Air Quality Assessment

Crabtree Lane, Manchester

Client: Keepmoat Homes Ltd

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Executive Summary

Redmore Environmental Ltd was commissioned by Keepmoat Homes Ltd to undertake an Air Quality Assessment in support of a residential development on land off Crabtree Lane, Manchester.

An Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the proposed development;
- Assess potential impacts associated with road transport emissions during the operational phase of the proposed development; and,
- Identify any requirement for relevant mitigation measures.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of earthworks, construction and trackout activities. It is considered that the use of the identified site-specific control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the development. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

Review of the dispersion modelling results indicated that air quality impacts as a result of traffic generated by the development were not predicted to be significant at any sensitive location in the vicinity of the site.

A number of mitigation measures were identified in line with the requirements of Manchester City Council's 'Air Quality and Planning Technical Guidance' in order to reduce vehicle exhaust emissions associated with the proposals. It is considered these are appropriate for a development of this scale and nature and will further control impacts during the operational phase.

Based on the assessment results, air quality factors are not considered a constraint to the development.

Table of Contents

1.0	**INTRODUCTION**	**1**
1.1	Instruction	1
1.2	Site Location and Context	1
1.3	Assessment Scope	1
1.4	Report Amendments	1
2.0	**LEGISLATION AND POLICY**	**3**
2.1	Legislation	3
2.2	Local Air Quality Management	5
2.3	Dust	5
2.4	National Planning Policy	6
2.5	National Planning Practice Guidance	7
2.6	Regional Planning Policy	8
2.7	Local Planning Policy	10
2.8	**Greater Manchester Clean Air Plan**	11
3.0	**METHODOLOGY**	**12**
3.1	Introduction	12
3.2	Construction Phase Assessment	12
	Step 1 - Screen the Need for an Assessment	13
	Step 2 - Assess the Risk of Dust Impacts	13
	Step 3 - Site-specific Mitigation	18
	Step 4 - Determine Significance	18
3.3	Operational Phase Assessment	18
4.0	**BASELINE**	**21**
4.1	Introduction	21
4.2	Local Air Quality Management	21
4.3	Air Quality Monitoring	22
4.4	Background Pollutant Concentrations	23
4.5	Sensitive Receptors	23
	Construction Phase Sensitive Receptors	24
	Operational Phase Sensitive Receptors	25
5.0	**CONSTRUCTION PHASE ASSESSMENT**	**26**
5.1	Introduction	26
5.2	Step 1 - Screen the Need for an Assessment	26
5.3	Step 2a - Define the Potential Dust Emission Magnitude	26

	Earthworks	26
	Construction	27
	Trackout	27
5.4	Step 2b - Define the Sensitivity of the Area	27
	Dust Soiling	27
	Human Health	27
	Ecological	28
5.5	Step 2c - Define the Risk of Dust Impacts	28
5.6	Step 3 - Site-specific Mitigation	29
5.7	Step 4 - Determine Significance	31
6.0	**OPERATIONAL PHASE ASSESSMENT**	**32**
6.1	Introduction	32
6.2	Potential Development Impacts	33
	Predicted Concentrations	33
	Predicted Impacts	35
6.3	Overall Impact Significance	38
6.4	Interim Planning Guidance for $PM_{2.5}$	39
7.0	**MITIGATION**	**41**
8.0	**CONCLUSION**	**43**
9.0	**ABBREVIATIONS**	**45**

Appendices

Appendix 1 - Assessment Input Data
Appendix 2 - Curricula Vitae

1.0 INTRODUCTION

1.1 Instruction

1.1.1 Redmore Environmental Ltd was commissioned by Keepmoat Homes Ltd to undertake an Air Quality Assessment in support of a residential development on land off Crabtree Lane, Manchester.

1.2 Site Location and Context

1.2.1 The site is located on land off Crabtree Lane, Manchester, at approximate National Grid Reference (NGR): 388781, 398003. The relevant Local Authority (LA) is Manchester City Council (MCC). Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise construction of 120 flats and 70 houses alongside car parking, landscaping, and associated infrastructure.

1.3 Assessment Scope

1.2.3 The proposals have the potential to cause air quality impacts at sensitive locations. As such, an Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the development;
- Assess potential impacts associated with road transport emissions during the operational phase of the development; and,
- Identify any requirement for relevant mitigation measures.

1.2.4 This is detailed in the following report.

1.4 Report Amendments

1.4.1 Following submission of the planning application (reference: 142609/FO/2025), the following comments were received by MCC in relation to air quality:

"1. The conclusions of the report are accepted; namely that potential air quality impacts as a result of the construction and operational phases of the development are considered to be not significant, with the implementation of construction dust mitigation measures.

2. Table 25 'Good Practice Design Principles for Operational Phase Air Quality Impacts' states the 'Principle' as "The provision of at least 1 EV "rapid charge" point per 10 residential dwellings... Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made". The 'Action' is stated as "EV charging will be provided for 100% of the houses and 20% of the flats associated with the development."

a. The 'Principle' of 1 EVCP per 10 dwellings is incorrect; MCC's guidance recommends an EVCP for each dwelling with allocated parking (as also stated in the report). This point requires amendment in the report.

b. The submitted DAS states that "Electric Vehicle (EV) charging bays are to be provided at one EV charge point for each dwelling with allocated parking." and the submitted drawing 'EV CHARGING LAYOUT' dated 07.04.25 (no drawing number) appears to correspond with the DAS and indicates that EVCP are proposed for more than 20% of the flats. This point requires clarification in the report and updating if necessary.

3. The proposals regarding boiler emission controls are accepted."

1.4.2 In response to the above comment, the report has been amended to reflect the current Electric Vehicle (EV) charging provision.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values were also provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 The Environmental Improvement Plan 2023[2] was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to $PM_{2.5}$. The Concentration Target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

[1] AQS: Framework for Local Authority Delivery, DEFRA, 2023.

[2] Environmental Improvement Plan 2023, DEFRA, 2023.

2.1.5 Table 1 presents the AQOs, Interim Target and Concentration Target for pollutants considered within this assessment.

Table 1 Air Quality Objectives/ Interim Target/ Concentration Target

Pollutant	Air Quality Objective/ Interim Target/ Concentration Target	
	Concentration (µg/m³)	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
$PM_{2.5}$	12[(a)]	Annual mean
	10[(b)]	Annual mean

Note: (a) Interim Target to be achieved by end of January 2028.
(b) Concentration Target to be achieved by 2040.

2.1.6 Table 2 summarises the advice provided in DEFRA guidance[3] on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term

3 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

2.2.1 LAs are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Dust

2.3.1 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 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). 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.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[4] (NPPF) was published in December 2024 and sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives including the following of relevance to air quality:

> "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."

2.4.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> "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

[4] NPPF, Ministry of Housing, Communities and Local Government, 2024.

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 […]."

2.4.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

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

2.4.5 The implications of the NPPF have been considered throughout this assessment.

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice Guidance[5] (NPPG) web-based resource was launched by the Department for Communities and Local Government to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?

[5] https://www.gov.uk/guidance/air-quality--3.

7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

2.5.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.6 Regional Planning Policy

2.6.1 The Places for Everyone Plan (PfEP)[6] was produced by the nine Greater Manchester Combined Authorities (GMCAs), Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan, and became part of the statutory development plan for each of the councils on 21st March 2024.

2.6.2 A review of the PfEP indicated the following policies of relevance to air quality that have been considered throughout this assessment:

> "Policy JP:S5: 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

[6] PfEP, GMCA, 2024.

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."

"Policy JP-P1 Sustainable Places

We aim to become one of the most liveable city regions in the world, consisting of a series of beautiful, healthy and varied places, each having the following key attributes that all development, wherever appropriate, should be consistent with:

[…]

15. Comfortable and inviting, with indoor and outdoor environments:

A. Offering a high level of amenity that minimises exposure to pollution; and,

[…]."

2.6.3 The above policies were taken into consideration throughout the undertaking of the assessment.

2.7 Local Planning Policy

2.7.1 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy Development Plan Document (DPD)[7] is central. This was adopted by MCC on 11th July 2012.

2.7.2 Review of the Core Strategy DPD indicated the following policies of relevance to the assessment:

"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 effect 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 effects on air quality, alongside other plan objectives. This includes cumulative effects, particularly in Air Quality Management Areas."

7 Core Strategy DPD, MCC, 2012.

"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:

[…]

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."

2.7.3 MCC has also produced 'Air Quality & Planning Technical Guidance'[8] which provides guidance on assessing the impact of proposed development on air quality.

2.7.4 The above policies and guidance were taken into consideration throughout the undertaking of the assessment.

2.8 Greater Manchester Clean Air Plan

2.8.1 The UK Government has instructed a number of LAs to take rapid action to reduce harmful roadside levels of NO_2 within their areas of jurisdiction in the quickest possible timeframe. The GMCA and Transport for Greater Manchester (TfGM) have collaborated to develop a Clean Air Plan (CAP) to ensure Greater Manchester achieves compliance with the relevant AQOs for NO_2 by 2026 at the latest. The initial CAP proposal included implementation of a Class C charging Clean Air Zone. The GMCA has subsequently updated the CAP proposals[9] to comprise an investment-led, non-charging approach. This is currently under review by the UK Government. The CAP was taken into account during the undertaking of this assessment.

[8] Air Quality & Planning Technical Guidance, MCC, 2022.

[9] Case for a New GM Clean Air Plan, GMCA and TfGM, 2022.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases. These have been assessed in accordance with the following methodology, which is based on the requirements of the 'Air Quality & Planning Technical Guidance'[10].

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V2.2'[11].

3.2.2 Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- Earthworks;
- Construction; and,
- Trackout.

3.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to PM_{10}.

3.2.4 The assessment steps are detailed below.

[10] Air Quality & Planning Technical Guidance, MCC, 2022.

[11] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Step 1 - Screen the Need for an Assessment

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the boundary or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 250m from the site entrance, then the assessment also proceeds to Step 2.

3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

Step 2 - Assess the Risk of Dust Impacts

3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

3.2.9 Step 2A defines the potential magnitude of dust emission during the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	• Total site area greater than 110,000m^2 • 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 6m in height

Magnitude	Activity	Criteria
	Construction	• Total building volume greater than 75,000m^3 • On site concrete batching • Sandblasting
	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 100m
Medium	Earthworks	• Total site area 18,000m^2 to 110,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 3m to 6m in height
	Construction	• Total building volume 12,000m^3 to 75,000m^3 • 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 50m to 100m
Small	Earthworks	• Total site area less than 18,000m^2 • 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 3m in height
	Construction	• Total building volume less than 12,000m^3 • 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 50m

3.2.10 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The sensitivities of specific receptors are shown in Table 4.

Table 4 Construction Dust - Sensitivities of People and Ecological Receptors

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect high levels of amenity • High aesthetic or value property • People expected to be present continuously for extended periods of time • Locations where members of the public are exposed over a time period relevant to the AQO for PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	• Locally designated site e.g. Local Nature Reserves

3.2.11 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 5.

Table 5 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

3.2.12 Table 6 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 6 Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
	24 - 28µg/m^3	More than 10	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low
	Less than 24µg/m^3	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low

3.2.13 Table 7 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 7 Construction Dust - Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

3.2.14 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

3.2.15 Table 8 outlines the risk category from earthworks, construction and trackout activities.

Table 8 Construction Dust - Dust Risk Category from Earthworks, Construction and Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Step 3 - Site-specific Mitigation

3.2.16 Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance[12] to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4 - Determine Significance

3.2.17 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

3.2.18 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. The IAQM guidance suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

3.3 Operational Phase Assessment

3.3.1 The development has the potential to affect air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site. Potential impacts have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2023 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2028 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2028 should the proposals be completed).

[12] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

3.3.2 Reference should be made to Appendix 1 for assessment input data and details of the verification process.

3.3.3 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)[13] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[14] on where the AQOs apply, as summarised in Table 2, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the development.

3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[15]. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 9.

Table 9 Significance of Operational Phase Road Vehicle Exhaust Emission Impacts

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of AQO/ Concentration Target (%)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO/Concentration Target	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO/Concentration Target	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO/Concentration Target	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO/Concentration Target	Moderate	Moderate	Substantial	Substantial
110% or more of AQO/Concentration Target	Moderate	Substantial	Substantial	Substantial

3.3.5 The matrix shown in Table 9 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell

13 LA 105: Air Quality, Highways England, 2019.

14 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

15 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[16] provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

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

3.3.7 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the impact is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**.

3.3.8 The determination of significance relies on professional judgement and reasoning has been provided as far as practicable. The IAQM guidance[17] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

16 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

17 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

4.0 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order 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), as amended by the Environment Act (2021), MCC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2 are above the AQO within the city. As such, a number of roads within Manchester have been included within the Greater Manchester Combined Authority (GMCA) AQMA. This is described as follows:

> "This is the part of the Greater Manchester Combined Authority AQMA located within the Manchester City Council area."

4.2.2 The development is located approximately 200m south of the AQMA. As such, there is the potential for exhaust emissions from vehicles travelling to and from the site to increase pollution levels in this sensitive area. This has been considered throughout the undertaking of the assessment.

4.2.3 The development is also located approximately 200m to the west of Tameside Metropolitan Borough Council's (TMBC's) administrative extents. TMBC has also undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2 are above the AQO within the borough. As such, a number of roads within Tameside have been included within the GMCA AQMA, which is described as follows:

> "This is the part of the Greater Manchester Combined Authority AQMA located within the Tameside Council area."

4.2.4 The development is located approximately 210m south-west of the AQMA. As such there is the potential for exhaust emissions from vehicles travelling to and from the site to

increase pollution levels in this sensitive area. This has been considered throughout the undertaking of the assessment.

4.2.5 MCC and TMBC have concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by MCC and TMBC throughout their areas of jurisdiction. Data has also been collected by the GMCA to inform the CAP. Recent NO_2 concentrations recorded in the vicinity of the development, as provided in the 'Greater Manchester LAQM and CAP NO_2 Diffusion Tube Results, 2011-2023'[18] are shown in Table 10.

Table 10 Monitoring Results

Monitoring Site	Monitored NO_2 Concentration (µg/m³)			
	2020	2021	2022	2023
MA28NO	26.4	29.4	29.3	26.9
MA95BNO	31.5	34.1	33.7	31.5
TA17NO	26.6	28.7	29.0	27.5

4.3.2 As shown in Table 10, annual mean NO_2 concentrations were below the AQO of 40µg/m³ at all monitors in recent years. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 Pollutant concentrations during 2020 and 2021 were affected by changes to travel patterns and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution. However, monitoring data for 2022 and beyond is now considered representative of post-pandemic conditions. This is supported by the IAQM[19], who have adopted the following position:

[18] Greater Manchester LAQM and CAP NO_2 Diffusion Tube Results, 2011-2023, GMCA, 2024.

[19] Use of 2020 and 2021 Monitoring Datasets - IAQM Position Statement V1.1, IAQM, 2023.

"ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline."

4.3.4 Monitoring of PM_{10} or $PM_{2.5}$ concentrations is not undertaken within the vicinity of the site.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located across two grid squares. Data for these locations was downloaded from the DEFRA website[20] for the purpose of the assessment and is summarised in Table 11.

Table 11 Background Pollutant Concentration Predictions

Grid Square (NGR)	Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
		2023	2024	2028
388500, 397500	NO_2	15.77	15.19	12.99
	PM_{10}	12.95	12.90	12.68
	$PM_{2.5}$	7.84	7.77	7.54
388500, 398500	NO_2	15.70	15.15	13.07
	PM_{10}	12.82	12.75	12.53
	$PM_{2.5}$	7.89	7.83	7.59

4.4.6 As shown in Table 11, predicted background concentrations are below the relevant AQOs, Interim Target and Concentration Target at the development site.

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.

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

Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 250m from the development boundary. These are summarised in Table 12.

Table 12 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 to 100	1
Up to 50	More than 100	1
Up to 100	More than 100	-
Up to 250	More than 100	-

4.5.3 The ecological receptor identified in Table 12 is the Ashton Canal Site of Biological Importance (SBI), which is approximately 5m north of the site boundary.

4.5.4 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 250m of the site access. These are summarised in Table 13.

Table 13 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 to 100	0
Up to 50	More than 100	0

4.5.5 Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as a **high**. This was because the identified receptors included residential properties and Higher Openshaw Community School.

4.5.6 The Ashton Canal, identified in Table 12, is classified as an SBI which is considered similar to a local designation. Based on the criteria shown in Table 4, the sensitivity of the Ashton Canal to potential dust impacts was therefore classified as **low**.

Operational Phase Sensitive Receptors

4.5.7 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 14.

Table 14 Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - Reading Close	388499.8	397921.0
R2	Residential - Old Lane	388723.6	397503.6
R3	Varna Community Primary School	388770.6	397359.2
R4	Residential - Edge Lane	389057.6	398245.8
R5	Residential - Manchester Road	389020.1	398280.6
R6	Residential - Fairfield Road	389258.8	397368.4
R7	Residential - Ashton Old Road	388367.7	397390.3
R8	Residential - Herne Street	387426.4	397512.1
R9	Residential - Turing Close	387227.9	397536.8
R10	Cornerstone Centre	387155.5	397533.7
R11	Residential - Falconwood Way	387102.9	397541.3
R12	Residential - Ashton Old Road	386647.8	397580.1
R13	Residential - Windermere Road	387248.2	397692.1

4.5.8 Reference should be made to Figure 3 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

5.0 CONSTRUCTION PHASE ASSESSMENT

5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction of the proposed development. These are assessed in the following Sections.

5.2 Step 1 - Screen the Need for an Assessment

5.2.1 The undertaking of activities such as excavation, groundworks, cutting, construction and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 250m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

5.3 Step 2a - Define the Potential Dust Emission Magnitude

Earthworks

5.3.1 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The area of the proposed development site is between 18,000m^2 and 110,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **medium**.

Construction

5.3.2 Due to the size of the development, the total building volume is estimated to be between 12,000m^3 and 75,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **medium**.

Trackout

5.3.3 Based on the site area, it is anticipated that the unpaved road length will be greater than 100m during certain stages of construction. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **large**.

5.4 Step 2b - Define the Sensitivity of the Area

Dust Soiling

5.4.1 Table 12 shows that there are between 10 and 100 **high** sensitivity receptors within 20m of the site boundary. The sensitivity of the area with respect to dust soiling from earthworks and construction, as defined using the criteria summarised in Table 5, is therefore considered to be **high**.

5.4.2 Table 13 shows that there are between 10 and 100 **high** sensitivity receptors within 20m of the road network within 250m of the site access. The sensitivity of the area with respect to dust soiling from trackout, as defined using the criteria summarised in Table 5, is therefore considered **high**.

Human Health

5.4.3 Table 11 shows the maximum annual mean PM_{10} background concentration at the site is 12.90µg/m^3. As shown in Table 6, where the background annual mean PM_{10} concentration is below 24µg/m^3 and there are between 10 and 100 **high** sensitivity receptors within 20m of the site boundary, the sensitivity of the area with respect to human health from earthworks and construction is considered to be **low**.

5.4.4 There are between 10 and 100 **high** sensitivity receptors within 20m of the road network within 250m of the site access. The sensitivity of the area with respect to human health

from trackout, as defined using the criteria summarised in Table 6, is therefore considered to be **low**.

Ecological

5.4.5 There is one ecological receptor within 20m of the site boundary. The sensitivity of this receptor with respect to ecological impacts from earthworks and construction, as defined using the criteria in Table 7, is therefore considered to be **low.**

5.5 Step 2c - Define the Risk of Dust Impacts

5.5.1 The derived dust emission magnitude for each activity was combined with the sensitivity of the area to determine the risk of unmitigated impacts in line with the methodology set out in Table 8. A summary of the risk from each dust generating activity is provided in Table 15.

Table 15 Summary of Potential Unmitigated Dust Risks

Potential Impact	Activity	Step 2A - Dust Emission Magnitude	Step 2B - Sensitivity of the Area	Step 2C - Risk
Dust Soiling	Earthworks	Medium	High	Medium
	Construction	Medium	High	Medium
	Trackout	Large	High	High
Human Health	Earthworks	Medium	Low	Low
	Construction	Medium	Low	Low
	Trackout	Large	Low	Low
Ecological	Earthworks	Medium	Low	Low
	Construction	Medium	Low	Low
	Trackout	-	-	-

5.5.2 As indicated in Table 15, the potential risk of dust soiling is **high** from trackout and **medium** from earthworks and construction. The potential risk of human health impacts is **low** from all activities. The potential risk for ecological impacts is **low** from earthworks and construction.

5.5.3 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.

5.6 Step 3 - Site-specific Mitigation

5.6.1 The IAQM guidance[21] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 16. 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.

Table 16 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
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, which may include measures to control other emissions, approved by the LA
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 LA upon request • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book

[21] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Issue	Control Measure
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 • Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request • Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	• 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 • Fully enclose site or specific operations where there is a high potential for dust production and they are 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 • 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 • Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate • Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable 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

Issue	Control Measure
Trackout	• Use water-assisted dust sweeper on access and local roads, if required • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving site are covered to prevent escape of materials • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable • Record all inspections of haul routes and any subsequent action in a site log book • Implement a wheel washing system, if required • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exist, wherever size and layout permits • Access gates to be located at least 10m from receptors where possible

5.7 Step 4 - Determine Significance

5.7.1 Assuming the relevant mitigation measures outlined in Table 16 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance[22].

[22] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

6.0 OPERATIONAL PHASE ASSESSMENT

6.1 Introduction

6.1.1 The development has the potential to increase concentrations of NO_2, PM_{10} and $PM_{2.5}$ as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

6.1.2 The assessment considered the following scenarios:

- 2023 - Verification;
- 2028 - DM; and,
- 2028 - DS.

6.1.3 The DM scenario (i.e. without development) included baseline traffic data, inclusive of anticipated growth and committed developments, for the relevant assessment year. The DS scenario (i.e. with development) included baseline traffic data, inclusive of anticipated growth and committed developments, in addition to predicted vehicle trips associated with the operation of the proposals.

6.1.4 For the purpose of the assessment traffic data for 2028 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emissions factors and background concentrations for 2023 were utilised within the dispersion model. The use of 2028 traffic data and 2023 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

6.1.5 Reference should be made to Appendix 1 for full assessment input details.

6.2 Potential Development Impacts

Predicted Concentrations

6.2.1 Annual mean NO_2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 17.

Table 17 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Reading Close	20.25	20.51	0.26
R2	Residential - Old Lane	26.36	26.84	0.48
R3	Varna Community Primary School	24.77	24.85	0.08
R4	Residential - Edge Lane	26.70	26.77	0.07
R5	Residential - Manchester Road	27.72	27.75	0.03
R6	Residential - Fairfield Road	30.38	30.47	0.09
R7	Residential - Ashton Old Road	27.26	27.40	0.14
R8	Residential - Herne Street	25.41	25.50	0.09
R9	Residential - Turing Close	32.09	32.21	0.12
R10	Cornerstone Centre	39.59	39.70	0.11
R11	Residential - Falconwood Way	30.35	30.42	0.07
R12	Residential - Ashton Old Road	31.13	31.21	0.08
R13	Residential - Windermere Road	26.75	26.78	0.03

6.2.2 As indicated in Table 17, predicted annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

6.2.3 Reference should be made to Figures 4 and 5 for graphical representations of annual mean NO_2 concentrations across the assessment area for the DM and DS scenarios, respectively.

6.2.4 Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 18.

Table 18 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Reading Close	13.71	13.80	0.09
R2	Residential - Old Lane	15.43	15.58	0.15
R3	Varna Community Primary School	14.94	14.97	0.03
R4	Residential - Edge Lane	15.52	15.54	0.02
R5	Residential - Manchester Road	15.77	15.78	0.01
R6	Residential - Fairfield Road	17.51	17.55	0.04
R7	Residential - Ashton Old Road	15.73	15.77	0.04
R8	Residential - Herne Street	15.58	15.62	0.04
R9	Residential - Turing Close	17.19	17.23	0.04
R10	Cornerstone Centre	19.83	19.87	0.04
R11	Residential - Falconwood Way	16.58	16.60	0.02
R12	Residential - Ashton Old Road	16.77	16.80	0.03
R13	Residential - Windermere Road	16.00	16.01	0.01

6.2.5 As indicated in Table 18, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

6.2.6 Reference should be made to Figures 6 and 7 for graphical representations of annual mean PM_{10} concentrations across the assessment area for the DM and DS scenarios, respectively

6.2.7 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 19.

Table 19 Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Reading Close	8.16	8.21	0.05
R2	Residential - Old Lane	9.08	9.16	0.08
R3	Varna Community Primary School	8.82	8.83	0.01
R4	Residential - Edge Lane	9.12	9.13	0.01
R5	Residential - Manchester Road	9.26	9.26	0.00
R6	Residential - Fairfield Road	10.18	10.20	0.02
R7	Residential - Ashton Old Road	9.24	9.26	0.02
R8	Residential - Herne Street	9.16	9.18	0.02
R9	Residential - Turing Close	10.02	10.04	0.02
R10	Cornerstone Centre	11.43	11.45	0.02
R11	Residential - Falconwood Way	9.69	9.71	0.01
R12	Residential - Ashton Old Road	9.80	9.81	0.01
R13	Residential - Windermere Road	9.38	9.38	0.01

6.2.8 As indicated in Table 19, predicted annual mean $PM_{2.5}$ concentrations were below the Interim Target at all sensitive receptors in both the DM and DS scenarios.

6.2.9 Reference should be made to Figures 8 and 9 for graphical representations of annual mean $PM_{2.5}$ concentrations across the assessment area for the DM and DS scenarios, respectively.

Predicted Impacts

6.2.10 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 20.

Table 20 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Reading Close	Below 75% of AQO	1	Negligible
R2	Residential - Old Lane	Below 75% of AQO	1	Negligible
R3	Varna Community Primary School	Below 75% of AQO	0	Negligible
R4	Residential - Edge Lane	Below 75% of AQO	0	Negligible
R5	Residential - Manchester Road	Below 75% of AQO	0	Negligible
R6	Residential - Fairfield Road	76 - 94% of AQO	0	Negligible
R7	Residential - Ashton Old Road	Below 75% of AQO	0	Negligible
R8	Residential - Herne Street	Below 75% of AQO	0	Negligible
R9	Residential - Turing Close	76 - 94% of AQO	0	Negligible
R10	Cornerstone Centre	95 - 102% of AQO	0	Negligible
R11	Residential - Falconwood Way	76 - 94% of AQO	0	Negligible
R12	Residential - Ashton Old Road	76 - 94% of AQO	0	Negligible
R13	Residential - Windermere Road	Below 75% of AQO	0	Negligible

6.2.11 As indicated in Table 20, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.12 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Reading Close	Below 75% of AQO	0	Negligible
R2	Residential - Old Lane	Below 75% of AQO	0	Negligible

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R3	Varna Community Primary School	Below 75% of AQO	0	Negligible
R4	Residential - Edge Lane	Below 75% of AQO	0	Negligible
R5	Residential - Manchester Road	Below 75% of AQO	0	Negligible
R6	Residential - Fairfield Road	Below 75% of AQO	0	Negligible
R7	Residential - Ashton Old Road	Below 75% of AQO	0	Negligible
R8	Residential - Herne Street	Below 75% of AQO	0	Negligible
R9	Residential - Turing Close	Below 75% of AQO	0	Negligible
R10	Cornerstone Centre	Below 75% of AQO	0	Negligible
R11	Residential - Falconwood Way	Below 75% of AQO	0	Negligible
R12	Residential - Ashton Old Road	Below 75% of AQO	0	Negligible
R13	Residential - Windermere Road	Below 75% of AQO	0	Negligible

6.2.13 As indicated in Table 21, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.14 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - $PM_{2.5}$

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Change as Proportion of Interim Target (%)	Impact Significance
R1	Residential - Reading Close	Below 75% of Interim Target	0	Negligible
R2	Residential - Old Lane	76 - 94% of Interim Target	1	Negligible
R3	Varna Community Primary School	Below 75% of Interim Target	0	Negligible

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Change as Proportion of Interim Target (%)	Impact Significance
R4	Residential - Edge Lane	76 - 94% of Interim Target	0	Negligible
R5	Residential - Manchester Road	76 - 94% of Interim Target	0	Negligible
R6	Residential - Fairfield Road	76 - 94% of Interim Target	0	Negligible
R7	Residential - Ashton Old Road	76 - 94% of Interim Target	0	Negligible
R8	Residential - Herne Street	76 - 94% of Interim Target	0	Negligible
R9	Residential - Turing Close	76 - 94% of Interim Target	0	Negligible
R10	Cornerstone Centre	95 - 102% of Interim Target	0	Negligible
R11	Residential - Falconwood Way	76 - 94% of Interim Target	0	Negligible
R12	Residential - Ashton Old Road	76 - 94% of Interim Target	0	Negligible
R13	Residential - Windermere Road	76 - 94% of Interim Target	0	Negligible

6.2.15 As indicated in Table 22, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.3 Overall Impact Significance

6.3.1 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the overall predicted impacts at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 23.

Table 23 Overall Impact Significance of Road Vehicle Exhaust Emission Impacts

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were below the relevant AQOs and Interim Target at all locations in the DM scenario It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs or Interim Target
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	It was assumed that vehicle exhaust emission rates and background concentrations will not reduce in future years. This provides worst-case results when compared with DEFRA and National Highways methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

6.3.2 The IAQM guidance[23] states that only if the impact is greater than **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

6.4 Interim Planning Guidance for $PM_{2.5}$

6.4.1 Interim Planning Guidance[24] on the consideration of the $PM_{2.5}$ targets identified in the Environment Act (2021) in planning decisions has been produced by DEFRA. This requires evidence that the key sources of air pollution within a development have been identified and appropriate action to minimise emissions of $PM_{2.5}$ and its precursors as far as is reasonably practicable be provided in support of planning applications. To assist the process, two questions and associated considerations are provided. These are summarised in Table 24, along with the development response.

23 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

24 https://uk-air.defra.gov.uk/pm25targets/planning.

Table 24 Interim Planning Guidance Questions

Question	Response
How has exposure to $PM_{2.5}$ been considered when selecting the development site? Factors to consider include: • Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these • Site proximity to pollution sources and the impact of these on users of the development • Exposure and emissions during both construction and in-use	The site is located in a predominantly residential and industrial setting approximately 4.0km east of Manchester city centre. The surrounding area includes Higher Openshaw Community School, as well as residential properties. As outlined in Section 6.2.6, $PM_{2.5}$ concentrations were predicted to be below the Interim Target at all sensitive receptors in 2028. Furthermore, it is anticipated that concentrations will reduce by the Concentration Target compliance year of 2040 As outlined in Section 6.2.12, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be negligible at all receptor locations. The site is distanced from any major pollutant sources, approximately 200m south of Ashton New Road and 500m north of Ashton Old Road. As such, users of the development are unlikely to be exposed to any existing air quality issues As outlined in Table 16, a number of mitigation measures will be used throughout the construction phase in order to reduce fugitive dust emissions as far as practicable. This will control potential exposure at off-site locations
What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors and to reduce emissions of $PM_{2.5}$ and its precursors? Factors to consider include: • Site layout • The development's design • Technology used in the construction or installed for use in the development • Construction and future use of the development	A number of mitigation measures have been incorporated into the design of the scheme in order to reduce $PM_{2.5}$ exposure for future residents. These include the following: • Residential units are distanced from major road sources and associated vehicle exhaust emissions In order to reduce emissions of $PM_{2.5}$ with associated impacts at nearby receptors, the following measures have also been included: • Provision of EV charging points to reduce reliance on diesel and petrol vehicles • Provision of secure cycle spaces • Production of a Travel Plan Further to the above, in order to reduce emissions during the construction phase, a number of mitigation measures will be used to minimise dust generation from associated activities

6.4.2 Based on the responses provided in Table 24 and the results of the assessment, as outlined in Sections 5.7 and 6.3, it is considered that the development has identified key sources of air pollution and taken appropriate action to minimise emissions of $PM_{2.5}$.

7.0 MITIGATION

7.1.1 A number of mitigation measures have been included within the development to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. These are in accordance with MCC's 'Air Quality and Planning Technical Guidance'[25], which is based upon the Good Practice Design Principles outlined in the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[26]. Table 25 describes the good practice principles along with how each has been addressed with regards to the proposals.

Table 25 Good Practice Design Principles for Operational Phase Air Quality Impacts

Phase	Principle	Action
Design Phase	New developments should not contravene the Council's AQAP[27], or render any of the measures unworkable	It is confirmed that the proposals will not contravene MCC's AQAP, or render any of the measures unworkable
	Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion	The development will not create a new street canyon or a building configuration that inhibits effective dispersion
	Delivering sustainable development should be the key theme of any application	The proposals have been designed to encourage sustainable behaviours, such as active and public transport due to its proximity to local bus routes and amenities
Operational Phase	The provision of at least 1 EV "rapid charge" point per 10 residential dwellings and/or 1,000m^2 of commercial floor space. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made	The proposals will include EV charging for every car parking space on-site

25 Air Quality & Planning Technical Guidance, MCC, 2022.

26 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

27 Greater Manchester AQAP 2016-2021, GMCA, 2016.

Phase	Principle	Action
	Where development generates significant additional traffic, provision of a detailed Travel Plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety	A Travel Plan has been produced by Curtins, the Transport Consultant for the project. The following measures are included within the document: • Footways to encourage walking; • Cycle parking/storage to enough cycling; • Connections to local public transport links; and, • Encouragement of car sharing and shared transport.
	All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh. All gas-fired CHP plant to meet a minimum emissions standard of: • Spark ignition engine: 250mgNO_x/Nm^3; • Compression ignition engine: 400mgNO_x/Nm^3; • Gas turbine: 50mgNO_x/Nm^3. A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of: • Solid biomass boiler: 275mgNO_x/Nm^3 and 25mgPM/Nm^3	Any boilers to be included in the development will be provisioned in accordance with the relevant requirements

7.1.2 It is considered the above methods would further reduce potential impacts associated with the scheme. Specific mitigation suited to the proposals may be stipulated as a planning condition if deemed necessary by the LA.

8.0 CONCLUSION

8.1.1 Redmore Environmental Ltd was commissioned by Keepmoat Homes Ltd to undertake an Air Quality Assessment in support of a residential development on land off Crabtree Lane, Manchester.

8.1.2 The proposals have the potential to cause air quality impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and assess potential effects as a result of the scheme.

8.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Site-specific dust control measures were subsequently determined based on the identified risk ratings. Subject to implementation, potential air quality impacts from dust generated by demolition, earthworks, construction and trackout activities are predicted to be **not significant**.

8.1.4 The development has the potential to impact on existing air quality in the vicinity of the site during operation. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

8.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of traffic exhaust emissions associated with the development were predicted to be **negligible** at all receptor locations. Following consideration of the relevant issues, residual impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.

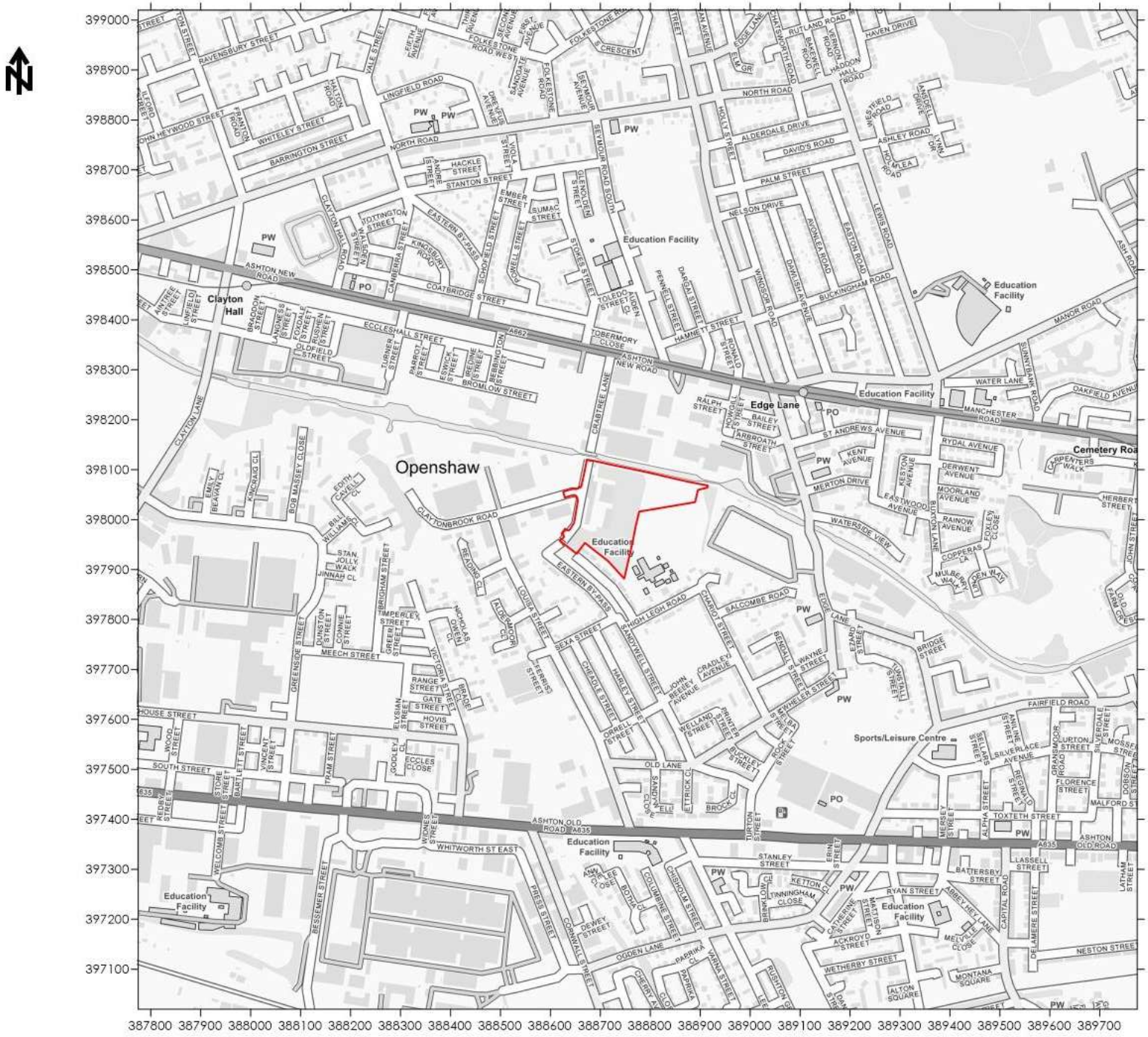
8.1.6 A number of mitigation measures were identified in line with the requirements of the MCC 'Air Quality and Planning Technical Guidance' in order to reduce vehicle exhaust emissions associated with the proposals. It is considered these are appropriate for a development of this scale and nature and will further control impacts during the operational phase.

8.1.7 Based on the assessment results, air quality factors are not considered a constraint to the development.

9.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
MCC	Manchester City Council
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
SBI	Site of Biological Interest
TMBC	Tameside Metropolitan Borough Council
z_0	Roughness length

Figures



Legend

Site Boundary

Title
Figure 1 - Site Location

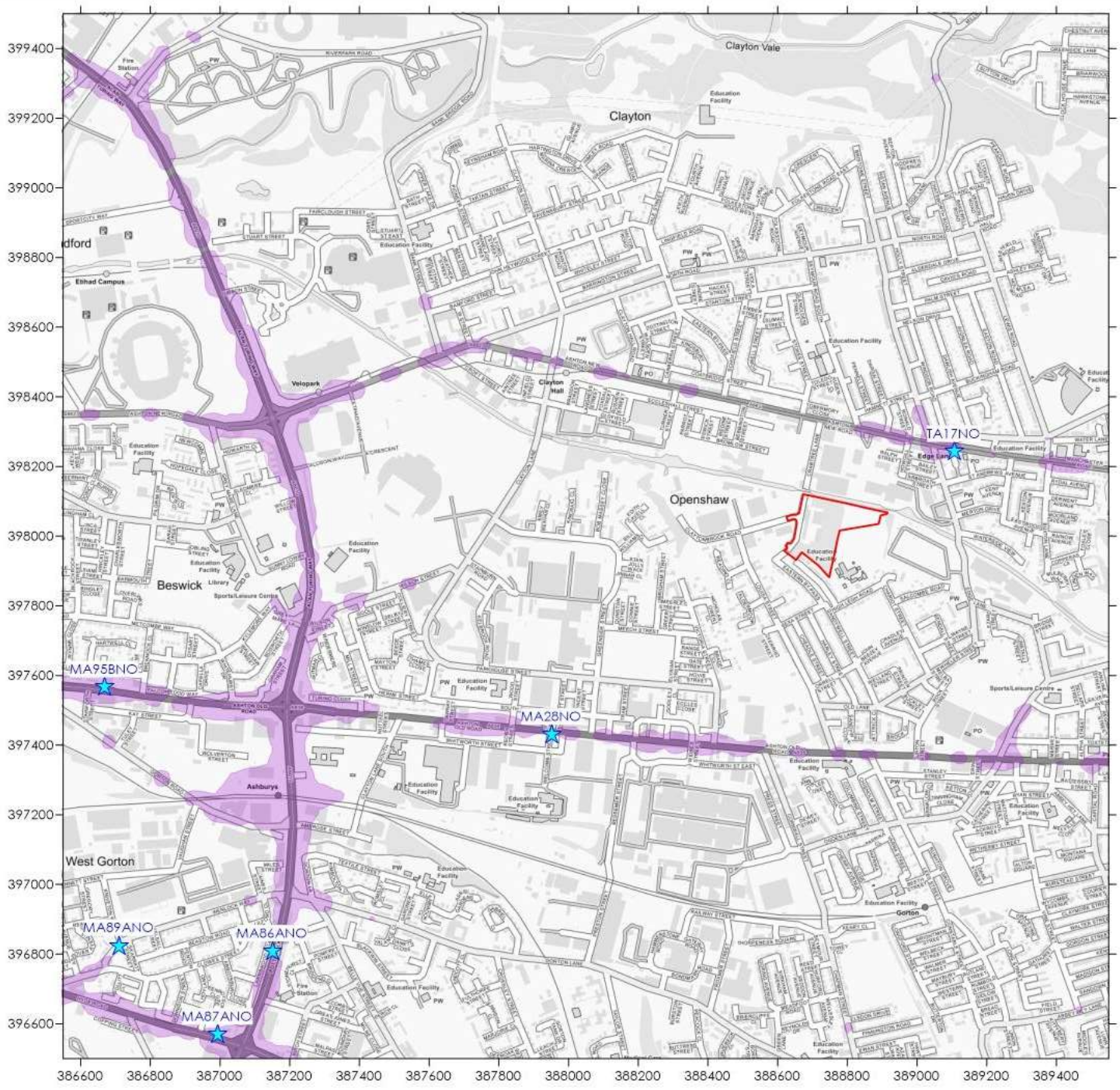
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Site Boundary

Monitor

AQMA

Title
Figure 2 - Monitoring Locations and AQMAs

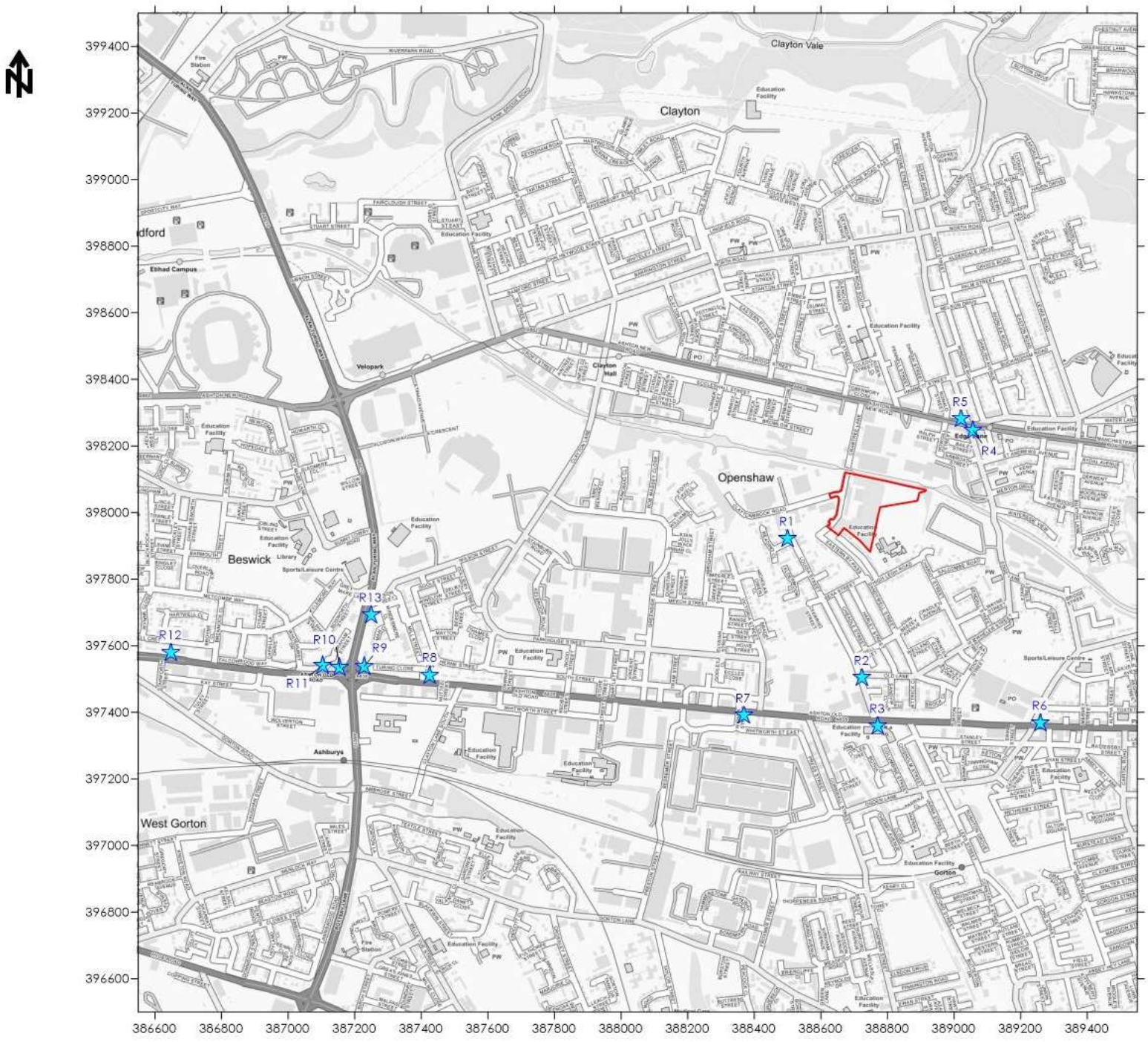
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Site Boundary

Receptor

Title

Figure 3 - Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptors

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Project Reference

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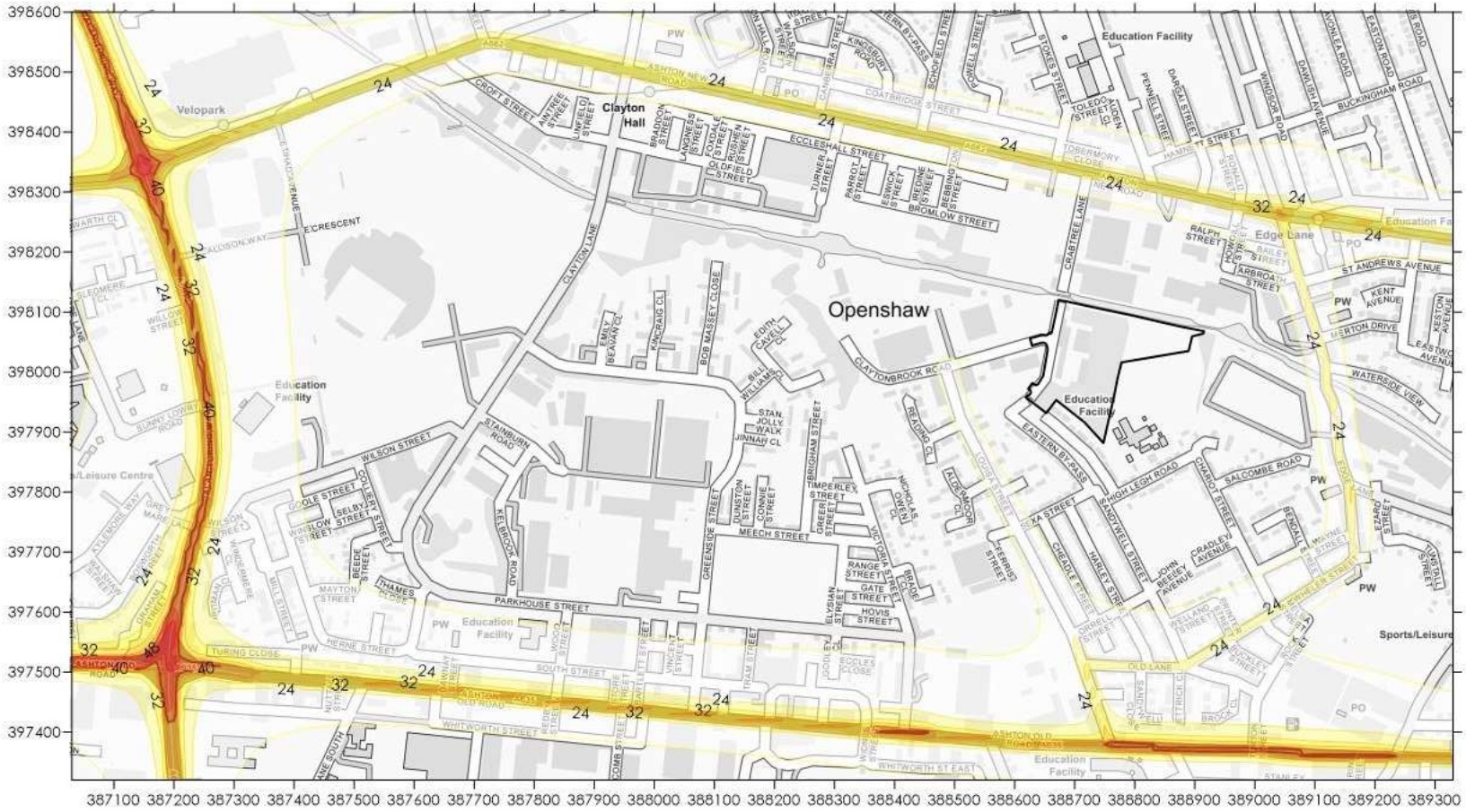
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Site Boundary

Annual Mean NO_2 Concentration (µg/m³)

48
44
40
36
32
28
24
20

Title
Figure 4 - Predicted Annual Mean NO_2 Concentrations (µg/m³)
Do-Minimum

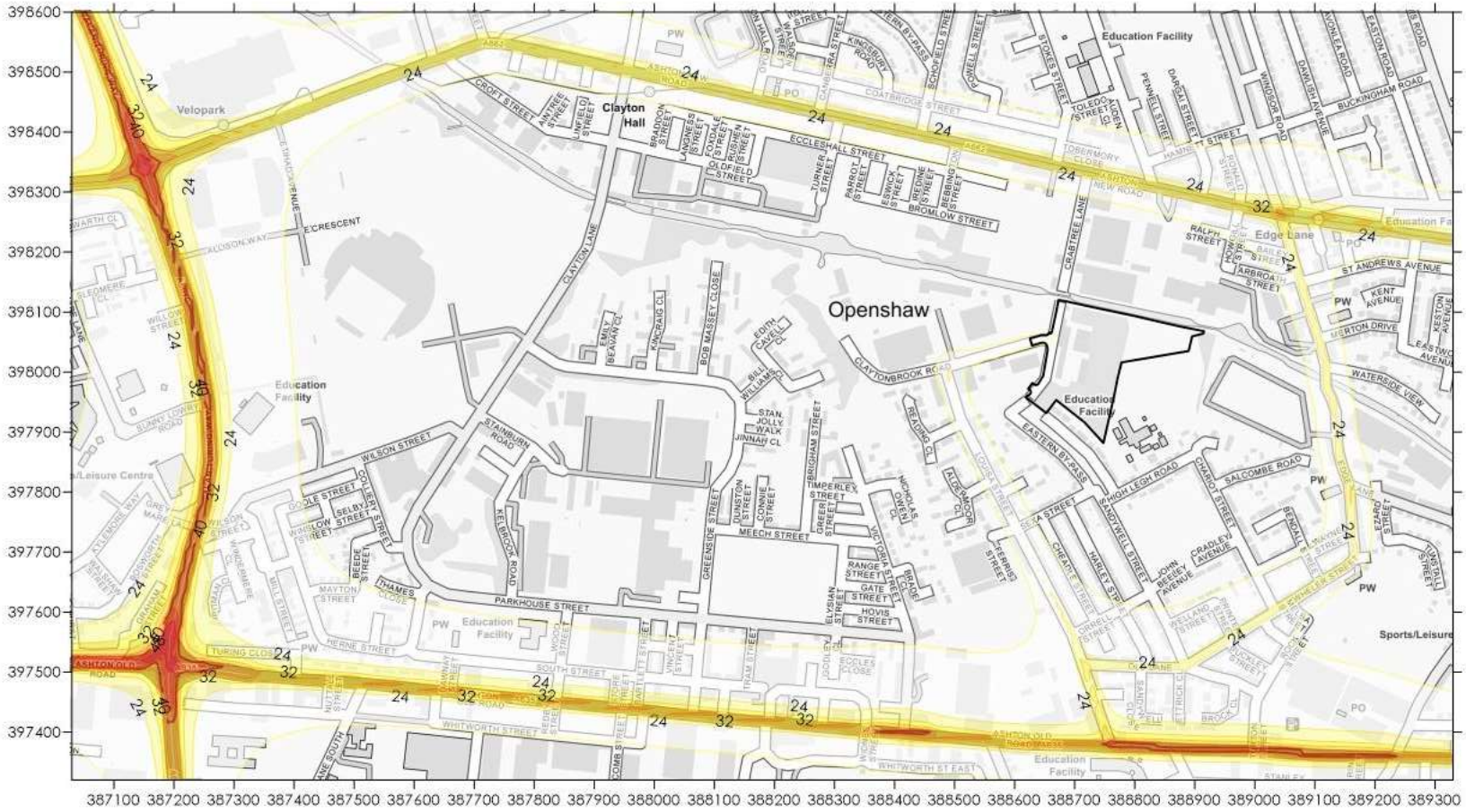
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Annual Mean NO_2 Concentration ($\mu g/m^3$)

Title
Figure 5 - Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$)
Do-Something

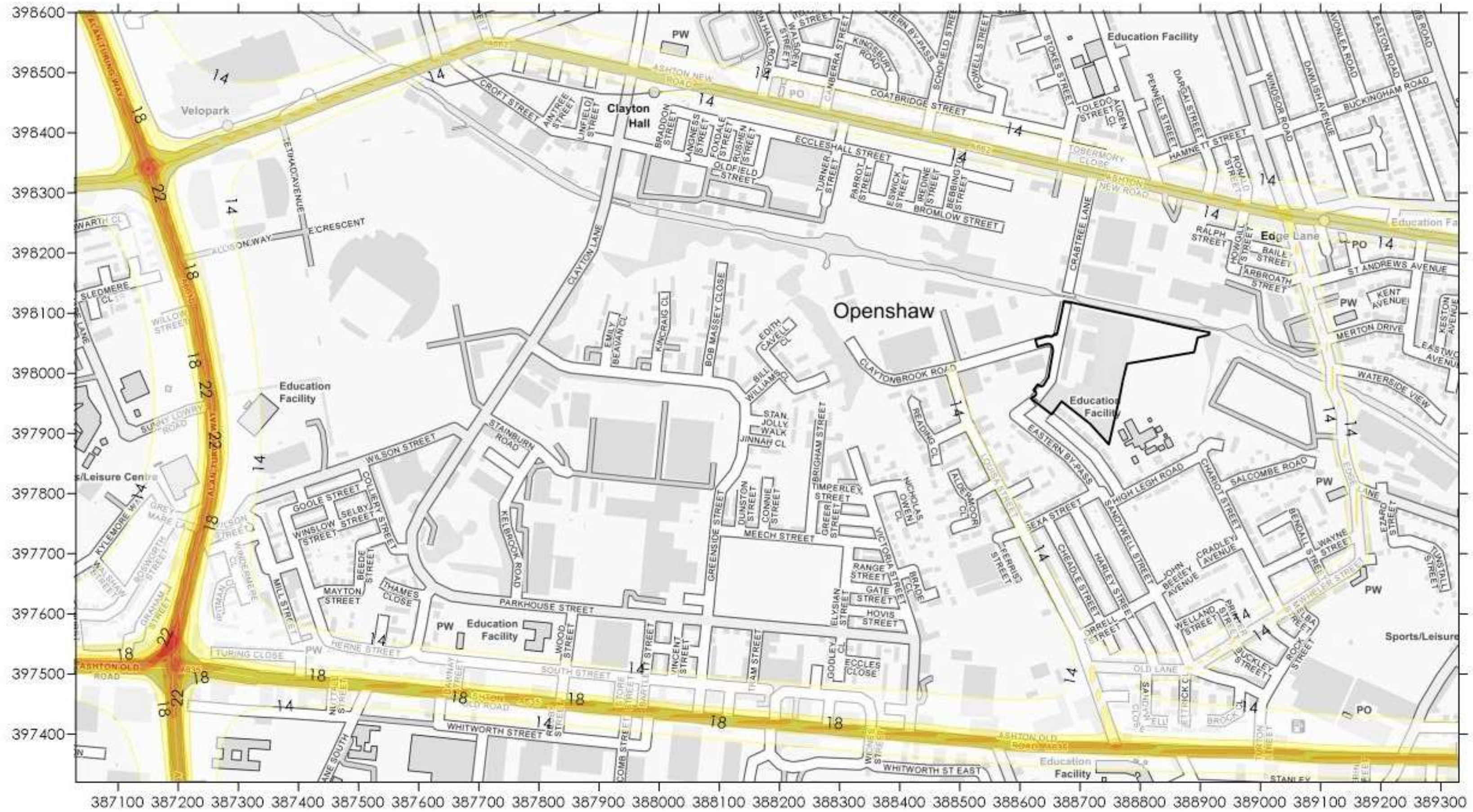
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Annual Mean PM_{10} Concentration ($\mu g/m^3$)

26
24
22
20
18
16
14

Title
Figure 6 - Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$) Do-Minimum

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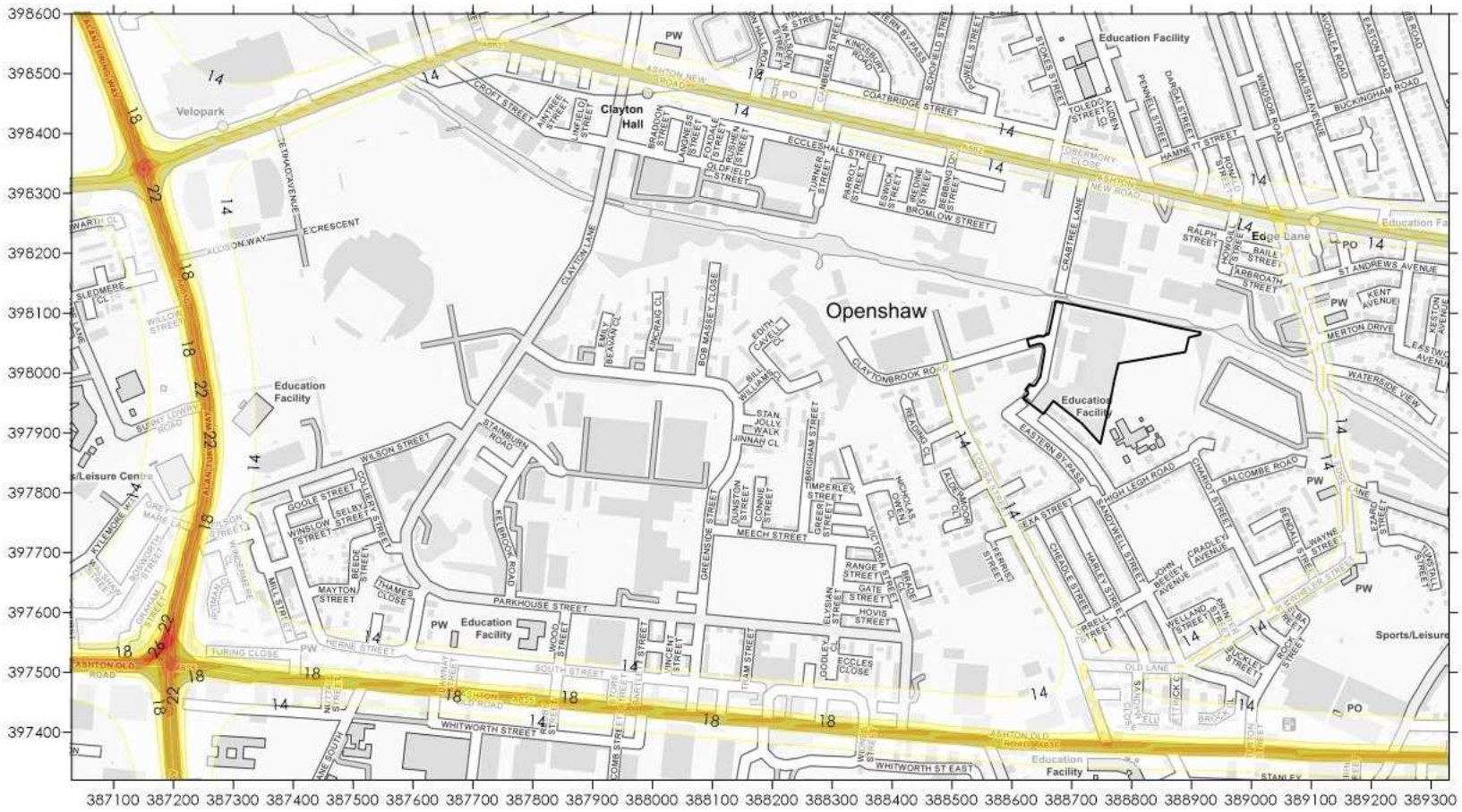
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Annual Mean PM_{10} Concentration (µg/m³)

26
24
22
20
18
16
14

Title
Figure 7 - Predicted Annual Mean PM_{10} Concentrations (µg/m³)
Do-Something

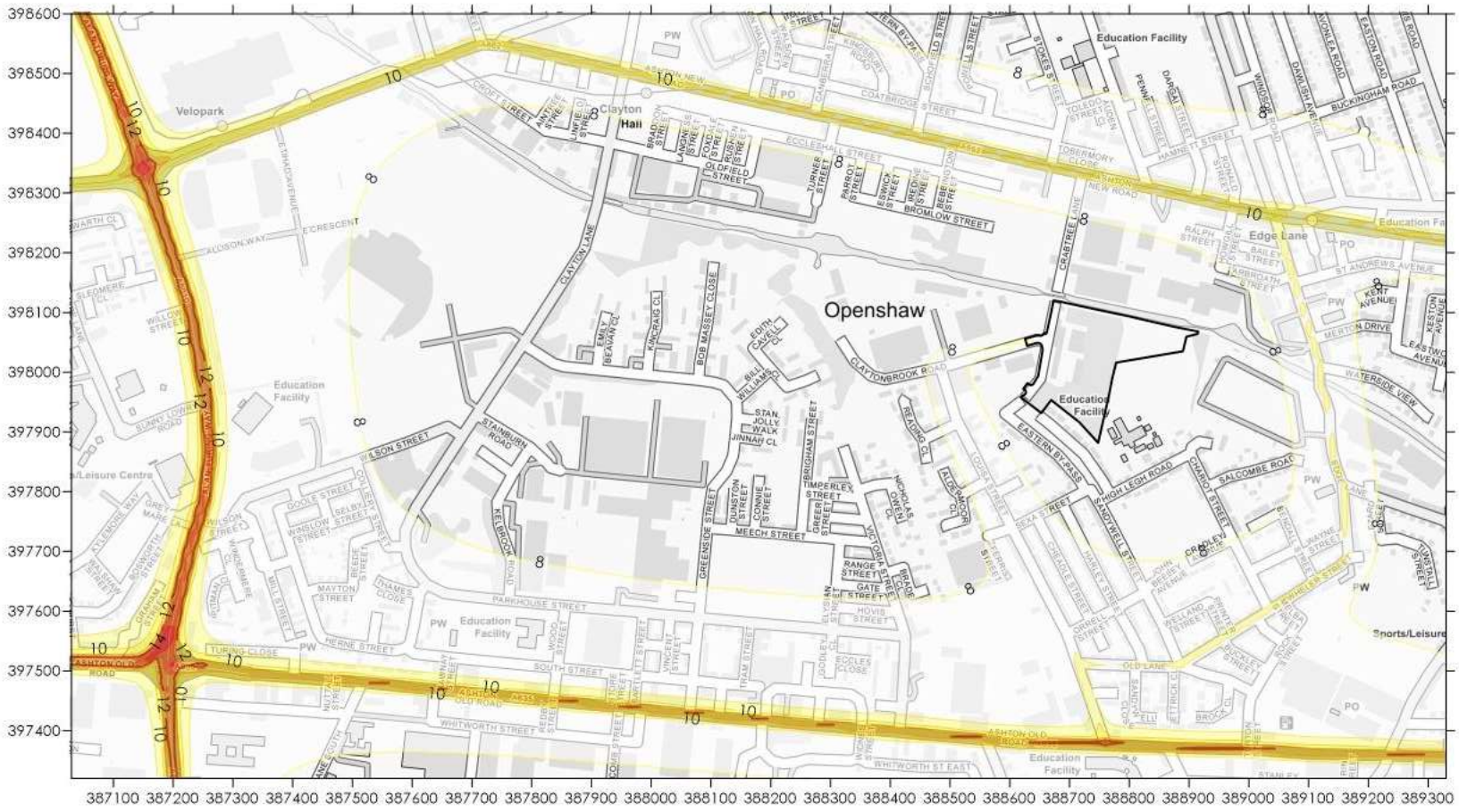
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Site Boundary

Annual Mean $PM_{2.5}$ Concentration (µg/m³)

14
13
12
11
10
9
8

Title
Figure 8 - Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m³)
Do-Minimum

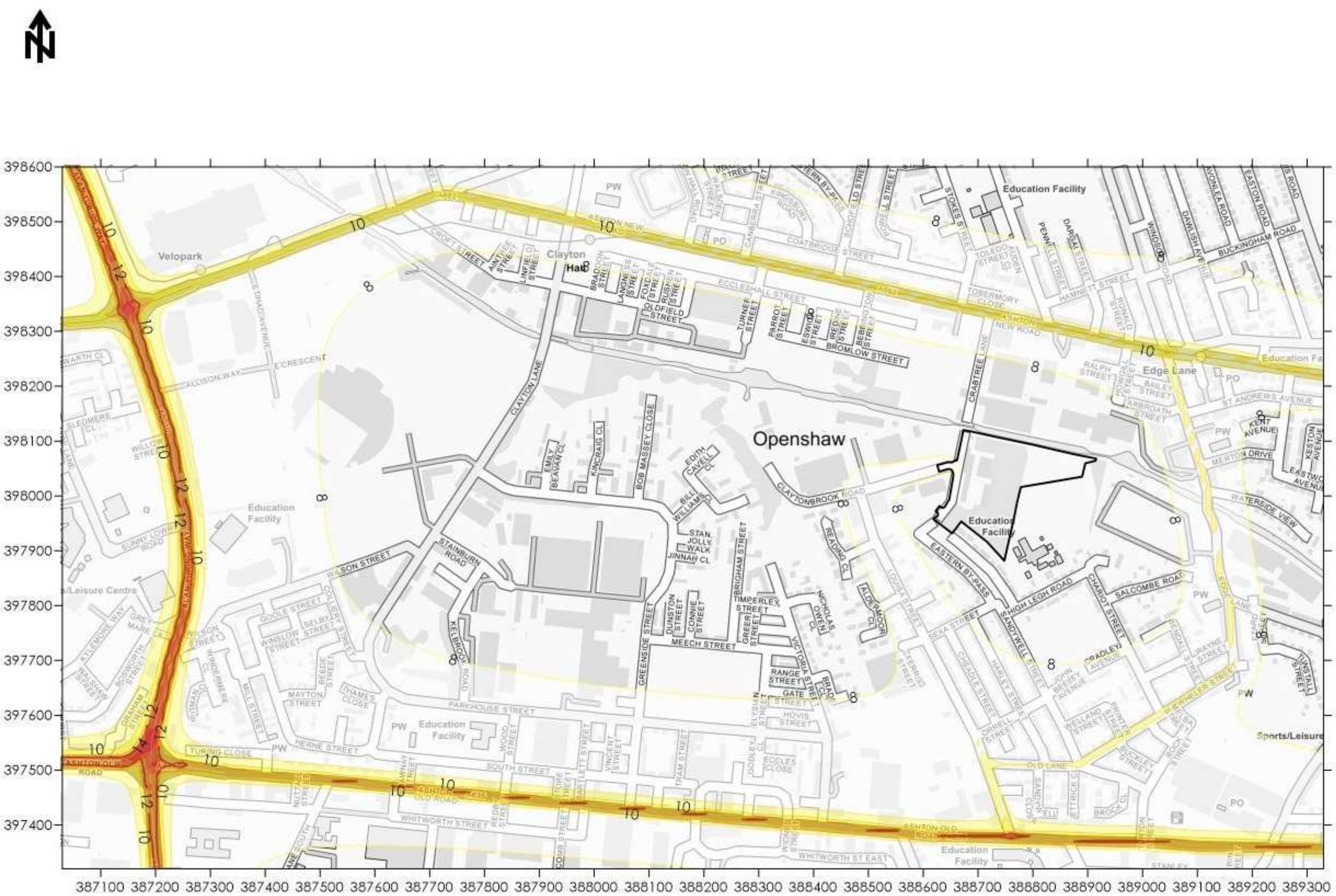
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Site Boundary

Annual Mean $PM_{2.5}$ Concentration (μg/m³): 14, 13, 12, 11, 10, 9, 8

Title
Figure 9 - Predicted Annual Mean $PM_{2.5}$ Concentrations (μg/m³) Do-Something

Project
Air Quality Assessment
Crabtree Lane, Manchester

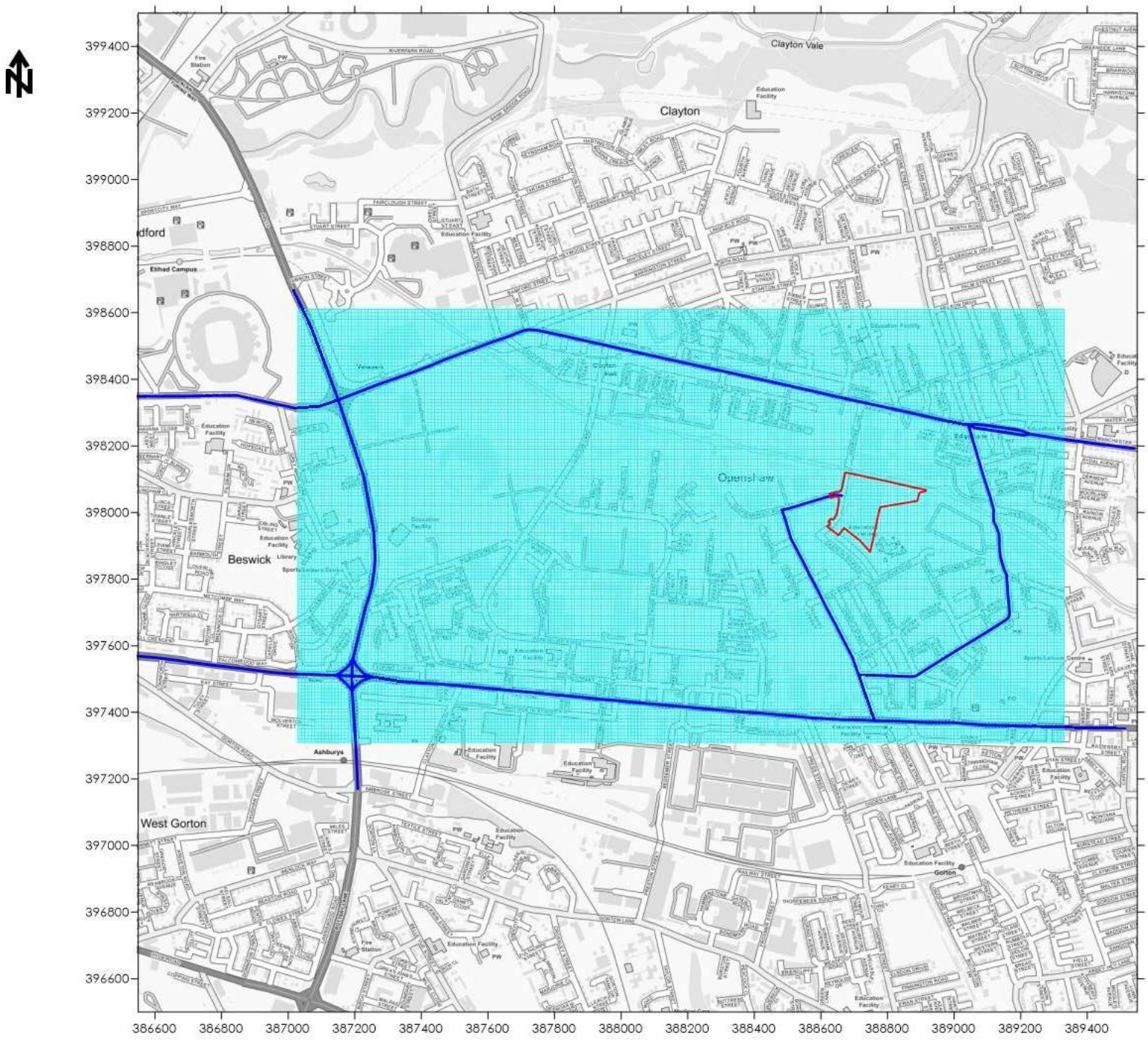
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Site Boundary

Road Link

Output Grid

Title
Figure 10 - ADMS-Roads Inputs

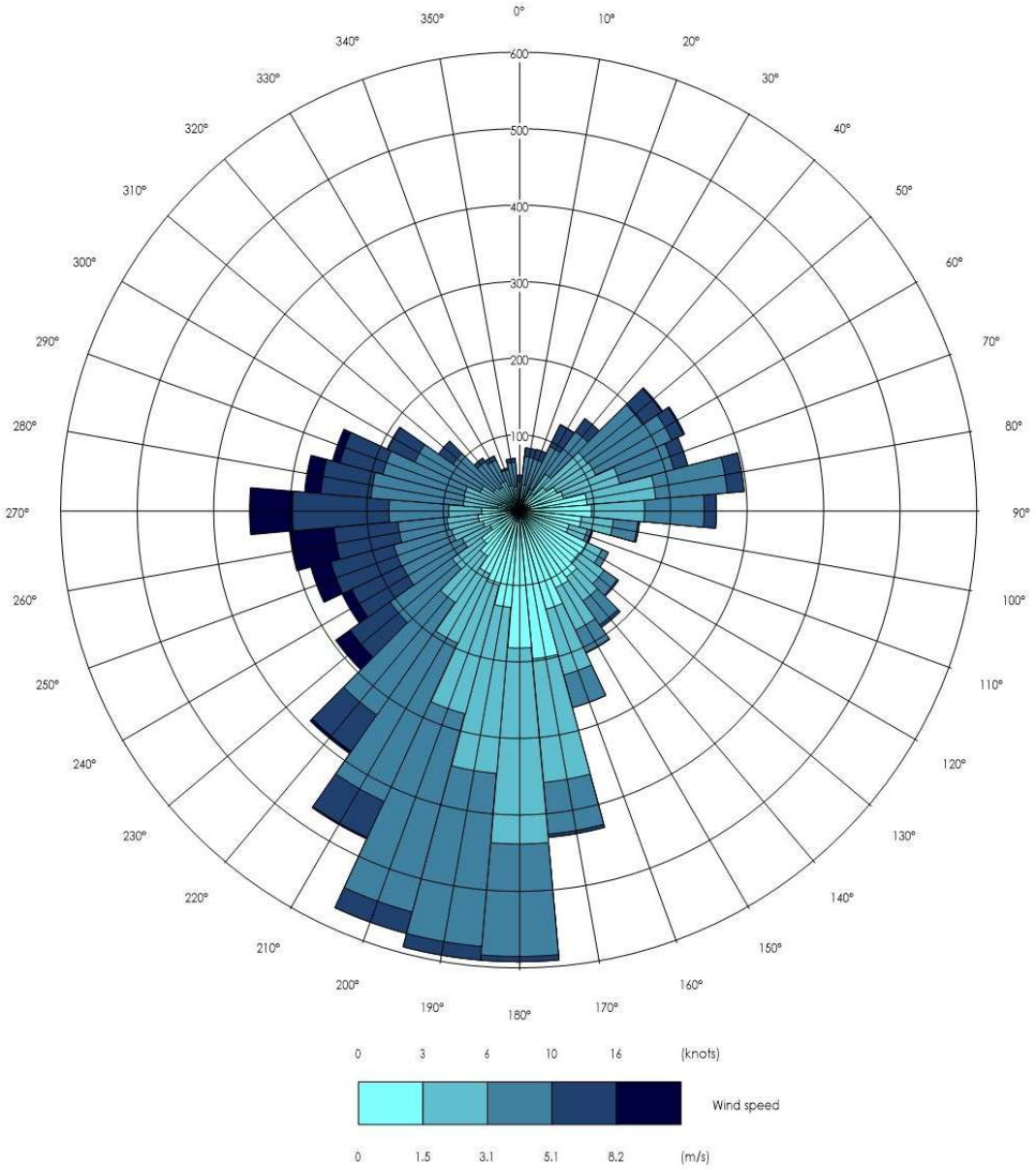
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Title
Figure 11 - Wind Rose for Manchester Airport Meteorological Station for 2023

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Appendix 1 - Assessment Input Data

Introduction

The proposals have the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0.1.3). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world 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.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

The relevant inputs are detailed in the following Sections.

Assessment Area

Ambient concentrations were predicted over the area NGR: 387030, 397310 to 389330, 398610. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 10 for a graphical representation of the assessment grid extents.

Traffic Flow Data

Baseline traffic data, including 24-hjour Annual Average Daily Traffic (AADT) flows and fleet composition, was obtained from the DfT[28]. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2023. It should be noted that the DfT web tool is referenced in DEFRA guidance[29] as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

The baseline traffic data was converted to the site opening year utilising a factor obtained from TEMPRo (Version 8.0). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

Vehicle movement associated with the development were provided by Curtins, the Transport Consultants for the project. These were added to the relevant links in order to determine future flows with the development in place.

Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards. A summary of the traffic flow data is provided in Table A1.1.

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Avg. Vehicle Speed (km/h)
		2023	2028 DM	2028 DS			
L1	Claytonbrook Road	263	277	880	22.91	7.2	30
L2	Louisa Street south of Clayton Brook Road Slow Phase (SP)	3,151	3,319	3,922	3.82	9.7	20
L3	Louisa Street south of Claytonbrook Road	3,151	3,319	3,922	3.82	7.4	40
L4	Louisa Street north of Old Lane SP	3,151	3,319	3,922	3.82	7.2	20
L5	Louisa Street south of Old Lane SP	5,790	6,099	6,618	2.67	7.3	20

28 https://roadtraffic.dft.gov.uk/#6/55.254/-11.107/basemap-regions-countpoints.

29 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Avg. Vehicle Speed (km/h)
		2023	2028 DM	2028 DS			
L6	Old Lane SP	3,565	3,756	3,840	1.93	6.0	20
L7	Old Lane	3,565	3,756	3,840	1.93	7.0	30
L8	Wheeler Street	5,818	6,128	6,213	3.55	7.8	40
L9	Wheeler Street SP	5,818	6,128	6,213	3.55	7.8	20
L10	Edge Lane	5,818	6,128	6,213	3.55	7.6	40
L11	Edge Lane SP	5,818	6,128	6,213	3.55	8.5	20
L12	Manchester Road Eastbound	6,902	7,271	7,278	3.19	6.4	20
L13	Manchester Road Westbound	5,378	5,665	5,673	3.90	6.4	20
L14	Manchester Road	12,280	12,936	12,952	3.51	10.3	45
L15	Ashton New Road west of Edge Lane SP	12,280	12,936	12,949	3.51	13.2	20
L16	Ashton New Road west of Edge Lane	12,280	12,936	12,949	3.51	9.5	45
L17	Ashton New Road Clayton Lane Junction SP	12,280	12,936	12,949	3.51	14.1	30
L18	Ashton New Road east of A6010	12,280	12,936	12,949	3.51	11.4	45
L19	Ashton New Road east of A6010 SP	12,280	12,936	12,949	3.51	18.7	20
L20	Ashton Old Road east of Louisa Street	20,245	21,326	21,504	3.84	11.1	20
L21	Ashton Old Road east of Turton Street	20,245	21,326	21,504	3.84	13.6	20
L22	Ashton Old Road east of Fairfield Street	20,245	21,326	21,504	3.84	11.4	45
L23	Ashton Old Road west of Louisa Street	20,245	21,326	21,667	3.84	10.9	45
L24	Ashton Old Road east of Victoria Street SP	20,245	21,326	21,667	3.84	15.4	20
L25	Ashton Old Road west of Victoria SP	20,245	21,326	21,667	3.84	15.4	20
L26	Ashton Old Road west of Victoria Street	20,245	21,326	21,667	3.84	11.8	45
L27	Ashton Old Road east of A6010	20,245	21,326	21,667	3.84	16.9	45
L28	Ashton Old Road east of A6010 SP	20,245	21,326	21,667	3.84	22.8	20
L29	Ashton Old Road east of A6010 through road SP	16,196	17,061	17,334	3.84	20.5	20

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Avg. Vehicle Speed (km/h)
		2023	2028 DM	2028 DS			
L30	A635 East to A6010 South SP	2,025	2,133	2,167	3.84	5.9	20
L31	A6010 North to A635 East Slip SP	2,025	2,133	2,167	3.84	5.7	20
L32	Ashton Old Road west of A6010 through road SP	2,608	2,748	2,766	4.17	20.4	20
L33	A6010 South to A6010 West Slip SP	2,608	2,748	2,766	4.17	5.9	20
L34	A635 West to A6010 North SP	20,867	21,982	22,130	4.17	5.7	20
L35	Ashton Old Road west of A6010 SP	26,084	27,477	27,662	4.17	16.7	20
L36	Ashton old Road west of A6010	26,084	27,477	27,662	4.17	11.8	45
L37	Ashton Old Road west of Brennock Close	26,084	27,477	27,662	4.17	11.8	45
L38	Ashton Old Road Staniforth Street and Gable Street Junction SP	26,084	27,477	27,662	4.17	17.2	20
L39	Pottery Lane	27,855	29,342	29,436	3.39	21.5	45
L40	Pottery Lane SP	27,855	29,342	29,436	3.39	22.5	20
L41	Pottery Lane through road SP	22,284	23,474	23,567	3.39	24.4	20
L42	Alan Turing Way through road SP	23,506	24,762	24,805	3.06	23.8	20
L43	Alan Turing Way north of A635 SP	29,383	30,952	30,995	3.06	22.6	20
L44	Alan Turing Way south of A662	29,383	30,952	30,995	3.06	19.2	45
L45	Alan Turing Way south of A662 SP	29,383	30,952	30,995	3.06	24.0	20
L46	Alan Turing Way north of A662 SP	28,037	29,534	29,577	4.07	24.0	20
L47	Alan Turing Way north of A662	28,037	29,534	29,577	4.07	16.0	45
L48	Ashton New Road west of A6010 SP	13,058	13,755	13,768	4.07	19.2	20
L49	Ashton New Road west of A6010	13,058	13,755	13,768	4.07	12.8	45

Reference should be made to Figure 10 for a graphical representation of the road link locations.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 12.1). This has been produced by DEFRA and incorporates COPERT 5.6 vehicle emission factors.

There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2023 emission factors were utilised in preference to the scheme opening year in order to provide robust model outputs. As predictions for 2023 were verified, it is considered the results are a robust indication of worst-case concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from Manchester Airport meteorological site over the period 1st January 2023 to 31st December 2023 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 15.5km south-west of the scheme. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 11 for a wind rose of the utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.5m was used to describe the modelling extents. This value is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

A z_0 of 0.2m was used to describe the meteorological site. This value is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (min)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe both the modelling extents and the meteorological site. This is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations for use in this assessment were obtained from the DEFRA mapping study for the grid square containing the monitor MA28NO (NGR: 334500, 439500) to include the highest NO_2 background concentration for a worst-case assessment. These are shown in Table A1.2.

Table A1.2 Background Pollutant Concentrations - Modelling Extents

Pollutant	Predicted Background Pollutant Concentrations (µg/m³)
NO_2	18.22
PM_{10}	13.02
$PM_{2.5}$	7.80

The background concentrations shown in Table A1.2 were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were higher than the DEFRA background from the grid square containing the site, as shown in Table 11.

Similarly to emission factors, background concentrations from 2023 were utilised in preference to the future year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations were converted to NO_2 concentrations using the spreadsheet provided by DEFRA, which is the method detailed within DEFRA guidance[30].

30 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of the assessment, model verification was undertaken for 2023 using traffic data, meteorological data and monitoring results from this year.

Monitoring of NO_2 concentrations was undertaken at three locations within the vicinity of roads included in the dispersion model during 2023. Results were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance[31]. The monitored annual mean NO_2 concentrations and calculated road NO_x concentrations are summarised in Table A1.3.

Table A1.3 NO_x Verification - Monitoring Results

Monitoring Location	Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_x Concentration ($\mu g/m^3$)
MA28NO	26.9	20.39
MA95BNO	31.5	32.61
TA17NO	27.5	21.92

The annual mean road NO_x concentrations predicted from the dispersion model and the road NO_x concentrations calculated from the monitoring results are summarised in Table A1.4.

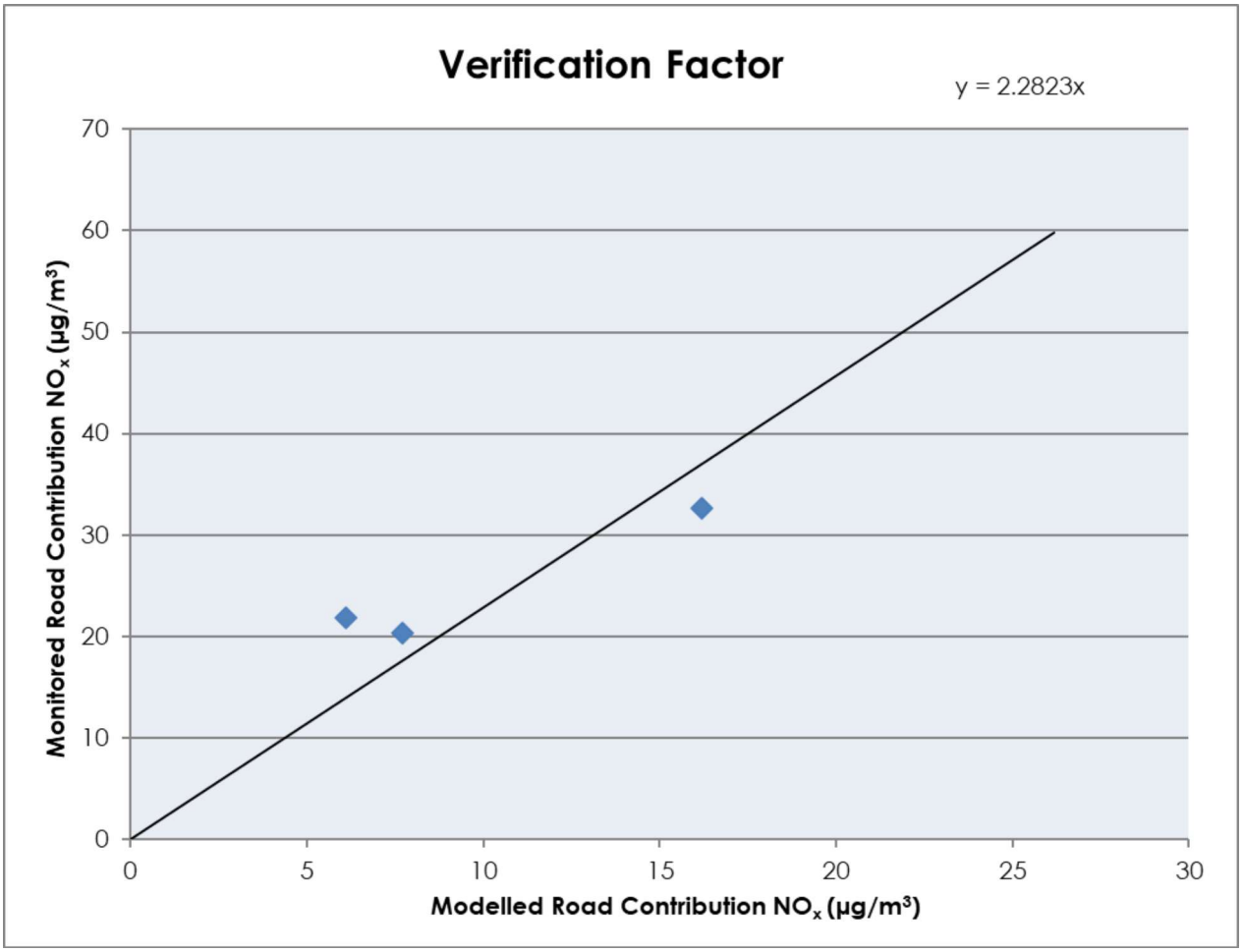
31 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Table A1.4 NO_x Verification - Modelling Results

Monitoring Location	Calculated Road NO_x Concentration (µg/m³)	Modelled Road NO_x Concentration (µg/m³)
MA28NO	20.39	7.73
MA95BNO	32.61	16.18
TA17NO	21.92	6.12

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated a verification factor of 2.2823 was required to be applied to all road NO_x modelling results, as shown in Graph 1.

Graph 1 NO_x Verification Factor



Monitoring of PM_{10} and $PM_{2.5}$ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance[32].

[32] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Appendix 2 - Curricula Vitae

JETHRO REDMORE

Director

BEng (Hons), MSc, MIAQM, MIEnvSc, PIEMA, CEnv

KEY EXPERIENCE:

Jethro is a Chartered Environmentalist and Director of Redmore Environmental with specialist experience in the air quality and odour sectors. His key capabilities include:

- Production and management of Air Quality, Dust and Odour Assessments for a wide-range of clients from the retail, residential, infrastructure, commercial and industrial sectors.
- Production and co-ordination of Environmental Permit applications for a variety of industrial sectors.
- Detailed dispersion modelling of road vehicle and industrial emissions using ADMS-Roads, ADMS-5, AERMOD-PRIME and BREEZE-ROADS. Studies have included impact assessment of ground level pollutant and odour concentrations and assessment of suitability of development sites for proposed end-use.
- Project management and co-ordination of Environmental Impact Assessments and scoping reports for developments throughout the UK.
- Provision of expert witness services at Planning Inquiries.
- Design and project management of pollutant monitoring campaigns.
- Co-ordination and management of large-scale multi-disciplinary projects and submissions.
- Provision of expert advice to local government and international environmental bodies, as well as involvement in production of industry guidance.

SELECT PROJECTS SUMMARY:

Industrial

Shanks Waste Management - Odour Assessments of two waste management facilities to support Environmental Permit Applications.

Tatweer Petroleum - dispersion modelling of Bahrain oil field.

Doha South Sewage Treatment Works - AQA for works extension in Qatar.

IRIS Environmental Appraisal Report Reviews, Isle of Man Government - odour assessment reviews.

Lankem, Greater Manchester - Environmental Permit Application for chemical manufacturing plant.

Newport Docks Bulk Drying, Pelleting and CHP Facility - air quality EIA for gas CHP.

Springshades, Leicester - Environmental Permit Variation Application for textile manufacturing plant.

Valspar, Chester - Odour Assessment and production of Odour Management Plan for a paint manufacturing plant in response to neighbour complaints.

Agrivert - dispersion modelling of odour and CHP emissions from numerous AD plants.

James Cropper Paper Mill, Cumbria - air quality EIA, Environmental Permit Variation and Human Health Risk Assessment for new biomass boiler adjacent to SSSI.

Rigg Approach, Leyton - Air Quality Assessment in support of waste transfer site.

Lynchford Lane Waste Transfer Station - biomass facility energy recovery plant.

Barnes Wallis Heat and Power, Cobham - biomass facility adjacent to AQMA.

Residential

Wood St Mill, Bury - residential development adjacent to scrap metal yard.

Hyams Lane, Holbrook - Odour Assessment to support residential development adjacent to sewage works.

North Wharf Gardens, London - peer review of EIA undertaken for large residential development.

Loxford Road, Alford - Air Quality EIA for residential development, included consideration of impacts from associated package sewage works

Elephant and Castle Leisure Centre - baseline AQA for redevelopment.

Carr Lodge, Doncaster - EIA for large residential development.

Queensland Road, Highbury - residential scheme including CHP.

Bicester Ecotown - dispersion modelling of energy centre.

Castleford Growth Delivery Plan - baseline air quality constraints assessment for town redevelopment.

York St, Bury - residential development adjacent to AQMA.

Temple Point Leeds - residential development adjacent to M1.

Commercial and Retail

Etihad Stadium - Air Quality EIA for the extension to the capacity of the Etihad Stadium, Manchester.

Wakefield College - redevelopment of city centre campus in AQMA.

Manchester Airport Cargo Shed - commercial development.

Manchester Airport Apron Extension - EIA including aircraft emission modelling.

National Youth Theatre, Islington - redevelopment to provide new arts space and accommodation.

ALEX CRAYTON

Associate Director

BSc (Hons), MIEnvSc, MIAQM

Tel: 0117 2510 595 | Email: alex.crayton@red-env.co.uk

KEY EXPERIENCE:

Alex is an Associate Director within Redmore Environmental with specialist experience in the air quality and odour sectors. His key capabilities include:

- Production of Air Quality Chapters to support large scale EIA developments for residential, mixed use and commercial land uses.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Undertaken dispersion modelling utilising ADMS and BREEZE AERMOD to assess air quality impacts of peak power plants and various industrial processes for planning and permit applications.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Production of site-specific construction environmental management plans.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Provided technical advice during a public debate on an odour nuisance issue.
- Qualitative and quantitative odour impact assessments determining the impact of odorous emissions on sensitive receptors
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Washingley Farm, Huntingdon

Air Quality Assessment forming part of an EIA for a proposed 500 residential unit development in Huntingdon. The assessment involved a construction impact assessment of fugitive dust emissions and an impact assessment of the operation of the development; this included increases in road traffic volume potentially impacting on local air quality. A cumulative impact assessment of relevant large scale committed developments in the area was key to the chapter.

Freightmaster Estate, Rainham

Air Quality Assessment for redevelopment of an industrial/storage park including the assessment of road transport emissions on an adjacent ecological designated site. Following a request from the local authority, a detailed review of the predicted impacts on the ecological site was provided.

Braintree Waste Transfer Station

Odour Impact Assessment compiled following comments from the Waste Planning Authority for a Waste Transfer Centre in Braintree. Odour concentrations were predicted at local sensitive receptors through a dispersion modelling assessment.

A46 Binley junction Improvement

Project managing a multi-disciplinary due diligence assessment of the A46 Binley Junction. Undertook passive air quality monitoring survey to support findings of Environmental Assessment Report (EAR).

Medway Industrial Estate

An Air Quality Assessment was required to determine the impacts of a proposed gas-fired engine Short Term Operating Reserve (STOR) site, located within an industrial estate. An iterative modelling process was undertaken in order to establish and agree a stack height with the Local Planning Authority. The industrial estate was located within a former quarry, thus meaning the ground level of the site was significantly below ground level (~9-16m). Through consultation with the engineers for the development several designs were discussed and modelled until a suitable solution was found.

Green Lanes, Haringey

A detailed Air Quality Assessment including dispersion modelling of both road transport emissions and energy centre emissions was provided. The energy centre included a fan assisted flue dilution system emitting at a low level in comparison with the adjacent residential blocks as part of the development. Calculations determined the relevant discharge velocity required in order to not produce significant effects on the residential receptors.

Fulham Town Hall, London

An Air Quality Assessment was provided for the proposed development converting Fulham Town Hall from the current usage into a hotel with business and leisure functions. Street canyon modelling was undertaken and input into the ventilation strategy and design provided in order to satisfy planning criteria due to high levels of air pollutant concentrations predicted.

MEGAN POND

Graduate Air Quality Consultant

BSc (Hons), AMIAQM, AMIEnvSc

Tel: 0117 2510 595 | Email: megan.pond@red-env.co.uk

KEY EXPERIENCE:

Megan is an Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included impact assessments on sensitive receptors and exposure of new residents to poor air quality.
- Advanced Canyon Modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sites.
- Production of Air Quality Neutral Assessments in accordance with The London Plan.
- Installation and management of diffusion tube monitoring campaigns in order to determine the potential for exposure of sensitive receptors to poor air quality.

SELECT PROJECTS SUMMARY:

Whitebirk, Blackburn

Air Quality Assessment in support of a residential development comprising demolition of existing buildings and construction of 152 dwellings on land at the Whitebirk Estate, Blackburn. The development had the potential to expose future occupants to any existing air quality issues and cause impacts at sensitive locations. Dispersion modelling was undertaken using ADMS-Roads. A construction dust assessment was also performed to provide mitigation for proposed dust generating activities. Results of the study indicated that air quality impacts and fugitive dust emissions were not significant.

Willow Lane, Mitcham

Air Quality Assessment in support of an industrial development off Willow Lane, Mitcham. Due to the size of the development, it was possible that traffic generated from the scheme may cause negative impacts on sensitive receptors nearby. NO_2 and PM_{10} concentrations were quantified at specific receptor points to ensure there would be no significant increases in pollution levels. Results revealed negligible impacts at all locations. An Air Quality Neutral Assessment was also undertaken in accordance with the London Plan. Following implementation of relevant mitigation measures, the development was considered Air Quality Neutral.

Harrow Road, London

Air Quality Assessment in support of a nursery. Detailed dispersion modelling, including advanced canyon inputs, was undertaken to evaluate the potential for exposure of future occupants to any existing issues at the site. The results indicated air quality conditions did not present an issue to planning consent.

The Green, Cheadle

Air Quality Assessment in support of a new Aldi store off the Green, Cheadle. Following concerns from the Local Authority regarding the potential for traffic generated by the proposals to cause air quality impacts, dispersion modelling was undertaken in order to quantify changes in pollutant concentrations at sensitive locations in the vicinity of the site. Results revealed negligible impacts at all locations.

Holloway Road, London

Kitchen Odour Assessment undertaken in line with the EMAQ+ and DEFRA guidance in support of a new restaurant on Holloway Road, London. Site-specific odour abatement options were identified in order to conform with best practice guidance. Based on the inclusion of the specified mitigation, odour effects associated with the development were not considered a constraint to planning consent.

Wyebridge Motors, Hereford

Ambient Air Quality Monitoring in support of a residential development. The Local Authority regarding the exposure of future residents to poor air quality as a result of pollution from the adjacent A49. Due to the irregular topography of the area, a scheme of diffusion tube monitoring was undertaken to determine baseline NO_2 concentrations at the site. Results indicated that concentrations were below the Air Quality Objective at the building façade and as such, the risk for exposure of future residents to poor air quality was not considered significant.