



Air Quality Assessment
South Heywood Commercial Plot 3

Reference: 11-697-r11
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AIR QUALITY ASSESSMENT

South Heywood Commercial Plot 3

Prepared for:
Russells South Heywood (Commercial) Limited

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Air Quality Assessment

October 2022

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1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by Russells South Heywood (Commercial) Limited to produce an Air Quality Assessment in relation to a Drop-In Outline Planning Application at the South Heywood Commercial Plot 3 development.

A Hybrid Planning Permission (Reference: 16/01399/HYBR) already exists on the site for B2/B8 usage. This Outline Application sits within the parameters previously approved and seeks an increase to the B8 Use quantum only.

The proposals may lead to adverse impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was undertaken in order to provide an update on the previously approved Use Class on the Site by determining updated baseline conditions and assessing potential impacts associated with the scheme.

1.2. SITE LOCATION AND CONTEXT

The site is located on land off Pilsworth Road, Heywood, at National Grid Reference (NGR): 384085, 409110. Reference should be made to Figure 1 for a map of the site and surrounding area.

The proposals comprise development of 40,000m² of B8 land use and associated infrastructure.

The development has the potential cause impacts at sensitive locations. These may include fugitive dust emissions during construction and road traffic exhaust emissions from vehicles travelling to and from the site during operation. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions and consider potential effects as a result of the proposals. This is detailed in the following report.

1.3. LIMITATIONS

The limitations of this report are presented in Appendix II.

1.4. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



2. LEGISLATION AND POLICY

2.1. LEGISLATION

The Air Quality Standards Regulations (2010) and subsequent amendments 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.

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

The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

Table 2.1 AQOs and AQLV for pollutants considered within this assessment.

TABLE 2.1 AIR QUALITY OBJECTIVES/AIR QUALITY LIMIT VALUES

POLLUTANT	AIR QUALITY OBJECTIVE/ AIR QUALITY LIMIT VALUES	
	Concentration (µg/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
PM _{2.5}	20	Annual mean

¹ The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.



The Environment Act (2021) was published 9th November 2021 and makes provision for the setting of lower PM_{2.5} targets. The final criteria will be included in legislation to be put before parliament by 31st October 2022. Prior to this time the AQLV outlined in Table 2.1 remains the adopted air quality standard within the UK.

Table 2.2 summarises the advice provided in DEFRA guidance² on where the AQOs for pollutants considered within this report apply.

TABLE 2.2 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 (including all of playgrounds), hospitals (and their grounds), care homes (and their grounds) 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 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	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping street) 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 more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2. LOCAL AIR QUALITY MANAGEMENT

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 2.2, 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 (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

² Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



2.3. DUST

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

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

Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4. NATIONAL PLANNING POLICY

The revised National Planning Policy Framework³ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

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

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

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

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

[...]

preventing new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality

[...]"

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

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the

³ NPPF, Ministry of Housing, Communities and Local Government, 2021.



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

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

2.5. NATIONAL PLANNING PRACTICE GUIDANCE

The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

- ✿ What air quality considerations does planning need to address?
- ✿ What is the role of plan-making with regard to air quality?
- ✿ Are air quality concerns relevant to neighbourhood planning?
- ✿ What information is available about air quality?
- ✿ When could air quality considerations be relevant to the development management process?
- ✿ What specific issues may need to be considered when assessing air quality impacts?
- ✿ How detailed does an air quality assessment need to be?
- ✿ How can an impact on air quality be mitigated?

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

2.6. LOCAL PLANNING POLICY

The Core Strategy 2016 - 2028⁵ was adopted by Rochdale Borough Council (RBC) in October 2016 and is the key document in the Rochdale Local Plan. It sets out the strategic planning framework for the borough's future development needs up to 2028.

Review of the document indicated the following policies of relevance to the assessment.

"Policy G9 - Reducing the Impact of Pollution, Contamination and Land Instability

⁴ <https://www.gov.uk/guidance/air-quality-3>.

⁵ Core Strategy 2016 - 2028, RBC, 2016.



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;

d) Requiring a Low Emissions Strategy where development requires a Transport Assessment, and in other circumstances as appropriate.

[...]

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

"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;

[...]."

"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:

[...]

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

[...]."

The above policies have been taken into consideration throughout the undertaking of the assessment.



3. METHODOLOGY

3.1. INTRODUCTION

The proposed development has the potential to cause air quality impacts during the construction and operational phases. These have been assessed in accordance with the following methodology.

3.2. CONSTRUCTION PHASE ASSESSMENT

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'⁶.

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

- ✿ Earthworks;
- ✿ Construction; and,
- ✿ Trackout.

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

- ✿ Annoyance due to dust soiling;
- ✿ Harm to ecological receptors; and,
- ✿ The risk of health effects due to a significant increase in exposure to PM₁₀.

The assessment steps are detailed below.

3.2.1. STEP 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to Step 2.

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

3.2.2. STEP 2

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

⁶ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.



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

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.1.

TABLE 3.1 CONSTRUCTION DUST - MAGNITUDE OF EMISSION

MAGNITUDE	ACTIVITY	CRITERIA
Large	Earthworks	Total site area greater than 10,000m ² Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved
	Construction	Total building volume greater than 100,000m ³ On site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Earthworks	Total site area 2,500m ² to 10,000m ² Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 4m to 8m in height Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	Total building volume 25,000m ³ to 100,000m ³ Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	10 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Earthworks	Total site area less than 2,500m ² Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 4m in height Total material moved less than 20,000 tonnes Earthworks during wetter months
	Construction	Total building volume less than 25,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 10 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m



Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 3.2.

TABLE 3.2 CONSTRUCTION DUST - EXAMPLES OF FACTORS DEFINING SENSITIVITY OF AN AREA

RECEPTOR SENSITIVITY	EXAMPLES	
	HUMAN RECEPTORS	ECOLOGICAL RECEPTORS
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀. e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve

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

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



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

These factors were considered in the undertaking of this assessment.

The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 3.3.

TABLE 3.3 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO DUST SOILING EFFECTS ON PEOPLE OF PROPERTY

RECEPTOR SENSITIVITY	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table 3.4 outlines the criteria for determining the sensitivity of the area to human health impacts.

TABLE 3.4 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO HUMAN HEALTH IMPACTS

RECEPTOR SENSITIVITY	ANNUAL MEAN BACKGROUND PM ₁₀ CONCENTRATION	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low



RECEPTOR SENSITIVITY	ANNUAL MEAN BACKGROUND PM ₁₀ CONCENTRATION	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	1 or More	Low	Low	Low	Low	Low

Table 3.5 outlines the criteria for determining the sensitivity of the area to ecological impacts.

TABLE 3.5 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO ECOLOGICAL IMPACTS

RECEPTOR SENSITIVITY	DISTANCE FROM THE SOURCE (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

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

Table 3.6 outlines the risk category from earthworks and construction activities.

TABLE 3.6 CONSTRUCTION DUST - DUST RISK CATEGORY FROM EARTHWORKS AND CONSTRUCTION ACTIVITIES

RECEPTOR SENSITIVITY	DUST EMISSION MAGNITUDE		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table 3.7 outlines the risk category from trackout activities.

TABLE 3.7 CONSTRUCTION DUST - DUST RISK CATEGORY FROM TRACKOUT ACTIVITIES

RECEPTOR SENSITIVITY	DUST EMISSION MAGNITUDE		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible



3.2.3. STEP 3

Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁷ to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

3.2.4. STEP 4

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

3.3. OPERATIONAL PHASE ASSESSMENT

The development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations.

The assessment considered the following scenarios:

- ✳ 2019 - Verification;
- ✳ Opening year Do-Minimum (DM) (predicted traffic flows in 2038 should the proposals not proceed); and,
- ✳ Opening year Do-Something (DS) (predicted traffic flows in 2038 should the proposals be completed).

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

Locations sensitive to potential changes in pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)⁸ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance⁹ on where the AQOs apply, as summarised in Table 2.2, was utilised to determine appropriate receptor positions.

The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'¹⁰. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 3.8.

⁷ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

⁸ LA 105: Air Quality, Highways England, 2019.

⁹ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

¹⁰ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.



TABLE 3.8 SIGNIFICANCE OF ROAD VEHICLE EXHAUST EMISSION IMPACTS

CONCENTRATION AT RECEPTOR IN ASSESSMENT YEAR	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO (%)			
	1	2 - 5	6 - 10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

The matrix shown in Table 3.8 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

Following the prediction of impacts at discrete receptor locations, the IAQM document¹¹ provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

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

The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**. The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

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



4. BASELINE

4.1. INTRODUCTION

Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

4.2. LOCAL AIR QUALITY MANAGEMENT

As required by the Environment Act (1995), 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 council's administrative extents. 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 Council area."

The development is located approximately 1.1km north-west of the AQMA. As such, there is the potential for vehicles travelling to and from the site to increase pollution levels in this sensitive area. This has been considered throughout the assessment.

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.

4.3. AIR QUALITY MONITORING

Monitoring of pollutant concentrations is undertaken by RBC throughout their area of jurisdiction. Recent NO₂ results recorded in the vicinity of the development are shown in Table 4.1.

TABLE 4.1 MONITORING RESULTS - NO₂

MONITORING SITE		MONITORED NO ₂ CONCENTRATION (µg/m ³)		
		2018	2019	2020
RO6ANO	Heywood Old Rd, Birch	41.9	42.5	31.8
RO20ANO	Manchester Road / Bader Drive	27.2	35.8	29.3

As shown in Table 4.1, annual mean NO₂ concentrations were above the AQO at RO6ANO during 2018 and 2019. As the site is situated at a roadside location within an AQMA, elevated levels are to be expected. Annual mean NO₂ concentrations were below the AQO at RO20ANO during recent years.

Reference should be made to Figure 2 for a map of the survey locations.

RBC do not undertake monitoring of PM₁₀ concentrations within the vicinity of the site.

4.4. BACKGROUND POLLUTANT CONCENTRATIONS

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed



development site is located in grid square NGR: 384500, 409500. Data for this location was downloaded from the DEFRA website¹² for the purpose of the assessment and is summarised in Table 4.2.

TABLE 4.2 BACKGROUND POLLUTANT CONCENTRATIONS

POLLUTANT	PREDICTED BACKGROUND POLLUTANT CONCENTRATION (µg/m ³)		
	2019	2022	2030
NO ₂	14.99	13.19	10.58
PM ₁₀	12.40	11.98	11.63
PM _{2.5}	7.87	7.56	7.29

As shown in Table 4.2, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and AQLV at the development site.

4.5. SENSITIVE RECEPTORS

A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

4.5.1. CONSTRUCTION PHASE SENSITIVE RECEPTORS

Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 4.3.

TABLE 4.3 EARTHWORKS AND CONSTRUCTION DUST SENSITIVE RECEPTORS

DISTANCE FROM SITE BOUNDARY (m)	APPROXIMATE NUMBER OF HUMAN RECEPTORS	APPROXIMATE NUMBER OF ECOLOGICAL RECEPTORS
Up to 20	0	0
Up to 50	10 to 100	0
Up to 100	10 to 100	-
Up to 350	10 to 100	-

Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access. These are summarised in Table 4.4.

TABLE 4.4 TRACKOUT DUST SENSITIVE RECEPTORS

DISTANCE FROM SITE ACCESS ROUTE (m)	APPROXIMATE NUMBER OF HUMAN RECEPTORS	APPROXIMATE NUMBER OF ECOLOGICAL RECEPTORS
Up to 20	10 to 100	0
Up to 50	10 to 100	0

¹² <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.



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

Based on the criteria shown in Table 3.2, the sensitivity of the receiving environment to potential dust impacts was determined as **medium** to **high**. This was because the identified receptors included residential properties and places of work. It should be noted that only receptors of **medium** sensitivity are located within 100m of the site boundary.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 4.5.

TABLE 4.5 SENSITIVITY OF THE SURROUNDING AREA TO POTENTIAL DUST IMPACTS

POTENTIAL IMPACT	SENSITIVITY OF THE SURROUNDING AREA		
	EARTHWORKS	CONSTRUCTION	TRACKOUT
Dust Soiling	Low	Low	Medium
Human Health	Low	Low	Low

4.5.2. OPERATIONAL PHASE ROAD VEHICLE EXHAUST EMISSION SENSITIVE RECEPTORS

Receptors sensitive to potential operational phase road vehicle exhaust emissions impacts were identified from a desk-top study and are summarised in Table 4.6.

TABLE 4.6 ROAD VEHICLE EXHAUST EMISSION SENSITIVE RECEPTOR LOCATIONS

RECEPTOR		NGR (m)	
		X	Y
R1	Residential - Pilsworth Road	384817.6	410066.8
R2	Residential - Jackson Fold	382520.1	409231.9
R3	Residential - Coal Pits Farm	383649.7	408868.6
R4	Residential - Manchester Road	385428.4	408345.2
R5	Residential - Coronation Avenue	386348.8	408987.4
R6	Residential - Coronation Avenue	386388.0	409011.5
R7	Residential - Coronation Avenue	386161.2	409514.5
R8	Residential - Hareshill Road	384972.5	409244.5
R9	Residential - Hareshill Road	385260.1	409037.5
R10	Residential - Hareshill Road	385631.3	408870.5
R11	Residential - Middleton Road	386387.1	408718.8
R12	Residential - Siddall Farm	385769.3	408360.3
R13	Residential - Broom Hill Farm	384005.4	408127.9
R14	Residential - Manchester Road	385816.7	409120.9
R15	Residential - Grassington Drive	382937.3	410097.6
R16	Residential - Manchester Road	385902.7	409228.6



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Reference should be made to Figure 3 for a map of the road vehicle exhaust emission sensitive receptor locations.



5. ASSESSMENT

5.1. INTRODUCTION

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

5.2. CONSTRUCTION PHASE ASSESSMENT

5.2.1. STEP 1

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

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

The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

5.2.2. STEP 2

EARTHWORKS

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The proposed development site covers an area greater than 10,000m². In accordance with the criteria outlined in Table 3.1, the magnitude of potential dust emissions from earthworks is therefore **large**.

Table 4.5 indicates the sensitivity of the area to dust soiling effects on people and property is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site for dust soiling as a result of earthworks.

Table 4.5 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site for human health impacts as a result of earthworks.

CONSTRUCTION

Due to the size of the development the total building volume is likely to be greater than 100,000m³. In accordance with the criteria outlined in Table 3.1, the magnitude of potential dust emissions from construction is therefore **large**.

Table 4.5 indicates the sensitivity of the area to dust soiling effects on people and property is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site as a result of construction activities.



Table 4.5 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site as a result of construction activities.

TRACKOUT

Based on the site area it is anticipated that the unpaved road length may be greater than 100m during certain stages of construction. In accordance with the criteria outlined in Table 3.1, the magnitude of potential dust emissions from trackout is therefore **large**.

Table 4.5 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 3.7, the development is considered to be a **medium** risk site as a result of trackout activities.

Table 4.5 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 3.7, the development is considered to be **low** risk site as a result of trackout activities.

SUMMARY OF THE RISK OF DUST EFFECTS

A summary of the risk from each dust generating activity is provided in Table 5.1.

TABLE 5.1 SUMMARY OF UNMITIGATED DUST RISKS DURING CONSTRUCTION

POTENTIAL IMPACT	UNMITIGATED DUST RISK		
	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Medium
Human Health	Low	Low	Low

As indicated in Table 5.1, the potential risk of dust soiling is **medium** from trackout and **low** from earthworks and construction. The potential risk of human health effects is **low** from earthworks, construction and trackout.

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

5.2.3. STEP 3

The IAQM guidance¹³ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 5.2. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the LA.

TABLE 5.2 FUGITIVE DUST EMISSION MITIGATION MEASURES

ISSUE	CONTROL MEASURE
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¹³ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.



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Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary Display the head or regional office contact information Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site management	Record all dust complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken Make the complaints log available to the Local Authority (LA) upon request Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book
Monitoring	Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked Carry out regular site inspections, record inspection results, and make an inspection log available to the LA on request Increase the frequency of site inspections when activities with a high potential to produce dust emissions are being carried out and during prolonged dry or windy conditions
Site preparation	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site Avoid site runoff of water or mud Keep site fencing, barriers and scaffolding clean using wet methods Remove materials that have the potential to produce dust from site as soon as possible unless being re-used on site
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary Avoid the use of diesel or petrol powered generators by using mains electricity as a power source as far as practicable
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is readily available on site to clean any dry spillages
Waste management	No bonfires or burning of waste materials
Demolition	Ensure effective water suppression is used during demolition activities Avoid explosive blasting, using appropriate manual or mechanical alternatives Bag and remove any biological debris or damp down such material before demolition
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable Use Hessian or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable Only remove the cover in small areas during work and not all at once



Construction	Avoid scabbling (roughening of concrete surfaces) if possible Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out Ensure bulk cement and other fine powder material are delivered in enclosed tankers and stored in silos with suitable emission control systems
Trackout	Use water-assisted dust sweeper on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving site are covered to prevent escape of materials Implement a wheel washing system, if required

5.2.4. STEP 4

Assuming the relevant mitigation measures outlined in Table 5.2 are implemented, the residual impact from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁴.

5.3. OPERATIONAL PHASE ASSESSMENT

Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

The assessment considered the following scenarios:

- ✳ 2019 - Verification;
- ✳ 2038 - DM; and,
- ✳ 2038 - DS.

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

For the purpose of the assessment traffic data for 2038 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors and background concentrations for 2019 were utilised within the dispersion model. The use of 2038 traffic data and 2019 emission factors and background concentrations is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted concentrations.

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

¹⁴

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



5.3.1. PREDICTED CONCENTRATIONS

Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.3.

TABLE 5.3 PREDICTED ANNUAL MEAN NO₂ CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN NO ₂ CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Pilsworth Road	24.25	24.35	0.10
R2	Residential - Jackson Fold	22.66	22.73	0.07
R3	Residential - Coal Pits Farm	22.01	22.04	0.03
R4	Residential - Manchester Road	38.64	38.66	0.02
R5	Residential - Coronation Avenue	36.13	36.43	0.30
R6	Residential - Coronation Avenue	36.00	36.20	0.20
R7	Residential - Coronation Avenue	24.52	24.56	0.04
R8	Residential - Hareshill Road	24.18	24.38	0.20
R9	Residential - Hareshill Road	22.90	22.98	0.08
R10	Residential - Hareshill Road	25.37	25.53	0.16
R11	Residential - Middleton Road	28.05	28.21	0.16
R12	Residential - Siddall Farm	24.85	24.86	0.01
R13	Residential - Broom Hill Farm	21.30	21.31	0.01
R14	Residential - Manchester Road	28.72	28.86	0.14
R15	Residential - Grassington Drive	23.62	23.73	0.11
R16	Residential - Manchester Road	25.14	25.22	0.08

As indicated in Table 5.3, predicted annual mean NO₂ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.4.

TABLE 5.4 PREDICTED ANNUAL MEAN PM₁₀ CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN PM ₁₀ CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Pilsworth Road	13.78	13.79	0.02
R2	Residential - Jackson Fold	13.47	13.48	0.01
R3	Residential - Coal Pits Farm	13.38	13.39	0.01
R4	Residential - Manchester Road	15.84	15.85	0.01
R5	Residential - Coronation Avenue	15.47	15.51	0.04



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R6	Residential - Coronation Avenue	15.48	15.51	0.03
R7	Residential - Coronation Avenue	13.79	13.79	0.01
R8	Residential - Hareshill Road	13.72	13.76	0.03
R9	Residential - Hareshill Road	13.48	13.49	0.01
R10	Residential - Hareshill Road	13.80	13.81	0.02
R11	Residential - Middleton Road	14.25	14.27	0.02
R12	Residential - Siddall Farm	13.71	13.71	0.00
R13	Residential - Broom Hill Farm	13.24	13.24	0.00
R14	Residential - Manchester Road	14.55	14.57	0.02
R15	Residential - Grassington Drive	13.65	13.67	0.02
R16	Residential - Manchester Road	13.88	13.89	0.01

As indicated in Table 5.4, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.5.

TABLE 5.5 PREDICTED ANNUAL MEAN PM_{2.5} CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN PM _{2.5} CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Pilsworth Road	8.80	8.81	0.01
R2	Residential - Jackson Fold	8.62	8.63	0.01
R3	Residential - Coal Pits Farm	8.57	8.57	0.00
R4	Residential - Manchester Road	10.18	10.18	0.00
R5	Residential - Coronation Avenue	9.87	9.90	0.02
R6	Residential - Coronation Avenue	9.88	9.90	0.02
R7	Residential - Coronation Avenue	8.81	8.82	0.00
R8	Residential - Hareshill Road	8.77	8.79	0.02
R9	Residential - Hareshill Road	8.63	8.64	0.01
R10	Residential - Hareshill Road	8.83	8.84	0.01
R11	Residential - Middleton Road	9.11	9.13	0.01
R12	Residential - Siddall Farm	8.80	8.80	0.00
R13	Residential - Broom Hill Farm	8.48	8.49	0.00
R14	Residential - Manchester Road	9.26	9.28	0.01
R15	Residential - Grassington Drive	8.72	8.73	0.01
R16	Residential - Manchester Road	8.87	8.88	0.01



As indicated in Table 5.5, predicted annual mean PM_{2.5} concentrations were below the relevant AQLV at all sensitive receptors in both scenarios.

5.3.2. PREDICTED IMPACTS

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 5.6.

TABLE 5.6 PREDICTED IMPACTS - NO₂

RECEPTOR		PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO (%)	IMPACT SIGNIFICANCE
R1	Residential - Pilsworth Road	Below 75% of AQO	0	Negligible
R2	Residential - Jackson Fold	Below 75% of AQO	0	Negligible
R3	Residential - Coal Pits Farm	Below 75% of AQO	0	Negligible
R4	Residential - Manchester Road	95 - 102% of AQO	0	Negligible
R5	Residential - Coronation Avenue	76 - 94% of AQO	1	Negligible
R6	Residential - Coronation Avenue	76 - 94% of AQO	1	Negligible
R7	Residential - Coronation Avenue	Below 75% of AQO	0	Negligible
R8	Residential - Hareshill Road	Below 75% of AQO	1	Negligible
R9	Residential - Hareshill Road	Below 75% of AQO	0	Negligible
R10	Residential - Hareshill Road	Below 75% of AQO	0	Negligible
R11	Residential - Middleton Road	Below 75% of AQO	0	Negligible
R12	Residential - Siddall Farm	Below 75% of AQO	0	Negligible
R13	Residential - Broom Hill Farm	Below 75% of AQO	0	Negligible
R14	Residential - Manchester Road	Below 75% of AQO	0	Negligible
R15	Residential - Grassington Drive	Below 75% of AQO	0	Negligible
R27	Residential - Manchester Road	Below 75% of AQO	0	Negligible

As indicated in Table 5.6, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 5.7.

TABLE 5.7 PREDICTED IMPACTS - PM₁₀

RECEPTOR		PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO (%)	IMPACT SIGNIFICANCE
R1	Residential - Pilsworth Road	Below 75% of AQO	0	Negligible



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R2	Residential - Jackson Fold	Below 75% of AQO	0	Negligible
R3	Residential - Coal Pits Farm	Below 75% of AQO	0	Negligible
R4	Residential - Manchester Road	Below 75% of AQO	0	Negligible
R5	Residential - Coronation Avenue	Below 75% of AQO	0	Negligible
R6	Residential - Coronation Avenue	Below 75% of AQO	0	Negligible
R7	Residential - Coronation Avenue	Below 75% of AQO	0	Negligible
R8	Residential - Hareshill Road	Below 75% of AQO	0	Negligible
R9	Residential - Hareshill Road	Below 75% of AQO	0	Negligible
R10	Residential - Hareshill Road	Below 75% of AQO	0	Negligible
R11	Residential - Middleton Road	Below 75% of AQO	0	Negligible
R12	Residential - Siddall Farm	Below 75% of AQO	0	Negligible
R13	Residential - Broom Hill Farm	Below 75% of AQO	0	Negligible
R14	Residential - Manchester Road	Below 75% of AQO	0	Negligible
R15	Residential - Grassington Drive	Below 75% of AQO	0	Negligible
R27	Residential - Manchester Road	Below 75% of AQO	0	Negligible

As indicated in Table 5.7, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 5.8.

TABLE 5.8 PREDICTED IMPACTS - PM_{2.5}

RECEPTOR		PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQLV (%)	IMPACT SIGNIFICANCE
R1	Residential - Pilsworth Road	Below 75% of AQLV	0	Negligible
R2	Residential - Jackson Fold	Below 75% of AQLV	0	Negligible
R3	Residential - Coal Pits Farm	Below 75% of AQLV	0	Negligible
R4	Residential - Manchester Road	Below 75% of AQLV	0	Negligible
R5	Residential - Coronation Avenue	Below 75% of AQLV	0	Negligible
R6	Residential - Coronation Avenue	Below 75% of AQLV	0	Negligible
R7	Residential - Coronation Avenue	Below 75% of AQLV	0	Negligible
R8	Residential - Hareshill Road	Below 75% of AQLV	0	Negligible
R9	Residential - Hareshill Road	Below 75% of AQLV	0	Negligible
R10	Residential - Hareshill Road	Below 75% of AQLV	0	Negligible
R11	Residential - Middleton Road	Below 75% of AQLV	0	Negligible
R12	Residential - Siddall Farm	Below 75% of AQLV	0	Negligible



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R13	Residential - Broom Hill Farm	Below 75% of AQLV	0	Negligible
R14	Residential - Manchester Road	Below 75% of AQLV	0	Negligible
R15	Residential - Grassington Drive	Below 75% of AQLV	0	Negligible
R27	Residential - Manchester Road	Below 75% of AQLV	0	Negligible

As indicated in Table 5.8, impacts on annual mean PM_{2.5} concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

5.3.3. OVERALL SIGNIFICANCE

The overall significance of road vehicle exhaust emission impacts was determined as **negligible**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in the road vehicle exhaust emission methodology. Further justification is provided in Table 5.9.

TABLE 5.9 OVERALL SIGNIFICANCE OF OPERATIONAL PHASE ROAD VEHICLE EXHAUST EMISSIONS IMPACTS

GUIDANCE	COMMENT
The existing and future air quality in the absence of the development	Predicted NO ₂ , PM ₁₀ and PM _{2.5} concentrations were below the relevant AQOs and AQLV at all locations in the DM scenario. This is unlikely to change in the absence of the proposals given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollution levels will not reduce in future years. This provides worst-case results when compared with the DEFRA and Highways England methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

The IAQM guidance¹⁵ states that only if the impact is **moderate** or **substantial**, the effect is considered **significant**. Given that the overall impact of operational phase road traffic emissions was concluded to be **negligible**, the effect of the proposals is considered to be **not significant**.

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



6. CONCLUSION

E3P was commissioned by Russells South Heywood (Commercial) Limited to produce an Air Quality Assessment in relation to the South Heywood Commercial Plot 3 development.

The development may lead to adverse impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, assess potential impacts associated with the scheme and identify appropriate mitigation where necessary.

During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **not significant**.

Potential impacts during the operational phase of the proposed development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. An assessment was therefore undertaken using detailed dispersion modelling to quantify NO₂, PM₁₀ and PM_{2.5} concentrations both with and without the proposals.

Review of the dispersion modelling results indicated that impacts on NO₂, PM₁₀ and PM_{2.5} concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations.

Following consideration of the relevant factors, air quality impacts as a result of the operation of the development were predicted to be **not significant**, in accordance with the IAQM guidance. This is the same position as previously assessed as part of the Hybrid Planning Permission 16/01399/HYBR.

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

END OF REPORT



APPENDIX I

ASSESSMENT INPUT

DATA

INTRODUCTION

The proposed development has the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the site. In order to assess changes in NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

DISPERSION MODEL

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0.1.3). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

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

These are detailed in the following Sections.

TRAFFIC FLOW DATA

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition, was provided by Focus Transport Planning, the Transport Consultants for the project.

At the time of assessment, the South Heywood Link Road was under construction to the south-east of the development. This will connect Pilsworth Road to junction 19 of the M62 and will be completed by the opening year of the proposal. As such, in order to ensure potential air quality impacts were assessed robustly, the amended road geometry was applied to both the DM and DS scenarios.

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

TABLE A1.1 TRAFFIC DATA

LINK	24-HOUR AADT FLOW			HDV PROP. OF FLEET (%)			AVG. SPEED (km/h)	ROAD WIDTH (m)
	VERIF.	DM	DS	VERIF.	DM	DS		



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L1	Pilsworth Road between slip road to M66 SB at junction 3 and approach to Moss Hall Road	12,855	12,391	12,330	21.66	21.36	23.07	40	9.7
L2	Pilsworth Road approach to Moss Hall Road	12,855	12,391	12,330	21.66	21.36	23.07	20	9.7
L3	Moss Hall Road between Bury Old Road and Heywood Distribution Park	6,919	7,949	7,997	4.54	13.80	14.94	40	6.9
L4	Moss Hall Road between Heywood Distribution Park and Pilsworth Road	5,617	7,949	7,997	3.39	13.80	14.94	40	6.9
L5	Moss Hall Road between Pilsworth Road and Great Bear	13,738	17,443	17,430	19.70	13.80	14.94	20	8.6
L6	Moss Hall Road between Great Bear and Pilsworth Road	13,738	17,443	17,430	19.70	13.80	14.94	40	7.6
L7	Pilsworth Road between Moss Hall Road and Site Access	13,738	14,483	14,744	19.70	15.83	16.90	40	7.6
L8	Pilsworth Road between Site Access and Hareshill Road	10,254	14,483	14,744	15.81	15.83	16.90	40	7.6
L9	Pilsworth Road between Hareshill Road and approach to Bridge Street	6,919	11,454	11,572	4.54	7.86	8.33	40	8.2
L10	Moss Hall Road south of Pilsworth Road	13,738	5,195	5,305	19.70	3.11	3.06	40	9.1
L11	Hareshill Road	10,254	18,196	18,622	15.81	7.86	8.33	40	9.4
L12	Manchester Street between Church Street and Hareshill Road	8,318	18,124	18,247	2.38	4.78	4.92	40	9.3
L13	Manchester Street approach to Hareshill Road	8,318	11,330	11,298	2.38	2.36	2.59	20	12.2
L14	Manchester Street exit from Hareshill Road	8,318	9,838	9,791	2.38	0.83	0.83	20	11.5
L15	Manchester Road south of Hareshill Road and	8,318	9,838	9,791	2.38	0.83	0.83	45	7.7
L16	M62 eastbound (EB) west of junction 19	69,930	73,058	72,999	13.57	14.20	14.35	90	14.0
L17	M62 EB at junction 19	49,149	73,058	72,999	15.03	14.20	14.35	90	14.0
L18	M62 EB east of junction 19	61,133	75,888	75,638	15.03	13.67	13.76	90	14.0
L19	M62 westbound (WB) west of junction 19	67,688	80,811	80,897	14.05	11.80	11.94	90	13.7
L20	M62 WB at junction 19	47,536	79,879	80,125	14.60	11.65	11.70	90	13.7



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L21	M62 WB east of junction 19	59,075	79,879	80,125	14.60	11.65	11.70	90	13.7
L22	Slip road from M62 EB to roundabout at junction 19	17,483	6,466	6,600	13.57	13.98	15.65	50	6.7
L23	Slip road from roundabout at junction 19 to M62 EB	15,283	9,330	9,268	15.03	9.38	10.16	50	7.4
L24	Slip road from roundabout at junction 19 to M62 WB	16,922	7,285	7,512	14.05	10.45	11.11	50	6.4
L25	Slip road from M62 WB to roundabout at junction 19	14,769	8,216	8,282	14.60	12.06	13.46	50	6.4
L26	Coronation Avenue between Manchester Road and Lenten Grove	18,821	15,296	15,352	3.53	5.36	5.38	40	11.2
L27	Coronation Avenue between Lenten Grove and M62 junction 19	18,821	15,296	15,352	3.53	5.36	5.38	35	11.3
L28	Coronation Avenue approach to M62 junction 19	9,411	7,648	7,676	3.53	5.36	5.38	20	7.9
L29	Coronation Avenue exit from M62 junction 19	9,411	7,648	7,676	3.53	5.36	5.38	20	7.4
L30	Middleton Road approach to M62 junction 19	13,697	17,347	17,484	3.03	3.97	4.50	20	11.8
L31	Middleton Road south of M62 junction 19	13,697	17,347	17,484	3.03	3.97	4.50	40	9.2
L32	M62 junction 19	14,594	26,677	26,752	11.36	6.67	7.33	30	9.2
L33	Coronation Avenue	18,821	3,824	3,838	3.53	5.36	5.38	20	8.2
L34	Moss Hall Road approach to Pilsworth Road	13,738	5,195	5,305	19.70	3.11	3.06	20	16.8
L35	Pilsworth Road approach to Hareshill Road (DS Only)	-	11,454	11,572	-	7.86	8.33	20	9.4
L36	Hareshill Road between Pilsworth Road and Manchester Road (DS Only)	-	20,167	20,370	-	15.51	17.85	40	9.4
L37	Hareshill Road approach to Manchester Road (DS Only)	-	21,141	21,355	-	15.09	17.32	20	12.0
L38	Hareshill Road exit from Manchester Road (DS Only)	-	22,640	23,031	-	13.90	15.76	20	12.0
L39	Hareshill Road between Manchester Road (DS Only)	-	22,640	23,031	-	13.90	15.76	40	9.4
L40	Hareshill Road approach to M62 junction 19 roundabout (DS Only)	-	11,320	11,515	-	13.90	15.76	20	6.0
L41	Hareshill Road exit from M62 junction 19 roundabout (DS Only)	-	11,320	11,515	-	13.90	15.76	20	6.0



Reference should be made to Figure 4 for a graphical representation of the road link locations.

EMISSION FACTORS

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates COPERT 5 vehicle emission factors and fleet information.

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, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

METEOROLOGICAL DATA

Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2019 to 21st December 2019 (inclusive). Manchester Airport meteorological station is located at NGR: 445745, 326055, which is approximately 25km south of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 for a wind rose of the utilised meteorological data.

ROUGHNESS LENGTH

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.3m 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 'agricultural areas (max)'.

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

MONIN-OBUKHOV LENGTH

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

BACKGROUND CONCENTRATIONS

Annual mean NO₂, PM₁₀ and PM_{2.5} background concentrations of 20.43µg/m³, 13.10µg/m³ and 8.40µg/m³ were used in the assessment. These were taken from the DEFRA mapping study for the grid square containing the RO6ANO monitor.



The values were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as the predicted annual mean concentrations were higher than the DEFRA backgrounds for the grid square containing the site, as shown in Table 4.3.

Similarly to emission factors, background concentrations from 2019 were utilised in preference to the development opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

NO_x TO NO₂ CONVERSION

Predicted annual mean oxides of nitrogen (NO_x) concentrations were converted to NO₂ concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance¹⁶.

VERIFICATION

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

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

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

For the purpose of the assessment model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'¹⁷, which states:

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

RBC undertook monitoring of NO₂ concentrations at two locations within the vicinity of roads included in the modelling extents during 2019. The results were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance¹⁸. The monitored annual mean NO₂ concentrations and calculated road NO_x concentrations are summarised in Table A1.2.

¹⁶ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

¹⁷ Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.

¹⁸ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



TABLE A1.2 NO_x VERIFICATION - MONITORING RESULTS

MONITORING LOCATION		MONITORED NO ₂ CONCENTRATION (µg/m ³)	CALCULATED ROAD NO _x CONCENTRATION (µg/m ³)
RO6ANO	Heywood Old Rd, Birch	42.5	45.55
RO20ANO	Manchester Road / Bader Drive	31.3	21.30

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

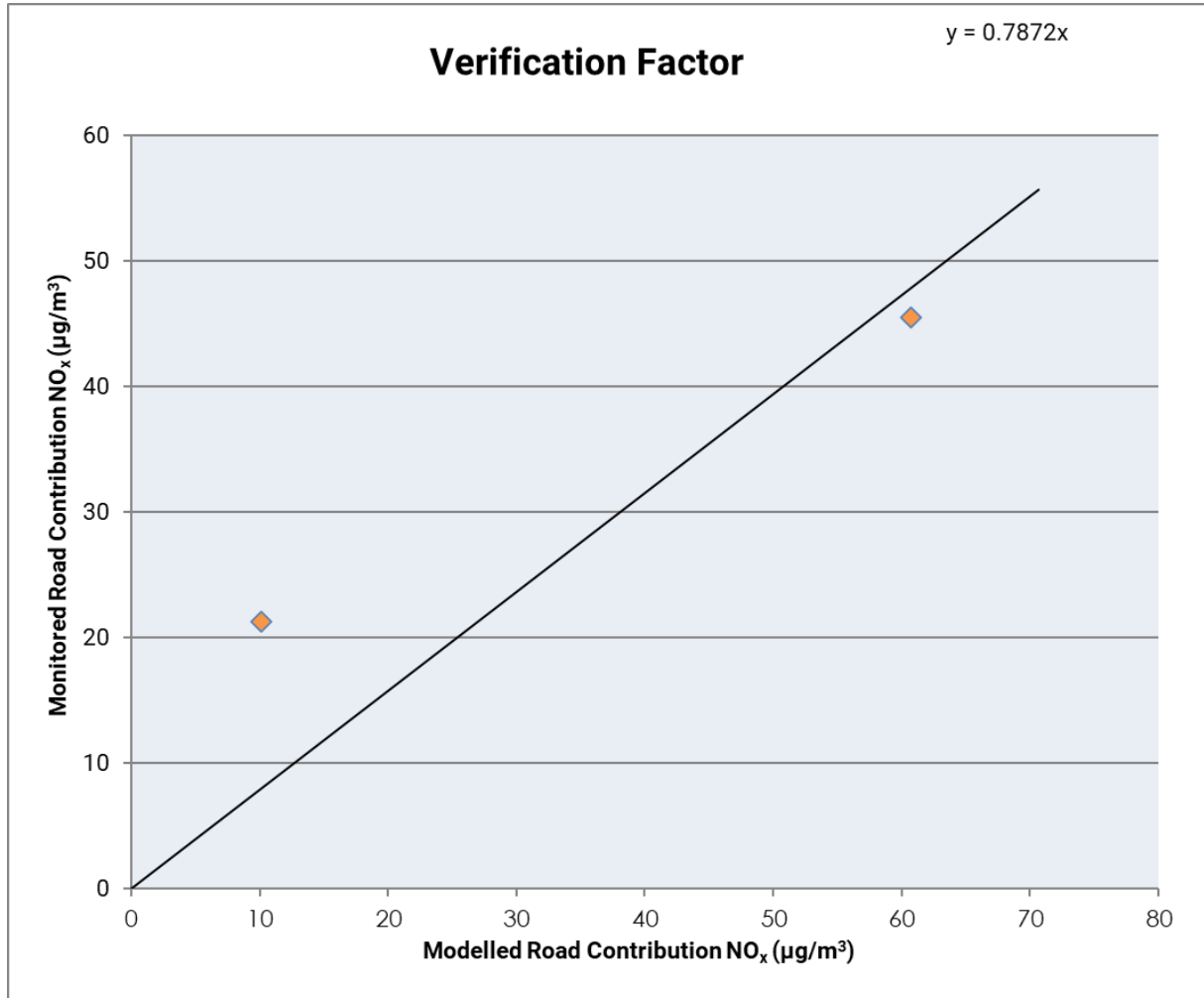
TABLE A1.3 NO_x VERIFICATION - MODELLING RESULTS

MONITORING LOCATION		CALCULATED ROAD NO _x CONCENTRATION (µg/m ³)	MODELLED ROAD NO _x CONCENTRATION (µg/m ³)
RO6ANO	Heywood Old Rd, Birch	45.55	60.69
RO20ANO	Manchester Road / Bader Drive	21.30	10.17

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated a verification factor of 0.7872 was required to be applied to all modelling results, as shown in Graph 1.



GRAPH 1 NO_x VERIFICATION FACTOR



Monitoring of PM₁₀ and PM_{2.5} concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with the DEFRA guidance¹⁹.

¹⁹ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



APPENDIX II LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



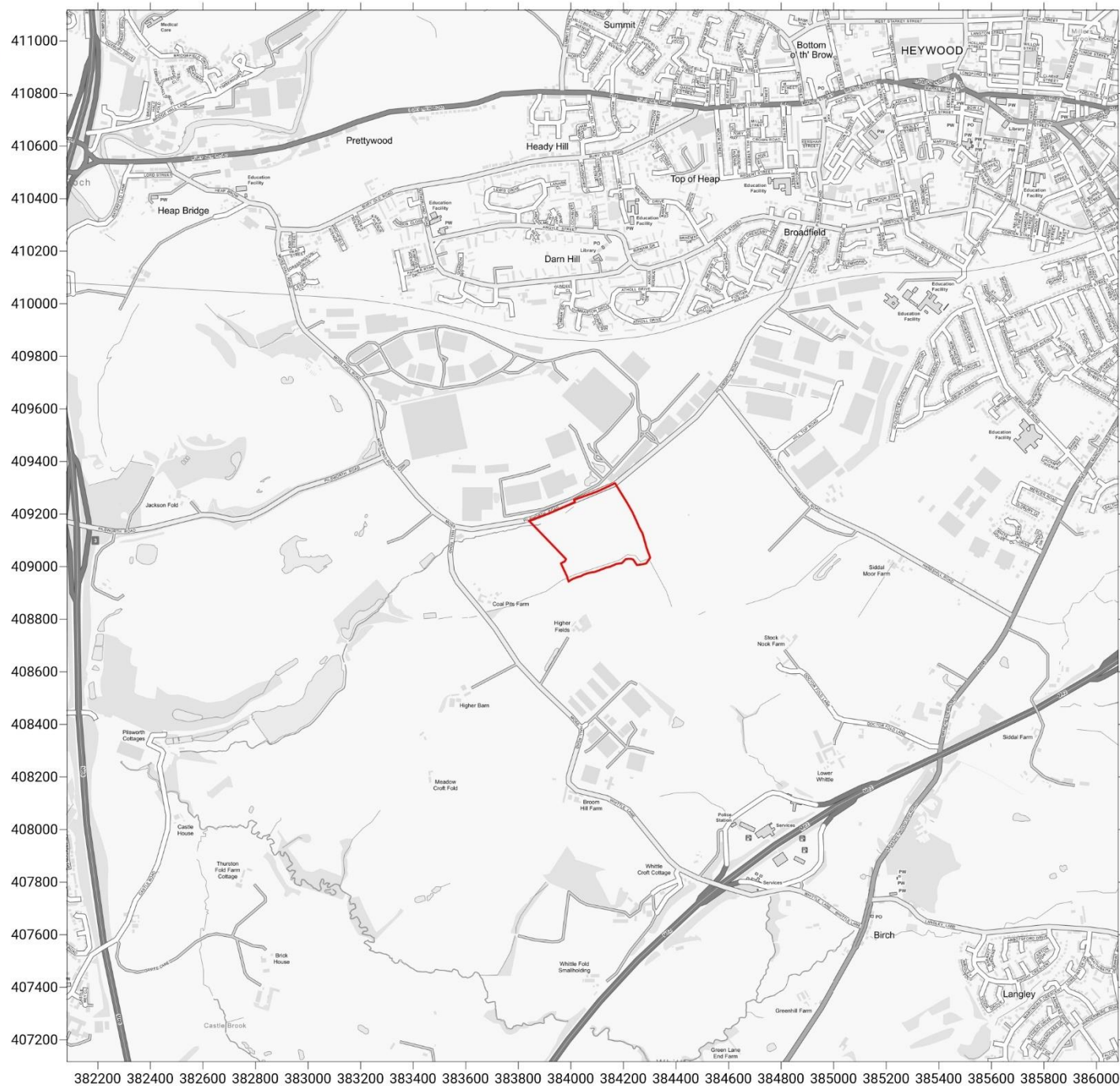
APPENDIX III GLOSSARY

TERMS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DS	Do-Something
EB	Eastbound
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
NB	Northbound
NGR	National Grid Reference
NO₂	Nitrogen dioxide
NO_x	Nitrogen oxide
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM_{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
RBC	Rochdale Borough Council
SB	Southbound
WB	Westbound
Z₀	Roughness length



APPENDIX IV DRAWINGS



Legend



Title

Figure 1 - Site Location

Project

Air Quality Assessment
South Heywood Commercial Plot 3

Project Number

11-697

Client

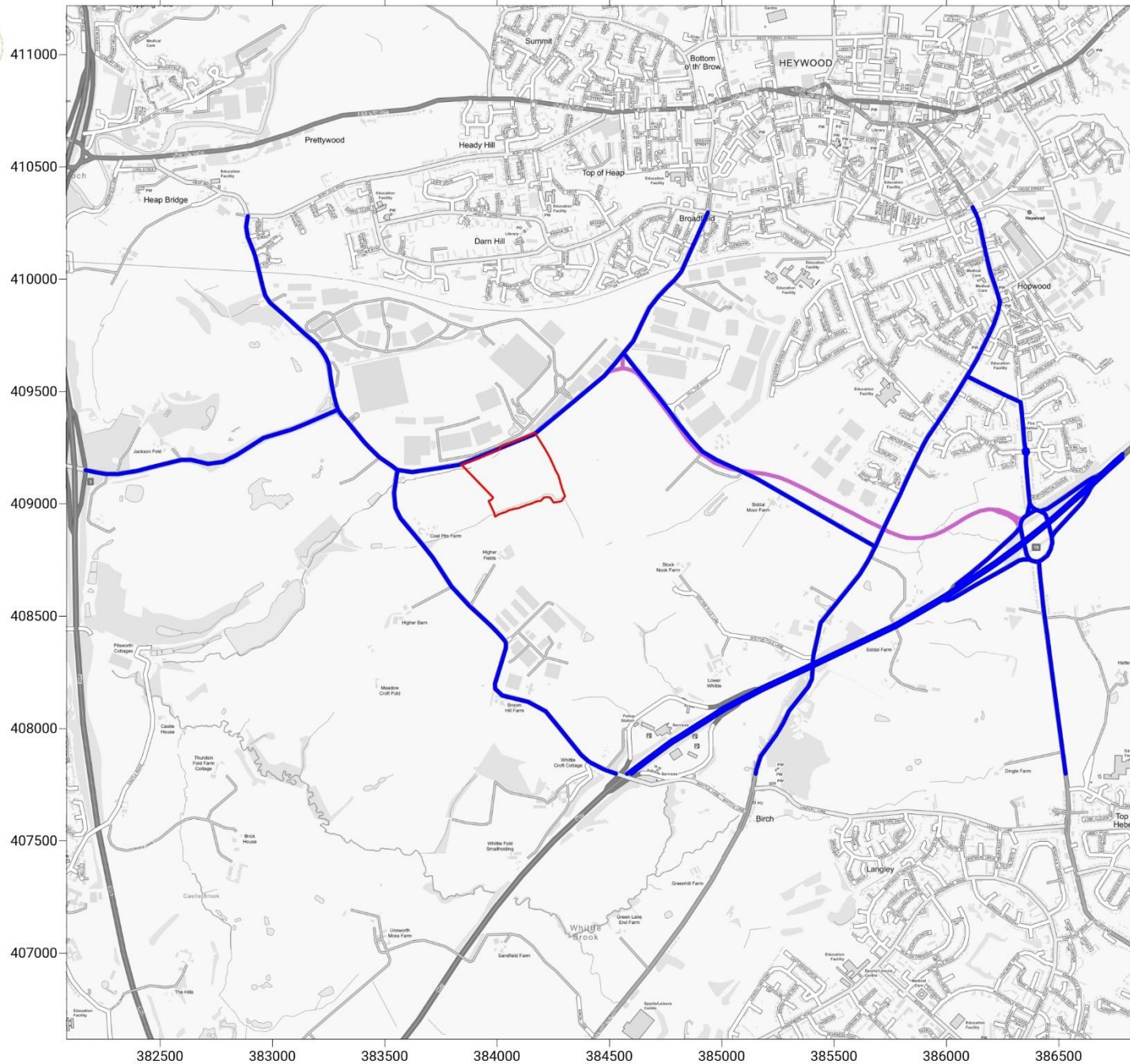
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Limited

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Legend



Site Boundary



Modelled Road Link -
Verification



Modelled Road Link -
DM and DS

Title

Figure 4 - ADMS-Roads Inputs

Project

Air Quality Assessment
South Heywood Commercial Plot 3

Project Number

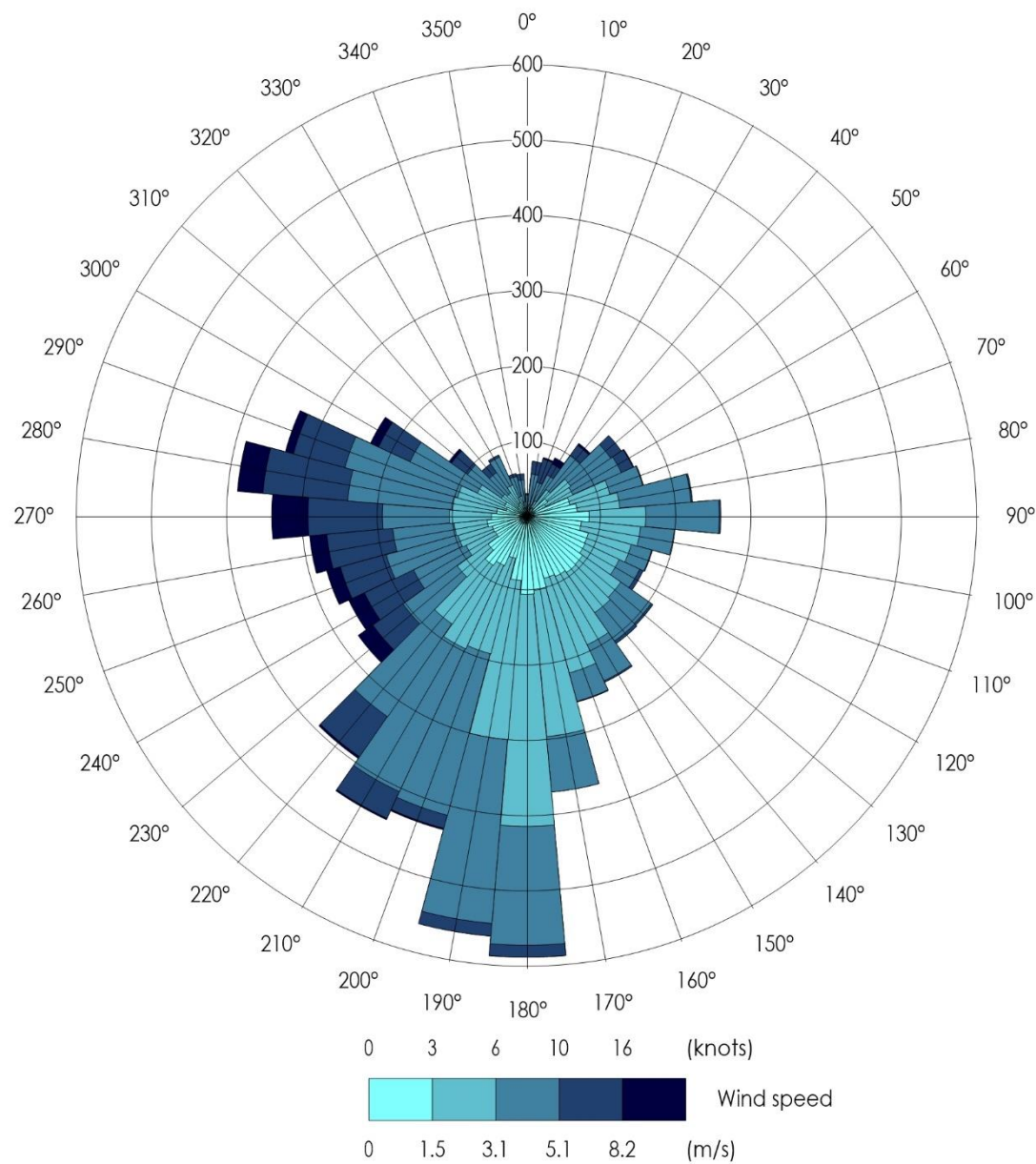
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Legend

Title
Figure 5 - Wind Rose of 2019
Manchester Airport Meteorological Data

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