
MANCHESTER CITY COUNCIL

AIR QUALITY ASSESSMENT

POSTAL STREET, MANCHESTER

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1 INTRODUCTION

1.1.1 By instruction from AtkinsRéalis, on behalf of Manchester City Council (MCC), NoiseAir Limited was commissioned to undertake an Air Quality Assessment (AQA) in support of a proposed residential development at land off Postal Street, Manchester, herein referred to as 'the Site'.

1.1.2 It is understood that the proposals are for the construction of a residential apartment building (Use Class C3a), of 8 storeys (126 apartments); together with ground floor commercial units (Use Class E), cycle parking provision, and other associated works.

1.1.3 Limitations of this report are outlined in **Appendix A**.

1.2 Site Location and Context

1.2.1 The Site is located at land off Postal Street, Manchester, at approximate National Grid Reference (NGR): 384728, 398445.

1.2.2 **Figure 1** details the location of the Site.

1.2.3 The Site is located in Manchester city centre, an area where air quality is mainly influenced by road traffic emissions along the local road network. As such, elevated pollutant concentrations may be experienced at and around this location. Subsequently, the Proposed Development may lead to adverse impacts at nearby sensitive receptors, as a result of fugitive dust emissions during construction and road vehicle exhaust emissions during operation. As such, an AQA has been carried out to determine potential impacts associated with the proposed development in accordance with the requirements of The National Planning Policy Framework (NPPF). The AQA has considered ambient pollutant concentrations, namely nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) around the Site.

1.2.4 The main potential sources of air pollution have been identified as emissions from road transport using the local road and network. There are no significant combustion sources identified within the immediate vicinity of the Site that will influence the local air quality.

1.2.5 The proposals are located within an Air Quality Management Area (AQMA), which has been declared by MCC due to elevated pollution levels. As such, there is the potential for future occupants to be exposed to elevated pollution levels, as well as adverse impacts as a result of the scheme within this sensitive area.

-
- 1.2.6 Currently, the Site is unused and the buildings previously occupying the Site have been demolished. The north to the northeast of the Site is bound by Postal Street, with a residential apartment block situated beyond. The northeast to the south of the Site is bound by Dean Street, whilst a car park operates along this road. The south to the southwest of the Proposed Development is bound by Faraday Street, with entertainment venues beyond. The southwest to the north of the Site is bound by Newton Street, with commercial and office buildings beyond.
- 1.2.7 The report presents the findings of an assessment of the potential air quality impacts of the Proposed Development during the construction and operational phases. For both phases, the significance of potential impacts are identified, and measures that should be employed to minimise these are described.

2 LEGISLATION AND POLICY

2.1 Air Quality Legislation and Policy

2.1.1 A summary of the relevant air quality legislation and policy is provided below.

UK Air Quality Strategy

- 2.1.2 The government's policy on air quality within the UK is set out in the Air Quality Strategy for England (AQS), with the latest framework for Local Authority delivery within England published in 2023¹.
- 2.1.3 The AQS provides a framework for reducing air pollution in England with the aim of meeting the requirements of European Union Legislation, and fulfils the statutory requirement of the Environment Act 1995 as amended by the Environment Act 2021, to publish an Air Quality Strategy setting out air quality standards, objectives, and measures for improving ambient air quality every 5 years. The AQS sets Air Quality Objectives (AQOs) for seven key pollutants to protect human health. These are benzene (C₆H₆), 1,3 butadiene (C₄H₆), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀) and sulphur dioxide (SO₂).
- 2.1.4 The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organization (WHO) with regards to current scientific knowledge and the effects of each pollutant on health and the environment.
- 2.1.5 The AQOs are medium-term policy-based targets set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to EPAQS recommended standards or WHO guideline limits, whereas other involve a margin of tolerance, i.e. a limited number of permitted exceedances of standards over a given period.
- 2.1.6 PM_{2.5} is not currently part of the Local Air Quality Management framework and therefore does not have any associated AQOs. The AQS, however, recognises this, and has set 2 new legally binding PM_{2.5} targets, each with an interim target:
- 10 µg/m³ annual mean concentration PM_{2.5} nationwide by 2040, with an interim target of 12 µg/m³ by January 2028; and

¹ Department for Environment, Food and Rural Affairs (Defra, 2023) Policy paper Air quality strategy: framework for local authority delivery.

- 35% reduction in average population exposure by 2040, with an interim target of a 22% reduction by January 2028, both compared to a 2018 baseline.

2.1.7 **Table 1** presents the AQOs/interim target for pollutants considered within this assessment.

Table 1: National Air Quality Objectives and European Directive Limit Values for the Protection of Human Health			
Pollutant	Applies to	Objective/Interim Target	Measured As
NO ₂	UK	40µg/m ³	Annual mean
	UK	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
PM ₁₀	UK (except Scotland)	40µg/m ³	Annual mean
	UK (except Scotland)	50µg/m ³ not to be exceeded more than 35 times a year	24-hour mean
PM _{2.5}	UK (except Scotland)	Interim target 12µg/m by 2028 Target of 22% reduction in population exposure by 2028 compared to 2018	Annual mean

2.1.8 For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO₂, the short-term standard is for a 1-hour averaging period, whereas for PM₁₀ it is 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.

Air Quality Regulations (2016)

2.1.9 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000² and the Air Quality (England) (Amendment) Regulations 2002³ for the purpose of Local Air Quality Management (LAQM).

2.1.10 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 The Air Quality (England) Regulations 2000 – Statutory Instrument 2000 No.928.

³ The Air Quality (England) (Amendment) Regulations 2002 – Statutory Instrument 2002 No.3043.

- 2.1.11 The Air Quality Standards (Amendment) Regulations 2016⁴ amends the Air Quality Standards Regulations 2010 that transpose the European Union Ambient Air Quality Directive (2008/50/EC) 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 PM₁₀, PM_{2.5} and NO₂. The limit values for NO₂ and PM₁₀ are the same concentration levels as the relevant AQS objectives and the limit value for PM_{2.5} is a concentration of 12µg/m³ to be achieved by 2028.

Environmental Protection Act 1990 – Control of Dust and Particles Associated with Construction

- 2.1.12 Section 79 of the Environmental Protection Act 1990⁵ 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'.

- 2.1.13 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.
- 2.1.14 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.

Environment Act 1995

- 2.1.15 Under Part IV of the Environment Act 1995⁶, local authorities must review 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.

⁴ The Air Quality Standards (Amendment) Regulations 2016 - Statutory Instrument 2016 No. 1184.

⁵ Environmental Protection Act. London 1990. HMSO.

⁶ Environment Act 1995. London HMSO.

Clean Air Strategy (2019)

- 2.1.16 In 2019, the UK government released its Clean Air Strategy 2019⁷, part of its 25 Year Environment Plan⁸. The Strategy sets out the comprehensive action that is considered to be required from across all parts of government and society.
- 2.1.17 The primary focus of air quality management has primarily related to NO₂, and its principal source in the UK, road traffic. The 2019 Strategy aims to broaden the focus to other areas, including actions on clean growth, and emissions from domestic wood burning stoves, industry and agriculture.

2.2 Planning Policy

- 2.2.1 A summary of the national and local planning policy relevant to the Proposed Development and air quality is provided below.

National Planning Policy Framework (2024)

- 2.2.2 The Government's overall planning policies for England are described in the National Planning Policy Framework⁹. 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".

- 2.2.3 The NPFF states that to achieve sustainable development in the planning system, three overarching objectives are required, which are interdependent from one another, and must be pursued in mutually supportive ways:

"a) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

b) a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful

⁷ Department for Environment, Food and Rural Affairs (2019) Clean Air Strategy 2019.

⁸ Department for Environment Food and Rural Affairs (Defra) (2018) A Green Future: Our 25 Year Plan to Improve the Environment.

⁹ Ministry of Housing, Communities & Local Government (2024) National Planning Policy Framework.

and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

*c) **an environmental objective** – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*

2.2.4 In relation to air quality, the following is relevant:

“9. Promoting sustainable transport

Transport issues should be considered from the earliest stages of plan-making and development proposals, using a vision-led approach to identify transport solutions that deliver well-designed, sustainable and popular places. This should involve:

- a) making transport considerations an important part of early engagement with local communities;*
 - b) ensuring patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places;*
 - c) understanding and addressing the potential impacts of development on transport networks;*
 - d) realising opportunities from existing or proposed transport infrastructure, and changing transport technology and usage – for example in relation to the scale, location or density of development that can be accommodated;*
 - e) identifying and pursuing opportunities to promote walking, cycling and public transport use; and*
 - 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.*
- The planning system should actively manage patterns of growth in support of these objectives. 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. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”; and*

“15. Conserving and enhancing the natural environment

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

[...]

Ground conditions and pollution

[...]

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.

[...]

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.”

2.2.5 The AQA has been undertaken in accordance with the NPPF.

2.3 Local Planning Policy

Manchester's Local Development Framework – Core Strategy Development Plan Document

- 2.3.1 The Manchester's Core Strategy¹⁰ was adopted by MCC on 11th July 2012. It is the key document in Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027. It describes Manchester today and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision. The Local Plan is currently under review to pursue a zero-carbon city by 2038 or before.
- 2.3.2 An overview of the Plan identified the following policies of relevance to air quality:

"Policy SP 1

Spatial Principles

The key spatial principles which will guide the strategic development of Manchester to 2027 are: The Regional Centre will be the focus for economic and commercial development, retail, leisure and cultural activity, alongside high quality city living. The growth of Manchester Airport will act as a catalyst for the regional economy, and will also provide the impetus for a second hub of economic activity in this part of the City. Beyond these areas, the emphasis is on the creation of neighbourhoods of choice, providing high quality and diverse housing around district centres which meet local needs, all in a distinct environment. The majority of new residential development in these neighbourhoods will be in the Inner Areas, defined by the North Manchester, East Manchester and Central Manchester Regeneration Areas.

[...]

Policy EN 16

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

¹⁰ Manchester City Council (2012) Manchester's Local Development Framework – Core Strategy Development Plan Document [Online] Available at: https://www.manchester.gov.uk/downloads/download/5672/core_strategy [Accessed 28/01/2025].

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.

[...]

Policy DM 1

Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

- *Appropriate siting, layout, scale, form, massing, materials and detail.*
- *Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development. Development should have regard to the character of the surrounding area.*
- *Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.*
- *Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes.*
- *Community safety and crime prevention.*
- *Design for health.*
- *Adequacy of internal accommodation and external amenity space.*
- *Refuse storage and collection.”*

Greater Manchester Clean Air Plan

- 2.3.3 Currently proposed for Greater Manchester, is a Clean Air Plan, which would replace the originally proposed clean air zone.

- 2.3.4 Greater Manchester is under direction from government to meet legal limits for NO₂ on local roads in the shortest possible time and by 2026 at the latest. By introducing the Clean Air Plan, it is proposed that legal limits for NO₂ could be met by 2026 at the latest through:

“£51.1m investment in 40 new zero-emission electric buses, EV charging infrastructure at bus depots, and upgrading 77 buses to be Euro VI (clean air compliant). Local control of bus services through the Bee Network allows us to run zero-emission electric and clean air compliant buses in areas where nitrogen dioxide exceeds legal limits.

£30.5m Clean Taxi Fund: To provide financial support to help every eligible hackney carriage and private hire vehicle licensed with a Greater Manchester authority by 1 October 2024 to upgrade to a cleaner vehicle and meet a new minimum emission standard by 31 December 2025. Funding would also be available to help owners of GM-licensed hackneys who meet the minimum emission standard upgrade to a zero emissions capable vehicle.

£5m investment in local traffic measures: To manage traffic flow on roads in Manchester and Salford. This will bring nitrogen dioxide within legal limits on Regent Road and Quay Street.”

- 2.3.5 Greater Manchester’s Air Quality Administration Committee has approved the updated Clean Air Plan proposals. The proposals will now be submitted to the government’s Joint Air Quality Unit; government will then decide what the final Clean Air Plan includes.

2.4 Guidance

National Planning Guidance

- 2.4.1 A summary of the publications referred to in undertaking this assessment is provided below.

Local Air Quality Management Review and Assessment Technical Guidance (2022)

- 2.4.2 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their review and assessment work. This guidance, referred to in this document as LAQM.TG22¹¹, has been used where appropriate in the assessment presented herein.

¹¹ Department for Environment, Food and Rural Affairs (Defra) (2022) Part IV The Environment Act 1995 as amended by the Environment Act 2021 Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG22.

Land-Use Planning & Development Control: Planning for Air Quality (2017)

- 2.4.3 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance¹² 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.

Guidance on the Assessment of Dust from Demolition and Construction (2024)

- 2.4.4 This document¹³ published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

National Planning Practice Guidance – Air Quality (2019)

- 2.4.5 This guidance¹⁴ provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, it explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account 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.

¹² Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017) Land Use Planning & Development Control: Planning for Air Quality.

¹³ Institute of Air Quality Management (2024) Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (January 2024).

¹⁴ Department of Communities and Local Government (DCLG) (Updated November 2019) National Planning Practice Guidance.

3 SCOPE AND METHODOLOGY

3.1 Scope

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

- A review of the plans of the Proposed Development;
- A review of the information provided by SK Transport Planning Ltd, the appointed Transport Consultant;
- Desktop study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality; and
- Review of Greater Manchester Combined Authority's (GMCA's) latest available Air Quality Annual Status Report (ASR)¹⁵, the GMCA Clean Air Data Hub¹⁶, air quality data surrounding the Site including data from Defra¹⁷.

3.1.2 The scope of the assessment includes consideration of the potential impact on local air quality resulting from:

- Dust and particle matter generated by on-site activities during the construction phase;
- Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant; and
- Increases in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational.

3.2 Construction Phase Assessment

3.2.1 Dust comprises particles typically in the size range of 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore is unlikely to cause long term or wide-spread changes to air quality; however, it's deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

¹⁵ Greater Manchester Combined Authority (2024) 2023 Air Quality Annual Status Report (ASR).

¹⁶ Greater Manchester Combined Authority (2024) Clean Air Greater Manchester Data Hub [Online] Available at <https://cleanairm.com/data-hub/diffusion-tubes#map> [Accessed 22/01/2025].

¹⁷ Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management (LAQM) Support Pages.

- 3.2.2 The smaller particles of dust are known as particulate matter, with less than 10µm in aerodynamic diameter (PM₁₀) representing only a small proportion of total dust released; this includes a finer fraction, known as PM_{2.5} (with an aerodynamic diameter less than 2.5µm). As these particles are at the smaller end of the size range of dust particles, they remain suspended in the atmosphere for a longer period of time than the larger dust particles, they can therefore be transported by wind over a wider area. PM₁₀ and PM_{2.5} are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health. However, it is worth noting that, according to the IAQM guidance, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. PM_{2.5-10}) with just 10-15% expected to comprise PM_{2.5}. The IAQM guidance therefore focusses on PM₁₀ for the purposes of assessment.
- 3.2.3 An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM₁₀ during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Development provided by the Client and Project Team; and the professional judgement of the NoiseAir team.
- 3.2.4 The IAQM methodology assesses the risk of potential dust and PM₁₀ impacts from the following four sources: demolition, earthworks, construction and trackout. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in PM₁₀ levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix C**.
- 3.2.5 In addition to the 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. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and considering the following:
- The number and type of construction traffic and plant likely to be generated by this phase of the 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.

3.3 Operational Phase Assessment

Impacts of the Local Area on the Development

- 3.3.1 The Proposed Development has the potential to expose future users to existing air quality issues. In accordance with the EPUK and IAQM guidance, there may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the Proposed Development itself. The Proposed Development is located within an AQMA and is situated along a busy road in Manchester city centre; therefore, it falls within the scope for an exposure assessment to be undertaken in accordance with the EPUK and IAQM guidance.
- 3.3.2 Of the pollutants included in the AQS, concentrations of NO₂, PM₁₀ and PM_{2.5} have been considered in this assessment as road traffic is a major source of these pollutants, and their concentrations often approach or exceed the relevant objectives, especially in urban areas.
- 3.3.3 To predict pollutant concentrations across the Site, the atmospheric dispersion model ADMS-Roads has been used. This model uses detailed information regarding traffic flows on the local road network, surface roughness and local meteorological conditions to predict pollutant concentrations. Details of the model input parameters are presented in **Appendix D**.

Meteorological Data

- 3.3.4 Meteorological data, such as wind speed and direction are used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in the assessment was taken from the Manchester Meteorological Recording Station over the period 1st January 2023 to 31st December 2023. The meteorological station is located at NGR: 384736, 398461, at approximately 14.6 km southwest of the Site. This station is considered to provide representative data for the assessment. The wind rose generated from the meteorological data used for the dispersion modelling of operational phase impacts is provided in **Appendix E**.

Traffic Data

Traffic Flows

- 3.3.5 The traffic data used in the assessment, comprising 24-hour AADT flows and fleet composition for the local road network for the 2023 base year comprises data from traffic surveys carried out by SK Transport Planning Ltd and from the Department for Transport (DfT) traffic count data¹⁸. Traffic speeds were reduced at traffic lights and junctions in line with guidance provided in LAQM.TG22 and using professional judgement.
- 3.3.6 The 2027 opening year 'with development' traffic data was provided by SK Transport Planning Ltd. This dataset comprises 24-hour AADT flows and was calculated by projecting the 2023 base year data to the opening year of 2027, using factors from TEMPRO. This software package has been developed by the DfT to calculate future traffic growth throughout the UK. Development generated flows were also incorporated into the 2027 opening year 'with development' scenario.
- 3.3.7 Reference should be made to **Figure 2** for a graphical representation of the modelled road links.
- 3.3.8 A summary of the traffic data and pollutant emission factors used in the assessment can be found in **Appendix D**.

Vehicle Emission Factors

- 3.3.9 Emission factors for each link were calculated using the relevant traffic flows and the Emission Factor Toolkit¹⁹ (EFT, Version 12.1). This has been produced by Defra and incorporates COPERT 5.6 vehicle emission factors and fleet information.

Street Canyons

- 3.3.10 Street canyons in air quality modelling are roads with continuous high buildings on either side. This arrangement tends to impede the dispersion of pollutants from the road, particularly when the wind is at right angles to it, since a vortex is created in the street canyon, retaining the pollution.

¹⁸ Department for Transport (DfT) (2023) Road traffic statistics [Online]. Available <https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints> [Accessed 21/01/2025].

¹⁹ Department for Environment, Food and Rural Affairs (Defra) Emissions Factor Toolkit [Online] Available at <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/> [Accessed on 21/01/2025].

- 3.3.11 Due to the location of the Proposed Development (i.e. in Manchester city centre), a number of street canyons have been included in the model.

Selection of Receptor Locations

- 3.3.12 A total of nine receptor locations were included in the model. Although commercial uses are proposed for the ground floor, three locations at the proposed façade were modelled at ground floor level, in order to predict the worst-case concentrations within the Site boundary. Receptors were included at a height of 1.5m at ground floor level and at increments of 3m between floors. A total of 3 floors were included in the model, at 3 separate locations along the boundary façade. Although the proposals include additional floors, it is considered that the selected receptor locations represent worst-case air quality conditions, as pollutant concentrations will be higher at lower floors, prior to the dispersion of roadside emissions.
- 3.3.13 Details of the proposed sensitive receptors modelled in the assessment are included in **Table 2**, below.

Table 2: Modelled Receptor Locations			
Receptor ID	Location		
	X (m)	Y (m)	Z (m)
R1-1	384730	398470	1.5
R1-2	384730	398470	4.5
R1-3	384730	398470	7.5
R2-1	384716	398454	1.5
R2-2	384716	398454	4.5
R2-3	384716	398454	7.5
R3-1	384701	398436	1.5
R3-2	384701	398436	4.5
R3-3	384701	398436	7.5

Selection of Background Concentrations

- 3.3.14 Background pollutant data for the operational phase assessment have been taken from the national maps provided on the Defra²⁰ website, where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1 km for the

²⁰ Department for Environment, Food and Rural Affairs (Defra) Background Concentrations 2021 [Online] Available at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021> [Accessed on 21/01/2025].

whole of the UK. Estimated background concentrations all available for all years between 2021 and 2040. The maps assume that background concentrations will improve (i.e., reduce) overtime, in line with the predicted reduction in vehicle emissions, and emissions from other sources.

Model Verification and Result Processing

- 3.3.15 The ADMS-Roads dispersion model, widely utilised for this type of assessment, is considered to be fit for purpose. Nonetheless, model validation undertaken by the software developer will not have included validation in the vicinity of the Proposed Development.
- 3.3.16 To determine the performance of the model at a local level, a comparison of modelled results and monitoring results carried out within the study area was undertaken. This verification process aims to minimise modelling uncertainty and systematic error by applying adjustment factors to the model's results to increase confidence in the final results. This approach adheres to the methodology specified in Chapter 7, Section 4 of LAQM.TG22. Details of the verification factor calculations are presented in **Appendix D**.
- 3.3.17 Four air quality monitoring locations were identified as suitable for use in the model verification process:
- MAN-F3;
 - MAN-M1;
 - MAN-M2; and
 - MAN-M3.
- 3.3.18 In the absence of local PM₁₀ and PM_{2.5} monitoring data being available for verification, and following the methodology outlined in LAQM.TG22, a road oxides of nitrogen (NO_x) adjustment factor was applied to the modelled road PM₁₀ and PM_{2.5} components prior to adding the appropriate background concentrations.
- 3.3.19 The calculated verification adjustment factor of **3.8803** was applied to modelled road NO_x, PM₁₀ and PM_{2.5} concentrations, in order to improve the model performance.
- 3.3.20 The road-NO_x output was converted to annual mean NO₂ concentrations utilising Defra's NO_x to NO₂ calculator (version 9.1)²¹. The predicted concentrations were compared against the relevant AQS objective levels for each pollutant set out in **Table 1**.

²¹ Department for Environment, Food and Rural Affairs (Defra) NO_x to NO₂ Calculator [Online] Available at <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/> [Accessed on 24/01/2024].

- 3.3.21 The air quality modelling generates pollutant estimates of road source contributed NO_x, PM₁₀ and PM_{2.5} at specified receptors. To permit comparison with the relevant air quality objectives for NO₂, PM₁₀ and PM_{2.5} it has been necessary to combine the model output data with the background concentrations.
- 3.3.22 To consider compliance with the 1-hour mean air quality objective for NO₂, Defra's guidance suggests that in locations where the annual mean NO₂ concentration exceeds 60 µg/m³, then the 1-hour mean objective may be exceeded. Where annual mean concentrations are less than 60 µg/m³, then exceedance of the 1-hour mean objective is considered unlikely. The risk of non-compliance with the 1-hour mean objective, where up to 18 exceedances of a 1-hour mean concentration of 200 µg/m³ are allowed in a calendar year, is therefore considered likely when the annual mean concentration is greater than 60µg/m³ but unlikely when is not. This approach has been adopted in this assessment.
- 3.3.23 To consider compliance with the 24-hour mean air quality objective for PM₁₀, Defra's guidance gives the following equation that relates the annual mean concentration to the number of exceedances of the 24-hour mean concentration of 50 µg/m³, where up to 35 exceedances are allowed:
- No.24-hour mean exceedances = $-18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$.
- 3.3.24 This approach has been adopted for 24-hour mean PM₁₀ concentrations for this assessment.

Impacts of the Development on the Local Area

- 3.3.25 The operational phase of the Proposed Development has the potential to impact air quality at existing sensitive receptors.
- 3.3.26 The EPUK and IAQM guidance sets out two stages for determining when an assessment of potential impacts on the local area is likely to be necessary. The Stage 1 criteria for an air quality assessment is presented below:
- A. If any of the following apply:
- 10 or more residential units or a site area of more than 0.5ha; or
 - More than 1,000 m² of floor space for all other uses or a site area greater than 1ha.
- B. 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.

3.3.27 Should these criteria not be met, then the EPUK and IAQM guidance considers air quality impacts associated with a scheme to be negligible and no further assessment is required. Should the criteria be met or exceeded, proceed to Stage 2. Stage 2 of the EPUK & IAQM guidance document states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Light Duty Vehicle (LDV) flows of more than 100 AADT within or adjacent to an AQMA or more than 500 elsewhere.
- Proposals that will cause a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 elsewhere.
- Proposals that would realign roads within an AQMA by more than 5m;
- Proposals that will introduce new junctions or remove existing junctions near relevant receptors.
- Proposals that will introduce or change a bus station or change flows of buses by more than 25 AADT within an AQMA or more than 100 AADT elsewhere.
- Proposals which will include an underground car park with extraction system which will be within 20m of a relevant receptor and have more than 100 movements per day.
- Proposals which include either a centralised plant using biofuel, a combustion plant with single or thermal input >300KWh or a standby emergency generator associated with a centralised energy centre; and,
- Proposals which include combustion processes of any size.

3.3.28 Should these criteria not be met, then the EPUK and IAQM guidance documents consider air quality impacts associated with a scheme to be not significant and no further assessment being required.

3.3.29 Should screening of the traffic data indicate that any of the above criteria are met, then potential impacts at sensitive receptor locations can be assessed by calculating the predicted change in pollutant concentrations as a result of the Proposed Development.

3.3.30 The significance of predicted impacts can then be determined in accordance with the methodology outlined in the EPUK and IAQM guidance.

4 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the Site have been determined to provide a baseline for assessment. These are detailed in the following Sections.

4.2 Local Air Quality Management

4.2.1 As required by the Environment Act (1995), GMCA undertake review and assessment of air quality within the 10 Greater Manchester local authorities that form GMCA, including MCC.

4.2.2 GMCA has declared a single AQMA across the district, Greater Manchester AQMA, which was declared in 2016 for exceedances of the NO₂ annual mean. The Site lies entirely within this AQMA.

4.3 Air Quality Monitoring

4.3.1 The 2023 GMCA ASR and GMCA Clean Air Hub have been reviewed. Monitoring of pollutant concentrations is undertaken by GMCA across the 10 Greater Manchester areas, including MCC.

4.3.2 Annual mean NO₂ concentrations recorded by local monitoring stations within the vicinity of the Site are outlined in **Table 3** and shown on **Figure 2**.

Table 3: MCC (as part of GMCA Monitoring) Annual Mean NO ₂ Concentrations in the Vicinity of the Site								
Site ID	Site Type	In AQMA?	Distance to Kerb of Nearest Road (m)	Distance to the Site (m)	Monitored NO ₂ Concentration (µg/m ³)			
					2020	2021	2022	2023
MAN-F3	Roadside DT	Yes	3.2	115	29.5	31.6	31.2	30.4
MAN-M1	Roadside DT	Yes	2.3	155	36.4	43	51.4	44.1
MAN-M2	Roadside DT	Yes	1.4	130	44.2	46.6	50.9	49.3
MAN-M3	Roadside DT	Yes	1.1	125	35.1	40	43	39.5
DT= Diffusion Tube Rounded to one decimal point Bold concentrations indicate exceedances of the annual mean NO ₂ AQO								

4.3.3 As shown in **Table 3**, the closest monitoring location to the Site, MAN-F3, has been consistently below the NO₂ annual mean AQO of 40 µg/m³ since at least 2020. However, there have been exceedances of the NO₂ annual mean AQO at three roadside monitoring locations in the vicinity of the Site; MAN-M1, MAN-M2 and MAN-M3. All three of these

monitoring locations are situated along the A665 Great Ancoats Street, which forms part of Manchester city centre's inner ring road. Therefore, it would be expected that pollutant concentrations at these locations would be elevated, in comparison to on-site.

4.4 Background Pollutant Concentrations

- 4.4.1 Predictions of background pollutant concentrations on a 1 km-by-1 km basis have been produced by DEFRA for the entire UK to assist local authorities in their review and assessment of air quality. The Site is located in grid square **384500, 398500**. Data for this location was downloaded from the DEFRA website for 2023 (i.e. the Base Year) and 2027 (i.e. the Opening Year), which is summarised in **Table 4**.

Table 4: Predicted Background Pollutant Concentrations						
OS Grid Reference (X, Y; m)	Predicted Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)					
	2023 Base Year			2027 Opening Year		
	NO ₂	PM ₁₀	PM _{2.5}	NO ₂	PM ₁₀	PM _{2.5}
384500, 398500	23.1	14.4	8.1	20	14.2	7.8
Rounded to one decimal point						

- 4.4.2 As shown in **Table 4**, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs/interim target across the assessment extents for both 2023 and 2027.

5 ASSESSMENT

5.1 Introduction

- 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

- 5.2.1 Construction activities have the potential to generate and/or re-suspend dust and PM₁₀ sources include:
- Site clearance and preparation including demolition activities;
 - Preparation of temporary access/egress to the Site and haulage routes;
 - Earthworks;
 - Materials handling, storage, stockpiling, spillage and disposal;
 - Movement of vehicles and construction traffic within the Site (including excavators and dumper trucks);
 - Use of crushing and screening equipment/plant;
 - Exhaust emissions from plant, especially when used at the extremes of their capacity and during mechanical breakdown;
 - Construction of buildings, roads and areas of hard standing alongside fabrication processes;
 - Internal and external finishing and refurbishment;
 - Trackout, whereby earth is carried from the Site on vehicle tyres, deposited on roads and may later become suspended in the air as a result of vehicle movements; and
 - Site landscaping after completion.
- 5.2.2 Most of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g., exposed soil produced from significant earthworks 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 has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

5.2.4 The findings of the assessment are presented below.

Demolition

5.2.5 All buildings that were previously on the Site have been demolished. Therefore, consideration of demolition has been scoped out of the construction phase assessment.

Earthworks

5.2.6 The entire Site area is approximately 2,000m²; therefore, the potential dust emission magnitude from earthworks activities is considered to be **small**.

Construction

5.2.7 The total building volume to be constructed is assumed to be 12,000m³-75,000m³, and there will be potentially dusty construction material (i.e. concrete). As such, the potential dust emission magnitude from construction activities is considered to be **medium**.

Trackout

5.2.8 Information on the number of HDVs associated with this phase of the Proposed Development is currently unavailable and professional judgement has been used. Given the size of the development, it is possible that there could be 20-50 HDV outward movements could be carried out in any one day. As such, the potential dust emission magnitude from trackout activities is considered to be **medium**.

5.2.9 **Table 5** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5: Potential Dust Emission Magnitude	
Activity	Dust Emission Magnitude
Demolition	-
Earthworks	Small
Construction Activities	Medium
Trackout	Medium

Assessment of Sensitivity of the Study Area

- 5.2.10 The prevailing wind direction is predominantly from the southwest. Therefore, receptors located to the northeast of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.
- 5.2.11 Under lower wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. Receptors northeast of the Site are expected to be affected the most as a result of the prevailing wind direction.
- 5.2.12 The closest ecological receptor to the Site is the Rochdale Canal Site of Special Scientific Interest (SSSI)/Special Area of Conservation (SAC), which is 4.9 km northeast. Therefore, there are no ecological receptors within 50m of the development boundary or access route, or within 50m of the Site entrance as identified using Multi Agency Geographic Information for the Countryside (MAGIC) website²².
- 5.2.13 Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 6**.

Table 6: Sensitivity of the Study Area				
Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	-	High	High	High
Human Health	-	Medium	Medium	Medium

²² Department for Environment, Food and Rural Affairs (Defra) (2022) Multi-Agency Geographic Information for the Countryside (MAGIC) [Online] Available at <https://magic.defra.gov.uk/> [Accessed on 21/01/2024].

Risk of Impacts

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

Table 7: Summary Dust Risk Table Defining Site Specific Mitigation				
Potential Impact	Dust Risk to the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	-	Low risk	Medium risk	Medium risk
Human Health	-	Low risk	Medium risk	Medium risk

Construction Vehicles and Plant

- 5.2.15 The greatest impact on air quality is emissions from vehicles and plant associated with the construction phase, and these impacts will be in the areas immediately adjacent to the Site access road. Construction traffic will access the Site via the local road network. Due to the size of the Site, it is considered likely that the construction traffic will be low in comparison to the existing traffic flows on these roads.
- 5.2.16 Final details of the exact plant and equipment likely to be used on-site will be determined by the appointed contractor. The number of plant and their location within the Site are likely to be variable over the construction.
- 5.2.17 Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are considered to being **negligible** in accordance with the assessment significance criteria.

5.3 Operational Phase Assessment

Impacts of the Local Area on the Development

- 5.3.1 The Proposed Development is located within an AQMA and includes land use sensitive to long term and short-term pollutant concentrations. To assess the Site's suitability for its intended residential use, an assessment was undertaken using dispersion modelling to predict pollutant concentrations at the façade of the Site, once the Site becomes operational.

- 5.3.2 Full results of the dispersion modelling are presented in **Appendix F**, with a summary of the modelled 2027 Opening Year 'with development' scenario provided below. All results have been verified in accordance with the methodology outlined in **Appendix D**.

Nitrogen Dioxide – Annual Mean

- 5.3.3 Annual mean NO₂ concentrations were predicted to be below the AQO of 40 µg/m³ at all receptor locations included in the modelled 2027 opening year 'with development' scenario. The highest concentration is predicted at receptor R3-1 with a concentration of 27.4 µg/m³.
- 5.3.4 As the highest modelled NO₂ concentration is below the AQO, the Site is deemed suitable for residential use, based on the extent of predicted population exposure to annual mean NO₂ concentrations in accordance with the EPUK and IAQM guidance.

Nitrogen Dioxide – 1-hour Mean

- 5.3.5 The annual mean NO₂ concentrations predicted by the model were all below 60 µg/m³, and therefore, hourly mean NO₂ concentrations are unlikely to cause a breach of the AQS objective. As such, the Site is deemed suitable for residential use, based on the extent of predicted population exposure to hourly mean NO₂ concentrations in accordance with the EPUK and IAQM guidance.

Particulate Matter (PM₁₀) – Annual Mean

- 5.3.6 Annual mean PM₁₀ concentrations were predicted to be below the AQO of 40 µg/m³ at all receptor locations included in the modelled 2027 opening year 'with development' scenario. The highest concentrations are predicted at receptors R1-1 and R2-1 with concentrations of 16.4 µg/m³.
- 5.3.7 As the highest modelled PM₁₀ concentrations are below the AQO, the Site is deemed suitable for residential use, based on the extent of predicted population exposure to annual mean PM₁₀ concentrations in accordance with the EPUK and IAQM guidance.

Particulate Matter (PM₁₀) – 24-hour Mean

- 5.3.8 The calculation outlined in paragraph 3.4.20 has been carried out for the receptors with the highest predicted annual mean PM₁₀ concentrations, i.e. R1-1 and R2-1.
- 5.3.9 The estimated number of exceedances at these locations is well below the **35-exceedance limit**, indicating compliance with the 24-hour PM₁₀ objective. Therefore, the 24-hour mean objective is not expected to be breached at any modelled receptor location once the

Proposed Development becomes operational. As such, the impacts of the 24-hour mean PM₁₀ on proposed receptor locations are **negligible** and the Site is deemed suitable for residential use, based on the extent of predicted population exposure to 24-hour mean PM₁₀ concentrations in accordance with the EPUK and IAQM guidance.

Particulate Matter (PM_{2.5}) – Annual Mean

- 5.3.10 Annual mean PM_{2.5} concentrations were predicted to be below the interim target of 12 µg/m³ at all receptor locations included in the modelled 2027 opening year ‘with development’ scenario. The highest predicted concentration is at receptor R1-3, with a concentration of 9.1 µg/m³.
- 5.3.11 As the highest modelled PM_{2.5} concentration is predicted to be below the interim target to be achieved by 2028, in the modelled 2027 Opening Year ‘with development’ scenario, PM_{2.5} concentrations can be deemed to be acceptable across the Proposed Development extents. Therefore, the Site is deemed suitable for residential use, based on the extent of predicted population exposure to annual mean PM_{2.5} concentrations in accordance with the EPUK and IAQM guidance.

Potential Development Impacts

- 5.3.12 Any vehicle movements associated with the Proposed Development will generate exhaust emissions on the local and regional road networks.
- 5.3.13 It is understood that the proposals are for the construction of a residential apartment building (Use Class C3a), of 8 storeys (126 apartments); together with ground floor commercial units (Use Class E), cycle parking provision, and other associated works.
- 5.3.14 As the criteria in Stage 1 of the IAQM/EPUK criteria has been met, it is deemed appropriate to consider the Stage 2 criteria.
- 5.3.15 Regarding the trip generation associated with the Proposed Development, SK Transport Planning Ltd, has stated the following:

“The development will be car free and so will only attract vehicle trips associated with servicing and taxis drop-offs, etc. The servicing trips will be a mix of modes, including cars, light goods vehicles, large goods vehicles and motorcycles. Based on this we are forecasting a total AADT of 56, of which 2 will be HDVs.”

-
- 5.3.16 Based on this information, the Proposed Development does not meet any of the Stage 2 criteria. According to EPUK and IAQM guidance, off-site air quality impacts associated with the scheme are considered to be **negligible** and, therefore, no further assessment is deemed necessary.

6 MITIGATION AND RESIDUAL EFFECTS

6.1 Construction Phase

- 6.1.1 Based on the construction phase assessment results, mitigation will be required for this phase. As the Site poses a maximum of **medium risk** for dust impacts, the IAQM's highly recommended mitigation measures for a **medium risk** site are presented below.

Communications:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), to be included in a future detailed Construction Environmental Management Plan (CEMP), 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 PM₁₀ continuous monitoring and/or visual inspections.

Site Management

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

Monitoring

- 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.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

- Agree dust deposition, dust flux, or real-time PM₁₀ 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.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating/Vehicle Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust /particle matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires or burning of waste materials.

Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Trackout

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

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

Residual Effects

- 6.1.3 The residual effects of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above and good Site practice is considered to be **not significant**.
- 6.1.4 The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **not significant**.

6.2 Operational Phase

- 6.2.1 The impact of the operational phase of the Proposed Development has been found to **be not significant**, in accordance with the EPUK and IAQM guidance, therefore, no mitigation measures are proposed.

Residual Effects

- 6.2.2 The residual effects of the operational phase Proposed Development are **not significant** for NO₂, PM₁₀ and PM_{2.5}, in accordance with EPUK and IAQM guidance.

7 SUMMARY AND CONCLUSIONS

- 7.1.1 NoiseAir Limited was commissioned to undertake an AQA in support of a proposed residential development on land off Postal Street, Manchester.
- 7.1.2 A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a maximum of **medium risk** of dust soiling impacts and a **medium risk** of increases in particulate matter concentrations due to unmitigated construction activities for human health. However, through good site practice and the implementation of highly recommended mitigation measures, the effect of dust and particulate matter releases would be significantly reduced. The residual effects of dust and particulate matter generated by construction activities on air quality are therefore considered to be **not significant**.
- 7.1.1 The Site lies within Greater Manchester AQMA, an area where air quality is mainly influenced by emissions associated with road traffic along the existing road network. Therefore, dispersion modelling was carried out to establish future air quality conditions for residents of the Proposed Development. Pollutants considered in this assessment were NO₂, PM₁₀ and PM_{2.5}.
- 7.1.2 The results indicate that pollutant concentrations across the Site are expected to be below the relevant AQOs/interim target for all pollutants considered. The residual effect of air quality on future occupiers of the Proposed Development is judged to be **not significant**.
- 7.1.3 In accordance with the IAQM and EPUK guidance, the Proposed Development is expected to result in a **negligible** air quality impact at nearby existing receptors. The residual effect of the Proposed Development is considered to be **not significant**.
- 7.1.4 It is considered that the Proposed Development complies with national and local policy for air quality and as such, the Site is suitable for the proposed use from an air quality perspective.

FIGURES

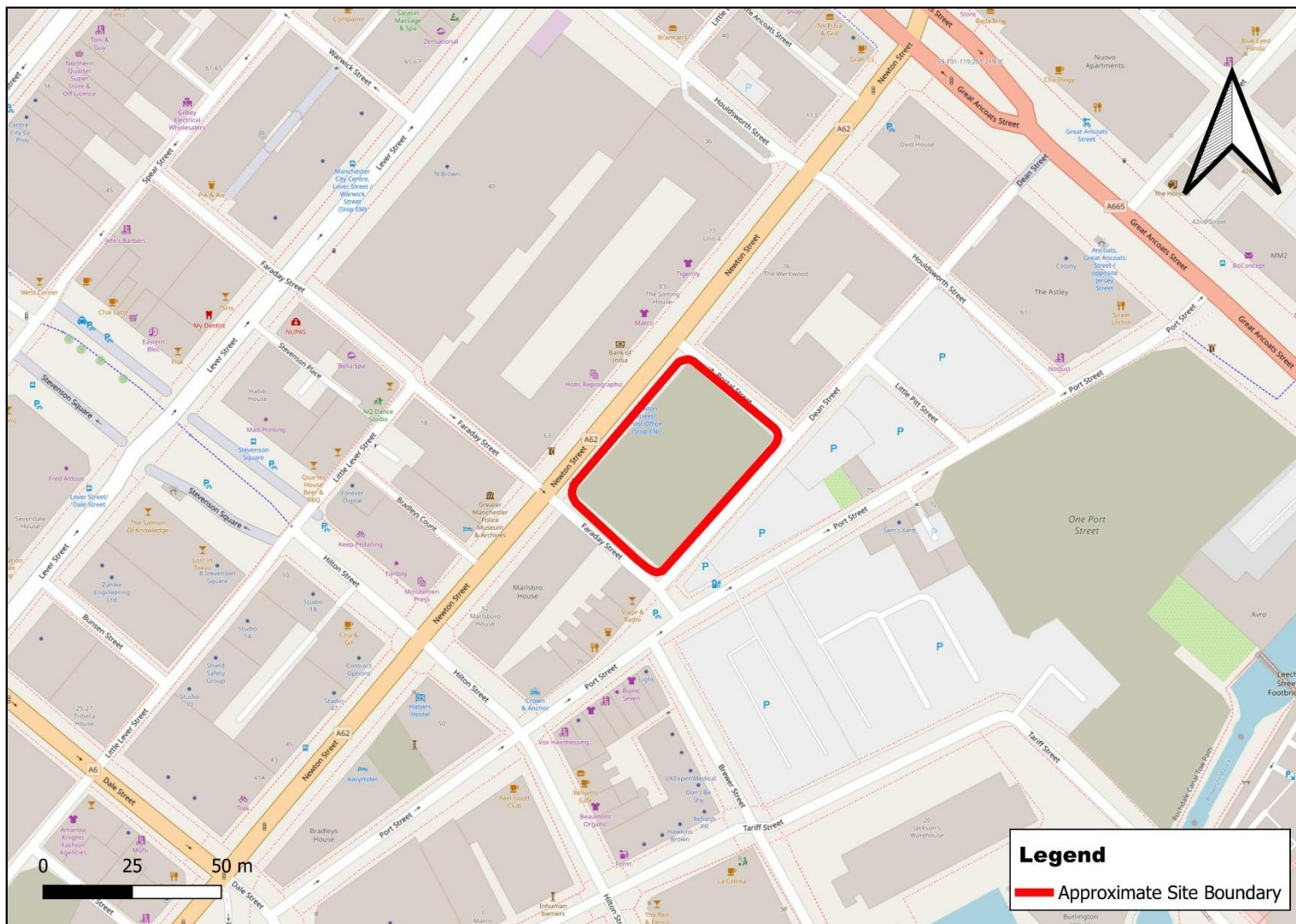


Figure 1 Site Location

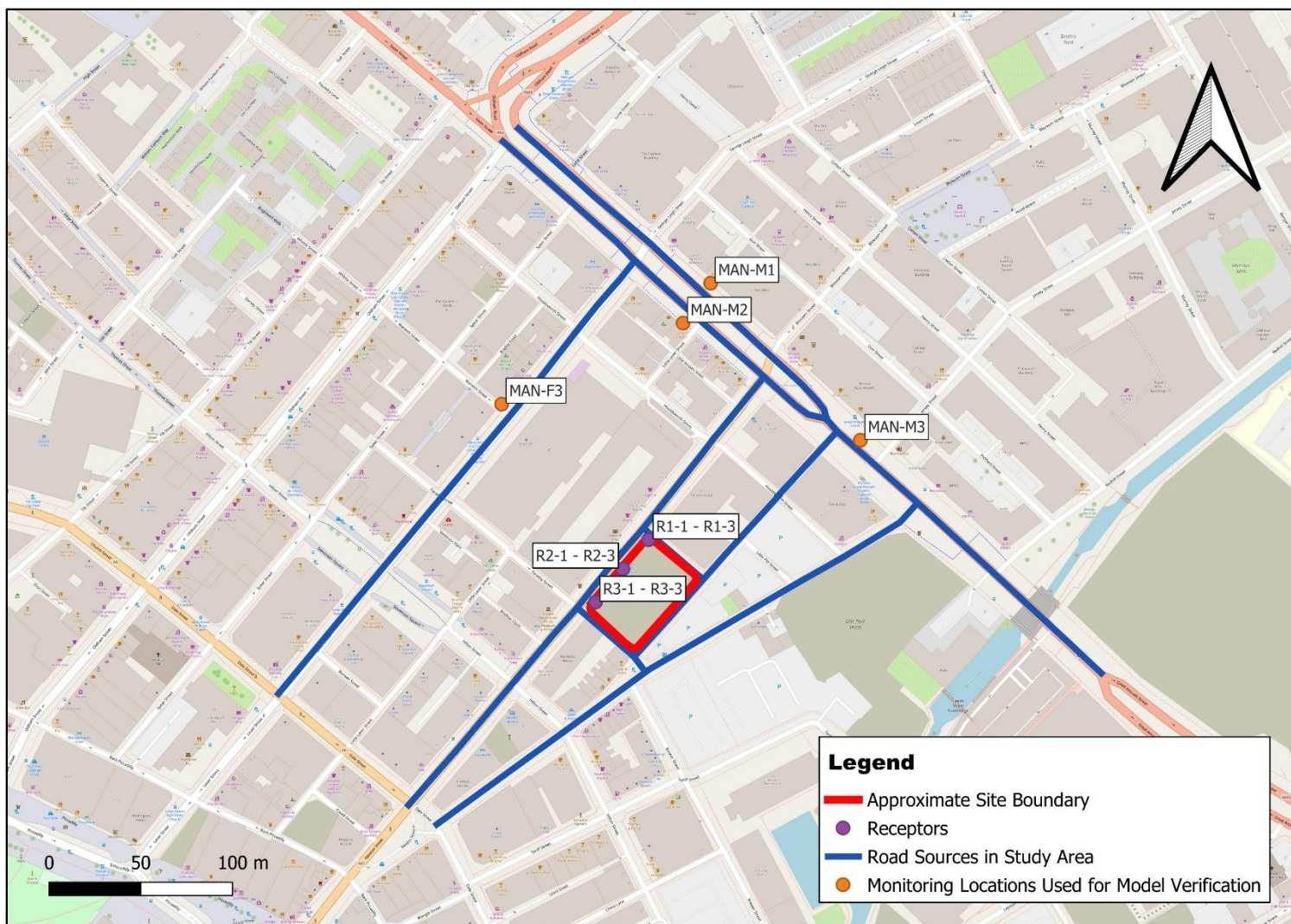


Figure 2 Roads, Receptors and Monitoring Locations Used for Model Verification

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Manchester City Council and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care, and diligence in the performance of the services required by Manchester City Council and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

This report has been prepared by NoiseAir Limited. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise.

The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from who it has been requested and that such information is accurate. Information obtained by NoiseAir Limited has not been independently verified by NoiseAir Limited unless otherwise stated in the report and should be treated accordingly.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Where / if estimates and projects are made within this report, are made based on reasonable assumptions as of the date of this report, such statements however by their very nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. NoiseAir Limited specifically does not guarantee or warrant any estimates or projects contained in this report.

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APPENDIX B – GLOSSARY

Table B1: Glossary	
Term	Description
AADT Annual Average Daily Traffic	A daily total traffic flow (24hrs), expressed as mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model.
AQO Air Quality Objective	Policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with the permitted number of exceedances within a specific time scale (see also air quality standard).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	the average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
Conservative	Trending to over predict the impact rather than under predict.
Data Capture	The percentage of all the possible measurements for given periods that were validly measured.
Defra	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
EFT	Emission Factor Toolkit.
Emission rate	The quantity of a pollutant released from a source over a given period of time.
EPUK	Environmental Protection (UK).
Exceedance	A period of time where the concentration of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
IAQM	Institute of Air Quality Management.
LAQM	Local Air Quality Management.
LDV/LGV	Light Duty Vehicle/Light Goods Vehicle.
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO₂	Nitrogen dioxide.
NO_x	Nitrogen oxides.
PM₁₀	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.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
µg/m³ micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m ³ means that one cubic metre of air contains one microgram (millionth of a gram) of a pollutant.

APPENDIX C – IAQM CONSTRUCTION DUST ASSESSMENT METHODOLOGY

IAQM Construction Dust Assessment Methodology

Step 1 – Screening the Need for a Detailed Assessment

An assessment will normally be required where there is:

- ‘human receptors’ within 250 m of the boundary of the site; all within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s); and/ or
- ‘ecological receptors’ within 50 m of the boundary of the site; or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s)

For specific (high risk) schemes the planning authority may require dust assessment despite the proposed site falling outside the distances above.

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

Step 2a – Define the Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large. The following are examples of how the potential dust emission magnitude for different activities can be defined.

Note that, in each case, not all criteria need to be met; other criteria may be used if justified within the assessment. Where relevant, multiple screening assessments may be completed for different development phases (or even sub-phases where demolition may be brief or there is a very short period of intense activity, for example).

Table C1: Construction Dust - Magnitude of Emission		
Magnitude	Activity	Criteria
Large	Demolition	- Total volume of building to be demolished greater than 75,000 m³. - Potentially dusty material (e.g., concrete). - On-site crushing and screening. - Demolition activities more than 12 m above ground level.
	Earthworks	- Total site area greater than 110,000 m². - Potentially dusty soil type (e.g., clay, which will be prone to suspension when dry due to small particle size). - More than 10 heavy earth moving vehicles active at any one time. - Formation of bunds greater than 6 m in height.
	Construction	- Total building volume greater than 75,000 m³. - On site concrete batching. - Sandblasting.

Table C1: Construction Dust - Magnitude of Emission		
Magnitude	Activity	Criteria
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day. - Potentially dusty surface material (e.g., high clay content). - Unpaved road length greater than 100 m.
Medium	Demolition	- Total volume of building to be demolished between 12,000 m³ and 75,000 m³. - Potentially dusty construction material. - Demolition activities 6 m to 12 m above ground level.
	Earthworks	- Total site area between 18,000 m² and 110,000 m². - Moderately dusty soil type (e.g., silt). - Between 5 and 10 heavy earth moving vehicles active at any one time. - Formation of bunds between 3 m and 6 m in height.
	Construction	- Total building volume 12,000 m³ to 75,000 m³. - Potentially dusty construction material (e.g., concrete). - On site concrete batching.
	Trackout	- 20 to 50 HDV trips per day. - Moderately dusty surface material (e.g., high clay content). - Unpaved road length 50 m to 100 m.
Small	Demolition	- Total volume of building to be demolished less than 12,000 m³. - Construction material with low potential for dust release (e.g., metal cladding or timber). - Demolition activities less than 6 m above ground.
	Earthworks	- Total site area less than 18,000 m². - Soil type with large grain size (e.g., sand). - Less than 5 heavy earth moving vehicles active at any one time. - Formation of bunds less than 3 m in height.
	Construction	- Total building volume less than 12,000 m³. - Construction material with low potential for dust release (e.g., metal cladding or timber).
	Trackout	- Less than 20 HDV trips per day. - Surface material with low potential for dust release. - Unpaved road length less than 50 m.

Step 2b – Define the Sensitivity of the Area

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to soiling, human health and ecological impacts respectively. The IAQM guidance

provides guidance to allow sensitivity of individual receptors 2 to soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table C2: 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 C3: Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	Annual Mean PM ₁₀ Concentrations (µg/m ³)	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

Table C3: Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	Annual Mean PM ₁₀ Concentrations (µg/m ³)	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
Low	-	>1	Low	Low	Low	Low

Table C4: Sensitivity of the Area to Ecological Impacts		
Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2c – Define the Risk of Impacts

The dust emissions magnitude determined in 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 C5: Risk of Dust Impacts			
Sensitivity of Surrounding	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 low, medium and high risk sites as determined in Step 2C.

Step 4 – Determine Significant Effects

Once the risk of dust impacts has been determined in Step 2C under the appropriate dust mitigation measures identified in Step 3, the final steps 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 the residual effects will normally be negligible.

APPENDIX D – MODEL INPUT PARAMETERS

MODEL INPUT PARAMETERS

Traffic Flow Data

2023 Base Year traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition was obtained from traffic surveys and from the DfT website. The data is shown in **Table D1**.

ADMS Road ID	AADT	HDV (%)	Speed (kph)	NO _x Emission Factor (g/km/s)	PM ₁₀ Emission Factor (g/km/s)	PM _{2.5} Emission Factor (g/km/s)
2a	2828	2.93%	48	0.00792	0.00125	0.00067
2SD	2829	2.93%	20	0.01155	0.00138	0.00074
2b	2830	2.93%	48	0.00792	0.00125	0.00067
1a	2866	2.93%	48	0.00802	0.00127	0.00068
1SD	2866	2.93%	20	0.01170	0.00140	0.00075
1b	2866	2.93%	48	0.00802	0.00127	0.00068
4c half a	20173	2.93%	48	0.05647	0.00894	0.00477
4c half b	20173	2.91%	48	0.05644	0.00893	0.00476
4b	40345	2.91%	48	0.11288	0.01786	0.00953
4c half c	20173	2.91%	48	0.05644	0.00893	0.00476
4c half d	20173	2.91%	48	0.05644	0.00893	0.00476
4a	40345	2.91%	48	0.11288	0.01786	0.00953
3c	1099	1.04%	48	0.00291	0.00046	0.00025
3b	1099	1.04%	48	0.00291	0.00046	0.00025
3a	1099	1.04%	48	0.00291	0.00046	0.00025
3SD	1099	1.04%	20	0.00405	0.00051	0.00027
5SD	94	4.30%	20	0.00041	0.00005	0.00003
5	94	4.30%	48	0.00027	0.00004	0.00002
5SD2	94	4.30%	20	0.00041	0.00005	0.00003
6SD	78	1.25%	20	0.00029	0.00004	0.00002
7SD	693	35.73%	20	0.00760	0.00060	0.00034

Traffic data for the 2027 Oening Year ‘with development’ scenario was derived by projecting the 2023 baseline data to the using growth factors from TEMPRO and includes development generated traffic flows, as provided by SK Transport Planning Ltd. The data is shown in **Table D2**.

Table D2: 2027 Opening Year 'With Development' Traffic Data						
ADMS Road ID	AADT	% HDV	Speed (kph)	NO _x Emission Factor (g/km/s)	PM ₁₀ Emission Factor (g/km/s)	PM _{2.5} Emission Factor (g/km/s)
2a	3025	2.96	48	0.00517	0.00128	0.00067
2SD	3025	2.96	20	0.00742	0.00140	0.00073
2b	3025	2.96	48	0.00517	0.00128	0.00067
3c	1168	1.04	48	0.00191	0.00047	0.00025
3b	1168	1.04	48	0.00191	0.00047	0.00025
3a	1168	1.04	48	0.00191	0.00047	0.00025
3SD	1168	1.04	20	0.00263	0.00052	0.00027
6SD	140	0.74	20	0.00031	0.00006	0.00003

Roughness Length

The roughness length (z_0) is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 value of 1.5 m, as suggested by ADMS-Roads for 'Large urban areas' was used to describe the modelling extents, while a z_0 value of 0.3 m, as suggested by ADMS-Roads for 'Agricultural areas (max)', was used to describe the meteorological station location. These z_0 values are considered appropriate for the morphology of their respective areas.

Monin-Obukhov

The Monin-Obukhov Length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30 m, as suggested by ADMS-Roads for 'Mixed urban/industrial,' was used to describe the modelling extents and the meteorological station. These values are considered appropriate for the nature of their respective areas.

Model Verification

[Introduction](#)

The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations, which can arise due to the presence of inaccuracies and/or uncertainties in model input data, modelling and monitoring data assumptions. The following are examples of potential causes of such discrepancies:

- Estimates of background pollutant concentrations;

- Meteorological data uncertainties;
- Traffic data uncertainties;
- Model input parameters, such as 'roughness length'; and
- Overall limitations of the dispersion model.

Nitrogen Dioxide

Most NO₂ is produced in the atmosphere by the reaction of nitric oxide (NO) with ozone. It is, therefore, most appropriate to verify the model in terms of the primary pollutant emissions of nitrogen oxides (NO_x = NO + NO₂), in line with the guidance provided within LAQM.TG22.

The model has been run to predict the 2023 Base Year annual mean road-NO_x contribution at 4 diffusion tubes within the modelled road network.

The model outputs of road-NO_x have been compared with 'measured' road-NO_x, which was determined from the measured NO₂ concentration at the verification monitor location, utilising the NO_x to NO₂ calculator and 2023 NO₂ background concentration, as shown in **Table D3**.

Site ID	2023 Monitored Total NO ₂ (µg/m ³)	2023 Background NO ₂ (µg/m ³)	2023 Monitored Road Contribution NO _x (µg/m ³)	2023 Modelled Road Contribution NO _x (µg/m ³)	Ratio
MAN-F3	30.4	23.05	17.7	3.3	5.3
MAN-M1	44.1	23.05	58.3	15.1	3.9
MAN-M2	49.3	23.05	77.0	20	3.9
MAN-M3	39.5	23.05	43.3	17.5	2.5

The road NO_x adjustment factor was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero. This resulted in a factor of **3.8803**, and the total NO₂ concentration was determined by importing the adjusted modelled road-NO_x concentration and background NO₂ concentration into the NO_x to NO₂ calculator.

Particulate Matter

There are no local PM₁₀ or PM_{2.5} monitoring data against which the model could be verified. Consequently, the verification factor determined above for adjusting the road-NO_x contribution

has been applied to the predicted road-PM₁₀ and PM_{2.5} contributions, consistent with the guidance set out in LAQM.TG22.

Model Uncertainty

An evaluation of model performance has been undertaken to establish confidence in the model results. LAQM.TG22 identifies a number of statistical procedures that are appropriate to evaluate model performance and assess the uncertainty. These include:

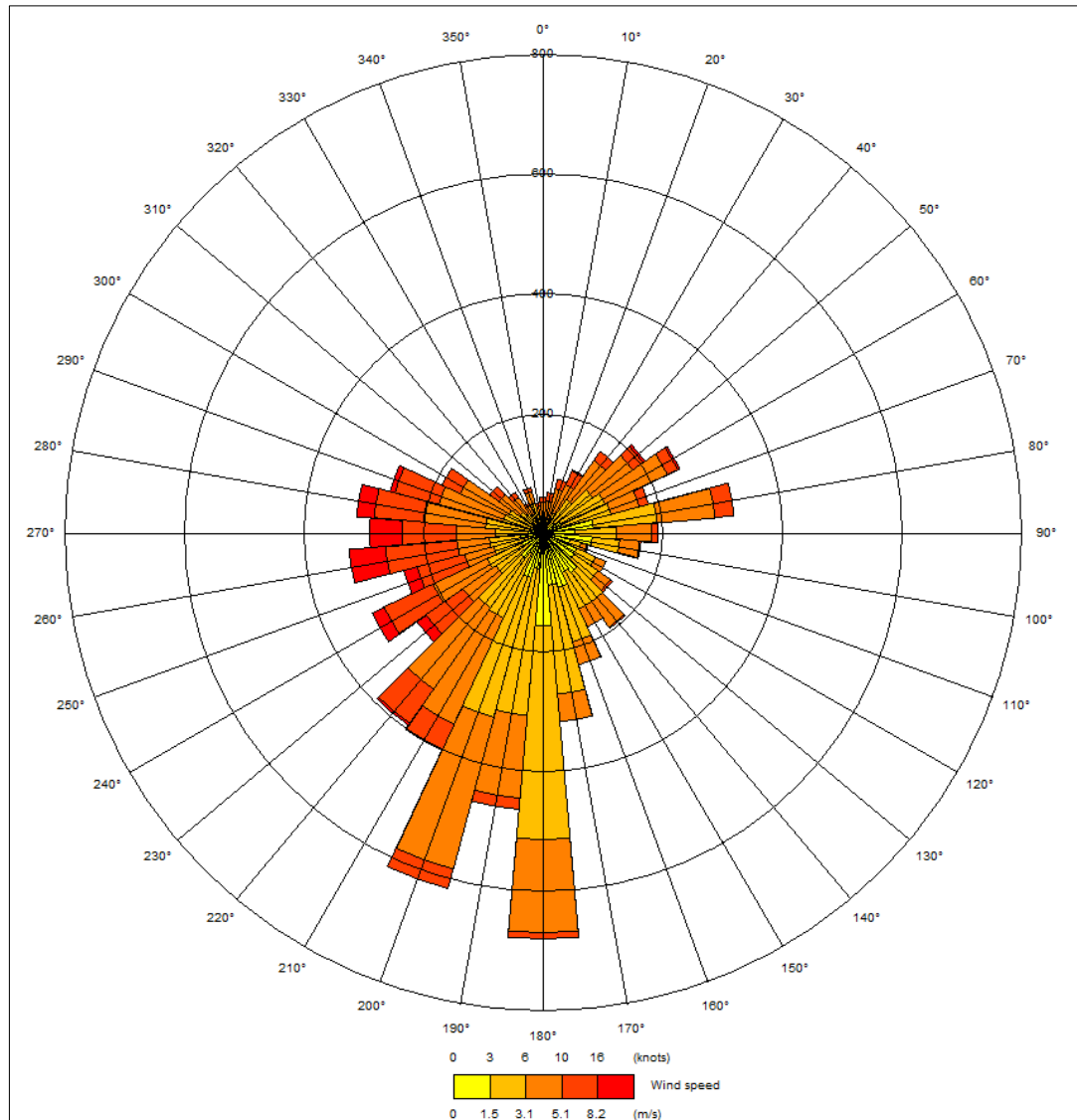
- Correlation coefficient (CC);
- Fractional bias (FB); and
- Root mean square error (RMSE).

These parameters estimate how the model results agree or diverge from the monitored observations. Nations can be carried out prior to, and after adjustment, and can provide useful information on model improvement. Full details can be found in box 7.17 of LAQM.TG22.

To assess the certainty of a model, the RMSE is the simplest parameter to calculate providing an estimate of the average over of the model in the same unit as the model predictions. It is also often easier to interpret the RMSE over other statistical parameters and therefore it has been calculated in this assessment to understand the model uncertainty.

The overall weighted RMSE value calculated after verification was below 25% and, therefore, the final predictions are considered to be acceptable.

APPENDIX E – 2023 WINDROSE FOR MANCHESTER



APPENDIX F – MODELLING RESULTS

Table F1: Results – 2027 Opening Year ‘With Development’ Modelled Receptors						
Receptor ID	X (m)	Y (m)	Z (m)	Predicted Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)		
				NO ₂	PM ₁₀	PM _{2.5}
R1-1	384730	398470	1.5	26.2	16.4	9.0
R1-2	384730	398470	4.5	25.4	16.1	8.9
R1-3	384730	398436	7.5	24.6	15.8	8.7
R2-1	384716	398454	1.5	26.4	16.4	9.0
R2-2	384716	398454	4.5	25.5	16.1	8.9
R2-3	384716	398470	7.5	24.6	15.8	8.7
R3-1	384701	398470	1.5	27.4	16.6	9.1
R3-2	384701	398436	4.5	26.0	16.1	8.9
R3-3	384701	398436	7.5	24.5	15.7	8.7
Results are rounded to 0.1						

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