Technical Note - Crabtree Lane (138914/FO/2023)
Air Quality Review and Appraisal of Updated Site Layout

Date: 16th October 2024

Author: Gabor Antony, MSc, MIAQM; MIEnvSc

Introduction

An Air Quality Assessment has previously been completed for the development proposals which comprised site clearance and demolition of all existing structures on Site to permit redevelopment works which included the construction of 9No. industrial units and all associated external works ('Proposed Development'), at the Former Walkers Site, Crabtree Lane in Clayton, Manchester M11 4GU (the 'Site'). This air quality assessment ('Former Walkers Site, Crabtree Lane Clayton' dated: 18th December 2023) is described in TRC report ref. 572948.0001.r1 (the 'Report').

Following submission of this report, comments from the Local Planning Authority (LPA) have been received in relation to the Air Quality Assessment, to address these, a previous Technical Note (TRC report ref. 572948.tn1; dated: 20th February 2024) has been prepared, as appended to this Technical Note. The Report and the subsequent Technical Note are appended to this Document.

Since the completion of this assessment there has been a change to the design of the proposed development. This comprises of the previous Units 1 to 4 being combined into a single 'Unit 1' with an updated overall footprint as presented in **Figure 1**.
This short technical note summarises the findings of an air quality review to identify the impact of the proposed changes.

Assessment of Design Change

The updated proposed scheme will comprise 6no. industrial units (Use Class E(g)(iii)/ B2/ B8) as well as on-site car parking provision, cycle parking and associated landscaping.
The footprint of the proposed new single Unit 1 remains identical apart from the removal of the inset loading bays in the previous Units 1 and 2.

The original layout allowed for 58no. car parking spaces in total, the update is for the inclusion of 50no. car parking spaces. Correspondingly there is an expected reduction of trip generation associated with the Proposed Development. The daily total trip rates fall from 39 to 36 and 40 to 39 in the AM and PM peaks respectively.

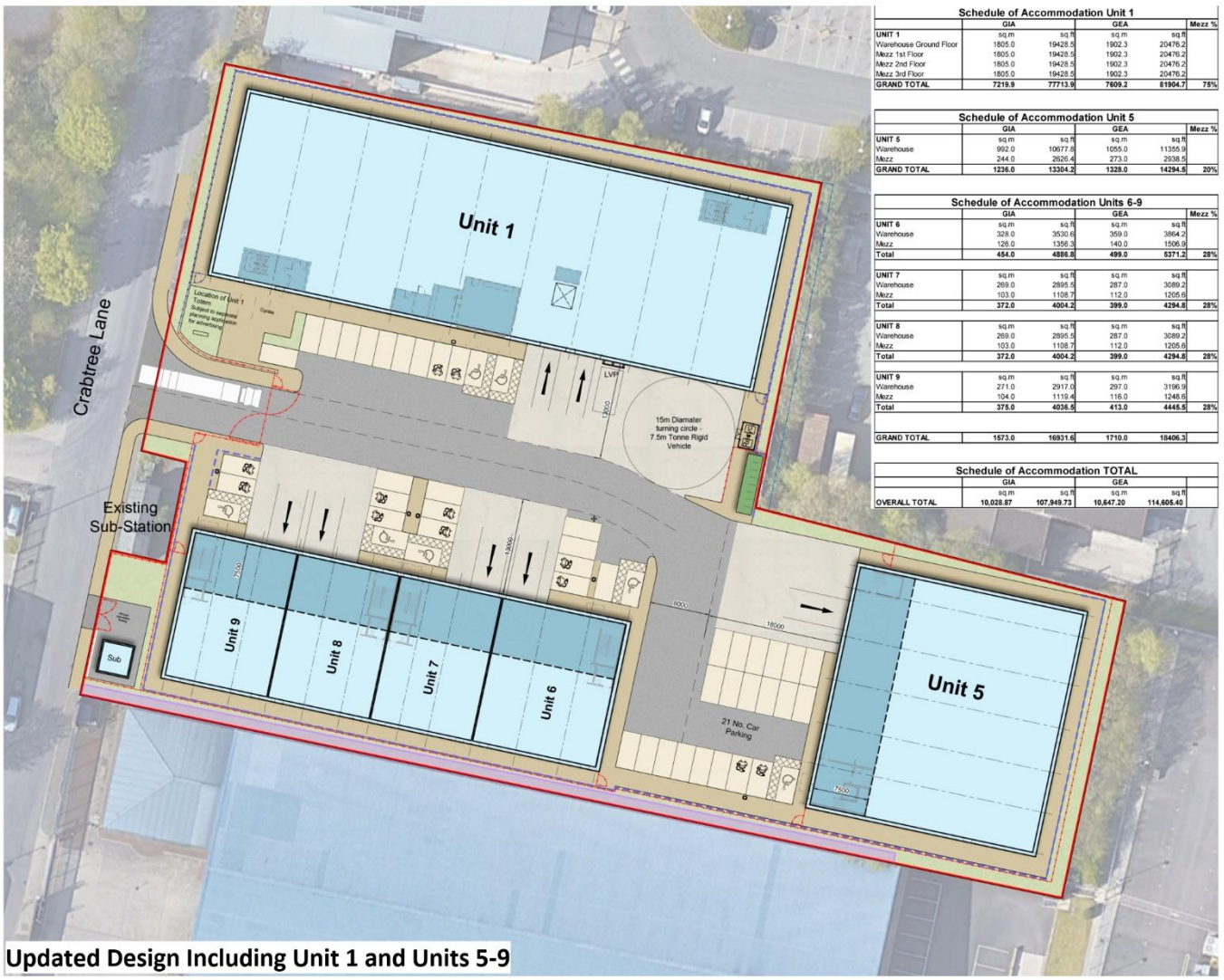
Based on the established reduction in trip generation as a result of the update in the Proposed Development, it considered that the proposed changes to the Site layout are likely to reduce the associated road traffic emissions from the operational trip generation of the scheme. Therefore, the assessment presented in the Report is a robust appraisal of the likely impacts associated with the updated scheme, and as such, the findings of the previous air quality assessment as presented in the Report (dated: 18 December 2023) and the subsequent technical note (dated: 20th February 2024) are considered to remain valid.

Conclusion

An air quality assessment has previously been completed for the development proposals ('Former Walkers Site, Crabtree Lane Clayton' dated: December 2023, TRC report ref. 572948.0001.r1)

It has been established that the changes to the Site layout are likely to result in a reduction in operational phase road traffic emissions of the Proposed Development. It is therefore considered that the findings of the previous air quality assessment and subsequent technical note (as presented in the appendices) remain valid.

Figures



Updated Design Including Unit 1 and Units 5-9

Schedule of Accommodation Unit 1

	GIA		GEA		Mezz %
UNIT 1	sq.m	sq.ft	sq.m	sq.ft	
Warehouse Ground Floor	1805.0	19428.5	1902.3	20476.2	
Mezz 1st Floor	1805.0	19428.5	1902.3	20476.2	
Mezz 2nd Floor	1805.0	19428.5	1902.3	20476.2	
Mezz 3rd Floor	1805.0	19428.5	1902.3	20476.2	
GRAND TOTAL	7219.9	77713.9	7609.2	81904.7	75%

Schedule of Accommodation Unit 5

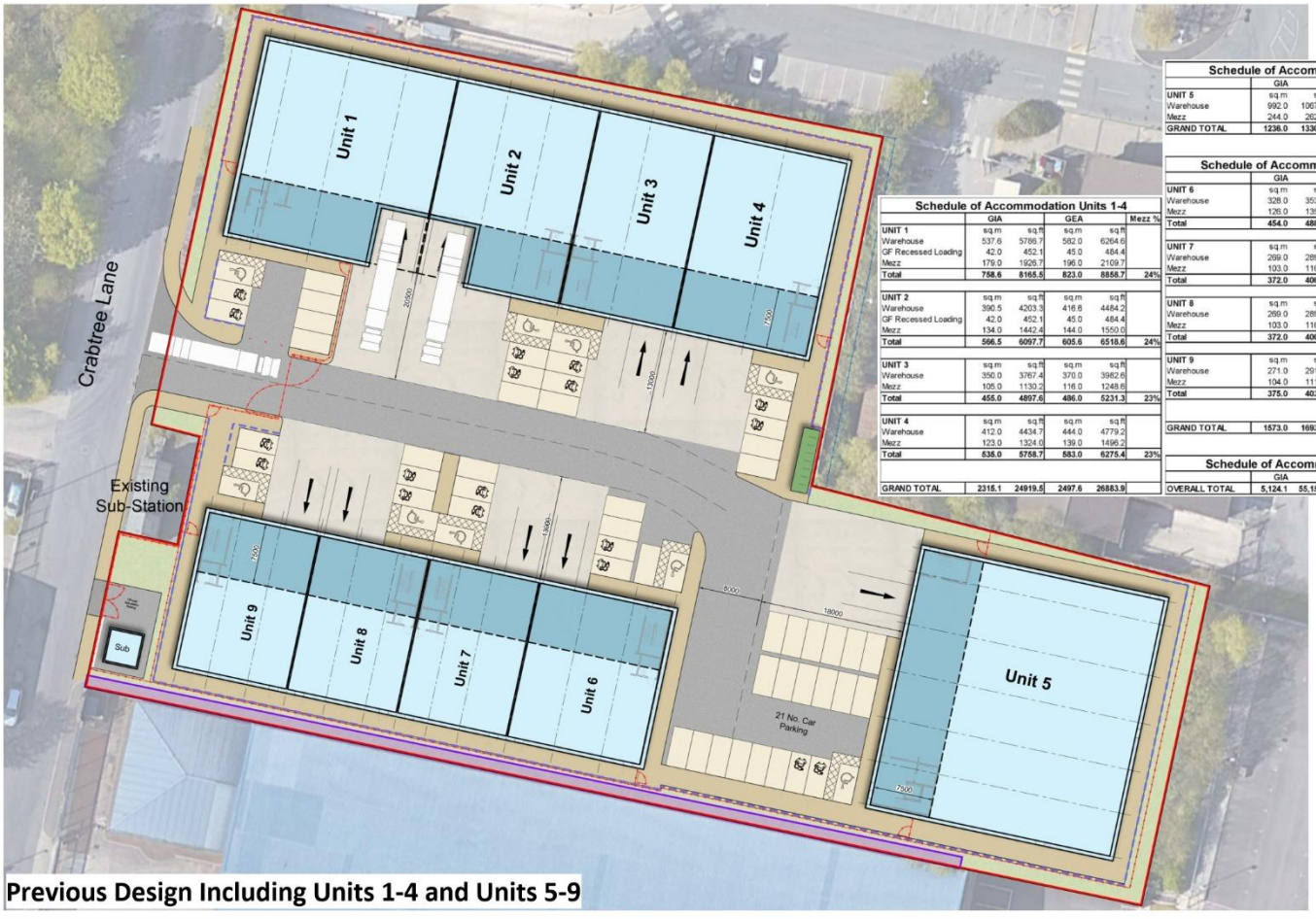
	GIA		GEA		Mezz %
UNIT 5	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	992.0	10677.8	1055.0	11355.9	
Mezz	244.0	2626.4	273.0	2938.5	
GRAND TOTAL	1236.0	13304.2	1328.0	14294.5	20%

Schedule of Accommodation Units 6-9

	GIA		GEA		Mezz %
UNIT 6	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	328.0	3530.6	359.0	3864.2	
Mezz	126.0	1356.3	140.0	1506.9	
Total	454.0	4886.8	499.0	5371.2	28%
UNIT 7	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	269.0	2895.5	287.0	3089.2	
Mezz	103.0	1108.7	112.0	1205.6	
Total	372.0	4004.2	399.0	4294.8	28%
UNIT 8	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	269.0	2895.5	287.0	3089.2	
Mezz	103.0	1108.7	112.0	1205.6	
Total	372.0	4004.2	399.0	4294.8	28%
UNIT 9	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	271.0	2917.0	297.0	3196.9	
Mezz	104.0	1119.4	116.0	1248.6	
Total	375.0	4036.5	413.0	4445.5	28%
GRAND TOTAL	1573.0	16931.6	1710.0	18406.3	

Schedule of Accommodation TOTAL

	GIA		GEA		
	sq.m	sq.ft	sq.m	sq.ft	
OVERALL TOTAL	10,028.87	107,949.73	10,647.20	114,605.40	



Previous Design Including Units 1-4 and Units 5-9

Schedule of Accommodation Units 1-4

	GIA		GEA		Mezz %
UNIT 1	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	537.6	5786.7	582.0	6264.6	
GF Recessed Loading	42.0	452.1	45.0	484.4	
Mezz	179.0	1926.7	196.0	2109.7	
Total	758.6	8165.5	823.0	8858.7	24%
UNIT 2	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	390.5	4203.3	416.6	4484.2	
GF Recessed Loading	42.0	452.1	45.0	484.4	
Mezz	134.0	1442.4	144.0	1550.0	
Total	566.5	6097.7	605.6	6518.6	24%
UNIT 3	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	356.0	3767.4	370.0	3982.6	
Mezz	105.0	1130.2	116.0	1248.6	
Total	455.0	4897.6	486.0	5231.3	23%
UNIT 4	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	412.0	4434.7	444.0	4779.2	
Mezz	123.0	1324.0	139.0	1496.2	
Total	535.0	5758.7	583.0	6275.4	23%
GRAND TOTAL	2315.1	24919.5	2497.6	26883.9	

Schedule of Accommodation Unit 5

	GIA		GEA		Mezz %
UNIT 5	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	992.0	10677.8	1055.0	11355.9	
Mezz	244.0	2626.4	273.0	2938.5	
GRAND TOTAL	1236.0	13304.2	1328.0	14294.5	20%

Schedule of Accommodation Units 6-9

	GIA		GEA		Mezz %
UNIT 6	sq.m	sq.ft	sq.m	sq.ft	
Warehouse	328.0	3530.6	359.0	3864.2	
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Mezz	104.0	1119.4	116.0	1248.6	
Total	375.0	4036.5	413.0	4445.5	28%
GRAND TOTAL	1573.0	16931.6	1710.0	18406.3	

Schedule of Accommodation TOTAL

	GIA		GEA		
OVERALL TOTAL	5,124.1	55,155.3	5,535.6	59,584.6	

TRC

TITLE: Site Location and Assessment Extents

DRAWN BY:	SCALE:	PROJECT NO:
GA	NTS	572948.02.00.04
CHECKED BY:	REVISION:	FIGURE NO:
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DATE: 16th October 2024		

Annexes

Annex A - Technical Note - Former Walkers Site, Crabtree Lane, Manchester Additional Air Quality Information
Date: 20th February 2024 (TRC Ref.: 572948.tn1)

Technical Note - Former Walkers Site, Crabtree Lane, Manchester Additional Air Quality Information

Date: 20th February 2024

Introduction

An air quality assessment has previously been completed for the development proposals which comprised site clearance and demolition of all existing structures on site to permit redevelopment works which comprise the construction of 9No. industrial units and all associated external works ('Proposed Development'), at the Former Walkers Site, Crabtree Lane in Clayton, Manchester M11 4GU (the 'Site'). This air quality assessment ('Former Walkers Site, Crabtree Lane Clayton' dated: December 2023) is described in TRC report ref. 572948.0001.r1 (the 'Report'), as appended to this Technical Note.

Subsequent to the submission of the Planning Application, the following conditions are recommended to be attached to any approval by Manchester City Council:

> a) Prior to commencement of the development, an air quality impact assessment together with any mitigation measures to safeguard local air quality shall be submitted to and approved in writing by the City Council as local planning authority.
>
> b) Prior to occupation of the development any agreed mitigation measures shall be implemented and verified as such in writing by the City Council as local planning authority and shall remain in situ whilst the use or development is in operation.
>
> Reason: To secure a reduction in air pollution from traffic or other sources in order to protect existing and future residents from air pollution, pursuant to policies EN16, SP1 and DM1 of the Core Strategy.

Additional comments from the Local Planning Authority (LPA) have been received in relation to the Air Quality Assessment:

> *Clarification is required of why the submitted TRC Air Quality Assessment, Ref: 572948.0001.r1, dated December 2023, does not identify existing or potential residential occupants of the nearby public house as receptors.

This technical note has been produced to address these recommended conditions and comments provided.

Responses to Recommended Conditions

Recommended Condition 'a'

> a) Prior to commencement of the development, an air quality impact assessment together with any mitigation measures to safeguard local air quality shall be submitted to and approved in writing by the City Council as local planning authority.

Response to Recommended Condition 'a'

As part of the Air Quality Assessment, as presented within the Report, the construction phase impacts have been considered in line with the relevant Institute of Air Quality Management (IAQM) guidance.

This assessment identified that the residual effects of the construction phase on air quality are considered to be **not significant**.

The risk category identified for each construction activity has been used to determine the level of mitigation required, and these measures, in accordance with the IAQM guidance, were presented in Section 6.1 of the Report.

During its operation, the Proposed Development is predicted to result in a net reduction of traffic generated, when considered in relation to the Site's previous use. However, to represent a robust assessment of likely effects associated with potential operational impacts, trip rates from the Proposed Development were considered in isolation.

It is reiterated, that this approach disregards any traffic that the previous use of the Site would have generated and thus regarded as a worst-case assessment scenario for the operational phase impacts.

Subsequently, the detailed dispersion modelling of operational phase road traffic emissions concluded, that the Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors and therefore, in accordance with the assessment criteria, additional mitigation is not required.

Based on the extent of predicted population exposure to the impacts on pollutant concentrations and the guidance provided by the IAQM, the effect of the Proposed Development is considered to be **not significant**.

It is therefore considered that the requirements of Recommended Condition 'a' are satisfied by the Report in full and no further assessment work needed prior to the commencement of the Proposed Development.

Recommended Condition 'b'

> b) Prior to occupation of the development any agreed mitigation measures shall be implemented and verified as such in writing by the City Council as local planning authority and shall remain in situ whilst the use or development is in operation.

Response to Recommended Condition 'b'

As stated above (in Response to Recommended Condition 'a'), the Proposed Development is predicted to result in a net reduction of traffic generated by the operation of the Site, when considered in relation to its previous use.

It is highlighted, that even when considering a worst-case assessment scenario for the operational phase impacts, by disregarding any traffic that the previous use of the Site would have generated, the resulting impact on nearby sensitive receptors is **negligible** (without the risk of exceedance of any relevant Air Quality Objectives (AQO)) and therefore, in accordance with the assessment criteria, additional operational phase air quality mitigation is not required.

It is therefore considered that the requirements of Recommended Condition 'b' are met as the Report demonstrated, that additional operational phase air quality mitigation is not required for the Proposed Development.

Response to Comment

Comment

*Clarification is required of why the submitted TRC Air Quality Assessment, Ref: 572948.0001.r1, dated December 2023, does not identify existing or potential residential occupants of the nearby public house as receptors.

Response to Comment

To complete the assessment of operational phase impacts, a number of 'receptors' representative of locations of relevant public exposure were identified at which pollution concentrations were predicted. Receptors have been located adjacent to the roads that are likely to experience the greatest change in traffic flows or composition, and therefore NO_2 and PM concentrations, as a result of the Proposed Development.

The Report confirms, that the annual mean NO_2 concentrations were predicted to be significantly below the AQO of 40µg/m^3 at all existing sensitive receptor locations in each of the modelled 2025 scenarios. The highest annual mean NO_2 concentrations of 26.9µg/m^3 and 27.4µg/m^3 were predicted at receptor R5 '821 Ashton New Road', in the 'Without Development' and 'With Development' scenarios, respectively. This resulted in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development.

The maximum predicted increase as a result of the Proposed Development was 0.6µg/m^3 at receptor R6 '2 Tobermory Close', resulting in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development, leading to an effect which is considered to be **not significant** in accordance with the EPUK/IAQM assessment criteria.

Based on the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on all pollutant concentrations considered are predicted to be **negligible**, with the resulting effect considered to be **not significant**.

Based on the extent of predicted population exposure to the impacts on pollutant concentrations and the guidance provided by the IAQM, the overall effect of the Proposed Development is considered to be **not significant**.

The assessment, as presented in the Report, focused on worst-case receptor locations to represent a robust appraisal of likely effects. These locations are identified as those being closest to the A662, where existing traffic flows could result in elevated pollutant concentrations, at the junction with Crabtree Lane, where the Site generated traffic would join the local road network.

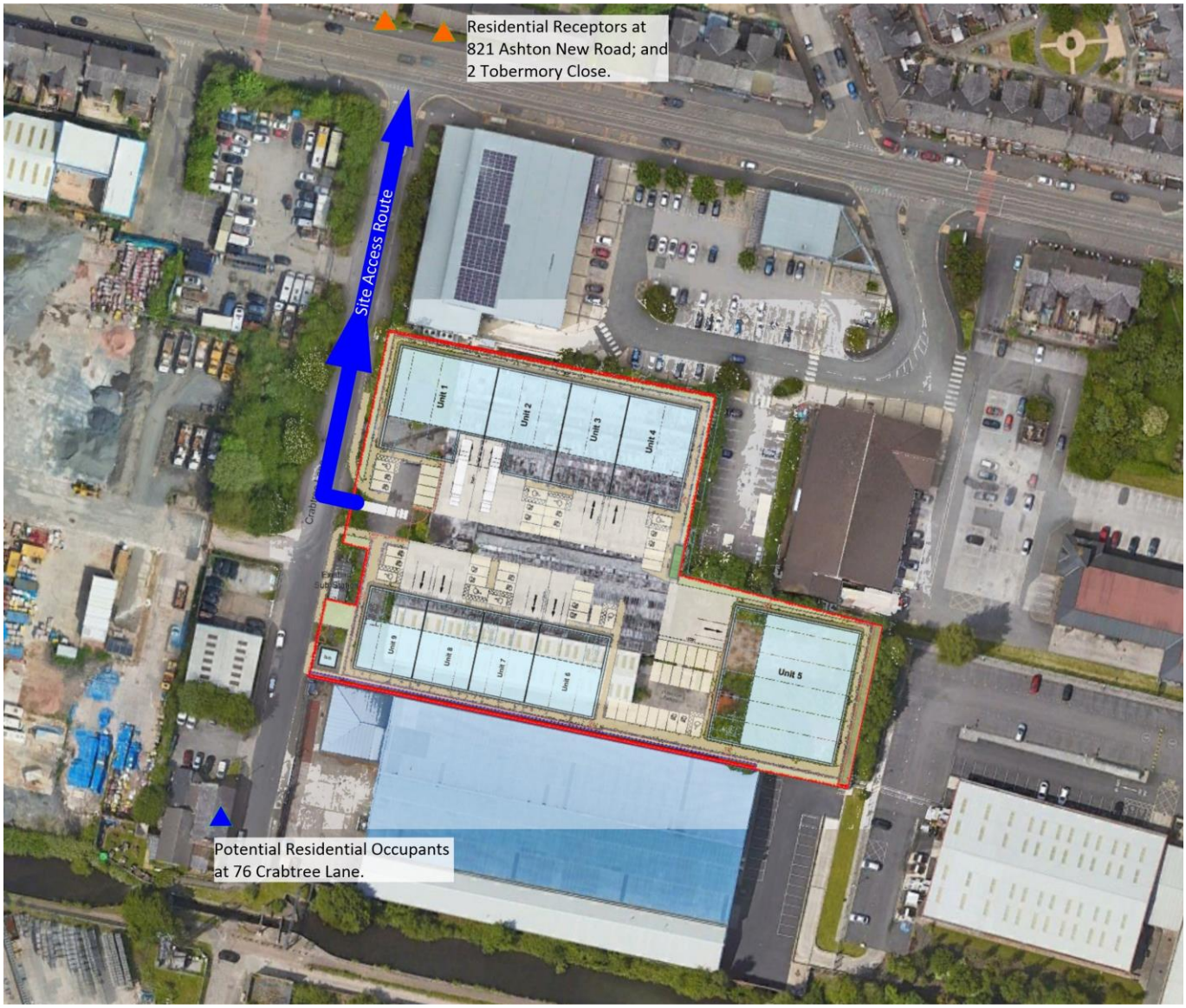
Reference should be made to **Figure 1** for a graphical representation of existing sensitive receptor locations considered within the assessment extents.

It is also demonstrated that the Potential Residential Occupants at 76 Crabtree Lane (located over 70m form the proposed Site entrance) are further away from the main A662 and the Site Access Route. As such this location is not considered to be representative of a worst-case exposure, within the assessment extents.

It can also be established that due to the distance of this 'potential' receptor from the main road network, any predicted pollutant concentration would be lower than those along the A662. Also any increase in pollutant concentrations associated with operational traffic would predicted to be lesser than those at receptors R5 and R6 (which received a **negligible** impact with a significant headroom when compared against the relevant AQOs), as presented in the Report.

It is therefore concluded that the operation of the Proposed Development at the Site would result in a **not significant** effect at the Potential Residential Occupants at 76 Crabtree Lane, without the risk of exceedance of the relevant AQOs, as specified for each pollutant considered within the Report.

Figure 1 - Site Location



Conclusion

An air quality assessment has previously been completed for the development proposals ('Former Walkers Site, Crabtree Lane Clayton' dated: December 2023, TRC report ref. 572948.0001.r1)

It is considered that the requirements of Recommended Condition 'a' are satisfied by the Report in full and no further assessment work needed prior to the commencement of the Proposed Development.

Furthermore the requirements of Recommended Condition 'b' are considered to be met as the Report demonstrated, that additional operational phase air quality mitigation is not required for the Proposed Development.

In relation to the Comment received from the LPA, it has been established that the operation of the Proposed Development at the Site would result in a **not significant** effect at the Potential Residential Occupants at 76 Crabtree Lane.

It is considered therefore, that the Proposed Development complies with national and local policy for air quality, and based on the assessment results, air quality is not considered a constraint to planning consent.

Annexes

Annex A – Air Quality Assessment
Former Walkers Site, Crabtree Lane, Manchester
December 2023 (TRC Ref.: 572948.0001.r1)

Air Quality Assessment

Former Walkers Site,
Crabtree Lane Clayton

December 2023
572948.0001.r1

Prepared For:
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Quality Control

Client Name:	Chancerygate Manchester Limited
Project Name:	Former Walkers Site, Crabtree Lane, Manchester
Project No.	572948
Document Title	Air Quality Assessment

Version:	Date:	Prepared By:	Reviewed By:	Approved By:
1.0	18th December 2023	Gabor Antony	Adam Sokolowski	Gabor Antony

Executive Summary

Site and Report Context	TRC Companies Ltd. (TRC), was commissioned by Chancerygate Manchester Limited (the 'Client') to undertake an Air Quality Assessment to inform a planning application for a development located at the Former Walkers Site, Crabtree Lane in Clayton, Manchester M11 4GU (the 'Site'). The proposed redevelopment works at the Site comprise the site clearance and demolition of all existing structures on site to permit redevelopment works which comprise the construction of 9No. industrial units and all associated external works (the 'Proposed Development'). The Site is located within the local planning authority (LPA) of Manchester City Council (MCC) within close proximity to the Greater Manchester Combined Authority Air Quality Management Area, where air quality is mainly influenced by road traffic emissions along the local road network and as such, elevated pollutant concentrations may be experienced at this location. Consequently, the Proposed Development should be assessed to determine whether it has the potential to cause adverse impacts to existing pollutant levels at nearby sensitive receptors as a result of fugitive dust and plant/vehicle emissions during construction and road vehicle exhaust emissions during operation. This Air Quality Assessment has been prepared to determine baseline conditions across and in the vicinity of the Site and to assess potential impacts associated with the Proposed Development, in accordance with the requirements of the National Planning Policy Framework (NPPF). Accordingly, the Air Quality Assessment will, consider ambient pollutant concentrations namely NO_2 and particulate matter (PM_{10} and $PM_{2.5}$), across and in the vicinity of the Site.
Summary	The assessment of construction phase impacts associated with emissions of fugitive dust and fine particulate matter (PM) with an aerodynamic diameter of less than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$, respectively), has been undertaken in line with the relevant Institute of Air Quality Management (IAQM) guidance. This identified that there is a **high** to **low risk** of dust soiling impacts, **medium** to **low risk** of ecological impacts and a **low** to **negligible risk** of increases in PM concentrations, due to unmitigated construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM releases would be significantly reduced. The residual effects of the construction phase on air quality are considered to be **not significant**. The Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors and the residual effects are considered to be **not significant**, in line with Environmental Protection UK (EPUK) and IAQM significance criteria.
Conclusions and Recommendations	Based on the results of the assessment, it is considered that, the Proposed Development complies with national and local planning policies and there are no air quality constraints considered to restrict planning consent.
This is intended as a summary only. Further detail and limitations of the assessment are provided within the main body of the report.	

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1.0 Introduction

1.1 Appointment

TRC Companies Ltd. (TRC), was commissioned by Chancerygate Manchester Limited (the 'Client') to undertake an Air Quality Assessment to inform a planning application for a development located at the Former Walkers Site, Crabtree Lane in Clayton, Manchester M11 4GU (the 'Site'). The proposed redevelopment works at the Site comprise the site clearance and demolition of all existing structures on site to permit redevelopment works which comprise the construction of 9No. industrial units and all associated external works (the 'Proposed Development').

1.2 Site Location and Context

The Site is located within the local planning authority (LPA) of Manchester City Council (MCC) within close proximity to the Greater Manchester Combined Authority Air Quality Management Area (AQMA), where air quality is mainly influenced by road traffic emissions along the local road network and as such, elevated pollutant concentrations may be experienced at this location. Reference should be made to **Figure 1** for a map of the Site and surrounding area.

Consequently, the Proposed Development should be assessed to determine whether it has the potential to cause adverse impacts to existing pollutant levels at nearby sensitive receptors as a result of fugitive dust and plant/vehicle emissions during construction and road vehicle exhaust emissions during operation.

An Air Quality Assessment has been prepared to determine baseline conditions across and in the vicinity of the Site and to assess potential impacts associated with the Proposed Development, in accordance with the requirements of the National Planning Policy Framework (NPPF)[1]. Accordingly, the Air Quality Assessment will, consider ambient pollutant concentrations namely nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$), across and in the vicinity of the Site.

The standard limitations associated with this assessment are presented in **Annex A**.

A glossary of terms used in this report is provided in **Annex B**.

[1] Ministry of Housing, Communities & Local Government (2023) National Planning Policy Framework.

2.0 Legislation, Planning Policy & Guidance

This assessment takes account of the following national, regional and local planning guidance.

2.1 Air Quality Legislation

A summary of the relevant air quality legislation is provided below.

UK Air Quality Strategy (2023)

The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS)[2]. The revised AQS[3] supersedes the air quality strategy: Volume 1[2] in England only. The revised AQS provides a framework for reducing air pollution in the UK and to enable local authorities to make improvements for their communities, sets out their powers, responsibilities, and further actions the government expects them to take.

The AQS also sets standards and objectives for the key air pollutants to protect health, vegetation and ecosystems. The standards and objectives for the pollutants considered in this assessment are given in **Annex C**.

The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM_{10}. Local authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area. However, there is no statutory objective given in the AQS for $PM_{2.5}$ at this time.

Air Quality Standards (Amendment) Regulations (2016)

Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[4] and the Air Quality (England) (Amendment) Regulations 2002[5] for the purpose of Local Air Quality Management (LAQM).

These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

> *'[…] the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present […]'*

The Air Quality Standards (Amendment) Regulations 2016[6] amends the Air Quality Standards Regulations 2010 that transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$ and NO_2.

Environmental Protection Act 1990 - Control of Dust and Particulates Associated with Construction

Section 79 of the Environmental Protection Act 1990[7] gives the following definitions of statutory nuisance relevant to dust and particles:

> *'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance'; and*
>
> *'Any accumulation or deposit which is prejudicial to health or a nuisance'.*

Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

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2 Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2).
3 Defra Policy paper - Air quality strategy: framework for local authority delivery Published 28 April 2023
4 The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928.
5 The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.
6 The Air Quality Standards (Amendment) Regulations 2016 - Statutory Instrument 2016 No. 1184.
7 UK Public General Acts 1990 Chapter 43

There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

Environment Act 2021

Schedule 11 contains amendments of Part IV of the Environment Act 1995 (air quality). Local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs within the area of jurisdiction, or to identify relevant sources within neighbouring authorities and to identify them. Where the objectives are not likely to be achieved within the relevant period, an authority is required to designate an AQMA. For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

Clean Air Strategy (2019)

In 2019, the UK government released its Clean Air Strategy 2019[8], part of its 25 Year Environment Plan[9]. The Strategy sets out the comprehensive action that is considered to be required from across all parts of government and society.

The primary focus of air quality management has primarily related to NO_2, and its principal source in the UK, road traffic. The 2019 Strategy aims to broaden the focus to other areas, including actions on clean growth, and emissions from domestic wood burning stoves, industry and agriculture.

2.2 Planning Policy

National Planning Policy Framework (as revised 2023)

The Government's overall planning policies for England are described in the NPPF[1]. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

> *'[…] meeting the needs of the present without compromising the ability of future generations to meet their own needs.'*

One of the three overarching objectives of the NPPF, is that the planning system should:

> *'protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'*

In relation to air quality, the following paragraphs in the document are relevant:

Paragraph 55, which states:

> *'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.';*

Paragraph 105, which states:

> *'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.';*

Paragraph 174, which states:

> *'Planning policies and decisions should contribute to and enhance the natural and local environment by: […] e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.';*

[8] Department for Environment, Food and Rural Affairs (Defra) (2019) Clean Air Strategy 2019.
[9] Department for Environment Food and Rural Affairs (Defra) (2018) A Green Future: Our 25 Year Plan to Improve the Environment.

Paragraph 185, which states:

> *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.';*

Paragraph 186, which states:

> *'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.';* and

Paragraph 188, which states:

> *'The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities'.*

2.3 Local Planning Policy

Manchester's Local Development Framework - Core Strategy Development Plan (July 2012)

The Core Strategy[10] was adopted by MCC on 11th July 2012. It is the key document in Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027. It describes Manchester today and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision. A review of the Local Plan has identified the following policies relevant to this assessment:

> *'Policy EN 7 Energy Infrastructure opportunities:*
>
> *There will be a general presumption in favour of low and zero carbon decentralised energy schemes, subject to the following considerations: […]*
>
> - *The cumulative impact of energy schemes will be taken into account when considering applications, to include modelled impacts on air quality and landscape character, with reference to Policy EN16. […]'*
>
> *'Policy EN 16 Air Quality:*
>
> *The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.*
>
> *When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.'*
>
> *'Policy DM1 Development Management:*
>
> *All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document: […]*
>
> - *Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise. […]'*

[10] Manchester City Council (2012) Manchester's Local Development Framework - Core Strategy Development Plan [Online] Available at: https://www.manchester.gov.uk/downloads/download/5672/core_strategy [Accessed on 01/12/2023].

The above policies relating to air quality have been considered within this assessment.

2.4 Guidance

Local Air Quality Management Technical Guidance (August 2022)

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their review and assessment work[11]. This guidance, referred to in this document as LAQM.TG22, has been used where appropriate in the assessment presented herein.

Land-Use Planning & Development Control: Planning for Air Quality (2017)

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[12] that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

Guidance on the Assessment of Dust from Demolition and Construction (2023)

This document[13] published by the IAQM was produced and updated in August 2023 to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified. Details of this assessment framework are presented in **Annex D**.

National Planning Practice Guidance - Air Quality (2019)

This guidance[14] provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, it explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by local authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

Greater Manchester Air Quality Action Plan 2016-2021

The Greater Manchester AQAP15 outlines the actions that GMCA plans to deliver between 2016-2021 (and beyond). This AQAP aims to bring together a robust and meaningful set of actions and measures that will bring about an improvement in air quality, to benefit the health of the population.

Manchester City Council Air Quality & Planning Technical Guidance (February 2022)

This guidance document[16] aims to provide help and advice in relation to air quality in a planning context to encourage good practice and mitigation of impacts. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and well-being of people that live and work within the City of Manchester.

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11 Department for Environment, Food and Rural Affairs (Defra) (August 2022) Part IV of the Environment Act 1995 as amended by the Environment Act 2021 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG22.

12 Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017) Land Use Planning & Development Control: Planning for Air Quality.

13 Institute of Air Quality Management (Version 2.1 Updated June 2023) Assessment of dust from demolition and construction

14 Department of Communities and Local Government (DCLG) (Updated November 2019) National Planning Practice Guidance.

15 Greater Manchester Combined Authority (GMCA) (2022) GMCA Air Quality Action Plan 2016-2021 [Online] Available at: https://assets.ctfassets.net/tlpgbvy1k6h2/q1FPXN4shw4Vm1njCDv74 /08c1577c985a8b03d5c1f57f33a779c8/air-quality-action-plan-2016-21.pdf [Accessed on 29/11/2023].

16 Manchester City Council (2022) Air Quality & Planning Technical Guidance [Online] Available at: https://www.manchester.gov.uk/downloads/download/5199/environmental_and_public_protection_information_for_developers [Accessed on 28/11/2023].

Greater Manchester Low-Emission Strategy (2016)

This Low Emission Strategy[17] takes a long-term, integrated approach to carbon emissions and air quality in the period up to 2040, allowing us to focus investment to greatest effect. It establishes a framework within which we will develop detailed action plans to reduce carbon emissions and improve air quality.

The aims of this strategy are to:

- Support the UK Government in meeting all EU thresholds for key pollutants at the earliest date;
- Contribute to reducing Greater Manchester's carbon footprint, in line with the Greater Manchester Climate Change Strategy and Implementation Plan; and
- Reduce air pollution as a contributor to ill-health in Greater Manchester.

Greater Manchester's Clean Air Plan to Tackle Nitrogen Dioxide Exceedances at the Roadside (GM CAP)

In Greater Manchester, the 10 local authorities, the GMCA and Transport for Greater Manchester, have worked together to develop a Clean Air Plan to tackle NO_2 Exceedances at the Roadside[18], referred to as the GM CAP.

The GM CAP Policy document includes the following:

- It sets out the policy for each of the measures, which together constitute the GM CAP, namely:
  - Greater Manchester Charging Clean Air Zone (Section 2);
  - Clean Bus Fund (Section 6);
  - Vehicle Finance (Section 7);
  - Clean Commercial Vehicle Fund (Section 8);
  - Clean Taxi Fund (Section 9);
- includes reference to specific technical materials which are published as part of the evidence base for the GM CAP; and
- it does not and is not intended to provide detailed information on the processes that underpin the delivery of the Policy for the GM CAP, e.g. how discounts and exemptions are applied for.

[17] Greater Manchester Combined Authority (2020) Greater Manchester Low-Emission Strategy (2016) [Online] Available at: https://assets.ctfassets.net/tlpgbvy1k6h2/6wQI2dxjrXZ2SCVByUBdOf /a13a19c17cc61261cb5b808943358f84/low-emission-strategy-dec-2016.pdf [Accessed on 28/11/2023].

[18] Manchester City Council (2021) Greater Manchester's Clean Air Plan to Tackle Nitrogen Dioxide Exceedances at the Roadside (GM CAP) [Online] Available at: https://assets.ctfassets.net/tlpgbvy1k6h2/2VNncClzejAvGh3CrVn0oo/d45528de22e593c9be285ddf5b26373b/Appendix_1_-_GM_Clean_Air_Plan_Policy_following_Consultation.pdf [Accessed on 28/11/2023].

3.0 Scope and Methodology

3.1 Scope

The scope of the assessment has been determined in the following way:

- Review of the latest available Air Quality Annual Status Report (ASR) from Greater Manchester[19] and air quality data for the area surrounding the Site, including data from MCC, Defra[20] and the Environment Agency (EA)[21];
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, as a result of the Proposed Development; and
- Review of the traffic data provided by the Project's Transport Consultant (the 'PTC') and the traffic data obtained from the Department for Transport's (DfT) Road Traffic Statistics website[22].

The scope of the assessment includes consideration of the potential impacts on local air quality resulting from:

- Dust and PM generated by on-site activities during the construction phase;
- Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant; and
- Increases in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational.

3.2 Methodology

Construction Phase Assessment

Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust, therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

The smaller particles of dust are known as PM, with less than 10µm in aerodynamic diameter (PM_{10}) representing only a small proportion of total dust released; this includes a finer fraction, known as $PM_{2.5}$ (with an aerodynamic diameter less than 2.5µm). As these particles are at the smaller end of the size range of dust particles, they remain suspended in the atmosphere for a longer period of time than the larger dust particles, they can therefore be transported by wind over a wider area. PM_{10} and $PM_{2.5}$ are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health.

However, it is worth noting that, according to the IAQM guidance, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. $PM_{2.5\text{-}10}$) with just 10-15% expected to comprise $PM_{2.5}$. The IAQM guidance therefore focusses on PM_{10} for the purposes of assessment.

An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM, the available information for this phase of the Proposed Development provided by the Client and Project Team, and professional judgement.

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19 Greater Manchester (2023) 2022 Air Quality Annual Status Report [Online] Available at: https://assets.ctfassets.net/tlpgbvy1k6h2/3eJDZpHcCKNK0ZO7TcUkI/3363e762b28868a832ab2200286a4841/Greater_Manchester_Air_Quality_Annual_Status_Report_2022.pdf [Accessed on 04/12/2023].

20 Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management (LAQM) Support Pages [Online] Available at: http://laqm.defra.gov.uk/ [Accessed on 04/12/2023].

21 Environment Agency (2023) Pollution Inventory [Online] Available at: https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory [Accessed on04/12/2023].

22 Department for Transport (DfT) (2021) Road Traffic Statistics [Online] Available at: https://roadtraffic.dft.gov.uk/ #6/ 55.254/-6.064/basemap-regions-countpoints [Accessed on 04/12/2023].

The IAQM methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition, earthworks, general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Annex D**.

In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the application Site and in the vicinity of the application Site itself. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the development;
- The number and proximity of sensitive receptors to the application Site and along the likely routes to be used by construction vehicles; and
- The likely duration of the construction phase and the nature of the construction activities undertaken.

Operational Phase Assessment

Of the pollutants included in the AQS, concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been considered in this assessment as road traffic is a major source of these pollutants and their concentrations tend to be close to, or in exceedance of, the objectives in urban locations.

In accordance with the EPUK/IAQM guidance, a significant change would be described as a change in Light Duty Vehicle (LDV) flows of 500 Annual Average Daily Traffic (AADT) or more and/or Heavy Duty Vehicle (HDV) flows of 100AADT or more. Alternatively, a change in LDV flows of 100AADT or more and/or HDV flows of 25AADT on routes through an AQMA would also be considered a significant change in accordance with the guidance. Where these thresholds are exceeded, a detailed assessment of air quality is normally required.

It should be noted that the Proposed Development is predicted to result in a net reduction of traffic generated by the operation of the Site, when considered in relation to its previous use. However, to represent a robust assessment of likely effects associated with potential operational impacts, trip rates from the Proposed Development were considered in isolation. This approach disregards any traffic that the previous use of the Site would have generated and thus regarded as a worst-case assessment scenario for the operational phase impacts.

In order to predict NO_2 and PM concentrations across and in the vicinity of the Site, the advanced dispersion model ADMS-Roads (version 5.0.1.3) has been used. This model uses detailed information regarding traffic flows on the local road network, surface roughness and local meteorological conditions to predict pollutant concentrations. Details of the model input parameters are presented in **Annex E**.

Meteorological Data

Meteorological data, such as wind speed and direction, are used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in this assessment were obtained from Manchester Airport in 2022. This station is considered to provide representative data for the assessment. A wind rose generated from the meteorological data used for both the consideration of construction phase impacts and the operational phase dispersion modelling is provided in **Annex F**.

Traffic Data

Traffic Flows

A summary of traffic data and pollutant emission factors used in the assessment can be found in **Annex E**. It includes details of the AADT flows, vehicle speeds (km/h) and the percentage of HDVs for the local road network in all assessment years considered. Traffic speeds were reduced at junctions in line with guidance provided in LAQM.TG22, and using professional judgement.

For the assessment, three scenarios were modelled, as follows:

- 2022 - Model Verification;
- 2025 - Anticipated Opening Year Without Development; and
- 2025 - Anticipated Opening Year With Development.

Reference should be made to **Figure 1** for a graphical representation of the modelled road link locations.

Vehicle Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (EFT) (version 12.0.1), provided on the Defra website[23]. This has been produced by Defra and incorporates COPERT 5.6 vehicle emission factors and fleet information.

2025 emission factors were utilised for the anticipated Site opening year, in order to provide realistic concentration predictions.

Selection of Background Concentrations

Background pollutant data for the operational phase assessment have been taken from the national maps provided on the Defra website[24], where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK. Estimated background concentrations are available for all years between 2018 and 2030.

2025 background concentrations for oxides of nitrogen (NO_x), NO_2, PM_{10} and $PM_{2.5}$ have been utilised in this assessment for the anticipated 2025 opening year.

Model Verification and Result Processing

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is considered to be fit for purpose. Model validation undertaken by the software developer will not have included validation in the vicinity of the Proposed Development.

To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process of verification aims to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results and was carried out following the methodology specified in Chapter 7, Section 4, of LAQM.TG22.

Details of the verification factor calculations are presented in **Annex E**. A factor of **1.62** was obtained during the verification process, indicating that the model was under-predicting. This factor was applied to the modelled road-NO_x outputs prior to conversion to annual mean NO_2 concentrations utilising the NO_x to NO_2 Calculator (version 8.1, 26th June 2020) provided by Defra[25]. The NO_2 diffusion tube monitoring results recorded by TC were subsequently used to derive an indicative baseline annual mean NO_2 concentration for each site in the vicinity of the Proposed Development. Reference should be made to **Figure 1**, which shows the diffusion tube monitoring locations within the assessment extents.

[23] Department for Environment, Food and Rural Affairs (Defra) (2021) Emissions Factor Toolkit (version 12.0) [Online] Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/ [Accessed on 06/12/2023].

[24] Department for Environment, Food and Rural Affairs (Defra) (2023) Background Concentrations [Online] Available at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018 [Accessed on 06/12/2023].

[25] Department for Environment, Food and Rural Affairs (Defra) NO_x to NO_2 Calculator (26/06/2020) [Online] Available at: https://laqm.defra.gov.uk/documents/NOx_to_NO2_Calculator_v8.1.xlsm [Accessed on 06/12/2023].

As local roadside monitoring data within the assessment extents are not available for PM_{10} or $PM_{2.5}$, the modelled road-PM_{10} and road-$PM_{2.5}$ components have been adjusted by the verification factor obtained for NO_x before adding to the appropriate background concentration. The number of days with PM_{10} concentrations greater than 50µg/m^3 was then estimated using the relationship with the annual mean concentration described in LAQM.TG22.

Once processed, the predicted concentrations were compared against the relevant AQS objective levels for NO_2, PM_{10} and $PM_{2.5}$ set out in **Annex C**.

The air quality modelling generates pollutant estimates of road source contributed NO_x, PM_{10} and $PM_{2.5}$ at specified receptors. To enable comparison with the relevant AQOs for NO_2, PM_{10} and $PM_{2.5}$ it has been necessary to combine the model outputs data with the background concentrations.

To consider compliance with the 1-hour mean AQO for NO_2, Defra's guidance suggests that in locations where the annual mean NO_2 concentration exceeds 60µg/m^3 then the 1-hour mean objective may be exceeded. Where annual mean concentrations are less than 60µg/m^3 then exceedance of the 1-hour mean objective is considered unlikely. The risk of non-compliance with the 1-hour mean objective, where up to 18 exceedances of a 1-hour mean concentration of 200µg/m^3 are allowed in a calendar year, is therefore considered likely when the annual mean concentration is greater than 60µg/m^3 but unlikely when not. This approach has been adopted for this assessment.

To estimate total annual mean concentrations for PM_{10} and $PM_{2.5}$, for comparison with the annual mean AQOs (40µg/m^3 and 20µg/m^3 respectively) the model output concentrations are simply added to the background concentrations for these pollutants.

To consider compliance with the 24-hour mean AQO for PM_{10}, Defra's guidance gives the following equation that relates the annual mean concentration to the number of exceedances of the 24-hour mean concentration of 50µg/m^3, where up to 35 exceedances are allowed:

- No. 24-hour mean exceedances = -18.5 + 0.00145 x annual mean^3 + (206/annual mean)

This approach has been adopted for 24-hour mean PM_{10} for this assessment.

3.3 Selection of Sensitive Receptors

Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development. These will include locations sensitive to an increase in dust deposition and PM_{10} exposure as a result of on-site construction activities, and locations sensitive to exposure to gaseous pollutants emitted from the exhausts of construction and operational traffic associated with the Proposed Development.

Construction Phase

The IAQM assessment is undertaken where there are: 'human receptors' within 250m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased PM in the ambient air will have the greatest impact on local air quality at sensitive receptors.

Operational Phase

In terms of locations that are sensitive to pollutants emitted from engine exhausts, these will include places where members of the public are likely to be regularly present over the period of time prescribed in the AQS. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as 24-hour mean or annual mean) may be more appropriate. Box 1-1 of LAQM.TG22 provides examples of the locations where the AQOs should/should not apply.

To complete the assessment of operational phase impacts, a number of 'receptors' representative of locations of relevant public exposure were identified at which pollution concentrations were predicted. Receptors have been located adjacent to the roads that are likely to experience the greatest change in traffic flows or composition, and therefore NO_2 and PM concentrations, as a result of the Proposed Development.

The locations of the assessment receptors are shown on **Figure 1** and listed in **Table 1.**

Table 1 - Receptor Locations Used in the Assessment

Receptor	Description / Address	Grid Reference		Height above Ground Level (m)
		X (m)	Y (m)	
R1	940 Ashton New Road	388659.4	398335.7	1.5
R2	914 Ashton New Road	388595.9	398349.0	1.5
R3	795 Ashton New Road	388641.0	398361.3	1.5
R4	805 Ashton New Road	388676.6	398353.8	1.5
R5	821 Ashton New Road	388715.9	398344.8	1.5
R6	2 Tobermory Close	388722.4	398344.1	1.5
R7	24 Tobermory Close	388761.2	398335.5	1.5
R8	861 Ashton New Road	388815.2	398323.6	4.5
R9	865 Ashton New Road*	388841.1	398318.8	1.5
R10	885 Ashton New Road*	388888.8	398308.4	1.5

*Receptors marked with an asterisk are located within the designated GM AQMA.

3.4 Significance Criteria

Construction Phase

The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO_2 and PM, the significance of residual effects has been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance, which are described below.

Operational Phase

The approach provided in the EPUK/IAQM guidance has been used within this assessment to assist in describing the air quality effects of additional emissions from traffic generated by the Proposed Development once operational.

This guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change in pollution concentration as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion, as summarised in **Table 2**.

Table 2 - Road Vehicle Exhaust Emissions - Significance of Impact

Long Term Average Concentration at Receptors in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	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

Notes

AQAL = air quality assessment level, which for this assessment related to the UK Air Quality Strategy objectives.
Where the %change in concentrations is <0.5%, the change is described as 'Negligible' regardless of the concentration.
When defining the concentration as a percentage of the AQAL, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase.
Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.

The matrix shown in **Table 2** is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as negligible.

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

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

The EPUK/IAQM guidance states that for most road transport related emissions, long-term average concentrations are the most useful for evaluating the impacts. The guidance does not include criteria for determining the significance of the effect on hourly mean NO_2 concentrations or daily mean PM_{10} concentrations. The significance of effects of hourly mean NO_2 and daily mean PM_{10} concentrations arising from the operational phase have therefore been determined qualitatively using professional judgement and the principles described above.

The EPUK/IAQM guidance says that 'Where the air quality is such that an AQO at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.'

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

4.0 Baseline Air Quality Conditions

4.1 Introduction

Existing air quality conditions in the vicinity of the Site were identified in order to provide a baseline for consideration. These are detailed in the following sections.

4.2 Local Air Quality Management

According to the latest available Air Quality ASR from MCC[19] and Defra[26], the Site is located within or close to either of the district's defined Air Quality Management Areas (AQMAs). Therefore, potential effects associated with the Proposed Development have been considered at sensitive receptor locations within the immediate vicinity of the Site, where the greatest impacts would be anticipated.

Local Emission Sources

The Site is located in an area where air quality is mainly influenced by emissions from road transport using the local road network.

Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken throughout MCC's area of jurisdiction utilising non-automatic (passive) methods and automatic (continuous) methods. The closest monitoring location with available data, diffusion tube MA28NO, is located approximately 1km south-west of the Site. Recent diffusion tube monitoring results recorded in the vicinity of the Proposed Development are shown in **Table 3**.

Table 3 - Diffusion Tube Monitoring Results

Monitoring Site			Monitored NO_2 Concentration (µg/m³)*				
ID	Location	Site Type	2018	2019	2020	2021	2022
MA28NO	Ashton Old Road	Roadside	37.1	36.1	26.4	29.4	29.3
MA73NO	Hyde Road	Roadside	38.7	38.0	27.3	31.6	31.5
MA78NO	Rostron Avenue	Urban Background	33.2	33.0	23.2	27.5	27.2
MA79NO	Victoria Terrace	Urban Background	29.9	29.3	22.3	25.6	25.4
MA86ANO	Pottery Lane	Roadside	32.1	33.6	25.5	27.5	27.5
MA87ANO	Hyde Road/Pottery Lane	Roadside	33.2	34.0	22.9	26.4	28.0
MA88NO	Angel St	Kerbside	**46.8**	**45.2**	30.1	36.8	35.7
MA88ANO	Hyde Road/Clowes Street	Roadside	**44.3**	**43.3**	32.5	35.3	39.2
MA89ANO	Wenlock Way	Roadside	30.3	30.3	23.7	25.2	25.6
MA95BNO	Ashton Old Road	Roadside	-	**43.4**	31.5	34.1	33.7

* Exceedances of the 40µg/m³ AQO are presented in bold.

As shown in **Table 3** annual mean NO_2 concentrations did not exceed the relevant AQOs at any of the closest monitoring sites, during the last 3 monitoring years. Results also indicate a reduction in pollutant concentrations from 2019 to 2020, indicating the impacts of travel restrictions during that period.

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 UK to assist Local Authorities in their Review and Assessment of air quality. The Site is located across grid square NGR: 388500, 398500. Data for these locations and the assessment extents were downloaded from the Defra website24 for the purpose of the project. These data are summarised in **Table 4** below.

Table 4 - Predicted Background Pollutant Concentrations (2022)

OS Grid Reference (X, Y; m)	NO_2	NO_X	PM_{10}	$PM_{2.5}$
515500, 126500	16.1	22.4	11.9	8.2

As shown in **Table 4**, predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs at the Site.

[26] Department for Environment, Food and Rural Affairs (Defra) (undated) Local Authority Details [Online] Available at: https://uk-air.defra.gov.uk/aqma/list?view=W [Accessed on 12/09/2023].

5.0 Assessment

5.1 Introduction

There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development. These are assessed in the following sections.

5.2 Construction Phase Assessment

Dust and PM_{10} Arising from On-Site Activities

Construction activities that have the potential to generate and/or re-suspend dust and PM10 include:

- Site clearance and preparation including demolition activities;
- Preparation of temporary access/egress to the Site and haulage routes;
- Earthworks;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Site (including excavators and dumper trucks);
- Use of crushing and screening equipment/plant;
- Exhaust emissions from plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- Internal and external finishing and refurbishment;
- Trackout, whereby earth is carried from the Site on vehicle tyres, deposited on roads and may later become suspended in the air as a result of vehicle movements; and
- Site landscaping after completion.

The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g., exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Assessment of Potential Dust Emission Magnitude

The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM_{10} sources: demolition, earthworks, construction, and trackout. The findings of the assessment are presented below.

Demolition

The key factors when determining the potential dust emission magnitude for the demolition element include the volume and height of the buildings being demolished and the type of materials present.

The existing commercial unit at the Site is to be demolished. The volume of buildings to be demolished is assumed to be between 12,000 to 75,000m^3 and as such, the potential dust emission magnitude for demolition activities is considered to be **medium** for demolition activities.

Earthworks

The exact number of heavy earth moving vehicles active on the Site at any one time is unknown, however, the total area of the Site is less than 18,000m^2 and therefore, the potential dust emission magnitude is considered to be **small** for earthwork activities.

Construction

The total volume of buildings to be constructed on the Site is assumed to be greater than 75,000m^3. Therefore, the potential dust emission magnitude is considered to be **large** for construction activities.

Trackout

Information on the number of HGVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. Whilst the unpaved road length on the Site is less than 50m, it is assumed that there will be approximately 10 to 50 HDV trips per day over the construction period. As such, it is considered that the potential dust emission magnitude is **medium** for trackout.

Table 5 provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Medium
Earthworks	Small
Construction	Large
Trackout	Medium

Assessment of Sensitivity of the Study Area

A wind rose generated using the meteorological data used for the consideration of construction phase impacts is provided in **Annex F**. This shows that the prevailing wind direction is mainly from the south-west. Therefore, receptors located to the north-east of the Site are more likely to be affected by dust and PM emitted and re-suspended during the construction phase.

Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. Receptors to the north through to the east have the greatest potential to be affected as a result of the prevailing wind direction. It has been assumed that the construction traffic will access the Site via the existing access roads.

There are no ecological receptors within the vicinity of the Site considered to be sensitive to dust or PM, and as such these effects are not considered further within this assessment.

Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM_{10} has been derived for each of the construction activities considered. The results are shown in **Table 6**.

Table 6 - Sensitivity of the Study Area

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

Risk of Impacts

The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 7** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 7 - Summary Dust Risk Table to Define Site Specific Mitigation

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

Construction Vehicles and Plant

The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the Site access road. Construction traffic will access the Site via the existing access roads.

Final details of the exact plant and equipment likely to be used on-site will be determined by the appointed contractor, it is considered likely to comprise dump trucks, tracked excavators, diesel generators, asphalt spreaders, rollers, compressors and trucks. The number of plant and their location within the Site are likely to be variable over the construction period.

Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are considered to be **negligible** according to the assessment significance criteria.

5.3 Operational Phase Assessment

Vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions on the local and regional road networks which have the potential to affect existing residential receptors. An assessment was, therefore, undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at existing sensitive locations in the vicinity of the Site.

It is reiterated that the Proposed Development is predicted to result in a net reduction of traffic generated by the operation of the Site, when considered in relation to its previous use. However, to represent a robust assessment of likely effects associated with potential operational impacts, trip rates from the Proposed Development were considered in isolation. This approach disregards any traffic that the previous use of the Site would have generated and thus regarded as a worst-case assessment scenario for the operational phase impacts.

The assessment considered the following three scenarios:

- 2022 - Model Verification;
- 2025 - Assumed Opening Year Without Development; and
- 2025 - Assumed Opening Year With Development.

The 2025 scenarios included anticipated baseline traffic data, inclusive of anticipated growth for the relevant assessment year, in addition to predicted vehicle trips associated with the operation of the Proposed Development, as provided by the PTC and calculated using the UK Government's Trip End Model Presentation Program (TEMPro) version 8.0, where applicable.

Additionally, as stated previously, for the purpose of the assessment, traffic data for 2025 were utilised as the assumed development opening year. Air quality is predicted to improve in the future based on expected reduction in roadside levels as a result of technological advancements as stated in Section 3.2. However, in order to provide a robust assessment, emission factors and background concentrations for 2022 were utilised within the assessment. The uses of 2025 traffic data and 2022 emission factors and background concentrations are considered to provide a worst-case scenario and therefore, a sufficient level of confidence can be placed within the predicted pollutant concentrations.

Full results of the dispersion modelling are presented in **Annex G** and a summary is provided below.

It should be noted that all presented results have been verified in accordance with the methodology outlined within **Annex F**.

Nitrogen Dioxide (NO_2)

Annual Mean

Annual mean NO_2 concentrations were predicted to be significantly below the AQO of 40µg/m^3 at all existing sensitive receptor locations in each of the modelled 2025 scenarios. The highest annual mean NO_2 concentrations of 26.9µg/m^3 and 27.4µg/m^3 were predicted at receptor R5 '821 Ashton New Road', in the 'Without Development' and 'With Development' scenarios, respectively. This resulted in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development.

The maximum predicted increase as a result of the Proposed Development was 0.6µg/m^3 at receptor R6 '2 Tobermory Close', resulting in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development, leading to an effect which is considered to be **not significant** in accordance with the EPUK/IAQM assessment criteria.

Based on the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean NO_2 concentrations is considered to be **negligible**, with the resulting effect considered to be **not significant**.

Based on the extent of predicted population exposure to the impacts on annual mean NO_2 concentrations and the guidance provided by the IAQM, the overall effect of the Proposed Development is considered to be **not significant**.

1-hour Mean

The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3, and therefore, hourly mean NO_2 concentrations are unlikely to cause a breach of the hourly mean AQS objective. The impact of the Proposed Development on hourly mean NO_2 concentrations at existing sensitive receptors is considered to be **negligible**, with the resulting effect considered to be **not significant**.

Particulate Matter (PM_{10})

Annual Mean

Annual mean PM_{10} concentrations were predicted to be well below the AQO of 40µg/m^3 at all existing sensitive receptor locations in each of the modelled 2025 scenarios. The highest annual mean PM_{10} concentration of 14.2µg/m^3 and 14.3µg/m^3 was predicted at receptor R5 '821 Ashton New Road', in the 'Without Development' and 'With Development' scenarios, respectively. This resulted in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development.

The predicted changes in annual mean PM_{10} concentrations were all <0.5% of the relevant AQO. Based on the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean PM_{10} concentrations is considered to be **negligible**, with the resulting effect considered to be **not significant**.

Based on the extent of predicted population exposure to the impacts on annual mean PM_{10} concentrations and the guidance provided by the IAQM, the overall effect of the Proposed Development is considered to be **not significant**.

<u>24-hour Mean</u>

There has been no predicted increase in the number of days exceeding the daily PM_{10} limit in the 'With Development' scenario, without the risk of exceedance of the AQS objective. As such, the impacts of increased emissions associated with the operational phase of the Proposed Development are **negligible**.

Particulate Matter ($PM_{2.5}$)

Annual Mean

Annual mean $PM_{2.5}$ concentrations were predicted to be well below the AQO of 20µg/m^3 in each of the modelled 2025 scenarios at all existing sensitive receptors. The highest annual mean $PM_{2.5}$ concentration of 9.4µg/m^3 and 9.5µg/m^3 was predicted at receptor R5 '821 Ashton New Road', in both the 'Without Development' and 'With Development' scenarios. This resulted in a **negligible** impact from the additional traffic associated with the operation of the Proposed Development.

The predicted changes in annual mean $PM_{2.5}$ concentrations were all <0.5% of the relevant AQO. Based on the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean $PM_{2.5}$ concentrations is considered to be **negligible**, with the resulting effect considered to be **not significant**.

Based on the extent of predicted population exposure to the impacts on annual mean $PM_{2.5}$ concentrations and the guidance provided by the IAQM, the overall effect of the Proposed Development is considered to be **not significant**.

Summary

Based on the extent of predicted population exposure to the impacts on pollutant concentrations and the guidance provided by the IAQM, the overall effect of the Proposed Development is considered to be **not significant**.

Predicted concentrations of all pollutants considered during both assessment scenarios for the operational phase, are below the relevant objectives without the risk of exceedance at existing sensitive receptor locations within the vicinity of the Site.

6.0 Mitigation Measures

6.1 Construction Phase

Based on the assessment results, mitigation will be required during the construction phase of the Proposed Development. Recommended mitigation measures are given below.

Mitigation Measures

General Communication

- A stakeholder communications plan that includes informing the community before work commences on-site should be developed and implemented.
- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the Site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

Site Management

- All dust and air quality complaints should be recorded and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the Local Authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and then the action taken to resolve the situation recorded in the logbook.

Monitoring

- Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the Local Authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the Site boundary, with cleaning to be provided if necessary.
- The frequency of Site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the Site

- Plan the Site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on-site.
- Where practicable, fully enclose Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period.
- Avoid Site runoff of water or mud.
- Keep Site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on-site. If they are being re-used on-site cover appropriately.

Operating Vehicle/Machinery and Sustainable Travel

- Make sure that all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- A Construction Logistics Plan should be produced to manage the sustainable delivery of goods and materials.

Vehicle Management

- Detailed mitigation measures to control construction traffic should be discussed with the Local Authority to establish the most suitable access and haul routes for the Site traffic. The most effective mitigation would be achieved by making sure that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean and sheeted when on public highways.
- Timing of large-scale vehicle movements to avoid peak hours on the local road network would also be beneficial and this can be incorporated into a Construction Environmental Management Plan (CEMP) for the Proposed Development.

Site Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Make sure that an adequate water supply is available on the Site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Make sure that equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition

- Make sure that effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Earthworks

- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Make sure that sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case make sure that that appropriate additional control measures are in place.

- For smaller supplies of fine powder materials make sure that bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

- Make sure that vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Detailed mitigation measures to control construction traffic should be discussed with the Local Authority to establish the most suitable access and haul routes for the Site traffic. The most effective mitigation will be achieved by making sure that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

It is anticipated that this will be considered with regard to the Proposed Development, where applicable.

Residual Effects

The residual effects of dust and PM_{10} generated by construction activities following the application of the mitigation measures described above and good site practice are considered to be **not significant**.

The residual effects of emissions to air from construction vehicles and plant on local air quality are considered to be **not significant**.

6.2 Operational Phase

Mitigation

The changes in pollutant concentrations attributable to traffic emissions associated with the operational phase of the Proposed Development (i.e., impacts on local air quality) are **negligible** and therefore, in accordance with the assessment criteria, additional mitigation is not required.

Residual Effects

The Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors. As such, no significant effects on air quality are anticipated at existing receptors.

Based on the extent of predicted population exposure to the impacts on pollutant concentrations and the guidance provided by the IAQM, the effect of the Proposed Development is considered to be **not significant**.

The residual effects of the Proposed Development on air quality are **not significant** for NO_2, PM_{10} and $PM_{2.5}$ according to the EPUK/IAQM assessment criteria.

7.0 Summary and Conclusions

TRC was appointed to prepare this Air Quality Assessment to inform a planning application for a development located at the Site.

A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a **high** to **low risk** of dust soiling impacts, **medium** to **low risk** of ecological impacts and a **low** to **negligible risk** of increases in PM concentrations due to unmitigated construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM_{10} releases would be significantly reduced. The residual effects of dust and PM_{10} generated by construction activities on air quality are therefore considered to be **not significant**. The residual effects of emissions to air from construction vehicles and plant on local air quality are considered to be **not significant**.

The Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors and the residual effects are considered to be **not significant**, in line with EPUK and IAQM significance criteria. As such, in accordance with the assessment criteria, additional mitigation is not required.

Based on the assessment significance criteria, the residual effects of the Proposed Development are considered to be **not significant** for all pollutants assessed at nearby sensitive receptors, and therefore, in accordance with the assessment criteria, additional mitigation is not required.

Furthermore, it is considered that the Proposed Development complies with national and local policy for air quality.

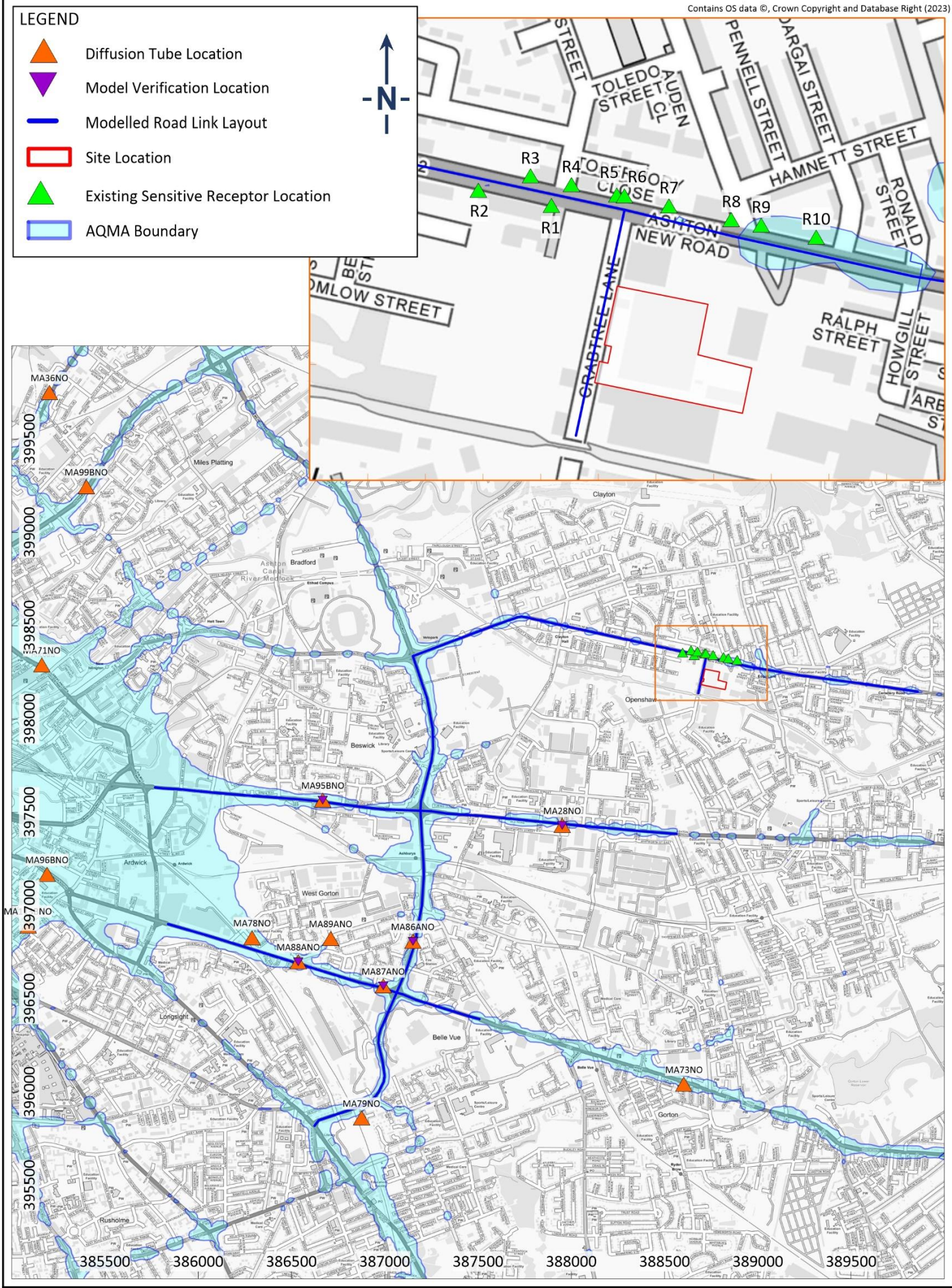
Based on the assessment results, air quality is not considered a constraint to planning consent.

Figures

Contains OS data ©, Crown Copyright and Database Right (2023)

LEGEND

- Diffusion Tube Location
- Model Verification Location
- Modelled Road Link Layout
- Site Location
- Existing Sensitive Receptor Location
- AQMA Boundary



TRC	TITLE: Site Location and Assessment Extents	DRAWN BY: GA / SCALE: NTS	PROJECT NO: 572948.0000.0000
		CHECKED BY: GA / REVISION: -	FIGURE NO: 1
		DATE: 7th December 2023	

Annexes

Annex A - Limitations and Exclusions

Reliance

The recommendations contained in this report represent TRC's professional opinions, based upon the currently available information, and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the Client. The contract between TRC and its Client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of TRC's Client and anyone else specifically identified in writing by TRC as a user of this report. TRC will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, TRC makes no express or implied warranty as to the contents of this report.

Significant Assumptions

The reliability of information provided by others to TRC cannot be guaranteed to be accurate or complete. Performance of this assessment is intended to reduce, but not eliminate, uncertainty regarding environmental conditions associated with the subject site; therefore, the findings and conclusions made in this report should not be construed to warrant or guarantee the subject site, or express or imply, including without limitation, warranties as to its marketability for a particular use. TRC found no reason to question the validity of information received unless explicitly noted elsewhere in this report.

Third Party Information

TRC has been provided with information from third parties for information purposes only and without representation or warranty, express or implied as to its accuracy or completeness and without any liability on such third parties part to revise or update the information. Where reliance has been provided by third parties to potential purchasers, this is noted in our report.

In performing the services to which this report relates, TRC has relied upon the information obtained from third parties. TRC makes no representation or warranty, express or implied as to the accuracy or completeness of any statement or advice contained within this report that is based upon the information obtained from third parties and to the fullest extent permissible by law we hereby exclude any and all liability we may have in respect of the same, provided that nothing shall be taken as limiting TRC's liability in respect of personal injury (including death) caused by its negligence.

Interpretation of Findings

TRC's report is based upon the information provided to TRC and TRC's observations made during the subject property reconnaissance. Given the inherent limitations of environmental assessment work, TRC does not guarantee that the subject property is free of additional air pollution sources or considerations, or that latent or undiscovered conditions will not become evident in the future. TRC's report is prepared in accordance with the proposal and the standard terms and conditions agreed between the Client and TRC, and no other warranties, representations, or certifications are made.

Annex B - Glossary

Glossary

Table B1: Glossary

Abbreviation	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model.
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive subgroups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area
AQO	Air Quality Objective
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emissions Factor Toolkit
Emission rate/factor	The quantity of a pollutant released from a source over a given period of time.
EPUK	Environmental Protection (UK)
Exceedance	A period of time where the concentration of a pollutant is greater than the appropriate air quality standard.
GMCA	Greater Manchester Combined Authority
MCC	Manchester City Council
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
PM	Particulate Matter
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
PTC	Project Transport Consultant
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
Robust	Tending to over-predict the impact rather than under-predict.
µg/m³ micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy' and has replaced it on recent European legislation.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

Annex C - Relevant UK Air Quality Strategy Objectives

Relevant UK Air Quality Strategy Objectives

Table C1: Relevant UK Air Quality Strategy Objectives

National Air Quality Objectives and European Directive Limit Values for the Protection of Human Health						
Pollutant	**Applies To**	**Objective**	**Measured As**	**Date to be achieved by and maintained thereafter**	**European Obligations**	**Date to be achieved by and maintained thereafter**
Nitrogen dioxide (NO_2)	UK	40µg/m^3	annual mean	31.12.2005	40µg/m^3	01.01.2010
	UK	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005	200µg/m^3 not to be exceeded more than 18 times a year	01.01.2010
Particulate Matter (PM_{10}) (gravimetric)[A]	UK (except Scotland)	40µg/m^3	annual mean	31.12.2005	40µg/m^3	01.01.2010
	UK (except Scotland)	50µg/m^3 not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	50µg/m^3 not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter ($PM_{2.5}$)	UK (except Scotland)	20µg/m^3	annual mean	01.01.2020	Stage 1 Limit - 25µg/m^3 Stage 2 Limit - 20µg/m^3	01.01.2015 01.01.2020

[A] Measured using the European gravimetric transfer sampler or equivalent

µg/m^3 = micrograms per cubic metre

Annex D - IAQM Construction Phase Assessment Methodology

IAQM Construction Assessment Methodology

Step 1 - Screening the Need for a Detailed Assessment

An assessment will normally be required where there are:

- 'human receptors' within 250m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or
- 'ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible'.

Step 2a - Define the Potential Dust Emission Magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table D1: Potential Dust Emission Magnitude

Magnitude	Activity	IAQM Criteria
Large	Demolition	• >75,000m^3 building demolished • Potentially dusty material (e.g., concrete) • On-site crushing/screening • Demolition >12m above ground level
	Earthworks	• Total site area >110,000m^2 • Potentially dusty soil type, e.g., clay • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6m in height
	Construction	• Total building volume >75,000m^3 • On site concrete batching • Sandblasting
	Trackout	• >50 HDV (>3.5t) outward movements in any one day • Potentially dusty surface material, e.g., high clay content • Unpaved road length >100m
Medium	Demolition	• 12,000 - 75,000m^3 building demolished • Potentially dusty material (e.g., concrete) • Demolition 6-12m above ground level
	Earthworks	• Total site area 18,000m^2 - 110,000m^2 • Moderately dusty soil type, e.g., silt • 5-10 heavy earth moving vehicles active at any one time • Formation of bunds 3m-6m in height
	Construction	• Total building volume 12,000m^3 - 75,000m^3 • Potentially dusty construction material, e.g., concrete • On site concrete batching
	Trackout	• 20-50 HDV(>3.5t) outward movements in any one day • Moderately dusty surface material, e.g., high clay content • Unpaved road length 50m - 100m
Small	Demolition	• <12,000m^3 building demolished • Non-dusty material (e.g metal cladding) • Demolition <6m above ground level • Work during wetter months
	Earthworks	• Total site area <18,000m^2 • Soil type with large grain size, e.g., sand • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height

Magnitude	Activity	IAQM Criteria
Small	Construction	• Total building volume <12,000 m^3 • Construction material with low potential for dust release, e.g., metal cladding or timber
	Trackout	• <20 HDV (>3.5t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50m

Step 2b - Define the Sensitivity of the Area

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table D2- Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250*
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note: * Distance from source has been reduced from 350m in accordance with the suggested screening distance.

Table D3: Factors to Consider - Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Human Receptors	Ecological Receptors
High	Users can expect enjoyment of a high level of amenity The appearance, aesthetics or value of their property would be diminished by soiling People or property reasonably expected to be present continuously, or at least regularly for extended periods, as part of the normal use of the land Indicative examples include dwellings, museums, medium and long-term car parks and car showrooms	Locations with an international or national designation and the designated features may be affected by dust soiling Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home The appearance, aesthetics or value of their property could be diminished by soiling The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal use of the land Indicative examples include parks and places of work	Location where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown Locations with a national designation where the features may be affected by dust deposition Indicative examples are a Site of Special Scientific Interest (SSSI) with dust sensitive features
Low	The enjoyment of amenity would not reasonably be expected Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling There is a transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads	Locations with a local designation where the features may be affected by dust deposition Indicative example is a local nature reserve with dust sensitive features

Table D4: Factors to Consider - Sensitivity of People to Health Effects of PM_{10}

Receptor Sensitivity	Human Receptors
High	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for 8 hours or more in a day). • Indicative examples include residential properties. Hospitals and schools should also be considered as have equal sensitivity to residential areas for the purposes of this assessment.
Medium	• Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for 8 hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
Low	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.

Table D5: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<250*
High	>32µg/m³ (>18 µg/m³ in Scotland)	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m³ (16-18 µg/m³ in Scotland	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m³ (14-16 µg/m³ in Scotland	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m³ (<14 µg/m³ in Scotland	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m³ (>18 µg/m³ in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m³ (16-18µg/m³ in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m³ (14-16µg/m³ in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m³ (<14µg/m³ in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Note: * Distance from source has been reduced from 350m in accordance with the suggested screening distance.

Table D6: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	Medium	Medium
Medium	Medium	Low
Low	Low	Low

Step 2c - Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table D7: Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 - Site Specific Mitigation

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Step 4 - Determine Significant Effects

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

Annex E - Dispersion Model Details

Model Input Parameters

Traffic Flow Data

2022 is the most recent year for which appropriate monitoring data and meteorological data are available to enable verification of the model results, and so this year has been used as the baseline year for this assessment. 2025 is the assumed opening year of the Proposed Development.

Traffic data for use in the assessment, including 24-hour AADT flows and fleet composition as HDV proportion, were obtained from the PTC and DfT's Road Traffic Statistics website[22], where applicable. The DfT web tool enables the user to view and download available traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 2000 to 2022. It should be noted that the DfT web tool is referenced in Defra's LAQM.TG22 guidance as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the Site.

The 2022 traffic data obtained from DfT were converted to the assumed operational year utilising a factor obtained from TEMPro (version 8.0). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

Table E1: 2022 Verification Traffic Data

Road Link	Description	AADT (Total vehicles)	%HDV	Speed (km/h)	NO_X Emission Factor (g/km/s)
1	Crabtree Lane	294	10.00	20	0.001771
2	A662 Ashton New Road	12,069	3.60	20	0.055710
3	A6010 Alan Turing Way (North of Ashton Old Road)	28,881	3.16	20	0.130519
4	A6010 Alan Turing Way (South of Ashton Old Road)	27,380	3.49	20	0.125723
5	A6010 Alan Turing Way (South of Hyde Road)	16,711	1.87	20	0.070781
6	A57 Hyde Road (West of A6010, Junction Approach)	20,702	5.25	20	0.103070
7	A57 Hyde Road (West of A6010)	20,702	5.25	10	0.142460
8	A57 Hyde Road (East of A6010, Junction Approach)	26,634	5.33	10	0.184154
9	A57 Hyde Road (East of A6010)	26,634	5.33	20	0.133072
10	A635 Ashton Old Road (East of A6010, Junction Approach)	21,573	4.8	10	0.144473
11	A635 Ashton Old Road (East of A6010)	21,573	4.8	15	0.119836
12	A635 Ashton Old Road (West of A6010, Junction Approach)	19,903	3.95	10	0.126353
13	A635 Ashton Old Road (West of A6010)	19,903	3.95	20	0.093403
14	A635 Ashton Old Road (West of A6010-Wide)	19,903	3.95	20	0.093403
15	A635 Ashton Old Road (West of A6010)	19,903	3.95	20	0.093403

Table E2: 2025 Without Development Traffic Data

Road Link	AADT (Total vehicles)	%HDV	Speed (km/h)	NO_X Emission Factor (g/km/s)	PM_{10} Emission Factor (g/km/s)	$PM_{2.5}$ Emission Factor (g/km/s)
1	301	10.00	20	0.001815	0.000175	0.000096
2	12,373	3.60	20	0.057114	0.006259	0.003383
3	29,609	3.16	20	0.133808274	0.014822	0.008002
4	28,070	3.49	20	0.128890724	0.014162	0.007653
5	17,132	1.87	20	0.072564245	0.008313	0.004471
6	21,224	5.25	20	0.10566732	0.011153	0.006056
7	21,224	5.25	10	0.146049903	0.011312	0.006215
8	27,305	5.33	10	0.188795017	0.014581	0.008013
9	27,305	5.33	20	0.136425781	0.014374	0.007807
10	22,117	4.80	10	0.14811408	0.011664	0.006400
11	22,117	4.8	15	0.122855818	0.011581	0.006316
12	20,405	3.95	10	0.129537183	0.010545	0.005770
13	20,405	3.95	20	0.095756682	0.010406	0.005631
14	20,405	3.95	20	0.095756682	0.010406	0.005631
15	20,405	3.95	20	0.095756682	0.010406	0.005631

Table E3: 2025 With Development Traffic Data

Road Link	AADT (Total vehicles)	%HDV	Speed (km/h)	NO_x Emission Factor (g/km/s)	PM_{10} Emission Factor (g/km/s)	$PM_{2.5}$ Emission Factor (g/km/s)
1	749	8.02	20	0.004183	0.000418	0.000229
2	12,820	3.71	20	0.059488	0.006502	0.003516
3	30,056	3.21	20	0.136160	0.015064	0.008134
4	28,517	3.54	20	0.131257	0.014405	0.007785
5	17,579	1.99	20	0.074922	0.008555	0.004603
6	21,671	5.28	20	0.108037	0.011395	0.006188
7	21,671	5.28	10	0.149394	0.011559	0.006351
8	27,752	5.35	10	0.192114	0.014827	0.008149
9	27,752	5.35	20	0.138782	0.014616	0.007939
10	22,564	4.84	10	0.151479	0.011911	0.006536
11	22,564	4.84	15	0.125598	0.011826	0.006450
12	20,852	4.01	10	0.132889	0.010792	0.005906
13	20,852	4.01	20	0.098130	0.010649	0.005763
14	20,852	4.01	20	0.098130	0.010649	0.005763
15	20,852	4.01	20	0.098130	0.010649	0.005763

Roughness Length

The roughness length (z_0) is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 1m was used to describe the modelling extents and 0.2m for the meteorological station site. These values of z_0 are considered appropriate for the morphology of these areas and are suggested within ADMS-Roads as being suitable for 'Cities, woodlands' and 'Agricultural areas (min)' respectively.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and 10m for the meteorological station site. These values are considered appropriate for the nature of these areas and are suggested within ADMS-Roads as being suitable for 'Cities and large towns' and 'Small towns <50,000', respectively.

Model Verification

Introduction

The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations, which can arise due to the presence of inaccuracies and/or uncertainties in model input data, modelling and monitoring data assumptions. The following are examples of potential causes of such discrepancy:

- Estimates of background pollutant concentrations;
- Meteorological data uncertainties;
- Traffic data uncertainties;
- Model input parameters, such as 'roughness length'; and
- Overall limitations of the dispersion model.

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is considered to be fit for purpose. Model validation undertaken by the software developer will not have included validation in the vicinity of the Proposed Development.

To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process of verification aims to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results and was carried out following the methodology specified in Chapter 7, Section 4, of LAQM.TG22.

Nitrogen Dioxide (NO_2)

Most NO_2 is produced in the atmosphere by the reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of the primary pollutant emissions of NO_x (NO_x = NO + NO_2), in line with the guidance provided within LAQM.TG22.

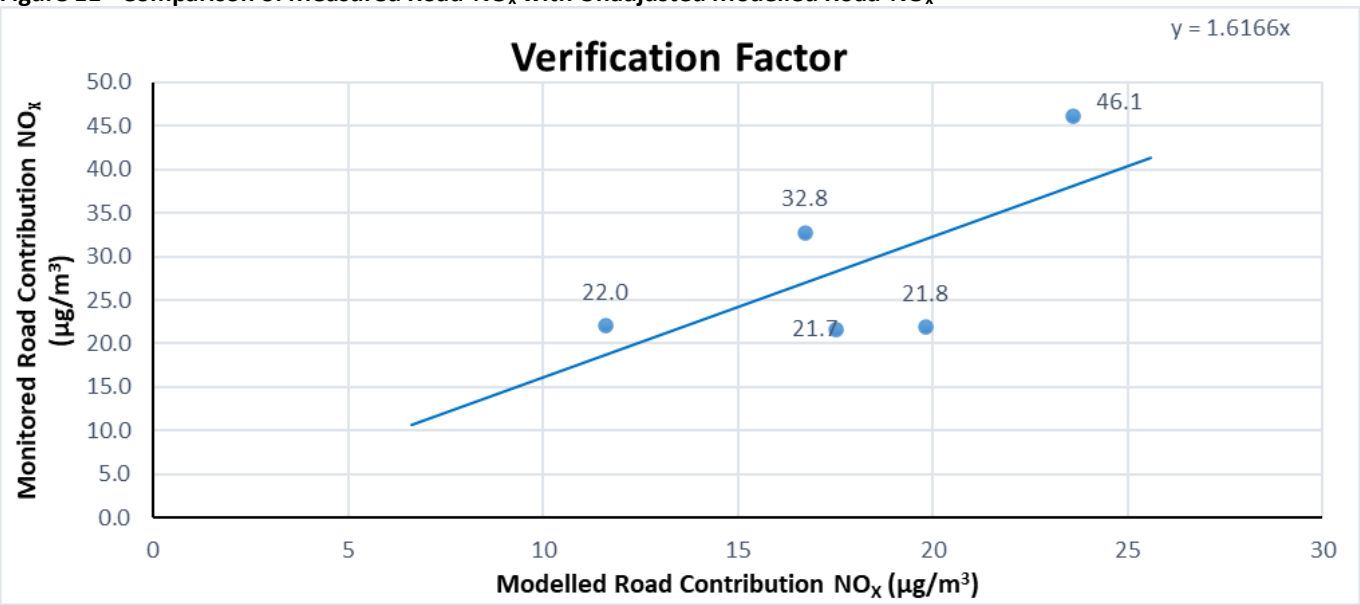
The model has been run to predict the 2022 annual mean road-NO_x contribution at five roadside diffusion tube within the modelled road network at the verification location with suitable monitoring data and traffic data. The model outputs of road-NO_x have been compared with the 'measured' road-NO_x, which was determined from the NO_2 concentrations measured using the diffusion tube at the monitoring location, utilising the NO_x to NO_2 Calculator provided by Defra and the NO_2 background concentrations (from the Defra background map). As discussed in the methodology section, the most recent suitable data available for model verification purposes is considered to be from 2022. This dataset provided a robust assessment approach considering the potential impact of travel restrictions on air quality in more recent years.

Table E4: Model Verification

Site ID	2022 Monitored Total NO_2 (µg/m³)	2022 Background NO_2 (µg/m³)	2022 Monitored Road Contribution NO_X (µg/m³)	2022 Modelled Road Contribution NO_X (µg/m³)	Ratio
MA28NO	29.3	18.1	22.0	11.6	1.892
MA86ANO	27.5	16.4	21.7	17.5	1.236
MA87ANO	28.0	16.8	21.8	19.8	1.101
MA88ANO	39.2	16.8	46.1	23.6	1.952
MA95BNO	33.7	17.3	32.8	16.7	1.958

The road-NO_x adjustment factor was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero (**Figure E1**). This resulted in a factor of **1.62**, indicating that the model was under-predicting. This road-NO_x adjustment factor was applied to the modelled road-NO_x concentrations for the monitoring sites to provide adjusted modelled road-NO_x concentrations. The total NO_2 concentrations were then determined by inputting the adjusted modelled road-NO_x concentrations and the background NO_2 concentrations into the NO_x to NO_2 Calculator (version 8.1, 26th June 2020) provided by Defra[25]. The NO_2 diffusion tube monitoring results recorded by GMCA were subsequently used to derive an indicative baseline annual mean NO_2 concentration for each site in the vicinity of the Proposed Development. Reference should be made to **Figure 1**, which shows the diffusion tube monitoring location within the assessment extents.

Figure E1 - Comparison of Measured Road-NO_x with Unadjusted Modelled Road-NO_x

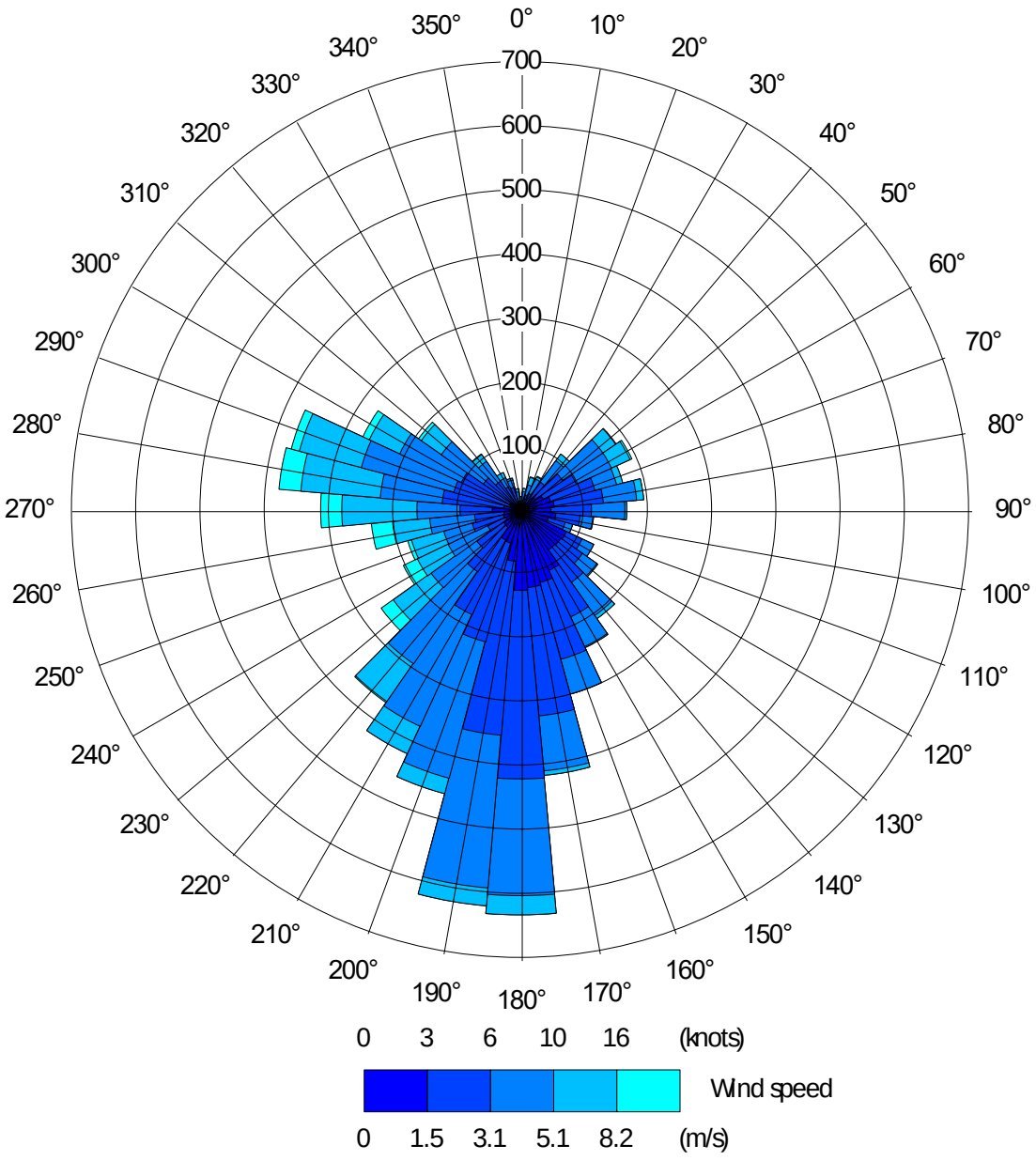


Particulate Matter (PM_{10} and $PM_{2.5}$)

There are no local PM_{10} or $PM_{2.5}$ monitoring data against which the model could be verified. Consequently, the verification factor determined above for adjusting the road-NO_x contribution has been applied to the predicted road-PM_{10} and road-$PM_{2.5}$ contributions, consistent with guidance set out in LAQM.TG22.

Annex F - Windrose for Manchester Airport 2022

Windrose for Manchester Airport 2022



Annex G - Dispersion Modelling Results

Dispersion Modelling Results

Annual Mean NO_2 Concentrations

Table G1 - Annual Mean NO_2 Concentrations

Receptor	Future Without Dev. (µg/m³)	Future With Dev. (µg/m³)	% of AQAL	Change (µg/m³)	% of AQO	Impact
R1	21.6	21.9	54.8	0.3	0.7	Negligible
R2	20.4	20.5	51.3	0.1	<0.5	Negligible
R3	26.5	26.9	67.3	0.4	1.0	Negligible
R4	26.4	26.8	67.0	0.4	1.0	Negligible
R5	26.9	27.4	68.5	0.5	1.3	Negligible
R6	26.3	26.9	67.3	0.6	1.5	Negligible
R7	25.7	26.1	65.3	0.4	1.0	Negligible
R8	21.5	21.7	54.3	0.2	0.5	Negligible
R9	24.4	24.7	61.8	0.3	0.8	Negligible
R10	24.3	24.6	61.5	0.3	0.8	Negligible

* Results are rounded to 0.1µg/m³

Annual Mean PM_{10} Concentrations

Table G2 - Annual Mean PM_{10} Concentrations

Receptor	Future Without Dev. (µg/m³)	Future With Dev. (µg/m³)	% of AQAL	Change (µg/m³)	% of AQO	Impact
R1	12.6	12.6	31.5	0.0	<0.5	Negligible
R2	12.8	12.8	32.0	0.0	<0.5	Negligible
R3	14.1	14.2	35.5	0.1	<0.5	Negligible
R4	14.1	14.2	35.5	0.1	<0.5	Negligible
R5	14.2	14.3	35.8	0.1	<0.5	Negligible
R6	14.1	14.2	35.5	0.1	<0.5	Negligible
R7	13.9	14.0	35.0	0.1	<0.5	Negligible
R8	13.0	13.1	32.8	0.1	<0.5	Negligible
R9	13.7	13.7	34.3	0.0	<0.5	Negligible
R10	13.6	13.7	34.3	0.1	<0.5	Negligible

* Results are rounded to 0.1µg/m³

Annual Mean $PM_{2.5}$ Concentrations

Table G3 - Annual Mean $PM_{2.5}$ Concentrations

Receptor	Future Without Dev.(µg/m³)	Future With Dev. (µg/m³)	% of AQAL	Change (µg/m³)	% of AQO	Impact
R1	8.3	8.4	42.0	0.1	0.5	Negligible
R2	8.7	8.7	43.5	0.0	<0.5	Negligible
R3	9.4	9.4	47.0	0.0	<0.5	Negligible
R4	9.4	9.4	47.0	0.0	<0.5	Negligible
R5	9.4	9.5	47.5	0.1	0.5	Negligible
R6	9.4	9.4	47.0	0.0	<0.5	Negligible
R7	9.3	9.3	46.5	0.0	<0.5	Negligible
R8	8.8	8.8	44.0	0.0	<0.5	Negligible
R9	9.1	9.2	46.0	0.1	0.5	Negligible
R10	9.3	9.3	46.5	0.0	<0.5	Negligible

* Results are rounded to 0.1µg/m³