# Air Quality Assessment

# Mount Road, Gorton

**Client: Kellen Homes Limited**

**Reference: 6170r3**

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## Report Issue

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## Executive Summary

Redmore Environmental Ltd was commissioned by Kellen Homes and the Greater Manchester Youth Federation to undertake an Air Quality Assessment in support of a residential development on land off Mount Road, Gorton.

The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future residents to elevated pollution levels. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.

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 good practice 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 site. 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 predicted air quality impacts as a result of traffic generated by the development were not significant at any sensitive location in the vicinity of the site.

The results of the assessment also indicated that pollution levels were below the relevant criteria at all sensitive locations across the development. As such, the site is considered suitable for the proposed use from an air quality perspective.

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

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# 1.0 INTRODUCTION

## 1.1 Background

1.1.1 This Air Quality Assessment has been prepared by Redmore Environmental Ltd on behalf of Kellen Homes and the Greater Manchester Youth Federation and is submitted in support of an application for full planning permission at Land at Mount Road, Gorton.

1.1.2 The scheme has the potential to cause air quality impacts at sensitive locations during the construction and operational phases, as well as expose future residents to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential effects associated with the scheme.

## 1.2 Site Location and Context

1.2.1 The site is located on land at Mount Road, Gorton, at approximate National Grid Reference (NGR): 388324, 395034. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The development comprises a full planning application proposing the erection of a youth, sports and community hub (Use Class E(d)(g)), F2(b)), 2no football pitches combined netball and basketball court, cricket strip (Use Class F2 (c)), a three storey apartment building comprising 36no apartments for young person's accommodation (Use Class C3) and 267no dwellinghouses (Use Class C3a), with associated landscaping, public realm, ecological mitigation, refuse storage, drainage, car parking and other associated works, with access from Wembley Road and Mount Road.

1.2.3 An Air Quality Management Area (AQMA) has been declared by Manchester City Council (MCC) due to exceedences of the Air Quality Objective (AQO) for annual mean concentrations of nitrogen dioxide ($NO_2$). The development is partially located within the AQMA. As such, there is the potential for vehicles travelling to and from the development to increase pollution levels in this sensitive area and for the exposure of future residents to poor air quality. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions and consider potential effects as a result of the proposals. This is detailed in the following report.

# 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:

- $NO_2$;
- 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 and Interim Target for pollutants considered within this assessment.

**Table 1 Air Quality Objectives/Interim Target**

| Pollutant | Air Quality Objective/Interim 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 |

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

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<br>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<br>Hotels, unless people live there as their permanent residence<br>Gardens of residential properties<br>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |
| 24-hour mean | All locations where the annual mean objective would apply, together with hotels<br>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 |
|---|---|---|
| 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)<br>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<br>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 Local Authorities (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 AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), 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 September 2023 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 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 […]."

[4] NPPF, Ministry of Housing, Communities and Local Government, 2023.

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 on 6th March 2014 and updated on 1st November 2019 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?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

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

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

## 2.6 Local Planning Policy

2.6.1 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy Development Plan Document[6] is central. This was adopted by MCC on 11th July 2012 and provides policies which guide the determination of planning applications within the city.

2.6.2 Review of the Core Strategy 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."
>
> "Policy DM 1
>
> Development Management

[6] Core Strategy Development Plan Document, MCC, 2012.

> 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."

2.6.3 MCC has also produced an 'Air Quality & Planning Technical Guidance' Supplementary Planning Document[7] (SPD) which provides guidance on assessing the impact of proposed development on air quality.

2.6.4 The above policies and SPD were taken into consideration throughout the undertaking of the assessment.

[7] Air Quality & Planning Technical Guidance, MCC, 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, as well as expose future residents to elevated pollution levels. These issues have been assessed in accordance with the following methodology, which is based on the requirements of MCC's 'Air Quality & Planning Technical Guidance'[8].

## 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 V2.1'[9].

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.

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

[9] Guidance on the Assessment of Dust from Demolition and Construction V2.1, IAQM, 2023.

- Step 1

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**

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 through 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$^2$<br>• Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size)<br>• More than 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds greater than 8m in height |

| Magnitude | Activity | Criteria |
|---|---|---|
| | Construction | • Total building volume greater than 75,000m$^3$<br>• On site concrete batching<br>• Sandblasting |
| | Trackout | • More than 50 Heavy Duty Vehicle (HDV) trips per day<br>• Potentially dusty surface material (e.g. high clay content)<br>• Unpaved road length greater than 100m |
| Medium | Earthworks | • Total site area 18,000m$^2$ to 110,000m$^2$<br>• Moderately dusty soil type (e.g. silt)<br>• 5 to 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds 3m to 6m in height |
| | Construction | • Total building volume 12,000m$^3$ to 75,000m$^3$<br>• Potentially dusty construction material (e.g. concrete)<br>• On site concrete batching |
| | Trackout | • 20 to 50 HDV trips per day<br>• Moderately dusty surface material (e.g. high clay content)<br>• Unpaved road length 50m to 100m |
| Small | Earthworks | • Total site area less than 18,000m$^2$<br>• Soil type with large grain size (e.g. sand)<br>• Less than 5 heavy earth moving vehicles active at any one time<br>• Formation of bunds less than 4m in height |
| | Construction | • Total building volume less than 12,000m$^3$<br>• Construction material with low potential for dust release (e.g. metal cladding or timber) |
| | Trackout | • Less than 20 HDV trips per day<br>• Surface material with low potential for dust release<br>• Unpaved road length less than 50m |

3.2.12 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 4.

**Table 4 Construction Dust - Examples of Factors Defining Sensitivity of an Area**

| Receptor Sensitivity | Examples | |
|---|---|---|
| | **Human Receptors** | **Ecological Receptors** |
| High | • Users expect high levels of amenity<br>• High aesthetic or value property<br>• People expected to be present continuously for extended periods of time<br>• 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<br>• Aesthetics or value of their property could be diminished by soiling<br>• 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<br>• Property would not be expected to be diminished in appearance<br>• Transient exposure, where people would only be expected to be present for limited periods. E.g. public footpaths, shopping streets, playing fields, farmland, short term car parks and roads | • Locally designated site e.g. Local Nature Reserve |

3.2.13 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and,

- Any known specific receptor sensitivities which go beyond the classifications given in the document.

3.2.14 These factors were considered in the undertaking of this assessment.

3.2.15 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 350 |
| High | More than 100 | High | High | Medium | Low |
| | 10 - 100 | High | Medium | Low | Low |
| | 1 - 10 | Medium | Low | Low | Low |
| Medium | More than 1 | Medium | Low | Low | Low |
| Low | More than 1 | Low | Low | Low | Low |

3.2.16 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 200 | Less than 350 |
| High | Greater than 32µg/m$^3$ | More than 100 | High | High | High | Medium | Low |
| | | 10 - 100 | High | High | Medium | Low | Low |
| | | 1 - 10 | High | Medium | Low | Low | Low |
| | 28 - 32µg/m$^3$ | More than 100 | High | High | Medium | Low | Low |
| | | 10 - 100 | High | Medium | Low | Low | Low |
| | | 1 - 10 | High | Medium | 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 200 | Less than 350 |
| | 24 - 28µg/m$^3$ | More than 100 | High | Medium | Low | Low | Low |
| | | 10 - 100 | High | Medium | Low | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low | Low |
| | Less than 24µg/m$^3$ | More than 100 | Medium | Low | Low | Low | Low |
| | | 10 - 100 | Low | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| Medium | Greater than 32µg/m$^3$ | More than 10 | High | Medium | Low | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low | Low |
| | 28 - 32µg/m$^3$ | More than 10 | Medium | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| | 24 - 28µg/m$^3$ | More than 10 | Low | Low | Low | Low | Low |
| | | 1 -10 | Low | Low | Low | Low | Low |
| | Less than 24µg/m$^3$ | More than 10 | Low | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| Low | - | 1 or more | Low | Low | Low | Low | Low |

3.2.17 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 |

| Receptor Sensitivity | Distance from the Source (m) | |
|---|---|---|
| | Less than 20 | Less than 50 |
| Low | Low | Low |

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

3.2.19 Table 8 outlines the risk category from earthworks and construction activities.

**Table 8 Construction Dust - Dust Risk Category from Earthworks and Construction Activities**

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

3.2.20 Table 9 outlines the risk category from trackout activities.

**Table 9 Construction Dust - Dust Risk Category from Trackout Activities**

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

**Step 3**

3.2.21 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance[10] to reduce potential dust impacts based upon the relevant risk categories

[10] Guidance on the Assessment of Dust from Demolition and Construction V2.1, IAQM, 2023.

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**

3.2.22 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**.

3.2.23 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. The IAQM guidance[11] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

## 3.3 Operational Phase Assessment

**Potential Development Impacts**

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

- 2019 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2025 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2025 should the proposals be completed).

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

[11] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017

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)[12] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[13] 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'[14]. 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 10.

**Table 10 Significance of Operational Phase Road Vehicle Exhaust Emissions Impact**

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

3.3.5 The matrix shown in Table 10 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

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

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

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

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[15] 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[16] 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.

**Potential Future Exposure**

3.3.9 The proposals have the potential to expose future residents to elevated pollution levels. In order to assess $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations across the development site, detailed dispersion modelling was undertaken. Reference should be made to Appendix 1 for a full description of the assessment input data.

3.3.10 The dispersion modelling results were compared against the relevant AQOs and Interim Target in order to determine the potential for exposure of future residents to elevated pollutant concentrations and identify any requirement for mitigation.

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

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 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 partially located within the AQMA. As such, there is the potential for vehicles travelling to and from the site to increase pollution levels in this sensitive area and exposure of future residents to poor air quality. This has been considered throughout the assessment.

4.2.3 MCC has 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 throughout their area of jurisdiction. Recent $NO_2$ results recorded in the vicinity of the development are shown in Table 11. Any exceedences of the AQO are shown in **bold**.

**Table 11 Monitoring Results**

| Monitoring Site | | Monitored Annual Mean $NO_2$ Concentration (µg/m³) | | | |
|---|---|---|---|---|---|
| | | 2019 | 2020 | 2021 | 2022 |
| MA73NO | Hyde Road | 38.0 | 27.3 | 31.6 | 31.5 |
| MA75NO | Stockport Road | **47.0** | 33.7 | 39.0 | 38.8 |

4.3.2 As shown in Table 11, annual mean $NO_2$ concentrations exceeded the AQO at MA75NO in 2019. As this site is located at a roadside location, elevated results would be expected. Concentrations were below the AQO at MA73NO. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 Pollutant concentrations recorded during 2020 and 2021 were lower than 2019 due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.

4.3.4 MCC does not undertake monitoring of $PM_{10}$ or $PM_{2.5}$ 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 in grid square NGR: 388500, 395500. Data for this location was downloaded from the DEFRA website[18] for the purpose of the assessment and is summarised in Table 12.

**Table 12 Background Pollutant Concentration Predictions**

| Pollutant | Predicted Background Pollutant Concentration (µg/m³) | | |
|---|---|---|---|
| | 2019 | 2023 | 2025 |
| $NO_2$ | 16.82 | 14.41 | 13.43 |
| $PM_{10}$ | 12.82 | 12.21 | 11.99 |
| $PM_{2.5}$ | 8.85 | 8.44 | 8.29 |

[18] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

4.4.2 As shown in Table 12, predicted background $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations are below the relevant AQOs and Interim 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.

### 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 350m from the development boundary. These are summarised in Table 13.

**Table 13 Earthworks and Construction Dust Sensitive Receptors**

| Distance from Site Boundary (m) | Approximate Number of Human Receptors | Approximate Number of Ecological Receptors |
|---|---|---|
| Up to 20 | More than 100 | 0 |
| Up to 50 | More than 100 | 0 |
| Up to 100 | More than 100 | - |
| Up to 350 | More than 100 | - |

4.5.3 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 500m of the site access. These are summarised in Table 14.

**Table 14 Trackout Dust Sensitive Receptors**

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

4.5.4 There are no ecological receptors within 50m of the development boundary or the access route within 500m of the site entrance. As such, ecological impacts have not been assessed further within this report.

4.5.5 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 15.

**Table 15 Additional Area Sensitivity Factors to Potential Dust Impacts**

| Guidance | Comment |
|---|---|
| Whether there is any history of dust generating activities in the area | The baseline study did not indicate any dust generating activities in the local area |
| The likelihood of concurrent dust generating activity on nearby sites | A review of the planning portal did not indicate any additional development proposals likely to result in concurrent dust generation in the vicinity of the site |
| Pre-existing screening between the source and the receptors | Trees and vegetation are located along the east boundary and sporadically along the south and west boundaries of the proposed site. These may act as a barrier between emission sources and receptors should they be retained during construction |
| Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place | As shown in Figure 3, the predominant wind bearing at the site is from the south. As such, receptors to the north are most likely to be affected by dust releases |
| Conclusions drawn from local topography | There are no significant topographical constraints to dust dispersion |
| Duration of the potential impact, as a receptor may become more sensitive over time | Currently it is unclear as to the duration of the construction phase. However, it is likely that it will extend over one year. The sensitivity of nearby receptors is unlikely to change during this time |
| Any known specific receptor sensitivities which go beyond the classifications given in the document | No specific receptor sensitivities identified during the baseline assessment |

4.5.6 Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because the identified receptors included schools and residential properties.

4.5.7 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 16.

**Table 16 Sensitivity of the Surrounding Area to Potential Dust Impacts**

| Potential Impact | Sensitivity of the Surrounding Area | | |
|---|---|---|---|
| | Earthworks | Construction | Trackout |
| Dust Soiling | High | High | High |
| Human Health | Medium | Medium | Medium |

**Operational Phase Sensitive Receptors**

4.5.8 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 17. Receptor heights were selected based on the location of residential units to allow for less sensitive land uses, such as retail, at ground level.

**Table 17 Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations**

| Receptor | | NGR (m) | | Height (m) |
|---|---|---|---|---|
| | | X | Y | |
| R1 | Gorton Primary School | 388086 | 395124 | 1.5 |
| R2 | Grange School | 388128 | 394903 | 1.5 |
| R3 | Residential - Matthews Lane | 388147 | 394835 | 1.5 |
| R4 | Residential - Mount Road | 388182 | 394767 | 1.5 |
| R5 | Residential - Mount Road | 388184 | 394543 | 1.5 |
| R6 | Residential - Hornbeam Road | 387815 | 394768 | 1.5 |
| R7 | Residential - Stockport Road | 387345 | 394694 | 4.5 |
| R8 | Residential - Buckley Road | 388080 | 395687 | 4.5 |
| R9 | Residential - B6178 | 387961 | 396286 | 1.5 |
| R10 | Residential - Hyde Road | 388306 | 396133 | 1.5 |
| R11 | Residential - Stockport Road | 387396 | 394388 | 4.5 |

4.5.9 Reference should be made to Figure 4 for a map of road vehicle exhaust emission sensitive receptor locations.

# 5.0 ASSESSMENT

## 5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction and operation of the proposed development, as well as the exposure of future residents to poor air quality. These issues are assessed in the following Sections.

## 5.2 Construction Phase Assessment

**Step 1**

5.2.1 The undertaking of activities such as excavation, ground works, cutting, construction and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements on the local road network also have the potential to result in the re-suspension of dust from 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 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

**Step 2**

Earthworks

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

5.2.5 Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 8, the development is considered to be a **medium** risk site for dust soiling as a result of earthworks.

5.2.6 Table 16 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 8, the development is considered to be a **medium** risk site for human health impacts as a result of earthworks.

Construction

5.2.7 Due to the size of the development, the total building volume will be greater than 75,000m$^3$. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **large**.

5.2.8 Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 8, the development is considered to be a **high** risk site for dust soiling as a result of construction activities.

5.2.9 Table 16 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 8, the development is considered to be a **medium** risk site for human health impacts as a result of construction activities.

Trackout

5.2.10 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**.

5.2.11 Table 16 indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria outlined in Table 9, the development is considered to be a **high** risk site for dust soiling as a result of trackout activities.

5.2.12 Table 16 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 9, the development is considered to be a **medium** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

5.2.13 A summary of the risk from each dust generating activity is provided in Table 18.

**Table 18 Summary of Potential Unmitigated Dust Risks**

| Potential Impact | Risk | | |
|---|---|---|---|
| | Earthworks | Construction | Trackout |
| Dust Soiling | Medium | High | High |
| Human Health | Medium | Medium | Medium |

5.2.14 As indicated in Table 18, the potential risk of dust soiling is **high** from construction and trackout and **medium** from earthworks. The potential risk of human health effects is **medium** from earthworks, construction and trackout.

5.2.15 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.

**Step 3**

5.2.16 The IAQM guidance[19] 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 19. 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.

[19] Guidance on the Assessment of Dust from Demolition and Construction V2.1, IAQM, 2023.

**Table 19 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.<br>• 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<br>• Display the head or regional office contact information<br>• Develop and implement a Dust Management Plan (DMP) or similar, 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<br>• Make the complaints log available to the LA upon request<br>• Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book |
| Monitoring | • Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA when asked<br>• Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request<br>• 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<br>• Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site<br>• Fully enclose specific operations where there is a high potential for dust production and they are active for an extensive period<br>• Avoid site runoff of water or mud<br>• Keep site fencing, barriers and scaffolding clean using wet methods<br>• Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used<br>• 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<br>• Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable<br>• Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas |

| Issue | Control Measure |
|---|---|
| Operations | • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques<br>• Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate<br>• Use enclosed chutes and conveyors and covered skips<br>• Minimise drop heights and use fine water sprays wherever appropriate<br>• Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods |
| Waste management | • No bonfires and burning of waste materials |
| Earthworks | • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable<br>• Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable<br>• Only remove the cover in small areas during work and not all at once |
| Construction | • Avoid scabbling (roughening of concrete surfaces), if possible<br>• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out<br>• Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery |
| Trackout | • Use water-assisted dust sweeper on access and local roads, if required<br>• Avoid dry sweeping of large areas<br>• Ensure vehicles entering and leaving site are covered to prevent escape of materials<br>• Implement a wheel washing system, if required<br>• Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever the size and layout permits |

**Step 4**

5.2.17 Assuming the relevant mitigation measures outlined in Table 19 are implemented, the residual impact from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance[20].

[20] Guidance on the Assessment of Dust from Demolition and Construction V2.1, IAQM, 2023.

## 5.3 Operational Phase Assessment

### Potential Development Impacts

5.3.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. 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.

5.3.2 The assessment included the following scenarios:

- 2019 - Verification;
- 2025 - DM; and,
- 2025 - DS.

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

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

Predicted Concentrations

5.3.5 Annual mean $NO_2$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20.

**Table 20 Predicted Annual Mean $NO_2$ Concentrations**

| Receptor | | Predicted Annual Mean $NO_2$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Gorton Primary School | 35.32 | 35.68 | 0.36 |
| R2 | Grange School | 34.31 | 34.55 | 0.24 |
| R3 | Residential - Matthews Lane | 35.30 | 35.53 | 0.23 |

| Receptor | | Predicted Annual Mean $NO_2$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R4 | Residential - Mount Road | 36.29 | 36.52 | 0.23 |
| R5 | Residential - Mount Road | 33.39 | 33.53 | 0.14 |
| R6 | Residential - Hornbeam Road | 30.68 | 30.76 | 0.08 |
| R7 | Residential - Stockport Road | 35.61 | 35.68 | 0.07 |
| R8 | Residential - Buckley Road | 33.41 | 33.66 | 0.25 |
| R9 | Residential - B6178 | 37.37 | 37.68 | 0.31 |
| R10 | Residential - Hyde Road | 35.05 | 35.16 | 0.11 |
| R11 | Residential - Stockport Road | 33.74 | 33.77 | 0.03 |

5.3.6 As indicated in Table 20, predicted annual mean $NO_2$ concentrations were below the relevant AQO at all receptors in both scenarios.

5.3.7 Reference should be made to Figures 5 and 6 for graphical representations of annual mean $NO_2$ concentrations for the DM and DS scenarios, respectively.

5.3.8 Annual mean $PM_{10}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 21.

**Table 21 Predicted Annual Mean $PM_{10}$ Concentrations**

| Receptor | | Predicted Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Gorton Primary School | 15.13 | 15.24 | 0.12 |
| R2 | Grange School | 14.83 | 14.91 | 0.08 |
| R3 | Residential - Matthews Lane | 15.40 | 15.49 | 0.09 |
| R4 | Residential - Mount Road | 15.85 | 15.95 | 0.09 |
| R5 | Residential - Mount Road | 14.73 | 14.78 | 0.05 |
| R6 | Residential - Hornbeam Road | 13.69 | 13.72 | 0.03 |

| Receptor | | Predicted Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R7 | Residential - Stockport Road | 15.51 | 15.53 | 0.02 |
| R8 | Residential - Buckley Road | 14.73 | 14.82 | 0.10 |
| R9 | Residential - B6178 | 15.99 | 16.11 | 0.11 |
| R10 | Residential - Hyde Road | 14.82 | 14.85 | 0.03 |
| R11 | Residential - Stockport Road | 14.84 | 14.85 | 0.01 |

5.3.9 As indicated in Table 21, predicted annual mean $PM_{10}$ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

5.3.10 Reference should be made to Figures 7 and 8 for graphical representations of annual mean $PM_{10}$ concentrations for the DM and DS scenarios, respectively.

5.3.11 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 22.

**Table 22 Predicted Annual Mean $PM_{2.5}$ Concentrations**

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Gorton Primary School | 9.92 | 9.99 | 0.07 |
| R2 | Grange School | 9.75 | 9.80 | 0.04 |
| R3 | Residential - Matthews Lane | 10.06 | 10.11 | 0.05 |
| R4 | Residential - Mount Road | 10.31 | 10.36 | 0.05 |
| R5 | Residential - Mount Road | 9.69 | 9.72 | 0.03 |
| R6 | Residential - Hornbeam Road | 9.11 | 9.13 | 0.02 |
| R7 | Residential - Stockport Road | 10.12 | 10.14 | 0.01 |
| R8 | Residential - Buckley Road | 9.69 | 9.74 | 0.05 |
| R9 | Residential - B6178 | 10.40 | 10.46 | 0.06 |

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R10 | Residential - Hyde Road | 9.75 | 9.77 | 0.02 |
| R11 | Residential - Stockport Road | 9.75 | 9.76 | 0.01 |

5.3.12 As indicated in Table 22, predicted annual mean $PM_{2.5}$ concentrations were below the Interim Target at all sensitive receptors in both scenarios.

5.3.13 Reference should be made to Figures 9 and 10 for graphical representations of annual mean $PM_{2.5}$ concentrations for the DM and DS scenarios, respectively.

Predicted Impacts

5.3.14 Predicted impacts on annual mean $NO_2$ concentrations at the sensitive receptor locations are summarised in Table 23.

**Table 23 Predicted Impacts - $NO_2$**

| Receptor | | Predicted Annual Mean $NO_2$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Gorton Primary School | 76 - 94% of AQO | 1 | Negligible |
| R2 | Grange School | 76 - 94% of AQO | 1 | Negligible |
| R3 | Residential - Matthews Lane | 76 - 94% of AQO | 1 | Negligible |
| R4 | Residential - Mount Road | 76 - 94% of AQO | 1 | Negligible |
| R5 | Residential - Mount Road | 76 - 94% of AQO | 0 | Negligible |
| R6 | Residential - Hornbeam Road | 76 - 94% of AQO | 0 | Negligible |
| R7 | Residential - Stockport Road | 76 - 94% of AQO | 0 | Negligible |
| R8 | Residential - Buckley Road | 76 - 94% of AQO | 1 | Negligible |
| R9 | Residential - B6178 | 95 - 102% of AQO | 1 | Slight |
| R10 | Residential - Hyde Road | 76 - 94% of AQO | 0 | Negligible |

| Receptor | | Predicted Annual Mean $NO_2$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R11 | Residential - Stockport Road | 76 - 94% of AQO | 0 | Negligible |

5.3.15 As indicated in Table 23, impacts on annual mean $NO_2$ concentrations as a result of the proposed development were predicted to be **slight** at one receptor and **negligible** at all remaining locations.

5.3.16 Predicted impacts on annual mean $PM_{10}$ concentrations at the sensitive receptor locations are summarised in Table 24.

**Table 24 Predicted Impacts - $PM_{10}$**

| Receptor | | Predicted Annual Mean $PM_{10}$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Gorton primary school | Below 75% of AQO | 0 | Negligible |
| R2 | Grange School | Below 75% of AQO | 0 | Negligible |
| R3 | Residential - Matthews Lane | Below 75% of AQO | 0 | Negligible |
| R4 | Residential - Mount Road | Below 75% of AQO | 0 | Negligible |
| R5 | Residential - Mount Road | Below 75% of AQO | 0 | Negligible |
| R6 | Residential - Hornbeam Road | Below 75% of AQO | 0 | Negligible |
| R7 | Residential - Stockport Road | Below 75% of AQO | 0 | Negligible |
| R8 | Residential - Buckley Road | Below 75% of AQO | 0 | Negligible |
| R9 | Residential - B6178 | Below 75% of AQO | 0 | Negligible |
| R10 | Residential - Hyde Road | Below 75% of AQO | 0 | Negligible |
| R11 | Residential - Stockport Road | Below 75% of AQO | 0 | Negligible |

5.3.17 As indicated in Table 24, impacts on annual mean $PM_{10}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

5.3.18 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 25.

**Table 25 Predicted Impacts - $PM_{2.5}$**

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration | Predicted Concentration Change as Proportion of Interim Target (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Gorton primary school | 76 - 94% of Interim Target | 1 | Negligible |
| R2 | Grange School | 76 - 94% of Interim Target | 0 | Negligible |
| R3 | Residential - Matthews Lane | 76 - 94% of Interim Target | 0 | Negligible |
| R4 | Residential - Mount Road | 76 - 94% of Interim Target | 0 | Negligible |
| R5 | Residential - Mount Road | 76 - 94% of Interim Target | 0 | Negligible |
| R6 | Residential - Hornbeam Road | 76 - 94% of Interim Target | 0 | Negligible |
| R7 | Residential - Stockport Road | 76 - 94% of Interim Target | 0 | Negligible |
| R8 | Residential - Buckley Road | 76 - 94% of Interim Target | 0 | Negligible |
| R9 | Residential - B6178 | 76 - 94% of Interim Target | 0 | Negligible |
| R10 | Residential - Hyde Road | 76 - 94% of Interim Target | 0 | Negligible |
| R11 | Residential - Stockport Road | 76 - 94% of Interim Target | 0 | Negligible |

5.3.19 As indicated in Table 25, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

**Potential Future Exposure**

5.3.20 The proposed development has the potential to expose future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 6, 8 and 10 for graphical representations of predicted annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations.

5.3.21 As shown in Figure 6, annual mean $NO_2$ concentrations were predicted to be below the AQO of 40µg/m$^3$ at all sensitive locations across the site. The maximum level at the building façade fronting Mount Road was 34.78µg/m$^3$.

5.3.22 As shown in Figure 8, annual mean $PM_{10}$ concentrations were predicted to be below the AQO of 40µg/m$^3$ at all sensitive locations across the site. The maximum level at the building façade fronting Mount Road was 14.46µg/m$^3$.

5.3.23 As shown in Figure 10, annual mean $PM_{2.5}$ concentrations were predicted to be below the Interim Target of 12µg/m$^3$ at all sensitive locations across the site. The maximum level at the building façade fronting Mount Road was 9.83µg/m$^3$.

5.3.24 Based on the assessment results, future residents are not predicted to be exposed to pollutant concentrations above the relevant AQOs and Interim Target. As such, the site is considered suitable for the proposed use from an air quality perspective.

**Overall Impact Significance**

5.3.25 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 26.

**Table 26 Overall Road Vehicle Exhaust Emissions Impact Significance**

| 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<br>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 |

| Guidance | Comment |
|---|---|
| The influence and validity of any assumptions adopted when undertaking the prediction of impacts | It is assumed that background pollution levels will not reduce in future years. This is likely to provide an overestimation of concentrations during the operation of the proposals and is therefore considered to provide a robust assessment.<br>Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature |

5.3.26 The IAQM guidance[21] 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.

[21] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

# 6.0 MITIGATION

6.1.1 A number of mitigation measures have been included within the development in accordance with the requirements of the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[22] to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. Table 27 describes the good practice principles detailed in the IAQM guidance[23] along with how each has been addressed with regards to the proposals.

**Table 27 Good Practice Design Principles for Operational Phase Air Quality Impacts**

| Phase | Principle | Action |
|---|---|---|
| Design Phase | New developments should not contravene the Council's AQAP[24], 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 public transport and amenities |
| Operational Phase | The provision of at least 1 Electric Vehicle (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 | EV charging points are proposed as part of the development. These include one charging station per dwelling and 10% provision for non-residential spaces |

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

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

24 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[25] has been produced in support of the development which sets out measures to encourage sustainable means of transport |
| | All gas-fired boilers to meet a minimum standard of <40mg$NO_x$/kWh.<br>All gas-fired CHP plant to meet a minimum emissions standard of:<br>• Spark ignition engine: 250mg$NO_x$/$Nm^3$;<br>• Compression ignition engine: 400mg$NO_x$/$Nm^3$;<br>• Gas turbine: 50mgNOx/$Nm^3$.<br>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:<br>• Solid biomass boiler: 275mg$NO_x$/$Nm^3$ and 25mgPM/$Nm^3$ | Any boilers to be included in the development will be provisioned in accordance with the relevant requirements |

6.1.2 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.

[25] Proposed Residential and Community Facility Development Land at Mount Road, Gorton, Manchester, Travel Plan Framework, CBO Transport, 2023.

## 7.0 CONCLUSION

7.1.1 Redmore Environmental Ltd was commissioned by Kellen Homes and Greater Manchester Youth Federation to undertake an Air Quality Assessment in support of a residential development on land off Mount Road, Gorton, Manchester.

7.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future residents to elevated pollution levels. As such, an Air Quality Assessment was required in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential effects as a result of the scheme.

7.1.3 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. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **not significant**.

7.1.4 The proposed development has the potential to impact on existing air quality in the vicinity of the site and expose future residents to elevated pollution levels during operation. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations as a result of emissions from the highway network. Results were subsequently verified using local monitoring data.

7.1.5 Review of the dispersion modelling results indicated that impacts on annual mean $NO_2$, concentrations as a result of exhaust emissions associated with traffic generated by the development were predicted to be **slight** at one receptor and **negligible** at all remaining locations. Impacts on $PM_{10}$ and $PM_{2.5}$ concentrations were **negligible** at all receptors.

7.1.6 The results of the dispersion modelling assessment also indicated that $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations were predicted to be below the relevant AQOs and Interim Target at all sensitive locations across the development. As such, the site is considered suitable for the proposed use from an air quality perspective.

7.1.7 Following consideration of the relevant issues, air quality impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance[26].

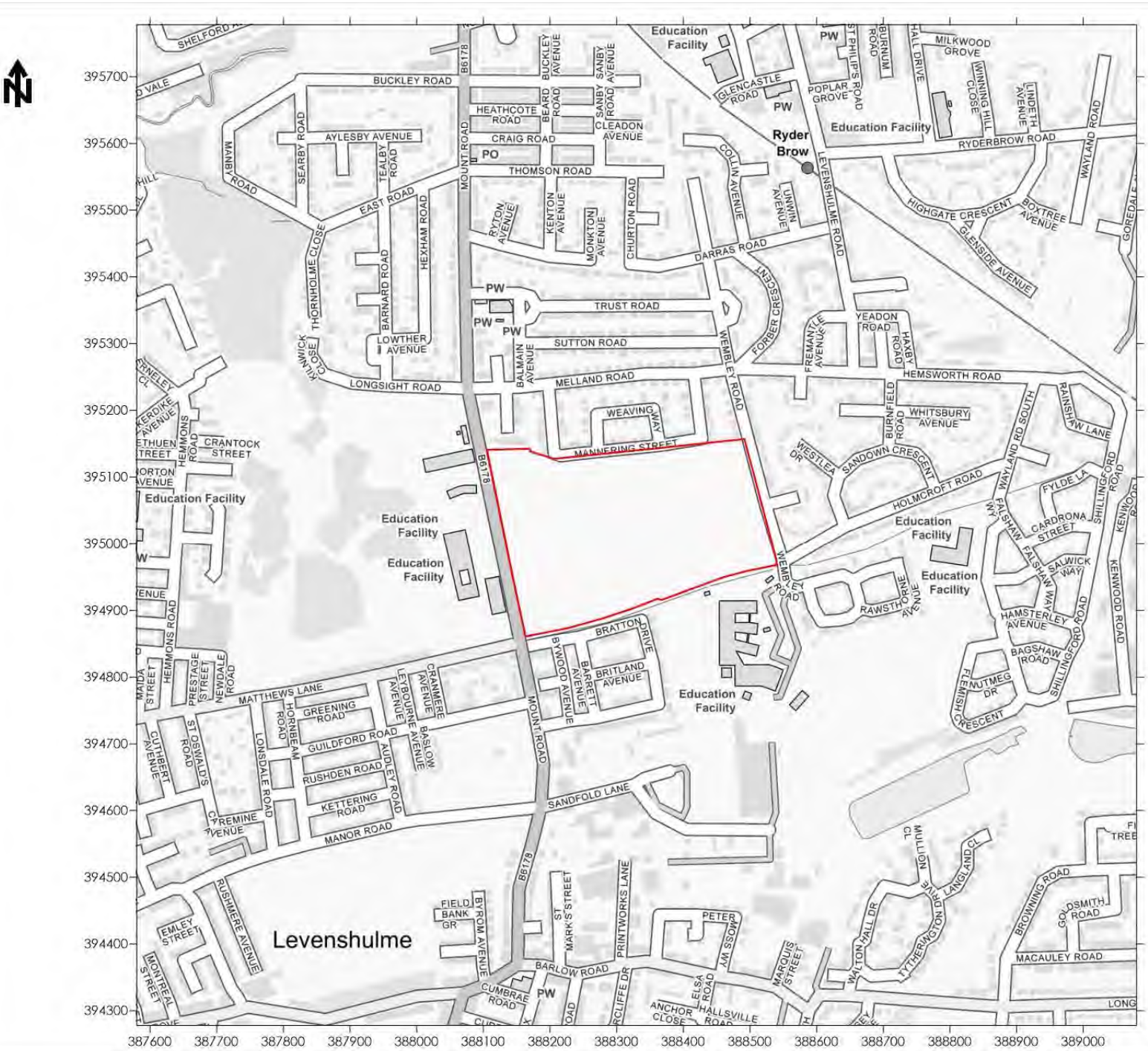
7.1.8 Based on the assessment results, air quality factors are not considered a constraint to planning consent for the development.

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

## 8.0 ABBREVIATIONS

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| ADM | Atmospheric Dispersion Modelling |
| AQAP | Air Quality Action Plan |
| 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 |
| DMP | Dust Management Plan |
| 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 |
| NGR | National Grid Reference |
| $NO_2$ | Nitrogen dioxide |
| $NO_x$ | Oxides of nitrogen |
| NPPF | National Planning Policy Framework |
| NPPG | National Planning Policy Guidance |
| MCC | Manchester City Council |
| $PM_{10}$ | Particulate matter with an aerodynamic diameter of less than 10µm |
| $PM_{2.5}$ | Particulate matter with an aerodynamic diameter of less than 2.5µm |
| SP | Slow Phase |
| $z_0$ | Roughness length |

# Figures




**Legend**

Site Boundary

**Title**
Figure 1 - Site Location

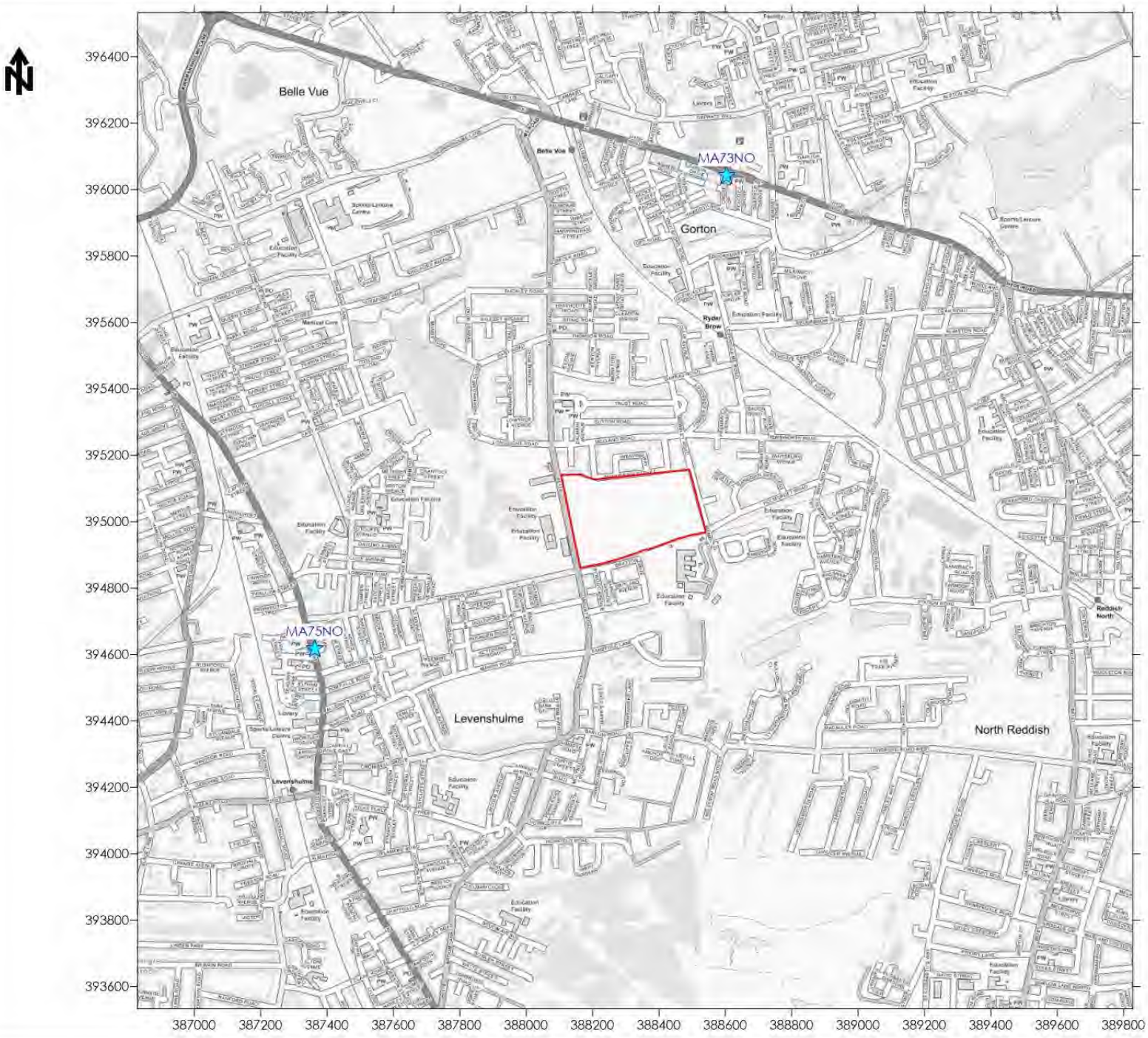
**Project**
Air Quality Assessment
Mount Road, Gorton

**Project Reference**
6170

**Client**
Kellen Homes and the Greater Manchester Youth Federation

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**Legend**

Site Boundary

Monitor

**Title**
Figure 2 - Monitoring Location

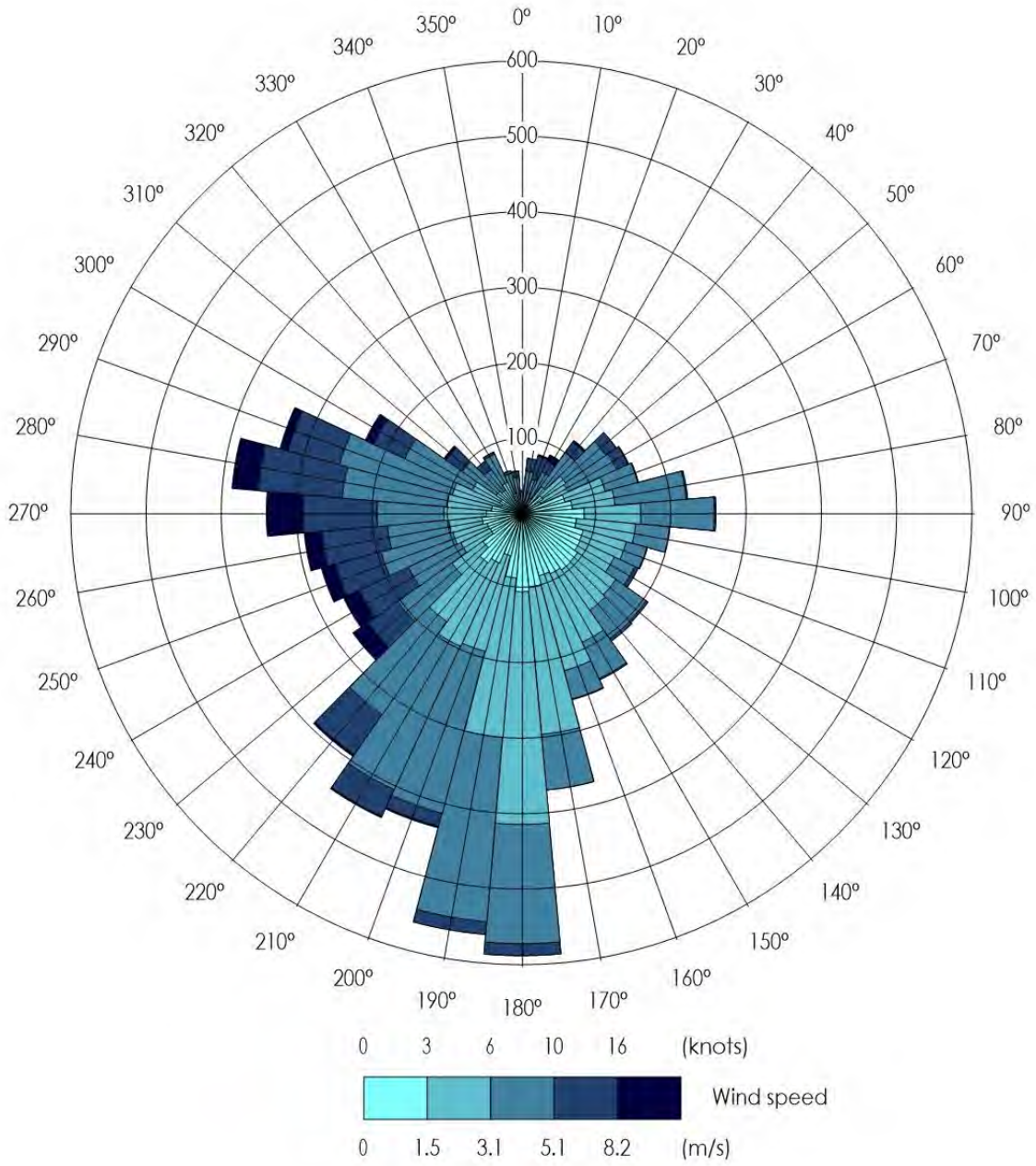
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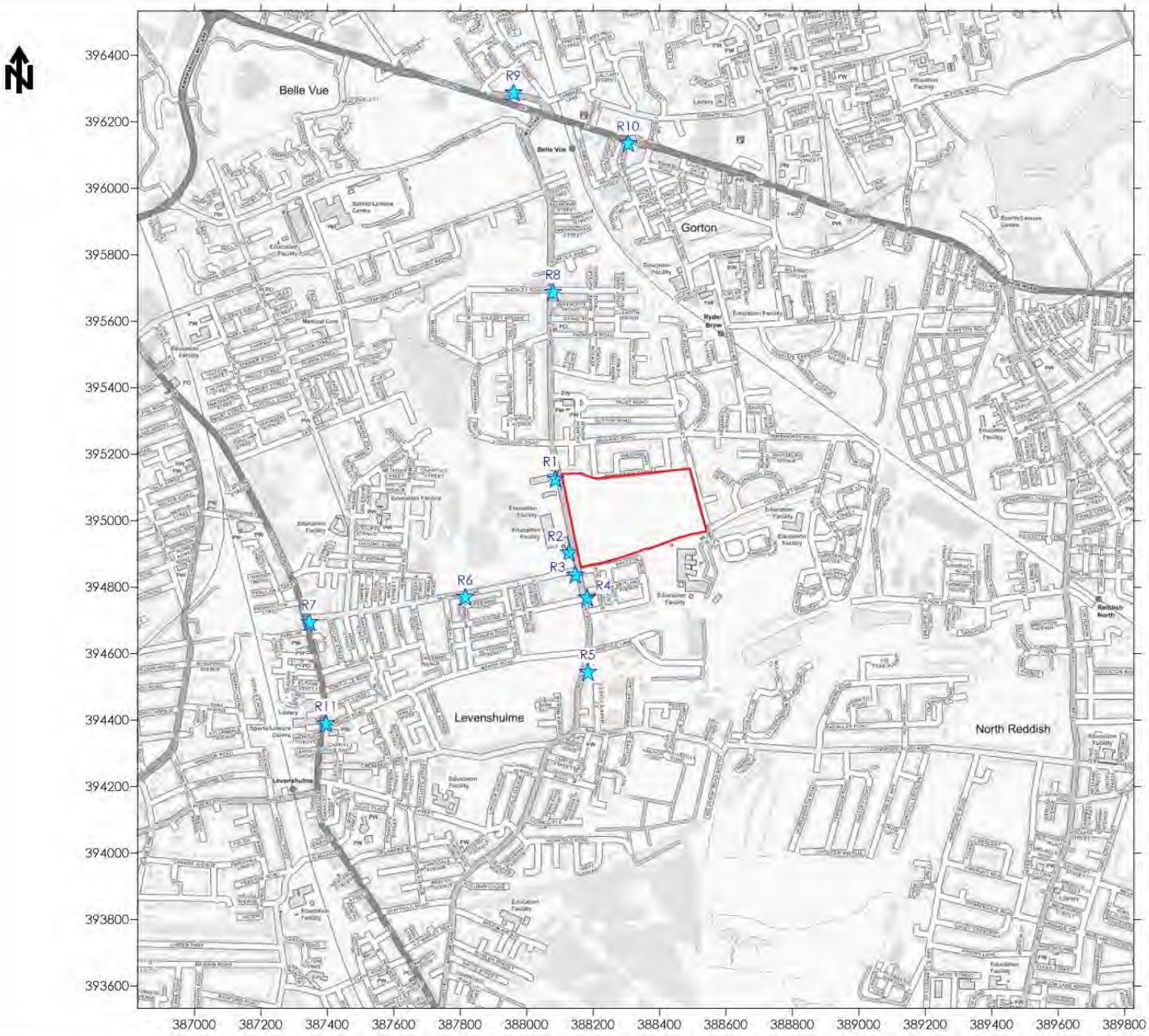
**Title**
Figure 3 - Wind Rose of 2019 Manchester Airport Meteorological Data

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**Legend**

Site Boundary

Receptor

**Title**
Figure 4 - Road Vehicle Exhaust Emissions Sensitive Receptor Locations

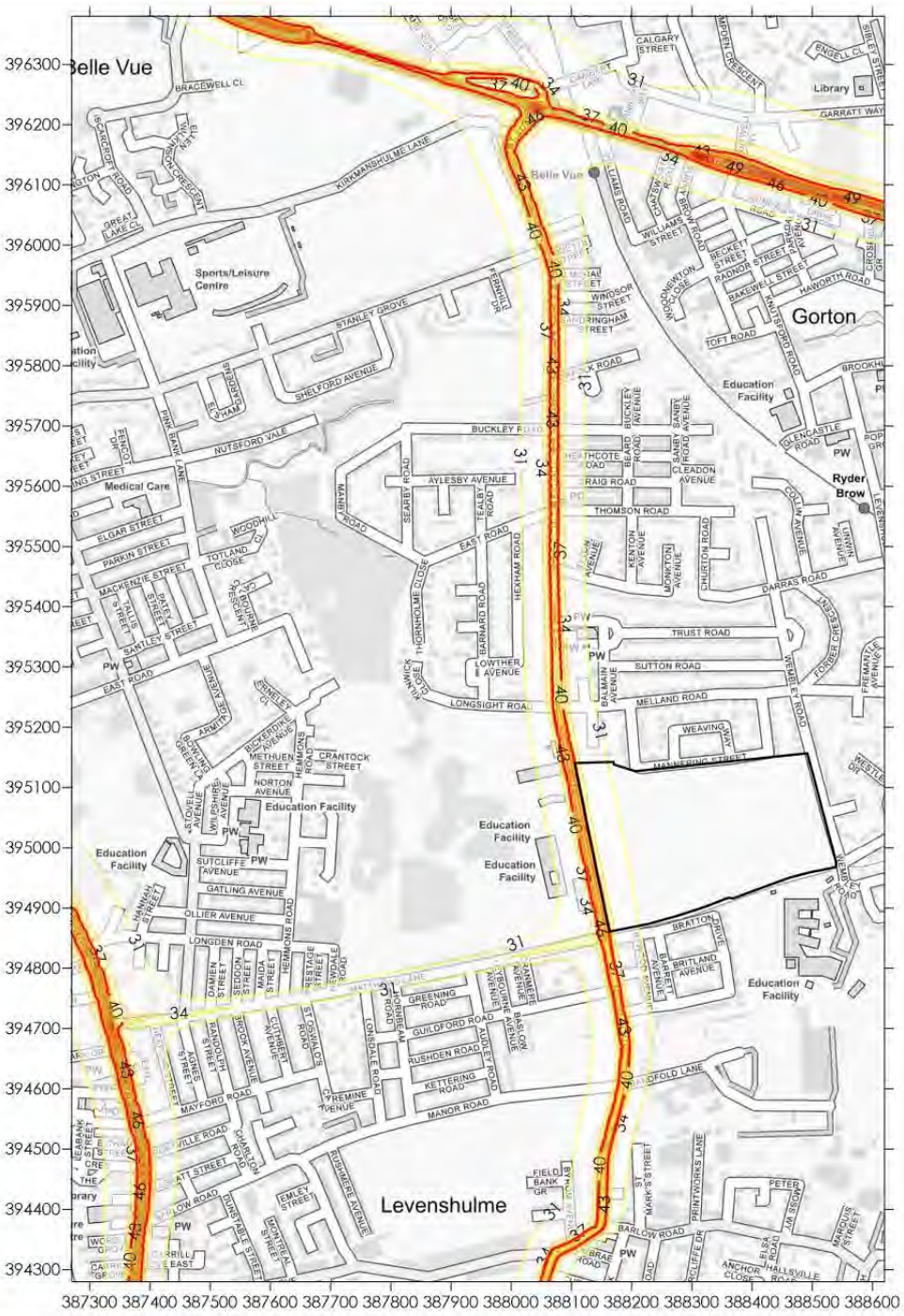
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**Legend**

Site Boundary

Annual Mean $NO_2$ Concentrations (µg/m³)

55
52
49
46
43
40
37
34
31

**Title**
Figure 5 - Predicted Annual Mean $NO_2$ Concentrations (µg/m³)
Do-Minimum

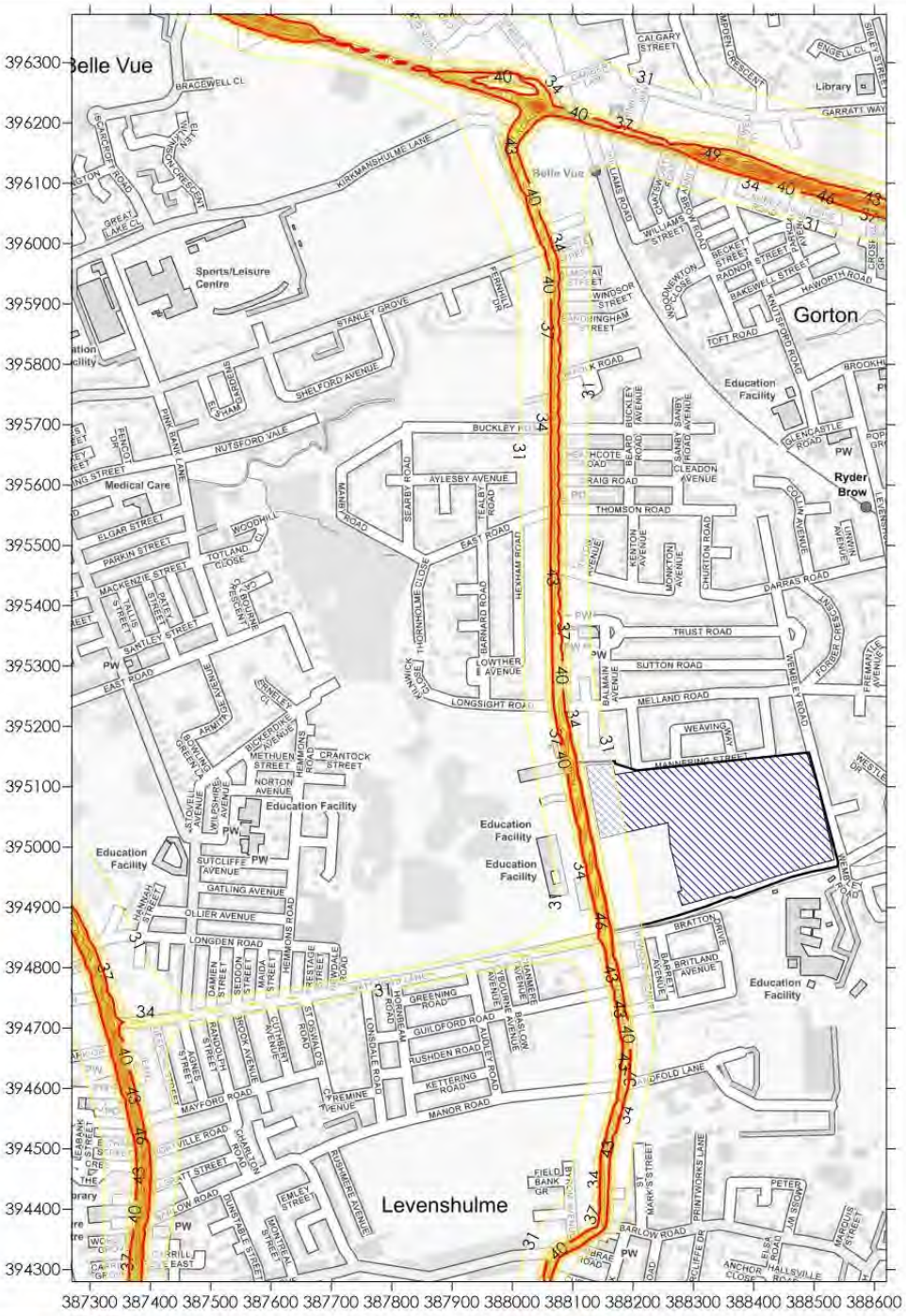
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**Legend**

Site Boundary

Residential Development

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

56
52
49
46
43
40
37
34
31

**Title**

Figure 6 - Predicted Annual Mean $NO_2$ Concentrations ($\mu g/m^3$) Do-Something

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Air Quality Assessment
Mount Road, Gorton

**Project Reference**

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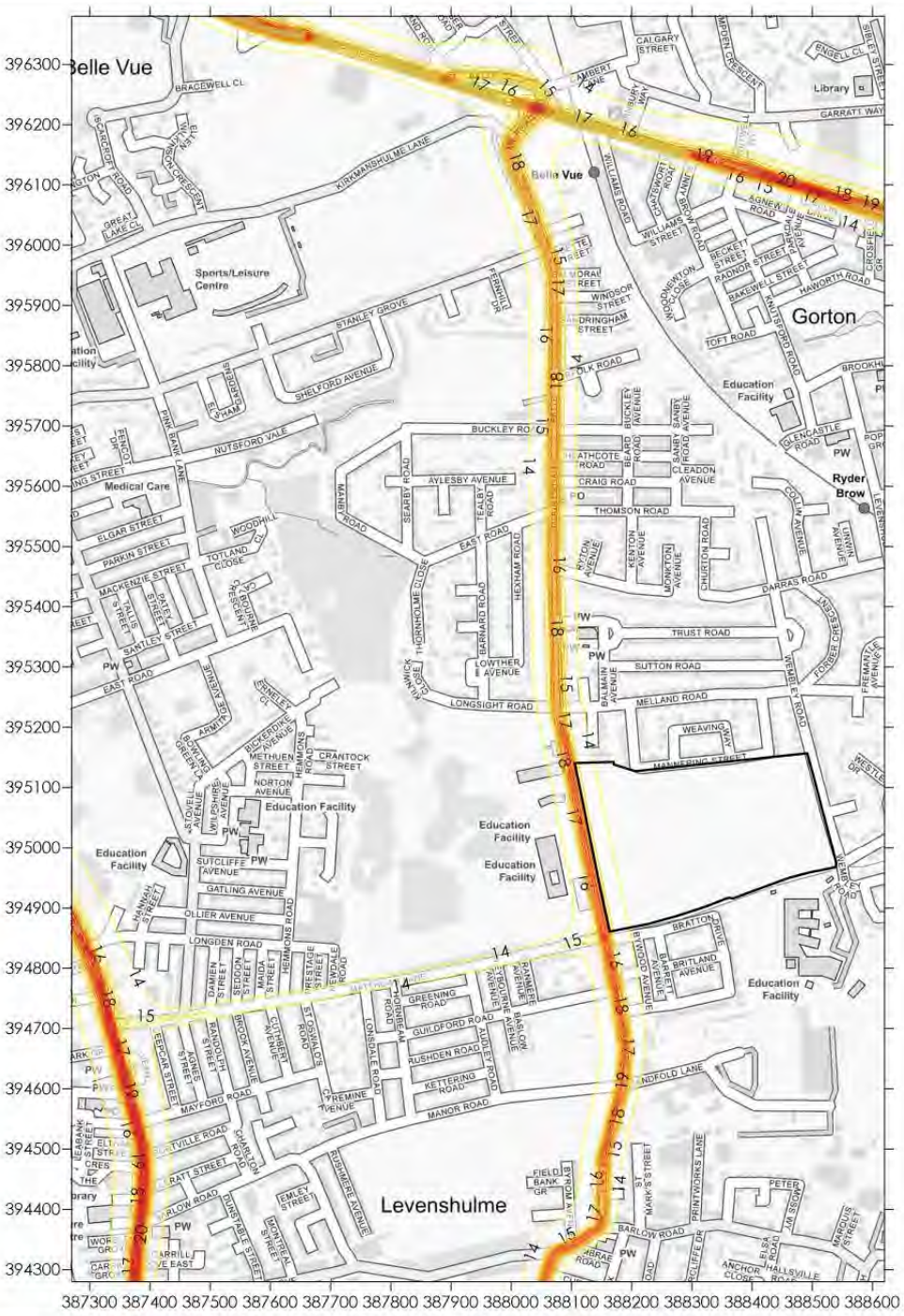
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**Legend**

Site Boundary

Annual Mean $PM_{10}$ Concentrations (µg/m³)

20
19
18
17
16
15
14

**Title**

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

**Project**

Air Quality Assessment
Mount Road, Gorton

**Project Reference**

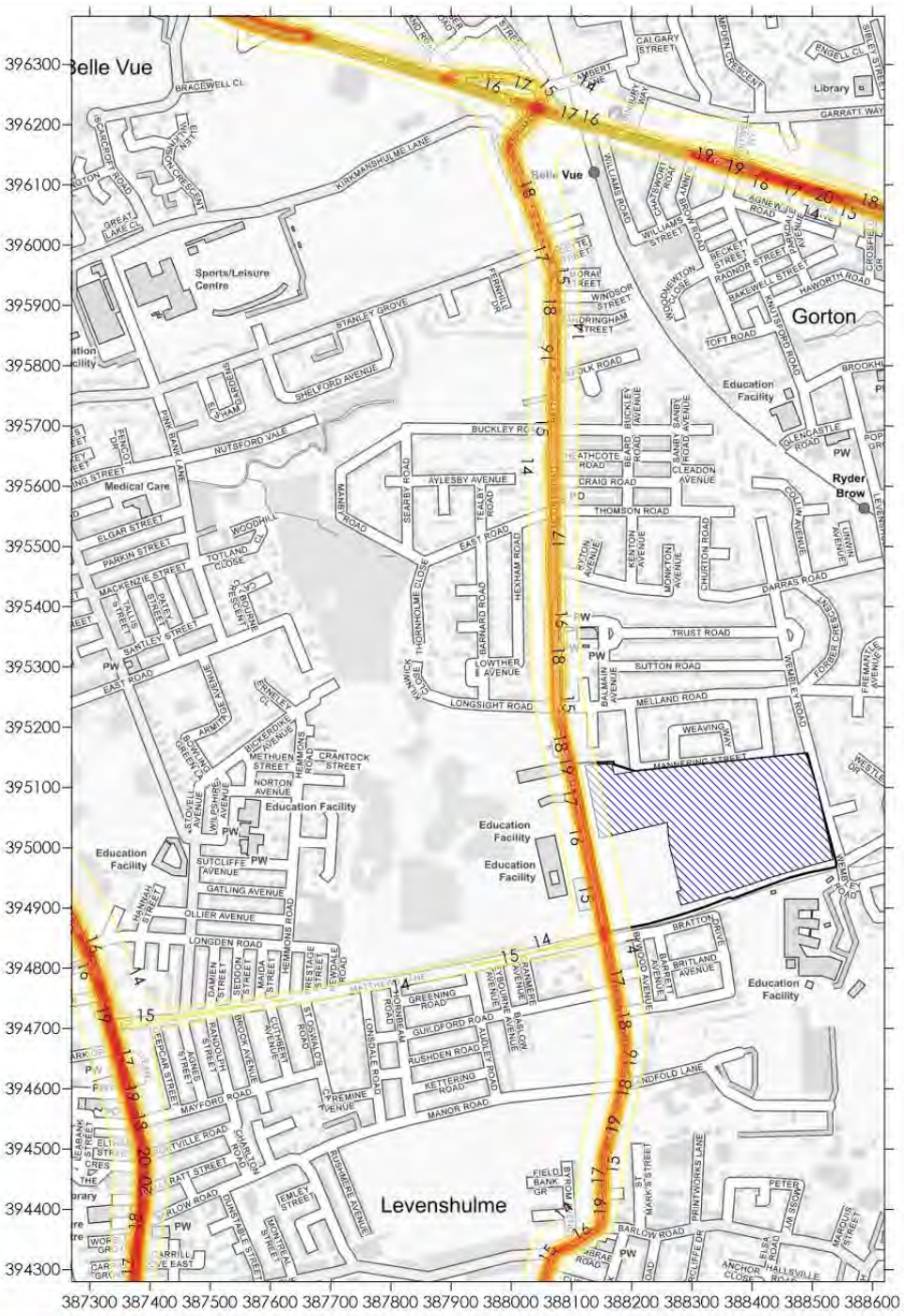
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**Legend**

Site Boundary

Residential Development

Annual Mean $PM_{10}$ Concentrations (µg/m³)

20
19
18
17
16
15
14

**Title**

Figure 8 - Predicted Annual Mean $PM_{10}$ Concentrations (µg/m³) Do-Something

**Project**

Air Quality Assessment
Mount Road, Gorton

**Project Reference**

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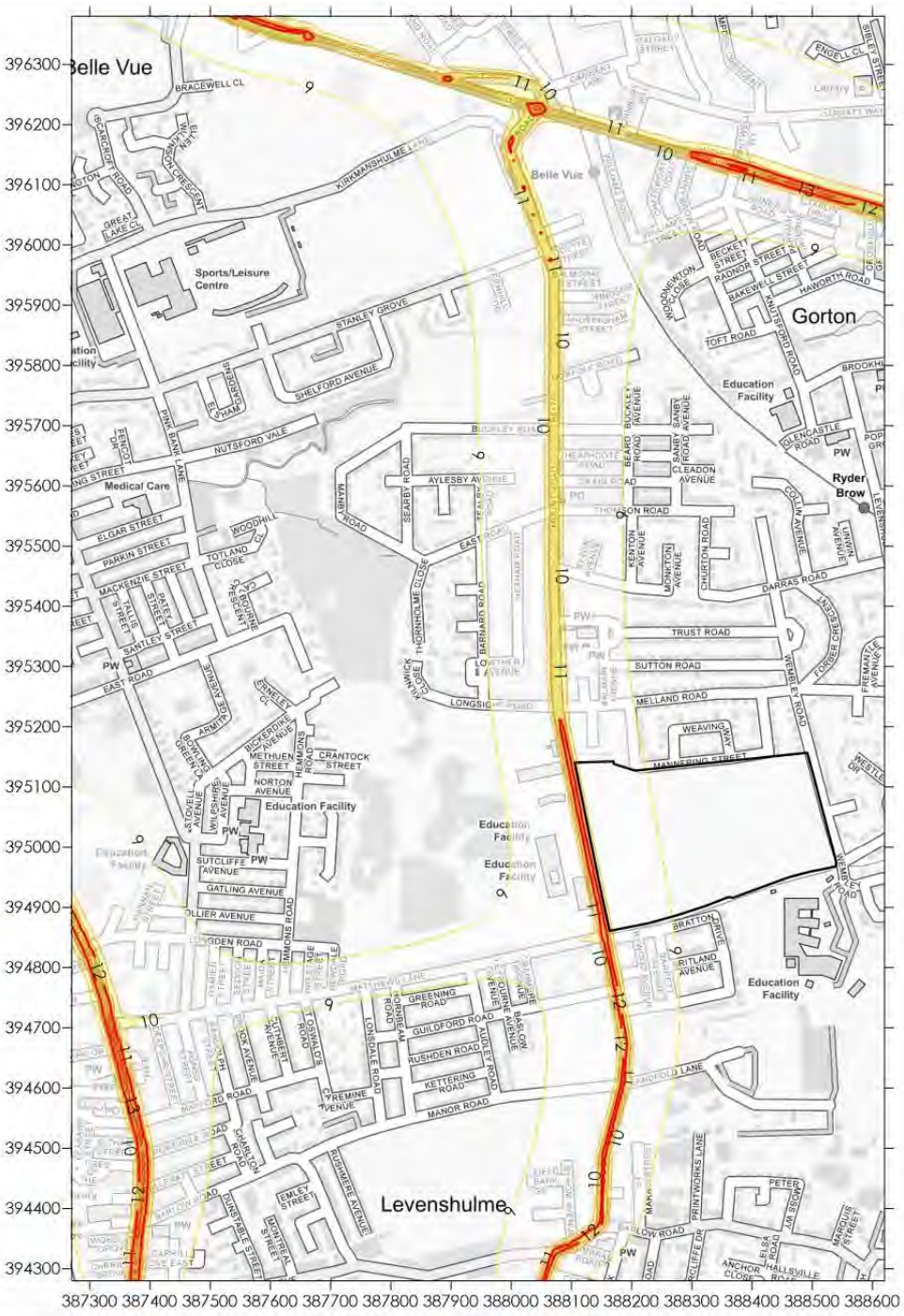
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**Legend**

Site Boundary

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

14
13
12
11
10
9

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

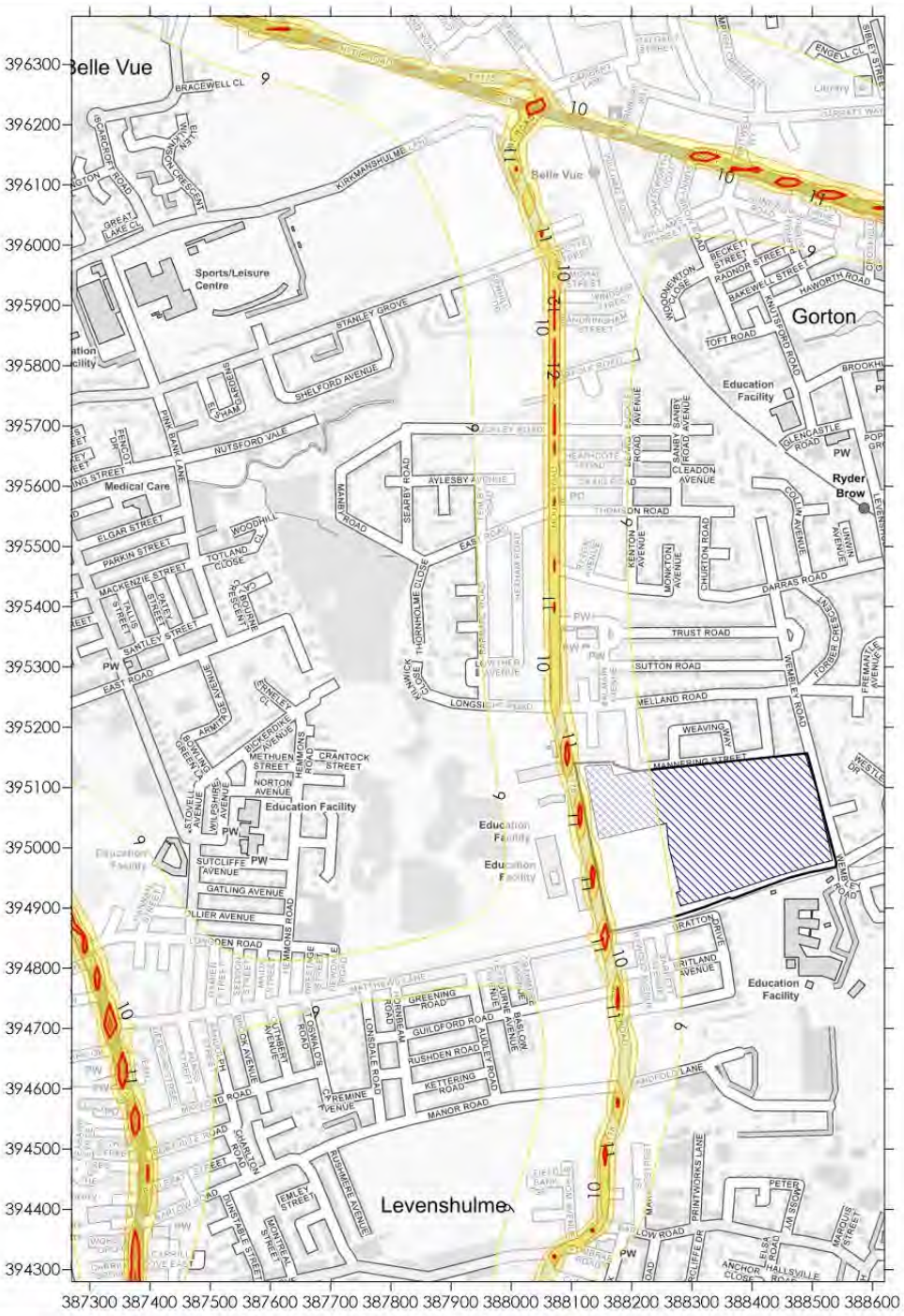
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**Legend**

Site Boundary

Residential Development

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

14
13
12
11
10
9

**Title**
Figure 10 - Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m³)
Do-Something

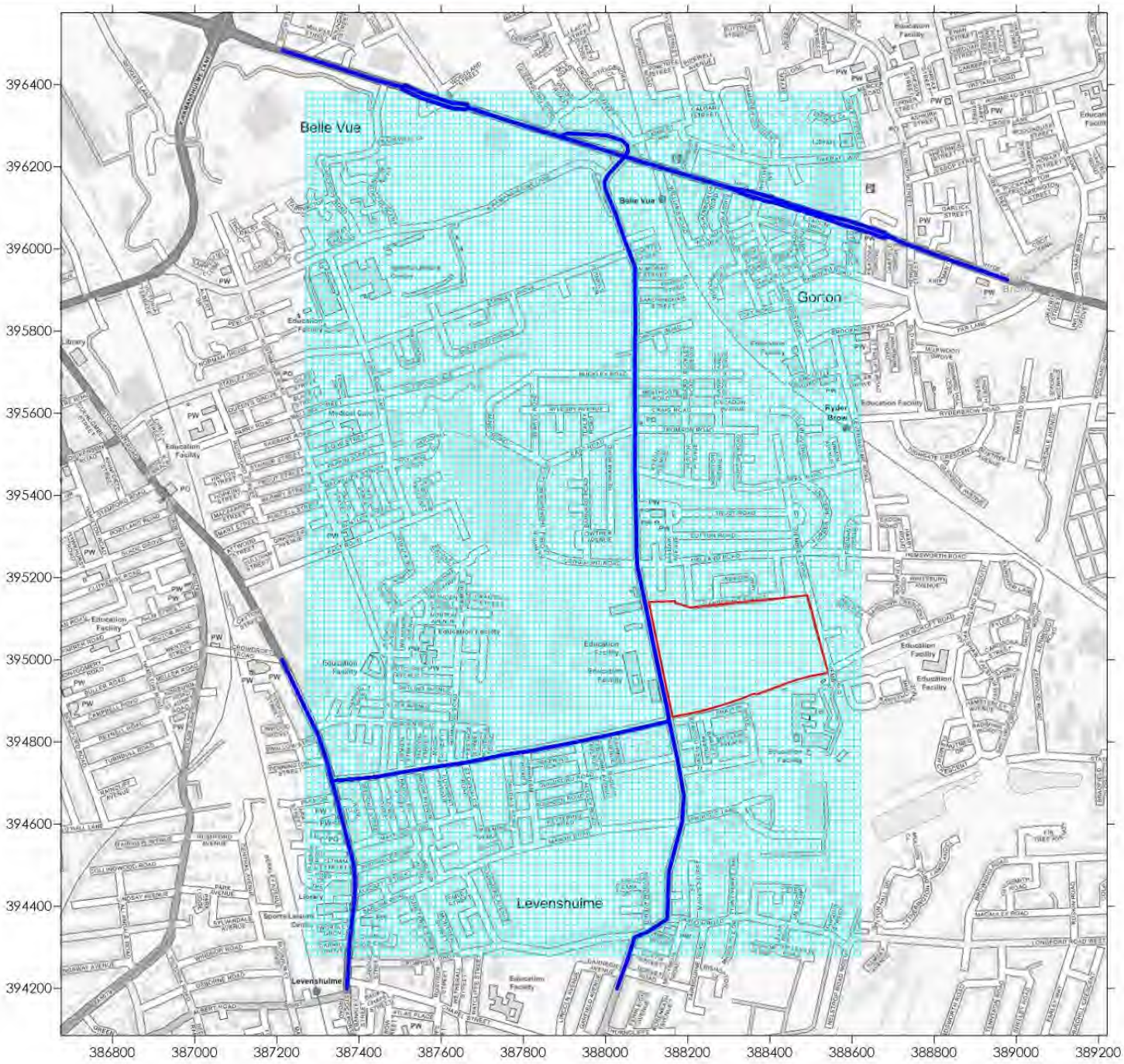
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**Legend**

Site Boundary

Road Link

Output Grid

**Title**
Figure 11 - ADMS-Roads Inputs

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# Appendix 1 - Assessment Input Data

## Introduction

The proposed development has the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the site, as well as expose future residents to elevated pollution levels. 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 following Sections detail the relevant inputs utilised in the assessment.

## Assessment Area

The assessment area was defined based on the location of the development and roads likely to impact pollutant levels across the site. Ambient concentrations were predicted over NGR: 387270, 388620 to 394280, 396380. 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 11 for a graphical representation of the assessment grid extents.

**Traffic Flow Data**

Baseline traffic data for Mount Road was provided by CBO Transport Limited, the transport consultant for the project. Traffic data for all other links, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as HDV proportion, was obtained from the Department for Transport (DfT)[27]. The DfT web tools 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 2021. It should be noted that the DfT web tool is referenced in DEFRA guidance[28] as being a suitable source of data for air quality assessments and it is therefore considered to provide 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 DfT to calculate future traffic growth throughout the UK.

Development trip generation was provided by CBO Transport Limited. Flows were added to the relevant links to provide an estimation of traffic 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 data used in the assessment 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) |
|---|---|---|---|---|---|---|---|
| | | 2019 | 2025 DM | 2025 DS | | | |
| L1 | B6178 - South of Site Access | 15,947 | 16,928 | 17,800 | 5.50 | 7.1 | 30 |
| L2 | B6178 - South of Matthews Lane | 15,947 | 16,928 | 17,504 | 5.50 | 7.3 | 45 |
| L3 | Matthew Lane - 20 mph zone | 4,052 | 4,301 | 4,597 | 4.18 | 9.5 | 30 |
| L4 | Matthew Lane - 30 mph zone | 4,052 | 4,301 | 4,597 | 4.18 | 7.9 | 45 |

27 https://roadtraffic.dft.gov.uk/#16/51.4518/-0.9760/basemap-countpoints.

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

| Link | | 24-hour AADT Flow | | | HDV Prop. Of Fleet (%) | Road Width (m) | Avg. Vehicle Speed (km/h) |
|---|---|---|---|---|---|---|---|
| | | 2019 | 2025 DM | 2025 DS | | | |
| L5 | Matthew Lane - Stockport Road Junction Traffic Lights Slow Phase (SP) | 4,052 | 4,301 | 4,597 | 4.18 | 8.3 | 20 |
| L6 | Stockport Road - North of Matthews Lane | 22,764 | 24,164 | 24,312 | 3.51 | 12.1 | 45 |
| L7 | Stockport Road - South of Matthews Lane | 22,764 | 24,164 | 24,312 | 3.51 | 8.5 | 45 |
| L8 | B6178 - North of Site Access - 20mph zone | 15,947 | 16,928 | 18,015 | 5.50 | 7.2 | 30 |
| L9 | Mount Road - 30mph zone | 15,947 | 16,928 | 18,015 | 5.50 | 10.2 | 45 |
| L10 | Mount Road - Hyde Road Junction SP | 15,947 | 16,928 | 17,974 | 5.50 | 20.1 | 20 |
| L11 | Hyde Road - between Mount Road junction and Whitwell Way | 11,737 | 12,459 | 12,829 | 4.71 | 11.3 | 30 |
| L12 | Whitwell Junction - Eastbound (EB) SP | 11,737 | 12,459 | 12,644 | 4.71 | 11.0 | 20 |
| L13 | Hyde Road EB - between Whitwell Way and Tescos | 11,737 | 12,459 | 12,644 | 4.71 | 8.6 | 30 |
| L14 | Hyde Road - Tesco Junction EB | 11,737 | 12,459 | 12,644 | 4.71 | 9.3 | 20 |
| L15 | Hyde Road - east of Wellington Street | 11,737 | 12,459 | 12,829 | 4.71 | 11.0 | 40 |
| L16 | Hyde Road Westbound (WB) - Tesco Junction SP | 11,421 | 12,123 | 12,308 | 4.53 | 11.1 | 20 |
| L17 | Hyde Road WB - between Whitwell Way and Tescos | 11,421 | 12,123 | 12,308 | 4.53 | 8.1 | 30 |
| L18 | Whitwell Junction WB SP | 11,421 | 12,123 | 12,308 | 4.53 | 8.0 | 20 |
| L19 | Hyde Road (between MT Road junction and Whitwell WY) | 11,421 | 12,123 | 12,461 | 4.53 | 11.3 | 30 |
| L20 | B6178 - One way system | 7,464 | 7,923 | 8,261 | 5.00 | 6.5 | 40 |
| L21 | B6178 - One way system SP | 7,464 | 7,923 | 8,261 | 5.00 | 9.4 | 20 |
| L22 | Hyde Road - between B6178 One Way System and Woodland Street | 11,737 | 12,459 | 13,129 | 4.71 | 11.5 | 40 |
| L23 | Woodland Street Junction EB SP | 11,737 | 12,459 | 12,797 | 4.71 | 9.7 | 20 |
| L24 | Woodland Street junction WB SP | 11,421 | 12,123 | 12,455 | 4.53 | 9.9 | 20 |
| L25 | Hyde Road - West of Woodland Street Junction | 11,737 | 12,459 | 13,129 | 4.71 | 12.5 | 40 |

Reference should be made to Figure 11 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 11.0). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

**Meteorological Data**

Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 11km south-west of the development. 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 3 for a wind rose of 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 1m was used to describe the modelling extents. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'cities and woodlands'.

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 value 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**

A review of DEFRA data and local monitoring results was undertaken in order to identify appropriate background values for use in the assessment. This indicated the annual mean $NO_2$ concentration recorded at the MA79NO – 79 monitor during 2019 was 29.3µg/m$^3$, higher than the DEFRA background for the grid square containing the development, as shown in Table 12. As such, the monitoring result was used in order to provide robust predictions.

Monitoring of $PM_{10}$ and $PM_{2.5}$ concentrations is not undertaken at a background location within the vicinity of the site. Annual mean concentrations of 13.19µg/m$^3$ and 8.83µg/m$^3$ were used for these species respectively, which were obtained from the DEFRA grid square containing the MA79NO – 79 monitor, NGR: 386875, 395861.

Background concentrations from 2019 were utilised in preference to the development opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposals.

**$NO_x$ to $NO_2$ Conversion**

Predicted annual mean $NO_x$ concentrations were converted to $NO_2$ concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance[29].

**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;

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

- 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 2019 using traffic data, meteorological data and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'[30], which states:

> "If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year"

MCC undertook monitoring of $NO_2$ concentrations at two locations within the vicinity of roads included within the model during 2019. The 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 A1.2.

**Table A1.2 $NO_x$ Verification - Monitoring Results**

| Monitoring Location | | Monitored $NO_2$ Concentration (µg/m³) | Calculated Road $NO_x$ Concentration (µg/m³) |
|---|---|---|---|
| MA73NO | Hyde Road | 38.00 | 17.69 |
| MA75NO | Stockport Road | 47.00 | 37.57 |

The annual mean road $NO_x$ concentrations predicted from the dispersion model and the 2019 road $NO_x$ concentrations calculated from the monitoring results are summarised in Table A1.3.

30 Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.

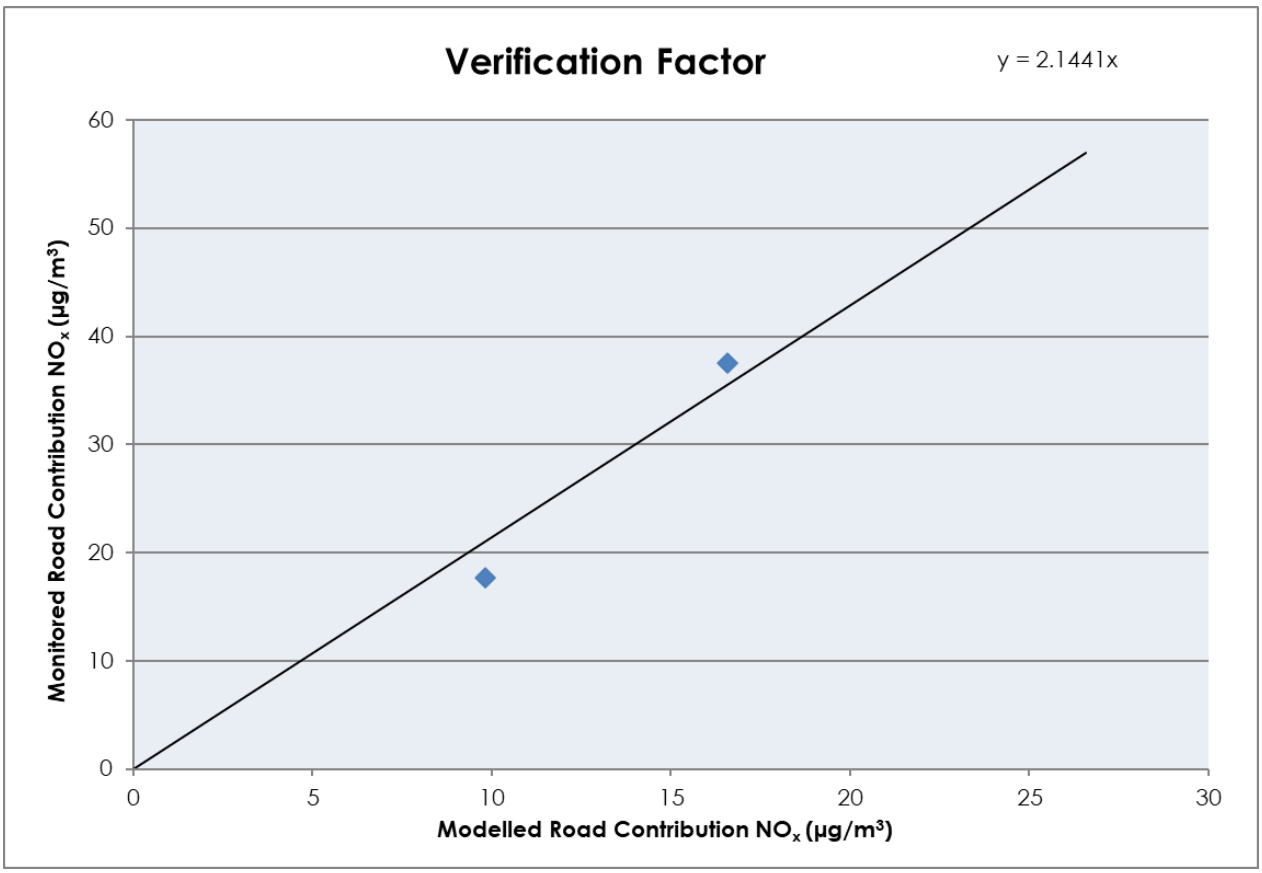
31 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

**Table A1.3 $NO_x$ Verification - Modelling Results**

| Monitoring Location | | Calculated Road $NO_x$ Concentration (µg/m³) | Modelled Road $NO_x$ Concentration (µg/m³) |
|---|---|---|---|
| MA73NO | Hyde Road | 17.69 | 9.83 |
| MA75NO | Stockport Road | 37.57 | 16.59 |

The monitored and modelled road $NO_x$ concentrations were graphed and the equation of the trendline based on linear progression though zero calculated. This indicated that a verification factor of 2.1441 was required to be applied to be applied to all road $NO_x$ modelling results, as shown in Graph 1.

**Graph 1 $NO_x$ Verification Factor**




Monitoring of $PM_{10}$ or $PM_{2.5}$ concentrations was 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.

# ALEC BARNETT

## Air Quality Consultant

MEarthSci, MSc, AMIEnvSc, AMIAQM

Tel: 0161 706 0075 | Email: alec.barnett@red-env.co.uk


**KEY EXPERIENCE:**

Alec is an Environmental Consultant with specialist experience in the air quality sector. His 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 assessment of road traffic exhaust emissions 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 sizes
- Assessment of fugitive dust impacts from a range of mineral extraction developments
- Assessment of petrol stations to address benzene concentrations and their impact on adjacent developments
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use

**SELECT PROJECTS SUMMARY:**

**1 Piccadilly Circus, London**

Air Quality Assessment in support of a tourist hostel located within an Air Quality Management Area (AQMA). The development had the potential to expose future occupants to elevated pollution levels and cause impacts at sensitive locations. Potential emissions from the proposals were also assessed to determine compliance with the Air Quality Neutral requirements of the London Plan. Results of the assessment indicated that the site was Air Quality Neutral and air quality factors were not a constraint to the development.

**Kingscroft Farm, Havant**

Air Quality Assessment in support of a residential development located in close proximity to the A27 and a number of gas-fired generator sites. The development had the potential to expose future residents to elevated pollution concentrations and cause impacts at sensitive locations. Detailed dispersion modelling was undertaken using ADMS-roads to assess pollutant concentrations across the development and a comparison was made between overall concentrations with and without the development in place. Results indicated pollutant concentrations were below the relevant standards across the site and impacts associated with the development were not significant.

**Trademark House, Petersfield**

Odour Assessment in support of a mixed-use development at Trademark House, Petersfield. The site was located in close proximity to a petrol filling station (PFS) and associated retail unit, which may result in loss of amenity at the development site. A two stage Odour Assessment was undertaken to assess baseline conditions across the site and consider the risk of reduced amenity. Results of the assessment indicated odour effects at the site did not represent a constraint to planning consent. An Air Quality Benzene Assessment was also undertaken to determine potential exposure of future occupants to elevated benzene concentrations associated with the PFS. Results indicated that exceedences of the Air Quality Objective (AQO) were not predicted at the development location.

**Granby Road, Buxton**

Air Quality Assessment in support of a residential development on land off Granby Road, Buxton. Results of detailed dispersion modelling utilising advanced canyons indicated air quality impacts associated with the development were not significant. The scheme was also located in close proximity to Ashwood Dale Quarry. Potential impacts on future residential amenity were assessed using the Source-Pathway-Receptor approach, which indicated that existing emissions associated with the operation of the quarry were not considered significant.

**Princess Road, Urmston**

Odour Assessment in support of a residential development on Princess Road, Urmston. The site was located in close proximity to several fast-food takeaways which have the potential to cause odour emissions during normal operation. A mitigation scheme was therefore identified to protect future residents from loss of amenity. Subject to the inclusion of the specified mitigation, overall effects of odour were considered to be not significant at the development.

# LAUREN CASEY

## Senior Air Quality Consultant

BSc (Hons), GradIEMA

Tel: 0161 706 0075 | Email: lauren.casey@red-env.co.uk


**KEY EXPERIENCE:**

Lauren 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 assessment of road traffic exhaust emissions 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 sizes.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Definition of baseline air quality and identification of sensitive areas across the UK.

Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

**SELECT PROJECTS SUMMARY:**

**Circle Court Tower, Stretford**

Air Quality Assessment for the refurbishment of the existing Circle Court Tower in Stretford, Greater Manchester, to provide improved apartments for occupants. Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions from vehicles using Junction 9 of the M60 motorway, adjacent to the site. Dispersion modelling was undertaken to quantify pollution levels at several different heights reflective of residential units within the development. Predicted concentrations were below the relevant Air Quality Objectives (AQO) at all sensitive locations across the development. Mitigation in the form of mechanical ventilation was therefore not required.

**Greenbrow Road, Wythenshawe**

Air Quality Assessment in support of a residential development of 56 units and associated infrastructure. The proposals involved demolition of hard standings prior to construction of low rise dwellings. An assessment of fugitive dust emissions was undertaken and the results indicated that the use of good practice control measures would provide suitable mitigation for the impacts of the scheme.

**The Grange, Handforth**

Co-ordination and management of a 3-month study in order to determine baseline conditions and identify any potential issues at a residential estate. Concerns were raised regarding the exposure of residents to poor air quality due to road traffic emissions from the new Manchester Airport Relief Road. The results of the monitoring identified nitrogen dioxide ($NO_2$) concentrations to be below the AQO.

**Copeley Hill, Birmingham**

Air Quality Assessment in support of proposed residential apartments and dwellings within an Air Quality Management Area (AQMA). A two-staged assessment was undertaken involving a three month diffusion tube study and subsequent dispersion modelling using ADMS-Roads. Predicted concentrations indicated elevated pollution levels at residential units along the site boundary. As such, suitable mitigation in the form of mechanical ventilation has been specified for the relevant dwellings in order to protect future residents from poor air quality.

**Clinton Place Car Park, Sunderland**

Air Quality Assessment in support of a proposed surface car park on land at Clinton Place, Sunderland. The development has potential to cause air quality impacts at sensitive locations during construction and operation. Detailed dispersion modelling was therefore undertaken to consider the potential impact of the development on air quality at sensitive receptor locations within the vicinity of the site. This included emissions for the local road network and vehicles on the car park itself. Results indicated that impacts were predicted to be negligible at all sensitive receptor locations. Suitable mitigation to control potential impacts associated with fugitive dust releases during construction were also identified.