AIR QUALITY ASSESSMENT
ALTRINCHAM RETAIL PARK, ALTRINCHAM

REC REFERENCE: AQ106978R1

REPORT PREPARED FOR: ORCHARD STREET INVESTMENT MANAGEMENT LLP

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EXECUTIVE SUMMARY

Resource and Environmental Consultants Limited was commissioned by Orchard Street Investment Management LLP to undertake an Air Quality Assessment in support of the redevelopment at Altrincham Retail Park, Altrincham.

The proposed development consists of the redevelopment of the existing Homebase to provide a new supermarket and garden centre.

The proposals are located partially within to the Greater Manchester Combined Authority Air Quality Management Area. As such, there is potential for the development to cause adverse impacts on existing pollution levels at nearby sensitive receptors during the construction and operational phases. An air quality assessment was therefore 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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APPENDIX

1. INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Ltd was commissioned by Orchard Street Investment LLP to undertake an Air Quality Assessment in support of a proposed redevelopment at Altrincham Retail Park, Altrincham.

1.2 Site Location and Context

The proposed development is located at Altrincham Retail Park, Altrincham at approximate National Grid Reference (NGR): 376570, 389280. Reference should be made to Figure 1 within Appendix I for a location plan.

The proposed development consists of the redevelopment of the existing Homebase to provide a new supermarket and garden centre.

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 (NO_2) 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 2.5µm ($PM_{2.5}$). 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 10µm (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 2007[1]. 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 (µg/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 2016 LAQM (TG16), DEFRA, 2016.

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 administration 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) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

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

Enforcement of the Act, in regard to nuisance, is currently under the 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[3] (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.*

[3] National Planning Policy Framework, Department for Communities and Local Government, 2018.

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 Guidance[4] (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 air quality pages are summarised under the following headings:

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 considered as necessary throughout the undertaking of this assessment.

[4] http://planningguidance.planningportal.gov.uk/.

2.6 Local Planning Policy

The proposed development site is located within Trafford Metropolitan Borough Council's (TMBC) area of administration. TMBC's Local Development Framework (LDF) consists of a series of planning documents, of which the Core Strategy is the overarching document. The Trafford Core Strategy was formally adopted in February 2012 and outlines an overall strategy and vision, establishing the broad aims and objectives for the use of land in Trafford. As such, the policies contained within the Core Strategy provide the current basis for the determination of planning applications within the borough.

A review of the Core Strategy indicated the following policy in relation to air quality:

> *"**Policy L5: Climate Change***
>
> *[…]*
>
> ***Pollution***
>
> *L5.I3 Development that has potential to cause adverse pollution (of air, light, water, and ground), noise or vibration will not be permitted unless it can be demonstrated that adequate mitigation measures can be put in place.*
>
> *L5.I4 Where development is proposed close to existing sources of pollution, noise or vibration, developers will be required to demonstrate that it is sited and designed in such a way as to confine the impact of nuisance from these sources to acceptable levels appropriate to the proposed use concerned.*
>
> *L5.I5 Within the Borough's Air Quality Management Zone developers will be required to adopt measures identified in Greater Manchester Air Quality Action Plan, to ensure that their development would not have an adverse impact on the air quality."*

Reference has been made to this policy by assessing impacts on existing sensitive receptors as a result of the proposals as well as assessing the suitability of the site for the proposed end use.

2.7 Greater Manchester Air Quality Action Plan

TMBC is a part of the Greater Manchester Air Quality Action Plan (AQAP)[5] which 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 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

[5] Greater Manchester Air Quality Action Plan 2016–2021

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 in addition to exposing future site users to elevated pollution levels. These issues have been assessed in accordance with the following methodology, which has been agreed with the Team Leader of Regularity Services at TMBC.

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 PM_{10}.

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:

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

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

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	• Total site area greater than 10,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Duty Vehicle (HDV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m
Medium	Earthworks	• Total site area 2,500m^2 to 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	• Total building volume 25,000m^3 to 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 10 to 50 HDV trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m

Magnitude	Activity	Criteria
Small	Earthworks	• Total site area less than 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 10 HDV trips per day • Surface material with low potential for dust release • Unpaved road length less than 50m

Step 2B defines the sensitivity of the area around the development 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 PM_{10} 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

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
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/m³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m³	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/m³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m³	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 guidance[6] 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 guidance[6] 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 introduce future site users to poor air quality as well a cause impacts on existing air quality as a result of road traffic exhaust emissions, such as NO_2, PM_{10} 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 NO_2, PM_{10} 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 details of the verification process.

Receptors potentially sensitive to changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations were identified within the assessment extents. 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 Institute of Air Quality Management (IAQM) guidance 'Land-Use Planning and Development Control: Planning for Air Quality[7].

[7] Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2015.

Table 10 Operational Traffic Exhaust Emissions - Significance 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

The criteria shown in Table 10 is adapted from the EPUK and IAQM[7] 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 guidance.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 10, the EPUK and IAQM[7] 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 NO_2 concentration of 41µg/m^3 should attract less significance than an annual mean of 51µg/m^3.

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 TMBC is a part of have undertaken Review and Assessment of air quality within their area of administration. This process has indicated that concentrations of NO_2 are above the AQO within the area. As such, one AQMA has been declared which is described as:

> *"Greater Manchester AQMA - An area covering the 10 districts of Greater Manchester, including arterial routes, district centres and airport."*

The proposed development is partially located within the Greater Manchester AQMA. 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.

GMCA has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated

4.2 Air Quality Monitoring

TMBC monitors pollutant concentrations using continuous and periodic methods throughout their area of administration. A review of GMCA's most recent Air Quality Annual Status Report[8] indicated that the closest continuous monitor to the proposed development is Trafford A56 and is located at NGR: 379413, 394014. This is approximately 5.4km north-east of the development boundary. Due to the distance between the development and monitoring sites, similar pollutant concentrations would not be anticipated and this source of data has not been considered further within this report.

TMBC utilise passive diffusion tubes to monitor NO_2 concentrations throughout the city. A review of the most recent monitoring data available indicated that there is one suitable diffusion tubes located in the vicinity of the proposed development. Recent NO_2 monitoring results from this location are shown in Table 11.

Table 11 Diffusion Tube Monitoring Results

Site Name		Type	NGR (m)		Annual Mean NO_2 Concentration ($\mu g/m^3$)		
			X	Y	2015	2016	2017
Trafford 22	A56 Timperley	Urban Traffic	377061	390086	35.30	32.34	32.50

As indicated in Table 11, the annual mean AQO for NO_2 was not exceeded at the diffusion tube in

[8] 2016 Air Quality Annual Status Report for Greater Manchester, 2016.

recent years. Reference should be made to Figure 2 within Appendix I for a graphical representation of the 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 in grid squares with NGR's: 376500, 389500. Data for these locations was downloaded from the DEFRA website[9] for the purpose of this assessment. The background concentrations are summarised in Table 12 for the verification year (2017), the predicted development opening year (2020).

Table 12 Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m³)	
	2017	2020
NO_x	27.88	23.55
NO_2	18.97	16.43
PM_{10}	14.19	13.86
$PM_{2.5}$	10.08	9.76

As shown in Table 12, background pollutant concentrations do not exceed the relevant AQOs. Comparison with the monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations.

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 construction dust 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	10 - 100	0
20 - 50	10 – 100	0

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

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
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 that construction traffic would access the site from the south via George Richards Way and the A56 ensure the maximum potential trackout distance was considered.

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	10 – 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 were no ecological receptors within 50m of the site boundary. As such, ecological impacts have not been further assessed 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 TMBC Planning Portal indicated there are no forthcoming large scale developments within the vicinity of the site. As such, the likelihood of concurrent dust generating activity is minimal.

Guidance	Comment
Pre-existing screening between the source and the receptors	There is sparse vegetation present along the northern boundary. If retained, this could provide limited natural protective screening to receptors in this direction
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 and west of the development, as shown in Figure 5 within Appendix I. As such, properties to the north and east of the site would be most affected by dust emissions
Conclusions drawn from local topography	The topography of the area 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 approximately a 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 3.1.2, 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	Low

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 varying heights to represent residential floor level and are summarised in Table 17.

Table 17 Existing Sensitive Human Receptors

Receptor		NGR (m)		Height (m)
		X	Y	
R1	4 Beaconsfield Road	376695.0	389256.9	1.5
R2	1 Beaconsfield Road	376671.6	389347.3	1.5
R3	201 Manchester Road	376654.4	389423.6	1.5
R4	243 Manchester Road	376696.3	389543.9	1.5
R5	Gecko Apartments	376693.4	389474.9	1.5
R6	Trafford College	376895.4	389867.2	1.5
R7	Above Shops Elements	377029.5	390000.5	4.5
R8	Pelican Grange, Manchester Road	377013.2	390029.9	1.5
R9	Above shops Washaway Road	377138.0	390224.4	1.5
R10	64-66 Manchester Road	376687.5	388788.8	4.5
R11	55 Manchester Road	376658.1	388832.1	4.5
R12	29 Manchester Road	376648.8	388658.2	1.5

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 of the proposed development in addition to the exposure of future site users to elevated pollution levels. 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 greater than 10,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **large**.

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 **high** risk site for dust soiling as a result of earthworks activities.

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

Construction

Due to the size of the development the total building volume is likely to be less than 25,000m^3 In accordance with the criteria outlined in Table 3, 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 impacts is **low**. In accordance with the criteria outlined in Table 8, the development is considered to be a **negligible** risk site for human health impacts as a result of construction activities.

Trackout

The number of HDV trips to be generated during the construction phase of the development was provided by traffic consultant, however 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 more than 100m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **large**.

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 **high** risk site for dust soiling as a result of trackout activities.

Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance within the criteria outlined in Table 9, the development is considered to be a **low** risk site for human health impacts 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	High	Low	High
Human Health	Low	Negligible	Low

As indicated in Table 18, the potential risk of dust soiling is **low** from construction activities and **high** from Earthworks and trackout activities. The potential risk of human health impacts is **negligible** from construction activities and **low** for earthworks and trackout 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 guidance[6] 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. The mitigation measures outlined in Table 19 can be reviewed prior to the commencement of construction works incorporated into the existing the strategies as applicable.

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 actives 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
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

Issue	Control Measure
	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 or burning of waste materials
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 • Ensure sand and other aggregates are stored and not able to dry out, unless it is required for a specific process • Ensure bulk cement and other fine powder materials are delivered and stored to prevent escape
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 guidance[6].

5.2 Operational Phase Assessment

Additional vehicle movements associated with the operation of the proposed development will generate exhaust emissions, such as NO_2, PM_{10} 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 DM; and
- 2020 DS.

The DM (i.e. without development) scenario is representative of anticipated traffic data for 2020. The DS (i.e. with development) scenarios are representative of anticipated traffic data for 2020 with the addition of predicted variations in traffic flow patterns as a result of the proposals.

For the purpose of this assessment traffic data was supplied for 2020, the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2017 were utilised within the dispersion model. The use of 2020 traffic data and 2017 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

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 NO_2, PM_{10} 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 Receptors

Annual mean NO_2 concentrations were predicted for the 2020 DM and DS scenarios and are summarised in Table 20.

Table 20 Predicted Annual Mean NO_2 Concentrations

Sensitive Receptor		Predicted Annual Mean NO_2 Concentration (µg/m³)		
		DM	DS	Change
R1	4 Beaconsfield Road	31.41	31.51	0.10
R2	1 Beaconsfield Road	31.21	31.29	0.08
R3	201 Manchester Road	29.46	29.52	0.06
R4	243 Manchester Road	27.82	27.86	0.04
R5	Gecko Apartments	30.66	30.72	0.06
R6	Trafford College	27.93	27.97	0.04
R7	Above Shops Elements	23.22	23.25	0.03
R8	Pelican Grange, Manchester Road	27.53	27.58	0.05

Sensitive Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	DS	Change
R9	Above shops Washaway Road	25.16	25.19	0.03
R10	64-66 Manchester Road	27.19	27.25	0.06
R11	55 Manchester Road	24.60	24.64	0.04
R12	29 Manchester Road	24.20	24.25	0.05

As indicated in Table 20, predicted annual mean NO_2 concentrations were predicted to be below the relevant AQO at all sensitive receptor locations considered in both the DM and DS scenario.

Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted NO_2 Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	4 Beaconsfield Road	0.25	76-94% of the AQO	Negligible
R2	1 Beaconsfield Road	0.20	76-94% of the AQO	Negligible
R3	201 Manchester Road	0.15	75% or Less of the AQO	Negligible
R4	243 Manchester Road	0.10	75% or Less of the AQO	Negligible
R5	Gecko Apartments	0.15	76-94% of the AQO	Negligible
R6	Trafford College	0.10	75% or Less of the AQO	Negligible
R7	Above Shops Elements	0.08	75% or Less of the AQO	Negligible
R8	Pelican Grange, Manchester Road	0.12	75% or Less of the AQO	Negligible
R9	Above shops Washaway Road	0.08	75% or Less of the AQO	Negligible
R10	64-66 Manchester Road	0.15	75% or Less of the AQO	Negligible
R11	55 Manchester Road	0.10	75% or Less of the AQO	Negligible
R12	29 Manchester Road	0.13	75% or Less of the AQO	Negligible

As indicated in Table 21, the significance of impacts on annual mean NO_2 concentrations as a result of the development was predicted to be **negligible** at all sensitive receptor locations. It is therefore considered that the overall impacts as a result of the proposed development on NO_2 concentration are **not significant**.

5.2.3 Particulate Matter (PM_{10})

Predicted Concentrations at Sensitive Receptors

Annual mean PM_{10} concentrations were predicted for each scenario and are summarised in Table 22.

Table 22 Predicted Annual Mean PM_{10} Concentrations

Sensitive Receptor		Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	4 Beaconsfield Road	16.09	16.11	0.02
R2	1 Beaconsfield Road	16.28	16.29	0.01
R3	201 Manchester Road	16.02	16.03	0.01
R4	243 Manchester Road	15.75	15.76	0.01
R5	Gecko Apartments	16.28	16.29	0.01
R6	Trafford College	15.49	15.50	0.01
R7	Above Shops Elements	14.74	14.75	0.01
R8	Pelican Grange, Manchester Road	15.53	15.54	0.01
R9	Above shops Washaway Road	15.10	15.11	0.01
R10	64-66 Manchester Road	15.23	15.24	0.01
R11	55 Manchester Road	14.91	14.92	0.01
R12	29 Manchester Road	14.95	14.96	0.01

As indicated in Table 22, annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptor locations for both scenarios considered.

Predicted impacts on annual mean PM_{10} concentrations are summarised in Table 23.

Table 23 Predicted PM_{10} Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	4 Beaconsfield Road	0.05	75% or Less of AQO	Negligible
R2	1 Beaconsfield Road	0.02	75% or Less of AQO	Negligible
R3	201 Manchester Road	0.03	75% or Less of AQO	Negligible
R4	243 Manchester Road	0.02	75% or Less of AQO	Negligible

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R5	Gecko Apartments	0.02	75% or Less of AQO	Negligible
R6	Trafford College	0.02	75% or Less of AQO	Negligible
R7	Above Shops Elements	0.02	75% or Less of AQO	Negligible
R8	Pelican Grange, Manchester Road	0.02	75% or Less of AQO	Negligible
R9	Above shops Washaway Road	0.02	75% or Less of AQO	Negligible
R10	64-66 Manchester Road	0.02	75% or Less of AQO	Negligible
R11	55 Manchester Road	0.02	75% or Less of AQO	Negligible
R12	29 Manchester Road	0.03	75% or Less of AQO	Negligible

As indicated in Table 23, impacts on annual mean PM_{10} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all sensitive receptor locations. It is therefore considered that the overall impacts as a result of the proposed development are **not significant.**

5.2.4 Particulate Matter ($PM_{2.5}$)

Predicted Concentrations at Sensitive Receptors

Annual mean $PM_{2.5}$ concentrations were predicted for each scenario and are summarised in Table 24.

Table 24 Predicted Annual Mean $PM_{2.5}$ Concentrations

Sensitive Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	4 Beaconsfield Road	11.21	11.22	0.01
R2	1 Beaconsfield Road	11.30	11.31	0.01
R3	201 Manchester Road	11.15	11.16	0.01
R4	243 Manchester Road	10.99	10.99	0.00
R5	Gecko Apartments	11.30	11.30	0.00
R6	Trafford College	10.85	10.86	0.01
R7	Above Shops Elements	10.38	10.38	0.00
R8	Pelican Grange, Manchester Road	10.84	10.84	0.00
R9	Above shops Washaway Road	10.59	10.59	0.00

Sensitive Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)		
		DM	DS	Change
R10	64-66 Manchester Road	10.60	10.61	0.01
R11	55 Manchester Road	10.40	10.41	0.01
R12	29 Manchester Road	10.42	10.43	0.01

As indicated in Table 24, 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 are summarised in Table 25.

Table 25 Predicted $PM_{2.5}$ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	4 Beaconsfield Road	0.04	75% or Less of AQO	Negligible
R2	1 Beaconsfield Road	0.04	75% or Less of AQO	Negligible
R3	201 Manchester Road	0.04	75% or Less of AQO	Negligible
R4	243 Manchester Road	0.00	75% or Less of AQO	Negligible
R5	Gecko Apartments	0.00	75% or Less of AQO	Negligible
R6	Trafford College	0.04	75% or Less of AQO	Negligible
R7	Above Shops Elements	0.00	75% or Less of AQO	Negligible
R8	Pelican Grange, Manchester Road	0.00	75% or Less of AQO	Negligible
R9	Above shops Washway Road	0.00	75% or Less of AQO	Negligible
R10	64-66 Manchester Road	0.04	75% or Less of AQO	Negligible
R11	55 Manchester Road	0.04	75% or Less of AQO	Negligible
R12	29 Manchester Road	0.04	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 sensitive receptor locations. It is therefore considered that the overall impacts as a result of the proposed development are **not significant**.

5.2.5 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 5.2. Further justification is provided in Table 26.

Table 26 Overall Road Traffic Exhaust Emission 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 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.
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.
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: ▶ 0.08% to 0.25% for NO_2, ▶ 0.00% to 0.05% for PM_{10}; and. ▶ 0.00% to 0.04% for $PM_{2.5}$ Therefore, resultant impacts were predicted to be **negligible** at all receptor 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 no exceedances of the annual mean AQO for NO_2, PM_{10} and $PM_{2.5}$ concentrations at any location within the modelling extent.
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 no exceedances of the annual mean AQO for NO_2, PM_{10} and $PM_{2.5}$ at any sensitive receptor location within the modelling extents

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 guidance[7]. The guidance recommends minimum best practice techniques for all developments. Following correspondence with the Team Leader of Regularity Services at TMBC, the following potential best practice mitigation option should be considered within the design of the development, and discussed with TMBC prior to the completion of the proposed development.

- Provision of incentives for the uptake of low emission vehicles, including Electric Vehicle (EV) charging points.

If the above technique proves viable and can be appropriately implemented into the scheme, this will further reduce the already negligible impacts associated with the proposed development.

7. CONCLUSION

REC Ltd was commissioned by Orchard Street Investment LLP to undertake an Air Quality Assessment in support of a proposed redevelopment at Altrincham Retail Park, Altrincham.

The proposed development consists of redeveloping the existing Homebase to provide a new supermarket and garden centre.

The proposed development is located partially within the GMCA AQMA, which has been declared for exceedances of the annual mean AQO for NO_2 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 TMBC.

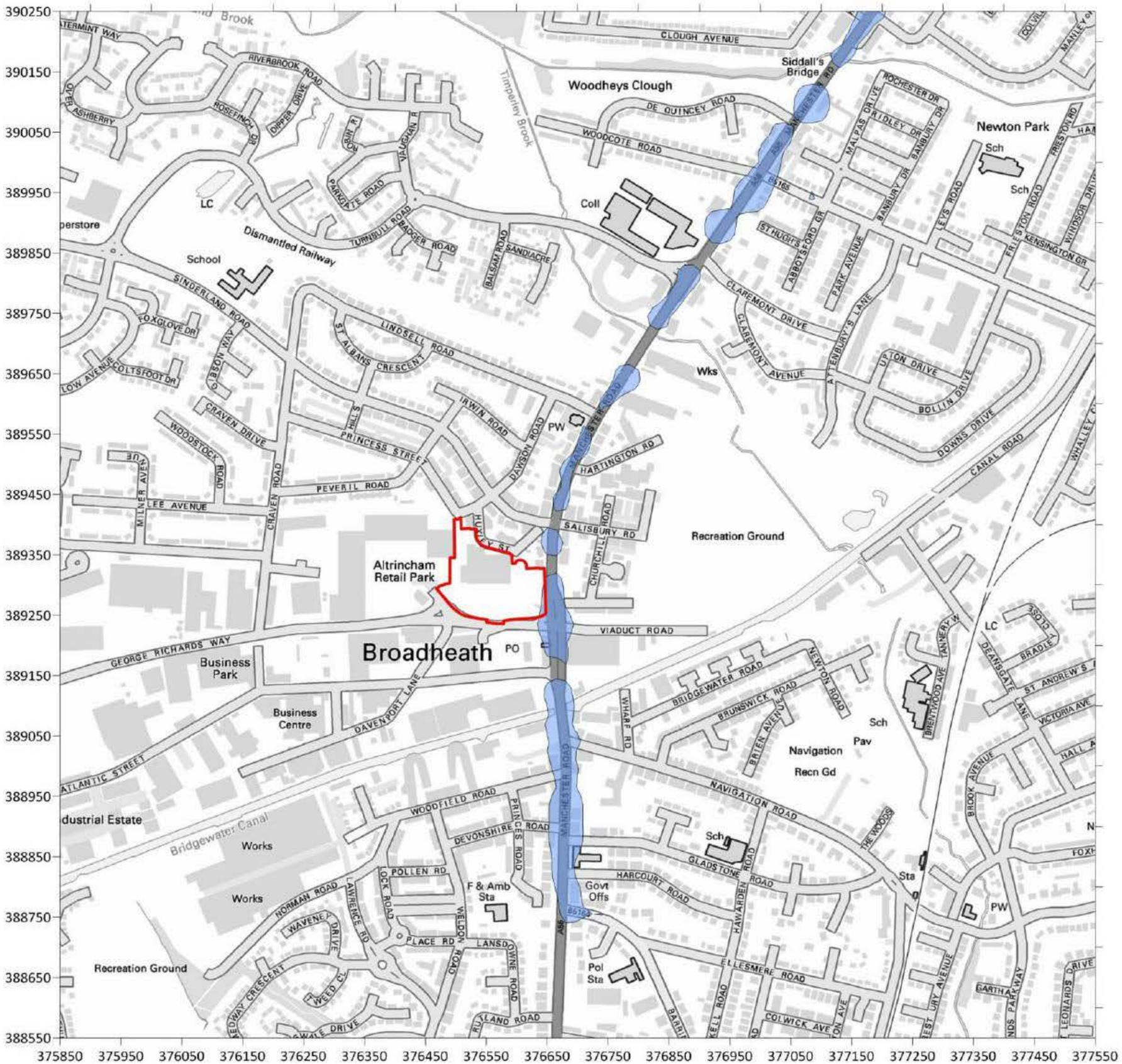
Predicted impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at all 12 sensitive receptor locations. The overall significance of potential impacts was determined to be **not significant**, in accordance with the 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
DMP	Dust Management Plan
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
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
TMBC	Trafford Metropolitan Borough Council
z_0	Roughness Length

APPENDIX I - FIGURES



Legend

Site Boundary

Air Quality Management Area

Title

Figure 1

Site Location

Project

Air Quality Assessment
Altrincham Retail Park, Altrincham

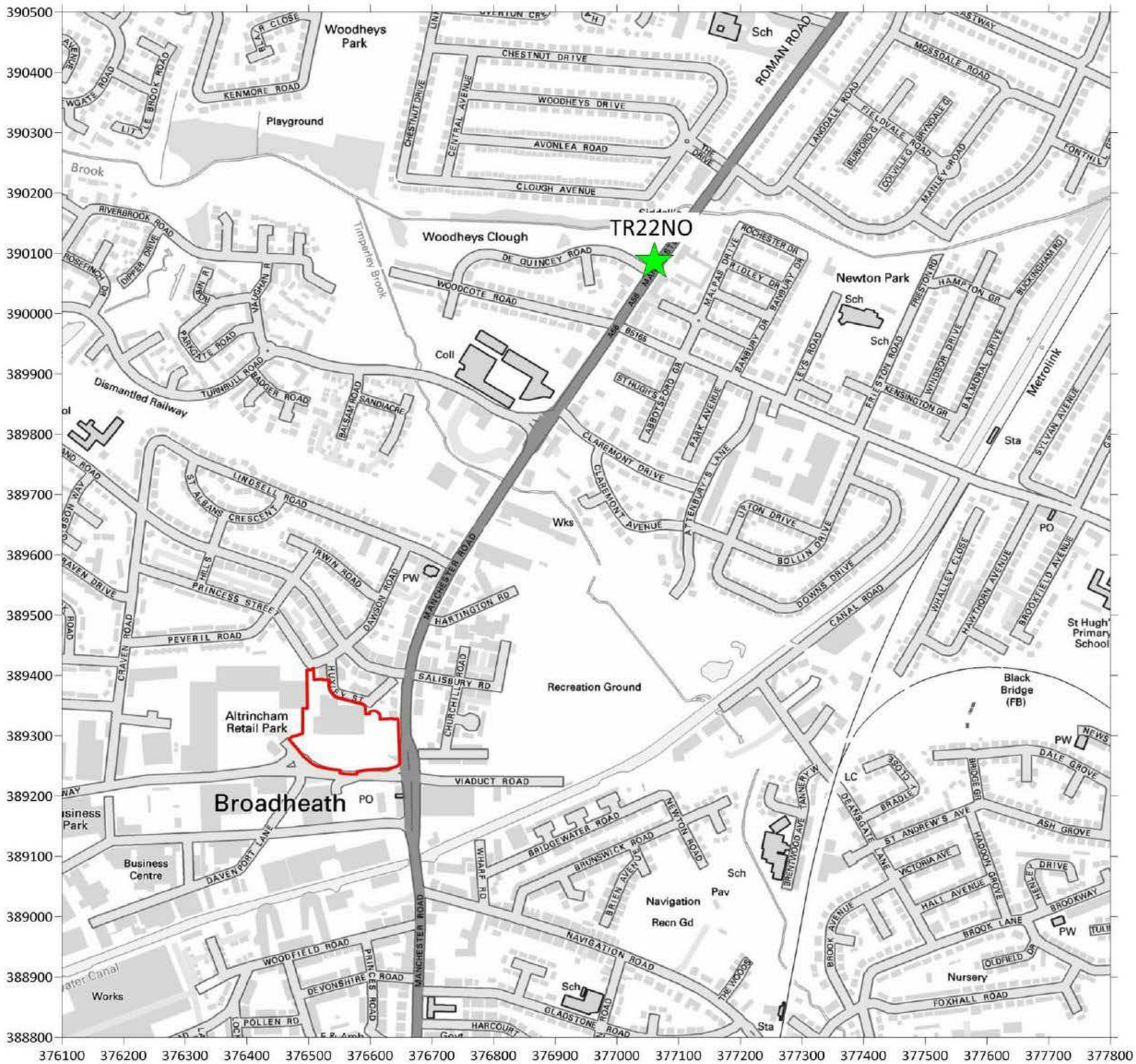
Project Number

AQ106978

Client

Orchard Street Investment Management LLP

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



Legend

Site Boundary

Diffusion Tube Monitoring Locations

Title

Figure 2

Diffusion Tube Monitoring Locations

Project

Air Quality Assessment
Altrincham Retail Park, Altrincham

Project Number

AQ106978

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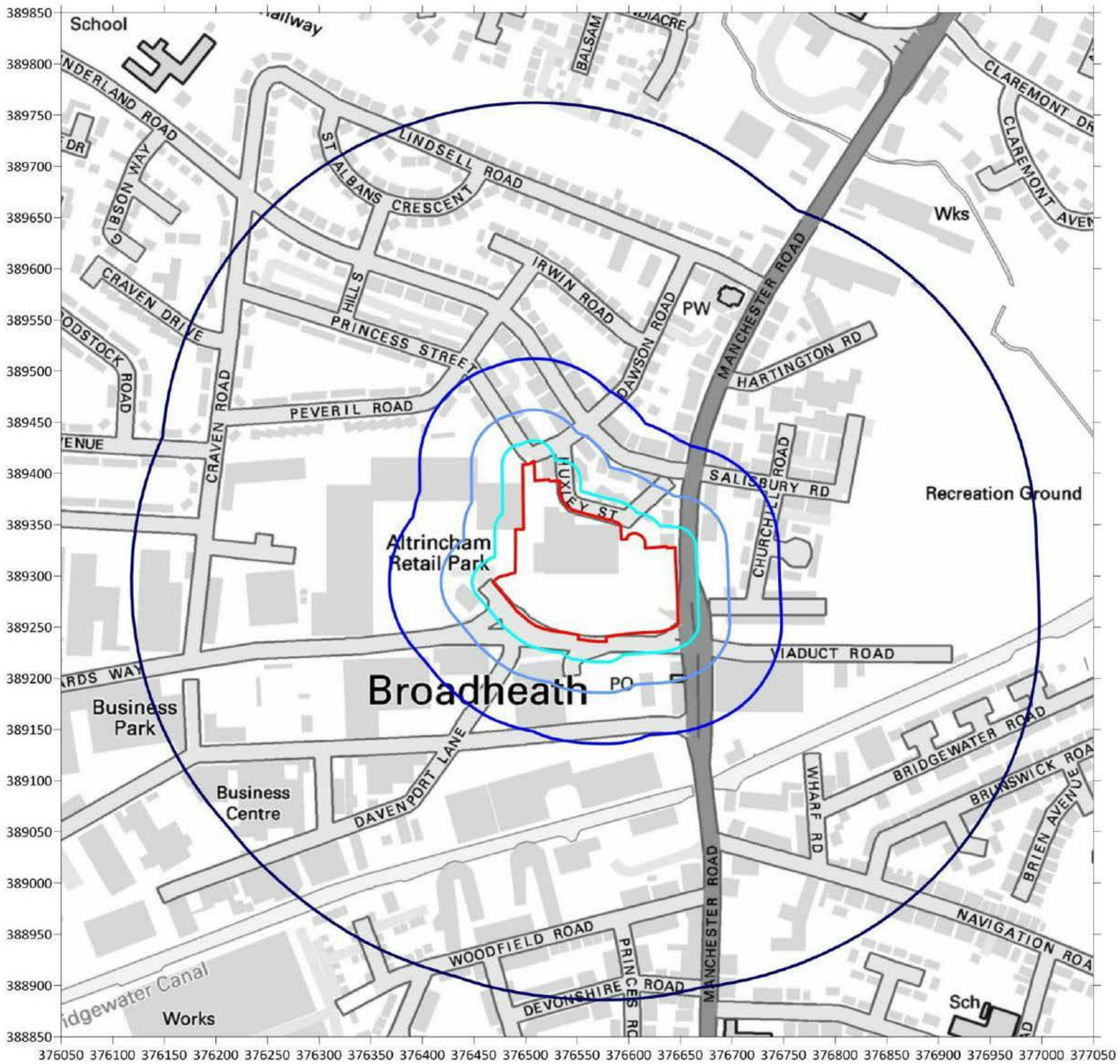

Legend

- 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
Altrincham Retail Park, Altrincham

Project Number

AQ106978

Client

Orchard Street Investment Management LLP

REC
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Osprey House, Broadway, Manchester M50 2UE
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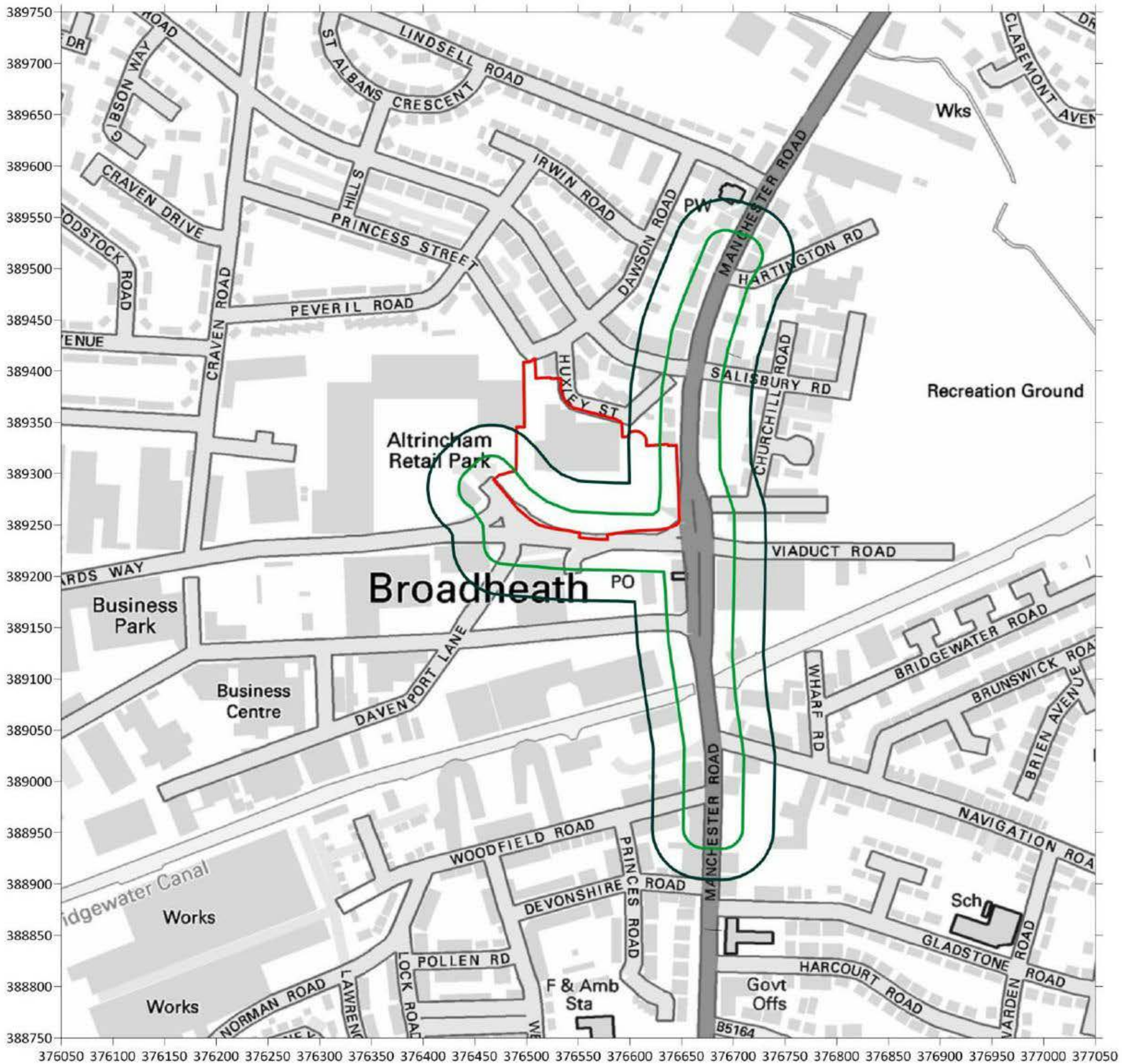

Legend

Site Boundary

20m from Site Access Route

50m from Site Access Route

Title

Figure 4

Trackout Dust Buffer Zones

Project

Air Quality Assessment
Altrincham Retail Park, Altrincham

Project Number

AQ106978

Client

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REC
Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
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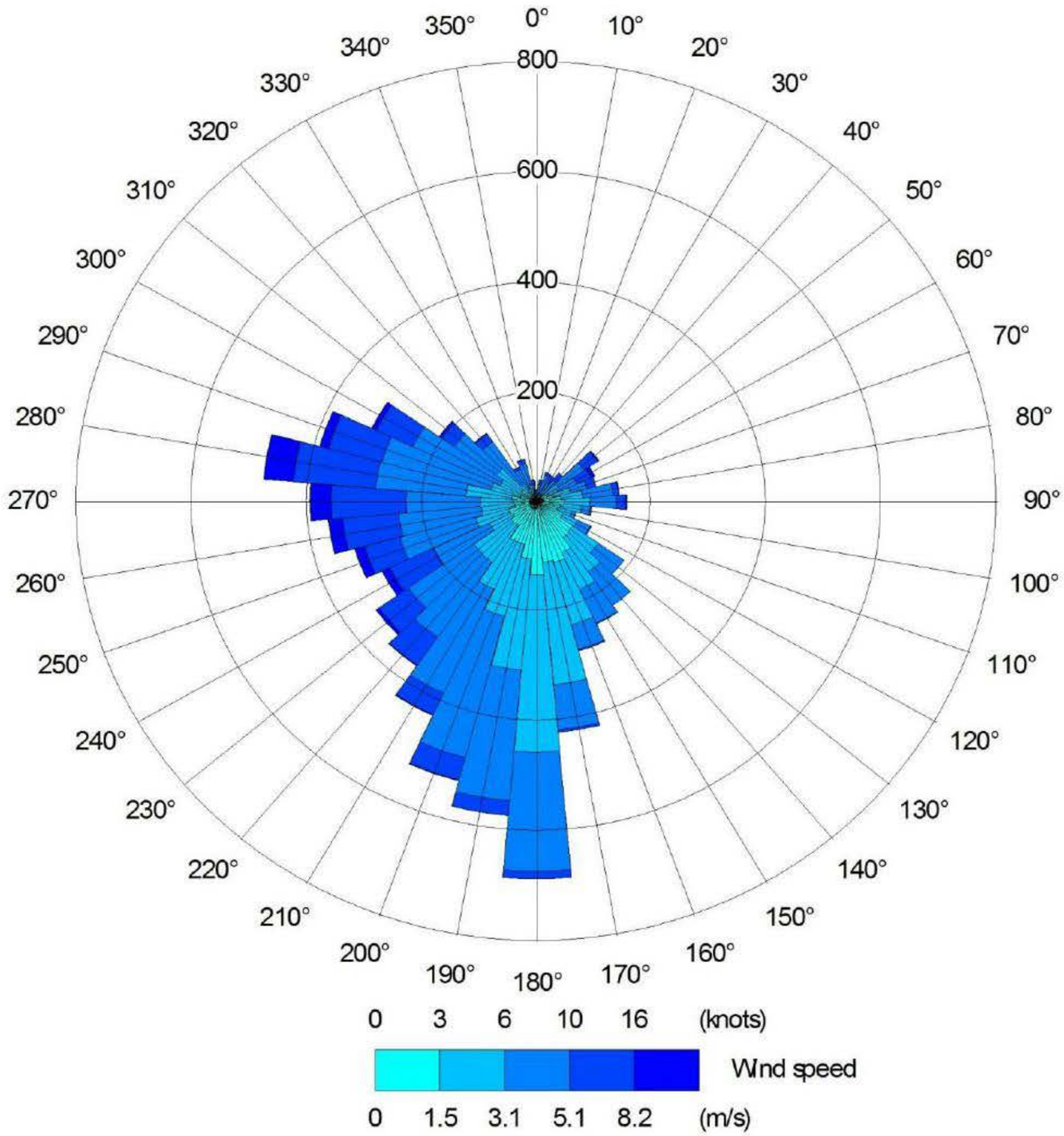

Title

Figure 5

Wind Rose Manchester Ringway Meteorological Station 2017

Project

Air Quality Assessment
Altrincham Retail Park, Altrincham

Project Number

AQ106978

Client

Orchard Street Investment Management LLP

REC

Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
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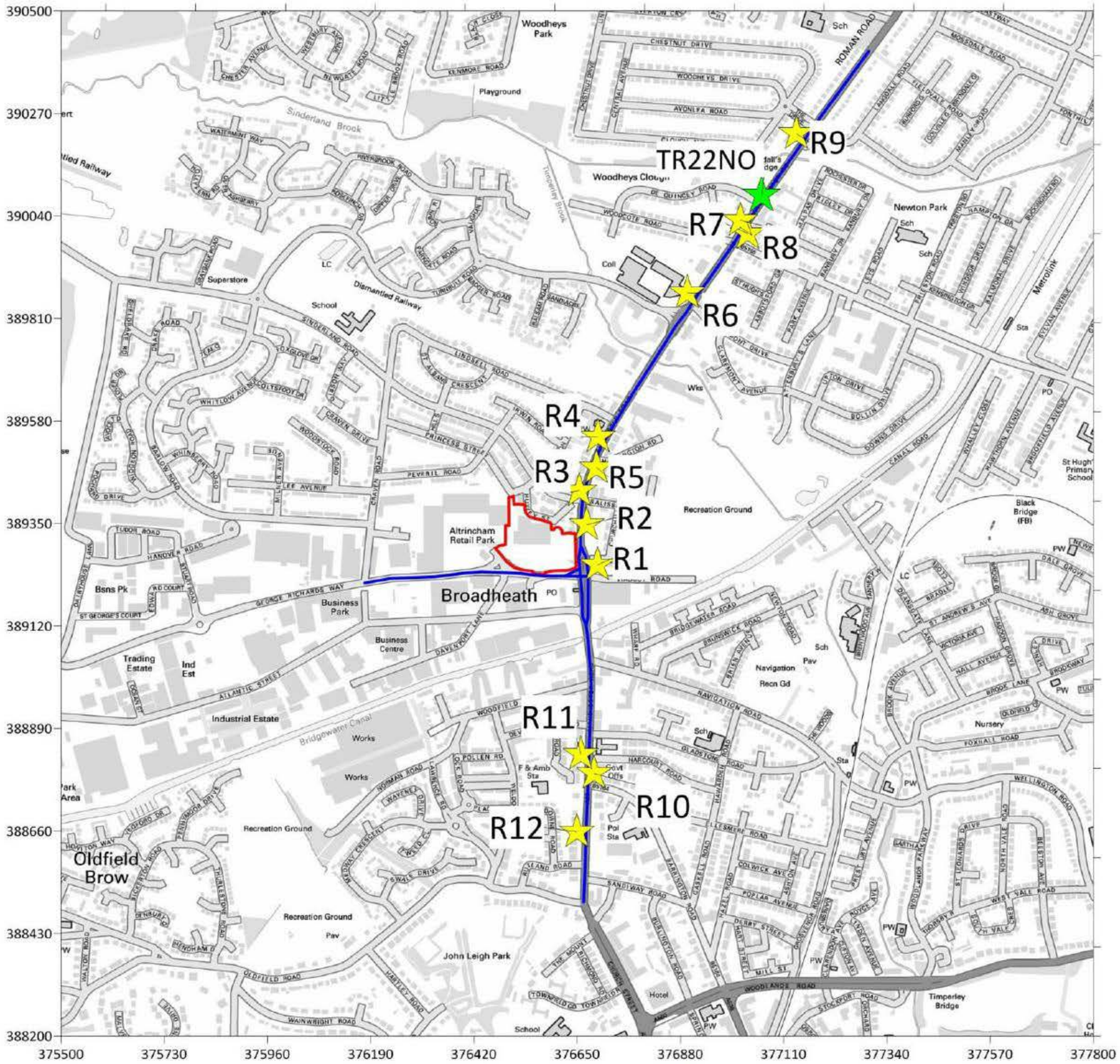

Legend

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

Title

Figure 6

ADMS-Roads Input

Project

Air Quality Assessment
Altrincham Retail Park, Altrincham

Project Number

AQ106978

Client

Orchard Street Investment Management LLP

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Resource and Environmental Consultants Ltd
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APPENDIX II - ASSESSMENT INPUTS

Assessment Inputs

Road vehicle trips associated with the development 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 NO_2, PM_{10} 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 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.

Assessment Area

Ambient concentrations were predicted over the proposed development site and surrounding highway network. One Cartesian grid was included in the model over the area NGR: 370580, 390070 to 371360, 390850 at height of 1.5m to represent the ground floor level for 2020 opening year scenario.

Results were subsequently used to produce contour plots within the Surfer software package.

Reference should be made to Figure 6 within Appendix I for a graphical representation of the assessment grid extents.

Traffic Flow Data

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

Growth factors provided by the Trip End Model Presentation Program (TEMPRO) 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 AII.1 and the traffic data used in the DM and DS scenarios is provided in Table AII.2.

Table AII.1 Verification Traffic Data

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L1	George Richards Way	6.8	9,308	1.9	48
L2	George Richards Way Traffic Light	14.5	9,308	1.9	24
L3	George Richards Way	16.9	16,350	2.9	16
L4	George Richards Way /Manchester Road Junction	4.7	8,175	2.9	24
L5	George Richards Way/Manchester Road Junction	12.6	8,175	2.9	24
L6	Manchester road	7.3	34,514	2.9	48
L7	Manchester road (South of Site) Traffic Lights	14.1	34,514	2.9	24
L8	Manchester road (South of George Richards Way)	13.0	34,514	2.9	40
L9	Manchester road (South of George Richards Way)	14.2	34,514	2.9	24
L10	Manchester road Traffic Lights	11.3	34,514	2.9	40
L11	Manchester road Northbound Split	7.9	17,257	2.9	24
L12	Manchester road Northbound Split	6.2	15,313	3.0	32
L13	Manchester road Southbound Split	6.9	17,257	2.9	40
L14	Manchester road Southbound Split	11.1	15,313	3.0	32
L15	Manchester road (North of Site)	10.6	30,625	3.0	48
L16	Manchester road (North of Site)	16.9	30,625	3.0	24
L17	Manchester road (North of Site)	14.4	30,625	3.0	48
L18	Manchester road (North of Site)	10.6	30,625	1.9	40
L19	Manchester road (North of Site)	9.0	30,625	1.9	48
L20	Manchester road (North of Site)	9.5	30,625	2.9	24
L21	Manchester road (North of Site)	9.9	30,625	2.9	48

A summary of the 2020 traffic data used for the proposed site operational phase scenarios is shown in Table AII.2. The road width and mean vehicle speed remained the same for the DM and DS

scenarios.

Table AII.2 2020 Traffic Data

Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L1	George Richards Way	9,526	1.9	9,638	1.9
L2	George Richards Way Traffic Light	9,526	1.9	9,638	1.9
L3	George Richards Way	16,733	2.9	17,267	2.9
L4	George Richards Way /Manchester Road Junction	8,366	2.9	8,633	2.9
L5	George Richards Way/Manchester Road Junction	8,366	2.9	8,633	2.9
L6	Manchester road	35,322	2.9	35,605	2.9
L7	Manchester road (South of Site) Traffic Lights	35,322	2.9	35,605	2.9
L8	Manchester road (South of George Richards Way)	35,322	2.9	35,605	2.9
L9	Manchester road (South of George Richards Way)	35,322	2.9	35,605	2.9
L10	Manchester road Traffic Lights	35,322	2.9	35,605	2.9
L11	Manchester road Northbound Split	17,661	2.9	17,802	2.9
L12	Manchester road Northbound Split	15,671	3.0	15,753	3.0
L13	Manchester road Southbound Split	17,661	2.9	17,802	2.9
L14	Manchester road Southbound Split	15,671	3.0	15,753	3.0
L15	Manchester road (North of Site)	31,342	3.0	31,507	3.0
L16	Manchester road (North of Site)	31,342	3.0	31,507	3.0
L17	Manchester road (North of Site)	31,342	3.0	31,507	3.0
L18	Manchester road (North of Site)	31,342	1.9	31,507	1.9
L19	Manchester road (North of Site)	31,342	1.9	31,507	1.9
L20	Manchester road (North of Site)	31,342	2.9	31,507	2.9
L21	Manchester road (North of Site)	31,342	2.9	31,507	2.9

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 NO_2 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 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 7.5km south of the proposed development and is therefore considered to provide a reasonable representation of conditions at the development site.

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 within Appendix I 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 and woodland'

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 predicted background concentrations by DEFRA used in the verification process for the diffusion tubes.

Table AII.3 Predicted Background Pollutant Concentrations for Diffusion Tubes

Receptor Grid Square	Diffusion Tubes	Pollutant	Predicted Background Concentration (µg/m³)
			2017
377500, 390500	Trafford 22	NO_x	26.69
		NO_2	18.33

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 (µg/m³)
			2017
376500, 388500	R1 to R6	NO_x	27.44
		NO_2	18.74
		PM_{10}	14.00
		$PM_{2.5}$	9.86
376500, 389500	R10 to R12	NO_x	27.88
		NO_2	18.97
		PM_{10}	14.19
		$PM_{2.5}$	10.08
377500, 390500	R7 to R9	NO_x	26.69
		NO_2	18.33
		PM_{10}	13.93
		$PM_{2.5}$	9.90

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

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO_2 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.

TMBC undertakes diffusion tube monitoring of NO_2 concentrations at one suitable location within the assessment extents. The road contribution to total NO_x concentration was calculated from the monitored NO_2 result for use in the verification process. This was undertaken following the methodology contained within DEFRA guidance LAQM (TG16)[2]. The monitored annual mean NO_2 concentration and calculated road NOx concentration are summarised in Table AII.5.

Table AII.5 Monitoring Results

TMBC ID	Monitoring Location	Modelled Road NO_x Concentration ($\mu g/m^3$)	Monitored Road NO_x Concentration ($\mu g/m^3$)	Difference %
Trafford22	A56 Corner of De Quincey Road	28.30	28.72	1.46

The monitored and modelled NO_x road contribution concentrations were compared. This indicated that a verification factor of **1.0148** was required to be applied to all NO_x modelling results, showing the model has accurately estimated pollutant concentrations throughout the assessment extents.

Table AII.6 presents the monitored annual mean NO_2 concentrations and the adjusted modelled total NO_2 concentration based on the above verification factor.

Table AII.6 Modelled Concentrations

TMBC ID	Monitoring Location	Monitored NO_2 Concentration ($\mu g/m^3$)	Adjusted Modelled Total NO_2 Concentration ($\mu g/m^3$)	Difference (%)
Trafford 22	A56 corner of De Quincey Road	32.50	32.50	0.00

As PM_{10} and $PM_{2.5}$ monitoring is not undertaken within the assessment extents, the NO_x verification factor of **1.0148** was also utilised to adjust model predictions of PM_{10} and $PM_{2.5}$ in accordance with the guidance provided within LAQM (TG16)[2].

APPENDIX III - ASSESSOR'S CURRICULUM VITAE

CONAL KEARNEY

Head of Noise and Air

BEng(Hons), MSc, MIAQM, MIEnvSc

KEY EXPERIENCE:

Conal is Head of Noise and Air at REC Ltd 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 Wale – 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

Salesians School, Chertsey - AQA for school extension near M25