

Air Quality Assessment

Stonehouse Farm, Ash Bank Road, Werrington

Carta Real Estate (Moorlands) Limited

MAN.9079.001.AQ.R.001.P01

Landscape
Hydrology
Permits
Ecology
Geo-Environmental
Transport
Planning
Noise
Agriculture
Air Quality



Contact Details:

Enzygo Ltd. (Manchester Office)
4th Floor, Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Tel: 0161 416 6444
www: enzygo.com
email: josh.davies@enzygo.com

Air Quality Assessment

Project	Stonehouse Farm, Ash Bank Road, Werrington
For	Carta Real Estate (Moorlands) Limited
Status	First Draft
Reference	MAN.9079.001.AQ.R.001.P01
Date	13/11/2025
Author	Josh Davies BSc(Hons) – Principal Air Quality Consultant
Reviewer	Conal Kearney MSc BEng(Hons) – Director of Air Quality

Disclaimer:

This report has been produced by Enzygo Limited within the terms of the contract with the client and taking account of the resources devoted to it by agreement with the client.
We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Enzygo Limited Registered in England No. 6525159
Registered Office: Gresham House, 5-7 St. Pauls Street, Leeds, England, LS1 2JG

CONTENTS

1.0	Introduction	4
2.0	Legislation Guidance and Policy	6
3.0	Methodology	9
4.0	Baseline Conditions	11
5.0	Assessment	13
6.0	Conclusions	14

Figure and Tables

Figure 1 – Site Location and Context	5
Table 1 – Air Quality Limit Values and Objectives	7
Table 2 – Where EQS Apply	7
Table 3 – Diffusion Tube Monitoring Results	11
Figure 2 – Monitoring Locations	12
Table 4 – DEFRA Predicted Background Concentrations	12

Appendices

Non-Technical Summary	iii
Glossary of Terms	15

Non-Technical Summary

Enzygo Limited was commissioned by Carta Real Estate (Moorlands) Limited to undertake an Air Quality Assessment in support of a commercial development at Stonehouse Farm, Ash Bank Road, Werrington, Staffordshire.

The development has potential to cause impacts at nearby sensitive locations during the operational phases, which may arise due to road traffic emissions associated with trips to and from the site.

An Air Quality Assessment is required to determine the baseline conditions and to consider the significance of development led impacts.

A review of available baseline air quality sources indicated that the site and roadside locations in the area are not experiencing elevated pollutant concentrations.

Operational impacts associated with vehicles travelling to and from the site were compared against industry standard screening criteria. Based on the predicted traffic generation, impacts were predicted to be not significant.

In addition, given that existing background concentrations at worst case roadside locations in the area are well below the national air quality standards impacts are likely to be negligible.

In summary it is predicted that air quality impacts are deemed not significant and should not form a constraint to planning consent.

1.0 Introduction

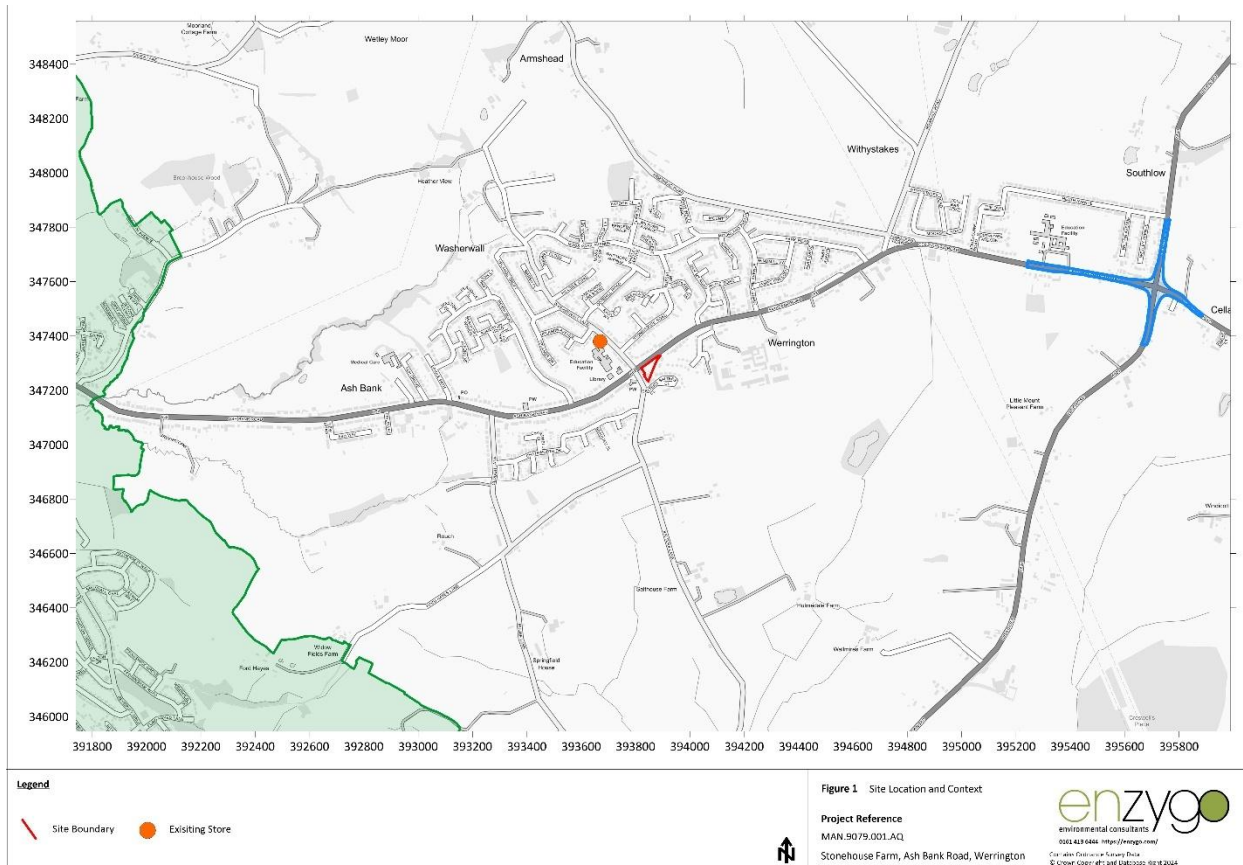
1.1 Background

- 1.1.1 Enzygo Limited (Ltd) was commissioned by Carta Real Estate (Moorlands) Ltd to undertake an Air Quality Assessment (AQA) to consider potential impacts associated with the erection of a Class E retail unit, alongside access, car parking and associated works, hereafter referred to as the 'Proposed Development'.
- 1.1.2 This AQA has been prepared to support a revised planning application, which follows an earlier submission (SMD/2022/0538) that was refused on design grounds. Air quality was not identified as an issue during the previous determination, and the Environmental Health Officer at Staffordshire Moorlands District Council (SMDC) raised no objections. Notwithstanding this, their consultation response indicated that provision of an AQA would be helpful to inform the revised application.
- 1.1.3 Accordingly, an assessment has been undertaken in accordance with industry standard guidance criteria to define baseline air quality conditions at the site and consider impacts generated during an operational phase. The assessment also determines site suitability with relation to pollutant concentrations from local emission sources.
- 1.1.4 Details of the assessment methodology, results and conclusions are presented within this report.

1.2 Location and Context

- 1.2.1 The Proposed Development is located at the approximate National Grid Reference (NGR): 393850, 347280, set within the village of Werrington, located approximately 6 km east of the City of Stoke-on-Trent.
- 1.2.2 It is understood that the proposals seek the relocation of an existing retail unit, located off Washerwall Lane, 180m north of the Proposed Development.
- 1.2.3 The application site is bound to the north by the A52 (Ash Bank Road) to the east and south by existing residential dwellings along Salter Close and Spindlestone Close. The site is also located close to two Air Quality Management Area (AQMA), designated by SMDC and the neighbouring Stoke City Council (SCC). No ecological designations were identified with the study area, therefore impacts upon ecological designations have not been considered further in this assessment.
- 1.2.4 Reference should be made to Figure 1 for a map of the site boundary, surrounding context, and location of the existing unit.

Figure 1 – Site Location and Context



1.3 Limitations

- 1.3.1 This report has been produced in accordance with Enzygo's standard terms of engagement. Enzygo has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Enzygo; a charge may be levied against such approval.

2.0 Legislation Guidance and Policy

2.1.1 The following legislation, guidance and policy will be considered and adhered to during the preparation of the Air Quality Assessment:

- The Air Quality Standards (Amendment) Regulations, updated on 31st December 2016¹;
- Part IV of the Environment Act (1995);
- Section 82 of the Environment Act (1995) (Part IV);
- The Air Quality Standards (Amendment) Regulations (2016);
- The National Planning Policy Framework (NPPF), updated on 7th February 2025;
- The National Planning Practice Guidance (NPPG), relevant chapters updated on 1st November 2019;
- Local Air Quality Management Technical Guidance 2022 LAQM (TG22), DEFRA, 2022²; and
- Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management (IAQM), January 2017³.

2.2 UK Legislation

2.2.1 Part IV of the Environment Act the Secretary of State to publish a national Air Quality Strategy (AQS). The national AQS¹ produced by the Department for Environment, Food and Rural Affairs (DEFRA) sets out the framework to reducing adverse impacts of air pollution upon human health, vegetation, and ecosystems. To achieve this the AQS defines air quality objectives (AQOs) for 10 key pollutant species, including nitrogen dioxide (NO₂), fine particulate matter (PM₁₀ and PM_{2.5}) which are relevant to this assessment.

2.2.2 In accordance with the Environment Act (1995), Local Authorities (LAs) have an obligation to periodically review and assess air quality within their administration to determine if specified pollutants are exceeding relevant objectives. This review involves the assessment of present and likely future air quality and is termed Local Air Quality Management (LAQM).

2.2.3 Should the LAQM process identify areas which are predicted to or currently exceeding relevant AQOs the local authority is required to designate an Air Quality Management Area (AQMA).

2.2.4 AQMAs require an Air Quality Action Plan (AQAP) which sets various measures and polices to improve air quality with the goal of restoring compliance with the AQOs. The process of LAQM is informed by DEFRA's Technical Guidance LAQM.TG22².

2.2.5 European Directive 2008/50/EC also sets out a similar approach to the AQS and defines limit values for the protection of human health and ecosystems. The Environmental

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

² Local Air Quality Management Technical Guidance 2022 (LAQM.TG22), DEFRA, August 2022

³ Land-Use Planning and Development Control: Planning for Air Quality, EPUK and IAQM, January 2017

Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2019 ensures that the Environmental Permitting (EP) regime can continue following the UK's exit from the European Union (EU).

2.2.6 The regulations state also that exceedances of the objectives should be assessed in relation to air quality 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”.

2.2.7 AQOs applicable to this assessment are summarised in Table 1 with relation to human health receptors. It should be noted that site suitability will be determined using these objectives.

Table 1 – Air Quality Limit Values and Objectives

Pollutant	Air Quality Standards	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Periods
Nitrogen Dioxide (NO_2)	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
Particulate matter with an aerodynamic diameter of less than $10\mu\text{m}$ (PM_{10})	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
Particulate matter with an aerodynamic diameter of less than $2.5\mu\text{m}$ ($\text{PM}_{2.5}$)	20	Annual mean

2.2.8 Table 2 summarises the advice provided in the DEFRA guidance LAQM.TG22² on where the EQS apply.

Table 2 – Where EQS Apply

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building facades 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

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
1-hour mean	As above, and kerbside sites (for example, pavements of busy shopping streets) 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 are expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access
24-hour mean	As above 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

2.2.9 Based on the proposed Class E land use the Proposed Development is not considered to provide any significant air quality exposure.

2.3 Local Planning Policy

Staffordshire Moorlands Local Plan

2.3.1 The SMDC Plan⁴ was adopted in September 2020 and sets out the development strategy, strategic and development management policies and land designations for the District. It influences how and where the Staffordshire Moorlands will develop in the future. The document also supersedes the 2014 Core Strategy. Policies relevant to air quality are detailed below.

Policy SD 4 Pollution and Water Quality

The Council will protect people and the environment from unsafe, unhealthy and polluted environments by ensuring proposals avoid potential adverse effects; and only permitting proposals that are deemed (individually or cumulatively) to result in pollution (including air/ water/ noise/ vibration/ light/ ground contamination) if after mitigation, potential adverse effects are deemed acceptable. This may be achieved by the imposition of planning conditions or through a planning obligation

2.3.2 Reference has been made to this policy during the undertaking of this AQA by assessing development lead impacts on nearby existing sensitive locations.

⁴ Liverpool Local Plan, Liverpool City Council, January 2022

3.0 Methodology

3.1 Emissions Assessment

3.1.1 Emissions generated by the Proposed Development during operation have potential to cause impacts at existing sensitive locations. Additionally, NO₂, and fine PM emissions associated with the local road network may introduce future site users to an area of existing poor air quality. Potential impacts were assessed in accordance with the following assessment steps:

- Baseline Assessment; and
- Operation Phase Impact Screening Assessment.

3.1.2 The assessment approach also accords with the methodology detailed in the IAQM planning guidance³.

3.2 Baseline Assessment

3.2.1 Baseline conditions within the assessment extents were determined by a review of the latest Air Quality Status Report (ASR)⁵ produced by SMDC and predicted background pollutant concentrations produced by DEFRA⁶. Local emission sources were also identified along with AQMA locations to identify potential emission sources in the assessment area.

3.2.2 With regards to the assessment area, this comprises an area extending approximately 2 km from the application boundary which includes major road traffic emission sources and representative SMDC air quality monitoring sites.

3.3 Operational Phase Impacts

Road Vehicle Emissions Impact Assessment

3.3.1 Potential operational impacts associated with vehicles travelling to and from the Proposed Development were compared against the criteria contained within the IAQM guidance³ to determine the likely significance of impacts and if further assessment is required to quantify operational impacts. The guidance states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Changes in Light Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) outside an AQMA or 100 AADT within or adjacent to an AQMA; and
- Changes in Heavy Duty Vehicle (HDV) flows of more than 100 AADT outside an AQMA, 25 AADT within or adjacent to an AQMA.

3.3.2 Where development traffic data falls below the thresholds, impacts are considered not significant and no further assessment is required. Should development traffic exceed the

⁵ Air Quality Annual Status Report 2024, SMDC, June 2024

⁶ <https://uk-air.defra.gov.uk/data/iaqm-background-maps?year=2021>

thresholds it may be necessary to undertake detailed dispersion modelling to quantify the significance of road vehicle exhaust impacts.

3.3.3 The result of the assessment is provided in Section 5.3.

4.0 Baseline Conditions

Available air quality data and the site surroundings were reviewed to provide a baseline for assessment.

4.1 Local Air Quality Management Areas

4.1.1 DEFRA's AQMA database⁷ indicated that SMDC has designated two AQMAs across their district, with the closest to the site is AQMA No.2 which is declared for annual mean NO₂ exceedances, and described as:

"SMDC AQMA No.2: Cellarhead - The area encompasses the area known locally as the Cellarhead crossroads, which is a busy junction between the A52 and the A520. The AQMA extends 250m (A520) North, 230m South (A520), 480m East (A52) and 210m West (A52) of the junction."

4.1.2 SMDC has concluded that concentrations of all other pollutants considered within the AQOS are currently below the relevant AQOs and as such no further AQMAs have been designated in the study area.

4.2 Local Air Quality Monitoring

4.2.1 The 2024 SMDC ASR⁵ was reviewed to identify representative monitoring locations close to the Proposed Development. SMDC do not currently operate any automatic analysers but do operate several roadside diffusion tube monitoring sites, of which the closest are sited within the No.2 AQMA. Recent monitoring data from these locations are presented in Table 3.

Table 3 - Diffusion Tube Monitoring Results

ID	Location	Distance to Site (m)	Annual Mean Concentration (µg/m³)			
			2021	2022	2023	2024
38	Cellarhead Junction 2 (Mean)	1,873	32.0	35.6	35.3	32.9
39	Cellarhead Junction 3 (Mean)	1,873	32.4	35.1	35.0	33.4
56	Cellar Head Junction 8	1,874	27.6	27.3	30.4	32.4
42	Cellar Head Junction 4 (Mean)	1,877	30.6	32.8	34.6	32.5
69	Cellarhead Junction 9	1,890	-	-	-	24.0
70	Cellarhead Junction 10	1,892	-	-	-	26.0
53	Cellar Head Junction 5	1,901	28.4	30.2	32.0	31.2
55	Cellar Head Junction 7	1,926	23.6	25.9	27.1	27.1
49	Cellar Head Junction 4	1,978	18.7	20.0	20.0	21.4

4.2.2 NO₂ concentrations recorded within the AQMA show no exceedances of the annual mean AQO in recent years. These sites represent worse case locations across the study and are likely to be an overestimation of site conditions which is well distanced from the AQMA.

4.2.3 Figure 2 provides a map of the monitoring locations referenced above.

⁷ <https://uk-air.defra.gov.uk/aqma/list>

Figure 2 – Monitoring Locations



4.2.4 PM₁₀ and PM_{2.5} monitoring is not currently carried out by SMDC, and as such the review of baseline condition will rely upon background prediction provided by DEFRA.

DEFRA Background Pollutant Concentrations

4.2.5 DEFRA produce predictions of background pollutant concentrations on a 1 km by 1 km grid basis for the entire of the UK to assist LAs in their review and assessment of air quality. The Proposed Development is located with the NGR square: 393500, 347500. Data for baseline year was downloaded from the DEFRA website for NO_x and NO₂ for 2024 and summarised in Table 4.

Table 4 – DEFRA Predicted Background Concentrations

Pollutant	2024 Annual Mean Concentration (µg/m³)
NO ₂	7.80
PM10	10.52
PM2.5	6.47

4.2.6 Based on DEFRA predictions, background concentrations are not expected to exceed their relevant AQOs during the current year.

5.0 Assessment

5.1 Operational Phase Impacts

Off-Site Road Traffic Exhaust Impacts

- 5.1.1 The Proposed Development provides a class E retail unit with additional parking spaces, which includes the relocation of an existing retail unit, off Washerwall Lane, 180 m north of the Proposed Development. Based on the traffic data provided by Exigo, the appointed traffic consultant, it is predicted that a net flow of 8 AADT would be generated if the Proposed Development were to go ahead.
- 5.1.2 The analysis includes the proportion of “new” trips on the local highway network as agreed with Staffordshire County Council Highways, with consideration that 90% of the flows would already be travelling on the network.
- 5.1.3 The analysis does not account trips associated the existing store, as this could be re-occupied by another operator without planning permission.
- 5.1.4 Subsequently, the anticipated traffic generation falls well below the assessment criteria stated in Section 3.3 and further assessment work is not necessary. In addition, given that existing background concentrations at worst case roadside locations in the area are well below the AQOs impacts are likely to be negligible.
- 5.1.5 As such, impacts relating to road traffic emissions were therefore considered to be not significant.

6.0 Conclusions

- 6.1.1 To consider operation phase impacts, a screening assessment in line with the EPUK and IAQM technical guidance was undertaken to determine potential impacts. During operation, the Proposed Development is anticipated to a net traffic flow of 8 AADT over a 24 hour period.
- 6.1.2 A review of representative SMDC monitoring data indicated that NO₂ and PM concentrations are expected to be below the relevant AQOs at all locations across the site and study area.
- 6.1.3 As development traffic flows are predicted below the EPUK and IAQM screening thresholds and that roadside pollutant concentrations are below the AQOs detailed assessment work was not required, and road vehicle exhaust emission impacts were screened as not significant.
- 6.1.4 In addition, given that existing background concentrations at worst case roadside locations in the area are well below the AQOs impacts are likely to be negligible.
- 6.1.5 Based on the assessment results air quality impacts are not significant and are not considered a constraint to planning consent. The Proposed Development also complies with the NPPF and SMDC planning policies.

Glossary of Terms

AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
ASR	Annual Status Report
DEFRA	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
NGR	National Grid Reference
NO ₂	Nitrogen Dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM ₁₀	Particulate Matter with an aerodynamic diameter less than 10µm
PM _{2.5}	Particulate Matter with an aerodynamic diameter less than 2.5µm
SMDC	Staffordshire Moorland District Council



Enzygo specialise in a wide range of technical services:

Landscape

Landscape and Visual Impact Assessments
Landscape Masterplanning
Landscape Architecture and Urban Design

Hydrology

Flood Risk Assessments and Modelling
Surface Water and Foul Drainage Strategies
Nutrient Neutrality Assessments

Permitting

Permitting Applications
Regulatory Advice and Guidance
Environmental Management Systems & Plans

Ecology

Ecological Impact Assessment
Protected Species Surveys
Biodiversity Mitigation Design & Implementation

Geoenvironmental

Contaminated Land Assessments
Site Risk Assessment & Monitoring
Geotechnical Assessment and Design

Transport

Transport Assessments and Statements
Traffic Monitoring, Audits and Analysis
Travel Plans and Management Plans

Planning

Planning Applications and Appeals
Feasibility Studies & Development Appraisals
Design & Access Statements

Noise

Noise and Vibration Assessments
Baseline and Compliance Monitoring
Acoustic Design and Management Plans

Arboriculture

Arboricultural Impact Assessments
Tree Surveys and Tree Constraints Plans
Tree and Woodland Management Plans

SHEFFIELD

Samuel House
5 Fox Valley Way
Stocksbridge
Sheffield
S36 2AA

BELFAST

City East
Business Centre
68 -72 Newton Road
Belfast
BT4 1GW

MANCHESTER

4th Floor
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

CAMBRIDGE

168 Cowley Road
Cambridge
CB4 0DL

CARDIFF

Regus House
Malthouse Avenue
Cardiff Gate
Buisness Park
CF23 8RU

CROMHALL

The Byre
Woodend Lane
Cromhall
Gloucesterhire
GL12 8AA

CENTRAL BRISTOL

Origin Workspace
40 Berkeley Square
Bristol
BS8 1HP

enzygo.com

