

Appendix F: Air Quality



Appendix F.1: Legislation, Policy Context, Guidance and Standards

Appendix F Air Quality

14.1 Legislation, Policy Context, Guidance and Standards

Legislation

- 14.1.1 The Air Quality (England) Regulations 2000 (AQR)¹ defined National Air Quality Objectives (NAQOs) (a combination of concentration-based thresholds, averaging periods and compliance dates) for a limited range of pollutants. Subsequent amendments were made to the AQR in 2001 and 2002 to incorporate 'limit values' and 'target values' for a wider range of pollutants as defined in European Union (EU) Directives.
- 14.1.2 These amendments were consolidated by the Air Quality Standards Regulations 2010² (AQSR) (with subsequent amendments most notably in 2016 and for the devolved administrations), which transposed the EU's Directive on ambient air quality and cleaner air for Europe (2008/50/EC).
- 14.1.3 Following the transition period after the UK's departure from the EU in January 2020, the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019³ (and subsequent amendments for the devolved administrations) have amended the Air Quality Standards Regulations 2010 to reflect the fact that the UK has left the EU. The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁴ amended the particulate matter (PM_{2.5}) limit value in the AQSR to 20 µg/m³.
- 14.1.4 The relevant NAQOs and limit values used in the air quality assessment are presented in **Table 14.1.1** below.

Table 14.1.1 Relevant Air Quality Objectives/ limit values

Pollutant	Time Period	Objectives	Source
NO ₂	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year	NAQO and AQSR limit value
	Annual mean	40 µg/m ³	NAQO and AQSR limit value
PM ₁₀	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year	NAQO and AQSR limit value
	Annual mean	40 µg/m ³	NAQO and AQSR limit value
PM _{2.5}	Annual mean	20 µg/m ³	NAQO and AQSR limit value

¹ Statutory Instrument 2000, The Air Quality (England) Regulations 2000, His Majesty's Stationery Office (HMSO), London. Available at: <https://www.legislation.gov.uk/ukSI/2000/928/contents/made>. (Accessed: 28/04/2023).

² Statutory Instrument 2010, The Air Quality Standards Regulations 2010, His Majesty's Stationery Office (HMSO), London. Available at: <https://www.legislation.gov.uk/ukSI/2010/1001/contents/made>. (Accessed: 28/04/2023).

³ Statutory Instrument 2019, The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019, His Majesty's Stationery Office (HMSO), London. Available at: <https://www.legislation.gov.uk/ukSI/2019/74/made#:~:text=Environmental%20Protection>

⁴ Statutory Instrument 2020, The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, His Majesty's Stationery Office (HMSO), London. Available at: [https://www.gov.uk/eu-withdrawal-act-2018-statutory-instruments/the-environment-miscellaneous-amendments-eu-exit-regulations-2020#:~:text=2018%20statutory%20instruments-,The%20Environment%20\(Miscellaneous%20Amendments\)%20\(EU%20Exit\)%20Regulations%202020,directly%20applicable%20retained%20EU%20law](https://www.gov.uk/eu-withdrawal-act-2018-statutory-instruments/the-environment-miscellaneous-amendments-eu-exit-regulations-2020#:~:text=2018%20statutory%20instruments-,The%20Environment%20(Miscellaneous%20Amendments)%20(EU%20Exit)%20Regulations%202020,directly%20applicable%20retained%20EU%20law). (Accessed: 28/04/2023)

- 14.1.5 The NAQOs for NO₂ and PM₁₀ were to have been achieved by 2005 and 2004 respectively, but also continue to apply in all future years thereafter.
- 14.1.6 The 2019 Clean Air Strategy⁵ includes a commitment to set a “*new, ambitious, long-term target to reduce people's exposure to PM_{2.5}*” which the Environment Act 2021⁶ commits the Secretary of State to setting. Two PM_{2.5} targets were published via The Environmental Targets (Fine Particulate Matter) Regulations 2023⁷ and set out below:
- An annual mean concentration target for PM_{2.5} levels in England to be 10 µg/m³ or below by 2040; and
 - A population exposure reduction target for a reduction in PM_{2.5} population exposure of 35% compared to 2018 to be achieved by 2040.
- 14.1.7 The Government has published an Environmental Improvement Plan 2023⁸ which sets out the following interim PM_{2.5} targets to be met by the end of January 2028:
- The highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m³ of PM_{2.5}; and
 - Compared to 2018, the reduction in population exposure to PM_{2.5} in the most recent full calendar year must be 22% or greater.
- 14.1.8 The plan also details how these targets will be met including reducing emissions at home, driving effective local action through local authorities, maintaining and improving the regulatory framework for industrial emissions, supporting farmers to reduce their impact on ammonia emissions and reducing emissions from cars and other forms of transport.

National Air Pollution Plan for NO₂ on the UK

- 14.1.9 The National Air Quality Plan for nitrogen dioxide (NO₂)⁹ sets out how the Government plans to deliver reductions in NO₂ throughout the UK, with a focus on reducing concentrations to below the EU Limit Values throughout the UK within the 'shortest possible time'.
- 14.1.10 The plan requires all local authorities in England which the Department for Environment, Food and Rural Affairs (DEFRA) identified as having exceedances of the Limit Values in their areas past 2020 to develop local plans to improve air quality and identify measures to deliver reduced emissions, with the aim of meeting the Limit Values within their area within "the shortest possible time". Potential measures include changing road layouts, encouraging public and private ultra-low emission vehicle (ULEV) uptake, the use of retrofitting technologies and new fuels and encouraging public transport. In cases where these measures are not sufficient to bring about the required change within 'the shortest possible time' then local authorities may consider implementing access restrictions on more polluting vehicles (e.g. Clean Air Zones (CAZs)). A CAZ is defined within the plan as being “an area where targeted action is taken to improve air quality and resources are prioritised and coordinated in a way that delivers improved health benefits and supports economic growth” and may be charging or non-charging.

⁵ Department of the Environment, Food and Rural Affairs (DEFRA) (2019). Clean Air Strategy 2019. Available at: <https://www.gov.uk/government/publications/clean-air-strategy-2019>. (Accessed: 28/04/2023).

⁶ UK Public General Acts (2021). The Environment Act 2021. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>. (Accessed: 28/04/2023).

⁷ Statutory Instruments 2023 No. 96. 'The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023' HMSO, London

⁸ Department for Environment, Food and Rural Affairs (DEFRA) (2023). 'Environmental Improvement Plan 2023'. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan>. (Accessed: 28/04/2023).

⁹ Department for Environment, Food and Rural Affairs (DEFRA) (2018). UK Plan for tackling Roadside Nitrogen Dioxide Concentrations: Detailed Plan. Available at: <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>. (Accessed: 28/04/2023).

Air Quality Strategy

- 14.1.11 Part IV of the Environment Act 1995¹⁰ required the Secretary of State to prepare and publish a 'strategy' regarding air quality.
- 14.1.12 The Air Quality Strategy (2007) establishes the policy framework for ambient air quality management and assessment in the UK¹¹. The primary objective of the Air Quality Strategy is to ensure that everyone can enjoy a level of ambient air quality which poses no significant risk to health or quality of life. The Air Quality Strategy sets out the NAQOs and Government policy on achieving these.
- 14.1.13 The Environment Act required an updated Air Quality Strategy, and the Air Quality Strategy¹² sets out six priorities including boosting active travel and public transport. The Air Quality Strategy sets out the Government policy on achieving the NAQOs, including the new targets for PM_{2.5}.
- 14.1.14 The Clean Air Strategy (2019)⁵ aims to lower national emissions of pollutants, thereby reducing background pollution and minimising human exposure to harmful concentrations of pollution. The Strategy aims to create a stronger and more coherent framework for action to tackle air pollution.

Local Air Quality Management

- 14.1.15 Part IV of the Environment Act 1995¹⁰ introduced a system of Local Air Quality Management (LAQM) which requires local authorities to regularly and systematically review and assess air quality within their boundary and appraise development and transport plans against these assessments.
- 14.1.16 Where a NAQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) setting out the measures it intends to introduce in pursuit of the NAQOs within its AQMA.
- 14.1.17 The Local Air Quality Management Technical Guidance 2022 (LAQM.TG(22))¹³, issued by the DEFRA for local authorities provides advice on where the NAQOs apply. These include outdoor locations where members of the public are likely to be regularly present for the averaging period of the objective (which vary from 15 minutes to a year) as summarised in **Table 14.1.2**.

¹⁰ UK Public General Acts 1995, Environment Act 1995, His Majesty's Stationery Office (HMSO), London. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents>. (Accessed: 28/04/2023).

¹¹ Department for Environment, Food and Rural Affairs (DEFRA) in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland (2007). 'The Air Quality Strategy for England, Scotland, Wales, Northern Ireland' HMSO, London.

¹² Department for Environment, Food and Rural Affairs (DEFRA) (2023). The Air Quality Strategy for England. Available at: <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england> (Accessed: 24/05/2023).

¹³ Department for Environment, Food and Rural Affairs (DEFRA) (2022). Local Air Quality Management Technical Guidance (TG22). August 2022. Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>. (Accessed: 28/04/2023).

Table 14.1.2 Relevant Public Exposure

Averaging Period	NAQOs should apply at:	NAQOs don't apply at:
Annual mean	All locations where members of the public might be regularly exposed For example: Building façades of residential properties, schools, hospitals, care homes etc	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 residences Kerbside sites Any other location where public exposure is expected to be short term
24-hour and 8-hour mean	All locations where the annual mean NAQO would apply, together with hotels and gardens of residences	Kerbside sites Any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean NAQOs apply as well as: Kerbside sites Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside locations where the public would not be expected to have regular access
15-minute mean	All locations where members of the public might reasonably be regularly exposed for a period of 15 minutes or longer.	

National Policy

National Planning Policy Framework

14.1.18 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how they are expected to be¹⁴. The following paragraphs are considered relevant from an air quality perspective.

14.1.19 Paragraph 108 on promoting sustainable transport states:

“Transport issues should be considered from the earliest stages of plan-making and development proposals, so that: ...

¹⁴ Department for Levelling Up, Housing and Communities (DLUHC) (2023). 'National Planning Policy Framework'. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Accessed: 21/11/2023).

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; ...”

14.1.20 Paragraph 109 goes on to state:

“Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.”

14.1.21 Paragraph 180 on conserving and enhancing the natural environment states:

“Planning policies and decisions should contribute to and enhance the natural and local environment by: ...

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land stability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans...”

14.1.22 Paragraph 191 within ground conditions and pollution states:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”

14.1.23 Paragraph 192 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.”

14.1.24 Paragraph 193 states that:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed”.

National Planning Practice Guidance

14.1.25 Paragraph 005, Reference 32-005-20191101 (Air Quality, revision date 01.11.2019), of the Planning Practice Guidance (PPG) ¹⁵ provides guidance on how considerations regarding air quality can be relevant to the development management process as follows:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

Where air quality is a relevant consideration the local planning authority may need to establish:

- *The 'baseline' local air quality, including what would happen to air quality in the absence of the development;*
- *Whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and*
- *Whether occupiers or users of the development could experience poor living conditions or health due to poor air quality."*

14.1.26 Paragraph 006, Reference 32-006-20191101 (Air Quality, revision date 01.11.2019), of the PPG identifies what specific air quality issues need to be considered in determining a planning application:

"Considerations that may be relevant to determining a planning application include whether the development would:

- *Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; and significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*
- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*

¹⁵ Department for Levelling Up, Housing and Communities (DLUHC) and Ministry of Housing, Communities & Local Government (MHCLG) (2019). 'Planning Practice Guidance (PPG).' [Online] Available at: <https://www.gov.uk/government/collections/planning-practice-guidance> (Accessed 16/11/2023).

- Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations; and
- Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."

14.1.27 Paragraph 007, Reference 32-007-20191101 (Air Quality, revision date 01.11.2019), of the PPG provides guidance on how detailed an assessment needs to be:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

and

"The following could form part of assessments:

- *A description of baseline conditions and any air quality concerns affecting the area, and how these could change both with and without the proposed development;*
- *Sensitive habitats (including designated sites of importance for biodiversity);*
- *The assessment methods to be adopted and any requirements for the verification of modelling air quality;*
- *The basis for assessing impacts and determining the significance of an impact;*
- *Where relevant, the cumulative or in-combination effects arising from several developments;*
- *Construction phase impacts;*
- *Acceptable mitigation measures to reduce or remove adverse effects; and*
- *Measures that could deliver improved air quality even when legally binding limits for concentrations of major air pollutants are not being breached."*

14.1.28 Paragraph 008, Reference 32-008-20140306 (Air Quality, revision date 01.11.2019), of the PPG provides guidance on how an impact on air quality can be mitigated:

"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.

Examples of mitigation include:

- *Maintaining adequate separation distances between sources of air pollution and receptors;*
- *Using green infrastructure, trees, where this can create a barrier or maintain separation between sources of pollution and receptors;*
- *Appropriate means of filtration and ventilation;*
- *Including infrastructure to promote modes of transport with a low impact on air quality (such as electric vehicle charging points);*

- *Controlling dust and emissions from construction, operation and demolition; and*
- *Contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development."*

Local Planning Policy

Rochdale Core Strategy 2016

14.1.29 Rochdale Borough Council (RBC) adopted the Rochdale Core Strategy in 2016¹⁶. The strategy sets out the Borough's vision for development up until 2028. The Strategy contains the following policies relevant to air quality:

14.1.30 Policy C6 – Improving health and well being:

"We will improve people's health and well being and reduce health inequalities by

- *Creating an economic, physical and social environment which promotes and supports healthy lifestyles;*
- *Supporting and promoting accessible new health facilities and services in town centres and local centres; and*
- *Focusing the above actions in areas of deprivation, poor health and/or greatest need.*

We will achieve this through:

[...] i. Identifying and implementing measures to reduce traffic movements and congestion to reduce air and noise pollution (Policy T1)[...]"

14.1.31 Policy G9 – Reducing the impact of pollution, contamination and land instability:

"We will reduce all forms of pollution, contamination and land instability in the borough, by:

a. Focusing on measures that reduce air pollution in Air Quality Management Areas, and other areas where pollution levels are unacceptable, particularly around motorways and main roads;

b. Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution;

c. Ensuring sensitive new developments such as housing, schools and hospitals are not adversely affected by existing sources of pollution such as roads and certain types of industry;

[...] g. Using planning conditions or obligations to control pollution from new development, or the impact of pollution on new development."

14.1.32 Policy T1 – Delivering sustainable transport:

"We will work with relevant agencies to secure strategic, borough-wide and local transport improvements that support our overall spatial strategy. This programme of sustainable transport proposals will ensure accessibility for all users (prioritising low and non-carbon modes of travel in line with our Accessibility Hierarchy) focusing particularly on town centres, economic growth corridors and regeneration areas. It will also meet borough

¹⁶ Rochdale Borough Council (2016). Rochdale Core Strategy 2016. Available at: <https://www.rochdale.gov.uk/downloads/file/405/core-strategy> (Accessed: 22/09/2023).

responsibilities to reduce pollution (NO_x and PM₁₀) and climate change (CO₂) emissions from traffic to meet GM and national targets. [...]

14.1.33 Policy T2 – Improved accessibility:

“We will improve accessibility by locating development where good access to public transport is available or can be provided, backed by measures to reduce the need for travel and effective provision for cyclists, pedestrians and people with impaired mobility. Development will be appropriately located to minimise the need to travel by car and the number and length of car trips made to access local amenities. Transport improvements will focus access to priority regeneration areas, e.g. town centres, housing regeneration areas and economic growth corridors. We will do this by: [...]

b) We will require Transport Assessments (TA) and Travel Plans (TP) for:;

i. Residential developments of 80 units or more;

ii. All schools and Further Education Institutions (including extensions);

iii. Developments located in, or having an impact on, Air Quality Management Areas (AQMA);

iv. Areas where the Council has defined initiatives or targets to reduce traffic, restrict development growth, promote public transport, walking and cycling or measures to promote low emissions and tackle poor air quality;

v. Areas where the local transport infrastructure is inadequate e.g. sub-standard roads, poor pedestrian / cycle access or public transport provision; and

vi. Areas where additional development traffic is likely to increase accidents or conflicts between motorised and non-motorised users, particularly children, the elderly or people with impaired mobility. ...”

14.1.34 Policy DM1 – General development requirements:

“All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they:

[...] d. Mitigate against any impacts due to noise, air, dust, light and odour pollution, traffic generation or inadequate access, where such mitigation is identified as being necessary;[...]

[...] f. Do not have an adverse impact on health, through its impact or the effect of existing problems e.g. land contamination, or poor air quality;[...]

[...] m. Do not lead to impacts detrimental to the conservation interests of European Protected Sites.”

14.1.35 Policy DM2 – Delivering planning contributions and infrastructure

“[...] 3. All types of development

For all types of development, including housing, we will seek contributions for any infrastructure or other measures necessary to mitigate any on site or off-site impacts from the development.

These contributions may cover, dependent on need:

...e) Mitigation or compensation against environmental impacts e.g. noise, air quality (particularly in Air Quality Management Areas...”

Rochdale Borough Transport Strategy (2014)

14.1.36 In 2014, RBC refreshed their Transport Strategy¹⁷ which runs until 2026. One of the major parts of its vision is to ensure that changes are made to Rochdale's transport network in order to reduce emissions and tackle air quality issues in the Borough. RBC hope to achieve this by offering more opportunities and / or a choice for people to travel actively, and by sustainable means.

Rochdale's Climate Change Strategy and Delivery Plan – a partnership approach (2021-2025)

14.1.37 The Climate Strategy and Delivery Plan¹⁸ outlines the action that RBC need to take to tackle the climate crisis to reach their goal of being carbon neutral by 2038. It also presents how air pollution in Rochdale is having negative effects on residents' health and is one of the five key areas RBC will take action to reduce emissions over the next five years.

Greater Manchester Clean Air Plan

14.1.38 RBC and nine other local authorities in Greater Manchester are currently working towards creating a Clean Air Plan for Greater Manchester¹⁹. The investment-led plan aims to address nitrogen dioxide exceedances on Manchester roads through funds for cleaner buses and taxis, with some localised traffic measures.

Greater Manchester Strategy (2021-2031)

14.1.39 The Greater Manchester Strategy²⁰ was implemented in 2021 and sets out the Authority's plans for the next decade. One of the commitments within the strategy is to make Greater Manchester carbon neutral by 2038 with better air quality and natural environment.

Greater Manchester Air Quality Action Plan (2016-2021)

14.1.40 The Greater Manchester Air Quality Action Plan²¹ was plan was implemented in 2016 with the primary objective to improve air quality across Greater Manchester and encourage low emissions behaviour in the population by meeting the EU's thresholds for air pollutants. Three 'Key Priority Areas' have been identified as ways to improve air quality these being, to reduce traffic, increase efficiency and decrease the number of highly polluting vehicles. Furthermore, a number of action plans have been set out in order to enable Greater Manchester to improve their Air Quality.

Greater Manchester Transport Strategy 2040

14.1.41 The Greater Manchester Combined Authority adopted the Greater Manchester Transport Strategy 2040²² in 2017. It sets out the long-term ambition for transport in the Greater

¹⁷ Rochdale Borough Council (2014) 'Rochdale Borough Transport Strategy'. Available at: <https://www.rochdale.gov.uk/downloads/file/924/transport-strategy> (Accessed 22/09/2023)

¹⁸ Rochdale Borough Council (2021) 'Rochdale's Climate Change Strategy and Delivery Plan – a partnership approach (2021-2025)'. Available at: <https://democracy.rochdale.gov.uk/documents/s87310/Appendix%201%20-%20Climate%20Change%20Strategy.pdf> (Accessed 22/09/2023)

¹⁹ Greater Manchester Combined Authority (2023). 'Clean Air Plan'. Available at: <https://www.rochdale.gov.uk/directory-record/139/clean-air-plan> (Accessed 21/02/2024).

²⁰ Greater Manchester Combined Authority (2021) 'Greater Manchester Strategy 2021-2031'. Available at: <https://aboutgreatermanchester.com/media/jlslgbys/greater-manchester-strategy-our-plan.pdf> (Accessed 22/09/2023)

²¹ Greater Manchester Combined Authority (2016) 'Greater Manchester Air Quality Action Plan 2016-2021'. Available at: https://www.manchester.gov.uk/download/downloads/id/24676/greater_manchester_air_quality_action_plan_-_2016-2021.pdf. (Accessed 22/09/2023)

²² Greater Manchester Combined Authority (2021) 'Greater Manchester Transport Strategy 2040'. Available at: https://assets.ctfassets.net/nv7y93idf4jq/01xbKQQNW0ZYLzYvcj1z7c/4b6804acd572f00d8d728194ef62bb89/Greater_Manchester_Transport_Strategy_2040_final.pdf (Accessed 22/09/23)

Manchester area including aiming to reduce air pollution and therefore improving air quality. The following policies are linked to air quality:

14.1.42 Policy 4 which states:

“Policy 4: We will work with developers to ensure that new developments are accessible by sustainable modes, and to reduce transport emissions and impacts on the highway network.”

14.1.43 Policy 9 which states:

“Policy 9: We will work with partners and key stakeholders to bring nitrogen dioxide (NO₂) levels on local roads within legal limits, and to reduce levels of particulate matter.”

14.1.44 Policy 16 states:

“Policy 16: We will work with partners to support a rapid transition towards low emission vehicles in Greater Manchester, including developing a clear strategy on the Electric Vehicle Charging Infrastructure network required to provide greater confidence to residents and businesses to invest in electric vehicles.”

Greater Manchester Low Emission Strategy (2016)

14.1.45 The Greater Manchester Low Emission Strategy²³ was adopted by the Greater Manchester Combined Authority in 2016 and sets out a framework for policies and measures to reduce air pollution, encourage low emission behaviour and help the UK government meet the EU air quality limits. The strategy offers sustainable and long-term approaches to help Greater Manchester meet their goals.

Greater Manchester Combined Authority 2022 Air Quality Annual Status Report (ASR)

14.1.46 The 2022 Air Quality Annual Status Report²⁴ was published in June 2023 and shows the strategies that the Greater Manchester Combined Authority have employed to reduce air pollution and improve air quality. It also reports current data from the Local Air Quality Management monitoring regime and reports the progress of the Air Quality Action Plan.

Guidance

DEFRA ‘Local Air Quality Management Technical Guidance (LAQM.TG(22))’

14.1.47 DEFRA LAQM.TG(22) was published for use by local authorities in their LAQM review and assessment work¹³. The document provides key guidance on aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

EPUK / IAQM ‘Land-Use Planning & Development Control: Planning for Air Quality’

14.1.48 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance to help ensure that air quality is properly accounted for in the development control process²⁵. It clarifies when an air quality assessment should be

²³ Greater Manchester Combined Authority (2016) ‘Greater Manchester Low-Emission Strategy’. Available at: <https://www.greatermanchester-ca.gov.uk/media/1276/low-emission-strategy-dec-2016.pdf> (Accessed 22/09/2023)

²⁴ Greater Manchester Combined Authority (2023) ‘2022 Air Quality Annual Status Report (ASR)’. Available at: https://assets.ctfassets.net/tlpgbvvy1k6h2/3eJDZpHcCKNK0ZOTcUkl/3363e762b28868a832ab2200286a4841/Greater_Manchester_Air_Quality_Annual_Status_Report_2022.pdf (Accessed 22/09/23)

²⁵ Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM) (2017). Land-use Planning & Development Control: Planning for Air Quality. V1.2. The Institute for Air Quality Management, London. Available at: <https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf> (Accessed: 27/04/2023).

undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'

- 14.1.49 Guidance on the assessment of dust from demolition and construction has been published by the IAQM²⁶. The guidance provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities in order to identify appropriate mitigation measures that are defined within further IAQM guidance.

²⁶ Institute of Air Quality Management (2024). 'Guidance on the Assessment of Dust from Demolition and Construction', version 2.2, IAQM, London. Available at: <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>. (Accessed 12/02/2024).

Appendix F.2: IAQM Dust Guidance (2024) Approach

14.2 IAQM Dust Guidance (2024) Approach

Table 14.2.1 Dust Emission Magnitude Classification

Activity	Dust Emission Magnitude		
	Large	Medium	Small
Demolition	Total building volume of >75,000 m ³ , potentially dusty construction material, on-site crushing and screening, demolition activities >12 m above ground	Total building volume of 12,000 – 75,000 m ³ , potentially dusty construction material, demolition activities 6 – 12 m above ground level	Total building volume of <12,000 m ³ , construction material with low potential for dust release, demolition activities <6 m above ground, demolition during wetter months
Earthworks	Total site area of >110,000 m ² , potentially dusty soil type, >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height	Total site area of 18,000 – 110,000 m ² , moderately dusty soil type, 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3 - 6 m in height	Total site area of <18,000 m ² , soil type with large grain size, <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height
Construction	Total building volume >75,000 m ³ , on-site concrete batching, sandblasting	Total building volume 12,000 - 75,000 m ³ , potentially dusty construction material, on-site concrete batching	Total building volume <12,000 m ³ , construction material with low potential for dust release
Trackout	>50 HDV outwards movements in any one day, potentially dusty surface material, unpaved road length >100 m	20 - 50 HDV outwards movements in any one day, moderately dusty surface material, unpaved road length 50 - 100 m	<20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

Table 14.2.2 Receptor Sensitivity

Receptor Sensitivity	Impact		
	High	Medium	Low
High	An area where: - Users can reasonably expect enjoyment of a high level of amenity; - The appearance, aesthetics of value of their property would be diminished by soiling; - The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day). Examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling; OR Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. Indicative examples include a SAC designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.

Medium	An area where: - Users would expect to enjoy of a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; - The appearance, aesthetics of value of their property could be diminished by soiling; - The 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. Examples include parks and places of work.	Locations where people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day). Examples include office and shop workers, but will generally not include workers occupationally exposed to for PM₁₀, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; OR Locations with a national designation where the features may be affected by dust deposition. Indicative example is a SSSI with dust sensitive features.
Low	An area where: - The enjoyment of amenity would not reasonably be expected; - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.	Locations where human exposure is transient. Examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a LNR with dust sensitive features.

Table 14.2.3 Sensitivity of an Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 14.2.4 Sensitivity of an Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m ³	>100	High	High	High	Medium
		10 – 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32 µg/m ³	>100	High	High	Medium	Low
		10 – 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28 µg/m ³	>100	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10 – 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32 µg/m ³	>10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	24 - 28 µg/m ³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 14.2.5 Sensitivity of an Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High Risk	Medium Risk
Medium	Medium Risk	Low Risk
Low	Low Risk	Low Risk

Table 14.2.6 Risk of Dust Impacts Calculation Matrix

Sensitivity of Area		Dust Emission Magnitude		
		Large	Medium	Small
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk

	Low	Medium Risk	Low Risk	Negligible Risk
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk



Appendix F.3: EPUK/IAQM Guidance (2017) Screening Criteria

14.3 EPUK / IAQM Guidance (2017) Screening Criteria

Table 14.3.1 Indicative criteria for requiring an air quality assessment

The development will:	Indicative criteria to proceed to a detailed air quality assessment:
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors.	A change of LDV flow of: • >100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; and • >500 AADT elsewhere.
Cause a significant change in HDV flows on local roads with relevant receptors.	A change of HDV flow of: • >25 AADT within or adjacent to an AQMA; and • >100 AADT elsewhere.
Realign roads i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle acceleration / deceleration, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	A change of bus flows of: • >25 AADT within or adjacent to an AQMA; and • >100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be located within 20 m of a relevant receptor; and The car park will have >100 movements per day (total in and out).

The screening criteria presented is amended from Table 6.2 of the EPUK / IAQM guidance²⁵. Only the screening criteria relevant to changes in transport (including both traffic and the transport network) are outlined.

Appendix F.4: Road Traffic Emissions Air Quality Model Inputs and Results Processing

14.4 Road Traffic Emissions Air Quality Model Inputs and Results Processing

Summary of Model Inputs

Table 14.4.1 Model Inputs

Meteorological Data	2022 hourly meteorological data from the Bingley No.2 meteorological station has been used in the model. The wind rose is shown in Figure 14.4.1 .
ADMS	Version 5.0.1.3
Time Varying Emission Factors	Based on Department for Transport statistics. Table TRA0307. Motor vehicle traffic distribution by time of day and day of the week on all roads, Great Britain: 2022
Latitude	53.6°
Minimum Monin-Obukhov length	A value of 30 for 'mixed urban/ industrial' was used to represent the modelled area, and a value of 10 for 'small towns <50,000' was used to represent the meteorological station site.
Surface roughness	A value of 0.5 m for 'parkland, open suburbia' was used to represent the modelled area. A value of 0.3 m for 'agricultural area (max)' was used to represent the meteorological station site.
Emission Factor Toolkit (EFT)	V12.0.1 ²⁷
NO _x to NO ₂ Conversion	NO _x to NO ₂ calculator version 8.1, August 2020 ²⁸
Background Maps	2018 reference year background maps ²⁹

Human Receptor Locations

Table 14.4.2 Air Quality Human Receptor Locations

Receptor	Description	X Coordinate	Y Coordinate	Modelled Height (m)	Receptor Type
Existing Receptors					
R01	85 Hollingworth Road	393652.6	415431.8	3	Residential
R02	99 Hollingworth Road	393709.3	415343.7	1.5	Residential
R03	115 Hollingworth Road	393756.2	415296.6	1.5	Residential
R04	Residence above the Wine Press	393779.8	415272.7	4.5	Residential
R05	Vistry Site to the North	393557.8	415707.5	1.5	Residential
R06	Vistry Site to the North	393543.0	415769.1	1.5	Residential
R07	47 Hollingworth Road	393640.9	416007.6	1.5	Residential

²⁷ Department for Environment, Food and Rural Affairs (DEFRA) (2023d). 'Emissions Factor Toolkit (Version 12.0.1)' Online, available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html> (Accessed 15/02/2024).

²⁸ Department for Environment, Food and Rural Affairs (DEFRA) (2020). NO_x to NO₂ Calculator v8.1. Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/>. (Accessed 15/02/2024).

²⁹ Department for Environment, Food and Rural Affairs (DEFRA) (2020). Background Mapping data for local authorities - 2018. Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>. (Accessed 15/02/2024).

Receptor	Description	X Coordinate	Y Coordinate	Modelled Height (m)	Receptor Type
Existing Receptors					
R08	2 Todmorden Road	393920.9	416389.5	1.5	Residential
R09	5 Church Street	393903.8	416373.5	1.5	Residential
R10	Riverside Nursing Home	393893.6	416375.0	1.5	Care Home
R11	12 Church Street	393828.5	416384.5	0.5	Residential
R12	98 Church Street	393573.0	416309.7	1.5	Residential
R13	The Ark Nursery Littleborough	393283.3	416210.0	3.5	Nursery
R14	42 New Road	392583.7	415989.5	1.5	Residential
R15	750 Halifax Road	392235.2	415748.3	1.5	Residential
R16	Residence above the Ox & Plough	392229.3	415767.5	4.5	Residential
R17	163 New Road	392254.3	415752.9	1.5	Residential
R18	154 New Road	392243.4	415781.6	1.5	Residential
R19	701 Halifax Road	391993.7	415648.7	1.5	Residential
R20	Belvoir Care Home	391998.0	415623.5	1.5	Care Home
R21	691 Halifax Road	391962.6	415631.6	1.5	Residential
R22	478 Halifax Road	391567.0	415418.0	1.5	Residential
R23	10 Wardle Road	391235.9	415247.6	0.5	Residential
R24	Apple Tree Day Nursery	390901.9	414829.9	1.5	Nursery
R25	251 Halifax Road	390834.1	414803.6	1.5	Residential
R26	101 Halifax Road	390776.8	414758.8	1.5	Residential
R27	187 Halifax Road	390739.5	414691.3	1.5	Residential
R28	67 Clarke Street	390777.5	414676.2	1.5	Residential
R29	104 Halifax Road	390691.1	414463.6	1.5	Residential
R30	111b Halifax Road	390670.3	414485.4	1.5	Residential
R31	17 Cook Terrace	390682.4	414451.6	1	Residential
R32	Smithy Bridge Foundation Primary School	392717.6	415172.2	0	School
R33	81 Smithy Bridge Road	392918.5	415115.3	0	Residential
R34	2 Milnrow Road	393056.9	414978.4	0	Residential
R35	157 Smithy Bridge Road	393085.3	414996.8	1.5	Residential
R36	Lakeside Residential Home	393095.1	414995.7	1.5	Care Home
R37	140 Smithy Bridge Road	393093.7	414973.6	1.5	Residential
R38	1 Smithy Bridge Road	393258.3	414935.5	1.5	Residential
R39	5 Smithy Bridge Road	393264.9	414943.8	1.5	Residential
R40	35 Milnrow Road (Bowtee)	392982.1	414711.8	1.5	Residential
R41	36 Collier Avenue	392826.5	413282.6	1.5	Residential
R42	97 Kiln Lane	392903.7	413068.7	1.5	Residential
R43	95 Kiln Lane	392895.4	413065.7	1.5	Residential
R44	84 Kiln Lane	392912.6	413046.8	1.5	Residential
R45	6 Wildhouse Lane	392900.6	413086.0	1.5	Residential
R46	House on The Grange	392869.1	413010.0	1.5	Residential
R47	Milnrow Parish Primary School	392753.9	412897.5	1.5	School
R48	23 Kiln Lane	392685.1	412853.3	1.5	Residential

Receptor	Description	X Coordinate	Y Coordinate	Modelled Height (m)	Receptor Type
Existing Receptors					
R49	14 Kiln Lane	392653.3	412788.0	1.5	Residential
R50	16 Bridge Street	392579.9	412758.3	0.5	Residential
R51	1 Wesley Street	392492.7	412712.1	1.5	Residential
R52	179 Rochdale Road	391856.4	413246.4	1.5	Residential
R53	222 Rochdale Road	391873.2	413256.6	1.5	Residential
R54a	Houses on Ladybarn Lane	392648.3	412378.4	1.5	Residential
R54b	Houses on Ladybarn Lane	392648.3	412378.4	4.5	Residential
R55a	River Beal Court	392600.9	412425.6	1.5	Residential
R55b	River Beal Court	392600.9	412425.6	4.5	Residential
R56	32 Bridge Street	392508.9	412750.6	1.5	Residential
Proposed Receptors					
PR1	Proposed Site Residential	393589.5	415528.7	1.5	Residential
PR2	Proposed Site Residential	393593.2	415500.3	1.5	Residential
PR3	Proposed Site Residential	393620.6	415440.7	1.5	Residential
PR4	Proposed Primary School Land	393629.9	415428.3	1.5	School

Table 14.4.3

Traffic Data input into model

Link Number	Location	2022 Baseline		2025 Without Development		2025 With Development	
		AADT	HDV (%)	AADT	HDV (%)	AADT	HDV (%)
2	Site Access (Northern)	0	0.0	0	0.0	666	0.0
3	B6225 Hollingworth Road between Site Accesses	11818	4.7	13633	4.1	14687	3.8
5	Site Access (Southern)	0	0.0	0	0.0	1994	0.0
7	Wardle Road	9126	2.2	9221	2.2	9221	2.2
8	A58 Halifax Rd east of Wardle Road	23570	3.9	25154	3.7	25864	3.6
9	A58 Halifax Rd west of Wardle Road	31065	3.6	32749	3.4	33459	3.4
10	Birch Rd	11549	1.3	11910	1.3	11921	1.3
11	A58 Halifax Rd east of Old Road	24815	3.7	26814	3.4	27557	3.3
12	Old Road	170	9.2	170	9.3	170	9.3
13	A58 Halifax Rd west of Old Road	22948	3.8	24736	3.5	25469	3.4
14	A58 Halifax Rd east of Smithy Bridge Road	19961	4.4	21894	4.0	22534	3.9
15	Smithy Bridge Road	9381	2.2	10935	1.9	11289	1.8
16	A58 Halifax Rd west of Smithy Bridge Road	24599	3.7	27084	3.4	27872	3.3
17	Smithy Bridge Road east of Milnrow Road	13443	3.3	14433	3.0	16148	2.7
18	B6225 Milnrow Road	16705	3.0	18261	2.8	19464	2.6
19	Smithy Bridge Road west of Milnrow Road	8975	2.5	9647	2.3	10159	2.2
20	Lake Bank	13161	3.2	14113	3.0	15872	2.7
21	Smithy Bridge Rd east of Milbury Drive	170	0.0	139	0.0	139	0.0
22	Milbury Drive	341	0.0	321	0.0	365	0.0
23	Smithy Bridge Road west of Milbury Drive	13181	3.3	14124	3.1	15839	2.7
24	Road between Milbury Drive and Smithy Bridge Road east	13207	3.3	14131	3.1	15890	2.7
25	Hollingworth Rd west of Rakewood Road	12709	3.2	13633	2.9	15454	2.6
26	Rakewood Road	970	2.4	931	2.5	931	2.5
27	Lake Bank west of Rakewood Road	13023	3.1	13962	2.9	15783	2.6
28	A6033 Todmorden Road	13829	3.6	14656	3.4	14764	3.4
29	Halifax Rd east of Todmorden Road	15506	3.8	16627	3.5	17375	3.4
30	Halifax Rd west of Todmorden Road	13299	5.1	14598	4.6	15237	4.4
31	Halifax Rd east of Canal Street	7147	3.1	7710	2.9	7801	2.8
32	Canal St, to northern Site Access	12539	3.9	14304	3.5	15143	3.3
33	Halifax Rd west of Canal Street	15506	3.8	17303	3.4	18051	3.3
34	Rochdale Road north of Bridge Street	18664	5.0	19824	4.7	20099	4.7
35	Bridge Street	20400	3.2	22904	2.9	24001	2.8
36	Elizabethan Way south of Bridge Street ^a	20210	5.0	23008	4.4	24203	4.2
37	Wesley St	13	0.0	13	0.0	13	0.0
38	Road between Wesley St and Bridge St	18651	5.0	19810	4.7	20086	4.7
39	Kiln Lane	19633	3.0	20959	2.8	22074	2.6
40	Dale St	12984	3.2	13678	3.0	13678	3.0
41	Bridge St west of Kiln Lane	19948	3.3	21719	3.0	22833	2.9
42	Wildhouse Lane	15788	3.2	17996	2.8	19110	2.6
43	Wildhouse Lane south bound at Kiln Lane junction	7894	3.2	8998	2.8	9555	2.6

44	Wildhouse Lane north bound at Kiln Lane junction	7894	3.2	8998	2.8	9555	2.6
45	Kiln Lane east of Wildhouse Lane	5038	1.9	5158	1.8	5158	1.8
46	Kiln Lane west of Wildhouse Lane	16685	3.3	18837	2.9	19952	2.8
47	Road between Wildhouse Lane enter and exit	10370	2.3	11762	2.0	12351	1.9
49	Smithy Bridge Road between Little Clegg Road and Rose Avenue (DFT 930696)	7540	2.7	8356	2.4	8789	2.3
50	Link 18 to Link 19 (Smithy Bridge Roundabout)	10702	3.0	11625	2.7	12501	2.5
51	Link 19 to Link 17 (Smithy Bridge Roundabout)	9496	2.9	10296	2.7	11053	2.5
52	Link 17 to Link 18 (Smithy Bridge Roundabout)	9208	3.0	9910	2.8	10850	2.6
53	Link 41 to Link 39 (Bridge Street Roundabout)	13194	3.2	14218	3.0	14778	2.9
54	Link 39 to Link 40 (Bridge Street Roundabout)	13787	3.1	14768	2.9	15405	2.8
55	Link 40 to Link 41 (Bridge Street Roundabout)	12438	3.1	13269	2.9	13741	2.8
56	Link 9 to Link 7 (Wardle Road Roundabout)	18208	3.5	19138	3.3	19523	3.2
57	Link 7 to Link 8 (Wardle Road Roundabout)	15760	3.6	16593	3.4	16943	3.3
58	Link 8 to Link 9 (Wardle Road Roundabout)	14380	3.6	15185	3.4	15532	3.3
59	Link 64 to Link 9 (Rochdale Bypass Roundabout)	17707	2.6	18502	2.5	18839	2.4
60	Link 9 to Link 62 (Rochdale Bypass Roundabout)	20252	3.2	21281	3.1	21712	3.0
61	Link 62 to Link 64 (Rochdale Bypass Roundabout)	18794	2.9	19518	2.8	19825	2.8
62	Albert Royds Street/Rochdale Bypass (DFT 7425)	21516	2.6	21516	2.6	21516	2.6
63	Red Lane (DFT 807446)	6294	2.2	6294	2.2	6294	2.2
64	Halifax Road west of Rochdale Bypass Roundabout (DFT 16558)	23066	2.3	24750	2.2	25460	2.1

^a Road link 36 has been partially modelled at a height of 3 metres to better simulate the dispersion of pollutants.

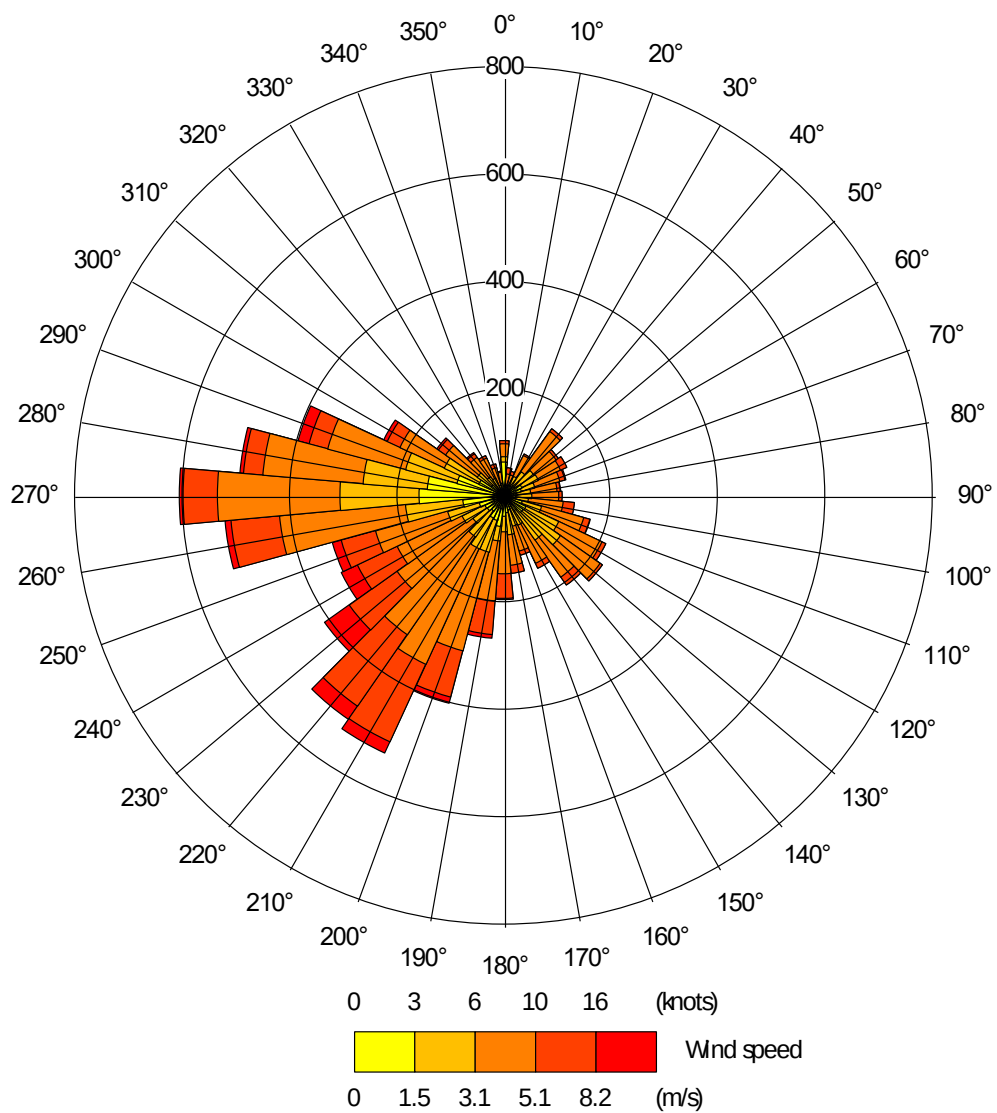


Figure 14.4.1 2022 Wind Rose for Bingley No.2 Meteorological Station

14.5 Road Traffic Emissions Air Quality Model Verification

NO₂

14.1.50 Most NO₂ is produced in the atmosphere by the reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emission of nitrogen oxides (NO_x = NO + NO₂). The model has been run to predict the 2022 annual mean road-NO_x contribution at two monitoring locations. Concentrations have been modelled at a height of 2 m for monitoring location RO12ANO, and 2.5 m for monitoring location RO28ANO. RO27ANO has been excluded from the model verification as it has a low data capture of 44.2% in 2022.

14.1.51 A primary adjustment factor of **3.27** has been determined as the slope of the best fit line between the modelled road NO_x contribution and the 'measured' road-NO_x (which is calculated from the measured and background NO₂ concentrations within DEFRA's NO_x from NO₂ calculator²⁸) forced through zero (**Figure 14.5.1**). This factor has then been applied to the raw modelled road-NO_x concentration to provide adjusted modelled road-NO_x concentrations.

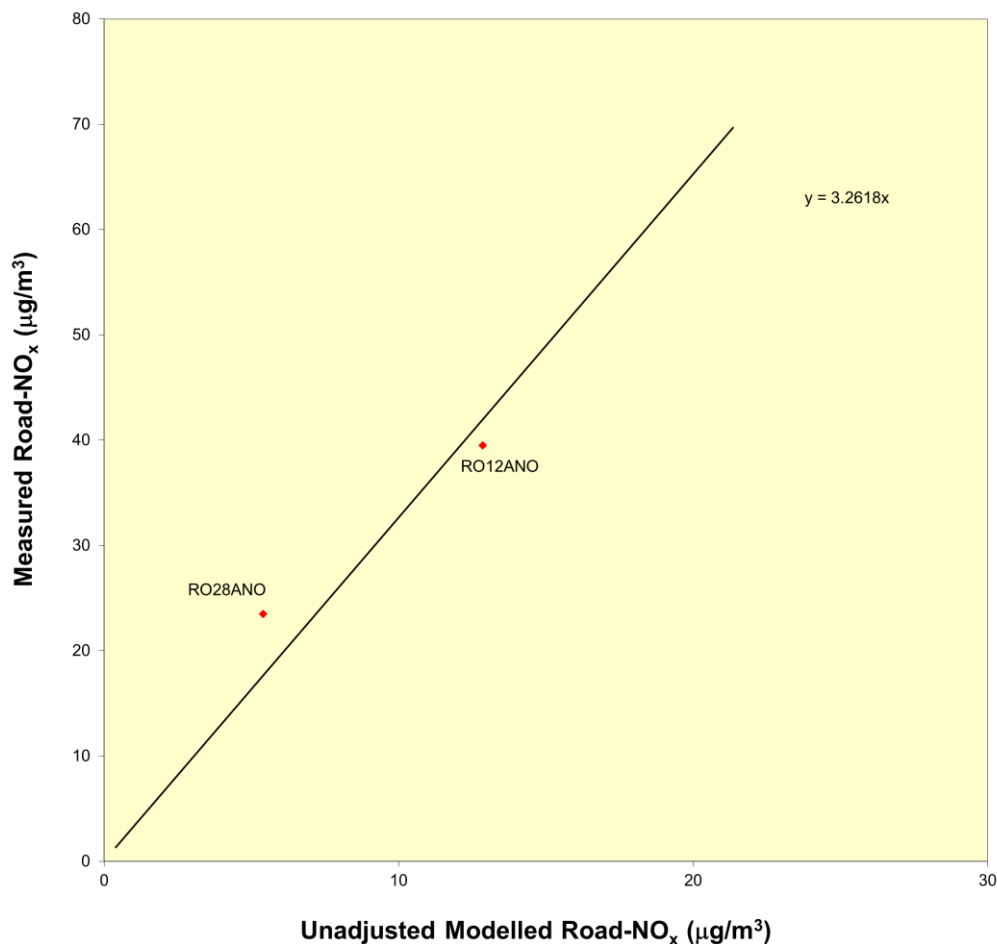


Figure 14.5.1 Measured and Unadjusted Road-NO_x Comparison

14.1.52 The total NO₂ concentrations have then been determined by combining the adjusted modelled road-NO_x concentrations with the background NO₂ concentration within DEFRA's NO_x from NO₂ calculator. A secondary adjustment factor of 1.01 has then been calculated as the slope of the best fit line applied to the adjusted data and forced through zero (Figure 14.5.2).

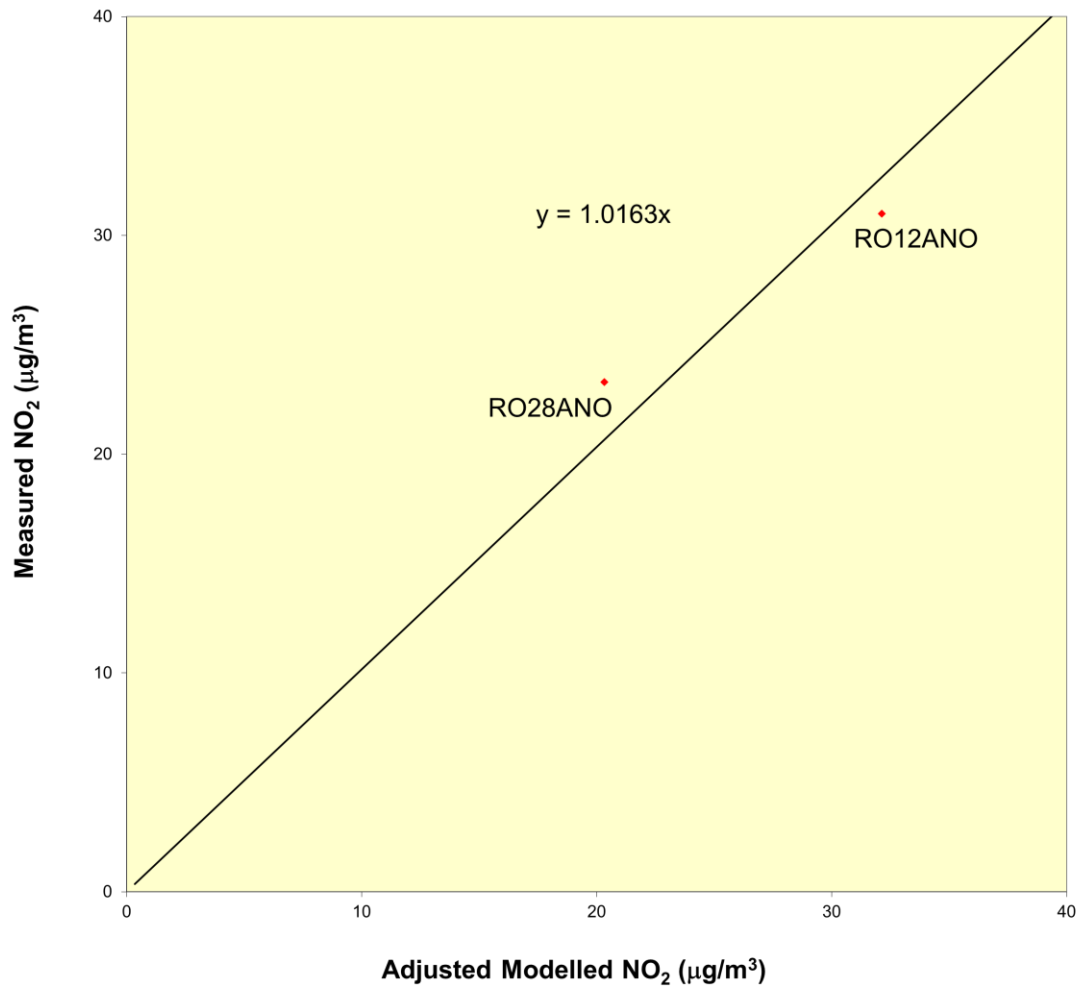


Figure 14.5.2 Measured and Primary Adjusted Modelled NO₂ Comparison

14.1.53 Figure 14.5.3 compares final adjusted modelled total NO₂ at each of the monitoring sites, to measured total NO_x and shows the 1:1 relationship, as well as $\pm 10\%$ and $\pm 25\%$ of the 1:1 line.

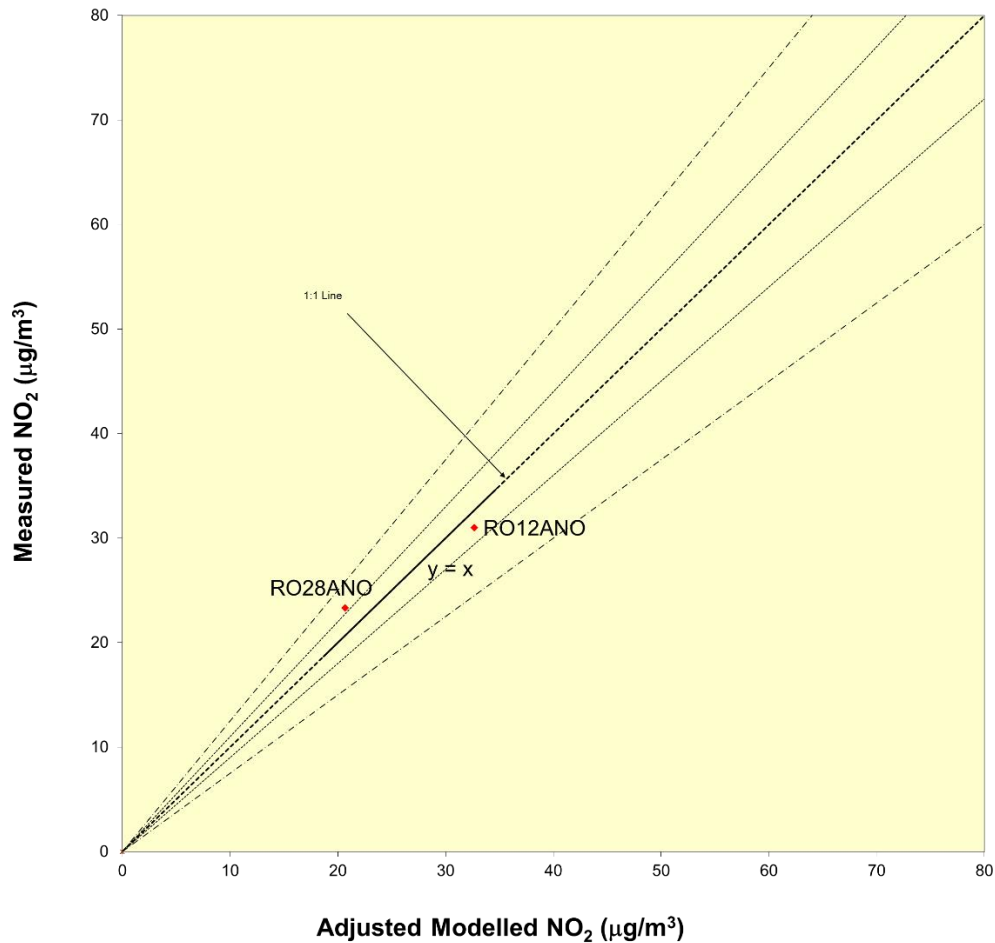


Figure 14.5.3 Measured and Final Adjusted Modelled NO₂ Comparison

14.1.54 The calculated adjustment factors imply that overall, the model has under-predicted the road-NO_x contribution. This is a common experience with this and most other models. The calculated Root Mean Square Error (RMSE) for this verification (2.2 µg/m³) lies within the range considered to be acceptable by DEFRA13 (0 – 4 µg/m³).

PM₁₀ and PM_{2.5}

14.1.55 There are no representative monitoring sites that measure concentrations of either PM₁₀ or PM_{2.5} located within the study area, and so it has not been possible to derive a PM₁₀ or PM_{2.5} specific adjustment factor. As such, the adjustment factor calculated for NO_x has been applied to the modelled road PM₁₀ and road PM_{2.5} concentrations.



Appendix F.5: Road Traffic Emissions Air Quality Model Verification



Appendix F.6: Human Receptor Road Traffic Emissions Air Quality Modelling Results

14.6 Human Receptor Road Traffic Emissions Air Quality Modelling Results

Baseline Concentrations

Table 14.6.1 Predicted Baseline Concentrations of NO₂, PM₁₀ and PM_{2.5} in 2022 and 2025

Receptor	Annual Mean (µg/m ³)					
	NO ₂		PM ₁₀		PM _{2.5}	
	2022	2025	2022	2025	2022	2025
R01	17.6	15.0	11.8	11.7	7.7	7.5
R02	24.2	19.8	13.7	13.5	8.6	8.4
R03	28.5	23.1	14.9	14.7	9.3	9.1
R04	15.1	12.8	11.2	10.9	7.3	7.1
R05	16.3	13.9	11.5	11.3	7.5	7.3
R06	16.3	14.0	11.5	11.3	7.5	7.3
R07	25.0	21.3	13.9	13.9	8.9	8.8
R08	39.9	32.3	16.8	16.7	10.5	10.2
R09	30.5	25.1	14.6	14.4	9.3	9.1
R10	31.0	25.5	14.7	14.5	9.3	9.1
R11	30.5	25.1	15.4	15.3	9.7	9.5
R12	26.7	22.3	14.4	14.3	9.2	9.0
R13	17.3	15.1	11.8	11.6	7.8	7.6
R14	28.2	23.2	15.0	14.9	9.4	9.3
R15	38.6	31.7	16.6	16.6	10.3	10.2
R16	24.7	20.5	13.3	13.1	8.5	8.3
R17	32.7	27.0	15.1	15.1	9.5	9.4
R18	28.4	23.3	14.1	14.0	9.0	8.8
R19	41.2	33.1	17.5	17.3	10.9	10.6
R20	29.4	23.9	14.5	14.3	9.3	9.0
R21	40.5	32.6	17.3	17.1	10.8	10.5
R22	33.8	27.2	16.7	16.5	10.4	10.2
R23	41.1	32.7	19.1	18.8	11.7	11.3
R24	29.9	24.5	15.3	15.0	9.8	9.5
R25	30.2	24.7	15.4	15.2	9.8	9.6
R26	23.4	19.6	13.8	13.5	8.9	8.7
R27	27.2	22.6	14.9	14.7	9.5	9.3
R28	26.8	22.2	14.8	14.5	9.4	9.2
R29	26.8	22.3	14.8	14.6	9.4	9.2
R30	27.0	22.5	14.9	14.7	9.5	9.2
R31	31.4	25.9	16.2	16.0	10.2	9.9
R32	15.2	13.2	11.4	11.2	7.5	7.3
R33	25.4	21.0	14.2	14.0	9.0	8.8
R34	18.7	15.6	11.9	11.7	7.7	7.5
R35	33.1	26.8	16.1	16.0	9.9	9.7
R36	28.9	23.4	14.8	14.7	9.2	9.0
R37	22.5	18.5	12.9	12.8	8.2	8.0
R38	25.9	21.0	13.9	13.7	8.8	8.5
R39	22.7	18.6	13.0	12.8	8.3	8.1
R40	22.7	18.9	13.4	13.2	8.4	8.3
R41	18.0	15.4	12.3	12.1	7.9	7.7
R42	28.8	24.1	15.0	15.0	9.4	9.2

Receptor	Annual Mean ($\mu\text{g}/\text{m}^3$)					
	NO ₂		PM ₁₀		PM _{2.5}	
	2022	2025	2022	2025	2022	2025
R43	27.2	22.8	14.7	14.7	9.2	9.1
R44	23.4	19.7	13.7	13.7	8.7	8.5
R45	32.9	27.3	15.8	15.8	9.8	9.7
R46	25.3	21.2	14.3	14.2	9.0	8.8
R47	22.1	18.6	13.6	13.4	8.7	8.5
R48	33.1	26.9	16.8	16.6	10.4	10.2
R49	36.8	29.8	17.8	17.6	11.0	10.7
R50	37.7	30.9	17.8	17.8	11.0	10.8
R51	25.9	21.6	14.0	13.9	9.0	8.8
R52	26.7	21.9	14.8	14.5	9.5	9.3
R53	35.8	28.7	17.5	17.2	10.9	10.7
R54a	18.0	15.4	12.4	12.2	8.1	7.9
R54b	18.2	15.7	12.4	12.2	8.1	7.9
R55a	16.7	14.4	12.0	11.8	7.9	7.7
R55b	16.4	14.2	12.0	11.7	7.9	7.7
R56	41.1	33.4	17.6	17.5	10.9	10.7
NAQOs	40		40		20	

Exceedances of the annual mean NAQO are highlighted in bold.

Operational Phase

NO₂ Concentrations

Table 14.6.2 Predicted Concentrations of NO₂ ($\mu\text{g}/\text{m}^3$), % Change and Impact at Each Existing Sensitive Receptor

Receptor	2025 Without Development	2025 With Development	Change ($\mu\text{g}/\text{m}^3$)	Change (as % of NAQO)	Impact Descriptor
R01	15.0	15.8	0.85	2	Negligible
R02	19.8	21.1	1.28	3	Negligible
R03	23.1	24.7	1.59	4	Negligible
R04	12.8	13.3	0.45	1	Negligible
R05	13.9	14.2	0.30	1	Negligible
R06	14.0	14.3	0.29	1	Negligible
R07	21.3	21.8	0.51	1	Negligible
R08	32.3	32.8	0.48	1	Negligible
R09	25.1	25.6	0.46	1	Negligible
R10	25.5	26.0	0.47	1	Negligible
R11	25.1	25.6	0.50	1	Negligible
R12	22.3	22.7	0.41	1	Negligible
R13	15.1	15.2	0.14	0	Negligible
R14	23.2	23.5	0.34	1	Negligible
R15	31.7	32.2	0.51	1	Negligible
R16	20.5	20.7	0.25	1	Negligible
R17	27.0	27.4	0.42	1	Negligible
R18	23.3	23.6	0.33	1	Negligible

Receptor	2025 Without Development	2025 With Development	Change (µg/m³)	Change (as % of NAQO)	Impact Descriptor
R19	33.1	33.5	0.42	1	Negligible
R20	23.9	24.2	0.28	1	Negligible
R21	32.6	33.1	0.48	1	Negligible
R22	27.2	27.6	0.38	1	Negligible
R23	32.7	33.0	0.28	1	Negligible
R24	24.5	24.7	0.23	1	Negligible
R25	24.7	25.0	0.23	1	Negligible
R26	19.6	19.7	0.13	0	Negligible
R27	22.6	22.8	0.23	1	Negligible
R28	22.2	22.4	0.19	0	Negligible
R29	22.3	22.6	0.25	1	Negligible
R30	22.5	22.7	0.24	1	Negligible
R31	25.9	26.2	0.34	1	Negligible
R32	13.2	13.4	0.15	0	Negligible
R33	21.0	21.5	0.52	1	Negligible
R34	15.6	16.0	0.44	1	Negligible
R35	26.8	27.9	1.14	3	Negligible
R36	23.4	24.5	1.07	3	Negligible
R37	18.5	19.2	0.69	2	Negligible
R38	21.0	22.2	1.22	3	Negligible
R39	18.6	19.6	1.00	2	Negligible
R40	18.9	19.4	0.54	1	Negligible
R41	15.4	15.7	0.27	1	Negligible
R42	24.1	24.7	0.65	2	Negligible
R43	22.8	23.4	0.61	2	Negligible
R44	19.7	20.2	0.45	1	Negligible
R45	27.3	28.1	0.81	2	Negligible
R46	21.2	21.7	0.54	1	Negligible
R47	18.6	18.9	0.32	1	Negligible
R48	26.9	27.6	0.64	2	Negligible
R49	29.8	30.6	0.72	2	Slight Adverse
R50	30.9	31.6	0.73	2	Slight Adverse
R51	21.6	22.0	0.37	1	Negligible
R52	21.9	22.0	0.12	0	Negligible
R53	28.7	28.9	0.18	0	Negligible
R54a	15.4	15.6	0.16	0	Negligible
R54b	15.7	15.8	0.17	0	Negligible
R55a	14.4	14.5	0.11	0	Negligible
R55b	14.2	14.3	0.11	0	Negligible
R56	33.4	34.0	0.62	2	Slight Adverse
NAQO	40		-		

PM₁₀ Concentrations

Table 14.6.3 Predicted Concentrations of PM₁₀ (µg/m³), % Change and Impact at Each Existing Sensitive Receptor

Receptor	2025 Without Development	2025 With Development	Change (µg/m ³)	Change (as % of NAQO)	Impact Descriptor
R01	11.7	12.0	0.29	1	Negligible
R02	13.5	14.0	0.49	1	Negligible
R03	14.7	15.4	0.63	2	Negligible
R04	10.9	11.1	0.16	0	Negligible
R05	11.3	11.4	0.11	0	Negligible
R06	11.3	11.4	0.11	0	Negligible
R07	13.9	14.1	0.19	0	Negligible
R08	16.7	16.8	0.17	0	Negligible
R09	14.4	14.6	0.16	0	Negligible
R10	14.5	14.7	0.16	0	Negligible
R11	15.3	15.4	0.20	0	Negligible
R12	14.3	14.4	0.16	0	Negligible
R13	11.6	11.6	0.05	0	Negligible
R14	14.9	15.0	0.13	0	Negligible
R15	16.6	16.8	0.18	0	Negligible
R16	13.1	13.2	0.08	0	Negligible
R17	15.1	15.3	0.14	0	Negligible
R18	14.0	14.1	0.11	0	Negligible
R19	17.3	17.4	0.15	0	Negligible
R20	14.3	14.4	0.10	0	Negligible
R21	17.1	17.3	0.17	0	Negligible
R22	16.5	16.7	0.16	0	Negligible
R23	18.8	18.9	0.12	0	Negligible
R24	15.0	15.1	0.08	0	Negligible
R25	15.2	15.2	0.08	0	Negligible
R26	13.5	13.6	0.05	0	Negligible
R27	14.7	14.8	0.09	0	Negligible
R28	14.5	14.6	0.07	0	Negligible
R29	14.6	14.7	0.10	0	Negligible
R30	14.7	14.7	0.09	0	Negligible
R31	16.0	16.1	0.13	0	Negligible
R32	11.2	11.2	0.05	0	Negligible
R33	14.0	14.2	0.20	0	Negligible
R34	11.7	11.9	0.16	0	Negligible
R35	16.0	16.5	0.47	1	Negligible
R36	14.7	15.1	0.42	1	Negligible
R37	12.8	13.0	0.26	1	Negligible
R38	13.7	14.2	0.47	1	Negligible
R39	12.8	13.2	0.38	1	Negligible
R40	13.2	13.4	0.21	1	Negligible
R41	12.1	12.2	0.10	0	Negligible
R42	15.0	15.3	0.24	1	Negligible
R43	14.7	15.0	0.24	1	Negligible
R44	13.7	13.8	0.17	0	Negligible
R45	15.8	16.1	0.30	1	Negligible

Receptor	2025 Without Development	2025 With Development	Change (µg/m³)	Change (as % of NAQO)	Impact Descriptor
R46	14.2	14.5	0.21	1	Negligible
R47	13.4	13.5	0.12	0	Negligible
R48	16.6	16.8	0.26	1	Negligible
R49	17.6	17.9	0.30	1	Negligible
R50	17.8	18.1	0.30	1	Negligible
R51	13.9	14.0	0.12	0	Negligible
R52	14.5	14.6	0.05	0	Negligible
R53	17.2	17.3	0.08	0	Negligible
R54a	12.2	12.2	0.05	0	Negligible
R54b	12.2	12.3	0.06	0	Negligible
R55a	11.8	11.8	0.04	0	Negligible
R55b	11.7	11.8	0.03	0	Negligible
R56	17.5	17.7	0.22	1	Negligible
NAQO	40		-		

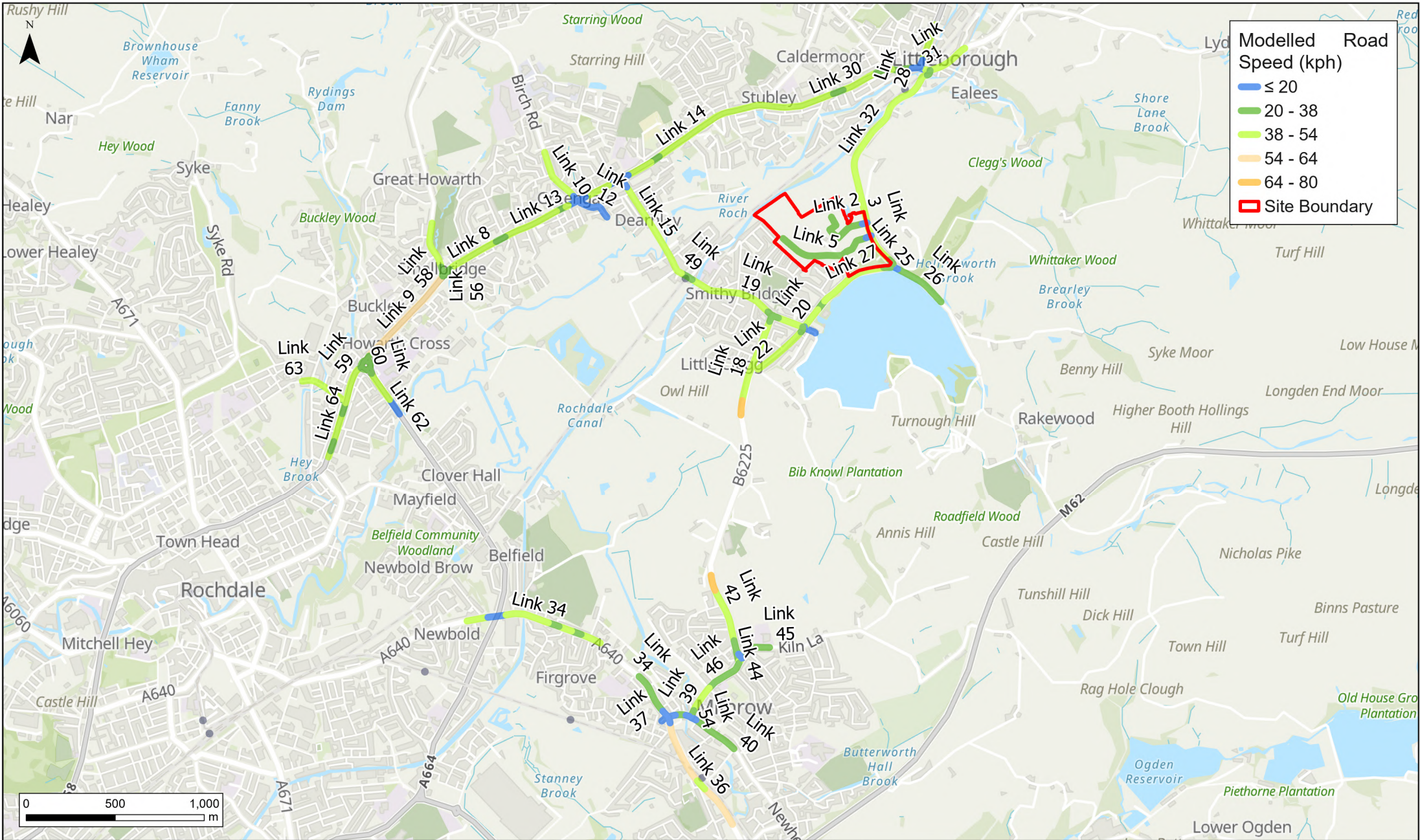
PM_{2.5} Concentrations

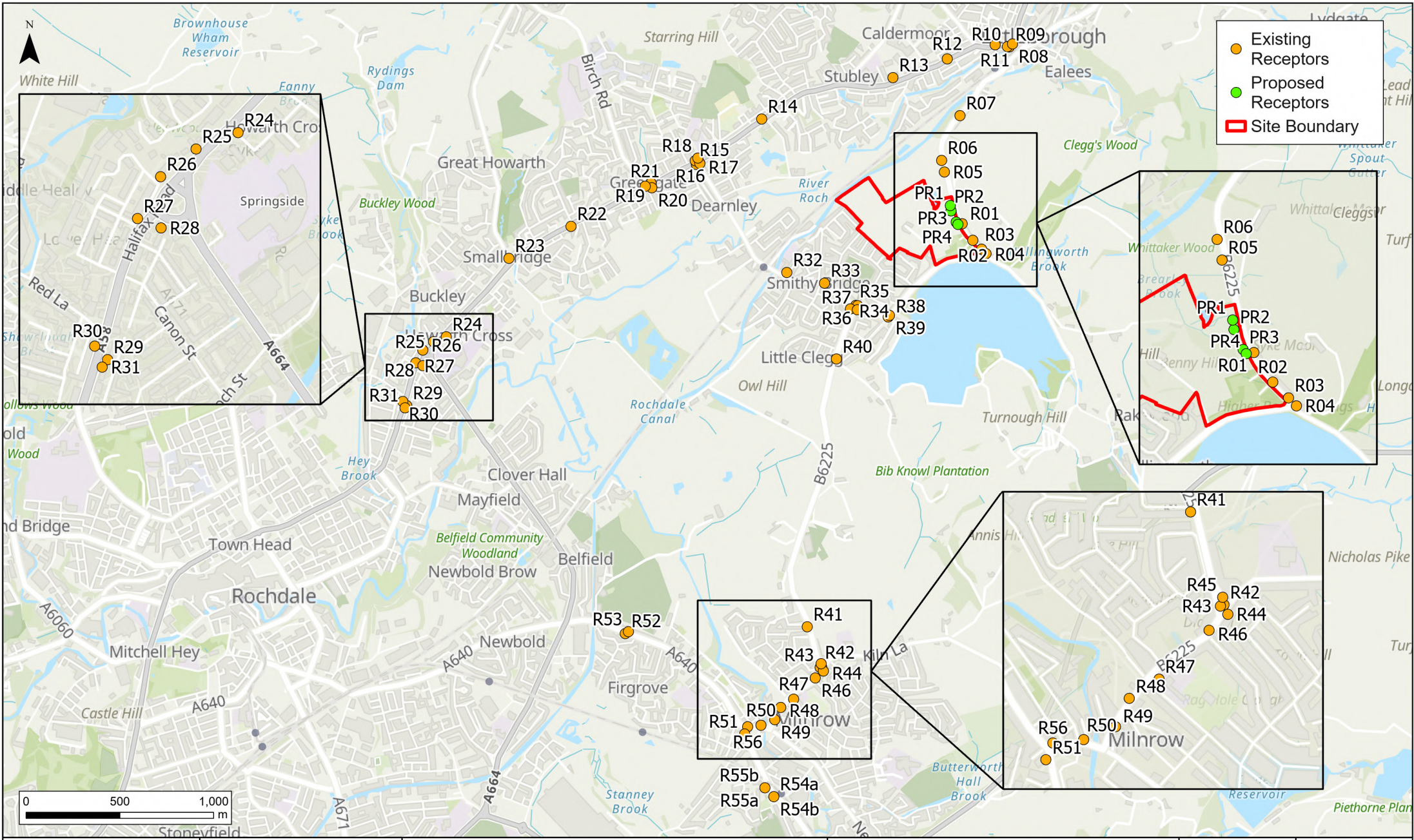
Table 14.6.4 Predicted Concentrations of PM_{2.5} (µg/m³), % Change and Impact at Each Existing Sensitive Receptor

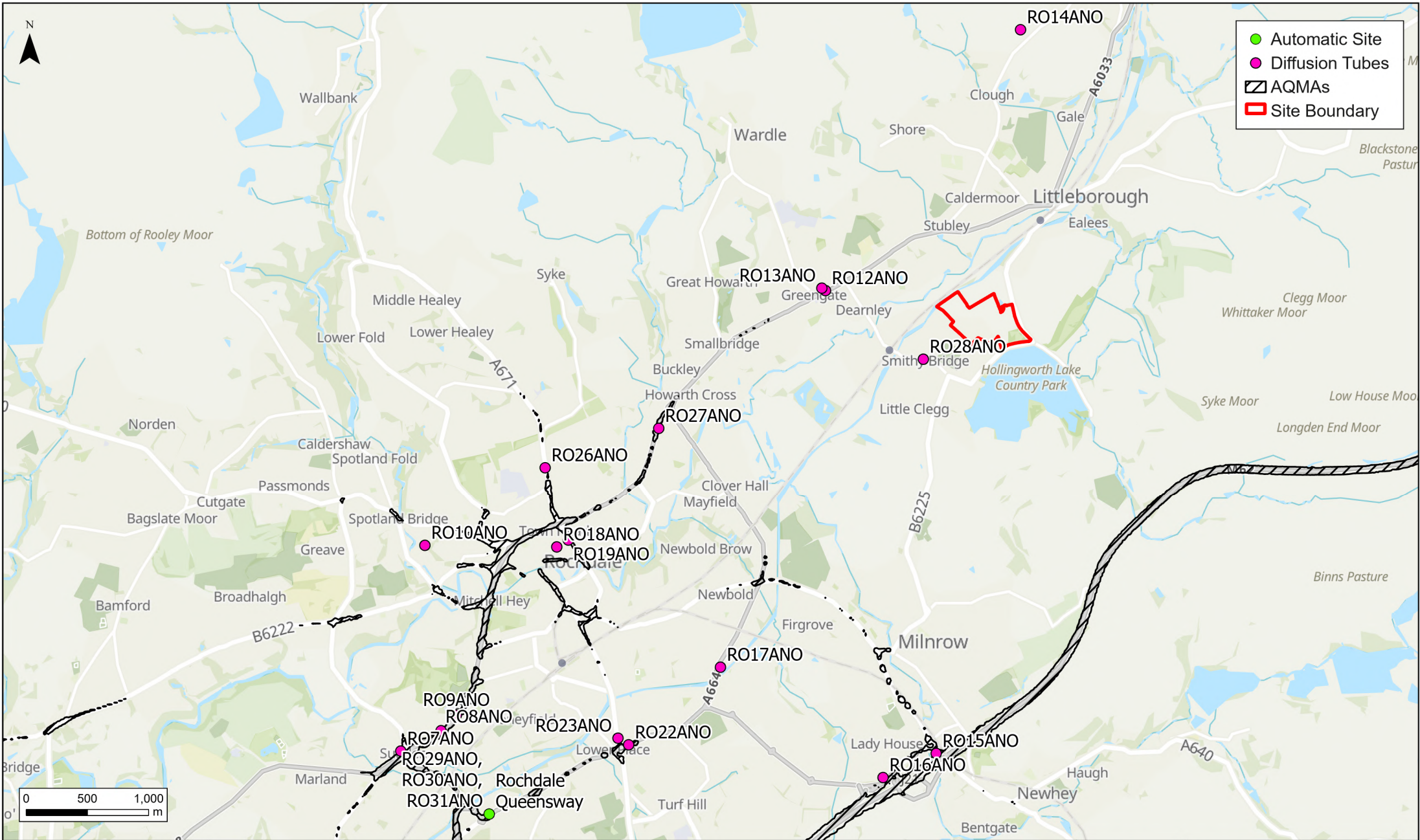
Receptor	2025 Without Development	2025 With Development	Change (µg/m³)	Change (as % of NAQO)	Impact Descriptor
R01	7.5	7.6	0.15	1	Negligible
R02	8.4	8.7	0.26	1	Negligible
R03	9.1	9.4	0.33	2	Negligible
R04	7.1	7.1	0.08	0	Negligible
R05	7.3	7.3	0.06	0	Negligible
R06	7.3	7.4	0.06	0	Negligible
R07	8.8	8.9	0.10	1	Negligible
R08	10.2	10.3	0.09	0	Negligible
R09	9.1	9.1	0.08	0	Negligible
R10	9.1	9.2	0.08	0	Negligible
R11	9.5	9.6	0.10	1	Negligible
R12	9.0	9.1	0.08	0	Negligible
R13	7.6	7.6	0.03	0	Negligible
R14	9.3	9.3	0.07	0	Negligible
R15	10.2	10.2	0.09	0	Negligible
R16	8.3	8.4	0.04	0	Negligible
R17	9.4	9.4	0.07	0	Negligible
R18	8.8	8.8	0.06	0	Negligible
R19	10.6	10.7	0.08	0	Negligible
R20	9.0	9.1	0.05	0	Negligible
R21	10.5	10.6	0.09	0	Negligible
R22	10.2	10.3	0.08	0	Negligible
R23	11.3	11.4	0.06	0	Negligible
R24	9.5	9.6	0.04	0	Negligible
R25	9.6	9.6	0.04	0	Negligible
R26	8.7	8.7	0.03	0	Negligible
R27	9.3	9.3	0.05	0	Negligible
R28	9.2	9.2	0.04	0	Negligible

Receptor	2025 Without Development	2025 With Development	Change (µg/m³)	Change (as % of NAQO)	Impact Descriptor
R29	9.2	9.3	0.05	0	Negligible
R30	9.2	9.3	0.05	0	Negligible
R31	9.9	10.0	0.07	0	Negligible
R32	7.3	7.3	0.03	0	Negligible
R33	8.8	8.9	0.10	1	Negligible
R34	7.5	7.6	0.08	0	Negligible
R35	9.7	10.0	0.24	1	Negligible
R36	9.0	9.2	0.22	1	Negligible
R37	8.0	8.2	0.14	1	Negligible
R38	8.5	8.8	0.25	1	Negligible
R39	8.1	8.3	0.20	1	Negligible
R40	8.3	8.4	0.11	1	Negligible
R41	7.7	7.8	0.05	0	Negligible
R42	9.2	9.4	0.13	1	Negligible
R43	9.1	9.2	0.12	1	Negligible
R44	8.5	8.6	0.09	0	Negligible
R45	9.7	9.8	0.15	1	Negligible
R46	8.8	8.9	0.11	1	Negligible
R47	8.5	8.6	0.06	0	Negligible
R48	10.2	10.3	0.13	1	Negligible
R49	10.7	10.9	0.15	1	Negligible
R50	10.8	11.0	0.15	1	Negligible
R51	8.8	8.8	0.06	0	Negligible
R52	9.3	9.3	0.02	0	Negligible
R53	10.7	10.7	0.04	0	Negligible
R54a	7.9	7.9	0.03	0	Negligible
R54b	7.9	8.0	0.03	0	Negligible
R55a	7.7	7.7	0.02	0	Negligible
R55b	7.7	7.7	0.02	0	Negligible
R56	10.7	10.8	0.12	1	Negligible
NAQO	20		-		

Appendix F.7: Air Quality Figures





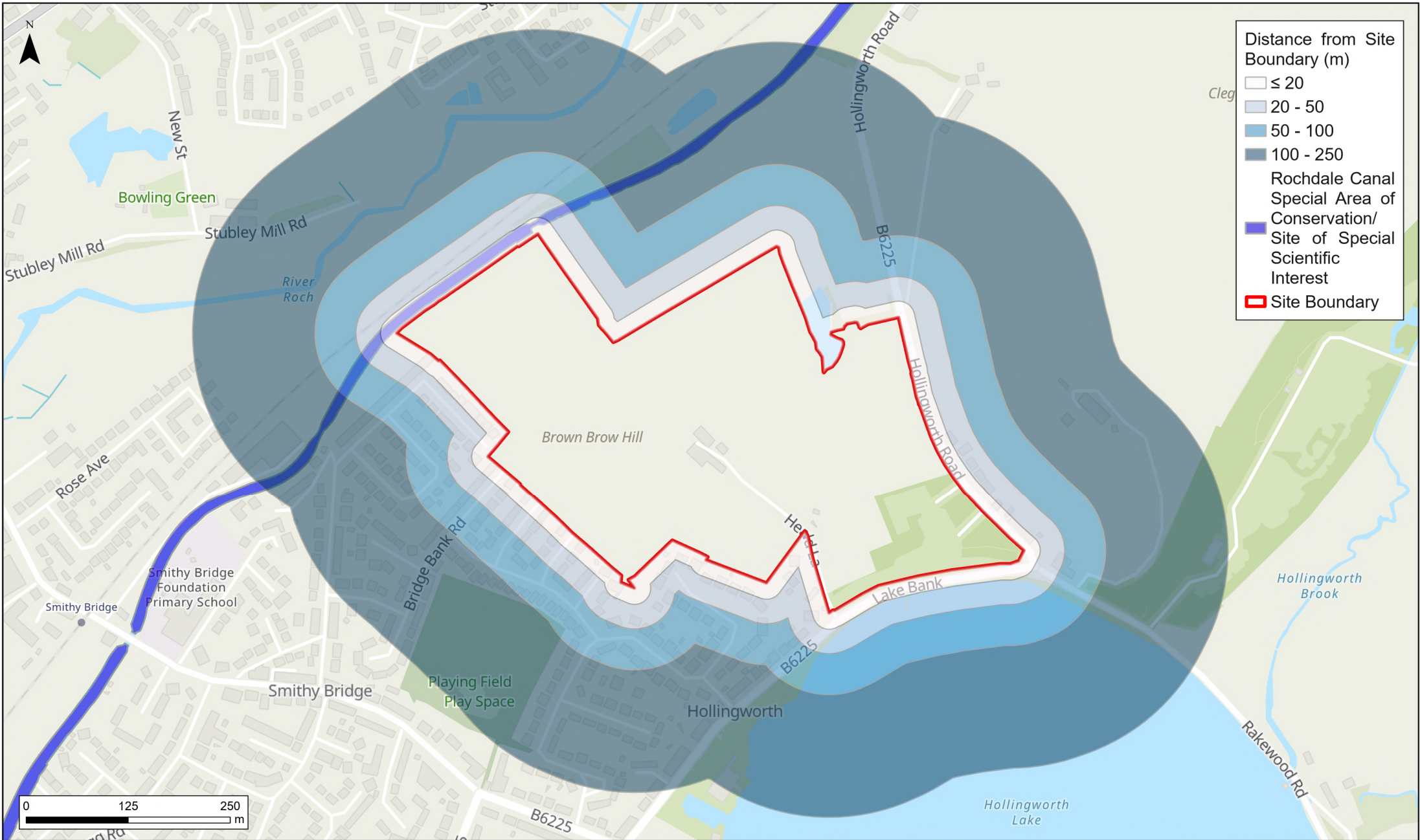


LAND NORTH OF SMITHY BRIDGE

Monitoring Locations and extent of the
GMCA AQMA in the vicinity of the Site

GB Topographic: Contains OS data © Crown Copyright and database
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Contains data from OS Zoomstack

1:40,000 @ A4	Date: 31/05/2024
Drawn: JD	Checked: LS
Figure 14.3	Rev A



Distance from Site Boundary (m)

- ≤ 20
- 20 - 50
- 50 - 100
- 100 - 250

Rochdale Canal
Special Area of
Conservation/
Site of Special
Scientific
Interest

Site Boundary



LAND NORTH OF SMITHY BRIDGE
Distances used in IAQM Construction Dust
Assessment, and location of Rochdale Canal SAC/
SSSI

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Contains data from OS Zoomstack

1:6,000 @ A4

Date: 31/05/2024

Drawn: JD

Checked: LS

Figure 14.4

Rev A