



AIR QUALITY ASSESSMENT WING FAT, ASHTON OLD ROAD, MANCHESTER

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EXECUTIVE SUMMARY

Resource and Environmental Consultants Ltd was commissioned by Golden Horse Limited to undertake an Air Quality Assessment in support of the proposed Cash and Carry located off Ashton Old Road, Manchester.

It is understood the proposals comprise the development of a Cash and Carry warehouse alongside associated infrastructure and parking.

The proposals are located partially within the Greater Manchester Combined Authority Air Quality Management Area. Additionally, due to the scale of the development, there is potential for the development to cause adverse impacts on existing pollution levels at nearby sensitive receptors during the construction and operational phases. As such, an air quality assessment was required in order to identify baseline conditions at the development and to quantify potential impacts associated with the proposals.

Potential construction phase air quality impacts from fugitive dust emissions were also 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.

Dispersion modelling was undertaken in order to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the development. Results were subsequently verified using local monitoring results.

The assessment concluded that overall impacts on pollutant levels as a result of operational phase vehicle were predicted to be **not significant**. The use of robust assumptions, where necessary, was considered to provide sufficient results confidence for an assessment of this nature.

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





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1. INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Ltd was commissioned by Golden Horse Limited to undertake an Air Quality Assessment in support of a proposed Cash and Carry located off Ashton Old Road, Manchester.

1.2 Site Location and Context

The site is located on land at Ashton Old Road, Manchester at approximate National Grid Reference (NGR): 386570, 397530. Reference should be made to Figure 1 within Appendix I for a location plan.

The proposals comprise the development of a Cash and Carry warehouse alongside associated infrastructure and parking.

The proposed development is located partially within the Greater Manchester Combined Authority's (GMCA) Air Quality Management Area (AQMA), which has been declared for exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO₂) and, as such, there is potential for the development to cause adverse impacts upon existing pollution levels at nearby sensitive receptors within the AQMA during the construction and operational phases.

An Air Quality Assessment is therefore required in order to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development in accordance with the requirements of the National Planning Policy Framework (NPPF). This is detailed in the following report.

1.3 Limitations

This report has been produced in accordance with REC's standard terms of engagement. REC 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 REC; a charge may be levied against such approval.





2. LEGISLATION AND POLICY

2.1 European Legislation

European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than $2.5\mu\text{m}$ ($\text{PM}_{2.5}$). The consolidated Directives include:

- ▶ Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for NO_2 , oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than $10\mu\text{m}$ (PM_{10});
- ▶ Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and
- ▶ Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- ▶ Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

2.2 UK Legislation

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

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 AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

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

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





Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	25	Annual mean

Table 2 summarises the advice provided in DEFRA guidance LAQM (TG16)² on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objectives Should Apply At	Objectives 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
1-hour mean	All locations where the annual mean and 24-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 Local Air Quality Management Technical Guidance LAQM (TG16), DEFRA, 2018.





2.3 Local Air Quality Management

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 considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4 Dust

The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2018) are those 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 administration 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). Enforcement can insist that there be no dust beyond the boundary of the works. 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 practice measures.

2.5 National Planning Policy

2.5.1 National Planning Policy Framework

The National Planning Policy Framework^[1] (NPPF) was published on 24th July 2018 (updated in 19th February 2019) and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

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

[...]

Preventing both 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

^[1] National Planning Policy Framework, Department for Communities and Local Government, 2012.





"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."

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

2.5.2 National Planning Practice Guidance

The National Planning Practice Guidance³ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The relevant air quality sections are highlighted below:

Paragraph 001 states that: *"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account, where the national assessment indicates that relevant limits have been exceeded or are near the limit". The role of Local Authorities under LAQM are stated and that Air Quality Action Plans should "identify measures that will be introduced in pursuit of the objectives"*

Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation"*

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality". In terms of mitigation, it states that "Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact"*.

Paragraph 009 shows a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

These were reviewed and the relevant guidance was considered throughout the undertaking of this assessment

³ <http://planningguidance.planningportal.gov.uk/>.





2.6 Local Planning Policy

The Manchester Local Development Framework (LDF) Core Strategy⁴ was formally adopted in 2012 and provides a framework for development within the city. The LDF comprises a number of documents which set out Manchester City Council's (MCC's) spatial policy framework for delivering a number of policies contained within the Core Strategy which have been saved in accordance with the Planning and Compulsory Purchase Act (2004) and therefore provide the basis for the determination of planning applications prior to the finalisation of the local development framework.

A review of the Core Strategy indicated the following policies in relation to air quality that relevant to this assessment:

"Policy EN16 - Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

"Policy DM1 - Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

Reference has been made to these policies during the preparation of this Air Quality Assessment by determining potential air quality impacts as a result of the proposed development.

2.7 Greater Manchester Air Quality Action Plan

The Greater Manchester Air Quality Action Plan (AQAP)⁵ has involved a review of the strategies, policies and plans which tackle or are in some way related to air quality, to develop a clear, robust and meaningful set of actions which will deliver real changes in terms of air quality, whilst supporting the sustainable economic growth of the region.

The primary objectives of the AQAP are to improve air quality across Greater Manchester and to embed low-emission behaviours into the culture of our organisations and lifestyles by 2025, whilst

⁴ Manchester Local Development Framework (LDF) Core Strategy

⁵ Greater Manchester Air Quality Action Plan 2016–2021





supporting the UK Government in meeting all EU thresholds for key air pollutants. The Plan identifies 'Key Priority Areas' which are generally locations near to major roads and heavily trafficked areas in Manchester city centre, and other major urban centres across the other nine districts.

The AQAP comprises a single document including actions that will be ratified by Transport for Greater Manchester (TfGM) and district authorities to tackle air quality in Key Priority Areas, whilst supporting the sustainable economic growth of the region. This plan will allow councils to carry out their statutory duties under Part IV of the Environment Act 1995, as its implementation will help mandatory EU limit values to be met. Consideration to the action plan has been made throughout the preparation assessment.





3. METHODOLOGY

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

3.1 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'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 was assessed for each activity that is likely to take place and considered three separate dust effects:

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

The assessment steps are detailed below.

3.1.1 Step 1

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

3.1.2 Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to 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

⁶ Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016.





(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.

Table 3 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
	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





Magnitude	Activity	Criteria
	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

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table 4.

Table 4 Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect of 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, playing fields, farmland, footpaths, short term car park 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 during the construction phase:





- ▶ 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 the 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 sensitivity of the area to dust soiling effects on people and property is shown in Table 5.

Table 5 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

Table 6 outlines the sensitivity of the area to human health impacts.

Table 6 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	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
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low



Receptor Sensitivity	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
	Less than 24µg/m ³	1 - 10	Medium	Low	Low	Low	Low
		More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

Table 7 outlines the sensitivity of the area to ecological impacts.

Table 7 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 8 outlines the risk category from earthworks and construction activities.

Table 8 Dust Risk Category from Earthworks and Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table 9 outlines the risk category from trackout.

Table 9 Dust Risk Category from Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

3.1.3 Step 3

Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁶ 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.

3.1.4 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'.

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 guidance⁶ suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix III.

3.2 Operational Phase Assessment

The development has the potential to impact on existing air quality as a result of road traffic exhaust





emissions, such as NO₂, PM₁₀ and PM_{2.5}, associated with vehicles travelling to and from the site. It should be noted that the proposed development site does not include any relevant exposure to long term pollutant concentrations, such as residential units, and as such exposure to the annual mean NO₂, PM₁₀ and PM_{2.5} concentrations do not apply. Subsequently, this has not been considered in further detail during the preparation of the assessment.

Potential impacts have been defined by predicting pollutant concentrations at existing sensitive locations using dispersion modelling for the following scenarios:

- ▶ 2017 Verification;
- ▶ Opening year do-minimum (DM) (predicted traffic flows in 2020 should the proposals not proceed); and
- ▶ Opening year do-something (DS) (predicted traffic flows in 2020 should the proposals be completed, with the addition of traffic generated by the proposed development).

Reference should be made to Appendix II for assessment input data.

Receptors potentially sensitive to changes in NO₂, PM₁₀ and PM_{2.5} concentrations were identified within 200m of the affected highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)⁷ on the likely limits of pollutant dispersion from road sources. LAQM (TG16)2 provides the following examples of where annual mean AQOs should apply:

- ▶ Residential properties;
- ▶ Schools;
- ▶ Hospitals; and
- ▶ Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 10. These are based upon the guidance provided within the Environmental Protection UK (EPUK) and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'⁸.

Table 10 Operational Traffic Exhaust Emissions - Assessment of Impact

Long Term Average Concentration	% Change in Concentration Relative to 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

⁷ Design Manual for Roads and Bridges Volume 11, Section 3, Part 1, HA207/07, Highways Agency, 2007.

⁸ Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2017.





The criteria shown in Table 10 is adapted from the EPUK and IAQM guidance⁸ with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance⁸.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 10, the EPUK and IAQM⁸ document states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for. Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:

- ▶ Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- ▶ Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- ▶ The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- ▶ Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- ▶ The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less significance than an annual mean of 51µg/m³.

These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that 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.





4. BASELINE

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.

4.1 Local Air Quality Management

As required by the Environment Act (1995), GMCA, of which MCC is a part of, has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that concentrations of NO₂ are above the AQO within the borough. As such, one AQMA has been declared, which is described as:

"Greater Manchester Combined Authority AQMA - This is the part of the Greater Manchester Combined Authority AQMA located within the Manchester City Council area."

The site is located partially within the Greater Manchester AQMA and as such, there is the potential for the development to cause adverse impacts to air quality within this area. This has been considered within this report. Reference should be made to Figure 1 within Appendix I for a graphical representation of the Greater Manchester AQMA.

MCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMA's have designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by MCC using both continuous and periodic methods throughout their area of administration. A review of the most recent monitoring results indicated the closest continuous monitor to the proposed development is the Manchester Oxford Road monitoring station at NGR: 384233, 397287. This is approximately 2.5km west of the development boundary. Due to the distance between the sites, similar pollutant concentrations would not be anticipated and as such this monitoring location has not been considered further within this report.

MCC also utilises passive diffusion tubes to monitor NO₂ concentrations throughout their area of administration. There are four diffusion tubes located in the vicinity of the proposed development and monitoring results from recent years are summarised in Table 11. Exceedances of the relevant AQO are highlighted in **bold**.

Table 11 Diffusion Tube Monitoring Results

Site ID	Site Name	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
			X	Y	2015	2016	2017
MAN28	Ashton Old Road	Urban Traffic	387951	397430	34.62	40.99	38.93
MAN86b	A6010 Pottery Lane	Urban Traffic	387150	396808	33.26	37.00	36.10
MAN73	Hyde Road	Urban Traffic	388601	396048	38.58	43.61	39.39





Site ID	Site Name	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
			X	Y	2015	2016	2017
MAN78	Rostron Avenue	Urban Background	386289	396828	31.89	37.00	38.72
MAN79	Victoria Avenue	Urban Background	386875	395861	30.53	32.68	32.21
MAN87b	A57 Hyde Road	Urban Traffic	387020	396561	36.59	37.27	37.11
MAN 88B	Hyde Road/Clowes Street	Urban Traffic	386536	396699	42.12	49.11	48.21
MAN89B	Wenlock Way	Kerbside	386681	396806	31.19	34.87	35.24

As indicated in Table 11, the annual mean AQO for NO₂ was exceeded at three of the monitoring locations during recent years. This is due to their roadside locations within an AQMA. Reference should be made to Figure 2 within Appendix I for a graphical representation of monitoring locations.

4.3 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: 386500, 397500. Data for this location was downloaded from the DEFRA website⁹ for the purpose of this assessment and is summarised in Table 12 for the verification year (2017) and the predicted development opening year (2020).

Table 12 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)	
	2017	2020
NO _x	32.66	27.14
NO ₂	22.19	18.96
PM ₁₀	13.34	13.01
PM _{2.5}	8.58	8.24

As shown in Table 12, background concentrations of NO₂, PM₁₀ and PM_{2.5} did not exceed the relevant AQOs. Comparison between the monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations.

⁹ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.





4.4 Construction Phase 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.

Receptors sensitive to potential dust impacts during, earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 13.

Table 13 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Less than 20	1 - 10	0
20 - 50	More than 100	0
50 - 100	More than 100	-
100 - 350	More than 100	-

Reference should be made to Figure 3 within Appendix I for a graphical representation of earthworks and construction dust buffer zones.

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 route. These are summarised in Table 14. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. However, it was assumed construction traffic would access the site from Stainforth Street and both east and west of Ashton Old Road.

Table 14 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
20 - 50	More than 100	0

Reference should be made to Figure 4 within Appendix I for a graphical representation of trackout dust buffer zones.

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

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





Table 15 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The proposals are located in a predominantly industrial and residential location. As such, historical dust generation may have occurred as a result of windblown emissions from commuting and industrial processes.
The likelihood of concurrent dust generating activity on nearby sites	A review of the MCC Planning Portal indicated that there are no large scale development schemes in the locality of the site. As such, the likelihood of concurrent dust generating activity is minimal.
Pre-existing screening between the source and the receptors	There is no vegetation present along the site boundaries. As such, pre-existing natural protective screening is limited
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the south west and west of the development, as shown in Figure 5 within Appendix I. As such, properties to the north and north-east would be most affected by dust emissions generated during the construction phase.
Conclusions drawn from local topography	The topography within the area of the proposed development appears to be predominantly flat. As such, there are no 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 given the 2020 opening year it is likely to last under one year.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline

Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was considered to be **high**. This was because users would expect to enjoy a reasonable level of amenity, aesthetics or value of their property could be diminished by soiling and people would be expected to be present for extended periods of time e.g. residential properties.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3, is shown in Table 16.

Table 16 Sensitivity of the Surrounding Area

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





4.5 Operational Phase Sensitive Receptors

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment. These were modelled at a height of 1.5m in order to represent ground floor level and are summarised in Table 17.

Table 17 Existing Sensitive Human Receptors

Receptor		NGR (m)	
		X	Y
R1	9 Stonehurst Close	387196	396768
R2	Flats at Wenlock Way/Pottery Lane	387171	396937
R3	Bridge College	387256	397351
R4	47 Falconwood Way	387083	397540
R5	17 Falconwood Way	386904	397557
R6	Outrington Drive	387248	397691
R7	3 Turing Close	387268	397543
R8	719 Ashton Old Road	387560	397498
R9	947 Ashton Old Road	388212	397426
R10	St Barnabas CofE Primary Academy	387800	397542
R11	423 Ashton Old Road	386646	397580
R12	Radcliffe House	386457	397598
R13	Residential - Wren Way	386368	397615

The sensitive receptors identified in Table 17 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the proposed development that have not been individually identified above. Reference should be made to Figure 6 within Appendix I for a graphical representation of operational phase emission sensitive human receptor locations.





5. ASSESSMENT

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

5.1 Construction Phase Assessment

5.1.1 Step 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 road 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.

5.1.2 Step 2

Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. Information on soil type was not available for the purpose of this assessment. As such, the soil type was considered to be potentially dusty in order to provide a worst-case scenario.

The proposed development site is estimated to cover a total area between 2,500m² and 10,000m². In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **medium**.

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

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

Construction

Due to the size of the development site the total building volume is likely to be less than 25,000m³. In accordance with the criteria outlined in Table 8, the magnitude of potential dust emissions from construction is therefore **small**.





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

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

Trackout

Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. Similarly, the surface material and unpaved road length was not known at this stage of the project.

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 9, the magnitude of potential dust emissions from trackout is therefore **medium**.

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

Table 16 indicates the sensitivity of the area to human health is **medium**. In accordance within the criteria outlined in Table 9, the development is considered to be a **low** risk site for human health 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 18.

Table 18 Summary of Potential Unmitigated Dust Risks

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

As indicated in Table 18, the potential risk of dust soiling is **medium** for earthworks and trackout activities and **low** for construction activities. The potential risk of human health impacts is **low** for earthworks and trackout activities and **negligible** for construction activities.

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.





5.1.3 Step 3

The IAQM guidance⁶ provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development site as summarised in Table 19. These may be reviewed prior to the commencement of construction works and potentially incorporated into a Construction Environmental Management Plan if required by the Local Planning Authority.

Table 19 Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary • Develop and implement a stakeholder communications plan that includes community engagement • 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 dusty and air quality complaints and make the complaints log available to the LA when asked • Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation • Make complaints log available to LA when asked
Monitoring	• Undertake daily on-site and off-site inspection where receptors are nearby to monitor dust • Carry out regular site inspections to monitor compliance with the DMP • Increase frequency of site inspections when activities with a high potential to produce dust are being carried out
Preparing and Maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors • Fully enclose site or specific operations where there is a high potential for dust production and the site as 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 • Cover, seed or fence stockpiles to prevent wind whipping Use water as dust suppressant where applicable





Issue	Control Measure
Operating Vehicle/ Machinery and Sustainable Travel	• All vehicles to switch off engines - no idling vehicles • Avoid the use of diesel or petrol-powered generators where practicable • Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph in unsurfaced haul roads • Produce a Construction Logistics Plan to manage sustainable deliveries • Implement a Travel Plan that supports and encourages sustainable travel
Operations	• Cutting equipment to use water as dust suppressant or suitable local extract ventilation • Ensure adequate water supply on the site for effective dust/particulate matter suppression/mitigation • Use enclosed chutes and covered skips • Minimise drop heights • Ensure equipment is readily available on site to clean any spillages
Waste Management	• No bonfires
Earthworks and Construction	• Re-vegetate earthworks and exposed areas • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate • Only remove the cover in small areas during work and not all at once • Avoid scabbling (roughening of concrete surfaces) • Ensure sand and other aggregates are stored and not able to dry out, unless it is required for a specific process
Trackout	• Use water-assisted dust sweeper on the access and local roads • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving sites are covered to prevent escape of materials • Inspect on-site routes for integrity, instigate necessary repairs and record in site log book • Install hard surfaced haul routes which are regularly damped down • Implement a wheel washing system at a suitable location near site exit • 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 • Access gates to be located at least 10m from receptors, where possible

5.1.4 Step 4

Assuming the relevant mitigation measures outlined in Table 19 are implemented, the residual effect from all dust generating activities is predicted to be **negligible**, in accordance with the IAQM guidance⁶.

5.2 Operational Phase Assessment

Additional vehicle movements associated with the operation of the proposed development from





both HDVs and cars will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} 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:

- ▶ 2017 Verification;
- ▶ 2020 Do-Minimum (DM); and
- ▶ 2020 Do-Something (DS).

The DM (i.e. without development) scenario is representative of anticipated traffic data for 2020. The DS (i.e. with development) scenario is representative of anticipated traffic data for with the addition of predicted variations in traffic flow patterns as a result of the proposals, inclusive of committed developments within the area.

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

5.2.1 Future Exposure

As discussed previously in Section 3.2, it should be noted that the proposed development does not include any relevant exposure to long term pollutant concentrations, such as residential units. As a result, consideration of annual mean NO₂, PM₁₀ and PM_{2.5} concentrations is not required across the development as in accordance with LAQM (TG16)² and has not been considered further in the context of pollutant exposure.

5.2.2 Nitrogen Dioxide

Predicted Concentrations at Sensitive Receptor Locations

Annual mean NO₂ concentrations were predicted for the 2020 DM and DS scenarios and are summarised in Table 20. Exceedances of the AQO are shown in **bold**.

Table 20 Predicted Annual Mean NO₂ Concentrations

Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	9 Stonehurst Close	28.63	28.64	0.01
R2	Flats at Wenlock Way/Pottery Lane	37.97	38.01	0.04
R3	Bridge College	30.90	30.93	0.03
R4	47 Falconwood Way	40.94	41.02	0.08
R5	17 Falconwood Way	37.15	37.22	0.07
R6	Outrington Drive	37.73	37.77	0.04





Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R7	3 Turing Close	38.62	38.66	0.04
R8	719 Ashton Old Road	39.37	39.40	0.03
R9	947 Ashton Old Road	48.41	48.47	0.06
R10	St Barnabas CofE Primary Academy	28.63	28.65	0.02
R11	423 Ashton Old Road	44.50	44.67	0.17
R12	Radcliffe House	40.89	40.99	0.10
R13	Residential - Wren Way	34.88	34.93	0.05

As indicated in Table 20, predicted annual mean NO₂ concentrations did exceed the AQO at four sensitive receptor locations for both the DM and DS scenarios. Critically, no new exceedances of the annual mean AQO for NO₂ are predicted to occur as a result of the proposed development.

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted NO₂ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R1	9 Stonehurst Close	0.03	75% or Less of the AQO	Negligible
R2	Flats at Wenlock Way/Pottery Lane	0.10	95-102% of the AQO	Negligible
R3	Bridge College	0.08	76-94% of the AQO	Negligible
R4	47 Falconwood Way	0.20	103-109% of the AQO	Negligible
R5	17 Falconwood Way	0.18	76-94% of the AQO	Negligible
R6	Outrington Drive	0.10	95-102% of the AQO	Negligible
R7	3 Turing Close	0.10	95-102% of the AQO	Negligible
R8	719 Ashton Old Road	0.08	95-102% of the AQO	Negligible
R9	947 Ashton Old Road	0.15	110+ of the AQO	Negligible
R10	St Barnabas CofE Primary Academy	0.05	75% or Less of the AQO	Negligible
R11	423 Ashton Old Road	0.43	110+ of the AQO	Negligible
R12	Radcliffe House	0.25	103-109% of the AQO	Negligible





Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R13	423 Ashton Old Road	0.12	76-94% of the AQO	Negligible

As indicated in Table 21, the impacts on annual mean NO₂ concentrations as a result of the development were predicted to be **negligible** at all 13 sensitive receptor locations.

It is therefore considered that the overall impacts as a result of the proposed development on NO₂ concentration are **not significant**. Further justification on the overall significance is provided in Section 5.2.4.

5.2.3 Particulate Matter – PM₁₀

Predicted Concentrations at Sensitive Receptor Locations

Annual mean PM₁₀ concentrations were predicted for the 2020 DM and DS scenarios and are summarised in Table 22.

Table 22 Predicted Annual Mean PM₁₀ Concentrations

Sensitive Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	9 Stonehurst Close	13.44	13.45	0.01
R2	Flats at Wenlock Way/Pottery Lane	15.13	15.14	0.01
R3	Bridge College	13.33	13.34	0.01
R4	47 Falconwood Way	14.95	14.97	0.02
R5	17 Falconwood Way	14.56	14.58	0.02
R6	Outrington Drive	14.52	14.53	0.01
R7	3 Turing Close	14.52	14.53	0.01
R8	719 Ashton Old Road	14.85	14.86	0.01
R9	947 Ashton Old Road	17.09	17.10	0.01
R10	St Barnabas CoFE Primary Academy	12.94	12.94	0.00
R11	423 Ashton Old Road	15.76	15.79	0.03
R12	Radcliffe House	15.04	15.05	0.01
R13	423 Ashton Old Road	13.58	13.59	0.01

As indicated in Table 22, annual mean PM₁₀ concentrations were below the relevant AQO at all





sensitive receptor locations for both scenarios considered.

Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted PM₁₀ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R1	9 Stonehurst Close	0.02	75% or Less of AQO	Negligible
R2	Flats at Wenlock Way/Pottery Lane	0.02	75% or Less of AQO	Negligible
R3	Bridge College	0.02	75% or Less of AQO	Negligible
R4	47 Falconwood Way	0.05	75% or Less of AQO	Negligible
R5	17 Falconwood Way	0.05	75% or Less of AQO	Negligible
R6	Outrington Drive	0.02	75% or Less of AQO	Negligible
R7	3 Turing Close	0.02	75% or Less of AQO	Negligible
R8	719 Ashton Old Road	0.02	75% or Less of AQO	Negligible
R9	947 Ashton Old Road	0.03	75% or Less of AQO	Negligible
R10	St Barnabas CofE Primary Academy	0.00	75% or Less of AQO	Negligible
R11	423 Ashton Old Road	0.07	75% or Less of AQO	Negligible
R12	Radcliffe House	0.03	75% or Less of AQO	Negligible
R13	423 Ashton Old Road	0.02	75% or Less of AQO	Negligible

As indicated in Table 23, impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all sensitive receptor locations considered.

The overall significance of operational phase road traffic emission impacts on annual mean PM₁₀ concentration was determined **not significant**.

5.2.3 Particulate Matter – PM_{2.5}

Annual mean PM_{2.5} concentrations were predicted for the 2020 DM and DS scenarios and are summarised in Table 22.





Table 24 Predicted Annual Mean PM_{2.5} Concentrations

Sensitive Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		DM	DS	Change
R1	9 Stonehurst Close	8.55	8.55	0.00
R2	Flats at Wenlock Way/Pottery Lane	9.54	9.55	0.01
R3	Bridge College	8.44	8.44	0.00
R4	47 Falconwood Way	9.41	9.41	0.00
R5	17 Falconwood Way	9.17	9.17	0.00
R6	Outrington Drive	9.14	9.15	0.01
R7	3 Turing Close	9.15	9.16	0.01
R8	719 Ashton Old Road	9.34	9.34	0.00
R9	947 Ashton Old Road	10.65	10.66	0.01
R10	St Barnabas CofE Primary Academy	8.21	8.21	0.00
R11	423 Ashton Old Road	9.86	9.88	0.02
R12	Radcliffe House	9.46	9.47	0.01
R13	423 Ashton Old Road	8.71	8.71	0.00

As indicated in Table 22, annual mean PM_{2.5} concentrations were below the relevant AQO at all sensitive receptor locations for both scenarios considered.

Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 23.

Table 25 Predicted PM_{2.5} Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R1	9 Stonehurst Close	0.00	75% or Less of AQO	Negligible
R2	Flats at Wenlock Way/Pottery Lane	0.04	75% or Less of AQO	Negligible
R3	Bridge College	0.00	75% or Less of AQO	Negligible
R4	47 Falconwood Way	0.00	75% or Less of AQO	Negligible
R5	17 Falconwood Way	0.00	75% or Less of AQO	Negligible
R6	Outrington Drive	0.04	75% or Less of AQO	Negligible





Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Change	Impact
R7	3 Turing Close	0.04	75% or Less of AQO	Negligible
R8	719 Ashton Old Road	0.00	75% or Less of AQO	Negligible
R9	947 Ashton Old Road	0.04	75% or Less of AQO	Negligible
R10	St Barnabas CofE Primary Academy	0.00	75% or Less of AQO	Negligible
R11	423 Ashton Old Road	0.08	75% or Less of AQO	Negligible
R12	Radcliffe House	0.04	75% or Less of AQO	Negligible
R13	423 Ashton Old Road	0.00	75% or Less of AQO	Negligible

As indicated in Table 23, impacts on annual mean PM_{2.5} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all receptor locations.

The overall significance of operational phase road traffic emission impacts on annual mean PM_{2.5} concentration was determined **not significant**.

5.2.4 Impact Significance

The overall significance of operational phase road traffic emission impacts was determined as **not significant**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 3. Further justification is provided in Table 26.

Table 26 Impact Significance

Guidance	Comment
Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance	Impacts on annual mean NO ₂ , PM ₁₀ and PM _{2.5} concentrations were predicted to be negligible at all sensitive receptors. The sensitive locations represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development Given the use of 2020 traffic data and 2017 emission factors and background data, the assessment is considered to provide a significant overestimation and therefore a sufficient level of confidence can be placed within the predicted not significant impacts.
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	No new exposure is expected to be introduced on the development site as a result of the proposals.





Guidance	Comment
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: ▶ 0.03% to 0.43% for NO₂; ▶ 0.00% to 0.07% for PM₁₀; and ▶ 0.00% to 0.08% for PM_{2.5} Impacts upon NO₂, PM₁₀ and PM_{2.5} concentrations were predicted to be negligible at all locations
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease	There were exceedances of the annual mean AQO for NO₂ at non-sensitive and sensitive receptor locations throughout the modelling extents. The area of exceedance was not predicted to substantially increase or decrease as a result of the development. Critically, no new exceedances were predicted as a result of the proposed development. There were no exceedances of the annual mean AQO for PM₁₀ or PM_{2.5} within the modelling extents.
The extent to which an objective is exceeded e.g. an annual mean NO ₂ concentration of 41µg/m ³ should attract less significance than an annual mean of 51µg/m ³	There were exceedances of the annual mean AQO for NO₂ at four sensitive receptor locations. Although three sensitive receptor locations experienced concentrations above 41µg/m³, the magnitude of change between the DM and DS scenarios were deemed insignificant. There were no exceedances of the annual mean AQO for PM₁₀ and PM_{2.5} at any sensitive receptor location within the modelling extents. Therefore, the overall significance of predicted impacts is judged to be not significant in the context of this assessment.

It should also be noted that the use of 2020 traffic data and 2017 emission factors is considered to provide a worst-case scenario, which may lead to overestimations of actual pollutant concentrations during the operation of the proposals. As such, the overall significance of operational phase road traffic emission impacts on annual mean NO₂ concentration was determined **not significant**.





6. PRINCIPLES OF GOOD PRACTICE

Whilst there is not a requirement to mitigate operational impacts the proposed development should comply with the EPUK and IAQM guidance⁸. The guidance recommends minimum best practice techniques for all developments.

Potential best practice mitigation options, are listed below, please note this is not an exhaustive list but provides a guide as to some options available. As stated previously, all techniques have financial implications and may therefore affect scheme viability, as such the below techniques should be considered and discussed with MCC prior to the completion of the proposed development.

- ▶ Provision of incentives for the uptake of low emission vehicles, including Electric Vehicle (EV) charging points;
- ▶ Contributions to low emission vehicle refuelling infrastructure;
- ▶ Support for and promotion of car clubs;
- ▶ Financial support to low emission public transport options;
- ▶ Travel plan (where required) including mechanisms for discouraging high emission vehicle use and encouraging the uptake of low emission fuels and technologies;
- ▶ Green infrastructure/landscaping, such as additional planting or green walls utilising species that would aid absorption of pollutants; (Field Maple (*Acer campestre*), Crab Apple and Rowan)
- ▶ Use of ultra low emission service vehicles;
- ▶ All commercial vehicles should comply with the current or previous European Emissions Standards;
- ▶ Replacement strategy should be in place for fleet delivery vehicles – Ensure that any new fleet would be Euro VI classified as a minimum;
- ▶ Fleet operations should provide a strategy for considering reduced emissions, low emission fuels and technologies;
- ▶ Differential parking charges depending on vehicle emissions;
- ▶ Public transport subsidy for employees;
- ▶ Support local walking and cycle initiatives; and
- ▶ Contributing funding to measures, including those identified in air quality action plans and low emissions strategies.

If the above techniques are appropriate and can be implemented into the scheme, this will further reduce potential impacts associated with the proposed development. As mentioned previously, all measures and techniques should be considered and fully discussed with MCC.





7. CONCLUSION

REC Ltd was commissioned by Golden Horse Limited to undertake an Air Quality Assessment in support of a proposed Cash and Carry located off Ashton Old Road, Manchester.

The proposed development is located partially within the GMCA AQMA, which has been declared for exceedances of the annual mean AQO for NO₂ and, as such, there is potential for the development to cause adverse impacts upon existing pollution levels at nearby sensitive receptors within the AQMA during the construction and operational phases. An Air Quality Assessment is therefore required in order to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development.

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**.

Dispersion modelling was undertaken in order to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the development. Results were subsequently verified using monitoring results obtained from MCC.

Predicted impacts on NO₂, PM₁₀ and PM_{2.5} concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at all 13 receptor locations. The overall significance of potential impacts was determined to be **not significant**, in accordance with the EPUK and IAQM guidance.

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





8. ABBREVIATIONS

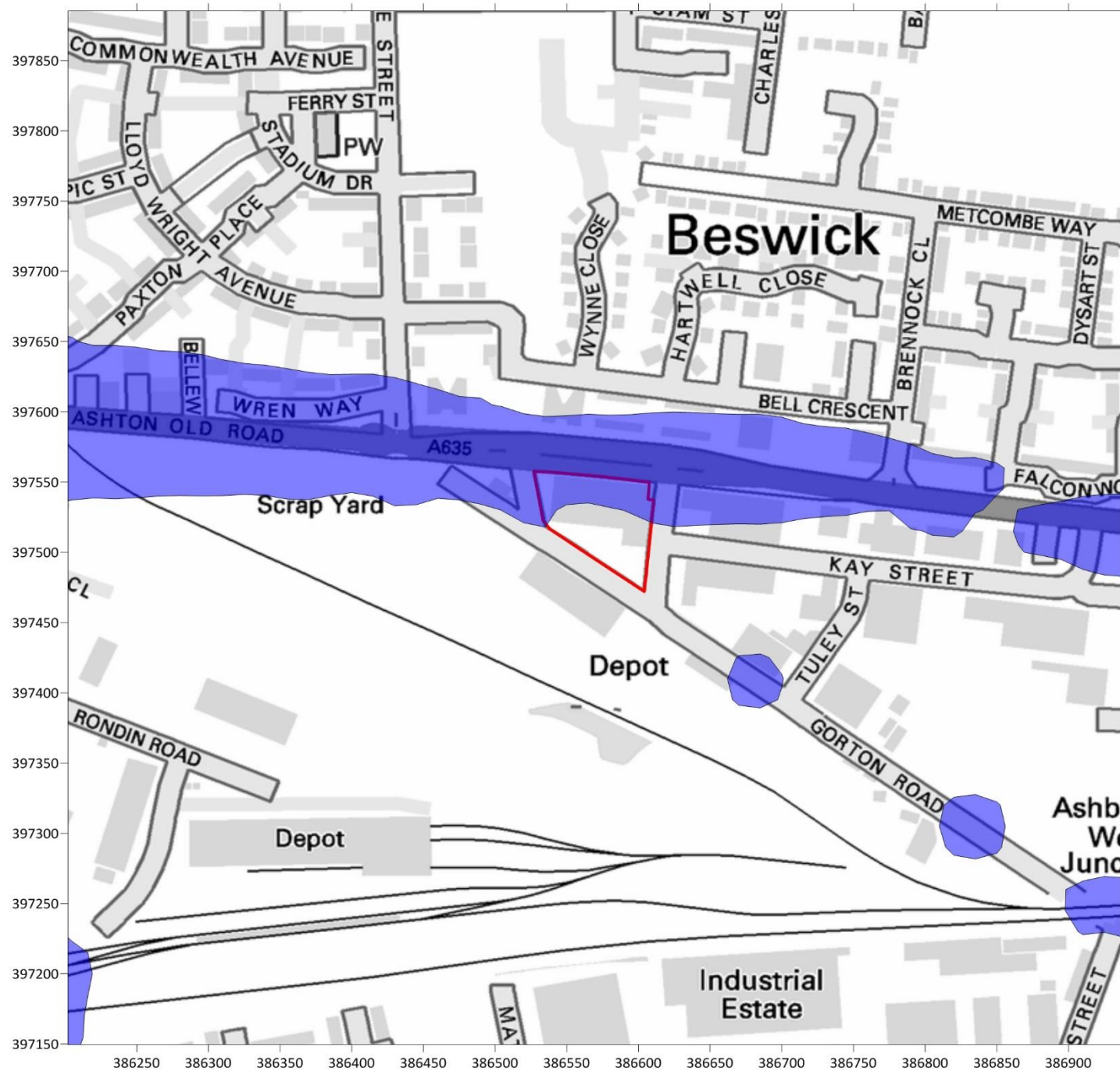
AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do Something
EPUK	Environmental Protection UK
EU	European Union
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
MCC	Manchester City Council
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
REC	Resource and Environmental Consultants
TEMPRO	Trip End Model Presentation Program
TfGM	Transport for Greater Manchester
Z ₀	Roughness Length





APPENDIX I FIGURES





Legend

-  Site Boundary
-  Air Quality Management Area

Title

Figure 1
Site Location

Project

Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number

AQ106984

Client

Golden Horse Limited

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Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
Tel - 0161 868 1300 Fax - 0161 868 1301
www.recitd.co.uk



Legend

-  Site Boundary
-  Diffusion Tube Monitoring Locations

Title

Figure 2
Diffusion Tube Monitoring Locations

Project

Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number

AQ106984

Client

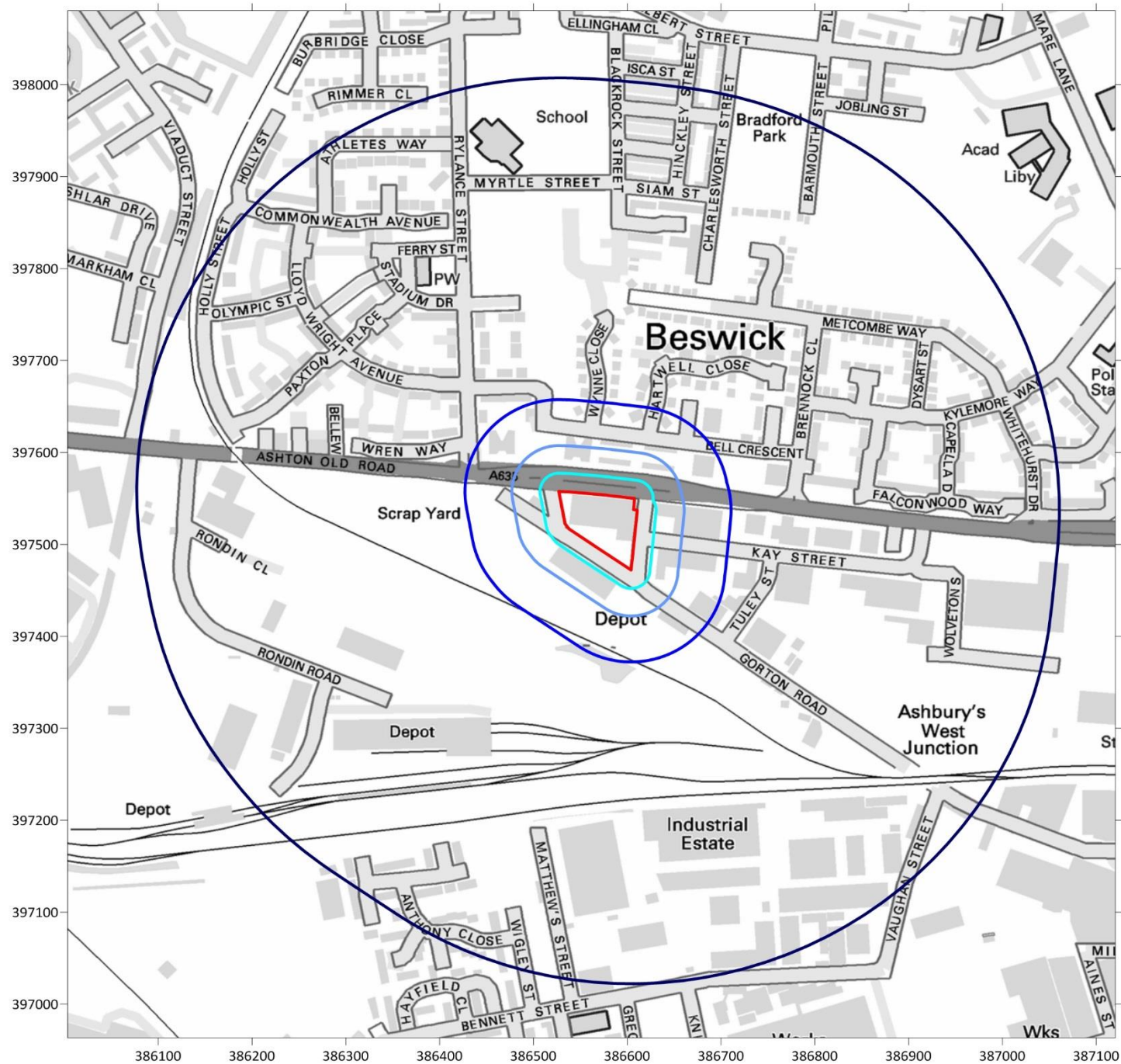
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Legend

-  Site Boundary
-  20m from Site Boundary
-  50m from Site Boundary
-  100m from Site Boundary
-  350m from Site Boundary

Title

Figure 3
Earthworks and Construction
Dust Buffer Zones

Project

Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number

AQ106984

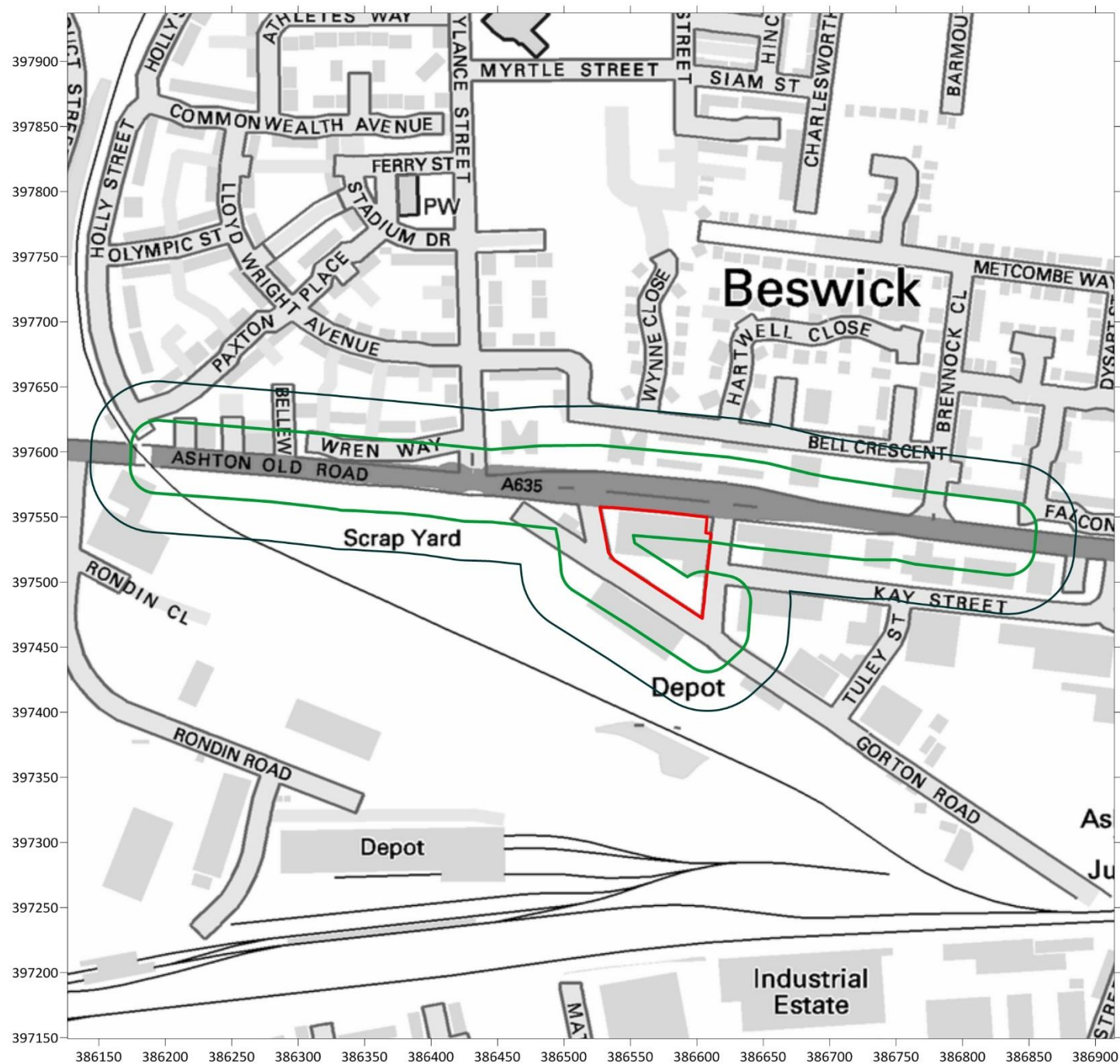
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Legend

-  Site Boundary
-  20m from Site Access Route
-  50m from Site Access Route

Title

Figure 4
Trackout Dust Buffer Zones

Project

Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number

AQ106984

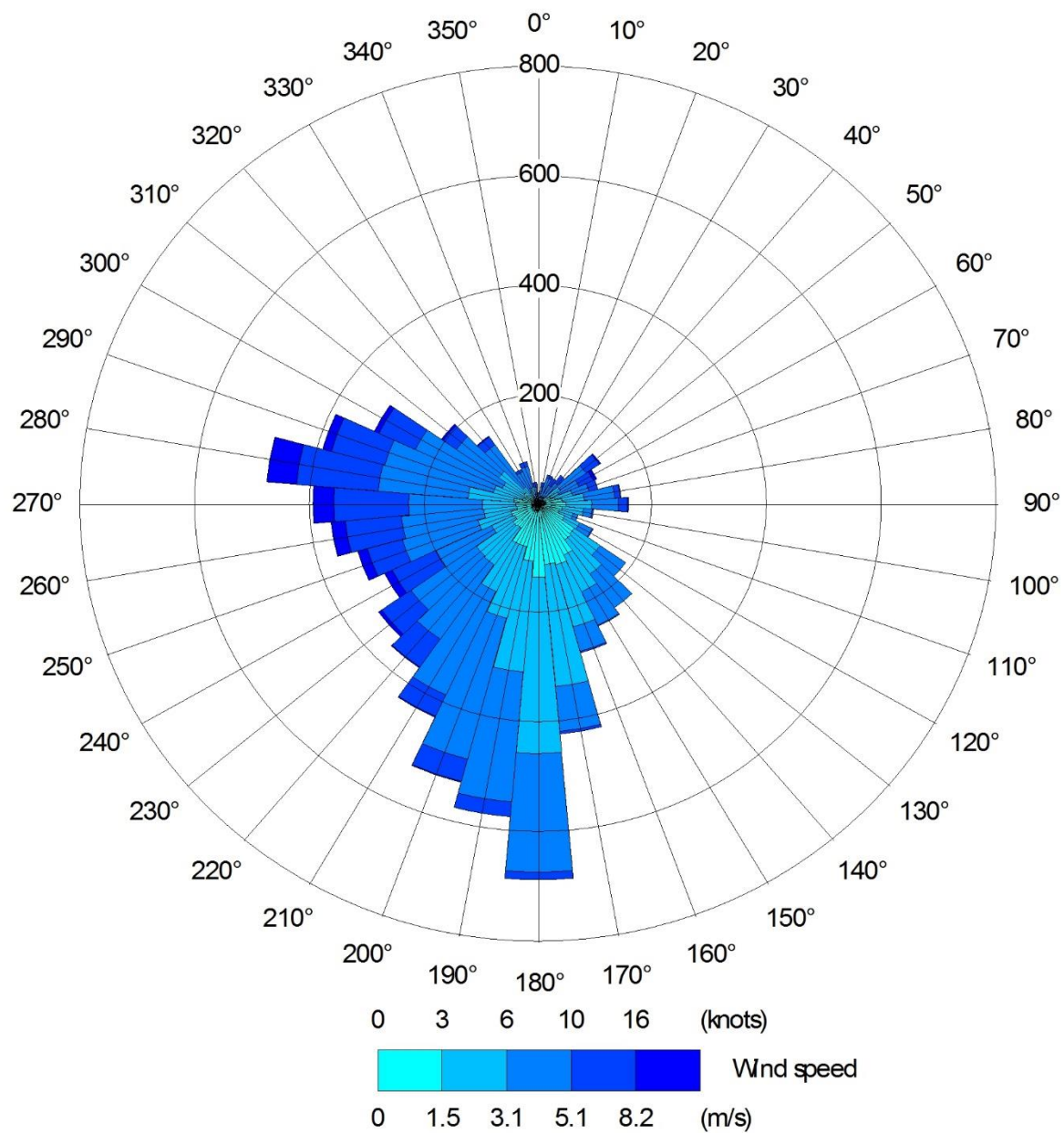
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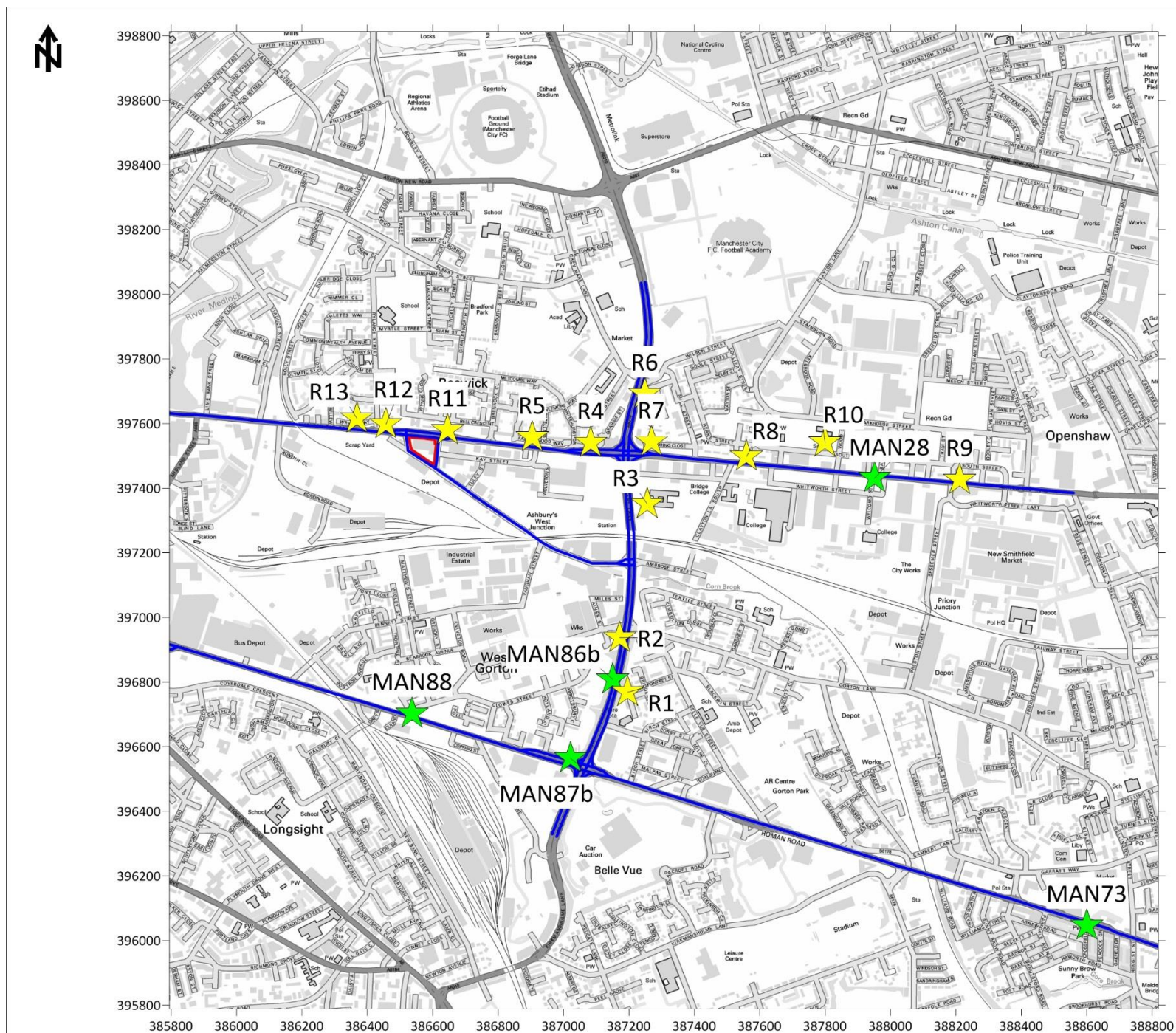
Title
Figure 5
Wind Rose 2017
Manchester Ringway Meteorological Station

Project
Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number
AQ106984

Client
Golden Horse Limited

REC
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Legend

-  Site Boundary
-  Modelled Road Link
-  Cartesian Grid
-  Diffusion Tube Monitoring Location
-  Sensitive Receptor Locations

Title

Figure 6
ADMS-Roads Input

Project

Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester

Project Number

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Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester
March 2019
AQ106984-1r1

APPENDIX II ASSESSMENT INPUT DATA





ADMS-ROADS ASSESSMENT INPUTS

Road vehicle trips associated with the development from both buses and cars have the potential to result in air quality impacts as a result of increased traffic exhaust emissions. Dispersion modelling using ADMS Roads was therefore undertaken to predict NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations both with and without the development in order to consider potential changes as a result of the proposals.

The dispersion 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; and
- ▶ Monin-Obukhov length.

Assessment inputs are described in the following subsections.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 4.0.1.0). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

Traffic Flow Data

Traffic data for use in the assessment, including development flows, was provided by Hydrock, the appointed Transport Consultants for the scheme.

This data did not include any baseline flows on a number of roads within the surrounding road network. As such, 24-hour flows and fleet composition were downloaded from the Department for Transport (DfT) Matrix.

Growth factors provided by the Trip End Model Presentation Program (TEMPO) software package were utilised to allow for conversion from the obtained 2017 traffic flow years to 2020, which was used to represent the opening year.

Vehicle speeds were estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards. A summary of the verification traffic data is provided in Table All.1 and the traffic data used in the DM and DS scenarios is provided in Table All.2.





Table AII.1 2017 Traffic Data

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L1	Pottery Lane, Southbound - North of Gorton Lane	6.8	14,810	3.36	40
L2	Pottery Lane, Southbound - South of Gorton Lane	6.6	14,810	3.36	40
L3	Gorton Lane Slowdown towards Junction	9.6	9,872	3.36	25
L4	Pottery Lane, Northbound, South of Gorton Lane	6.7	11,795	4.13	40
L5	Pottery Lane, Northbound, South of Gorton Lane Slowdown	8.1	11,795	4.13	40
L6	Pottery Lane, Northbound - North of Gorton Lane	6.5	11,795	4.13	30
L7	A6010 Junction Southbound	7.2	6,370	2.26	30
L8	A6010 Junction Northbound	7.7	5,875	3.93	25
L9	Junction onto Pottery Lane Northbound	11.0	7,863	4.13	25
L10	Hyde Road East Slowdown	4.1	11,414	4.64	25
L11	Hyde Road East Junction Approach	6.8	3,804	4.64	25
L12	Hyde Road onto Pottery Lane	4.4	3,804	4.64	30
L13	Junction Exit onto Hyde Road	4.4	11,728	4.82	30
L14	Junction Exit onto Hyde Road	7.0	7,818	4.82	30
L15	Pottery Lane onto Hyde Road	4.4	4,936	3.36	30
L16	Junction onto A57	3.9	6,251	4.64	30
L17	Junction Exit onto A57	6.7	9,378	4.64	30
L18	A57 Junction Approach	6.8	8,923	5.57	25
L19	A57 onto Junction	3.4	5,948	5.57	25
L20	A57 onto Pottery Lane	4.1	2,974	5.57	30
L21	Kirkmanshulme onto A57	4.0	2,937	3.93	30
L22	Hyde Road West of Pottery Lane	12.5	18,301	5.09	35
L23	Hyde Road East of Pottery Lane	10.5	23,142	4.73	40
L24	Kirkmanshulme Southbound	6.9	9,556	2.26	40
L25	Kirkmanshulme Lane Northbound	7.7	8,813	3.93	40
L26	Pottery Lane Southbound - South of Ashton Old Road	7.0	14,810	3.36	40





Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L27	Pottery Lane, Southbound - Slowdown at Ambrose Street	6.9	14,810	3.36	25
L28	Pottery Lane, Northbound - Slowdown at Ambrose Street	9.4	11,795	4.13	25
L29	Pottery Lane, Northbound - North of Ambrose Street	10.7	11,795	4.13	40
L30	Pottery Lane, Northbound - Slowdown at Ashton Old Road	7.5	7,863	4.13	25
L31	Junction Exit onto Pottery Lane North of Ashton Old Road	6.8	4,562	3.46	30
L32	Pottery Lane, Northbound - North of Ashton Old Road	6.1	13,687	3.46	40
L33	Pottery Lane, Southbound - Exit onto Ashton Old Road	7.2	9,872	3.36	30
L34	Pottery Lane Slowdown, onto Junction	7.2	8,846	3.90	25
L35	Pottery Lane, Southbound - North of Ashton Old Road	6.2	13,270	3.90	40
L36	Ashton Old Road, West - Eastbound	8.9	13,270	3.90	30
L37	Ashton Old Road, West - Slowdown	10.7	13,270	3.90	25
L38	Ashton Old Road West, Westbound	7.3	13,386	4.58	35
L39	Ashton Old Road West, Junction Exit	8.2	13,386	4.58	25
L40	Ashton Old Road, East Slowdown	10.1	12,317	4.98	25
L41	Ashton Old Road East - Slowdown	9.8	8,211	4.98	25
L42	Ashton Old Road East onto Pottery Lane Southbound	4.2	4,105	4.98	30
L43	Pottery Lane Northbound onto Ashton Old Road West	4.0	3,931	4.13	30
L44	Ashton Old Road West onto Pottery Lane Northbound	4.6	4,573	4.31	30
L45	Junction Exit onto Ashton Old Road East	7.9	11,312	4.66	30
L46	Ashton Old Road East Junction Exit	7.3	7,541	4.66	25
L47	Pottery Lane onto Ashton Old Road East	4.0	4,423	3.90	30
L48	Ashton Old Road West	11.5	27,106	4.44	40
L49	A635 Westbound Slowdown	6.0	13,386	4.58	25
L49a	A635 Westbound	8.9	13,386	4.58	40
L50	Ashton Old Road East	11.0	23,629	4.82	40
L51	Ashton Old Road East, Traffic Lights	11.2	23,629	4.82	15
L52	Ashton Old Road East of Traffic Lights	12.3	23,629	4.82	40





Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L53	Wilson Street Junction Northbound Slowdown	6.3	13,687	3.46	25
L54	Alan Turing Way Northbound	6.7	13,687	3.46	40
L55	Alan Turing Way Southbound	6.8	13,270	3.90	40
L56	Wilson Street Junction Southbound Slowdown	6.3	13,270	3.90	25
L57	Hyde Road East of Knutsford Road	15.5	23,142	4.73	15
L57a	Hyde Road at Superstore Junction	19.9	23,142	4.73	10
L57b	Hyde Road East of Oakfield Grove	10.3	23,142	4.73	15
L58	Hyde Road East of Wellington Street	10.2	23,142	4.73	40
L59	A635 Eastbound Slowdown	8.7	13,720	4.31	25
L59a	A635 Eastbound	6.1	13,720	4.31	30
L60	Ashton Old Road West of Site	10.3	27,106	4.44	35
L61	A635 East onto Fairfield Street	9.6	9,034	4.44	25
L62	Fairfield Street Junction onto Fairfield Street	6.4	7,385	5.55	30
L63	Fairfield Street Westbound	9.4	11,078	5.55	35
L64	Chancellor Lane Northbound Slowdown	7.4	5,810	5.33	25
L65	Ashton Old Road onto Chancellor Lane	6.4	9,034	4.44	25
L66	Chancellor Lane	9.6	17,433	5.33	40
L67	Mancunian Way Northbound	7.5	20,236	3.30	55
L68	Mancunian Way Northbound Slowdown	13.4	20,236	3.30	25
L69	Mancunian Way North of Fairfield Street, Northbound	6.4	11,078	5.55	40
L70	Mancunian Way Northbound Slowdown onto Pin Mill Brow	8.0	11,078	5.55	25
L71	Fairfield Street onto Mancunian Way Southbound	7.4	3,692	5.55	25
L72	Pin Mill Brow onto Mancunian Way Southbound	6.3	10,840	5.94	30
L73	Mancunian Way North of Fairfield Street, Southbound	7.0	10,840	5.94	40
L74	Mancunian Way North of Fairfield Street, Southbound - Slowdown	6.3	10,840	5.94	25
L75	Fairfield Street Eastbound	6.0	10,840	5.94	35





Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L76	Fairfield Street Eastbound - Slowdown	6.9	10,840	5.94	25
L77	Fairfield Street Junction onto Ashton Old Road	6.5	9,034	4.44	30
L78	Mancunian Way Southbound	7.1	20,300	3.37	55
L79	Pin Mill Brow Northbound	6.2	10,840	5.94	35
L80	Pin Mill Brown Slowdown at Mancunian Way	7.0	10,840	5.94	25
L81	Pin Mill Brow Northbound North of Mancunian Way	7.0	17,183	2.87	35
L82	Pin Mill Brow Southbound North of Mancunian Way	7.4	14,823	3.04	35
L83	Pin Mill Brow onto A635	7.3	1,108	5.55	30
L84	Pin Mill Brow Southbound South of Mancunian Way	8.1	11,078	5.55	35
L85	Pin Mill Brown Slowdown	7.2	11,078	5.55	25
L86	Fairfield Street Junction onto Chancellor Lane	6.3	5,810	5.33	30
L87	Devonshire Street North Slowdown	7.4	17,433	5.33	25
L88	A57 Slowdown	18.0	16,769	8.45	25
L89	A57 West of Devonshire Street North	10.5	16,769	8.45	40
L90	Devonshire Street	10.0	17,345	3.55	40
L91	Devonshire Street Slowdown	9.9	17,345	3.55	25
L92	A57 onto Devonshire Street	5.8	1,830	5.09	25
L93	Great Ancoats Street	15.8	32,006	2.95	35
L94	Gable Street	7.0	2,587	11.00	40
L95	Gorton Road Along Site	7.3	2,587	11.00	40
L95a	Gorton Road Site Access to Stainforth Street	7.1	2,587	11.00	40
L96	Stainforth Street	7.0	2,380	8.00	40
L96a	North of Stainforth Street Site Access	7.2	2,380	8.00	40
L97	Gorton Road East of Stainforth Street	7.4	4,456	9.00	40
L98	Gorton Road Slowdown	10.4	2,228	4.50	25
L99	Pottery Lane onto Gorton Road	7.6	2,228	4.50	30

The road widths, mean vehicle speeds and road heights shown in Table All.1 remained the same for





the 2020 scenario. A summary of the 2020 traffic data is shown in Table AII.2.

Development traffic generation distribution was provided by Hydrock. Where distribution data was limited at the Pottery Lane/Ashton Old Road/Alan Turing Way junction, it was assumed that 50% of the movements on Ashton Old Road was applied to both Ashton Old Road East, Pottery Lane and Alan Turing Way. As such, a robust assessment was undertaken.

Table AII.2 2020 Traffic Data

Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L1	Pottery Lane, Southbound - North of Gorton Lane	15,497	3.36	15,519	3.37
L2	Pottery Lane, Southbound - South of Gorton Lane	15,497	3.36	15,519	3.37
L3	Gorton Lane Slowdown towards Junction	10,330	3.36	10,352	3.37
L4	Pottery Lane, Northbound, South of Gorton Lane	12,342	4.13	12,364	4.14
L5	Pottery Lane, Northbound, South of Gorton Lane Slowdown	12,342	4.13	12,364	4.14
L6	Pottery Lane, Northbound - North of Gorton Lane	12,342	4.13	12,364	4.14
L7	A6010 Junction Southbound	6,666	2.26	6,687	2.29
L8	A6010 Junction Northbound	6,147	3.93	6,169	3.95
L9	Junction onto Pottery Lane Northbound	8,227	4.13	8,249	4.15
L10	Hyde Road East Slowdown	11,944	4.64	11,965	4.66
L11	Hyde Road East Junction Approach	3,981	4.64	4,002	4.68
L12	Hyde Road onto Pottery Lane	3,981	4.64	4,002	4.68
L13	Junction Exit onto Hyde Road	12,272	4.82	12,294	4.83
L14	Junction Exit onto Hyde Road	8,181	4.82	8,202	4.84
L15	Pottery Lane onto Hyde Road	5,165	3.36	5,187	3.39
L16	Junction onto A57	6,541	4.64	6,563	4.66
L17	Junction Exit onto A57	9,813	4.64	9,835	4.65
L18	A57 Junction Approach	9,337	5.57	9,359	5.58
L19	A57 onto Junction	6,224	5.57	6,246	5.59
L20	A57 onto Pottery Lane	3,112	5.57	3,134	5.61





Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L21	Kirkmanshulme onto A57	3,074	3.93	3,095	3.98
L22	Hyde Road West of Pottery Lane	19,150	5.09	19,172	5.10
L23	Hyde Road East of Pottery Lane	24,216	4.73	24,237	4.74
L24	Kirkmanshulme Southbound	9,999	2.26	10,021	2.28
L25	Kirkmanshulme Lane Northbound	9,222	3.93	9,243	3.94
L26	Pottery Lane Southbound - South of Ashton Old Road	15,497	3.36	15,519	3.37
L27	Pottery Lane, Southbound - Slowdown at Ambrose Street	15,497	3.36	15,519	3.37
L28	Pottery Lane, Northbound - Slowdown at Ambrose Street	12,342	4.13	12,364	4.14
L29	Pottery Lane, Northbound - North of Ambrose Street	12,342	4.13	12,364	4.14
L30	Pottery Lane, Northbound - Slowdown at Ashton Old Road	8,227	4.13	8,256	4.16
L31	Junction Exit onto Pottery Lane North of Ashton Old Road	4,774	3.46	4,802	3.51
L32	Pottery Lane, Northbound - North of Ashton Old Road	14,322	3.46	14,344	3.47
L33	Pottery Lane, Southbound - Exit onto Ashton Old Road	10,330	3.36	10,359	3.38
L34	Pottery Lane Slowdown, onto Junction	9,256	3.90	9,285	3.92
L35	Pottery Lane, Southbound - North of Ashton Old Road	13,886	3.90	13,907	3.91
L36	Ashton Old Road, West - Eastbound	13,886	3.90	13,929	3.92
L37	Ashton Old Road, West - Slowdown	13,886	3.90	13,914	3.91
L38	Ashton Old Road West, Westbound	14,007	4.58	14,050	4.60
L39	Ashton Old Road West, Junction Exit	14,007	4.58	14,036	4.59
L40	Ashton Old Road, East Slowdown	12,889	4.98	12,910	4.99
L41	Ashton Old Road East - Slowdown	8,591	4.98	8,620	5.00
L42	Ashton Old Road East onto Pottery Lane Southbound	4,296	4.98	4,310	4.98
L43	Pottery Lane Northbound onto Ashton Old Road West	4,114	4.13	4,128	4.14
L44	Ashton Old Road West onto Pottery Lane Northbound	4,785	4.31	4,799	4.31
L45	Junction Exit onto Ashton Old Road East	11,837	4.66	11,858	4.67
L46	Ashton Old Road East Junction Exit	7,890	4.66	7,919	4.69





Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L47	Pottery Lane onto Ashton Old Road East	4,628	3.90	4,642	3.90
L48	Ashton Old Road West	28,364	4.44	28,450	4.46
L49	A635 Westbound Slowdown	14,007	4.58	14,050	4.64
L49a	A635 Westbound	14,007	4.58	14,050	4.64
L50	Ashton Old Road East	24,725	4.82	24,768	4.84
L51	Ashton Old Road East, Traffic Lights	24,725	4.82	24,768	4.84
L52	Ashton Old Road East of Traffic Lights	24,725	4.82	24,768	4.84
L53	Wilson Street Junction Northbound Slowdown	14,322	3.46	14,344	3.47
L54	Alan Turing Way Northbound	14,322	3.46	14,344	3.47
L55	Alan Turing Way Southbound	13,886	3.90	13,907	3.91
L56	Wilson Street Junction Southbound Slowdown	13,886	3.90	13,907	3.91
L57	Hyde Road East of Knutsford Road	24,216	4.73	24,237	4.74
L57a	Hyde Road at Superstore Junction	24,216	4.73	24,237	4.74
L57b	Hyde Road East of Oakfield Grove	24,216	4.73	24,237	4.74
L58	Hyde Road East of Wellington Street	24,216	4.73	24,237	4.74
L59	A635 Eastbound Slowdown	14,357	4.31	14,400	4.37
L59a	A635 Eastbound	14,357	4.31	14,400	4.37
L60	Ashton Old Road West of Site	28,364	4.44	28,450	4.46
L61	A635 East onto Fairfield Street	9,454	4.44	9,454	4.44
L62	Fairfield Street Junction onto Fairfield Street	7,727	5.55	7,727	5.55
L63	Fairfield Street Westbound	11,592	5.55	11,592	5.55
L64	Chancellor Lane Northbound Slowdown	6,080	5.33	6,080	5.33
L65	Ashton Old Road onto Chancellor Lane	9,454	4.44	9,454	4.44
L66	Chancellor Lane	18,242	5.33	18,242	5.33
L67	Mancunian Way Northbound	21,175	3.30	21,175	3.30
L68	Mancunian Way Northbound Slowdown	21,175	3.30	21,175	3.30





Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L69	Mancunian Way North of Fairfield Street, Northbound	11,592	5.55	11,592	5.55
L70	Mancunian Way Northbound Slowdown onto Pin Mill Brow	11,592	5.55	11,592	5.55
L71	Fairfield Street onto Mancunian Way Southbound	3,864	5.55	3,864	5.55
L72	Pin Mill Brow onto Mancunian Way Southbound	11,343	5.94	11,343	5.94
L73	Mancunian Way North of Fairfield Street, Southbound	11,343	5.94	11,343	5.94
L74	Mancunian Way North of Fairfield Street, Southbound - Slowdown	11,343	5.94	11,343	5.94
L75	Fairfield Street Eastbound	11,343	5.94	11,343	5.94
L76	Fairfield Street Eastbound - Slowdown	11,343	5.94	11,343	5.94
L77	Fairfield Street Junction onto Ashton Old Road	9,454	4.44	9,454	4.44
L78	Mancunian Way Southbound	21,242	3.37	21,242	3.37
L79	Pin Mill Brow Northbound	11,343	5.94	11,343	5.94
L80	Pin Mill Brown Slowdown at Mancunian Way	11,343	5.94	11,343	5.94
L81	Pin Mill Brow Northbound North of Mancunian Way	17,980	2.87	17,980	2.87
L82	Pin Mill Brow Southbound North of Mancunian Way	15,511	3.04	15,511	3.04
L83	Pin Mill Brow onto A635	1,159	5.55	1,159	5.55
L84	Pin Mill Brow Southbound South of Mancunian Way	11,592	5.55	11,592	5.55
L85	Pin Mill Brown Slowdown	11,592	5.55	11,592	5.55
L86	Fairfield Street Junction onto Chancellor Lane	6,080	5.33	6,080	5.33
L87	Devonshire Street North Slowdown	18,242	5.33	18,242	5.33
L88	A57 Slowdown	17,547	8.45	17,547	8.45
L89	A57 West of Devonshire Street North	17,547	8.45	17,547	8.45
L90	Devonshire Street	18,150	3.55	18,150	3.55
L91	Devonshire Street Slowdown	18,150	3.55	18,150	3.55
L92	A57 onto Devonshire Street	1,915	5.09	1,915	5.09
L93	Great Ancoats Street	33,491	2.95	33,491	2.95





Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L94	Gable Street	2,766	11.00	2,938	11.06
L95	Gorton Road Along Site	2,766	11.00	2,938	11.06
L95a	Gorton Road Site Access to Stainforth Street	2,766	11.00	3,049	10.63
L96	Stainforth Street	2,543	8.00	2,722	8.92
L96a	North of Stainforth Street Site Access	2,543	8.00	2,762	8.79
L97	Gorton Road East of Stainforth Street	4,764	9.00	4,908	9.15
L98	Gorton Road Slowdown	2,298	4.50	2,370	4.79
L99	Pottery Lane onto Gorton Road	2,298	4.50	2,370	4.79

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 8.0.1) released in 2017, which incorporates updated COPERT 5 vehicle emissions factors for NO_x and vehicle fleet information.

There is current uncertainty over NO₂ concentrations within the UK, with roadside levels not reducing as previously expected due to the implementation of new vehicle emission standards. Therefore, 2017 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year in order to provide a robust assessment.

Meteorological Data

Meteorological data used in this assessment was taken from Manchester Ringway 2017 meteorological station over the period 1st January 2017 to 31st December 2017 (inclusive). Manchester Ringway meteorological station is located at approximate NGR: 381745, 383960 which is approximately 14.3km south-west of the proposed development.

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 utilised meteorological data.

Roughness Length

A roughness length (z_0) of 1m was used in this dispersion modelling study. This value of z_0 is considered appropriate for the morphology of the assessment area and is suggested within ADMS-Roads as being suitable for 'Cities, woodlands'.

A z_0 of 0.3m was utilised to represent the morphology of the meteorological station location and is





suggested as being suitable for 'agricultural areas (max)'.

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 in this dispersion modelling study. This value is considered appropriate for both the nature of the assessment area and morphology of the meteorological station location; and is suggested within ADMS-Roads as being suitable for 'Mixed Urban/Industrial' and 'Cities and Large Towns'.

Background Concentrations

Since both the monitoring locations used in the verification process and the receptor locations used in the operational phase assessment were located in several grid squares, predicted concentrations from their respective grid squares were used to represent their respective background concentrations for the modelling process.

Table AII.3 displays the specific background concentrations by DEFRA used for each diffusion tube in the verification process. This data was used in to ensure an accurate and robust model.

Table AII.3 Predicted Diffusion Tube Monitoring Background Pollutant Concentrations

Receptor Grid Square	Diffusion Tube	Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
			2017
387500, 397500	MAN28	NO _x	33.92
		NO ₂	22.88
		PM ₁₀	13.61
		PM _{2.5}	8.76
387500, 396500	MAN86b, MAN87b,	NO _x	30.29
		NO ₂	20.86
		PM ₁₀	13.48
		PM _{2.5}	8.62
388500, 396500	MAN73	NO _x	29.60
		NO ₂	20.46
		PM ₁₀	13.08
		PM _{2.5}	8.41
386500, 396500	MAN88	NO _x	32.58
		NO ₂	22.17





Receptor Grid Square	Diffusion Tube	Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
			2017
		PM ₁₀	13.47
		PM _{2.5}	8.63

Table AII.4 displays the predicted background concentrations by DEFRA used in the operational phase assessment for the sensitive receptor locations.

Table AII.4 Predicted Background Pollutant Concentrations for Receptors

Receptor Grid Square	Receptors	Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
			2017
387500, 396500	R1, R2	NO _x	30.29
		NO ₂	20.86
		PM ₁₀	13.48
		PM _{2.5}	8.62
387500, 397500	R3, R4, R6-R8	NO _x	33.92
		NO ₂	22.88
		PM ₁₀	13.61
		PM _{2.5}	8.76
386500, 397500	R5, R11-R13	NO _x	32.66
		NO ₂	22.19
		PM ₁₀	13.34
		PM _{2.5}	8.58
387500, 397500	R9	NO _x	29.45
		NO ₂	20.35
		PM ₁₀	13.07
		PM _{2.5}	8.42

Similar to emission factors, background concentrations for 2017 were utilised in preference to the development opening year of 2020. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the proposals.





NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO₂ concentrations using the spreadsheet provided by DEFRA, which is the method detailed within LAQM (TG16)².

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 this assessment model verification was undertaken for 2017, using traffic data, meteorological data and monitoring results from this year.

MCC undertakes monitoring of NO₂ concentrations at four locations suitable for verification purposes within the assessment extents. The road contribution to total NO_x concentration was calculated from the monitored NO₂ result for use in the verification process. This was undertaken following the methodology contained within IAQM and EPUK guidance LAQM (TG16)².

The dispersion model was run with the traffic input data previously detailed for 2017 to predict the NO_x concentration at the monitoring locations. The results are shown in Table AII.5.

Table AII.5 NO_x Verification Results

MCC ID	Site Name	Modelled Road NO _x Concentration (µg/m ³)	Monitored Road NO _x Concentration (µg/m ³)	Difference (%)
MAN28	Ashton Old Road	14.94	33.76	55.73
MAN86b	A6010 Pottery Lane	18.45	31.61	41.63
MAN87b	A57 Hyde Road	21.19	33.88	37.46
MAN73	Hyde Road	15.70	39.95	60.70
MAN88	Wenlock Way	18.13	57.62	68.54

The monitored and modelled NO_x road contribution concentrations were graphed and the equation of the trend line based on the linear progression through zero was calculated, as shown in Graph 1





This indicated that a verification factor of **2.1900** was required to be applied to all NO_x modelling results. This verification factor shows that the model underestimated pollutant concentrations.

Graph 1 – Verification Adjustment Factor

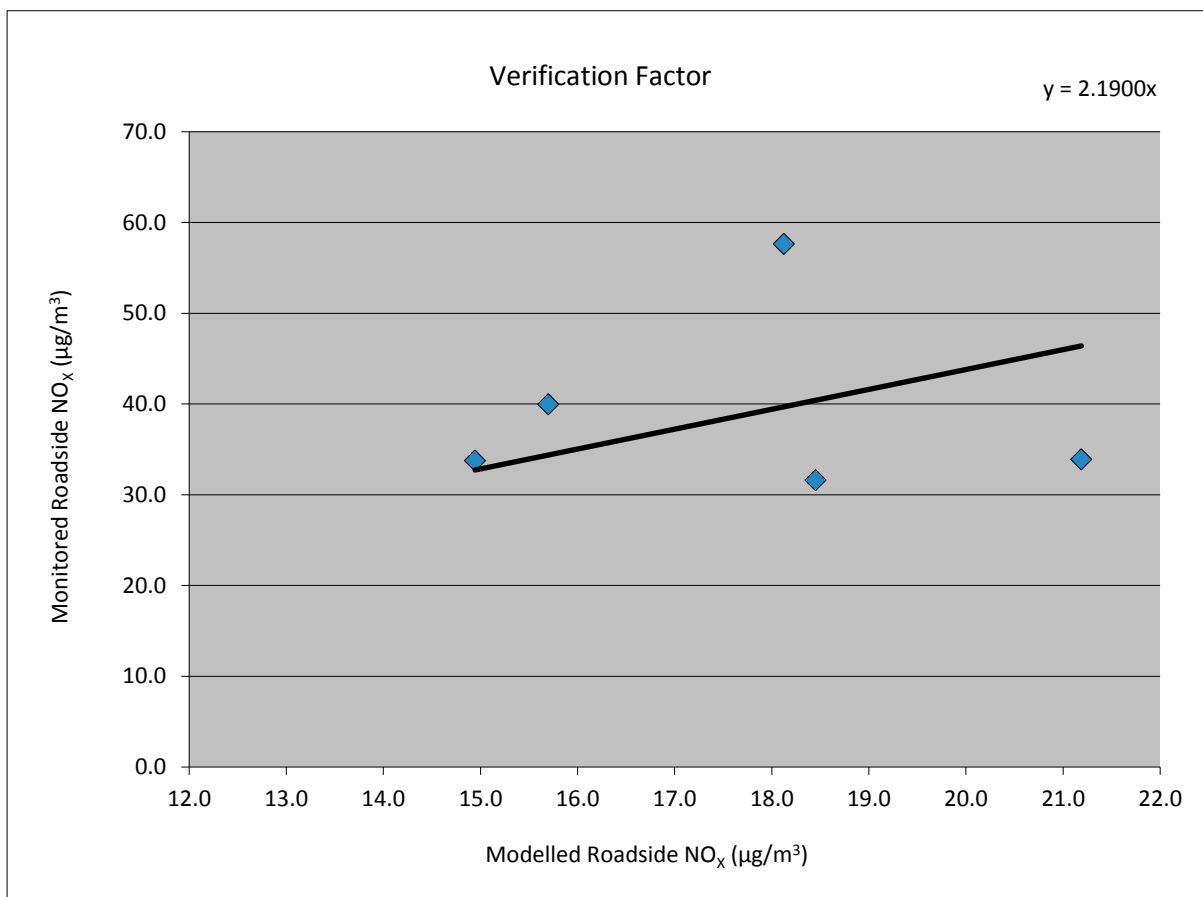


Table AII.6 presents the monitored annual mean NO₂ concentrations and the adjusted modelled total NO₂ concentration based on the above verification factor. Exceedances of the annual mean AQO are shown in **bold**.

Table AII.6 2017 NO₂ Monitoring Results

MCC ID	Site Name	Monitored NO ₂ Concentration (µg/m³)	Adjusted Modelled Total NO ₂ Concentration (µg/m³)	Difference (%)
MAN28	Ashton Old Road	38.93	38.47	1.17
MAN86b	A6010 Pottery Lane	36.10	39.95	-10.66
MAN87b	A57 Hyde Road	37.11	42.49	-14.49
MAN73	Hyde Road	39.39	36.96	6.17
MAN88	Wenlock Way	48.21	40.84	15.29





As PM_{10} and $PM_{2.5}$ monitoring is not undertaken within the assessment extents, the NO_2 adjustment factor of **2.1900** were applied to the respective location to adjust model predictions of PM_{10} in accordance with the guidance provided within LAQM (TG16)².





Air Quality Assessment
Wing Fat, Ashton Old Road, Manchester
March 2019
AQ106984-1r1

APPENDIX III ASSESSOR'S CURRICULUM VITAE





CONAL KEARNEY

Head of Noise and Air

BEng(Hons), MSc, MIAQM, MEnvSc

KEY EXPERIENCE:

Conal is Head of Noise and Air with specialist experience in the air quality and odour sector. His key capabilities include:

- ▶ Advanced atmospheric air dispersion modelling of road vehicle and industrial emissions using ADMS-ROADS and AIRVIRO.
- ▶ Preparation of factual and interpretative Air Quality Assessment reports and Air Quality Environmental Statement chapters in the vicinity of proposed schemes and developments in accordance with DEFRA, Environment Agency and Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) methodologies.
- ▶ Management and delivery of project work on key, land development and urban regeneration projects.
- ▶ Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- ▶ Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- ▶ Dust and Odour impact assessments from minerals and waste sites
- ▶ Representing clients at public enquiries and planning hearings.

QUALIFICATIONS:

- ▶ Bachelor of Engineering
- ▶ Master of Science
- ▶ Member of Institute of Air Quality Management
- ▶ Member of the Institute of Environmental Science (IES)

SELECT PROJECTS SUMMARY:

Industrial Developments

Buck Park, Denholme - AQA and dust assessment for proposed mineral extraction and site restoration project.

Messingham Quarry, North Lincolnshire - AQA and dust impacts for proposed new sand extraction site.

Arden Quarry, Derbyshire - AQA for proposed mineral extraction and site restoration

Calder Brick Works, Yorkshire - AQA for proposed site restoration plan

Coopers Moss, St Helens AQA and dust assessment for materials import and site restoration.

Clayton Hall Landfill, Chorley - AQA and odour assessment for proposed landfill extension and mineral extraction.

Highways Developments

Alderley Edge Bypass, Cheshire - AQA for major new road scheme.

South Heywood – EIA for new link road and mixed use joint development

Residential Developments

Beck's Mill, Silsden – AQA and emissions calculation for proposed residential development

Bredbury Curve, Stockport - AQA assessment for proposed residential development in AQMA.

Hollin Lane, Middlewich – AQA for large scale residential development.

Friars School, Southwark, London. School development for mixed use education and residential building in AQMA.

Abbotsford House, Bearsden, Scotland – AQA and dust assessment for residential development

Kelvedon Street, Newport, South Wales – AQA for new housing development

Westcraig, Edinburgh - EIA for residential development

Public Sector

Technical advisor on Manchester Airport Consultative Committee - advise members on environmental technical matters in relation to the airport's operations.

Cheshire County Council - compile AQ chapters for Local Transport Plan

Cheshire East Council - specialist AQ advice on highways, minerals and waste projects

Local Air Quality Management

Broughton Gyratory, Chester - dispersion model for City Centre detailed assessment report

Congleton town centre - dispersion modelling assessment for detailed and further assessment reports.

Disley - dispersion modelling assessment for detailed and further assessments

Holmes Chapel - dispersion modelling assessment for detailed and further assessment reports for road and rail sources.

Crewe - town centre dispersion modelling for detailed and further assessment reports.

Commercial Developments

Granta Park Daycare Centre, Oxfordshire. AQA for new build daycare centre adjacent to major road.

Curzon Cinema, Colchester. Air quality assessment for town centre new build cinema.

Newfoundland Circus, Bristol - AQA for hotel development in city centre

Saleians School, Chertsey - AQA for school extension near M25

