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AIR QUALITY ASSESSMENT
MANCHESTER COLLEGE, OPENSHAW CAMPUS

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DELIVERING ENVIRONMENTAL
AND RISK MANAGEMENT SOLUTIONS

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EXECUTIVE SUMMARY

Resource and Environmental Consultants Limited was commissioned by The Manchester College to undertake an Air Quality Assessment in support of a proposed development at land at Manchester College, Openshaw Campus.

It is understood that the proposals comprise the redevelopment of the existing Manchester College, Openshaw Campus, which will include the demolition of a number of existing buildings, and the construction of a new cark park, 4G Sports Pitch, and associated building. The proposals also include the provision of 2 boiler units to provide heating to the development.

The proposed development is located within an area identified by Manchester City Council as experiencing elevated pollutant concentrations. Subsequently, there is potential for the proposals to cause impacts at nearby sensitive receptors during the construction and operational phases, as well as to expose future site users to elevated pollutant concentrations. 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 Institute of Air Quality Management methodology. Assuming appropriate mitigation measures are implemented, air quality impacts during the construction phase are considered to be acceptable for a development of this size and nature.

Dispersion modelling was also undertaken in order to predict pollutant concentrations across the site, and to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the proposed development. Results were subsequently verified using monitoring data obtained from Manchester City Council.

The dispersion modelling indicated that pollutant levels across the site were below the relevant air quality standards and, as such, the location is considered suitable for the proposed end-use without the inclusion of mitigation methods. Additionally, the assessment concluded that impacts on pollutant levels as a result of operational phase were predicted to be **not significant** at any sensitive location. The use of robust assumptions, where necessary, was considered to provide sufficient confidence for an assessment of this nature.

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

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1. INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Limited was commissioned by The Manchester College to undertake an Air Quality Assessment in support of a proposed development as part of the Openshaw Campus.

1.2 Site Location and Context

The site is located at land at Manchester College, Openshaw Campus at approximate National Grid Reference (NGR): 387560, 397350. Reference should be made to Figure 1 for a location plan.

The proposals comprise the redevelopment of the existing Manchester College Openshaw Campus, which will include the demolition of a number of existing buildings, and the construction of a new cark park, 4G Sports Pitch, and associated building.

The proposed development is located adjacent to the A635, which is a significant sources of road vehicle emissions, including both nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10µm (PM_{10}). The proposed development is also located within an Air Quality Management Area (AQMA). Subsequently, there is the potential for the development to introduce future site users to poor air quality, as well as causing adverse impacts on existing pollution levels at nearby sensitive receptors within the local area. An Air Quality Assessment was therefore required to determine baseline conditions, consider location suitability for the proposed end-use and provide consideration of potential effects as a result of the proposals. This is detailed in this 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.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m³)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year

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

Pollutant	Air Quality Objective	
	Concentration (µg/m^3)	Averaging Period
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

2.3 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

[2] Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, 2016.

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[3] (NPPF) was published on 24th July 2018 (updated on 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:

> *"The planning system 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*
>
> *"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."*

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

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

2.5.2 National Planning Practice Guidance

The National Planning Policy Framework[4] (NPPF) was published on 24th July 2018 (updated on 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:

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

2.6 Local Planning Policy – Manchester City Council

Manchester Local Development Framework (LDF) Core Strategy was formally adopted in 2012 and provides a framework for development within the city. The LDF comprises a number of documents which set out MCC's spatial policy framework. A review of the Core Strategy indicated the following policy in relation to air quality that is relevant to this assessment:

- Policy EN 16 – Air Quality
- Policy CC5 – Transport; and
- Policy DM1 – Development Management

Reference has been made to these policies during the undertaking of this Air Quality Assessment by assessing pollutant concentrations across the Site and 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) 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 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.

Reference has been made to this policy during the undertaking of this Air Quality Assessment by assessing pollutant concentrations across the Proposed Development.

3. METHODOLOGY

There is the potential for the proposed development to expose future site users to elevated pollution concentrations and to cause impacts at sensitive locations during the construction and operational phases. These 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'[5].

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} and $PM_{2.5}$.

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 defined as low, medium or high sensitivity (Step 2B).

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

The two factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

3.1.3 Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance 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[5] guidance suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix III.

3.2 Operational Phase Assessment

The operational phase will introduce new sensitive receptors to an area of potentially poor air quality. This change will not generate direct effects to air quality but is considered in the context of suitability for the intended land use.

The Proposed Development will have an overall net reduction in traffic movements. This change in traffic has the potential to have a positive change to local air quality concentrations.

The Proposed Development will however introduce a local emissions source associated with the onsite provision of heating from two new boilers. These emissions sources will emit the combustion products of natural gas and discharge from the onsite stack. The direct effect from a change in local emissions sources will potentially have a negative effect on the local air quality.

Detailed dispersion modelling was therefore undertaken to quantify NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site and determine suitability for the proposed use, using the following scenarios:

- 2018 Verification;
- Opening year do-minimum (DM) (predicted traffic flows in 2021 should the proposals not proceed); and
- Opening year do-something (DS) (predicted traffic flows in 2021 should the proposals be completed, with the addition of traffic generated by the proposed development).

The DM (i.e. without development) scenario is representative of anticipated traffic data for 2021. The DS (i.e. with development) scenario is representative of anticipated traffic data for 2021 with the addition of predicted variations in traffic flow patterns as a result of the proposals (net reduction).

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

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model. The use of 2021 traffic data and 2018 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 assessment input data details of the verification process.

Receptors potentially sensitive to changes in NO_2 concentrations were identified within 200m of the affected highway network in accordance with the guidance provided within the IAQM guidance[6] 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 3. 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[6].

Table 3 Operational Traffic Exhaust Emissions – Assessment of Impacts

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 3 is adapted from the EPUK and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'[6] 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 3 the EPUK and IAQM[5] 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. Note that impacts

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

may be adverse or beneficial, depending on whether the change in concentration is positive or negative. 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), MCC has undertaken Review and Assessment of air quality within their area of administration. This process concluded that annual mean and one hour mean concentrations of NO_2 are above the AQO within their administration. As such, three AQMAs have been declared, the closest to development is described as:

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

The proposed development site is 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.

MCC 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 designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by MCC using both periodic and continuous methods throughout their area of administration. A review of the most recent monitoring results indicated the closest continuous monitor to the proposed development is Manchester Piccadilly at NGR: 384310, 398337. This is approximately 1km north east of the development boundary at a roadside location. 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 utilise passive diffusion tubes for monitoring NO_2 concentrations throughout their administration. A further review of the most recent monitoring results indicated that there is one suitable diffusion tubes located in the vicinity of the site. Monitoring results from recent years, for the diffusion tube located within the modelling extents are summarised in Table 4 below. Reference should be made to Figure 2 for a graphical representation of the diffusion tube monitoring locations.

Table 4 MCC Diffusion Tube Monitoring Results

Site ID	Type	NGR (m)		Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		X	Y	2016	2017	2018
MAN28 – Ashton Old Road	Kerbside	387951	397430	**41.0**	38.9	37.1
MAN86 – A9010 Pottery Lane	kerbside	387150	396808	37.0	36.1	31.9

As indicated in Table 4, the annual mean AQO for NO_2 was exceeded at the MAN28 diffusion tube location in recent years. This is to be expected given its roadside location with an AQMA. Reference should be made to Figure 2 within Appendix I for a graphical representation of the diffusion tube

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 within the grid square:

- NGR: (387500, 397500)

Data for this location was downloaded from the DEFRA website[7] for the purpose of this assessment for the verification year (2018) and development opening year (2021). The concentrations are summarised in Table 5.

Table 5 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m^3)	
	2018	2021
NO_x	34.2	28.1
NO_2	22.4	19.0
PM_{10}	11.9	11.5
$PM_{2.5}$	8.1	7.8

As shown in Table 5 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. It should be noted that maximum predicted pollutant concentrations were utilised to represent conditions across the site. This was to ensure a worse case and robust assessment was undertaken.

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.

4.4.1 Construction Phase Sensitive Receptors

Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 6.

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

Table 6 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Residential Receptors	Approximate Number of Ecological Receptors
Less than 20	1 – 10	0
20 - 50	1 – 10	0
50 - 100	10 – 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 7. 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 development via Ashton Old Road.

Table 7 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Residential Receptors	Approximate Number of Ecological Receptors
Less than 20	10 – 100	0
20 - 50	10 – 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 8

Table 8 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The site is predominantly located within a commercial area, undergoing significant regeneration. As such, historical dust generation may have occurred as a result of windblown emissions from regeneration, specifically as a result of construction phase processes.

Guidance	Comment
The likelihood of concurrent dust generating activity on nearby sites.	A review of the MCC Planning Portal indicated that there are large-scale planning application within 500m of the site. There is therefore the potential for concurrent dust generation as a result of construction of the site.
Pre-existing screening between the source and the receptors	There is sparse vegetation present along the eastern and western boundaries of the site. As such pre-existing 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 of the development, as shown in Figure 5 within Appendix I. As such, properties to the north 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 the duration of the construction phase is unknown but considering the 2021 opening year it is likely to extend over a few years.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline

4.4.2 Operational Phase Sensitive Receptors

Receptors sensitive to potential operational phase road vehicle exhaust emissions and energy emissions impacts were identified from a desk-top study and are summarised in Table 9. Respective heights were modelled to reflect a worst case exposure from road vehicle emissions (1.5m) and energy emissions as well as potential impacts from the energy centre upon the proposed development itself at the highest applicable floor level or equal to level 3 of the proposed development 13.9 m.

Table 9 Existing Sensitive Human Receptors

Receptor		NGR (m)		Height (m)
		X	Y	
R1	707 Ashton Old Road	387439.2	397508.2	1.5
R2	707 Aston Old Road	387469.3	397505.5	1.5
R3	713 Ashton Old Road	387495.4	397503	1.5
R4	707 Ashton Old Road	387439.2	397508.2	7.9
R5	707 Aston Old Road	387469.3	397505.5	7.9
R6	713 Ashton Old Road	387495.4	397503	7.9
R7	717 Ashton Old Road	387535.3	397498.9	1.5
R8	721 Ashton Old Road	387559.9	397496.9	1.5

Receptor		NGR (m)		Height (m)
		X	Y	
R9	725 Ashton Old Road	387581.5	397495.1	1.5
R10	729 Ashton Old Road	387607.1	397493.6	1.5
R11	717 Ashton Old Road	387535.3	397498.9	7.9
R12	721 Ashton Old Road	387559.9	397496.9	7.9
R13	725 Ashton Old Road	387581.5	397495.1	4.8
R14	729 Ashton Old Road	387607.1	397493.6	4.8
R15	Bridge College	387355.9	397381.6	1.5
R16	Bridge College	387355.9	397381.6	4.1
R17	8 Churchfield Walk	387249.8	397686.9	1.5
R18	16 Pitman Close	387245.4	397607.6	1.5
R19	Residential - Turning Court	387227	397537.6	1.5
R20	Residential - Turning Court	387224.7	397569.5	1.5
R21	Residential - Wenlock Court	387171.3	396935.3	1.5
R22	17 Bridgend Close	387215.6	396858.9	1.5
R23	13 Dougall Walk	387195.5	396767.7	1.5
R24	22 Lawnson Road	387120.5	396815	1.5
R25	45 Falconwood Way	387001.5	397549.8	1.5

The sensitive receptors identified in Table 9 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 operation 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 - Screening

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 desk-study detailed in Section 3.1 identified a number of highly sensitive receptors within 350m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections.

Reference should be made to Appendix III for details of the relevant IAQM[5] construction phase assessment criteria, which were utilised in conjunction with site specific information.

5.1.1 Step 2A – Magnitude

The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Appendix III, with the outcome of Step 2A is summarised below in Table 10.

Earthworks

The proposed development site is estimated to cover an approximate area of 8,900m^2. Based on this information the magnitude of potential dust emissions related to earthwork activities is therefore considered ***medium***.

Construction

The proposals comprise the construction of a mixed use development to include a theatre, specialised studios restaurant and beauty salon. Given the scale of the development, the total building volume is likely to be between 25,000 m^3 and 100,000m^3. The magnitude of potential dust emissions related to construction activities is therefore considered ***medium***.

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 to 100m. The magnitude of potential dust emissions from trackout is therefore ***medium***.

Table 10 Dust Emission Magnitude

Magnitude of Activities		
Earthworks	**Construction**	**Trackout**
Medium	Medium	Medium

5.1.2 Step 2B – Sensitivity

The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Dust Soiling

As shown in Table 6 and Table 7, the desk top study indicated are approximately ***1 - 10*** sensitive receptors within 20m of the proposed development boundary, and ***10 - 100*** within 20m of the anticipated trackout routes. Based on the assessment criteria detailed in Appendix III, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be ***medium*** for earthworks and construction activities and **high** for trackout activities. This is because users would expect to enjoy a reasonable level of amenity and residents would be expected to be present for extended periods of time.

Human Health

The annual mean concentration of PM_{10} is less than 24 µg/m^3 as detailed in Table 5. Given the presence of ***1 - 10*** sensitive receptors within 20m of the proposed development boundary, and ***10 – 100*** within 20m of the anticipated trackout routes. Based on the assessment criteria detailed in Appendix III, the area is considered to be of ***low*** sensitivity for all construction phase activities.

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.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria detailed in Appendix III is summarised in Table 11

Table 11 Sensitivity of the Surrounding Area

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

5.1.3 Step 2C – Risk

Both the magnitude and sensitivity factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

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. A summary of the risk from each dust generating activity is provided in Table 12.

Table 12 Summary of Potential Unmitigated Dust Risks

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

5.1.3 Step 3 – Mitigation

The IAQM guidance[5] 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 13. The mitigation measures outlined in Table 13 can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

Table 13 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 • Hold regular liaison meetings with other high-risk construction sites that are within 500m of the site boundary. Ensuring plans are co-ordinated and dust and particulate matter emission are minimised
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 actives are for an extensive period

Issue	Control Measure
	• 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 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	• Avoid bonfires and burning of waste material
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 • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust
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 – Residual Impacts

Assuming the relevant mitigation measures outlined in Table 13 are implemented, the residual effect from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance[5].

5.2 Operational Phase Assessment

The development has the potential to impact on existing air quality as a result of on-site energy generating activities, as well as exposing future users to elevated pollutant levels. 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.

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

5.2.1 Nitrogen Dioxide

Predicted Concentrations at the Development Site

Annual mean NO_2 concentrations were predicted across the development for the 2021 DS scenario at the following building heights to represent exposure in 2021 across the ground and first floor level of the proposed building:

- Ground floor Level (1.5m); and
- Third Floor Level (13.9m).

Reference should be made to Figures 7 and 8 for a graphical representation of contour plots for predicted 2021 annual mean NO_2 concentrations. It should be noted that exact floor heights were not available during the preparation of the chapter. As such, heights were estimated utilising digital plans provided by the client and subsequently provide an accurate representation of pollutant exposure across each floor level.

Predicted annual mean NO_2 concentrations across the development site during the DS scenario are summarised in Table 14.

Table 14 Modelling Results - Annual Mean NO_2

Floor Level	Predicted 2021 Annual Mean NO_2 Concentration Range (µg/m^3)
Ground (1.5m)	23.33 – 36.69
Third Floor (13.9m)	23.15 – 24.46

The predicted concentrations shown in Table 14 indicate that there were no exceedances of the annual mean AQO at the ground floor. Reference should be made to Figure 7 and 8 for a graphical representation of predicted concentrations across the assessment extents.

Furthermore Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM (TG16)[2] if annual mean NO_2 concentrations are below 60µg/m^3 then it is unlikely that the 1-hour AQO will be exceeded. As such based on the results

in Table 14, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO_2 across the development site in the opening year scenario.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for the proposed use without the implementation of mitigation techniques to protect future site users from elevated NO_2 concentrations.

Predicted Concentrations at Sensitive Receptors

Annual mean NO_2 concentrations were predicted for 2021 DM and DS scenarios and are summarised in Table 15.

Table 15 Predicted Annual Mean NO_2 Concentrations

Sensitive Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	707 Ashton Old Road	34.03	33.99	-0.04
R2	707 Aston Old Road	34.02	33.98	-0.04
R3	713 Ashton Old Road	33.88	33.85	-0.03
R4	707 Ashton Old Road	27.79	27.79	0.00
R5	707 Aston Old Road	27.70	27.70	0.00
R6	713 Ashton Old Road	27.63	27.63	0.00
R7	717 Ashton Old Road	33.92	33.90	-0.02
R8	721 Ashton Old Road	33.82	33.81	-0.01
R9	725 Ashton Old Road	33.80	33.78	-0.02
R10	729 Ashton Old Road	33.46	33.44	-0.02
R11	717 Ashton Old Road	27.55	27.56	0.01
R12	721 Ashton Old Road	27.50	27.52	0.02
R13	725 Ashton Old Road	30.66	30.66	0.00
R14	729 Ashton Old Road	30.49	30.49	0.00
R15	Bridge College	24.99	24.99	0.00
R16	Bridge College	24.93	24.93	0.00
R17	8 Churchfield Walk	31.56	31.54	-0.02
R18	16 Pitman Close	30.28	30.27	-0.01
R19	Residential - Turning Court	38.86	38.81	-0.05
R20	Residential - Turning Court	34.98	34.95	-0.03

Sensitive Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	DS	Change
R21	Residential - Wenlock Court	33.92	33.90	-0.02
R22	17 Bridgend Close	24.58	24.57	-0.01
R23	13 Dougall Walk	24.16	24.15	-0.01
R24	22 Lawnson Road	25.83	25.82	-0.01
R25	45 Falconwood Way	32.03	32.01	-0.02

As indicated in Table 15, annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptor locations. It should be noted that negative changes (reductions) in predicted annual mean concentrations are a result of a net reduction in traffic associated with the development.

Predicted impacts on annual mean NO_2 concentrations are summarised in Table 16.

Table 16 Predicted NO_2 Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	707 Ashton Old Road	-0.10	76-94% of the AQO	Negligible
R2	707 Aston Old Road	-0.11	76-94% of the AQO	Negligible
R3	713 Ashton Old Road	-0.07	76-94% of the AQO	Negligible
R4	707 Ashton Old Road	0.00	75% or Less of the AQO	Negligible
R5	707 Aston Old Road	-0.01	75% or Less of the AQO	Negligible
R6	713 Ashton Old Road	0.01	75% or Less of the AQO	Negligible
R7	717 Ashton Old Road	-0.04	76-94% of the AQO	Negligible
R8	721 Ashton Old Road	-0.04	76-94% of the AQO	Negligible
R9	725 Ashton Old Road	-0.04	76-94% of the AQO	Negligible
R10	729 Ashton Old Road	-0.06	76-94% of the AQO	Negligible
R11	717 Ashton Old Road	0.03	75% or Less of the AQO	Negligible
R12	721 Ashton Old Road	0.06	75% or Less of the AQO	Negligible
R13	725 Ashton Old Road	0.01	76-94% of the AQO	Negligible
R14	729 Ashton Old Road	-0.01	76-94% of the AQO	Negligible
R15	Bridge College	0.00	75% or Less of the AQO	Negligible
R16	Bridge College	0.00	75% or Less of the AQO	Negligible

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R17	8 Churchfield Walk	-0.04	76-94% of the AQO	Negligible
R18	16 Pitman Close	-0.04	75% or Less of the AQO	Negligible
R19	Residential - Turning Court	-0.11	95-102% of the AQO	Negligible
R20	Residential - Turning Court	-0.06	76-94% of the AQO	Negligible
R21	Residential - Wenlock Court	-0.04	76-94% of the AQO	Negligible
R22	17Bridgenf Close	-0.02	75% or Less of the AQO	Negligible
R23	13 Dougall Walk	-0.02	75% or Less of the AQO	Negligible
R24	22 Lawnson Road	-0.02	75% or Less of the AQO	Negligible
R25	45 Falconwood Way	-0.05	76-94% of the AQO	Negligible

As indicated in Table 16, impacts on annual mean NO_2 concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all 24 receptor locations considered. It is therefore considered that the overall impacts as a result of the proposed development are **not significant.** Further justifications are discussed in Section 5.2.2.

5.2.2 Impact Significance

The overall significance of operational phase road traffic emission impacts for 2021 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 justifications are provided in Table 17.

Table 17 Overall Road Emissions 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 concentrations were predicted to be **negligible** at all 25 sensitive receptors locations considered. These represent worst-case locations and therefore it is considered that overall balance on air quality impacts as a result of the Proposed Development is deemed **not significant.**
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	The proposed development will not result in any new exposure to pollutant concentrations above the AQOs at sensitive locations and as such no new exposure has been introduced.

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: ▶ -0.11% to 0.06% for NO_2, Negative changes in concentrations were as a result of a net reduction in traffic associated with the proposed development. Resultant impacts were subsequently predicted to be **negligible** at all receptor locations considered.
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 NO_2 across the local road networks within the modelling extents. There were no exceedances of the annual mean AQOs at sensitive uses for NO_2 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 AQOs for NO_2, at any sensitive receptor location within the modelling extent

6. CONCLUSION

REC Ltd was commissioned by The Manchester College to undertake an Air Quality Assessment in support of a proposed development as part of the Openshaw Campus for Manchester College.

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.

The dispersion modelling results indicated that pollutant levels at sensitive locations across the site were below the relevant AQOs. The location is therefore considered suitable for the proposed use without the inclusion of mitigation methods to protect future users from poor air quality

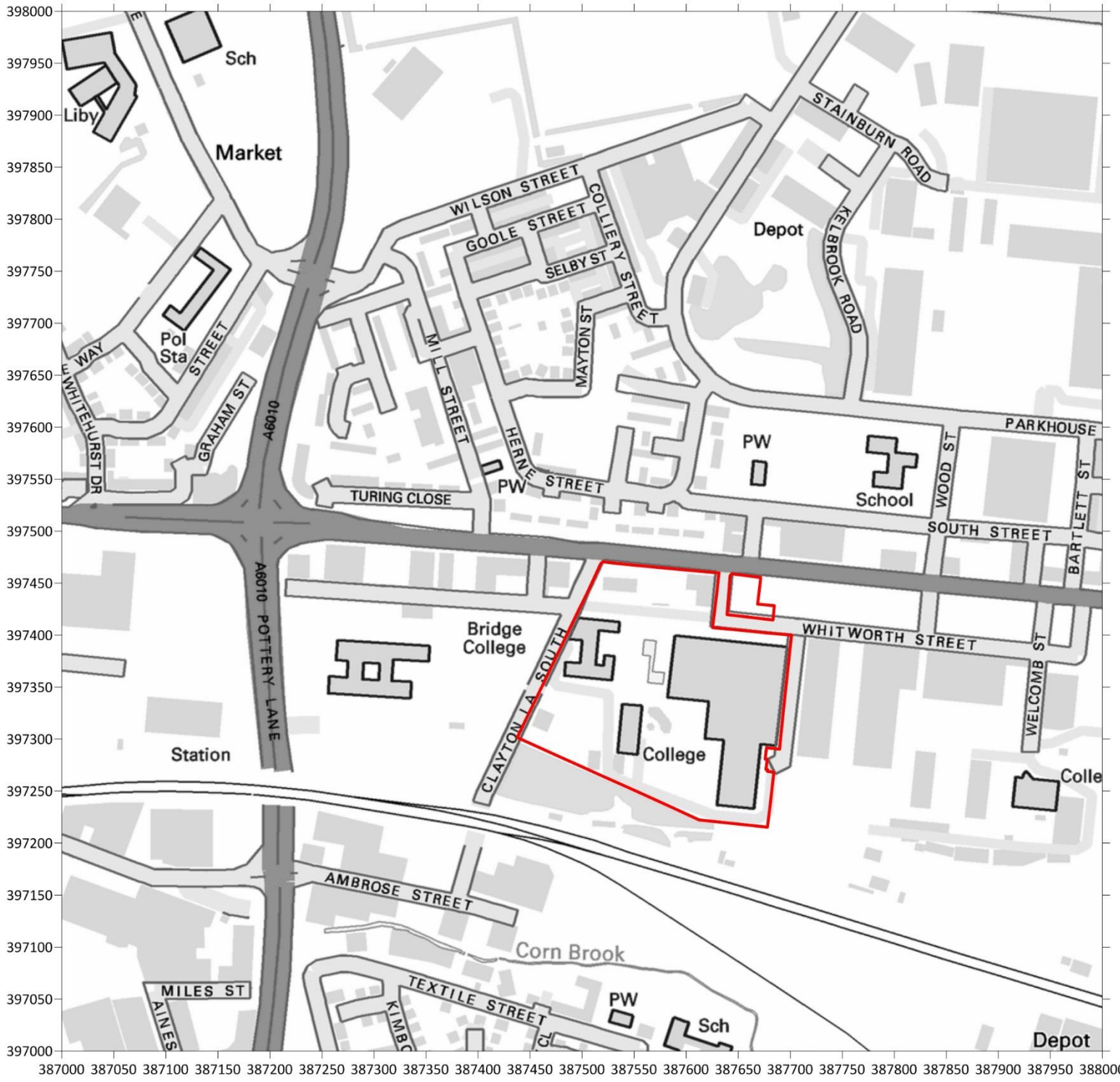
Predicted impacts on annual mean NO_2, concentrations as a result of operational phase energy emissions were predicted to be **negligible** at all 25 sensitive receptor locations considered within the vicinity of the site. The overall significance of potential impacts was determined to be **not significant**, in accordance with the EPUK and IAQM guidance. Furthermore, since there is a net reduction in traffic associated with the proposed development, potential impacts were shown to have non-significant, beneficial impacts.

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

7. 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
DMRB	Design Manual for Roads and Bridges
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
z_0	Roughness Length

APPENDIX I - FIGURES



Legend

Site Boundary

Title

Figure 1

Site Location

Project

Air Quality Assessment
Manchester College, Openshaw Campus

Project Number

AQ107786

Client

The Manchester College

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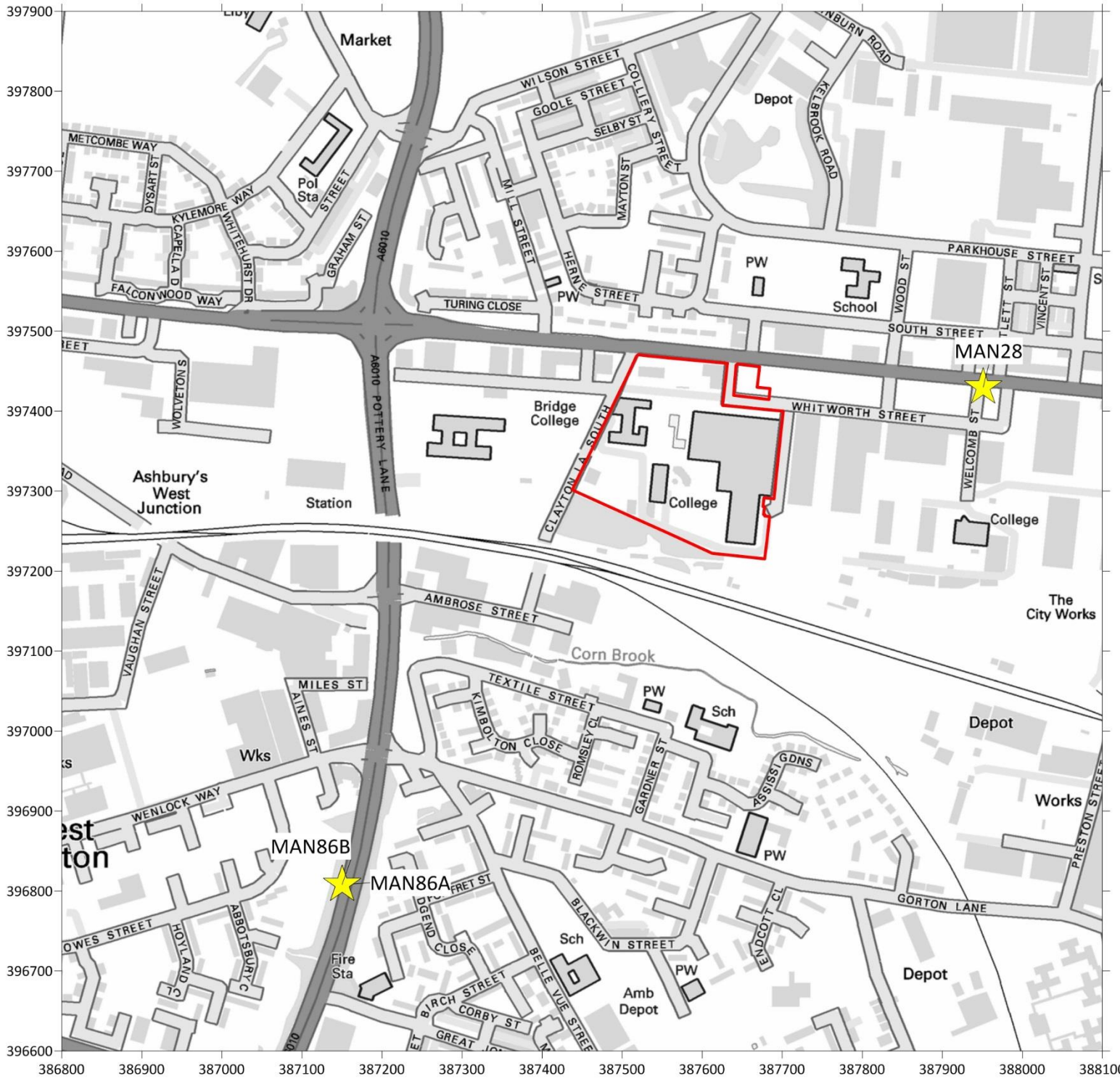

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Site Boundary

Diffusion Tube Monitoring Locations

Title

Figure 2

Diffusion Tube Monitoring Locations

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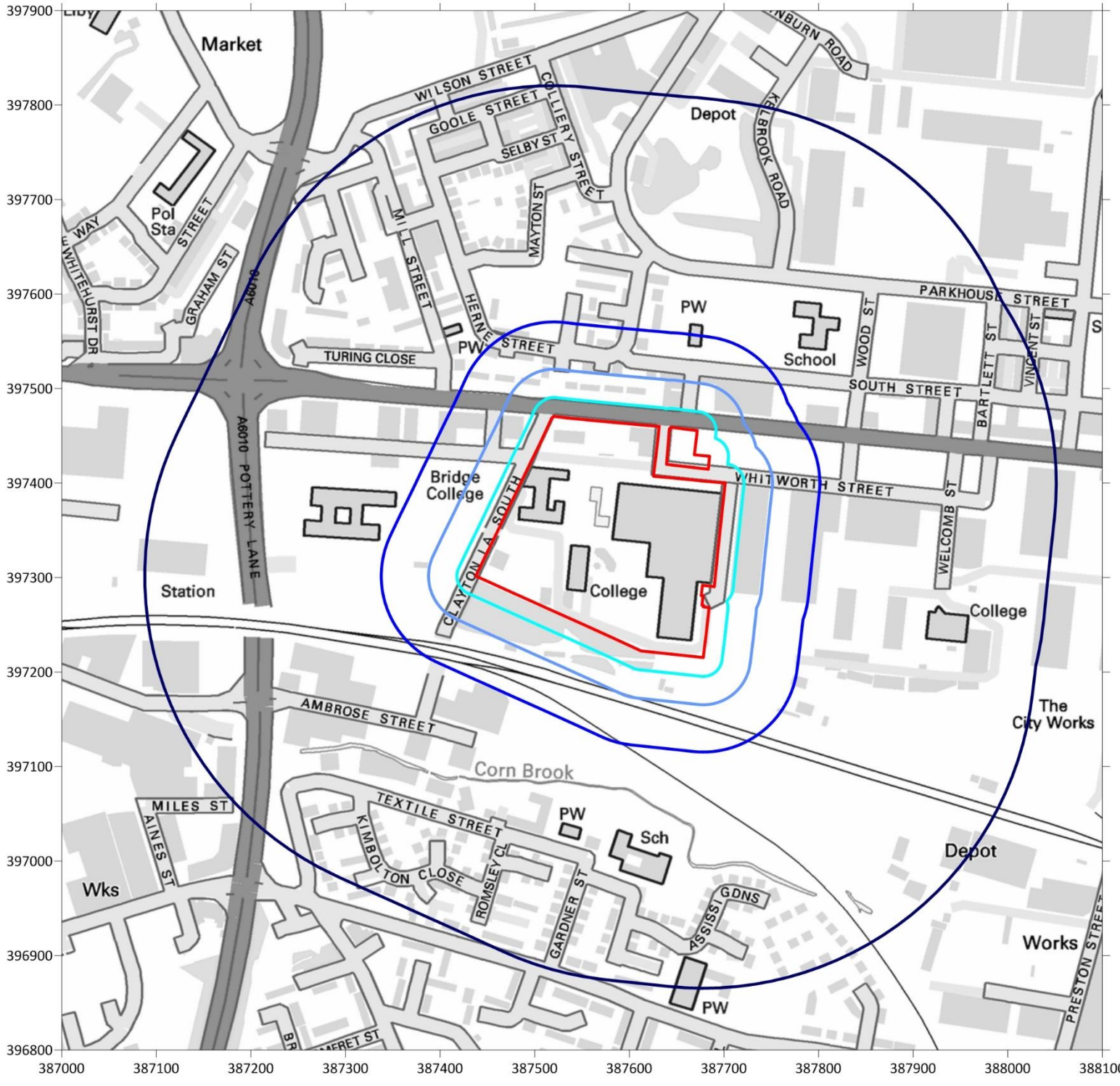

Legend

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

Title

Figure 3

Demolition, Earthworks and Construction Dust Buffer Zones

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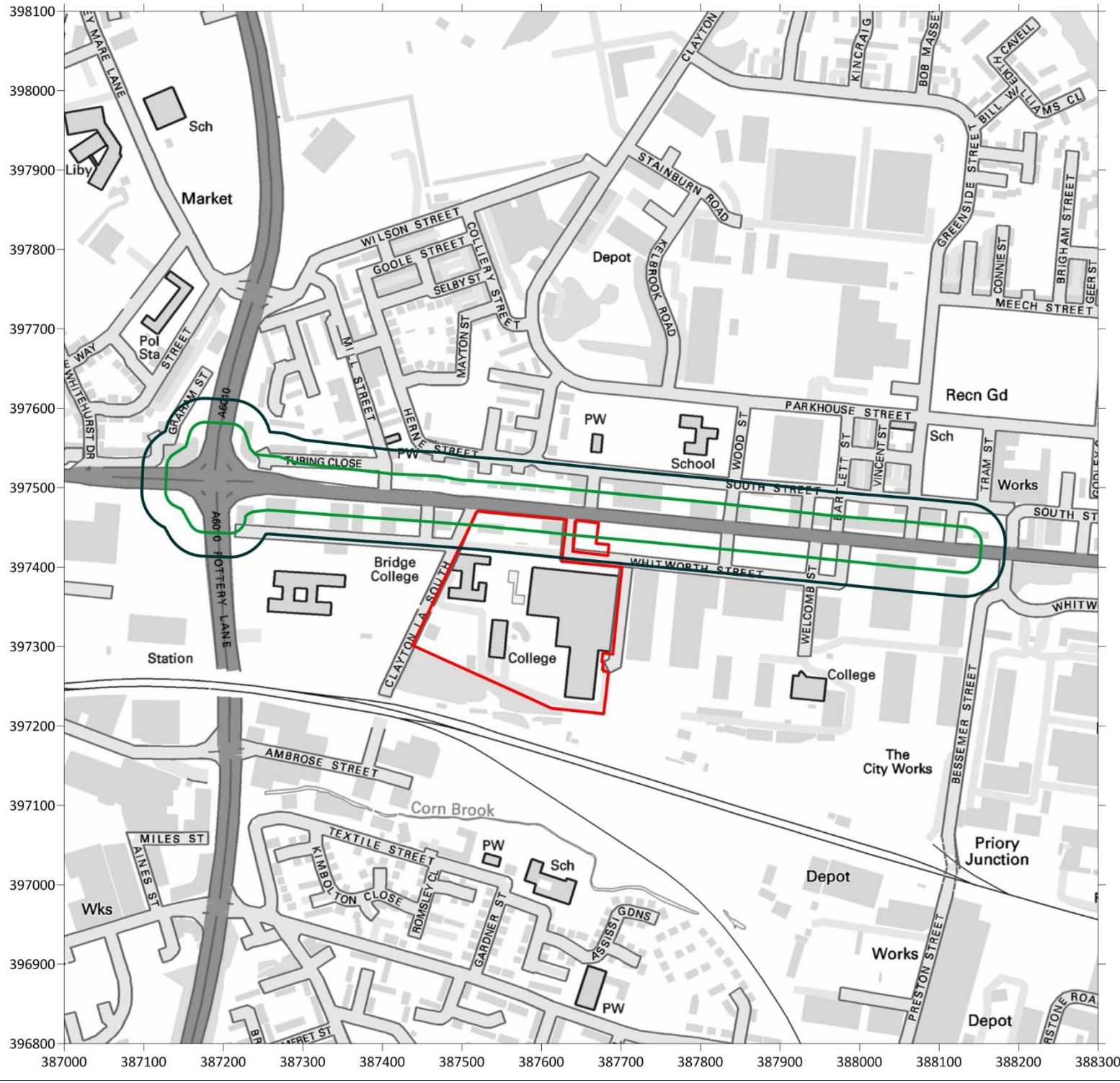

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Figure 4

Trackout Dust Buffer Zones

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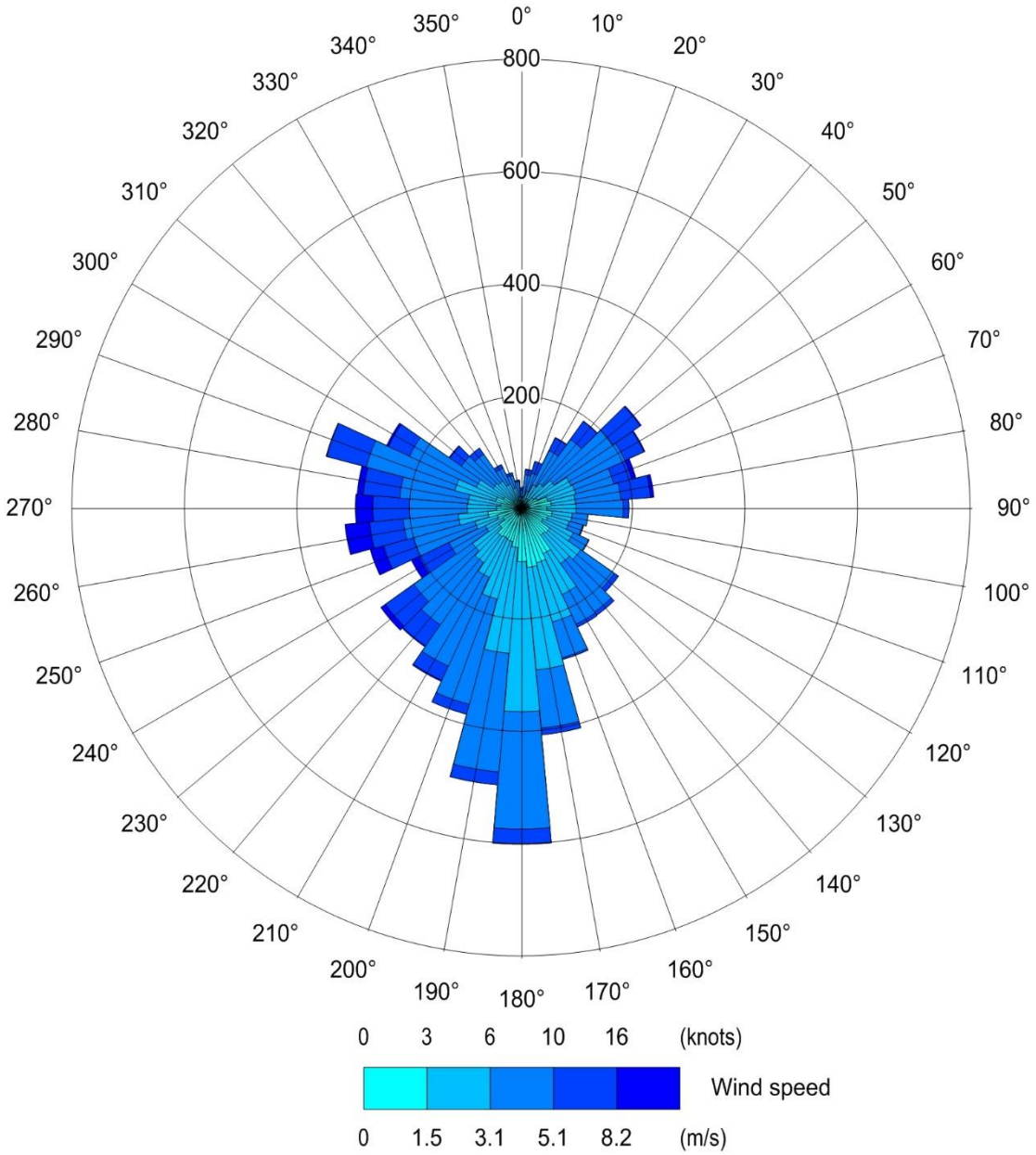

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Figure 5

Wind Rose Manchester Airport 2018
Meteorological Station

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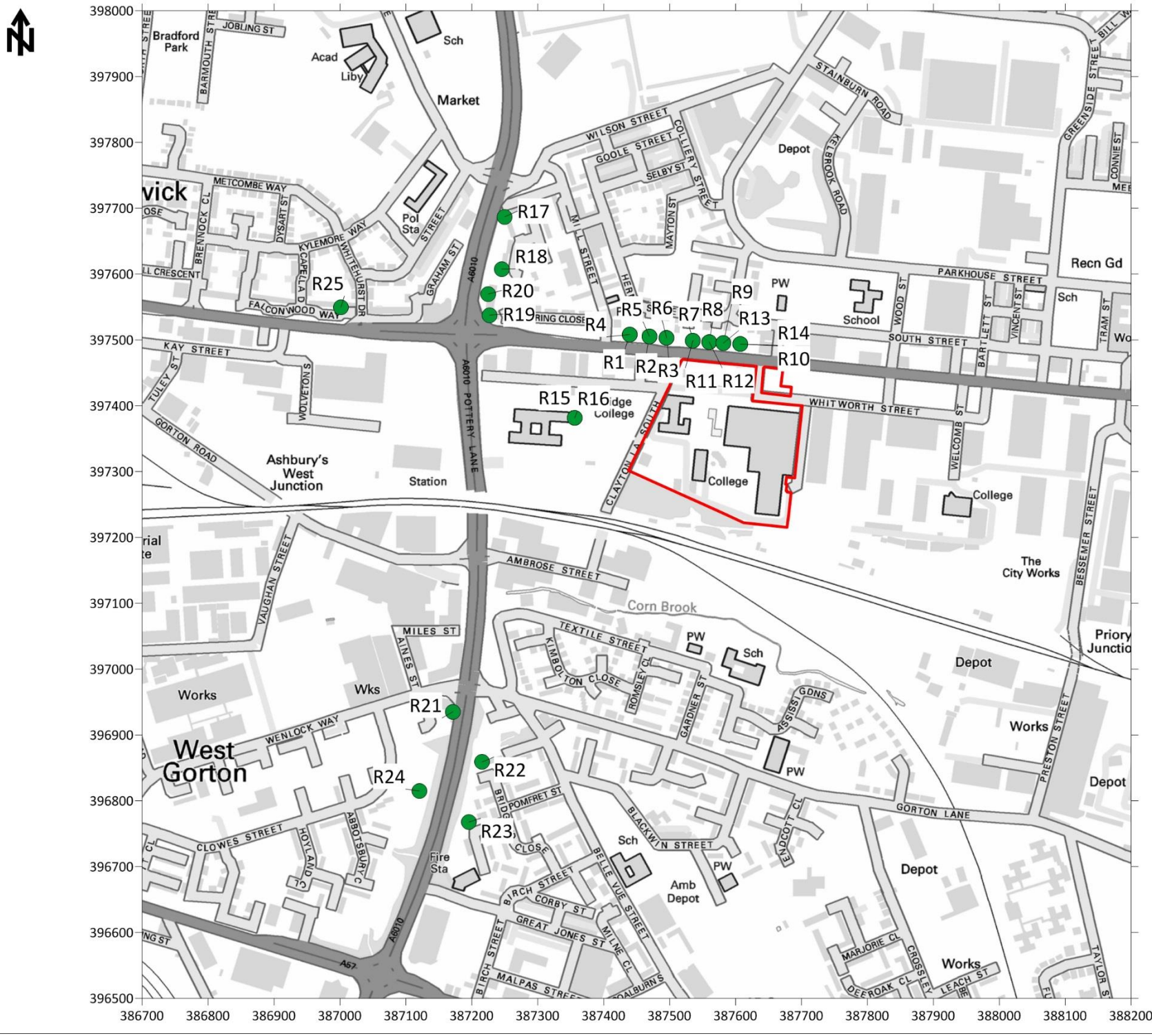

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Site Boundary

Sensitive Receptor Locations

Title

Figure 6

Sensitive Receptor Locations

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Manchester College, Openshaw Campus

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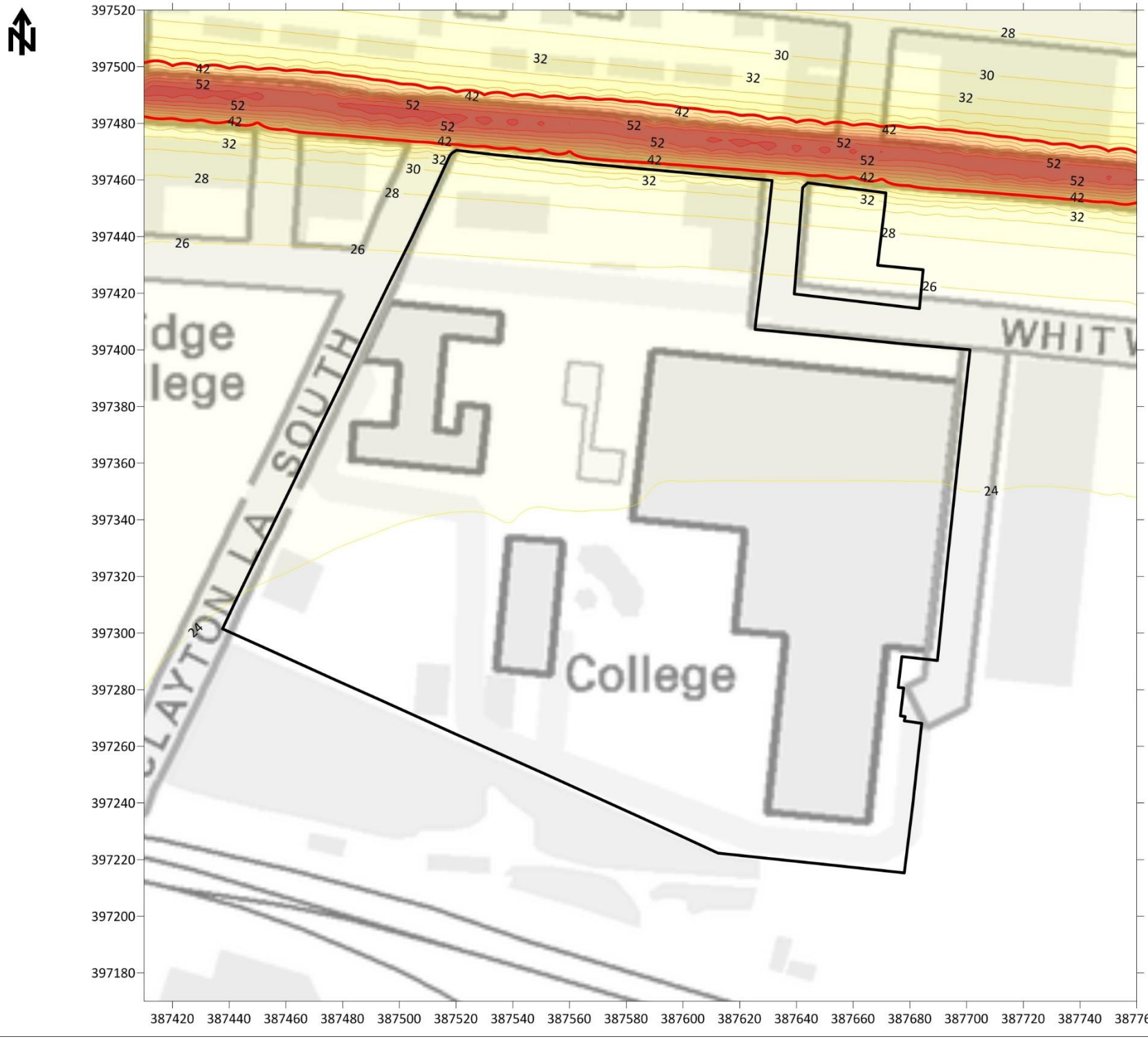

Legend

Site Boundary

Predicted Annual Mean NO_2 Concentration (µg/m³)

56.0
54.0
52.0
50.0
48.0
46.0
44.0
42.0
40.0
38.0
36.0
34.0
32.0
30.0
28.0
26.0
24.0
22.0

Title

Figure 7

Predicted Annual Mean NO_2 Concentrations (µg/m³) 2021 DS

Height: (z=1.5m)

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Air Quality Assessment
Manchester College, Openshaw Campus

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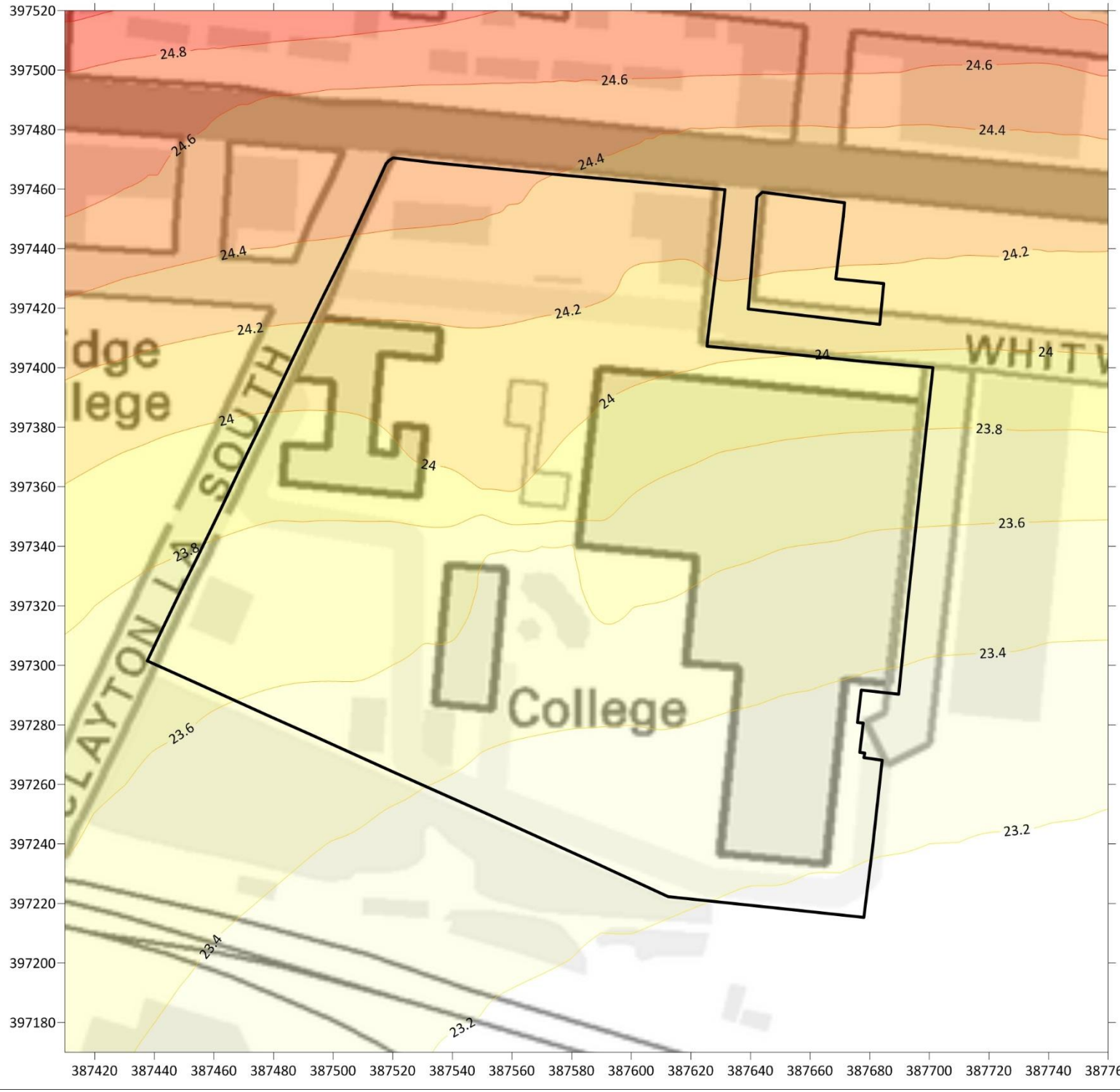

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Site Boundary

25.2
25.0
24.8
24.6
24.4
24.2
24.0
23.8
23.6
23.4
23.2
23.0

Predicted Annual Mean NO_2 Concentration (µg/m³)

Title

Figure 8

Predicted Annual Mean NO_2 Concentrations (µg/m³) 2021 DS

Height: (z=13.9m)

Project

Air Quality Assessment
Manchester College, Openshaw Campus

Project Number

AQ107786

Client

The Manchester College

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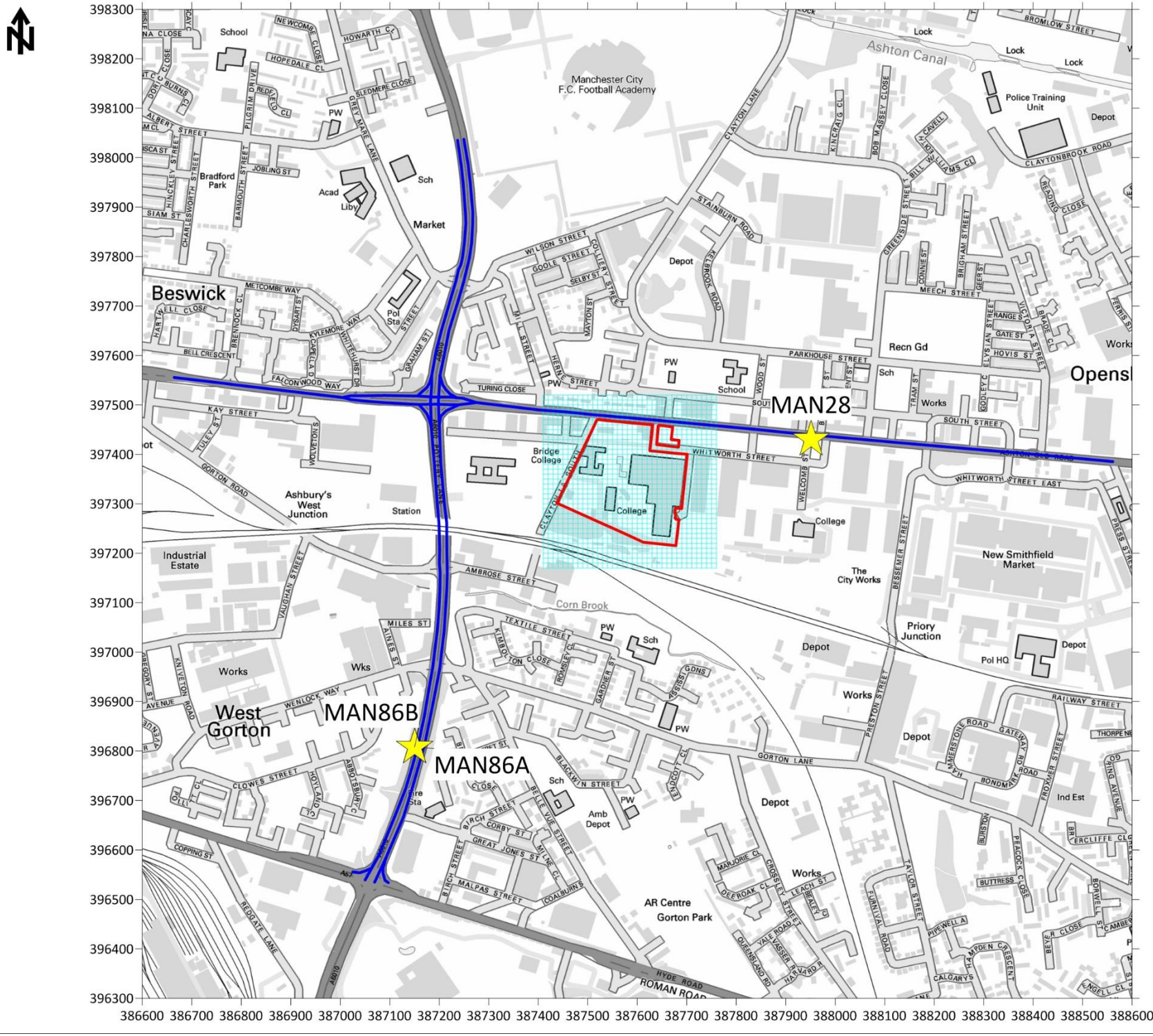

Legend

- Site Boundary
- Modelled Road Link
- Cartesian Grid
- Diffusion Tube Monitoirng Location

Title

Figure 9

ADMS-Roads Input

Project

Air Quality Assessment
Manchester College, Openshaw Campus

Project Number

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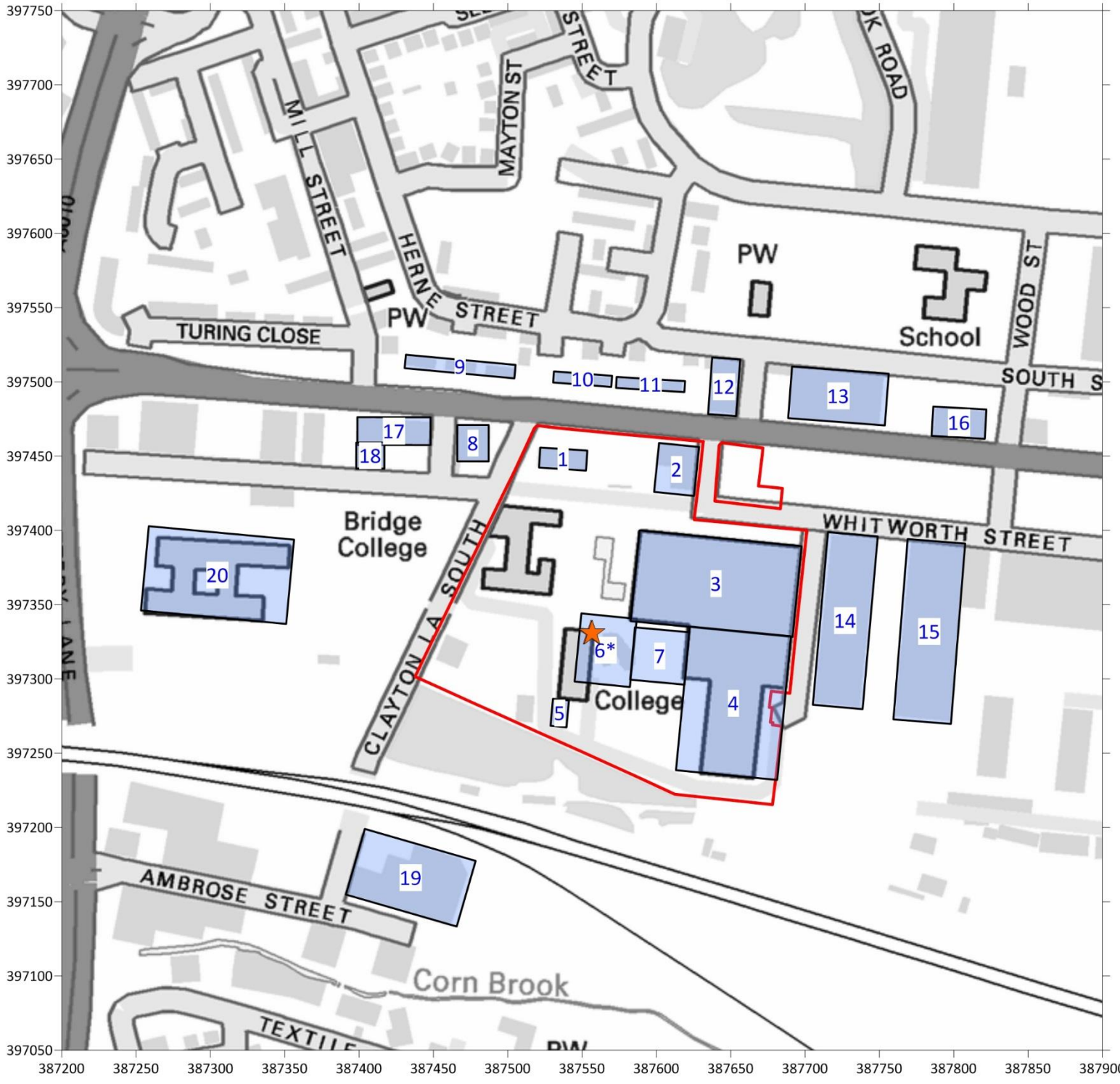

Legend

- Site Boundary
- Proposed Boiler Locations
- Modelled Building Locations

Title

Figure 10

ADMS- 5 Inputs

Project

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APPENDIX II - ASSESSMENT INPUTS

Assessment Inputs

The proposed development has the potential to introduce future site users to poor air quality, as well as the potential to cause impacts during the construction and operational phases of the development. Dispersion modelling using ADMS Roads was therefore undertaken to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site and at sensitive locations both with and without the development in place, to consider potential impacts and assess site suitability for the proposed end-use.

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: 387410, 397170 to 397520, and 399370 at height of 1.5m to represent the ground floor level and height of 6.6m to represent the first floor.

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

It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.

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 SK Transport Planning Ltd, 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 to 2018 which was used to represent the baseline year scenario. 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.

Reference should be made to Figure 6 within Appendix I for a graphical representation of the road link locations.

A summary of the traffic data used in the verification scenarios is provided in Table AII.1.

Table AII.1 2018 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	13,494	3.7	40
L2	Pottery Lane, Southbound - South of Gorton Lane	6.6	13,494	3.7	40
L3	Gorton Lane Slowdown towards Junction	9.6	13,494	3.7	25
L4	Pottery Lane, Northbound, South of Gorton Lane	6.7	13,494	3.7	40
L5	Pottery Lane, Northbound, South of Gorton Lane Slowdown	8.1	13,494	3.7	40
L6	Pottery Lane, Northbound - North of Gorton Lane	6.5	13,494	3.7	30
L9	Junction onto Pottery Lane Northbound	11.0	13,494	3.7	25
L15	Pottery Lane onto Hyde Road	4.4	2,699	3.7	30
L20	A57 onto Pottery Lane	4.1	2,699	3.7	30
L26	Pottery Lane Southbound - South of Ashton Old Road	7.0	13,494	3.7	40
L27	Pottery Lane, Southbound - Slowdown at Ambrose Street	6.9	13,494	3.7	25
L28	Pottery Lane, Northbound - Slowdown at Ambrose Street	9.4	13,494	3.7	25
L29	Pottery Lane, Northbound - North of Ambrose Street	10.7	13,494	3.7	40
L30	Pottery Lane, Northbound - Slowdown at Ashton Old Road	7.5	13,494	3.7	25
L31	Junction Exit onto Pottery Lane North of Ashton Old Road	6.8	13,673	3.7	30
L32	Pottery Lane, Northbound - North of Ashton Old Road	6.1	13,673	3.7	40

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Mean Vehicle Speed (km/h)
L33	Pottery Lane, Southbound - Exit onto Ashton Old Road	7.2	13,494	3.7	30
L34	Pottery Lane Slowdown, onto Junction	7.2	13,673	3.7	25
L35	Pottery Lane, Southbound - North of Ashton Old Road	6.2	13,673	3.7	40
L36	Ashton Old Road, West - Eastbound	8.9	13,748	4.4	30
L37	Ashton Old Road, West - Slowdown	10.7	13,748	4.4	25
L38	Ashton Old Road West, Westbound	7.3	13,748	4.4	35
L39	Ashton Old Road West, Junction Exit	8.2	13,748	4.4	25
L40	Ashton Old Road, East Slowdown	10.1	2,397	4.8	25
L41	Ashton Old Road East - Slowdown	9.8	11,985	4.8	25
L42	Ashton Old Road East onto Pottery Lane Southbound	4.2	2,397	4.8	30
L43	Pottery Lane Northbound onto Ashton Old Road West	4.0	2,699	3.7	30
L44	Ashton Old Road West onto Pottery Lane Northbound	4.6	2,750	4.4	30
L45	Junction Exit onto Ashton Old Road East	7.9	2,735	3.7	30
L46	Ashton Old Road East Junction Exit	7.3	11,985	4.8	25
L47	Pottery Lane onto Ashton Old Road East	4.0	2,735	3.7	30
L48	Ashton Old Road West	11.5	27,496	4.4	40
L50	Ashton Old Road East	11.0	23,969	4.8	40
L50a	Ashton Old Road East - East of the Site	11.0	23,969	4.8	40
L51	Ashton Old Road East, Traffic Lights	11.2	23,969	4.8	15
L52	Ashton Old Road East of Traffic Lights	12.3	23,969	4.8	40
L53	Wilson Street Junction Northbound Slowdown	6.3	13,673	3.7	25
L54	Alan Turing Way Northbound	6.7	13,673	3.7	40
L55	Alan Turing Way Southbound	6.8	13,673	3.7	40
L56	Wilson Street Junction Southbound Slowdown	6.3	13,673	3.7	25

The road width, height and mean vehicle speed shown in Table AII.1 remained the same for the 2021 scenarios.

A summary of the 2021 traffic data is shown in Table AII.2.

Table AII.2 2021 Traffic Data

Road Link		DM		DS		Change
		24-hour AADT Flow	HDV Prop (%)	24-hour AADT Flow	HDV Prop (%)	
L1	Pottery Lane, Southbound - North of Gorton Lane	14,149	3.7	14,117	3.7	-32
L2	Pottery Lane, Southbound - South of Gorton Lane	14,149	3.7	14,117	3.7	-32
L3	Gorton Lane Slowdown towards Junction	14,149	3.7	14,117	3.7	-32
L4	Pottery Lane, Northbound, South of Gorton Lane	14,149	3.7	14,117	3.7	-32
L5	Pottery Lane, Northbound, South of Gorton Lane Slowdown	14,149	3.7	14,117	3.7	-32
L6	Pottery Lane, Northbound - North of Gorton Lane	14,149	3.7	14,117	3.7	-32
L9	Junction onto Pottery Lane Northbound	14,149	3.7	14,117	3.7	-32
L15	Pottery Lane onto Hyde Road	2,830	3.7	2,823	3.7	-6
L20	A57 onto Pottery Lane	2,830	3.7	2,823	3.7	-6
L26	Pottery Lane Southbound - South of Ashton Old Road	14,149	3.7	14,117	3.7	-32
L27	Pottery Lane, Southbound - Slowdown at Ambrose Street	14,149	3.7	14,117	3.7	-32
L28	Pottery Lane, Northbound - Slowdown at Ambrose Street	14,149	3.7	14,117	3.7	-32
L29	Pottery Lane, Northbound - North of Ambrose Street	14,149	3.7	14,117	3.7	-32
L30	Pottery Lane, Northbound - Slowdown at Ashton Old Road	14,149	3.7	14,117	3.7	-32
L31	Junction Exit onto Pottery Lane North of Ashton Old Road	14,336	3.7	14,304	3.7	-32
L32	Pottery Lane, Northbound - North of Ashton Old Road	14,336	3.7	14,304	3.7	-32
L33	Pottery Lane, Southbound - Exit onto Ashton Old Road	14,149	3.7	14,117	3.7	-32

Road Link		DM		DS		Change
		24-hour AADT Flow	HDV Prop (%)	24-hour AADT Flow	HDV Prop (%)	
L34	Pottery Lane Slowdown, onto Junction	14,336	3.7	14,304	3.7	-32
L35	Pottery Lane, Southbound - North of Ashton Old Road	14,336	3.7	14,304	3.7	-32
L36	Ashton Old Road, West - Eastbound	14,415	4.4	14,383	4.5	-33
L37	Ashton Old Road, West - Slowdown	14,415	4.4	14,383	4.5	-33
L38	Ashton Old Road West, Westbound	14,415	4.4	14,383	4.5	-33
L39	Ashton Old Road West, Junction Exit	14,415	4.4	14,383	4.5	-33
L40	Ashton Old Road, East Slowdown	2,513	4.8	2,494	4.9	-19
L41	Ashton Old Road East - Slowdown	12,566	4.8	12,469	4.9	-97
L42	Ashton Old Road East onto Pottery Lane Southbound	2,513	4.8	2,494	4.9	-19
L43	Pottery Lane Northbound onto Ashton Old Road West	2,830	3.7	2,823	3.7	-6
L44	Ashton Old Road West onto Pottery Lane Northbound	2,883	4.4	2,877	4.5	-7
L45	Junction Exit onto Ashton Old Road East	2,867	3.7	2,861	3.7	-6
L46	Ashton Old Road East Junction Exit	12,566	4.8	12,469	4.9	-97
L47	Pottery Lane onto Ashton Old Road East	2,867	3.7	2,861	3.7	-6
L48	Ashton Old Road West	28,830	4.4	28,765	4.5	-65
L50	Ashton Old Road East	25,132	4.8	24,938	4.9	-194
L50a	Ashton Old Road East - East of the Site	25,132	4.8	25,068	4.8	-64
L51	Ashton Old Road East, Traffic Lights	25,132	4.8	24,938	4.9	-194
L52	Ashton Old Road East of Traffic Lights	25,132	4.8	25,068	4.8	-64
L53	Wilson Street Junction Northbound Slowdown	14,336	3.7	14,304	3.7	-32
L54	Alan Turing Way Northbound	14,336	3.7	14,304	3.7	-32
L55	Alan Turing Way Southbound	14,336	3.7	14,304	3.7	-32
L56	Wilson Street Junction Southbound Slowdown	14,336	3.7	14,304	3.7	-32

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 9.0.1) released in 2018, 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, 2018 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

It should be noted that PM_{10} emission factors were calculated using the Emission Factor Toolkit (version 9.0.1) for the 2018 Verification scenario and the 2021 DM and DS scenarios.

Meteorological Data

Meteorological data used in this assessment was taken from Manchester Airport Meteorological station over the period 1st January 2018 to 31st December 2018 (inclusive). Manchester Airport Meteorological station is located at approximate NGR: 381745, 383960 which is approximately 14.5km South 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 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, 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 the nature of the assessment area and is suggested within ADMS-Roads as being suitable for ‘cities and large towns'.

A Monin-Obukhov length of 30m was used to represent the meteorological station location and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Background Concentrations as predicted by DEFRA, as detailed in Table 5, have been used in the dispersion modelling assessment to represent annual mean background concentrations in the vicinity of the site.

Table AII.3 displays the specific background concentrations as predicted by DEFRA, utilised to represent the condition at the monitoring locations used within the verification process.

Table AII.3 Predicted Background Pollutant Concentrations for Diffusion Tubes

Monitoring Location		DEFRA Grid Square	Pollutant	2018 Predicted Background Concentration (µg/m^3)
Mann 28	Ashton Old Road	384500, 398500	NO_x	34.22
			NO_2	22.38
Man 86	A6010 Pottery Lane	387500, 396500	NOx	29.91
			NO_2	20.12

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	2018 Predicted Background Concentration (µg/m^3)
387500, 397500	R1 – R20, R25	NO_x	34.22
		NO_2	22.38
387500, 396500	R21 – R24	NO_x	29.91
		NO_2	20.12

Similar to emission factors, background concentrations for 2018 were utilised in preference to predicted background concentrations for the development opening years. 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 2018, using traffic data, meteorological data and monitoring results from this year.

MCC undertakes monitoring of NO_2 concentrations at 2 location suitable for verification purposes 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 dispersion model was run with the traffic input data previously detailed for 2018 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

ID	Monitoring Location	Modelled Road NO_x Concentration ($\mu g/m^3$)	Monitored Road NO_x Concentration ($\mu g/m^3$)	Difference (%)
MAN 28	Ashton Old Road	14.79	30.96	52.22
MAN 86	A6010 Pottery Lane	16.12	24.13	33.21

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 **1.7696** was required to be applied to all NOx modelling results. This verification factor shows that the model underestimated pollutant concentrations

Graph 1 – Verification Adjustment Factor

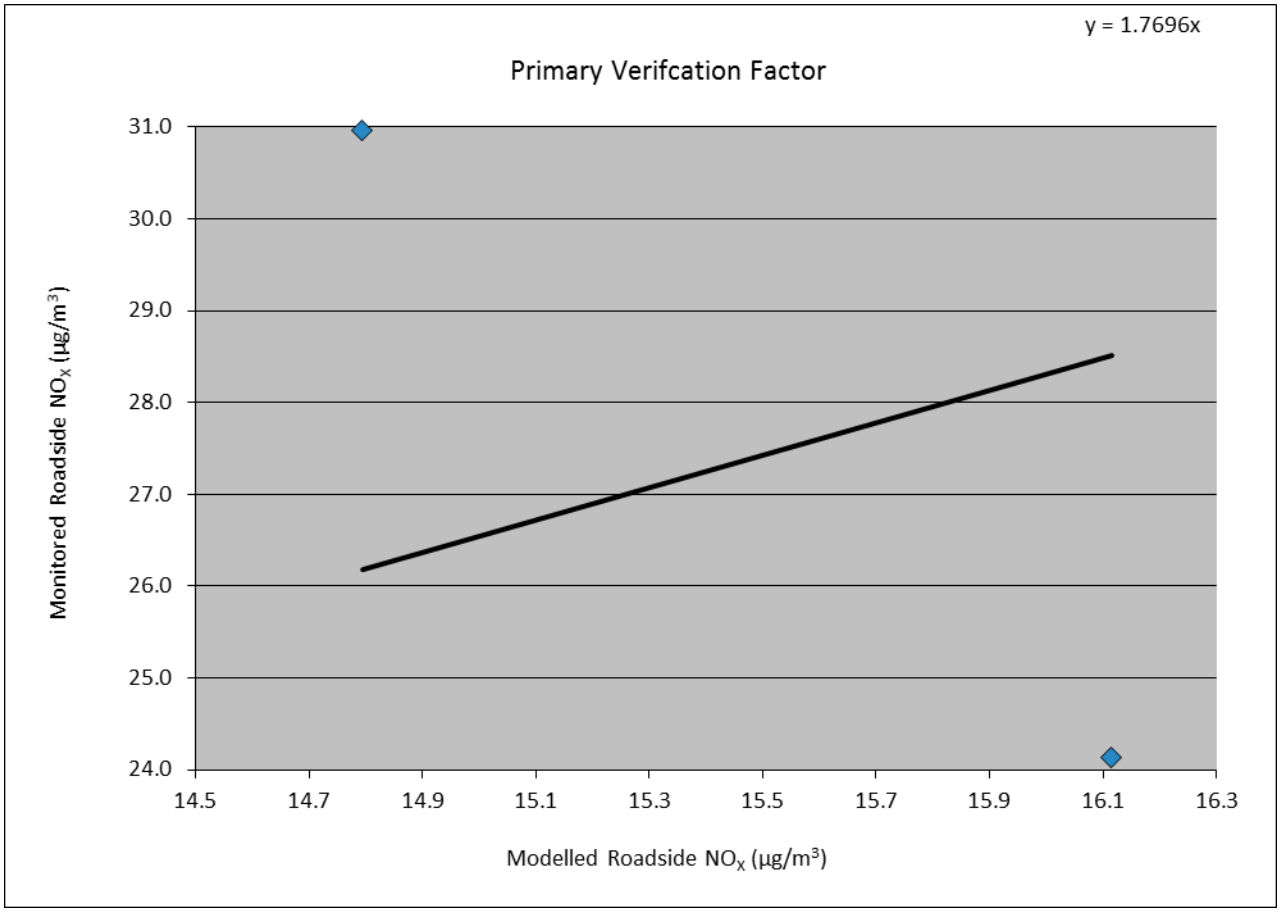

Table AII.6 presents the monitored annual mean NO_x concentrations and the adjusted modelled total NO_2 concentration based on the above verification factor. Exceedances of the relevant AQO are highlighted in **bold.**

Table AII.6 2018 NO_2 Monitoring Results

ID	Monitoring Location	Monitored NO_2 Concentration (µg/m³)	Adjusted Modelled Total NO_2 Concentration (µg/m³)	Difference (%)
MAN 28	Ashton Old Road	**37.10**	34.97	5.66
MAN 86	A6010 Pottery Lane	31.90	33.90	-6.27

APPENDIX III CONSTRUCTION PHASE ASSESSMENT CRITERIA

CONSTRUCTION PHASE METHODOLOGY

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'[8].

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

- Demolition
- 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} and $PM_{2.5}$.

The assessment steps are detailed below.

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.

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 (Step 2B).

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

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table AIII.1.

Table AIII.1 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 50,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities greater than 20m above ground level
	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	Demolition	• Total building volume 20,000m^3 to 50,000m^3 • Potentially dusty construction material • Demolition activities 10m to 20m above ground level
	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	Demolition	• Total building volume under 20,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities less than 10m above ground level • Demolition during wetter months
	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 AIII.2.

Table AIII.2 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

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
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 AIII.3.

Table AIII.3 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

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

Table AIII.4 outlines the sensitivity of the area to human health impacts.

Table AIII.4 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
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	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

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
Low	-	More than 1	Low	Low	Low	Low	Low

Table AIII.5 outlines the sensitivity of the area to ecological impacts.

Table AIII.5 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 AIII.6 outlines the risk category from demolition activities

Table AIII.6 Dust Risk Category from Demolition

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

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

Table AIII.7 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 AIII.8 outlines the risk category from trackout.

Table AIII.8 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

Step 3

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

Step 4

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'.

APPENDIX IV - 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 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 schol extension near M25

MARYAM MAKANVAND

Graduate Air Quality Consultant

BA, M.Sc.

KEY EXPERIENCE:

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

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- 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.
- Production of air quality mitigation strategies for developments throughout the UK.
- Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- Master of Science

SELECT PROJECTS SUMMARY:

Environmental Impact Assessment:

The Acres, Formby – EIA for a medium scale residential development in close proximity to the A565 Formby Bypass

Campdown, Purbrook – EIA for a large scale residential-led mixed use development in close proximity to the A3 Motorway

North Cheshire Garden Village – EIA for a large mixed use development including 1500 residential dwellings, employment land, a local centre and primary school in close proximity to the A34 and A555

Residential Development:

120 Chigwell Road, South Woodford, London

Air Quality Assessment in support of a proposed development comprising of a 3 storey temporary modular accommodation for homeless households. Concerns were raised as the site was located within the Redbridge AQMA. Subsequently, there were concerns the proposals would introduce future users to poor air quality. Dispersion modelling of road vehicle exhaust emissions was completed using ADMS-Roads to consider site suitability for the proposed end-use. Pollutant concentrations were predicted to be above the air quality standards at sensitive locations across the site and as such mitigation measures were required and referenced. Subject to the inclusion of the relevant mitigation measures, air quality issues were not considered a constraint to planning consent

Commercial Development

Aldi Foodstore, Eridge Road

AQA in support of a proposed Aldi Foodstore with approximately 80 car parking spaces, partially located within Tunbridge Wells AQMA

Mixed Use Development:

Cornbrook, Manchester

Air Quality Assessment in support of a PRS scheme for circa 280 residential units and a hotel. Concerns were raised as the site was located adjacent to the Manchester/Liverpool Diesel railway line. Additionally the site was partially located within the Manchester AQMA.

Rutland Mills, Wakefield Waterfront

Air Quality Assessment in support of a proposed mixed use scheme comprising of a range of uses including commercial, hotel, training and education. Concerns were raised as the site was located within the City of Wakefield AQMA.

Educational Development:

Uphall Primary School, Ilford

AQA for a development to include central boilers on site. The results from the dispersion modelling indicated that overall predicted impacts as a result of the boiler were not significant.

Farnham Campus at the University for the Creative Arts

AQA for a proposed student residential development. Proposals included five accommodation blocks to be served by a central plantroom, including 4 gas boilers and 2 Combined Heat and Power Units. Increases in pollutant concentrations at receptor locations were found to be negligible.

Odour Assessments:

Pitlivie Farm, Carnoustie

Qualitative assessment in support of a fertiliser lagoon.

Monitoring Experience

Co-ordination and management of NO_2 diffusion tube monitoring surveys in accordance with DEFRA guidance.