

Air Quality Assessment
Royal Buildings, Manchester

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Executive Summary

Redmore Environmental Ltd was commissioned by Criterion Capital to undertake an Air Quality Assessment in support of a hotel development at the Royal Buildings, Manchester.

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

During the operational phase of the development there is the potential for air quality impacts as a result of traffic exhaust emissions associated with vehicles travelling to and from the site. These were assessed using standard screening criteria. As the proposals do not include any car parking spaces, road traffic exhaust emission impacts were not predicted to be significant.

The potential for exposure of future occupants to elevated pollution levels was assessed based on the results of a desk top study. This indicated that concentrations are likely to be below the relevant criteria at the development location. The site is therefore considered suitable for the proposed end-use from an air quality perspective.

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

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 Redmore Environmental Ltd was commissioned by Criterion Capital to undertake an Air Quality Assessment in support of a hotel development at the Royal Buildings, Manchester.
- 1.1.2 The development has the potential to cause air quality impacts during operation, as well as expose future occupants to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential impacts associated with the scheme.

1.2 Site Location and Context

- 1.2.1 The site is located at the Royal Buildings, Mosley Street, Manchester, at approximate National Grid Reference (NGR): 384262, 398341. Reference should be made to Figure 1 for a map of the site and surrounding area.
- 1.2.2 The proposals comprise the change of use of upper floors from offices (Use Class E) to hotel (Use Class C1), including limited infilling of lightwells.
- 1.2.3 Manchester City Council (MCC) has declared an Air Quality Management Area (AQMA) due to exceedences of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO₂). The development is located within the AQMA. As such, there is the potential for adverse impacts in this sensitive area as a result of the operation of the proposals, as well as the exposure of future occupants to poor quality. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions, assess potential impacts as a result of the scheme and define any requirement for mitigation. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

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

2.1.2 Air Quality Target Values have also been provided for several additional pollutants. It should be noted that the AQLV for PM_{2.5} stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023¹. The document contains standards, objectives and measures for improving ambient air quality, including a number of AQOs. These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 The Environmental Improvement Plan 2023² was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to PM_{2.5}. The concentration target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

¹ The AQS: Framework for Local Authority Delivery, DEFRA, 2023.

² Environmental Improvement Plan 2023, DEFRA, 2023.

2.1.5 Table 1 presents the AQOs and Interim Target for pollutants considered within this assessment.

Table 1 Air Quality Objectives/Interim Target

Pollutant	Air Quality Objective/Interim Target	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
PM _{2.5}	12 ^(a)	Annual mean

Note: (a) Interim Target to be achieved by end of January 2028.

2.1.6 Table 2 summarises the advice provided in DEFRA guidance³ on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

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

³ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

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

2.2 **Local Air Quality Management**

2.2.1 Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 **National Planning Policy**

2.3.1 The revised National Planning Policy Framework⁴ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

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

"c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving

⁴ NPPF, Ministry of Housing, Communities and Local Government, 2021.

biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

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

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

[...]

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

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

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[...]

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 [...]."

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

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

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

2.4 National Planning Practice Guidance

2.4.1 The National Planning Practice Guidance⁵ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

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

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

⁵ <https://www.gov.uk/guidance/air-quality--3>.

2.5 Local Planning Policy

2.5.1 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy Development Plan Document⁶ is central. This was adopted by MCC on 11th July 2012 and provides policies which guide the determination of planning applications within the city.

2.5.2 Review of the Core Strategy Development Plan Document indicated the following policies of relevance to the assessment:

"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 effect 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 effects on air quality, alongside other plan objectives. This includes cumulative effects, particularly in Air Quality Management Areas."

"Policy DM 1

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:

[...]

⁶ Core Strategy Development Plan Document, MCC, 2012.

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."

2.5.3 MCC has also produced an 'Air Quality & Planning Technical Guidance'⁷ Supplementary Planning Document (SPD) which provides guidance on assessing the impact of proposed development on air quality.

2.5.4 The above policies and SPD were taken into consideration throughout the undertaking of the assessment.

⁷ Air Quality & Planning Technical Guidance, MCC, 2022.

3.0 **METHODOLOGY**

3.1 **Introduction**

3.1.1 The proposed development has the potential to cause air quality impacts during the operational phase, as well as expose future occupants to any existing air quality issues at the site. These have been assessed in accordance with the following methodology.

3.2 **Potential Development Impacts**

3.2.1 The development has the potential to increase concentrations of NO₂, PM₁₀ and PM_{2.5} as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. A screening assessment was therefore undertaken using the criteria contained within the Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality'⁸ guidance to determine the potential for trips generated by the development to affect local air quality.

3.2.2 The following criteria are provided to help establish when an assessment of potential road traffic impacts on the local area is likely to be considered necessary:

A. If any of the following apply:

- 10 or more residential units or a site area of more than 0.5ha; or,
- more than 1,000 m² of floor space for all other uses or a site area greater than 1ha.

B. Coupled with any of the following:

- the development has more than 10 parking spaces; or,
- the development will have a centralised energy facility or other centralised combustion process.

3.2.3 Should these criteria not be met, then the IAQM guidance⁹ considers air quality impacts associated with a scheme to be **not significant** and no further assessment is required.

⁸ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

⁹ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

- 3.2.4 Should screening of the relevant data indicate that any of the above criteria are met, then potential impacts at sensitive receptor locations can be assessed by calculating the change in pollutant concentrations as a result of the proposed development. The significance of predicted impacts can then be determined in accordance with the methodology outlined in the IAQM guidance¹⁰.

3.3 Potential Future Exposure

- 3.3.1 As shown in Table 2, hotels are considered locations of relevant exposure for short-term AQOs. Existing air quality conditions at the site were therefore assessed through consideration of local monitoring results and the development proposals. The findings were subsequently used to determine the potential for AQO exceedence at the site and any requirement for mitigation.

¹⁰ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

4.0 BASELINE

4.1 Introduction

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

4.2 Local Air Quality Management

- 4.2.1 As required by the Environment Act (1995), as amended by the Environment Act (2021), MCC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ are above the AQO within the city. As such, a number of roads within Manchester have been included within the Greater Manchester Combined Authority (GMCA) AQMA. This is described as follows:

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

- 4.2.2 The development is located within the AQMA. As such, there is the potential for the exposure of future occupants to poor air quality and any emissions associated with the proposals to cause air quality effects within this sensitive location. This has therefore been considered within the assessment.
- 4.2.3 MCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMA's have been designated.

4.3 Air Quality Monitoring

- 4.3.1 Monitoring of pollutant levels is undertaken by MCC throughout the city. Recent 1-hour mean NO₂ results recorded in the vicinity of the development are shown in Table 3.

Table 3 Monitoring Results - 1-hour Mean NO₂ Concentrations

Monitoring Site		Number of Hours with NO ₂ Concentrations above 200µg/m ³		
		2019	2020	1
MAN3	Manchester Piccadilly	0	0	0

4.3.2 As shown in Table 3, the number of hours with NO₂ concentrations above 200µg/m³ was below the permitted number of 18 at the MAN3 monitor between 2018 and 2020.

Reference should be made to Figure 1 for a map of the monitoring location.

4.3.3 Recent 24-hour mean PM₁₀ results recorded in the vicinity of the development are shown in Table 4.

Table 4 Monitoring Results - 24-hour Mean PM₁₀ Concentrations

Monitoring Site		Number of Days with PM ₁₀ Concentrations above 50µg/m ³		
		2019	2020	2021
MAN3	Manchester Piccadilly	7	1	2

4.3.4 As shown in Table 4, the number of days with PM₁₀ concentrations above 50µg/m³ was below the permitted number of 35 at the MAN3 monitor between 2018 and 2020.

4.3.5 Pollutant concentrations during 2020 were lower than previous years due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background annual mean pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 383500, 399500. Data for this location was downloaded from the DEFRA website¹¹ for the purpose of the assessment and is summarised in Table 5.

¹¹ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Table 5 Background Annual Mean Pollutant Concentration Predictions

Pollutant	Predicted 2023 Background Annual Mean Pollutant Concentration ($\mu\text{g}/\text{m}^3$)
NO ₂	25.53
PM ₁₀	12.92

4.4.2 As shown in Table 5, predicted background NO₂ and PM₁₀ concentrations are below the annual mean AQOs at the proposed development site.

5.0 **ASSESSMENT**

5.1 **Introduction**

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

5.2 **Potential Development Impacts**

- 5.2.1 Any vehicle movements associated with the proposals will generate exhaust emissions on the local and regional road networks. However, the development does not include any car parking spaces. As such, potential air quality impacts associated with the operational phase road vehicle exhaust emissions are predicted to be **not significant**, in accordance with the IAQM¹² screening criteria shown in Section 3.2.

5.3 **Potential Future Exposure**

- 5.3.1 Hotel land use is considered sensitive to elevated short term pollutant concentrations. As such, the proposed development has the potential to introduce new receptors into an area of poor air quality.
- 5.3.2 Review of local data indicated that the MAN3 monitor is located approximately 30m east of the proposed development. Recent monitoring results, as outlined in Table 3 and Table 4, indicate no recorded exceedences of the 1-hour mean AQO for NO₂ or the 24-hour mean AQO for PM₁₀ over the period 2018 to 2020. Due to the distance between the development and survey site, air quality conditions are considered to be comparable. As such, exceedences are not anticipated at the development boundary.
- 5.3.3 Based on the above, it is considered unlikely that there will be exceedences of the short term AQOs for NO₂ and PM₁₀ at the site. As such, the site is considered suitable for the proposed end use.

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

6.0 MITIGATION

6.1.1 A number of mitigation measures have been included within the development in accordance with the requirements of the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'¹³ to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. Table 6 describes the good practice principles detailed in the IAQM guidance along with how each has been addressed with regards to the proposals.

Table 6 Good Practice Design Principles for Operational Phase Air Quality Impacts

Phase	Principle	Action
Design Phase	New developments should not contravene the Council's AQAP ¹⁴ , or render any of the measures unworkable	It is confirmed that the proposals will not contravene MCC's AQAP, or render any of the measures unworkable
	Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion	The development will not create a new street canyon or a building configuration that inhibits effective dispersion
	Delivering sustainable development should be the key theme of any application	The proposals have been designed to encourage sustainable behaviours, such as active and public transport due to its proximity to public transport and amenities
Operational Phase	The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1,000m ² of commercial floor space. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made	The proposals do not include provision of any car parking spaces and therefore EV charging points are not considered necessary

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

¹⁴ Greater Manchester AQAP 2016-2021, GMCA, 2016.

Phase	Principle	Action
	Where development generates significant additional traffic, provision of a detailed Travel Plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety	A Travel Plan may be produced if required by the LA
	All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh. All gas-fired CHP plant to meet a minimum emissions standard of: • Spark ignition engine: 250mgNO_x/Nm³; • Compression ignition engine: 400mgNO_x/Nm³; • Gas turbine: 50mgNO_x/Nm³. A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of: • Solid biomass boiler: 275mgNO_x/Nm³ and 25mgPM/Nm³	Any boilers to be included in the development will be provisioned in accordance with the relevant requirements

6.1.2 It is considered the above methods would further reduce potential impacts associated with the scheme. Specific mitigation suited to the proposals may be stipulated as a planning condition if deemed necessary by the LA.

7.0 CONCLUSION

- 7.1.1 Redmore Environmental Ltd was commissioned by Criterion Capital to undertake an Air Quality Assessment in support of in support of a hotel development at the Royal Buildings, Manchester.
- 7.1.2 The development has the potential to cause air quality impacts during operation, as well as expose future occupants to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.
- 7.1.3 The potential for air quality impacts as a result of traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase was assessed against the screening criteria provided within the IAQM guidance document. As the proposals do not include any car parking spaces, road traffic impacts were predicted to be **not significant**.
- 7.1.4 The potential for the exposure of future occupants to elevated pollution levels was assessed based on recent monitoring results and the development layout. This indicated that concentrations of NO₂ and PM₁₀ are likely to be below the relevant AQOs at the development location. As such, the site is considered suitable for the proposed end-use from an air quality perspective without the inclusion of mitigation.
- 7.1.5 Based on the assessment results, air quality factors are not considered a constraint to planning consent for the development.

8.0 **ABBREVIATIONS**

AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
DEFRA	Department for Environment, Food and Rural Affairs
EV	Electric Vehicle
GMCA	Greater Manchester Combined Authority
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
MCC	Manchester City Council
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
SPD	Supplementary Planning Document

Figures



Legend

-  Site Boundary
-  Monitor

Title

Figure 1 - Site Location and Monitoring Position

Project

Air Quality Assessment
Royal Buildings, Manchester

Project Reference

6832

Client

Criterion Capital

Contains Ordnance Survey Data
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