

Air Quality Assessment
Lower Road, Knowsley

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Executive Summary

Redmore Environmental Ltd was commissioned by M.A.C. (Roofing and Contracting) Limited to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Lower Road, Knowsley.

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

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

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

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

The results of the assessment also demonstrated that predicted pollution levels were below the relevant air quality standards across the development. As such, the site is considered suitable for the proposed end use from an air quality perspective.

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

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by M.A.C. (Roofing and Contracting) Limited to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Lower Road, Knowsley.

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

1.2 Site Location and Context

1.2.1 The site is located on land off Lower Road, Knowsley, at approximate National Grid Reference (NGR): 345780, 385900. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise the construction of 12 residential units and associated infrastructure.

1.2.3 The proposals have the potential to cause air quality impacts at sensitive locations. These may include fugitive dust emissions associated with construction works and road traffic exhaust emissions from vehicles travelling to and from the site during the operational phase. There is also the potential for the exposure of future residents to any existing air quality issues. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions and consider potential effects as a result of the proposals. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

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

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

2.1.2 Air Quality Target Values (AQTVs) were also provided for several additional pollutants.

2.1.3 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean

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

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

2.1.5 Table 2 presents the AQTV considered within this assessment.

Table 2 Air Quality Target Values

Pollutant	Air Quality Target Values	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
PM _{2.5}	25	Annual mean

2.1.6 Table 3 summarises the advice provided in DEFRA guidance² on where the AQOs and AQTV for pollutants considered within this report apply.

Table 3 Examples of Where the Air Quality Objectives Apply

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

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

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

2.2.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 3, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Dust

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

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

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists,

or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework³ (NPPF) was published in February 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

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

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

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

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

[...]

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

³ NPPF, Ministry of Housing, Communities and Local Government, 2019.

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

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

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

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice 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:

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

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

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

2.6 Local Planning Policy

- 2.6.1 The Knowsley Local Plan: Core Strategy⁵ as adopted by Knowsley Metropolitan Borough Council (KMBC) in January 2016 and sets out the strategic framework for the growth and development of Knowsley up to 2028.

- 2.6.2 A review of the KMBC Local Plan: Core Strategy indicated the following policies of relevance to this assessment:

"Policy CS2

Development Principles

New development in Knowsley and the preparation of subsequent stages of the Local Plan will be expected to support the following development principles:

[...]

Principle 4: Recognise environmental limits. Protect and enhance environmental assets, enhance local character and promote quality of place by:

[...]

j) Minimising negative impact upon flood risk, air quality, water quality, land quality, soil quality, and noise or vibration and ensuring any negative impacts are appropriately mitigated."

- 2.6.3 The Knowsley Replacement Unitary Development Plan (UDP)⁶ was adopted in June 2006. Under the transitional arrangements for moving to the Local Plan system, 39 UDP Policies have been saved, these include the following in relation to air quality:

⁵ Knowsley Local Plan: Core Strategy, KMBC, 2016.

⁶ Knowsley Replacement Unitary Development Plan, KMBC, 2006.

"Policy ENV1: Control of Pollution in New Development

Development will not be permitted which is likely to cause significant harm to amenity as a result of impact on any of the following:

- a) Air quality;
- b) The quality of land and soil (due to contamination); or
- c) The quality of the water environment."

2.6.4 These policies have been considered throughout this assessment by considering potential air quality effects as a result of the proposals.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases, as well as expose future residents to elevated pollution levels. These issues have been assessed in accordance with the following methodology, which was agreed with the Environmental Health Department at KMBC on 9th November 2020.

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'⁷.

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

- Earthworks;
- Construction; and,
- Trackout.

3.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered for 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.

3.2.4 The assessment steps are detailed below.

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

Step 1

- 3.2.5 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.
- 3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

Step 2

- 3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:
- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
 - The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).
- 3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.
- 3.2.9 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 4.

Table 4 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	• Total site area greater than 10,000m² • 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

Magnitude	Activity	Criteria
	Construction	- Total building volume greater than 100,000m³ - 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 2,500m² to 10,000m² - 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 25,000m³ to 100,000m³ - 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 2,500m² - 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 25,000m³ - 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

3.2.16 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 5.

Table 5 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

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

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

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

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

3.2.19 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 6.

Table 6 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

3.2.20 Table 7 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 7 Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low
			1 - 10	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Low	-	1 or more	Low	Low	Low	Low

3.2.21 Table 8 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 8 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

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

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

3.2.23 Table 9 outlines the risk category from earthworks and construction activities.

Table 9 Construction Dust - Dust Risk Category from Earthworks and Construction Activities

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

3.2.24 Table 10 outlines the risk category from trackout activities.

Table 10 Construction Dust - Dust Risk Category from Trackout Activities

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

Step 3

3.2.25 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁸ to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

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

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

3.3 Operational Phase Assessment

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

- 2019 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2022 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2022 should the proposals be completed).

⁸ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

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

Potential Development Impacts

3.3.3 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)⁹ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance¹⁰ on where the AQOs apply, as summarised in Table 3, was utilised to determine appropriate receptor positions.

3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'¹¹. 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 11.

Table 11 Significance of Road Vehicle Exhaust Emissions Impact

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

3.3.5 The matrix shown in Table 11 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**.

⁹ Environmental Assessment, DMRB Volume 11, Section 3, Part 1, LA 105, Highways England, 2019.

¹⁰ Local Air Quality Management (TG16), DEFRA, 2018.

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

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document¹² provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

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

3.3.7 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**.

3.3.8 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts. The IAQM guidance¹³ suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

Potential Future Exposure

3.3.9 The proposals have the potential to expose future residents to any existing air quality issues at the site. Pollutant concentrations were therefore quantified across the development using dispersion modelling. The results were subsequently compared with the relevant AQOs and AQTv to determine the potential for any exceedence.

¹² Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

¹³ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

4.0 **BASELINE**

4.1 **Introduction**

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

4.2 **Local Air Quality Management**

- 4.2.1 As required by the Environment Act (1995), KMBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that concentrations of all pollutants considered within the AQS are currently below the relevant AQOs. As such, no AQMAs have been designated within the borough.

4.3 **Air Quality Monitoring**

- 4.3.1 Monitoring of pollutant concentrations is undertaken by KMBC throughout their area of jurisdiction. Recent NO₂ results from sites in the vicinity of the development are shown in Table 12.

Table 12 NO₂ Monitoring Results

Monitoring Site		Monitored NO ₂ Concentration (µg/m ³)		
		2017	2018	2019
Halewood	Higher Road, Halewood	27.8	30.3	24.3

- 4.3.2 As shown in Table 12, annual mean NO₂ concentrations were below the relevant AQO at the Halewood site in recent years.
- 4.3.3 Recent PM₁₀ results recorded within the vicinity of the development are shown in Table 13.

Table 13 PM₁₀ Monitoring Results

Monitoring Site		Monitored PM ₁₀ Concentration (µg/m ³)		
		2017	2018	2019
Halewood	Higher Road, Halewood	20.8	16.8	19.9

4.3.4 As shown in Table 13, PM₁₀ concentrations were below the annual mean AQO at the Halewood monitoring site during 2019.

4.3.5 Recent PM_{2.5} results recorded within the vicinity of the development are shown in Table 14.

Table 14 PM_{2.5} Monitoring Results

Monitoring Site		Monitored PM _{2.5} Concentration (µg/m ³)		
		2017	2018	2019
Halewood	Higher Road, Halewood	8.6	9.2	9.2

4.3.6 As shown in Table 14, PM_{2.5} concentrations were below the AQTV at the Halewood monitor in recent years.

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

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 345500, 385500. Data for this location was downloaded from the DEFRA website¹⁴ for the purpose of the assessment and is summarised in Table 15.

¹⁴ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Table 15 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2019	2020	2022
NO ₂	14.27	13.58	12.80
PM ₁₀	12.07	11.82	11.61
PM _{2.5}	8.05	7.88	7.71

4.4.2 As shown in Table 15, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and AQTV at the development site.

4.5 Sensitive Receptors

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

Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 16.

Table 16 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	10 - 100	0
Less than 50	10 - 100	0
Less than 100	10 - 100	-
Less than 350	More than 100	-

4.5.3 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access. These are summarised in Table 17.

Table 17 Trackout Dust Sensitive Receptors

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

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

4.5.5 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 18.

Table 18 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	There is no recent history of dust generating activities within the area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal indicated that two planning applications for circa 1,450 residential dwellings adjacent to the site are currently awaiting approval. It is therefore possible that there will be concurrent dust generation should the construction phases overlap
Pre-existing screening between the source and the receptors	Trees are located directly to the south and east of the site boundary. These may act as a barrier between emission sources and receptors should they be retained during construction
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in Figure 3, the predominant wind bearing at the site is from the north-west. As such, receptors to the south-east of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is possible that it will extend over one year

Guidance	Comment
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

4.5.6 Based on the criteria shown in Table 5, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because the identified receptors included residential properties.

4.5.7 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 19.

Table 19 Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	High
Human Health	Low	Low	Low

Operational Phase Sensitive Receptors

4.5.8 Receptors sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study. These are summarised in Table 20.

Table 20 Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - Lower Road	345716.7	385833.6
R2	Residential - Lower Road	345761.9	385778.7
R3	Residential - Lower Road	345635.5	385832.5
R4	Residential - Yew Tree Farm	345852.4	385728.4
R5	Residential - Lower Road	345644.4	385883.3
R6	Residential - Lower Road	345540.9	385885.3

Receptor		NGR (m)	
		X	Y
R7	Residential - Lower Road	345398.9	385948.3
R8	Residential - Greensbridge Lane	345501.6	386135.3

4.5.9 Reference should be made to Figure 4 for a graphical representation of the sensitive receptor locations.

5.0 **ASSESSMENT**

5.1 **Introduction**

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

5.2 **Construction Phase Assessment**

Step 1

- 5.2.1 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.
- 5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2

Earthworks

- 5.2.4 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 4, the magnitude of potential dust emissions from earthworks is therefore **large**.

5.2.5 Table 19 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 9, the development is considered to be a **high** risk site for dust soiling as a result of earthworks.

5.2.6 Table 19 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for human health impacts as a result of earthworks.

Construction

5.2.7 Due to the size of the development the total building volume is likely to be less than 25,000m³. In accordance with the criteria outlined in Table 4, the magnitude of potential dust emissions from construction is therefore **small**.

5.2.8 Table 19 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for dust soiling as a result of construction activities.

5.2.9 Table 19 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a **negligible** risk site for human health impacts as a result of construction activities.

Trackout

5.2.10 Based on the site area, it is anticipated that the unpaved road length is likely to be between 50m and 100m. In accordance with the criteria outlined in Table 4, the magnitude of potential dust emissions from trackout is therefore **medium**.

5.2.11 Table 19 indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria outlined in Table 10, the development is considered to be a **medium** risk site for dust soiling as a result of trackout.

5.2.12 Table 19 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 10, the development is considered to be a **low** risk site for human health impacts as a result of trackout.

Summary of the Risk of Dust Effects

5.2.13 A summary of the risk from each dust generating activity is provided in Table 21.

Table 21 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	High	Low	Medium
Human Health	Low	Negligible	Low

5.2.14 As indicated in Table 21, the potential risk of dust soiling is **high** from earthworks, **medium** from trackout and **low** from construction. The potential risk of human health impacts is **low** from earthworks and trackout and **negligible** from construction.

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

Step 3

5.2.16 The IAQM guidance¹⁵ 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 22. 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.

¹⁵ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Table 22 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager • Display the head or regional office contact information • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken • Make the complaints log available to the LA upon request • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book
Monitoring	• Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA upon request • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request • Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible • Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period • Avoid site runoff of water or mud • Keep site fencing, barriers and scaffolding clean using wet methods • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used • Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable

Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate • Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	• No bonfires or burning of waste materials
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces 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
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 • Record all inspections of haul routes and any subsequent action in a site log book • Implement a wheel washing system, if required • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits

Step 4

5.2.17 Assuming the relevant mitigation measures outlined in Table 22 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁶.

¹⁶ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

5.3 Operational Phase Assessment

5.3.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site, as well as consider potential exposure of future residents to AQO and AQTV exceedences.

5.3.2 The assessment considered the following scenarios:

- 2019- Verification;
- 2022 - DM; and,
- 2022 - DS.

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

5.3.4 For the purpose of the assessment, traffic data for 2022 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 for 2019 were utilised within the dispersion model. The use of 2022 traffic data and 2019 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

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

Potential Development Impacts

Predicted Concentrations

5.3.6 Annual mean NO₂ concentrations were predicted at sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 23.

Table 23 Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Lower Road	15.77	15.78	0.01
R2	Residential - Lower Road	16.32	16.34	0.02
R3	Residential - Lower Road	15.99	15.99	0.00
R4	Residential - Yew Tree Farm	15.40	15.41	0.01
R5	Residential - Lower Road	15.80	15.80	0.00
R6	Residential - Lower Road	16.10	16.10	0.00
R7	Residential - Lower Road	18.57	18.57	0.00
R8	Residential - Greensbridge Lane	20.37	20.38	0.00

5.3.7 As indicated in Table 23, predicted annual mean NO₂ concentrations were below the relevant AQO at all receptor locations in both scenarios.

5.3.8 Reference should be made to Figures 5 and 6 for graphical representations of annual mean NO₂ concentrations across the assessment area for the DM and DS scenarios, respectively.

5.3.9 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 24.

Table 24 Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Lower Road	12.36	12.37	0.00
R2	Residential - Lower Road	12.49	12.49	0.00
R3	Residential - Lower Road	12.40	12.40	0.00
R4	Residential - Yew Tree Farm	12.30	12.30	0.00
R5	Residential - Lower Road	12.36	12.36	0.00

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R6	Residential - Lower Road	12.42	12.42	0.00
R7	Residential - Lower Road	12.88	12.88	0.00
R8	Residential - Greensbridge Lane	13.11	13.12	0.00

5.3.10 As indicated in Table 24, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

5.3.11 Reference should be made to Figures 7 and 8 for graphical representations of predicted annual mean PM₁₀ concentrations throughout the assessment extents for the DM and DS scenarios, respectively.

5.3.12 Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 25.

Table 25 Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Lower Road	8.23	8.23	0.00
R2	Residential - Lower Road	8.30	8.30	0.00
R3	Residential - Lower Road	8.25	8.25	0.00
R4	Residential - Yew Tree Farm	8.19	8.19	0.00
R5	Residential - Lower Road	8.23	8.23	0.00
R6	Residential - Lower Road	8.26	8.26	0.00
R7	Residential - Lower Road	8.53	8.53	0.00
R8	Residential - Greensbridge Lane	8.67	8.67	0.00

5.3.13 As indicated in Table 25, predicted annual mean PM_{2.5} concentrations were below the AQTV at all sensitive receptors in both scenarios.

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

Predicted Impacts

5.3.15 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 26.

Table 26 Predicted Impacts - NO₂

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Lower Road	Below 75% of AQO	0	Negligible
R2	Residential - Lower Road	Below 75% of AQO	0	Negligible
R3	Residential - Lower Road	Below 75% of AQO	0	Negligible
R4	Residential - Yew Tree Farm	Below 75% of AQO	0	Negligible
R5	Residential - Lower Road	Below 75% of AQO	0	Negligible
R6	Residential - Lower Road	Below 75% of AQO	0	Negligible
R7	Residential - Lower Road	Below 75% of AQO	0	Negligible
R8	Residential - Greensbridge Lane	Below 75% of AQO	0	Negligible

5.3.16 As indicated in Table 26, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.17 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 27.

Table 27 Predicted Impacts - PM₁₀

Receptor		Predicted Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Lower Road	Below 75% of AQO	0	Negligible
R2	Residential - Lower Road	Below 75% of AQO	0	Negligible
R3	Residential - Lower Road	Below 75% of AQO	0	Negligible
R4	Residential - Yew Tree Farm	Below 75% of AQO	0	Negligible
R5	Residential - Lower Road	Below 75% of AQO	0	Negligible
R6	Residential - Lower Road	Below 75% of AQO	0	Negligible
R7	Residential - Lower Road	Below 75% of AQO	0	Negligible
R8	Residential - Greensbridge Lane	Below 75% of AQO	0	Negligible

5.3.18 As indicated in Table 27, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.19 Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive locations are summarised in Table 28.

Table 28 Predicted Impacts - PM_{2.5}

Receptor		Predicted Annual Mean PM _{2.5} Concentration	Predicted Concentration Change as Proportion of AQTV (%)	Impact Significance
R1	Residential - Lower Road	Below 75% of AQTV	0	Negligible
R2	Residential - Lower Road	Below 75% of AQTV	0	Negligible
R3	Residential - Lower Road	Below 75% of AQTV	0	Negligible
R4	Residential - Yew Tree Farm	Below 75% of AQTV	0	Negligible
R5	Residential - Lower Road	Below 75% of AQTV	0	Negligible
R6	Residential - Lower Road	Below 75% of AQTV	0	Negligible
R7	Residential - Lower Road	Below 75% of AQTV	0	Negligible

Receptor		Predicted Annual Mean PM _{2.5} Concentration	Predicted Concentration Change as Proportion of AQTV (%)	Impact Significance
R8	Residential - Greensbridge Lane	Below 75% of AQTV	0	Negligible

5.3.20 As indicated in Table 28, impacts on annual mean PM_{2.5} concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

Potential Future Exposure

5.3.21 The proposed development has the potential to cause the exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 6, 8 and 10 for graphical representations of annual mean NO₂, PM₁₀ and PM_{2.5} concentrations, respectively.

5.3.22 As shown in Figure 6, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the development. The maximum level at the site boundary was 18.28µg/m³. As such, future residents are not predicted to be exposed to NO₂ concentrations above the AQO.

5.3.23 As shown in Figure 8, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the development. The maximum level at the site boundary was 18.63µg/m³. As such, future residents are not predicted to be exposed to PM₁₀ concentrations above the AQO.

5.3.24 As shown in Figure 10, annual mean PM_{2.5} concentrations were predicted to be below the AQTV of 25µg/m³ at all locations across the development. The maximum level at the site boundary was 8.48µg/m³. As such, future residents are not predicted to be exposed to PM_{2.5} concentrations above the AQTV.

5.3.25 Based on the assessment results, future residents are not predicted to be exposed to pollutant concentrations above the AQOs and AQTV. The site is therefore considered suitable for the proposed end use from an air quality perspective.

Overall Impact Significance

5.3.26 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 3.3. Further justification is provided in Table 29.

Table 29 Overall Impact Significance of Operational Phase Road Vehicle Exhaust Emissions

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO ₂ , PM ₁₀ and PM _{2.5} concentrations were below the relevant AQOs and AQTV at all sensitive receptors in the DM scenario. It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs or AQTV
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollutant levels will not reduce in future years. This provides worst-case results when compared with 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

5.3.27 The IAQM guidance¹⁷ states that only if the impact is greater than **slight**, 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**.

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

6.0 CONCLUSION

- 6.1.1 Redmore Environmental Ltd was commissioned by M.A.C. (Roofing and Contracting) Limited to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Lower Road, Knowsley.
- 6.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future residents to any existing air quality issues. As such, an Air Quality Assessment was required in order to determine baseline conditions and assess potential effects as a result of the scheme.
- 6.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **not significant**.
- 6.1.4 The proposed development has the potential to expose future residents to elevated pollution levels and impact existing air quality in the vicinity of the site during operation. Dispersion modelling was therefore undertaken using ADMS-Roads in order to predict pollutant concentrations as a result of emissions from the local highway network. Results were subsequently verified using local monitoring data.
- 6.1.5 Review of the dispersion modelling results indicated that impacts on annual mean 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.
- 6.1.6 The results of the dispersion modelling assessment also indicated that predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and AQTV at all locations across the development. The site is therefore considered suitable for the proposed use from an air quality perspective

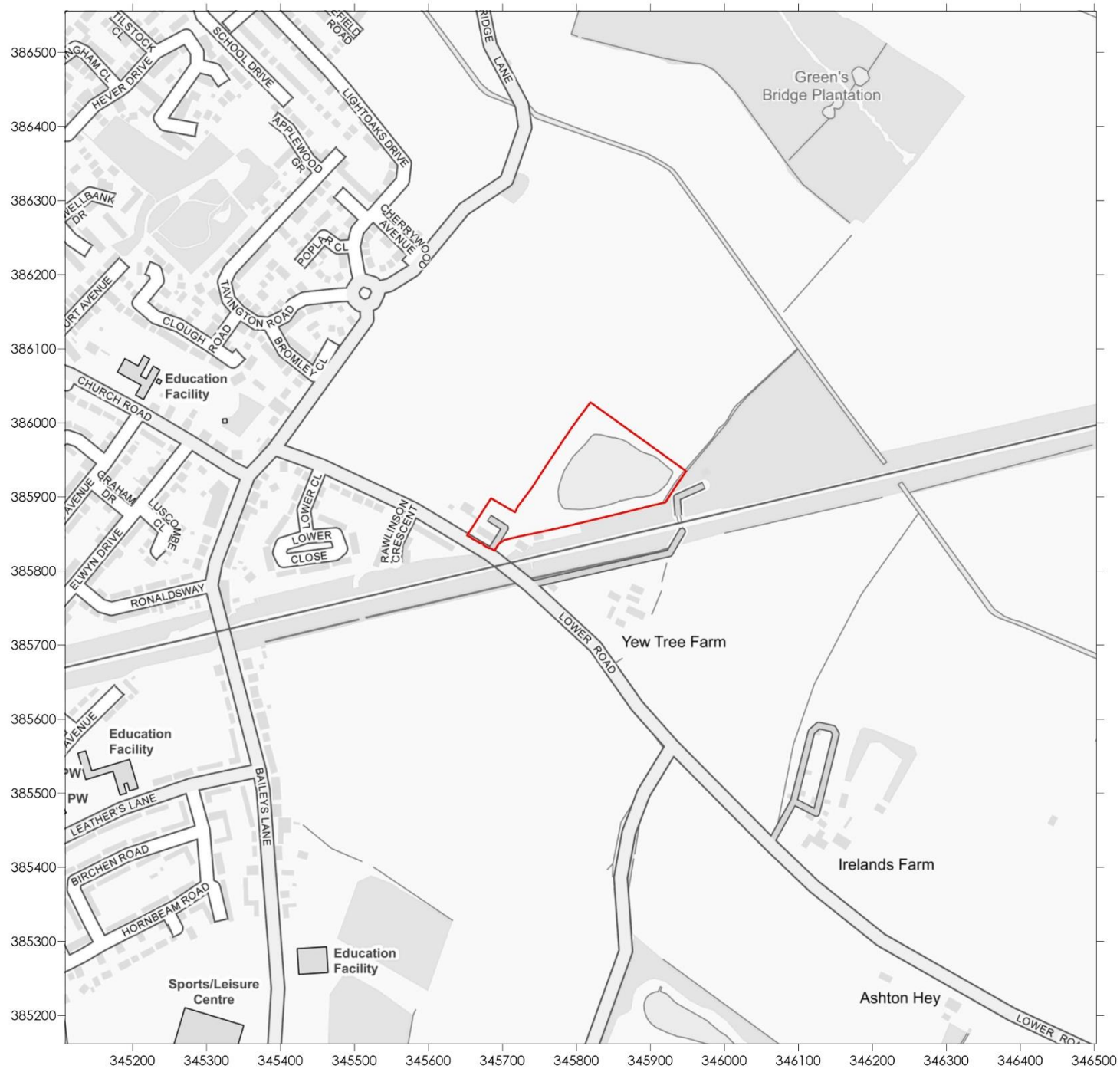
6.1.7 Following consideration of the relevant issues, air quality impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.

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

7.0 **ABBREVIATIONS**

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
AQTV	Air Quality Target Value
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EB	Eastbound
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
KMBC	Knowsley Metropolitan Borough Council
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
SP	Slow Phase
UDP	Unitary Development Plan
WB	Westbound
Z ₀	Roughness length

Figures



Legend



Site Boundary

Title

Figure 1 - Site Location Plan

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

Client

M.A.C. (Roofing and Contracting)
Limited

Contains Ordnance Survey Data
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Legend

-  Site Boundary
-  Monitor

Title

Figure 2 - Monitoring Location

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

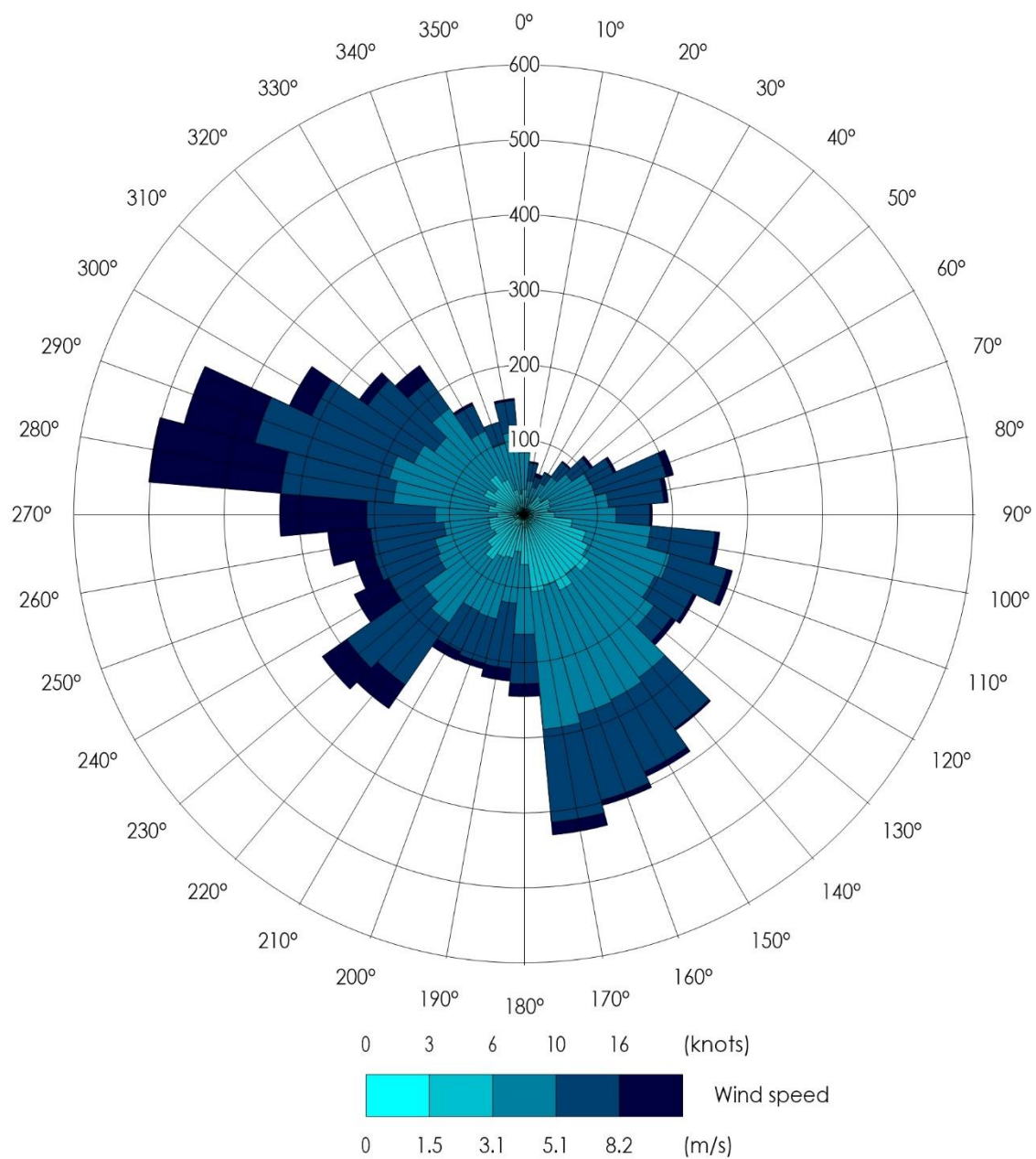
Client

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Limited

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Legend

Title

Figure 3 - Wind Rose of 2019
Liverpool Airport Meteorological
Data

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

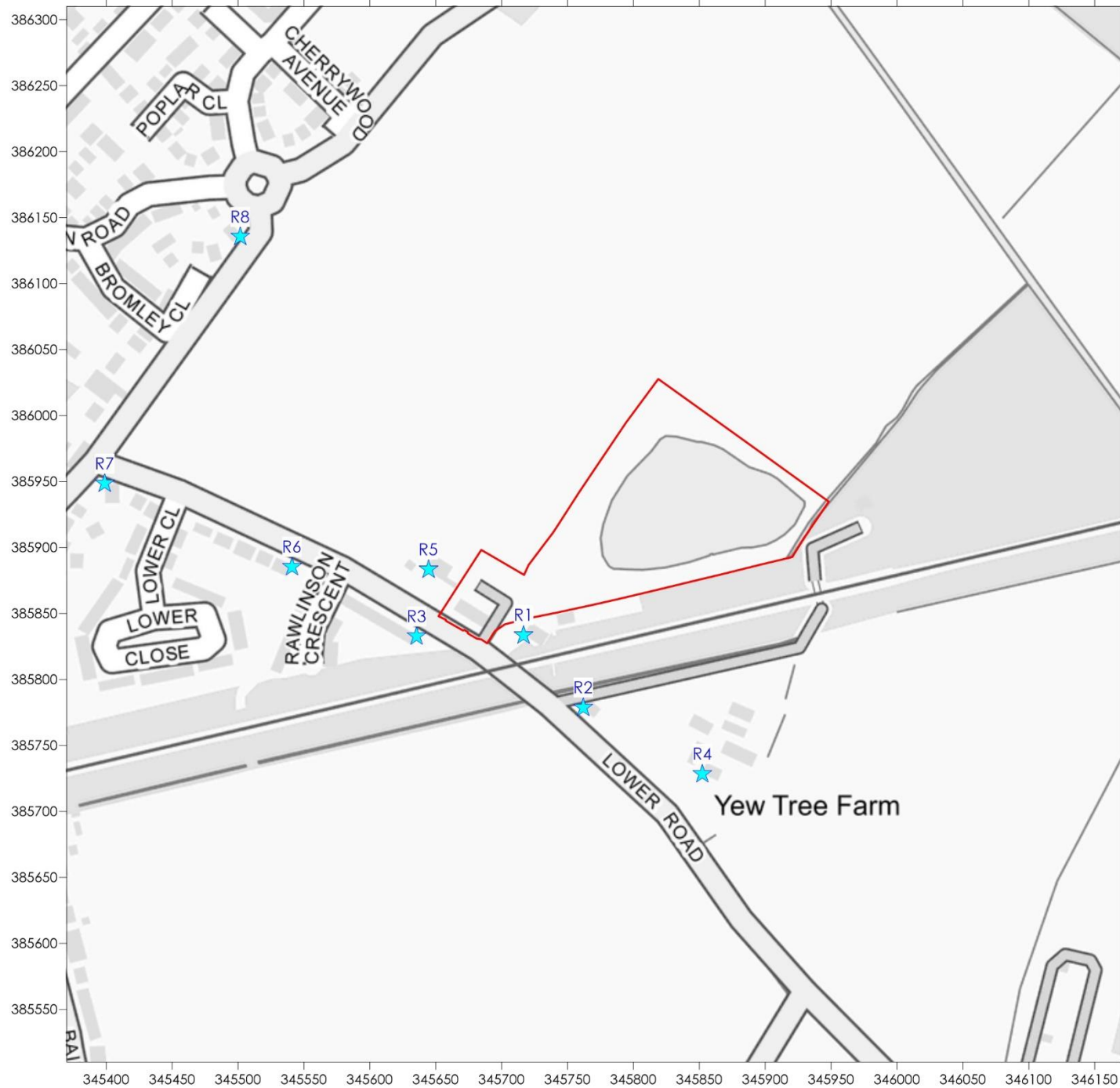
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Legend

-  Site Boundary
-  Receptor

Title

Figure 4 - Road Vehicle Exhaust
Emissions Sensitive Receptor
Locations

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

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Legend



Site Boundary



32

30

28

26

24

22

20

18

16

Annual Mean NO₂
Concentrations
(µg/m³)

Title

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

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

Client

M.A.C. (Roofing and Contracting)
Limited

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Legend



Site Boundary



32

30

28

26

24

22

20

18

16

Annual Mean NO₂
Concentrations
(µg/m³)

Title

Figure 6 - Predicted Annual Mean
NO₂ Concentrations (µg/m³)
Do-Something

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

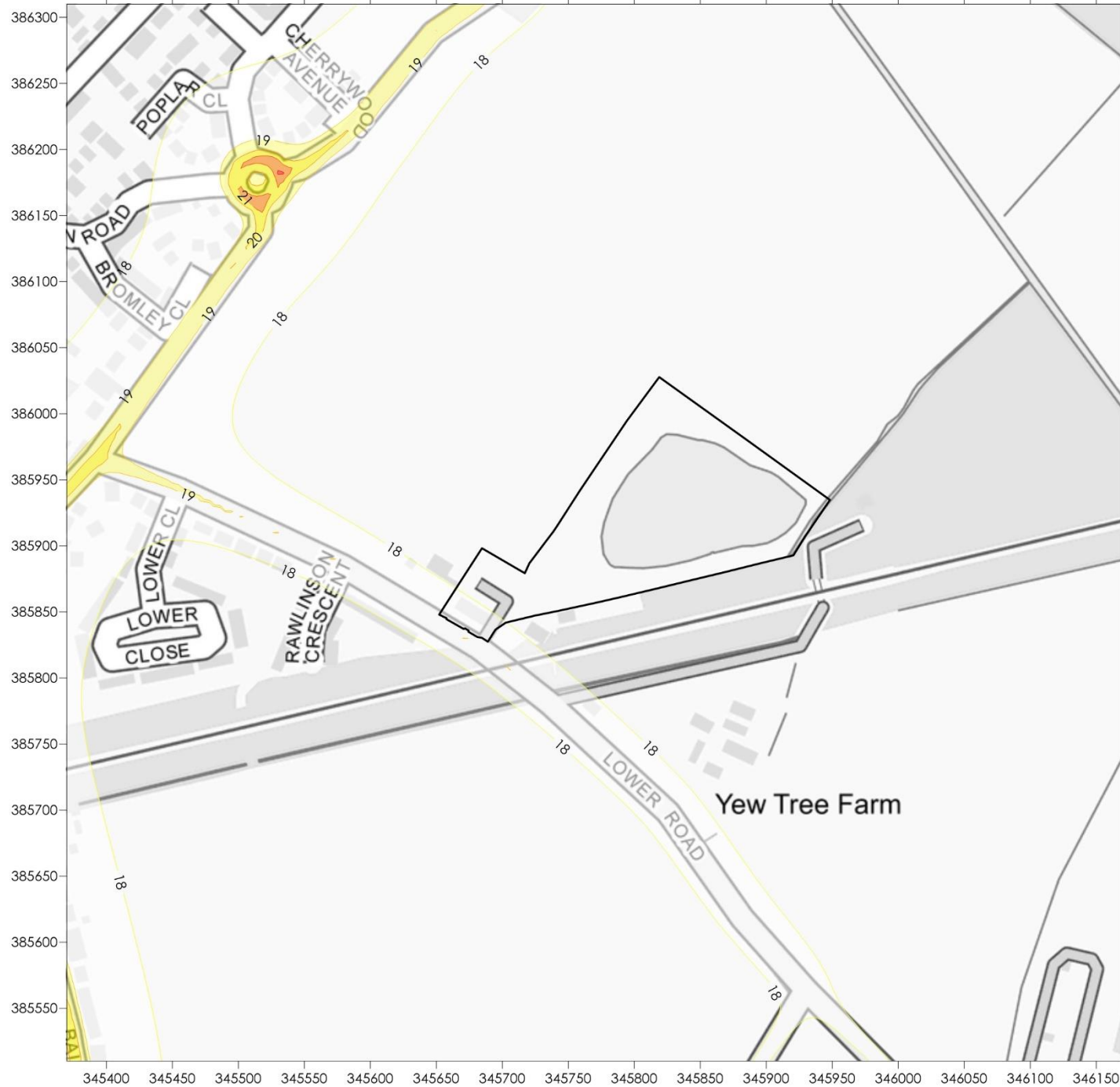
Client

M.A.C. (Roofing and Contracting)
Limited

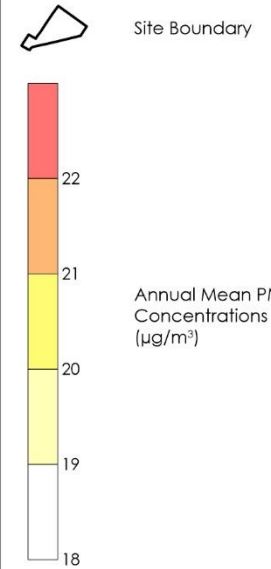
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Legend



Title

Figure 7 - Predicted Annual Mean
PM₁₀ Concentrations (µg/m³)
Do-Minimum

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

Client

M.A.C. (Roofing and Contracting)
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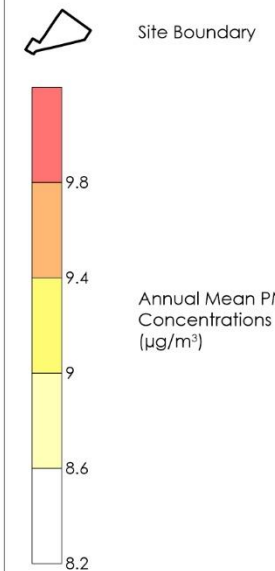


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Legend



Title

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

Project

Air Quality Assessment
Lower Road, Knowsley

Project Reference

4084

Client

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Appendix 1 - Assessment Input Data

Introduction

The proposals have the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development, as well as expose future residents to any existing air quality issues at the site. In order to assess 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 5.0.0.1). 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.

Assessment Area

The assessment area was defined based on the site location and anticipated vehicle trip distribution from the development. Ambient concentrations were predicted over NGR: 345370, 385510 to 346170, 386310. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 10 for a map of the assessment area.

Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as HDV proportion, was obtained from an Air Quality Assessment¹⁸ produced in support of the residential-led development on land known as East Halewood adjacent to the proposed site. The flows were based on recent traffic counts and therefore considered appropriate for an assessment of this nature.

Baseline traffic data was converted to 2019 and 2022 flows utilising a factor obtained from TEMPro (version 7.2). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

The following committed developments in the vicinity of the site were included in the 2022 traffic flows to take account of cumulative vehicle movements and associated air quality impacts:

- Erection of up to 730 dwellings comprising Plot 1 and Plot 3 (reference: 19/00521/HYB); and,
- Erection of up to 413 dwellings comprising Plot 2 and Plot 4 (reference: 20/00063/FUL).

Daily traffic movements generated as a result of the development and associated distribution were provided by Amni Transportation, the Transport Consultants for the project. These were added to the relevant links to establish the DS flows.

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 (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2022 DM	2022 DS			
L1	Greenbridge Lane	10,020	13,138	13,143	3.77	6.0	45

¹⁸ Chapter F: Air Quality, East Halewood, REC, 2019.

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2022 DM	2022 DS			
L2	Greenbridge Lane north of Roundabout 2 slow phase (SP)	10,020	13,138	13,143	3.77	6.0	30
L3	Greenbridge Lane north of Lower Road SP	10,020	13,138	13,143	3.77	6.0	30
L4	Greenbridge Lane north of Lower Road	10,020	13,138	13,143	3.77	6.0	45
L5	Baileys Lane, south of Lower Road	11,797	16,558	16,560	4.50	6.0	45
L6	Baileys Lane SP	11,797	16,558	16,560	4.50	6.0	30
L7	Higher Road west of Baileys Lane SP	17,686	19,703	19,704	3.19	9.6	30
L8	Higher Road west of Baileys Lane	17,686	19,703	19,704	3.19	9.4	45
L9	A562 Higher Road east of Baileys Lane Eastbound (EB)	12,115	14,819	14,819	4.97	7.0	65
L10	A562 Higher Road approach to A561 Speke Boulevard EB	10,484	12,875	12,903	4.94	7.0	65
L11	A562 Higher Road exit from A561 Speke Boulevard Westbound (WB)	10,484	12,875	12,903	4.94	7.0	65
L12	A562 Higher Road WB	10,484	12,875	12,903	4.94	4.5	65
L13	A561 Speke Boulevard WB	21,127	25,914	25,914	8.36	7.6	95
L14	A561 Speke Boulevard EB	21,127	25,914	25,914	8.36	7.1	95
L15	Lower Road approach to Baileys Lane SP	3,216	6,369	6,375	1.85	6.8	30
L16	Lower Road west of site access	3,216	6,369	6,375	1.85	6.0	45
L17	Lower Road east of site access	3,216	6,369	6,425	1.85	6.0	45
L18	Lower Road west of Finch Lane	3,216	6,369	6,425	1.85	6.0	80
L19	Finch Lane	1,748	2,232	2,287	1.53	4.6	80
L20	Lower Road east of Finch Lane	1,528	1,807	1,807	3.62	6.0	95
L21	A561 Speke Boulevard EB east of slip road	21,127	25,914	25,942	8.36	11.6	95
L22	A561 Speke Boulevard WE east of slip road	21,127	25,914	25,942	8.36	11.6	95
R1	Tavington/Light Oaks roundabout	5,263	6,637	6,639	2.15	7.5	30

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2022 DM	2022 DS			
R2	Baileys Lane roundabout	12,158	16,741	16,744	3.30	7.7	30

Reference should be made to Figure 11 for a graphical representation of the road link locations.

Emission Factors

The emission factors were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 10.1). This has been produced by DEFRA and incorporates COPERT 5.3 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 Liverpool Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Liverpool Airport is located at NGR: 343488, 381791, which is approximately 4.6km south-west of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.3m was used to describe the modelling extents. This is considered appropriate

for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (max)'.

A z_0 of 0.1m was used to describe the meteorological site. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'root crops'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 10m was used to describe the modelling extents. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'small towns <50,000'.

A minimum Monin-Obukhov length of 30m was used to describe the meteorological site. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Background NO₂, PM₁₀ and PM_{2.5} concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the development site, as shown in Table 15.

Similarly to emission factors, background concentrations from 2019 were utilised in preference to the 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 NO_x concentrations were converted to NO₂ concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance¹⁹.

¹⁹ Local Air Quality Management (TG16), DEFRA, 2018.

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.

KMBC undertook monitoring of NO₂ concentrations at one location within the modelling extents during 2019. The result was obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance²⁰. The monitored annual mean NO₂ concentration and calculated road NO_x concentration is summarised in Table A1.2.

Table A1.2 NO_x Verification - Monitoring Result

Monitoring Location		Monitored NO ₂ Concentration (µg/m ³)	Calculated Road NO _x Concentration (µg/m ³)
Halewood	Higher Road, Halewood	24.3	19.10

The annual mean road NO_x concentration predicted from the dispersion model and the 2019 road NO_x concentration calculated from the 2019 monitoring result is summarised in Table A1.3

²⁰ Local Air Quality Management (TG16), DEFRA, 2018.

Table A1.3 NO_x Verification - Modelling Result

Monitoring Location		Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
Halewood	Higher Road, Halewood	19.10	17.59

The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.0861 was required to be applied to all modelling results.

Monitoring of PM₁₀ concentrations was undertaken at one location within the modelling extents during 2019. The monitored annual mean PM₁₀ concentration and modelled PM₁₀ concentration is shown in Table A1.4.

Table A1.4 PM₁₀ Verification - Modelling Result

Monitoring Location		Monitored PM ₁₀ Concentration (µg/m ³)	Calculated Road PM ₁₀ Concentration (µg/m ³)
Halewood	Higher Road, Halewood	19.9	13.7

The monitored and modelled PM₁₀ concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.4574 was required to be applied to all modelling results.

Monitoring of PM_{2.5} concentrations was undertaken at one location within the modelling extents during 2019. The monitored annual mean PM_{2.5} concentration and modelled PM_{2.5} concentration is shown in Table A1.5.

Table A1.5 PM_{2.5} Verification - Modelling Result

Monitoring Location		Monitored PM _{2.5} Concentration (µg/m ³)	Calculated Road PM _{2.5} Concentration (µg/m ³)
Halewood	Higher Road, Halewood	9.2	9.0

The monitored and modelled PM_{2.5} concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.0235 was required to be applied to all modelling results.

Appendix 2 - Curricula Vitae

KEY EXPERIENCE:

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

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

SELECT PROJECTS SUMMARY:

Industrial

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

Tatweer Petroleum - dispersion modelling of Bahrain oil field.

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

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

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

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

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

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

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

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

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

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

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

Residential

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

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

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

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

Elephant and Castle Leisure Centre - baseline AQA for redevelopment.

Carr Lodge, Doncaster - EIA for large residential development.

Queensland Road, Highbury - residential scheme including CHP.

Bicester Ecotown - dispersion modelling of energy centre.

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

York St, Bury - residential development adjacent to AQMA.

Temple Point Leeds - residential development adjacent to M1.

Commercial and Retail

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

Wakefield College - redevelopment of city centre campus in AQMA.

Manchester Airport Cargo Shed - commercial development.

Manchester Airport Apron Extension - EIA including aircraft emission modelling.

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

KEY EXPERIENCE:

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

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Bowlers Yard, Manchester

Air Quality Assessment in support of an eleven storey residential development to provide circa 65 units on land known as Bowlers Yard, Manchester. The site was located in an Air Quality Management Area (AQMA) and concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{2.5}, PM₁₀ and NO₂ concentrations across the site. Results indicated that pollution levels were below the air quality objectives across the development.

Freemasons Arms Hotel, Heywood

Air Quality Assessment to support a residential-led development in an AQMA. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. Predicted concentrations of NO₂ were found to exceed air quality criteria at the building façade fronting Market Place at first floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Griffin Road, London

Air Quality Assessment in support of a residential development located in an AQMA. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM₁₀ and NO₂ concentrations across the site. Results indicated that pollution levels were classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance.

High Street, Dudley

Odour Impact Assessment in support of a proposed residential-led development. Due to the location of the site, being above an existing hot food takeaway, odour surveys were required to assess the level of odour across the development. A risk assessment was also undertaken in accordance with the relevant odour guidance. An appropriate ventilation system was identified on the basis of the assessment results.

East Common Lane, Selby

Air Quality Assessment in support of an industrial development on land associated with Access 63 Business Park, East Common Lane Selby. Due to the size of the development it was possible that traffic generated from the scheme may cause negative impacts on sensitive receptors nearby. NO₂ and PM₁₀ concentrations were quantified at specific receptor points to ensure there would be no significant increases in pollution levels. Results revealed negligible impacts.

Wharton Road, Winsford

Air Quality Assessment in support of a residential development of circa 138 units on land off Wharton Road, Winsford. Using sensitive receptors, located in areas where increased road traffic may affect NO₂ concentrations, a comparison was made between overall concentrations with and without the development in place. Results revealed pollutant concentrations were below the relevant standards across the site and impacts were not significant.

KEY EXPERIENCE:

Amelia is a Senior Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Eagle House, South Ruislip

Air Quality Assessment for the change of use from an office block to a hotel in an Air Quality Management Area (AQMA). Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM₁₀ and NO₂ concentrations across the site as well as an Air Quality Neutral Assessment in accordance with the London Plan requirements. Results revealed that pollution levels were below the air quality standards across the development.

Parr Bridge, Tyldesley

Air Quality Assessment to support a residential development of 154 units. Dispersion modelling was undertaken due to the proximity of the site to an AQMA. Using sensitive receptors located in areas where increased road traffic may affect NO₂ levels, a comparison was made between concentrations with and without the development in place. Results indicated the impacts were not significant.

St James's Street, Westminster

Air Quality Assessment in support of a mixed-use development in an AQMA. Dispersion modelling was undertaken at several different heights reflective of residential units within the development. Predicted concentrations of NO₂ were found to exceed air quality criteria from ground to third floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Rookery Avenue, Whiteley, Farnborough

Odour Impact Assessment in support of a hot food takeaway with a drive thru facility in Whiteley. The assessment considered a number of factors, including the scale and nature of potential emissions, the location of nearest receptors and the proposed cooking type in accordance with the relevant DEFRA guidance. An appropriate ventilation system was identified and described on the basis of the assessment results.

Hoole Way, Chester

Air Quality Assessment in support of an eight-storey student accommodation block to provide circa 373 units on land off Hoole Way, Chester. Concerns had been raised in relation to the potential exposure of future occupants to elevated pollution concentrations. An assessment was therefore undertaken using dispersion modelling in order to quantify air quality conditions across the site. The results revealed that the use of good practice control measures would provide suitable mitigation for the development.

St James Place, Liverpool

Air Quality Assessment in support of a residential-led development located across three different sites in an AQMA on land off St James Place, Liverpool. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. The results revealed pollutant concentrations were below the relevant standards across the site.