraphs in the document are relevant:

- Paragraph 56, which states, 'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.'
- Paragraph 109, which relates to the need to consider transport related issues at the earliest stages of plan making and development proposals, so that '...e) identifying and pursuing opportunities to promote walking, cycling and public transport use; f) identifying, assessing and taking into account the environmental impacts of traffic and transport infrastructure – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains...'.
- Paragraph 110, which states 'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health.;
- Paragraph 187, which states 'Planning policies and decisions should contribute to and enhance the natural and local environment by: ...e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions

[14] Ministry of Housing, Communities & Local Government (December 2024, as amended February 2025). National Planning Policy Framework.

such as air and water quality, taking into account relevant information such as river basin management plans.';

- Paragraph 198, which states 'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.'
- Paragraph 199, which states 'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.';
- Paragraph 201, which states 'The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.'

2.4. LOCAL PLANNING POLICY

MANCHESTER'S LOCAL DEVELOPMENT FRAMEWORK

2.4.1. The Local Development Framework (LDF)[15] is the Core Strategy Development Plan Document, which sets out the local planning authority's spatial planning strategy for the area and provides the policy framework against which planning applications are assessed. It comprises a suite of development plan documents and supporting material that guide the location, scale and type of development, alongside the protection of environmental, social and economic interests. Collectively, the LDF seeks to deliver sustainable development by balancing growth with the need to safeguard public

[15] Manchester City Council (2012). Manchester's Local Development Framework Core Strategy Development Plan Document.

health, environmental quality and community well-being, ensuring that new development contributes positively to the long-term objectives of the area.

2.4.2. The LDF includes a number of policies that directly and indirectly relate to air quality. These policies seek to manage the impacts of development on air quality, reduce exposure to air pollution, and support wider objectives relating to public health, climate change and sustainable transport.

2.4.3. In particular, the LDF places emphasis on reducing emissions from development and transport, promoting sustainable travel modes, and ensuring that new development does not give rise to unacceptable impacts on local air quality. Where necessary, developments are required to incorporate appropriate mitigation measures to minimise emissions and protect human health.

2.4.4. The following policies relate to air quality:

Policy EN16 – Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.

GMCA's Places for Everyone

2.4.5. The Places for Everyone (PfE) Plan[16] prepared by the Greater Manchester Combined Authority on behalf of nine Greater Manchester districts, was adopted on 21 March 2024 and now forms part of the statutory development plan for those authorities. The plan establishes a long-term strategic spatial framework to guide sustainable growth across Greater Manchester, setting out the scale and distribution of new housing, employment development and supporting infrastructure up to 2039. It prioritises redevelopment of brownfield and urban land, while identifying selected sites for development outside existing urban areas and revising Green Belt boundaries where justified. The plan also seeks to support economic growth, improve transport connectivity, deliver key infrastructure, protect environmental assets, and ensure new development is sustainably integrated with communities and the wider transport network.

[16] Greater Manchester Combined Authority (2024). Places for Everyone Joint Development Plan Document.

Policy JP-SA5: Clean Air

A comprehensive range of measures will be taken to support improvements in air quality, focusing particularly on locations where people live, where children learn and play, where there are impacts on the green infrastructure network and where air quality targets are not being met, including:

1. Locating and designing development, and focusing transport investment, so as to reduce reliance on forms of transport that generate air pollution;
2. Determining planning applications having regard to the most recent development and planning control guidance published jointly by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK), and the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction, or relevant successor guidance, including the requirement for developers to submit construction management plans as appropriate;
3. Requiring applications for developments that could have an adverse impact on air quality to submit relevant air pollution data so that adverse impacts on air quality can be fully assessed and development only permitted where they are acceptable and/or suitable mitigation can be provided;
4. Restricting developments that would generate significant point source pollution such as some types of industrial activity and energy generation;
5. Significantly expanding the existing commercial network of electric vehicle charging points, both for public and private use, including as part of new developments;
6. Implementing the Clean Air Plan and associated measures;
7. Facilitating the more sustainable distribution of goods within the urban area, including through accommodating urban consolidation centres and urban distribution centres that use ultra-low-emission vehicles, and local delivery facilities to reduce repeat delivery attempts;
8. Designing streets to avoid trapping air pollution at ground level, including through the appropriate location and scale of buildings and trees;
9. Controlling traffic and parking within and around schools, early years sites and other locations that are particularly sensitive to air quality;
10. Promoting actions that help remove pollutants from the air, such as enhancing the green infrastructure network and using innovative building materials that capture air pollutants; and
11. Development should be located in areas that maximise the use of sustainable travel modes and be designed to minimise exposure to high levels of air pollution, particularly for vulnerable users.

3. SCOPE & METHODOLOGY

3.1. SCOPE

3.1.1. The scope of the assessment has been determined in the following way:

- Review of MCC's latest review and assessment reports[17] and air quality data for the area surrounding the Application Site, including data from MCC and Defra[18];
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality and a review of the plans for the Proposed Development to establish the location of relevant sensitive receptors.
- Review of the scheme drawings available for the Proposed Development to establish the locations of proposed sensitive receptors; and
- Review of relevant traffic flow data for the local area.

3.1.2. The assessment includes consideration of:

- Generation of dust and particulate matter from on-site activities during the site preparation and construction phase;
- Increase in local pollutant concentrations (i.e. NO_2 and $PM_{10}/_{2.5}$) arising from the exhaust emissions of construction traffic and plant;
- Increase in local pollutant concentrations (i.e. NO_2 and $PM_{10}/_{2.5}$) arising from the exhaust emissions from the development once operational; and
- Exposure of future users of the Proposed Development to concentrations of relevant pollutants (notably NO_2 and $PM_{10}/_{2.5}$) arising from the exhaust emissions of existing road traffic travelling on the local road network.

3.1.3. The Proposed Development has the potential to affect air quality during the construction and operation phase, as well as expose future occupants to elevated pollution levels. These issues have been assessed using the following methodology.

3.2. METHODOLOGY FOR PREDICTION OF IMPACTS

CONSTRUCTION PHASE DUST EMISSION ASSESSMENT

3.2.1. There is the potential for fugitive dust emissions to occur because of construction phase activities. An assessment of the likely significant impacts on local air quality due to the generation and

[17] Manchester City Council (WCC). 2025 Air Quality Annual Status Report (ASR)

[18] Defra Local Air Quality Management (LAQM) Support Pages. Available at: http://laqm.defra.gov.uk/ Accessed in January 2026

dispersion of dust and PM_{10} during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM[19]; the available information for this phase of the Proposed Development provided by the Client and Project Team; and professional judgement.

3.2.2. The IAQM assessment is undertaken where there are: 'human receptors' within 250m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased PM_{10} in the ambient air will have the greatest impact on local air quality at sensitive receptors.

3.2.3. There are a number of 'human receptors' located within the distances defined above. The effects at these receptors have, therefore, been considered within the following assessment. It should be noted that there are no relevant ecological receptors located within the distances defined above and therefore no further consideration has been given to ecological receptors.

3.2.4. The assessment considers the risk of potential dust and PM_{10} impacts from the following four sources:

- demolition;
- earthworks;
- general construction activities; and
- trackout.

3.2.5. It considers the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, site-specific mitigation proportionate to the level of risk is identified, and the significance of residual effects is determined. A summary of the IAQM assessment methodology is provided in Appendix B.

3.2.6. In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the Application Site and in the vicinity of the Application Site itself.

[19] Institute of Air Quality Management (2024). Guidance on the Assessment of Dust from Demolition and Construction Version 2.2

3.2.7. As information on the number of vehicles and plant associated with each part of the construction phase is not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the Proposed Development;
- The number and proximity of sensitive receptors to the Application Site and along the likely routes to be used by construction vehicles; and
- The likely duration of the construction phase and the nature of the construction activities undertaken.

OPERATIONAL PHASE ASSESSMENT METHODOLOGY

3.2.8. The Proposed Development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site, as well as expose future occupants to elevated pollution levels.

3.2.9. Of the pollutants included in the AQS, concentrations of NO_2 and $PM_{10}/_{2.5}$ have been considered in this assessment as road traffic is a major source of these pollutants and their concentrations tend to be close to, or in exceedance of, the objectives in urban locations.

Potential Development Impacts

3.2.10. Guidance published by the IAQM and EPUK in 2017 provides a two-stage approach to determine the level of assessment required in the consideration of the impact of development-generated road traffic emissions on local air quality.

Stage 1

3.2.11. The Stage 1 criteria require that the assessment progress to Stage 2 if any of the following apply:

- The development comprises:
  - 10 or more residential units or a site area of more than 0.5ha; or
  - More than 1,000m^2 of floor space for all other uses or a site area greater than 1ha;
- Coupled with any of the following:
  - The development has more than 10 parking spaces; or
  - The development will have a centralised energy facility or other centralised combustion process.

Note: Consideration should be given to the potential impacts of neighbouring sources on the site, even if an assessment of the impacts of the development on the surrounding area is screened out.

Stage 2

3.2.12. The Stage 2 Institute of Air Quality Management (IAQM) indicative criteria for requiring an Air Quality Assessment is shown in Table 3.1.

Indicative Criteria to Proceed to an Air Quality Assessment
A change in Light -Duty Vehicle (LDV) traffic flows on local roads with relevant receptors - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere
A change in Heavy-Duty Vehicle (HDV) flows on local roads with relevant receptors - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere
A change in the alignment of roads by 5m or more and the road is within an AQMA
Introduction of a new junction or remove an existing junction near to relevant receptors - Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station - Where bus flows will change by: a) more than 25 AADT within or adjacent to an AQMA b) more than 100 AADT elsewhere
Has an underground car park with an extraction system within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
Has one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. - includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.

Table 3.1 Indicative Criteria to Proceed to an Air Quality Assessment

3.2.13. Where IAQM indicative criteria for requiring an Air Quality Assessment are met, potential impacts can be defined by predicting pollutant concentrations at sensitive locations using ADMS-Roads dispersion modelling.

3.2.14. The criteria provided within DEFRA guidance on where the AQOs apply was utilised to determine appropriate receptor positions.

SITE SUITABILITY ASSESSMENT

3.2.15. Site suitability was determined using professional judgement and taking into account a range of additional factors including:

- The existing air quality;
- The future air quality in the absence of the development;
- The extent of current and future population exposure to impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

DISPERSION MODELLING INPUT DATA

3.2.16. To assess pollutant concentrations across the Site, consideration was made of the proximity of the Site to major roads and background pollution concentrations. In order to predict NO_2 and $PM_{10}/PM_{2.5}$ concentrations across the Application Site, the advanced dispersion model ADMS Roads (version 5.1.0.2) has been used. ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the UK for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

3.2.17. This model uses detailed information regarding traffic flows on the local road network, surface roughness, and local meteorological conditions to predict pollutant concentrations at specific receptor locations, as determined by the user. These are detailed in the following Sections.

METEOROLGICAL DATA

3.2.18. Meteorological data, such as wind speed and direction, is used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in the model was obtained from the Met Office observing station at Manchester Airport. This station is located approximately 13.6km south of the Application Site and is considered to provide representative data for the assessment. The meteorological data used for this assessment was from 2024.

3.2.19. Reference should be made to Appendix C for a wind rose of utilised meteorological data.

TRAFFIC FLOW DATA

3.2.20. Traffic data for use in the assessment, including 24-hour AADT flows and fleet composition, was obtained from Department for Transport (DfT). The DfT data is deemed to be a suitable source of data for air quality assessments and is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the Site.

3.2.21. Operation traffic data were projected using the traffic growth projection factor derived by the Department for Transport (DfT)'S TEMPro model (version 8.0). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth within the UK.

3.2.22. A summary of traffic data is provided in Appendix D. Road widths were estimated from aerial photography and UK highway design standards.

EMISSION FACTORS

3.2.23. The vehicle emission factors adopted for use in the assessment have been obtained using the Emission Factor Toolkit (EFT) version 13.1. This has been produced by DEFRA and incorporates COPERT 5 vehicle emission factors and fleet information. Emission factors are available for all years between 2021 and 2050 and take into account the most recent evidence relating to factors such as advances in vehicle and exhaust technology and changes in composition of the vehicle fleet; the emission factors consequently reduce over time.

ROUGNES LENGTH

3.2.24. The z0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z0 of 1.0m was used to describe the modelling extents of the Site area, and 0.5m for the meteorological site. The values of z0 are considered correct for the morphology of the Site area and meteorological site and are suggested within ADMS-Roads as being suitable for 'Cities' and 'Parkland, Open Suburbia' respectively.

MONIN-OBUKHOV LENGTH

3.2.25. The Monin-Obukhov length supplies a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the Site area and meteorological site modelling extents. The values are considered correct for the nature of the area and meteorological site and are suggested within ADMS-Roads as being suitable for 'Cities and Large Towns'.

NO_x TO NO_2 CONVERSION

3.2.26. Predicted annual mean NOx concentrations were converted to NO_2 concentrations using the spreadsheet (version 9.1) provided by DEFRA, which is the method detailed within DEFRA guidance.

MODEL VERIFICATION AND PROCESSING OF RESULTS

3.2.27. The ADMS Roads advanced dispersion model has been widely validated for this type of assessment and is considered to be fit for purpose. Model validation undertaken by the software developer will not have included validation in the vicinity of the Proposed Development. To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process of verification aims to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results and was carried out following the methodology specified in LAQM.TG(22).

3.2.28. Further details of the verification calculations are presented in Appendix D. A factor of 2.69 was obtained during the verification process; this indicates that the model is under-predicting pollutant concentrations. This factor has therefore been applied to the modelled road-NOx component for each receptor, prior to conversion to annual mean NO_2 concentrations utilising the NO_x from NO_2 calculator (version 9.1, released August 2024) provided by DEFRA.

3.2.29. Once processed, the predicted concentrations were compared against the current statutory limit values and objectives for NO_2 and PM_{10}. LAQM.TG(22) advises that an exceedance of the 1 hour mean NO_2 objective is unlikely to occur where the annual mean concentration is below 60µg/m^3, where road transport is the main source of pollution. This concentration has been used to screen whether the hourly mean objective is likely to be achieved.

3.2.30. As local roadside monitoring data are not available for PM_{10}, the modelled road-PM_{10} component has been adjusted using the factor calculated for road-NOx, before adding to the appropriate background concentration. The number of days with PM_{10} concentrations greater than 50µg/m^3 was then estimated using the relationship with the annual mean concentration described in LAQM.TG(22).

3.2.31. Reference should be made to Appendix D for assessment input data and details of the verification process.

BACKGROUND CONCENTRATIONS

3.2.32. Annual mean NO_2 and PM_{10} background concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the development site. These maps provide estimated background concentrations for the whole of the UK at a grid resolution of 1km x1km, for all years between 2021 and 2040.

DEFRA $PM_{2.5}$ TARGETS: INTERIM PLANNING GUIDANCE

3.2.33. Defra is in the process of developing guidance related to the new $PM_{2.5}$ targets that will be considered in the planning process. The forthcoming guidance will require planning applications to address how developments will minimise population exposure to $PM_{2.5}$ from the design stage. Although the full guidance is still being developed, an interim version has been published, advising planning applications to consider the following points:

- How has $PM_{2.5}$ exposure been assessed when selecting the development site?
- What measures or mitigations have been proposed to reduce $PM_{2.5}$ exposure for development users and nearby receptors (e.g., homes, hospitals, schools) and to reduce $PM_{2.5}$ emissions and their precursors?

3.2.34. The interim guidance has been taken into account in the assessment.

3.3. ASSESSMENT CRITERIA

CONSTRUCTION PHASE

3.3.1. The IAQM assessment methodology recommends assigning significance only to the identified risk of dust impacts from construction activities with appropriate mitigation measures in place. For most construction activities, the implementation of effective mitigation measures should prevent significant effects on sensitive receptors, resulting in residual effects that are typically negligible.

3.3.2. The significance of the effects of exhaust emissions (NO_2 and PM_{10}) generated by construction vehicles and on-site plant during the construction phase of the Proposed Development has been evaluated qualitatively, using professional judgement and the principles of the EPUK significance criteria outlined below for operational phase impacts.

OPERATIONAL PHASE

3.3.3. The EPUK/IAQM[20] air quality planning guidance provides a framework for assessing the effect of additional emissions from development-generated traffic on local air quality. Where detailed assessment or modelling is undertaken, the guidance outlines a method for describing impacts at individual receptors. The degree of impact is determined by expressing the magnitude of the incremental change in pollutant concentration as a proportion of the relevant assessment level. This change is then considered alongside the new total concentration and its relationship with the assessment criterion. However, the guidance emphasises that this represents only a starting point, with the overall significance of effects ultimately determined through professional judgement.

3.3.4. This general approach can also be adopted where modelling is not undertaken. The guidance states that the significance of an impact should be determined based on its consequence. Areas where air quality is likely to be close to or exceeding an air quality objective are considered more sensitive, with any subsequent impacts likely to be of greater significance.

3.3.5. The EPUK/IAQM guidance states that for most road transport-related emissions, long-term average concentrations are the most useful for evaluating the severity of impacts. The guidance does not include criteria for determining the significance of the effect on hourly mean NO_2 concentrations or daily mean PM_{10} concentrations. The significance of effects of hourly mean NO_2 and daily mean PM_{10} concentrations arising from the operational phase has therefore been determined qualitatively using professional judgement and the principles described above.

[20] See Table 6.3 of the EPUK/IAQM Guidance

4. BASELINE CONDITIONS

4.1. REVIEW & ASSESSMENT OF AIR QUALITY

4.1.1. Greater Manchester Combined Authority (GMCA) has declared an Air Quality Management Area (AQMA) as a result of their Review and Assessment work, which covers the trunk road network across Greater Manchester and Manchester City Centre. The AQMA has been designated due to exceedances and likely exceedances of the AQS objectives for NO_2 annual mean concentrations. The Proposed Development is located within the AQMA; therefore, there is the potential for the Site to be affected by elevated pollutant concentrations, as well as any emissions from the proposals to impact this sensitive area. These issues have been considered throughout the assessment.

4.1.2. As required by the Environment Act (2021), GMCA has undertaken a Review and Assessment of air quality within their area of jurisdiction. This process has indicated that both annual mean concentrations and hourly mean concentrations of NO_2 have continued to improve, and indicates that the steps Greater Manchester is taking to invest in cleaner buses through the Bee Network is helping to improve the air quality across Greater Manchester.

4.1.3. Within Manchester City Centre, monitoring shows high levels of NO_2 recorded in 2024 along Oxford Street. The Annual Status Report (ASR) shows that since January 2025, early indications were that zero exhaust emissions and cleaner buses on the Oxford Road corridor are reducing NO_2 levels. Concentrations across Manchester City ranged between 22.6 and 59.4µg/m^3, with 31 exceedances recorded in 2024.

4.1.4. At automatic monitoring sites, long-term concentrations of NO_2 have fallen at three of the four monitoring sites. Again, a continued long-term downward trend was also shown at diffusion tube monitoring sites, however some sites have shown a slow down or stabilisation of the decrease in concentrations.

4.1.5. The historical Greater Manchester Air Quality Action Plan and related low-emission strategies remain part of the local policy framework for managing emissions, but the current Government-approved Greater Manchester Clean Air Plan (CAP) now functions as the primary implementation programme to achieve compliance with statutory nitrogen dioxide limits on local roads by the legally required deadline. The CAP's investment-led measures supersede earlier proposals for charging Clean Air Zones and provide the focus for air quality improvements across the city-region.

4.2. LOCAL EMISSION SOURCES

4.2.1. The Application Site is located in an area where air quality is mainly influenced by emissions from road transport. The nearest 'A' roads are situated within 50m to the north (A635 Mancunian Way) and 130m south (A6 Ardwick Green South) of the Proposed Development.

4.3. LOCAL AUTHORITY AIR QUALITY MONITORING

NITROGEN DIOXIDE

4.3.1. Monitoring is undertaken by MCC throughout their jurisdiction; however, no monitoring is carried out in the immediate vicinity of the Proposed Development. Annual mean NO_2 results recorded at the sites nearest to the Proposed Development, taken from readily available online information, are presented in Table 4.1.

4.3.2. Monitoring at the tubes nearest to the Proposed Development has shown a general decrease in concentrations, particularly over the last three years. As shown in Table 4.1, monitored concentrations at the tubes closest to the Site were below the AQO.

Monitoring Site	Distance to Site (m)	Monitor Type	Monitored NO_2 Concentration (µg/m³)				
			2020	2021	2022	2023	2024
MA72NO	441	Diffusion Tube (Urban Background)	24.5	27.5	26.3	24.3	24.0
MA96NO	192	Diffusion Tube (Roadside)	36.4	41.0	43.5	39.7	36.4
MA113NO	482	Diffusion Tube (Roadside)	-	28.1	29.2	28.2	27.6

Table 4.1 NO_2 Monitoring Concentrations

4.3.3. As shown in Table 4.1, the monitoring site closest to the Proposed Development (MA96NO) recorded an annual mean NO_2 concentration of 36.4µg/m³ in 2024, which is 9.0% below the AQS objective of 40µg/m³.

4.3.4. The Proposed Development is located away from major road sources. The monitoring locations presented in Table 4.1 (MA96NO and MA113NO) are situated adjacent to busy roads with higher traffic flows than those in the immediate vicinity of the Site and are therefore considered to represent conservative roadside environments. As such, these locations are expected to experience higher NO_2 concentrations than those anticipated at future receptors within the Proposed Development.

4.3.5. Diffusion tube MA27NO is located approximately 60 m from a major 'A' road and is therefore considered to be more representative of local background conditions in the vicinity of the Site. This location provides additional context for assessing air quality conditions away from the immediate influence of roadside traffic.

4.3.6. Figure 4.1 shows the location of MCC diffusion tube monitoring sites closest to the Proposed Development.

Figure 4.1 – WCC Diffusion Tube Monitoring Locations

PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$)

4.3.7. Monitoring of particulate matter is carried out across Greater Manchester. Both PM_{10} and $PM_{2.5}$ concentrations are well below the AQO (PM_{10}) and target value ($PM_{2.5}$).

BACKGROUND AIR QUALITY DATA

4.3.8. Background air quality monitoring is not currently undertaken by MCC in close proximity to the Site. Therefore, background pollutant concentrations were obtained from the latest Defra background concentration maps. These maps provide estimated pollutant concentrations across the UK on a 1km-by-1km grid basis to assist Local Authorities in their Review and Assessment of air quality. The Proposed Development site is located in grid square NGR: 385500, 397500.

4.3.9. Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were obtained for the grid squares covering the study area for the 2026 Current Baseline and 2027 Future Baseline. The background concentrations used in the assessment are summarised in Table 4.2.

Pollutant	Predicted Background Concentration (µg/m³)	
	2026	2027
NO_2	18.8	18.1

PM_{10}	13.8	13.7
$PM_{2.5}$	7.8	7.7

Table 4.2 Background Concentrations

4.3.10. As shown in Table 4.2, all background concentrations are well below the air quality objectives for NO_2, PM_{10} and $PM_{2.5}$.

4.4. PCM MODELLED AIR QUALITY DATA

4.4.1. Defra's air quality modelling produces a number of meteorological simulations, gridded outputs and pollution concentration maps (PCM). This modelling produces GIS shapefiles of the modelled base year roadside NO_2 concentrations. A 2023 compliance assessment was carried out and results for the PCM 2023 base year NO_2 concentrations for the modelled road links were made available. The maps of predicted NO_2 concentrations are shown in Figure 4.2. There is a colour key provided on the maps so concentrations at particular points can be obtained. The nearest modelling to the site is available for the A635 Mancunian Way; the predicted values for the closest road links are well below 40µg/m^3. However, these values are higher than the background levels at the Proposed Development.

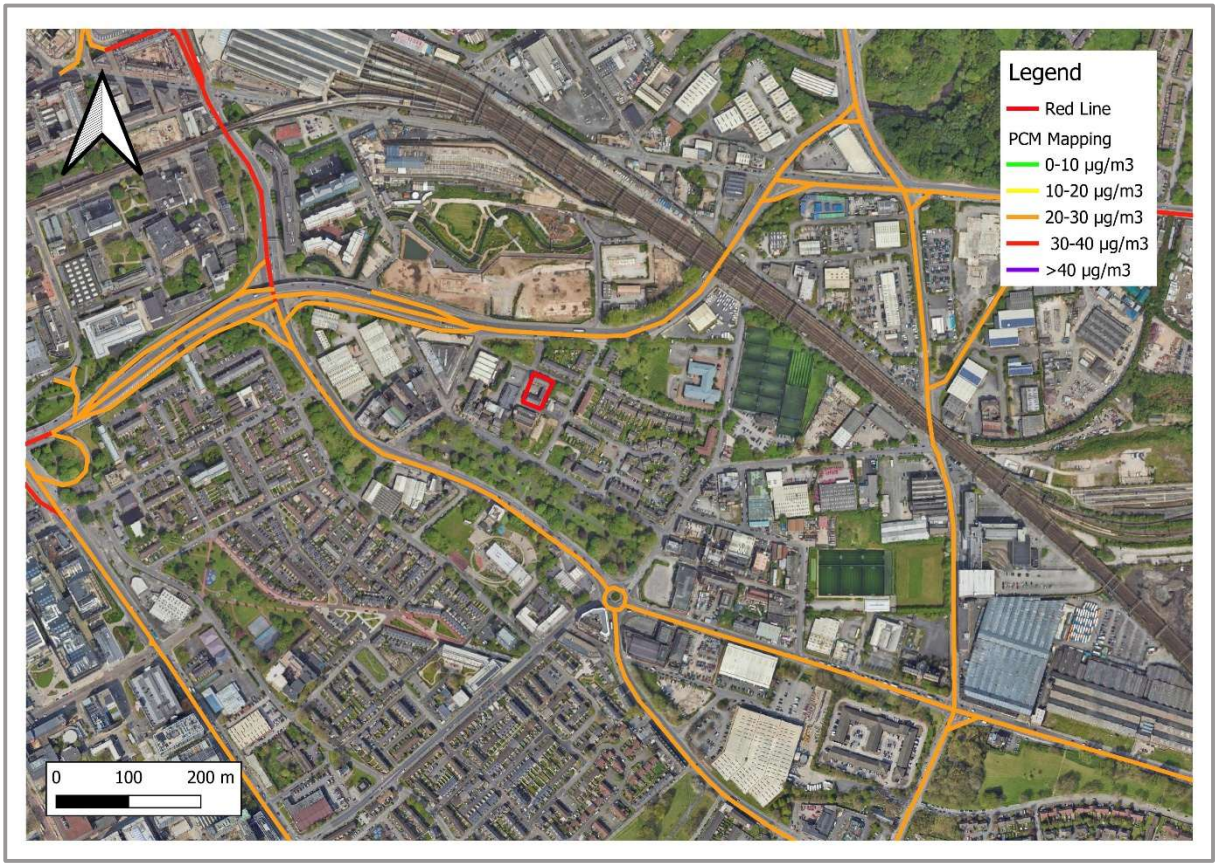


Figure 4.2 Predicted annual mean NO_2 concentrations from PCM Mapping

4.5. SENSITIVE RECEPTORS

4.5.1. A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

5. ASSESSMENT OF IMPACTS

5.1. IMPACTS

5.1.1. There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development. These are assessed in the following Sections.

5.2. CONSTRUCTION PHASE ASSESSMENT

DUST AND PM_{10} ARISING FROM ON-SITE ACTIVITIES

5.2.1. Construction activities that have the potential to generate and/or re-suspend dust and PM_{10} include:

- Site clearance and preparation, including potential demolition activities;
- Preparation of temporary access/egress to the Application Site and haulage routes;
- Materials handling, storage, spillage and disposal;
- Movement of vehicles and construction traffic within the Application Site;
- Use of crushing and screening equipment/plant;
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction alongside fabrication processes; and
- Internal and external finishing and refurbishment.

5.2.2. The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities), in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

ASSESSMENT OF POTENTIAL DUST EMISSION MAGNITUDE

5.2.3. The IAQM assessment methodology[21] has been used to determine the potential dust emission magnitude for the following four different dust and PM_{10} sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

5.2.4. As the scheme is for change of use, there will be no major demolition activities taking place on-site externally. Therefore, the potential dust emission magnitude is considered to be small for demolition activities.

[21] Institute of Air Quality Management (2024). Guidance on the assessment of dust from demolition and construction.

Earthworks

5.2.5. There are no earthwork activities taking place onsite.

Construction

5.2.6. There is expected to be minimal construction activity on site, with works being largely fit-out and the installation of a bin store and cycle store. There is expected to be no on-site concrete batching or sandblasting. Therefore, the potential dust emission magnitude is considered to be small for construction activities.

Trackout

5.2.7. There are likely to be less than 20 HDV outward movements on any one day over paved road. Therefore, the potential dust emission magnitude is considered to be small for trackout activities.

5.2.8. A summary of the potential dust emission magnitude determined for each construction activity is presented in Table 5.1.

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	N/A
Construction Activities	Small
Trackout	Small

Table 5.1 Potential Dust Emission Magnitude

ASSESSMENT OF SENSITIVITY OF THE STUDY AREA

5.2.9. The prevailing wind direction in the UK is from the southwest. Therefore, receptors located to the northeast of the Proposed Development are more likely to be affected by dust and particulate matter emitted or re-suspended during the construction phase. Land immediately to the northeast comprises residential properties.

5.2.10. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. Residential, industrial and commercial receptors are located within 20m of the site boundary.

5.2.11. Figure 5.1 was utilised to determine the number of receptors located within the distance bands provided in the IAQM guidance for determining receptor sensitivity.

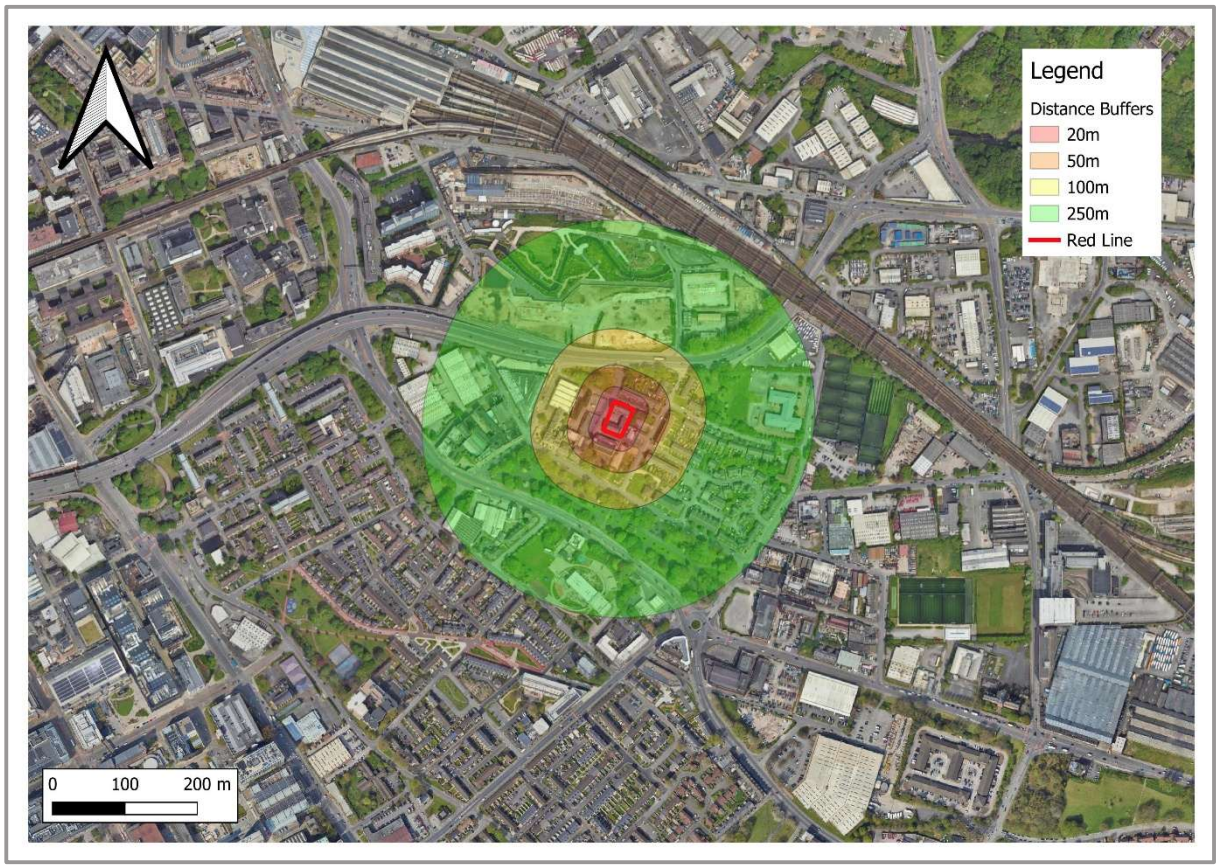


Figure 5.1 – Construction Phase Assessment Dust Distance Buffers

5.2.12. Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM_{10} has been derived for each of the construction activities considered. The results are shown in Table 5.2.

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

Table 5.2 Sensitivity of the Study Area

Risk of Impacts

5.2.13. The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. Table 5.3 below provides a summary of the risk of dust impacts for the Proposed Development.

5.2.14. The risk category identified for each construction activity has been used to determine the level of mitigation required.

5.2.15. Overall, there is a Low Risk of dust impacts relating to the expected construction phase activities, prior to mitigation being applied.

Potential Impact	Risk			
	Demolition (Small)	Earthworks (Small)	Construction (Small)	Trackout (Small)
Dust Soiling (Medium)	Low	N/A	Low	Low
Human Health (Low)	Negligible	N/A	Negligible	Negligible

Table 5.3 - Summary Dust Risk Table to Define Site

CONSTRUCTION VEHICLES & PLANT

5.2.16. The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via Thirsk Street. Due to the size of the Proposed Development and nature of construction works; construction traffic volumes will be relatively low within the context of existing traffic flows on this road.

5.2.17. Existing background levels of relevant pollutants (NO_2, PM_{10} and $PM_{2.5}$, see Section 4.9) are predicted to be well under the respective annual mean objectives.

5.2.18. Therefore, based on the available information and professional judgement, the local air quality impact associated with emissions from construction vehicles and plant are expected to be negligible.

5.3. OPERATION PHASE ASSESSMENT

IMPACTS OF OPERATIONAL PHASE TRAFFIC EMISSIONS ON LOCAL AIR QUALITY

5.3.1. The Proposed Development has been considered against the Institute of Air Quality Management (IAQM) guidance on the assessment of development-related air quality impacts to determine whether changes in traffic associated with the operational phase could result in significant effects on local air quality. Given that the scheme comprises more than 1,000m^2 floor space, the potential need for further screening has been considered in line with IAQM guidance.

5.3.2. In accordance with the IAQM Stage 2 screening approach, the potential impacts of development-related traffic emissions on local air quality have been assessed using professional judgement, informed by the scale and characteristics of the Proposed Development. The scheme is not expected to result in a material increase in vehicle movements on the local road network. As such, a detailed quantitative assessment of development-related traffic emissions is not considered necessary. This conclusion is based on the following considerations:

- Any increase in Light-Duty Vehicle (LDV) traffic flows on local roads with relevant receptors is predicted to be less than 100 Annual Average Daily Traffic (AADT), which falls below the IAQM screening threshold. A total of 32 LDV trips have been forecasted for this Scheme, which is well below the IAQM screening threshold.
- Any increase in Heavy-Duty Vehicle (HDV) traffic flows on local roads with relevant receptors is predicted to be less than 25 AADT, which is below the IAQM screening threshold. A total of 2 HDV trips have been forecasted for this Scheme, which is well below the IAQM screening threshold.
- The development does not propose any realignment of roads by 5m or more within an AQMA.
- The proposals do not include the introduction of a new junction, the removal of an existing junction, or changes to bus stations that could materially affect air quality at relevant receptors.
- The development does not include an underground car park or any substantial combustion processes, which are typically associated with higher air quality risks.

5.3.3. On this basis, and applying professional judgement in line with IAQM guidance, the Proposed Development is not expected to give rise to measurable changes in local air quality during the operational phase. Any residual effects associated with development-related traffic emissions are therefore anticipated to be negligible, and the impacts are considered not significant. No further quantitative assessment of operational traffic emission impacts is required.

SITE SUITABILITY ASSESSMENT

5.3.4. Development of the Site for an independent Special Educational Needs (SEN) school will introduce new sensitive receptors into the local area. As noted in the baseline section, the Site lies within an existing AQMA, therefore air quality concentrations may be above the air quality objectives due to the location of the Site.

5.3.5. Following the guidance provided within the DMRB[22] locations sensitive to road traffic emissions within 200m of the highway network are likely to be within the limits of pollutant dispersion from road sources.

5.3.6. The annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations for the development were calculated using dispersion modelling for the opening year of 2027. Predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at receptors are shown in Table 5.4, Table 5.5 and Table 5.6.

Receptors	Predicted Annual Mean NO_2 Concentration (µg/m^3)	% of AQS Objective
R1	20.8	52.1
R2	20.4	51.0
R3	20.4	50.9
R4	20.6	51.5
R5	20.7	51.7
R6	20.3	50.8
R7	20.3	50.7
R8	20.5	51.3

Table 5.1 Annual Mean NO_2 Concentrations at Discrete Receptor Locations

Receptors	Predicted Annual Mean PM_{10} Concentration (µg/m^3) (Days Exceedance)	% of AQS Objective
R1	14.9, (0.1)	37.2
R2	14.7, (0.1)	36.7
R3	14.7, (0.1)	36.7
R4	14.8, (0.1)	37.0
R5	14.8, (0.1)	37.0
R6	14.7, (0.1)	36.6
R7	14.6, (0.1)	36.6
R8	14.7, (0.1)	36.8

Table 5.1 Annual Mean PM_{10} Concentrations at Discrete Receptor Locations

Receptors	Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m^3)	% of AQS Objective
R1	8.4	69.7

[22] DMRB Volume 11, Section 3, Part 1, LA 105, Highways England, 2019.

R2	8.3	68.9
R3	8.3	68.8
R4	8.3	69.3
R5	8.3	69.4
R6	8.2	68.7
R7	8.2	68.6
R8	8.3	69.1

Table 5.1 Annual Mean $PM_{2.5}$ Concentrations at Discrete Receptor Locations

5.3.7. Based on the assessment results, future occupant exposure to exceedances of the annual mean NO_2 and PM_{10} objective is unlikely at any floor level within the Proposed Development. All predicted concentrations remain below the relevant AQS objectives.

5.3.8. Modelled annual mean NO_2 concentrations are all well below 60µg/m^3; therefore exceedances of the hourly mean NO_2 objective are considered unlikely to occur within the Proposed Development.

5.3.9. The objective for 24 hourly mean PM_{10} concentrations (50µg/m^3, not to be exceeded no more than 35 times a year) is predicted to be met at all receptor locations. No days of exceedance are forecast.

5.3.10. Predicted concentrations of $PM_{2.5}$ remain below the 20µg/m^3 threshold and are also well below the interim target of 12µg/m^3 and the 2040 target of 10µg/m^3.

5.3.11. The modelled concentrations at the Proposed Development remain below the AQS objectives and are considered representative of conditions at the Site. However, given the Site is within an AQMA, it would be prudent to incorporate proportionate mitigation measures, as outlined in Section 6, to ensure future occupants are protected and to provide additional resilience should concentrations in the local area rise further.

6. MITIGATION & RESIDUAL EFFECTS

6.1. CONSTRUCTION PHASE

MITIGATION AND RESIDUAL EFFECTS

6.1.1. Based on the construction phase air quality assessment results, there is a Low Risk of dust impacts occurring at identified sensitive receptors throughout the construction phase. Appropriate mitigation is required to further prevent or minimise the release of dust entering the atmosphere and/or being deposited on nearby receptors. Particular attention should be paid to operations that unavoidably take place in the immediate vicinity of sensitive receptors.

6.1.2. The IAQM's guidance provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase, examples are summarised in Table 6.1.

6.1.3. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the LA.

Issue / Control Measure	Site Risk		
	Low	Medium	High
General			
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	-	Recommended	
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	Committed		
Display the head or regional office contact information	Committed		
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. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	As required	Recommended	
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.	Committed		

Make the complaints log available to the local authority when asked	Committed	
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 logbook.	Committed	
Hold regular liaison meetings with other high risk construction sites within 500 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.	As required	Recommended
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.	As required	Recommended
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	Committed	
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.	Committed	
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.	As required	Recommended
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.	Committed	
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Committed	

Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period	As required	Recommended
Avoid site runoff of water or mud.	Committed	
Keep site fencing, barriers and scaffolding clean using wet methods.	As required	Recommended
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	As required	Recommended
Cover, seed, or fence stockpiles to prevent wind whipping	As required	Recommended
Operating Vehicle/Machinery and Sustainable Travel		
Ensure all vehicles switch off engines when stationary - no idling vehicles.	Committed	
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable	Committed	
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)	As required	Recommended
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	-	Recommended
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	-	Recommended
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	Committed	
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate	Committed	
Use enclosed chutes and conveyors and covered skips.	Committed	

Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Committed	
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.	As required	Recommended
Waste Management		
Avoid bonfires and burning of waste materials	Committed	
Measures Specific to Demolition		
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	As required	Recommended
Ensure effective water suppression is used during demolition operations. Handheld 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.	Committed	
Avoid explosive blasting, using appropriate manual or mechanical alternatives	Committed	
Bag and remove any biological debris or damp down such material before demolition.	Committed	
Measures Specific to Construction		
Avoid scabbling (roughening of concrete surfaces) if possible	As required	Recommended
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.	As required	Recommended
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	-	Recommended
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	-	Recommended
Measures Specific to Trackout		

Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	As required	Recommended
Avoid dry sweeping of large areas.	As required	Recommended
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	As required	Recommended
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	-	Recommended
Record all inspections of haul routes and any subsequent action in a site logbook.	As required	Recommended
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	-	Recommended
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	As required	Recommended
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.	-	Recommended
Access gates to be located at least 10 m from receptors where possible	-	Recommended

Table 6.1 IAQM Potential Mitigation Measures

6.1.4. Assuming the relevant mitigation measures outlined in Table 6.1 are implemented, the residual effects of dust and PM_{10} generated by construction activities, following the application of the appropriate site mitigation measures described above and combined with good site practices, are expected to be not significant.

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

6.2. OPERATIONAL PHASE

MITIGATION AND RESIDUAL EFFECTS

6.2.1. The assessment has concluded that the Proposed Development is not expected to give rise to significant adverse air quality effects during the operational phase. As such, no site-specific mitigation is required to address unacceptable impacts. Nevertheless, a range of good-practice,

design-led measures may be incorporated to support wider air quality and sustainability objectives and to maximise benefits for future occupiers. These include:

- Encouraging Sustainable Transport: Prioritise sustainable transport options for the development, including public transport, cycling, and walking. This will reduce reliance on private vehicles, lower traffic emissions, and encourage greener travel choices for staff and visitors.
- Low-Emission Heating Technologies: The use of low-carbon, low-emission heating systems, such as air source or ground source heat pumps, is encouraged. Where gas-fired boilers are proposed, these should meet a minimum emission standard of <40 mgNOx/kWh to minimise nitrogen oxide emissions.
- Green Infrastructure: Integrate planting throughout the site, particularly in public spaces, to absorb dust, particulate matter, and other pollutants where possible. Green spaces will also provide cooling benefits, support biodiversity, and mitigate the urban heat island effect, improving the overall environment for pupils and staff.

6.2.2. The incorporation of these measures reflects a design-led approach in which air quality considerations are integrated at an early stage. While the assessment has concluded that the Proposed Development is acceptable in air quality terms, these measures support wider sustainability objectives and demonstrate a commitment to protecting public health, enhancing environmental quality and promoting long-term community wellbeing.

DEFRA $PM_{2.5}$ TARGETS: INTERIM PLANNING GUIDANCE

6.2.3. The Environment Act 2021 introduced a statutory target to reduce population exposure to fine particulate matter ($PM_{2.5}$), including an annual mean concentration target of 10 µg/m^3 to be achieved by 2040. In response, Defra has signalled an emerging policy direction that places increased emphasis on considering $PM_{2.5}$ exposure at the design stage of new development, particularly for proposals introducing new sensitive receptors.

6.2.4. In line with this emerging approach, $PM_{2.5}$ has been considered as part of the air quality assessment for the Proposed Development, with regard to baseline concentrations, development-related impacts, and opportunities for exposure reduction. This has included the following:

- A review of nearby emission sources identified road traffic as the primary contributor to local air pollution. Based on Defra background air quality maps and local monitoring evidence, annual mean $PM_{2.5}$ concentrations in the vicinity of the Site are expected to remain below the 2040 target value of 10 µg/m^3.

- A qualitative assessment of potential operational-phase traffic emissions confirmed that the Proposed Development is not expected to result in a material increase in vehicle movements on the local road network. In particular, any changes in traffic flows are predicted to remain well below the IAQM indicative screening thresholds of 100 AADT for light-duty vehicles and 25 AADT for heavy-duty vehicles.
- The site suitability assessment indicates that future $PM_{2.5}$ concentrations at the Proposed Development are unlikely to exceed the 2040 target, and no significant $PM_{2.5}$ exposure risks have been identified for future occupiers.

6.2.5. Overall, the Proposed Development is not expected to result in a significant change in local $PM_{2.5}$ concentrations, and operational phase effects are anticipated to be negligible. This conclusion is consistent with current IAQM guidance and reflects a proportionate, risk-based assessment approach.

6.2.6. On this basis and taking account of the design-led measures incorporated within the scheme to support sustainable travel, low-emission heating and green infrastructure, no further mitigation specific to $PM_{2.5}$ is considered necessary.

7. CONCLUSIONS

7.1.1. This report presents the findings of an air quality impact assessment undertaken in support of a planning application for the Proposed Development, change of use from former photographic studio (Use Class E) to independent special educational needs (SEN) school (Use Class F1) and associated minor works including installation of cycle parking and bin store located along Thirsk Street, Ardwick. The assessment has considered the potential effects of the Proposed Development on local air quality during both the construction and operational phases.

7.1.2. During the construction phase, the potential for air quality impacts arises from fugitive dust emissions associated with demolition, construction activities and trackout. These impacts were assessed in accordance with the Institute of Air Quality Management (IAQM) guidance. With the implementation of appropriate good practice dust control measures, the residual significance of construction-phase air quality impacts is predicted to be not significant.

7.1.3. A qualitative road traffic emissions assessment was undertaken to consider the impact of development-generated road traffic on local air quality. The proposed trip generation did not exceed the relevant screening criteria and therefore detailed dispersion modelling of development-generated road traffic was not undertaken, and the impacts are considered not significant.

7.1.4. As the Proposed Development has the potential to introduce new receptors into an area of existing traffic emissions, dispersion modelling was undertaken using ADMS-Roads to predict future pollutant concentrations from the local highway network. Model results, verified against local monitoring data, indicate that future occupants are unlikely to be exposed to pollutant concentrations (NO_2 and $PM_{10/2.5}$) exceeding the relevant air quality objectives at any floor level.

7.1.5. Given the Site's location within a declared AQMA, it is prudent to incorporate proportionate mitigation measures to provide resilience against potential future increases in pollution. Measures such as promoting sustainable transport, low-emission heating technologies and integrating green infrastructure are therefore recommended to enhance long-term air quality and protect future occupants.

7.1.6. Taking the modelling results and proposed mitigation into account, air quality is not considered a constraint to planning permission for the Proposed Development.

APPENDIX A

GLOSSARY

Term	Definition
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
Defra	Department for Environment, Food and Rural Affairs.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
NO_2	Nitrogen dioxide.
NO_X	Nitrogen oxides.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
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.
µg/m^3 microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1ug/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

APPENDIX B

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY

Step 1 – Screening the need for a Detailed Assessment

An assessment will normally be required where there are:

- 'Human receptors' within 250m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or
- 'Ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

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

Step 2A – Define the Potential Dust Emission Magnitude

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

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

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

Dust Emission Magnitude	Activity
Large	Demolition >75,000m^3 building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >12m above ground level
	Earthworks >110,000m^2 site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >6m high bunds formed, >100,000 tonnes material moved
	Construction >75,000m^3 building volume, on site concrete batching, sandblasting Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads

Medium	Demolition 12,000-75,000m³ building demolished, dusty material (e.g. concrete) 6-12m above ground level
	Construction 12,000 - 75,000m³ building volume, dusty material e.g. concrete, on-site concrete batching
	Trackout 20 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads

Step 2B – Define the Sensitivity of the Area

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

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

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

Table 2Bb: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration (µg/m³)	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32	>100	High	High	High	Medium

		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table 2Bc: Sensitivity of the Area to Ecological Impacts

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

Step 2C – Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For

those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2C: Risk of Dust Impacts

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

Step 3 –Site Specific Mitigation

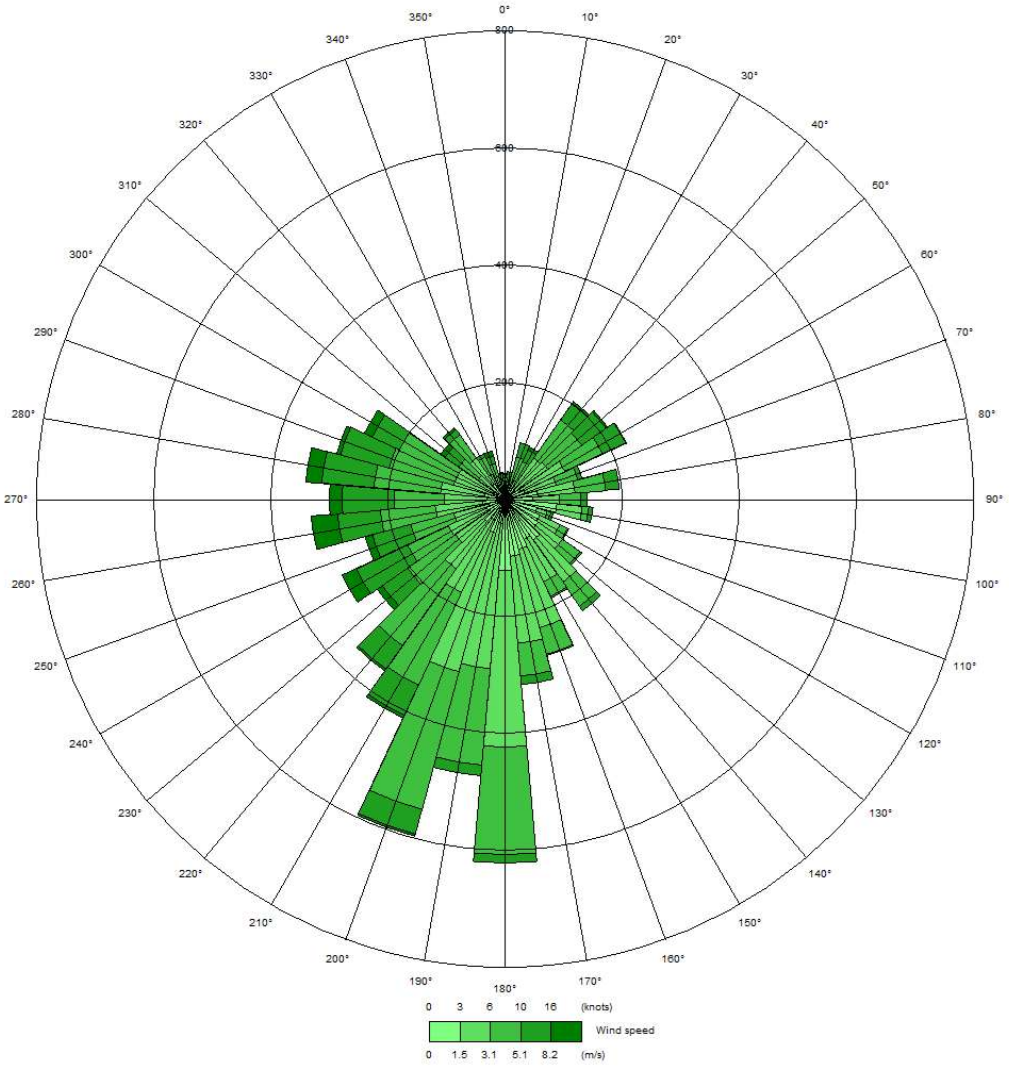
Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high-risk site. The IAQM guidance details the mitigation measures required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

Step 4 – Determine Significant Effects

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

APPENDIX C

WIND ROSE MANCHESTER AIRPORT



APPENDIX D

LIMITATIONS AND ASSUMPTIONS

The assessment of the operational phase of the Proposed Development has adopted the following limitations and assumptions:

- Roads modelling has used traffic data provided by DfT;
- Local monitoring data available for 2027, same as verification year;
- 2024 and 2027 Defra's vehicle emission rates have been assumed to provide a very conservative estimate for baseline and future years of assessment; and
- Local background monitoring has been used for background concentrations.

Worst Case Receptor

Worst case receptors have been assumed, which represent the anticipated location of maximum exposure of air pollutants within the development. Details of the receptors are summarised in Table D1 and Figure D1.

ID	Representative	X	Y	Z
R1	Ground Floor	385210	397378	1.5
R2	Ground Floor	385216	397356	1.5
R3	Ground Floor	385194	397340	1.5
R4	Ground Floor	385190	397367	1.5
R5	First Floor	385210	397378	4.5
R6	First Floor	385216	397356	4.5
R7	First Floor	385194	397340	4.5
R8	First Floor	385190	397367	4.5

Table D1 Modelled Receptor Locations

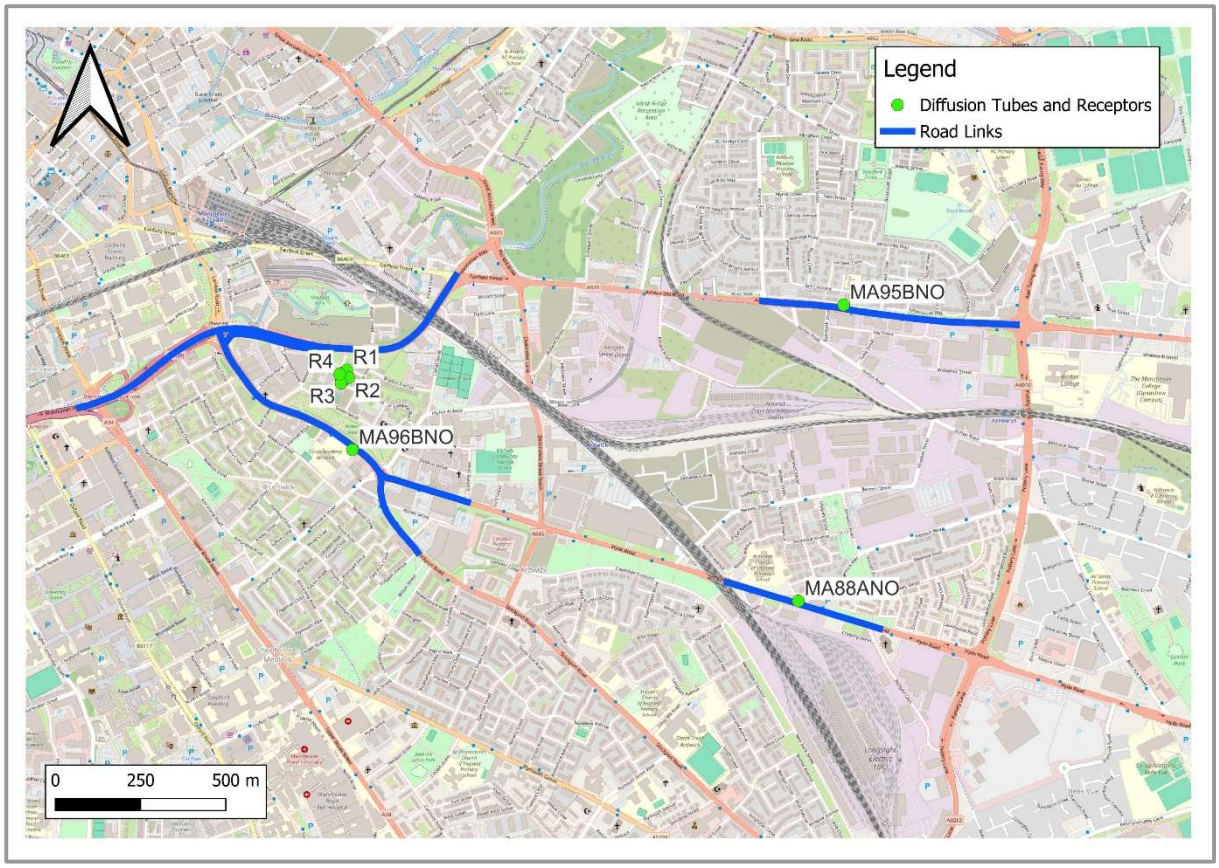


Figure D1 Model Receptors and Road Links

Traffic Data

The traffic data used in the assessment are summarised in Table D2 and Table D3.

Table 2 Traffic Data Used in the Dispersion Modelling Assessment (2024)

ID	Road Name	2024 AADT	2027 AADT	%HDV	Mean Vehicle Speed (km/h)
1	A635	40682	41904	3.1	30
2	A635 Slip	8137	8382	3.1	30
3	A57 (M)	32547	33525	3.1	30
4	A6 Ardwick Green South	22437	23111	8.0	30
5	A57 Hyde Road	20629	21249	3.9	20
6	A635 Ashton Old Road	26467	27262	4.1	20

7	A57 Hyde Road Verification	14060	14483	11.6	30
8	A6 Stockport Road Verification	9795	10089	4.9	30

Verification

An evaluation of model performance has been undertaken to establish confidence in model results. LAQM.TG (22) identifies several statistical procedures that are appropriate to evaluate model performance and assess the uncertainty. The statistical parameters used in this assessment are:

- root mean square error (RMSE);
- fractional bias (FB); and
- correlation coefficient (CC).

A brief explanation of each statistic is provided in Table D4 and further details can be found in LAQM.TG (22) Box 7.21 (Defra, 2022).

Statistical Parameter	Comments	Ideal Value
RMSE	RMSE is used to define the average error or uncertainty of the model. If the RMSE values are higher than 25% of the objective being assessed, it is recommended that the model inputs and verification should be revisited in order to make improvements. For example, if model predictions are of an annual mean NO2 objective of 40µg/m3 and the RMSE is 10µg/m3 or above, it is advised to revisit the model parameters and model verification. Ideally an RMSE within 10% of the air quality objective would be derived, which equates to 4µg/m3 for the annual mean NO2 objective.	0.01
FB	It is used to identify if the model shows a systematic tendency to over or under predict.	0.00

	FB values vary between +2 and -2 and has an ideal value of zero. Negative values suggest a model over-prediction and positive values suggest a model under-prediction.	
CC	It is used to measure the linear relationship between predicted and observed data. A value of zero means no relationship and a value of 1 means absolute relationship. This statistic can be particularly useful when comparing a large number of model and observed data points.	1.00

Table D4 Model Performance Statistics

These parameters estimate how the model results agree or diverge from observations. These calculations have been conducted prior to, and after, model adjustment and provide information on the improvement of the model predictions as a result of the application of the adjustment factor.

The verification process involves a review of the annual mean modelled pollutant concentrations against corresponding monitoring data to determine how closely the air quality model corresponds. The acceptable limits of model verification are set out in LAQM.TG (22). Depending on the outcome it may be considered that there is no need to adjust any of the modelled results (LAQM.TG (22)). Alternatively, the model may not correlate against the monitoring data. There is then a need to check all the input data to ensure that it is reasonable and accurately represented in the air quality modelling process.

Where all input data, such as traffic data, emissions rates, and background concentrations have been checked and considered reasonable, then the model requires adjustment to best align with the monitoring data. This may either be a single adjustment factor to be applied to the modelled concentrations across the study area, or a range of different adjustment factors to account for different zones in the study area e.g., motorways, local roads. Suitable monitoring locations were selected and used in the verification process, considering the site types, position of the diffusion tubes and representation of local air quality environment.

There are three monitoring sites at the study area available for traffic emission verification with suitable data capture and adequate traffic data. The non-adjusted modelled versus monitored NO_2 concentrations at those locations determined as suitable for the verification process are presented in Table D5.

Statistical Parameter	No Adjustment	With Adjustment
Adjustment a	-	2.69
Correlation Co-efficient	0.3	-1.0
RMSE	9.5	5.4
Fractional Bias	0.3	0.2
Within +10%	0	0
Within -10%	0	1
Within +-10%	**0**	**1**
Within +10 to 25%	0	1
Within -10 to 25%	1	1
Within +-10 to 25%	**1**	**2**
Over +25%	**2**	**0**

Table D5 Model Performance Statistics

Site ID	Monitored Total NO_2	Modelled Total NO_2 Before Adjustment	Modelled Total NO_2 After Adjustment
MA96BNO	36.4	23.4	28.6
MA88ANO	31.9	22.7	30.7
MA95BNO	27.3	23.2	32.5

Table D6 Modelled Versus Monitored Total NO_2 µg/m³ (Before and After Adjustment)

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to under predict NO_2 concentrations over the modelled area.

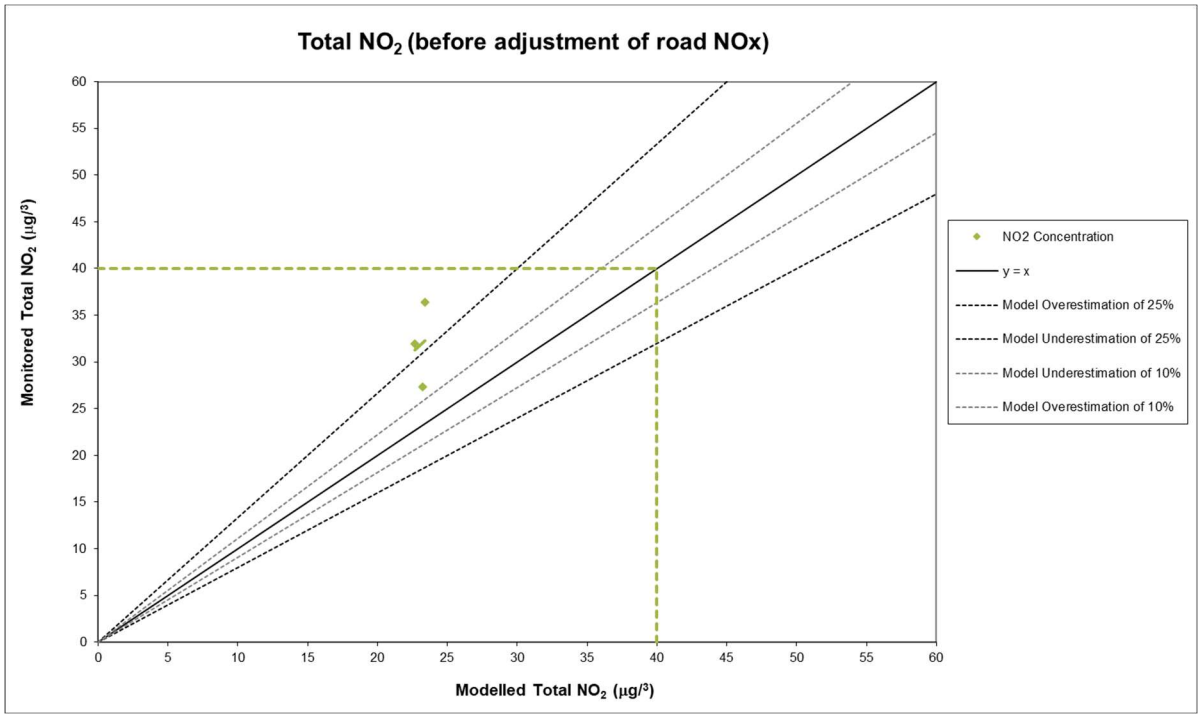


Figure D1 Modelled NO_2 vs Monitoring NO_2 before Adjustment

Model adjustment was undertaken in accordance with DEFRA guidance[23]. Modelled Road NO_x concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor (2.69) to account for the under-prediction of Road NO_x by the model. As shown in **Figure D1**.

[23] Local Air Quality Management (LAQM), Technical Guidance 2022 (LAQM.TG (22)), DEFRA, 2022

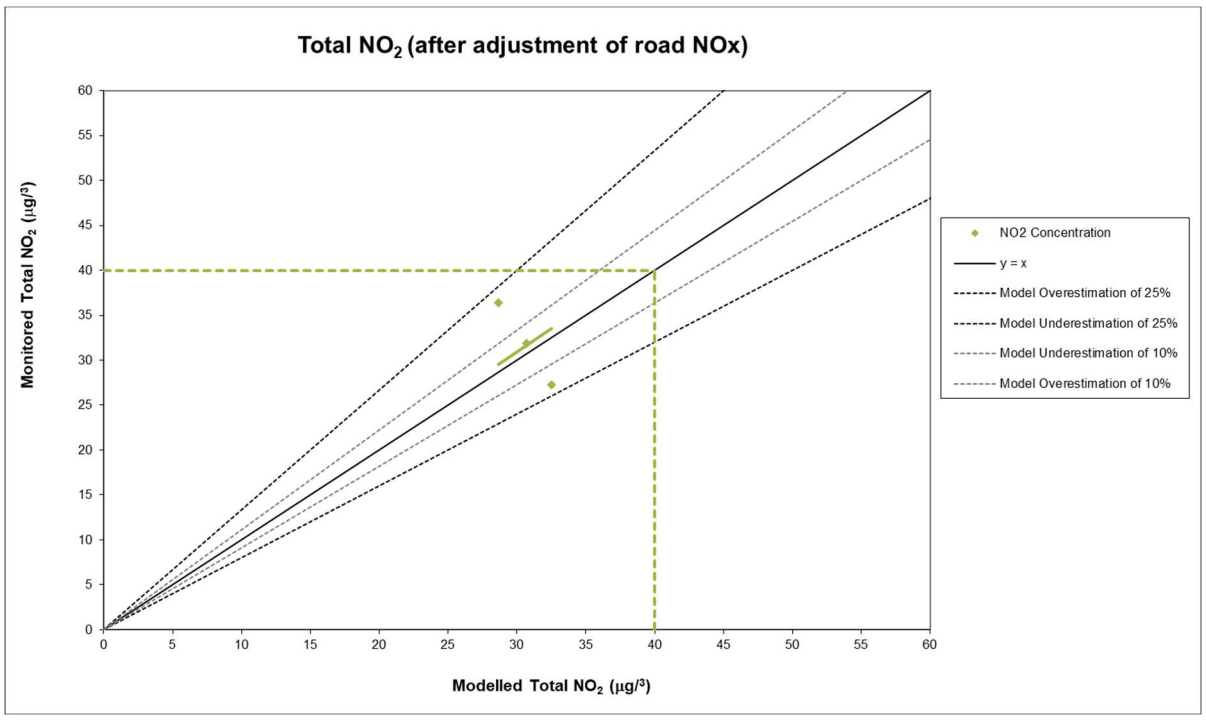


Figure D2 Modelled NO_2 vs Monitoring NO_2 after Adjustment

The model performance statistics show that the uncertainty in the predictions of adjusted total NO_2 was acceptable, as the RMSE reduces to 5.4, which is well below 10 µg/m^3.

AIR QUALITY ASSESSMENT

February 2026

03303 202125

01905 419920

Mill House, Court Farm, Church Lane, Worcester, WR5 2PS

enquiries@hazeenvironmental.com

airquality@hazeenvironmental.com