

Air Quality Assessment
Manchester Road, Rochdale

Client: Redrow Homes Lancashire Limited

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Report Issue

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Executive Summary

Redmore Environmental Ltd was commissioned by Redrow Homes Lancashire Limited to undertake an Air Quality Assessment in support of a residential development on a parcel of land off Manchester Road, Rochdale.

The site is bound to the north by the M62 and to the east and south by the A627(M). This may cause elevated pollution levels due to vehicle exhaust emissions and act as a constraint to residential land use. As such, an Air Quality Assessment has been undertaken in order to determine baseline conditions at the site, consider its suitability for the proposed end-use and inform the masterplan design process.

Dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed development site as a result of emissions from the local highway network. Outputs were subsequently verified using local monitoring data.

The results of the dispersion modelling assessment indicated that predicted pollutant levels were below the relevant criteria across the development. As such, the site is considered suitable for residential use from an air quality perspective.

Based on the assessment results, it is concluded that poor air quality is not considered a constraint to use of the site for residential development.

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Redrow Homes Lancashire Limited to undertake an Air Quality Assessment in support of a residential development on a parcel of land off Manchester Road, Rochdale.

1.1.2 The site is located in the vicinity of the M62 and A627(M). These may influence air quality conditions at the development location and act as a constraint to residential end use. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and consider location suitability for the proposals.

1.2 Site Location and Context

1.2.1 The site comprises a 211 acre parcel of land off Manchester Road, Middleton, Rochdale, at approximate National Grid Reference (NGR): 389239, 409585. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 It is proposed to develop the site to provide residential units with associated infrastructure.

1.2.3 The site is bound to the north by the M62 and to the east and south by the A627(M). This may cause elevated pollution levels due to vehicle exhaust emissions and act as a constraint to residential land use. An Air Quality Assessment was therefore undertaken in order to define baseline conditions, consider site suitability for the proposed end-use and inform the masterplan design process. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO₂);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- Particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5});
- Benzene; and,
- Carbon monoxide.

2.1.2 Target Values were also provided for an additional 5 pollutants. These include:

- Ozone;
- Arsenic;
- Cadmium;
- Nickel; and,
- Benzo(a)pyrene.

2.1.3 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that 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 Table 1 presents the AQOs for pollutants considered within this assessment.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Table 1 Air Quality Objectives

| Pollutant | Air Quality Objective | |
|------------------|--|--|
| | Concentration ($\mu\text{g}/\text{m}^3$) | Averaging Period |
| NO ₂ | 40 | Annual mean |
| | 200 | 1-hour mean, not to be exceeded on more than 18 occasions per annum |
| PM ₁₀ | 40 | Annual mean |
| | 50 | 24-hour mean, not to be exceeded on more than 35 occasions per annum |

2.1.5 Table 2 summarises the advice provided in DEFRA guidance² on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

| Averaging Period | Objective Should Apply At | Objective Should Not Apply At |
|------------------|---|---|
| Annual mean | All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc. | Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |
| 24-hour mean | All locations where the annual mean objective would apply, together with hotels Gardens of residential properties | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |

² Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

| Averaging Period | Objective Should Apply At | Objective Should Not Apply At |
|------------------|--|--|
| 1-hour mean | <p>All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets)</p> <p>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</p> <p>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer</p> | Kerbside sites where the public would not be expected to have regular access |

2.2 Local Air Quality Management

2.2.1 Under Section 82 of the Environment Act (1995) (Part IV) 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 Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

3.0 BASELINE

3.1 Introduction

3.1.1 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.

3.2 Local Air Quality Management

3.2.1 As required by the Environment Act (1995), Rochdale Borough Council (RBC) has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ are above the AQO within the borough. As such, a number of roads within Rochdale 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 Rochdale Borough Council area."

3.2.2 The site is bound by the M62 and A627(M) which are included in the AQMA. As such, there is the potential for elevated pollution levels at the proposed development location. This has been considered throughout the assessment.

3.2.3 RBC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMA's have been designated.

3.3 Air Quality Monitoring

3.3.1 Monitoring of pollutant concentrations is undertaken by RBC throughout their area of jurisdiction. Recent results recorded in the vicinity of the site are shown in Table 3.

Table 3 Monitoring Results

| Monitoring Site | | Monitored NO ₂ Concentration (µg/m ³) | | |
|-----------------|----------------------|--|------|------|
| | | 2016 | 2017 | 2018 |
| 2 | Trows Lane | 33.3 | 35.0 | 28.9 |
| 3 | 52 Cherrington Drive | 29.9 | 23.4 | 20.6 |
| 4 | Middleton Library | 30.9 | 29.5 | 26.7 |

3.3.2 As shown in Table 3, annual mean NO₂ concentrations were below the relevant AQO at the three monitoring locations in recent years. Reference should be made to Figure 2 for a map of the survey positions.

3.3.3 RBC do not undertake PM₁₀ monitoring within their administrative extents.

3.4 Background Pollutant Concentrations

3.4.1 Predictions of background NO₂ and PM₁₀ 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 partially located in four grid squares. Data for these locations was downloaded from the DEFRA website³. Predicted background NO₂ concentrations are summarised in Table 4.

Table 4 Background Pollutant Concentration Predictions - NO₂

| Grid Square (NGR) | Predicted Background NO ₂ Concentration (µg/m ³) | | |
|-------------------|---|-------|-------|
| | 2018 | 2020 | 2025 |
| 388500, 409500 | 21.67 | 19.48 | 15.39 |
| 389500, 409500 | 20.44 | 18.49 | 14.67 |
| 388500, 408500 | 17.03 | 15.59 | 13.07 |
| 389500, 408500 | 17.27 | 15.79 | 12.90 |

³ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017>.

3.4.2 As shown in Table 4, predicted background NO₂ concentrations are below the relevant AQOs at the site.

3.4.3 Predicted background PM₁₀ concentrations are summarised in Table 5.

Table 5 Background Pollutant Concentration Predictions - PM₁₀

| Grid Square (NGR) | Predicted Background PM ₁₀ Concentration (µg/m ³) | | |
|-------------------|--|-------|-------|
| | 2018 | 2020 | 2025 |
| 388500, 409500 | 12.42 | 12.14 | 11.80 |
| 389500, 409500 | 12.48 | 12.21 | 11.88 |
| 388500, 408500 | 11.06 | 10.80 | 10.47 |
| 389500, 408500 | 11.66 | 11.41 | 11.10 |

3.4.4 As shown in Table 5, predicted background PM₁₀ concentrations are below the relevant AQO at the site.

4.0 METHODOLOGY

4.1 Introduction

4.1.1 Residential development at the proposed location may lead to the exposure of future occupants to elevated pollution levels. In order to assess whether concentrations are a constraint to residential land use, detailed dispersion modelling was undertaken in accordance with the following methodology.

4.2 Dispersion Model

4.2.1 Dispersion modelling was undertaken in order to predict NO₂ and PM₁₀ concentrations across the site using the ADMS-Roads dispersion model (version 4.1.1.0). 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.

4.2.2 Modelling was undertaken for 2018 to allow verification against recent monitoring results and 2025 to represent the potential occupation year of the development.

4.2.3 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.

4.2.4 These are detailed in the following Sections.

4.3 Assessment Area

4.3.1 Ambient concentrations were predicted over the area NGR: 388290, 408400 to 390040, 410150. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

4.3.2 It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.

4.3.3 Reference should be made to Figure 3 for a graphical representation of the assessment grid extents.

4.4 Traffic Flow Data

4.4.1 Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as Heavy Duty Vehicle (HDV) proportion, was obtained from an Air Quality Assessment⁴ undertaken by Redmore Environmental Ltd (Reference: 2171-1r1) for a proposed development immediately south of the site.

4.4.2 Baseline traffic data was converted to 2018 and 2025 flows utilising a factor obtained from TEMPro (Version 7.2). This software package has been developed by the DfT to calculate traffic growth throughout the UK.

4.4.3 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 6.

Table 6 Traffic Data

| Link | | 24-hour AADT Flow | | HDV Prop. of Fleet (%) | Road Width (m) | Avg. Vehicle Speed (km/h) |
|------|--------------------------|-------------------|--------|------------------------|----------------|---------------------------|
| | | 2018 | 2025 | | | |
| L1 | Rochdale Road Roundabout | 10,510 | 11,375 | 4.82 | 8.7 | 25 |

⁴ Air Quality Assessment - Stakehill Business Park, Rochdale (2171-1r1), Redmore Environmental, 2019.

| Link | | 24-hour AADT Flow | | HDV Prop. of Fleet (%) | Road Width (m) | Avg. Vehicle Speed (km/h) |
|------|--|-------------------|--------|------------------------|----------------|---------------------------|
| | | 2018 | 2025 | | | |
| L2 | A627(M) Eastbound (EB) Slow Phase (SP) | 5,809 | 6,287 | 4.82 | 7.1 | 25 |
| L3 | A627(M) EB | 5,809 | 6,287 | 4.82 | 6.7 | 100 |
| L4 | A627(M) EB SP | 5,809 | 6,287 | 4.82 | 7.3 | 25 |
| L5 | A627(M) Westbound (WB) SP | 5,809 | 6,287 | 4.82 | 7.3 | 25 |
| L6 | A627(M) WB | 5,809 | 6,287 | 4.82 | 6.7 | 100 |
| L7 | A627(M) WB SP | 5,809 | 6,287 | 4.82 | 7.3 | 25 |
| L8 | A672(M) Roundabout | 19,783 | 21,411 | 7.61 | 9.3 | 25 |
| L9 | A672(M) Northbound (NB) Slip North of Roundabout | 4,237 | 4,585 | 4.94 | 7.0 | 80 |
| L10 | A672(M) NB North of Roundabout | 16,947 | 18,342 | 4.94 | 11.1 | 100 |
| L11 | A627(M) NB Slip to M62 Junction 20 | 16,947 | 18,342 | 4.94 | 10.2 | 80 |
| L12 | Junction 20 Roundabout | 28,991 | 31,377 | 15.73 | 9.1 | 25 |
| L13 | M627(M) Southbound (SB) Slip from M62 | 16,947 | 18,342 | 4.94 | 7.3 | 80 |
| L14 | M627M SB North of Roundabout | 16,947 | 18,342 | 4.94 | 9.7 | 100 |
| L15 | A627M SB Slip North of Roundabout | 4,237 | 4,585 | 4.94 | 6.7 | 80 |
| L16 | M62 WB east of Roundabout | 28,686 | 31,046 | 15.73 | 11.3 | 100 |
| L17 | M62 WB Slip east of Roundabout | 7,171 | 7,762 | 15.73 | 7.6 | 80 |
| L18 | M62 WB Slip West of Roundabout | 7,324 | 7,927 | 15.39 | 7.1 | 80 |
| L19 | M62 WB West of Roundabout | 29,297 | 31,708 | 15.39 | 9.3 | 100 |
| L20 | M62 EB West of Roundabout | 29,297 | 31,708 | 15.39 | 9.7 | 100 |
| L21 | M62 EB Slip West of Roundabout | 7,324 | 7,927 | 15.39 | 10.1 | 80 |
| L22 | M62 EB Slip East of Roundabout | 7,171 | 7,762 | 15.73 | 7.0 | 80 |
| L23 | M62 EB east of Roundabout | 28,686 | 31,046 | 15.73 | 11.3 | 100 |
| L24 | A627(M) NB north of M62 Junction 20 | 11,279 | 12,208 | 3.98 | 7.2 | 100 |
| L25 | A627(M) SB north of M62 Junction 20 | 11,279 | 12,208 | 3.98 | 7.2 | 100 |
| L26 | M62 WB | 43,487 | 47,066 | 15.73 | 9.8 | 100 |

| Link | | 24-hour AADT Flow | | HDV Prop. of Fleet (%) | Road Width (m) | Avg. Vehicle Speed (km/h) |
|------|---|-------------------|--------|------------------------|----------------|---------------------------|
| | | 2018 | 2025 | | | |
| L27 | M62 EB | 43,487 | 47,066 | 15.73 | 9.8 | 100 |
| L28 | Rochdale Road | 15,233 | 16,487 | 2.83 | 11.2 | 45 |
| L29 | Rochdale Road | 15,233 | 16,487 | 2.83 | 10.4 | 45 |
| L30 | Rochdale Road | 15,233 | 16,487 | 2.83 | 13.9 | 25 |
| L31 | Rochdale Road | 13,331 | 14,428 | 2.79 | 13.1 | 25 |
| L32 | Rochdale Road | 13,331 | 14,428 | 2.79 | 10.6 | 45 |
| L33 | Rochdale Road SP to Junction with Hollin Lane | 13,331 | 14,428 | 2.79 | 11.2 | 25 |
| L34 | Rochdale Road South SP | 13,216 | 14,303 | 3.27 | 11.8 | 25 |
| L35 | Long Street | 13,216 | 14,303 | 3.27 | 8.7 | 40 |
| L36 | Hollin Lane | 10,467 | 11,329 | 1.71 | 9.3 | 45 |
| L37 | A664 Rochdale Road SP | 13,412 | 14,516 | 3.41 | 7.9 | 25 |
| L38 | A664 Rochdale Road | 13,412 | 14,516 | 3.41 | 9.7 | 45 |
| L39 | A627M NB South of Roundabout | 22,619 | 24,480 | 7.61 | 7.6 | 100 |
| L40 | A627M NB Slip South of Roundabout | 5,655 | 6,120 | 7.61 | 7.1 | 80 |
| L41 | A627M SB Slip South of Roundabout | 5,655 | 6,120 | 7.61 | 6.6 | 80 |
| L42 | A627M SB South of Roundabout | 22,619 | 24,480 | 7.61 | 7.6 | 100 |
| L43 | A627 NB | 29,674 | 32,116 | 7.61 | 7.0 | 100 |
| L44 | A627 SB | 29,674 | 32,116 | 7.61 | 7.0 | 100 |
| L45 | Bentley Avenue Slow | 1,778 | 1,924 | 2.16 | 8.5 | 25 |
| L46 | Bentley Avenue | 1,778 | 1,924 | 2.16 | 7.8 | 40 |

4.4.4 Reference should be made to Figure 3 for a graphical representation of the road link locations.

4.5 Emission Factors

4.5.1 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 9.0). This has been produced by DEFRA and incorporates COPERT5 vehicle emission factors and fleet information.

4.5.2 There is current uncertainty over NO₂ concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2018 emission factors were utilised in preference to the future year in order to provide robust concentration predictions. As predictions for 2018 were verified, it is considered the results are an indication of worst case concentrations during the operation of the proposals.

4.6 Meteorological Data

4.6.1 Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2018 to 31st December 2018 (inclusive). Manchester Airport meteorological station is located at NGR: 381792, 384116, which is approximately 26km 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.

4.6.2 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 4 for a wind rose of utilised meteorological data.

4.7 Roughness Length

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

4.7.2 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)'.

4.8 Monin-Obukhov Length

4.8.1 The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and 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'.

4.9 Background Concentrations

4.9.1 As shown in Table 4 and Table 5, the proposed development site is partially located in four grid squares. The relevant data was reviewed and an annual mean NO₂ background concentration of 17.27µg/m³ and PM₁₀ background concentration of 11.66µg/m³ was chosen for use in the assessment. These were selected to provide a model verification factor closest to 1.

4.9.2 Similarly to emission factors, background concentrations from 2018 were utilised in preference to the future year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

4.10 NO_x to NO₂ Conversion

4.10.1 Predicted annual mean NO_x concentrations were converted to NO₂ concentrations using the spreadsheet (version 7.1) provided by DEFRA, which is the method detailed within DEFRA guidance⁵.

4.11 Verification

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

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

⁵ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

- Uncertainties associated with monitoring data, including locations.

4.11.2 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.

4.11.3 For the purpose of the assessment model verification was undertaken for 2018 using traffic data, meteorological data and monitoring results from this year.

4.11.4 RBC undertook monitoring of NO₂ concentrations at three locations within the vicinity of roads included within the model during 2018. The results were obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance⁶. The monitored annual mean NO₂ concentrations and calculated road NO_x concentrations are summarised in Table 7.

Table 7 Verification - Monitoring Results

| Monitoring Location | | Monitored NO ₂ Concentration (µg/m ³) | Calculated Road NO _x Concentration (µg/m ³) |
|---------------------|----------------------|--|--|
| 2 | Trows Lane | 28.9 | 23.27 |
| 3 | 52 Cherrington Drive | 20.6 | 6.51 |
| 4 | Middleton Library | 26.7 | 18.63 |

4.11.5 The annual mean road NO_x concentrations predicted from the dispersion model and the 2018 road NO_x concentrations calculated from the monitoring results are summarised in Table 8.

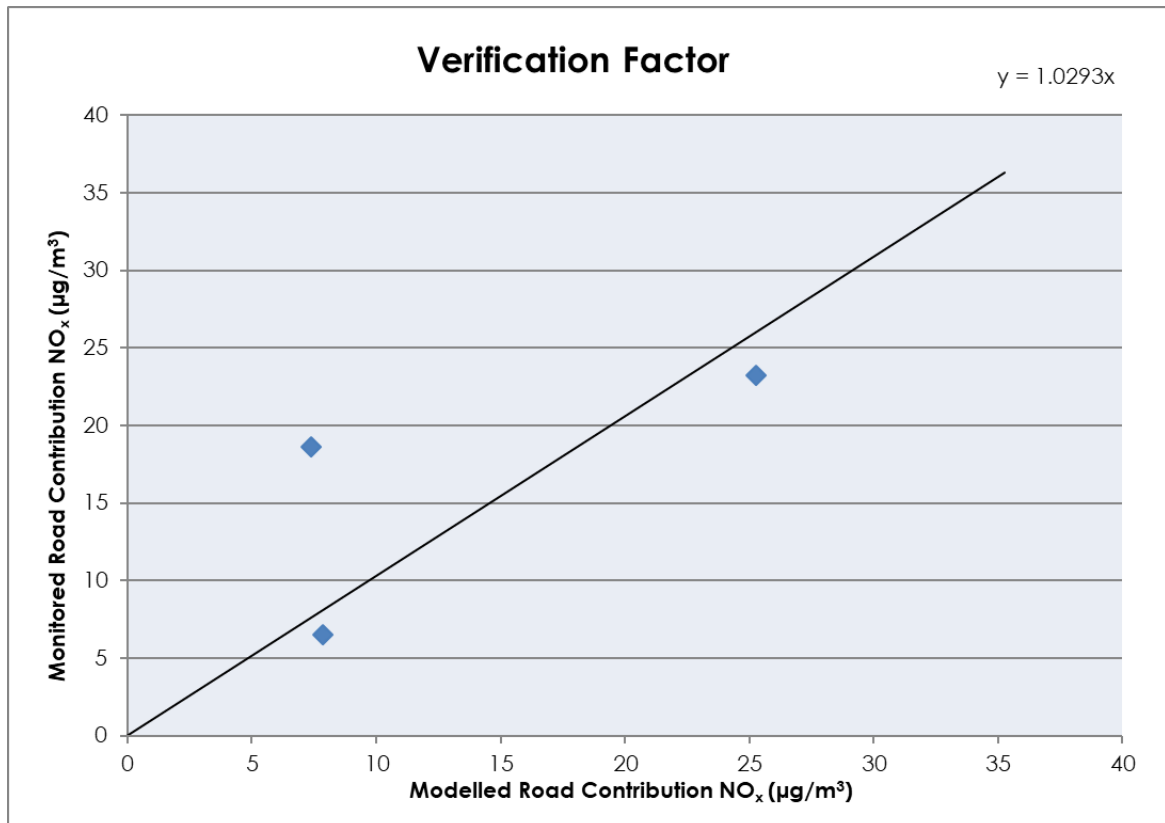
Table 8 Verification - Modelling Results

| Monitoring Location | | Calculated Road NO _x Concentration (µg/m ³) | Modelled Road NO _x Concentration (µg/m ³) |
|---------------------|----------------------|--|--|
| 2 | Trows Lane | 23.27 | 25.26 |
| 3 | 52 Cherrington Drive | 6.51 | 7.85 |
| 4 | Middleton Library | 18.63 | 7.37 |

⁶ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

4.11.6 The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 1.0293 was required to be applied to all road NO_x modelling results, as shown in Graph 1.

Graph 1 Verification



4.11.7 Monitoring of PM₁₀ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust PM₁₀ model predictions in lieu of more accurate data in accordance with DEFRA guidance⁷.

⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

5.0 ASSESSMENT

- 5.1.1 Residential development at the proposed location may lead to the exposure of future occupants to elevated pollutant levels. Dispersion modelling was therefore undertaken with the inputs described in Section 4.0 to quantify air quality conditions at the site. Reference should be made to Figure 5 and 6 for graphical representations of the results.
- 5.1.2 As shown in Figure 5, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the site. The maximum level at the boundary was 28.05µg/m³.
- 5.1.3 As shown in Figure 6, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the site. The maximum level at the boundary was 12.93µg/m³.
- 5.1.4 Based on the assessment results, there are no predicted exceedences of the relevant AQOs for NO₂ or PM₁₀ at any location across the proposed development location. As such, the site is considered suitable for residential use from an air quality perspective without constraint to the masterplan design.

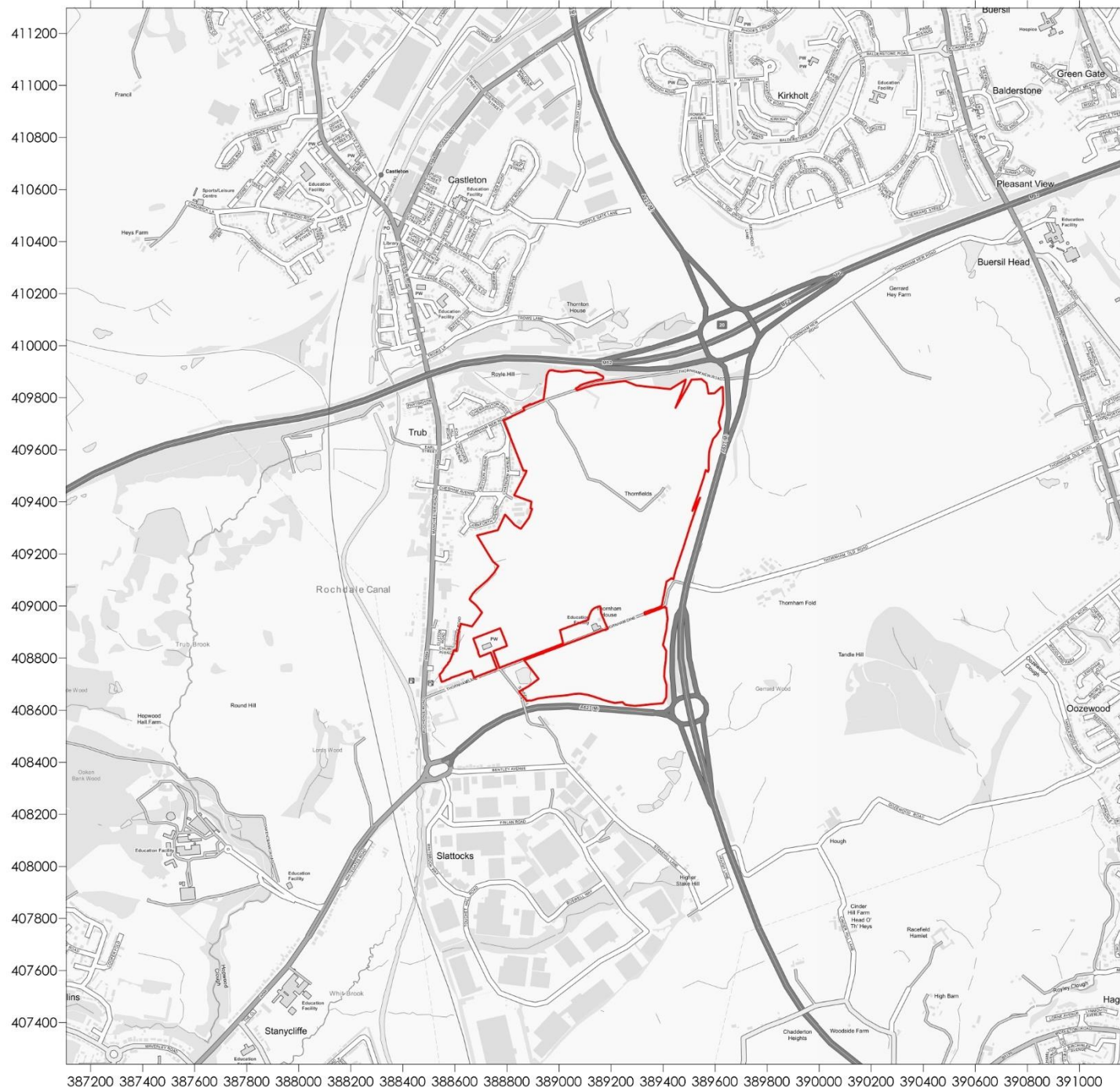
6.0 CONCLUSION

- 6.1.1 Redmore Environmental Ltd was commissioned by Redrow Homes Lancashire Limited to undertake an Air Quality Assessment in support of a residential development on a parcel of land off Manchester Road, Rochdale.
- 6.1.2 The site is bound to the north by the M62 and to the east and south by the A627(M). This may cause elevated pollution levels due to vehicle exhaust emissions and act as a constraint to residential land use. As such, an Air Quality Assessment was undertaken in order to define baseline conditions, consider site suitability for the proposed end use and inform the masterplan design process.
- 6.1.3 Dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed development site as a result of emissions from the local highway network. Outputs were subsequently verified using local monitoring data obtained from RBC.
- 6.1.4 The results of the dispersion modelling assessment indicated that predicted annual mean NO₂ and PM₁₀ concentrations were below the relevant AQOs at all locations across the development.
- 6.1.5 Based on the assessment results, the site is considered suitable for residential use from an air quality perspective without constraint to the masterplan design.

7.0 **ABBREVIATIONS**

| | |
|------------------|---|
| AADT | Annual Average Daily Traffic |
| ADM | Atmospheric Dispersion Modelling |
| AQLV | Air Quality Limit Value |
| AQMA | Air Quality Management Area |
| AQO | Air Quality Objective |
| AQS | Air Quality Strategy |
| CERC | Cambridge Environmental Research Consultants |
| DEFRA | Department for Environment, Food and Rural Affairs |
| EB | Eastbound |
| HDV | Heavy Duty Vehicle |
| LA | Local Authority |
| LAQM | Local Air Quality Management |
| NB | Northbound |
| NGR | National Grid Reference |
| NO ₂ | Nitrogen dioxide |
| NO _x | Oxides of nitrogen |
| PM ₁₀ | Particulate matter with an aerodynamic diameter of less than 10µm |
| RBC | Rochdale Borough Council |
| SB | Southbound |
| SP | Slow Phase |
| WB | Westbound |
| Z ₀ | Roughness length |

Figures



Legend



Site Boundary

Title

Figure 1 - Site Location Plan

Project

Air Quality Assessment
Manchester Road, Rochdale

Project Reference

3496

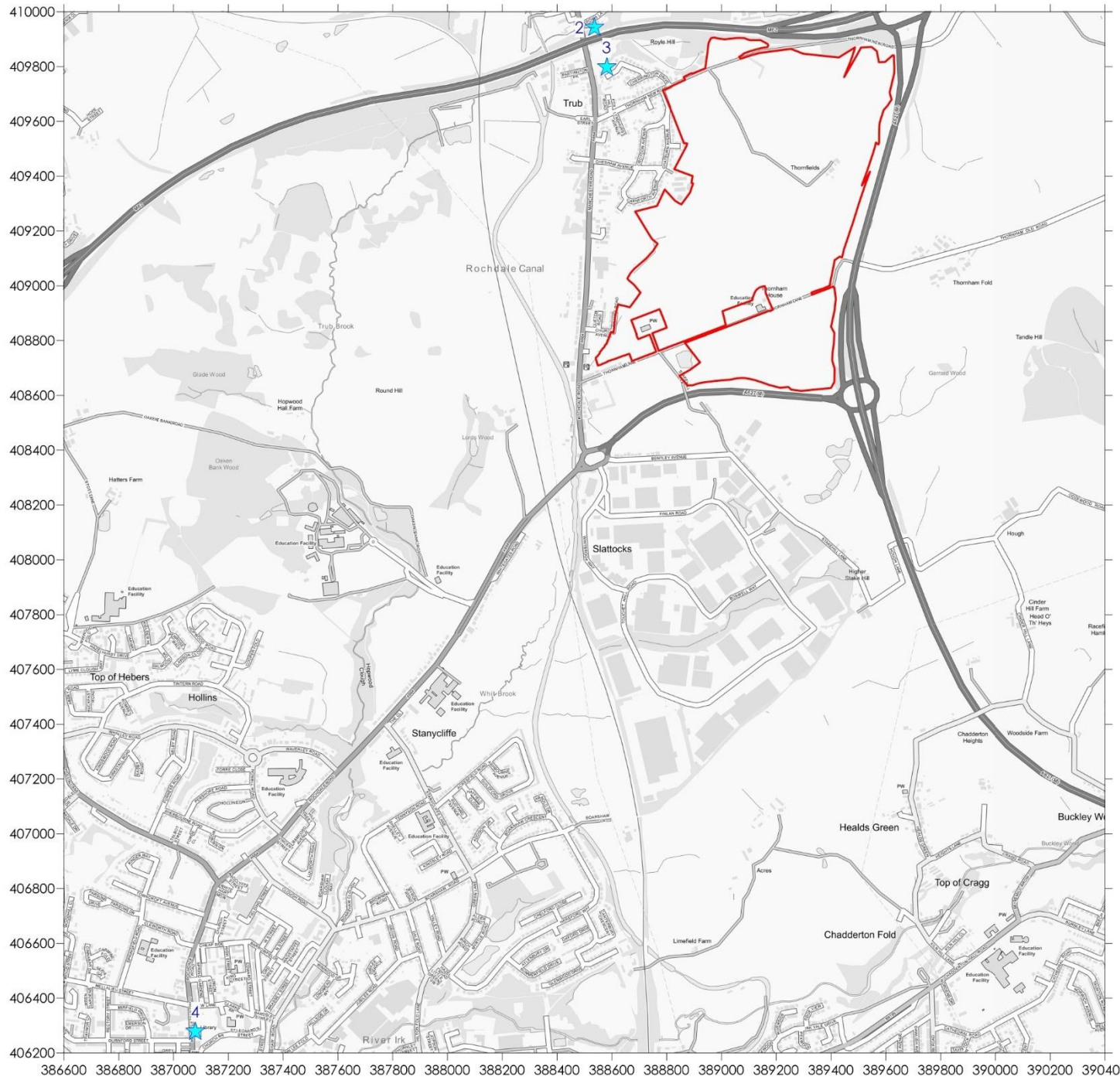
Client

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Legend



Site Boundary



Monitor

Title

Figure 2 - Monitoring Locations

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3496

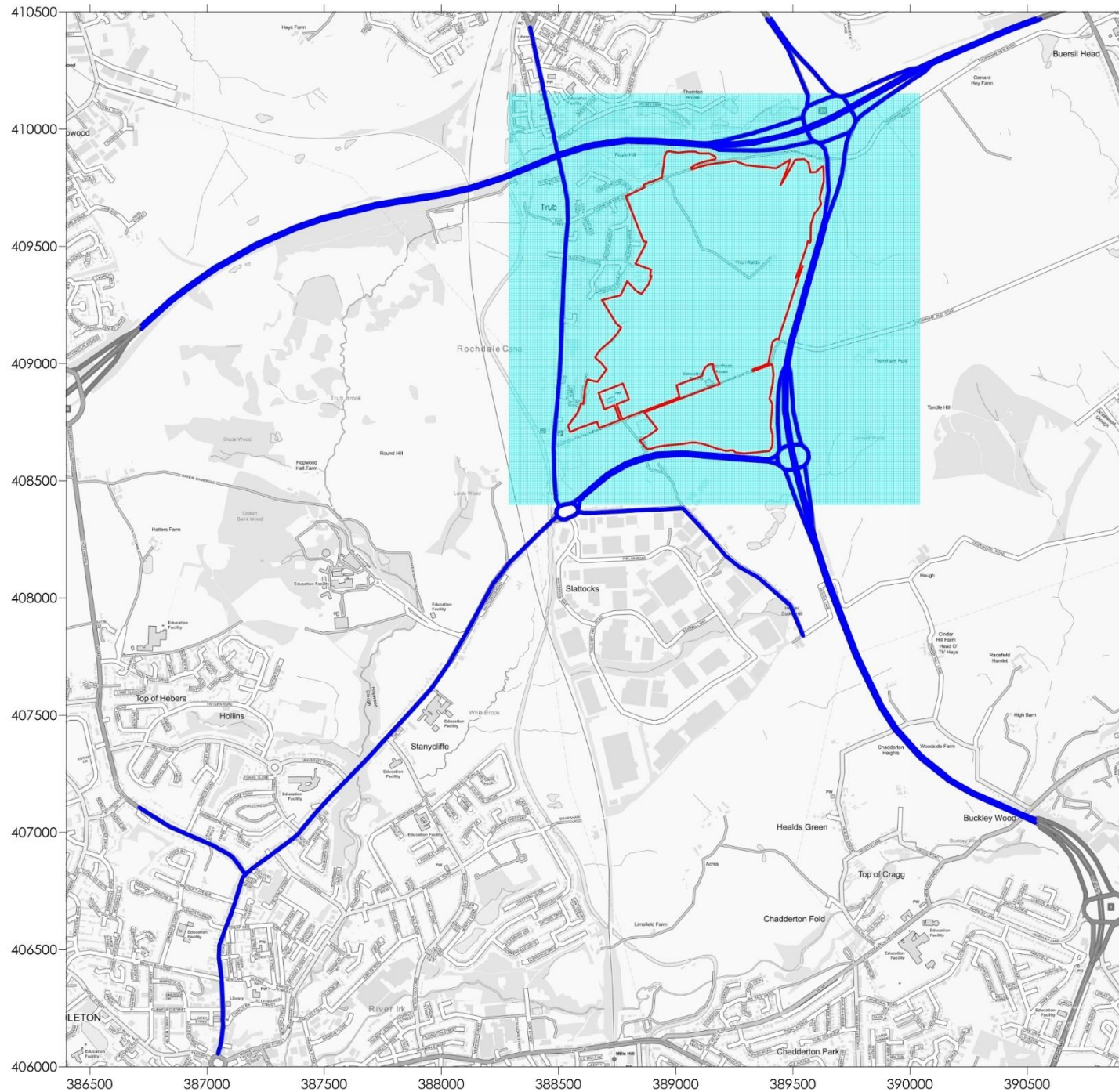
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

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Legend

-  Site Boundary
-  Output Grid
-  Road Link

Title
Figure 3 - ADMS-Roads Inputs

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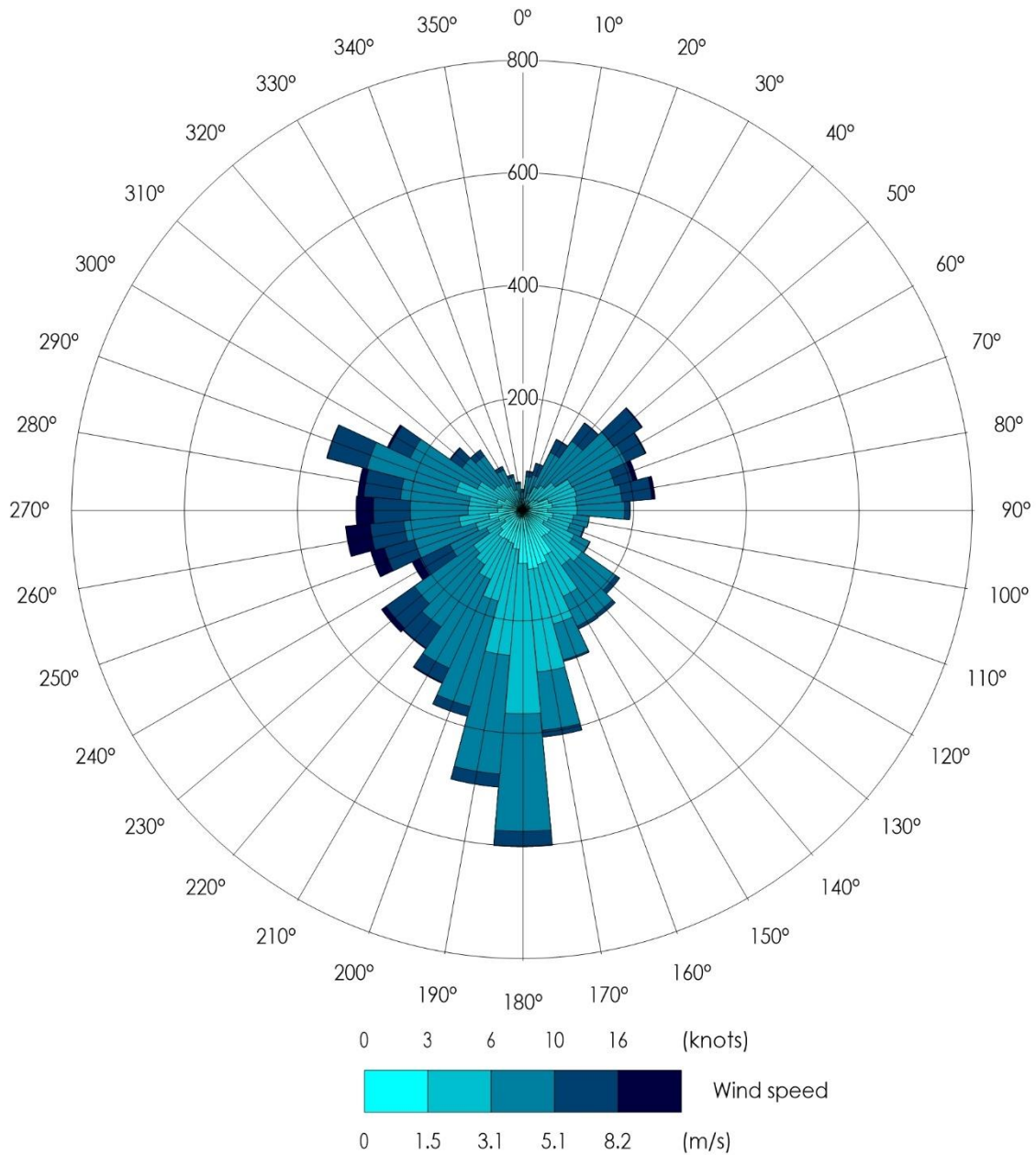
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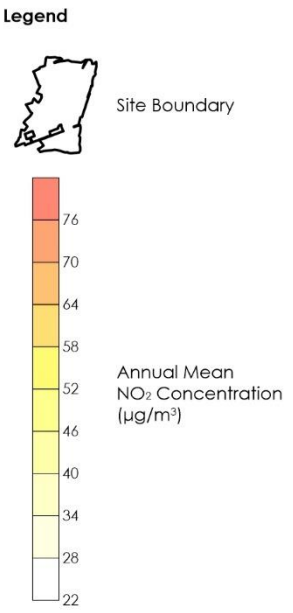
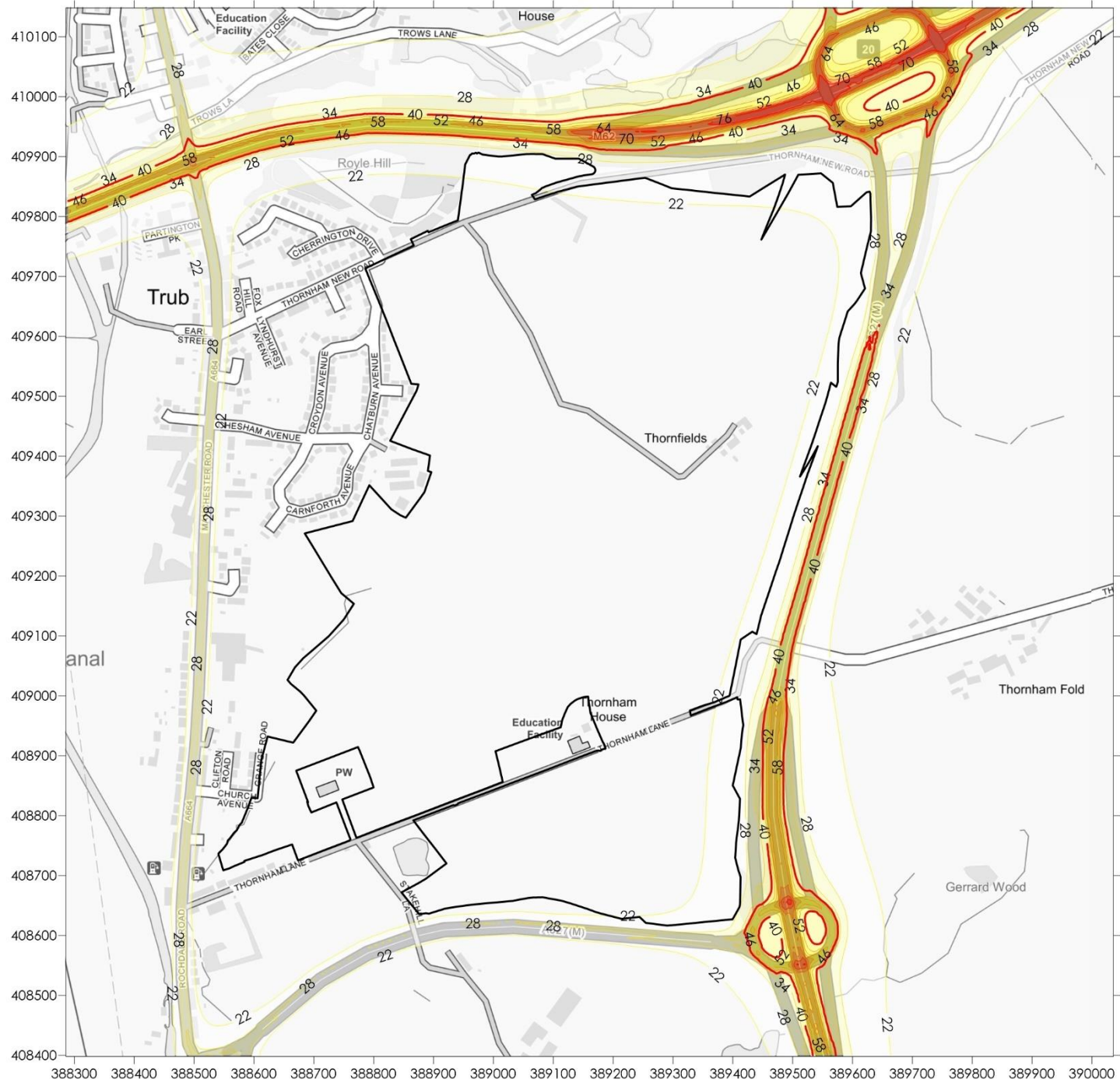
Title
 Figure 4 - Wind Rose of 2018
 Manchester Airport
 Meteorological Data

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 Air Quality Assessment
 Manchester Road, Rochdale

Project Reference
 3496

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 Redrow Homes Lancashire





Title
Figure 5 - Predicted Annual Mean NO₂ Concentrations (µg/m³)

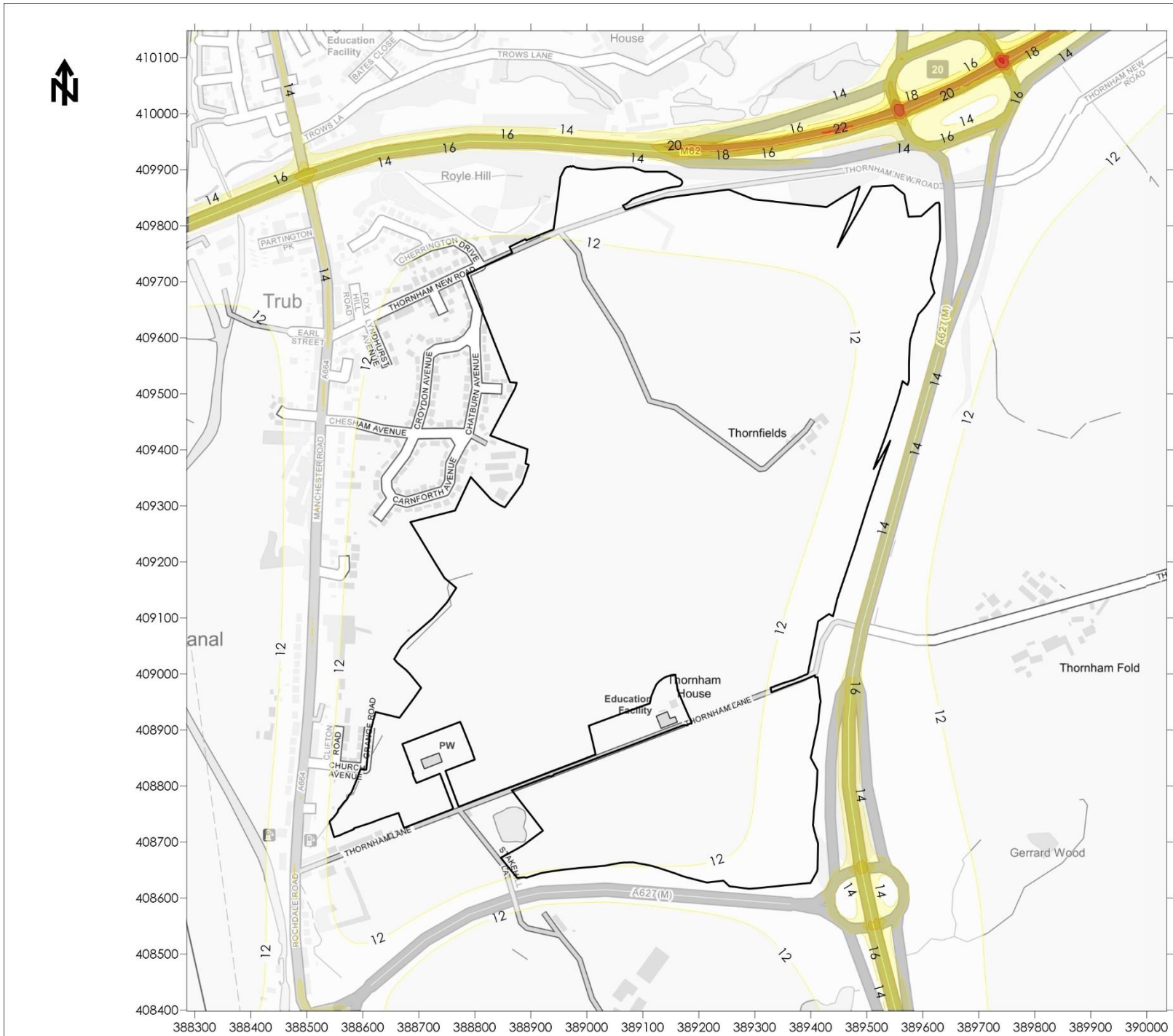
Project
Air Quality Assessment
Manchester Road, Rochdale

Project Reference
3496

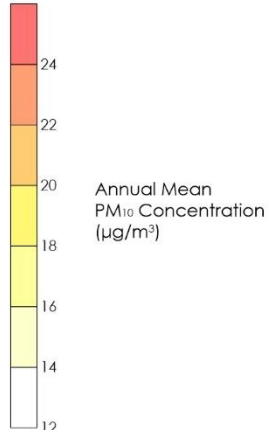
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Legend



Title
Figure 6 - Predicted Annual Mean PM₁₀ Concentrations (µg/m³)

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