Barugh Green, Barnsley

Air Quality Assessment

Avant Homes (England)

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Basis of Report

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1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by Avant Homes (England) Ltd ('Avant') to undertake an Air Quality Assessment to accompany the planning application for c.155 residential units and associated infrastructure (the 'Proposed Development'), on land to the south of Barugh Green Road, Barugh Green, Barnsley (the 'Site').

The Site forms part of the wider allocation for mixed-use development within the Barnsley Local Plan (2019), forming part of policy reference: *MU1 Land South of Barugh Green Road*.

The Site currently comprises vacant agricultural land and is located at the approximate National Grid Reference (NGR): x431800, y407800. The surrounding area comprises:

- Barugh Green Road running adjacent to the northern boundary, beyond which are commercial land-uses;
- Existing residential dwellings forming Claycliffe Avenue immediately to the east; and
- Currently vacant agricultural land to the immediate south and west, which comprises the remainder and wider MU1 allocation. This land is associated with a hybrid planning application for the development of 1,560 dwellings, a school and shops alongside associated infrastructure (Barnsley Metropolitan Borough Council (BMBC) planning reference: 2021/1090), which presently remains pending.

Primary vehicular access to the Site will be via Barugh Green Road to the north.

1.1 Scope of Assessment

Consultation with the Environmental Health Officer (EHO) at BMBC was attempted to agree upon the extent and methodology of the air quality assessment[1]. At the time of writing, no response had been received. Nonetheless, the following scope of works has been undertaken as part of this Air Quality Assessment in line with published guidance and best practice:

- Baseline Evaluation – Assessment of existing air quality in the local area;
- Construction Phase – Identification and assessment of potential air quality impacts associated with the construction phase of the Proposed Development;
- Operational Phase – Identification and assessment of potential air quality impacts associated with the operational phase of the Proposed Development; and
- Mitigation Measures – Identification of mitigation measures, as appropriate.

[1] Email sent from SLR Consulting Ltd to BMBC (pollutioncontrol@barnsley.gov.uk), dated 28th January 2025.

2.0 Background Context

2.1 Legislation

A dual set of regulations, applicable to National and Local Government separately are currently operable within the UK.

2.1.1 National Obligations

2.1.1.1 Air Quality Standards

The Air Quality Standards Regulations 2010[2] (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation, in order to align and mirror European obligations. The AQSR includes Limit Values which are legally binding ambient concentration thresholds, however, must be assessed at specific locations (micro and macroscale sampling points). Carriageways or central reservations of roads and any location where the public do not have access (e.g. industrial sites) are exempt. If the sampling point does not comply with the siting locations (Schedule 1: AQSR), then strict comparison cannot be made.

Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[3] was introduced to mirror revisions to supporting EU legislation. The fine particulate matter ($PM_{2.5}$) Limit Value is 20µg/m^3 (to be met by 2020).

The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government and Devolved Administrations who undertake assessments on an annual basis. Local Authorities have no responsibility to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

In response to persistent exceedances, the Government published its 2017 plan[4] for reducing roadside nitrogen dioxide (NO_2) concentrations in order to achieve compliance in the shortest time possible. This has resulted in the introduction of Clean Air Zones across England. However, BMBC were not identified as required to conduct a feasibility study to achieve compliance.

2.1.1.2 Environment Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[5] introduced an annual mean concentration target of 10µg/m^3 to be met across England by 2040. Central Government and Devolved Administrations is responsible for meeting this target, however not until 2040. Local Authorities have no responsibility to achieve this target.

2.1.2 Local Obligations

Part IV of the Environment Act 1995 (as amended) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify if required. It also

[2] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

[3] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313, The Stationary Office Limited.

[4] UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations, 2017.

[5] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. UK Statutory Instruments 2023 No. 96.

established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within its area.

The Air Quality (England) Regulations 2000 (as amended) ('the Regulations') provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently cited within the Regulations, however in line with the AQS and the *'$PM_{2.5}$ Targets: Interim Planning Guidance'* issued by the Department for Environment, Food & Rural Affairs (Defra) in November 2024[6], Local Authorities are required to work towards reducing $PM_{2.5}$.

The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (relevant exposure). Table B provides an indication of those locations. Where any of the prescribed Air Quality Objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the objective.

The latest AQS for England was published in 2023[7]. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table A. These are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving – reflective of the Local Planning Authority's duties. The $PM_{2.5}$ AQSR AQAL has also been included for completeness, to provide an indicative assessment (as the sampling point may not comply with the siting locations prescribed under Schedule 1: AQSR).

Table A: Relevant Ambient AQALs

Pollutant	AQAL (µg/m^3)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (as PM_{10})	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles (as $PM_{2.5}$)	20	Annual mean
Table Notes: The $PM_{2.5}$ AQAL is not prescribed within the Air Quality (England) Regulations 2000 / 2002 and there is no requirement for local authorities to meet it. Exceedances are only valid at specific siting locations (Schedule 1: AQSR).		

[6] Defra, $PM_{2.5}$ Targets: Interim Planning Guidance, (2024).

[7] Air Quality Strategy: Framework for Local Authority Delivery, Department for Environment Food and Rural Affairs, April 2023.

Table B: Human Health Relevant Exposure

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
Annual Mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990[8] sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as, '*any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*'.

Section 79 requires that, where a complaint of a statutory nuisance is made to it by a person living within its area, a Local Authority must take steps as are reasonably practicable to investigate the complaint and decide whether the odour is prejudicial to health or a nuisance. Proposed developments which result in the introduction of future sensitive receptors are however subject to the Agent of Change principle to ensure potential interactions with the existing environment and operations are assessed and mitigated to minimise restrictions being placed on existing businesses.

Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.2 Policy

2.2.1 National Policy

2.2.1.1 Clean Air Strategy

The 2019 Clean Air Strategy[9] sets out the Government's proposals aimed at delivering cleaner air in England and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.2.1.2 Environment Improvement Plan 2023

The 2023 Environment Improvement Plan[10] is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environment

[8] The Environmental Protection Act 1990. Available at http://www.legislation.gov.uk/ukpga/1990/43/contents.

[9] The Clean Air Strategy, Defra. January 2019.

[10] Environmental Improvement Plan 2023, Defra. 2023.

Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution.

2.2.1.3 National Planning Policy Framework

The December 2024 update to the National Planning Policy Framework[11] (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

In specific relation to air quality policy, the document states:

> ***Chapter 15 - Conserving and Enhancing the Natural Environment***
>
> *"Para 199: Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG)[12] which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regard to air quality, the PPG states:

> *"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant limit values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified."*
>
> *"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species)."*

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that "*Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific* […] *Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact*".

[11] Ministry of Housing, Communities & Local Government, National Planning Policy Framework, (2024).

[12] Ministry of Housing, Communities & Local Government, Planning Practice Guidance: Air Quality, (2019).

2.2.2 Local Policy

2.2.2.1 Local Plan

The Barnsley Local Plan[13] is the currently adopted strategic planning document within BMBC and provides a framework for guiding planning decisions. The Local Plan was adopted in January 2019 and contains the following policies relating to air quality and the Proposed Development:

> ***"Policy T5: Reducing the Impact of Road Travel***
>
> *We will reduce the impact of road travel by:*
>
> *Developing and implementing robust, evidence based air quality action plans to improve air quality;*
>
> *Working with our sub regional partners, fleet and freight operators to improve the efficiency of vehicles and goods delivery, and reduce exhaust emissions; and*
>
> *Implementing measures to ensure the current road system is used efficiently."*
>
> ***"Policy AQ1: Development in Air Quality Management Areas***
>
> *Development which impacts on areas sensitive to air pollution in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), taking into account any suitable and proportionate mitigation required for the development.*
>
> *We will only allow residential development which impacts on areas sensitive to air pollution, where the developer provides an assessment that shows living conditions will be acceptable for future residents, subject to any required mitigation.*
>
> *We will only allow development which impacts on areas sensitive to air pollution which could cause more air pollution, where the developer provides an assessment that shows there will not be a significantly harmful effect on air quality, subject to any required mitigation.*
>
> *Furthermore, development which impacts on areas sensitive to air pollution due to traffic emissions will be expected to demonstrate suitable and proportionate mitigation relative to the increased traffic emissions generated by the development."*

Furthermore, as referenced within Section 1.0 the Site forms part of the wider allocation for mixed-use within the Barnsley Local Plan, under policy reference MU1. Policy MU1 does not make any specific references to air quality requirements.

The above policies have been considered as part of this assessment.

2.3 Assessment Guidance

This assessment has been carried out in accordance with the following principles contained within the guidance documents below.

- BMBC: Air Quality and Emissions Good Practice Planning Guidance[14] (hereafter referred to as the 'BMBC Guidance');

[13] Barnsley Metropolitan Borough Council, Barnsley Local Plan, adopted January 2019.

[14] Barnsley Metropolitan Borough Council, Air Quality and Emissions Good Practice Planning Guidance, November 2021.

- Defra: Local Air Quality Management Technical Guidance (LAQM.TG(22))[15];
- Defra: COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021[16];
- Defra: $PM_{2.5}$ Targets: Interim Planning Guidance[6] (the '$PM_{2.5}$ IPG');
- National Highways: Design Manual for Roads and Bridges, LA105 - Air Quality (Vertical Barriers)[17] (the 'DMRB LA 105' guidance);
- Environmental Policy Implementation Community (EPIC) (previously Environmental Protection UK (EPUK)) and the Institute of Air Quality Management (IAQM): Land-Use Planning and Development Control: Planning for Air Quality[18] (hereafter referred to as the 'EPIC & IAQM guidance');
- IAQM: Guidance on the Assessment Dust from Demolition and Construction[19]; and
- IAQM: Use of 2020 and 2021 Monitoring Datasets[20].

[15] Local Air Quality Management Technical Guidance (22), Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland. August 2022.

[16] Defra and the Greater London Authority, COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021. April 2021.

[17] National Highways, DMRB, LA 105 – Air Quality (Vertical Barriers), (2024).

[18] EPIC and IAQM, Land-Use Planning and Development Control: Planning for Air Quality, v1.2 2017.

[19] IAQM, Guidance on the Assessment Dust from Demolition and Construction, v2.1, August 2023.

[20] IAQM, Use of 2020 and 2021 Monitoring Datasets, v1.1, December 2023.

3.0 Assessment Methodology

3.1 Development Classification

The Proposed Development comprises c.155 dwellings and associated infrastructure. This meets the criteria for 'Medium' development, presented in Table C below and as referenced within the BMBC Guidance.

Table C: Relevant BMBC Guidance Development Classification Criteria

Land Use	Description	Criteria
Dwelling Houses (C3)	Dwellings for individuals, families or not more than six people in a single household.	>50 units

It is not considered that any of the '*additional trigger for major developments*' have been met, as outlined in Table 4 of the BMBC Guidance.

As such, the Proposed Development is classified as 'medium' and the required scope of works defined on this basis.

3.2 Construction Phase

A construction dust assessment has been undertaken in accordance with the IAQM guidance. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

The first stage of the assessment involves a screening review to determine if there are sensitive receptors within threshold distances of the Site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- Human receptor is located within 250m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement by a technically competent assessor. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

Given the short-term nature of the construction phase and the comparatively low volume of vehicle movements that will likely arise (when compared to the operational phase), it is unlikely that significant air quality effects from development related road traffic emissions during the construction phase will arise. Such potential impacts have therefore been scoped out from requiring detailed assessment based on their assumed 'insignificant' effect in reference to the EPIC & IAQM guidance.

3.3 Operational Phase

The assessment of potential air quality effects in relation to the operation of the Proposed Development has been undertaken qualitatively, in accordance with the EPIC & IAQM guidance.

The EPIC & IAQM guidance provides a series of '*indicative criteria for assessment*' where, if exceeded, requires further consideration to determine the potential effect on air quality. If the change in road traffic movements on the local road network is found not to exceed any of the relevant indicative criteria presented, then a detailed impact assessment is consequently not required and concluded to result in an 'insignificant' effect on local air quality.

The indicative screening criteria relevant for this assessment is as follows:

- Outside of an AQMA:
  - A change of Light-Duty Vehicles (LDV - <3.5t) flows of more than 500 Annual Average Daily Traffic (AADT) flows; and/or
  - A change of Heavy-Duty Vehicles (HDV - >3.5t) flows of more than 100 AADT.
- Inside of an AQMA:
  - A change of LDV flows of more than 100 AADT; and/or
  - A change of HDV flows of more than 25 AADT.

3.4 Exposure Assessment

In accordance with the BMBC Guidance and as required for all 'minor' and 'medium' developments, an 'exposure assessment' has been undertaken to determine whether future occupants of the scheme are likely to be exposed to existing levels of poor air quality.

Guidance for determining operational phase effects associated with air quality is provided by EPIC & IAQM, as follows:

> *"where the air quality is such that an air quality objective 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".*

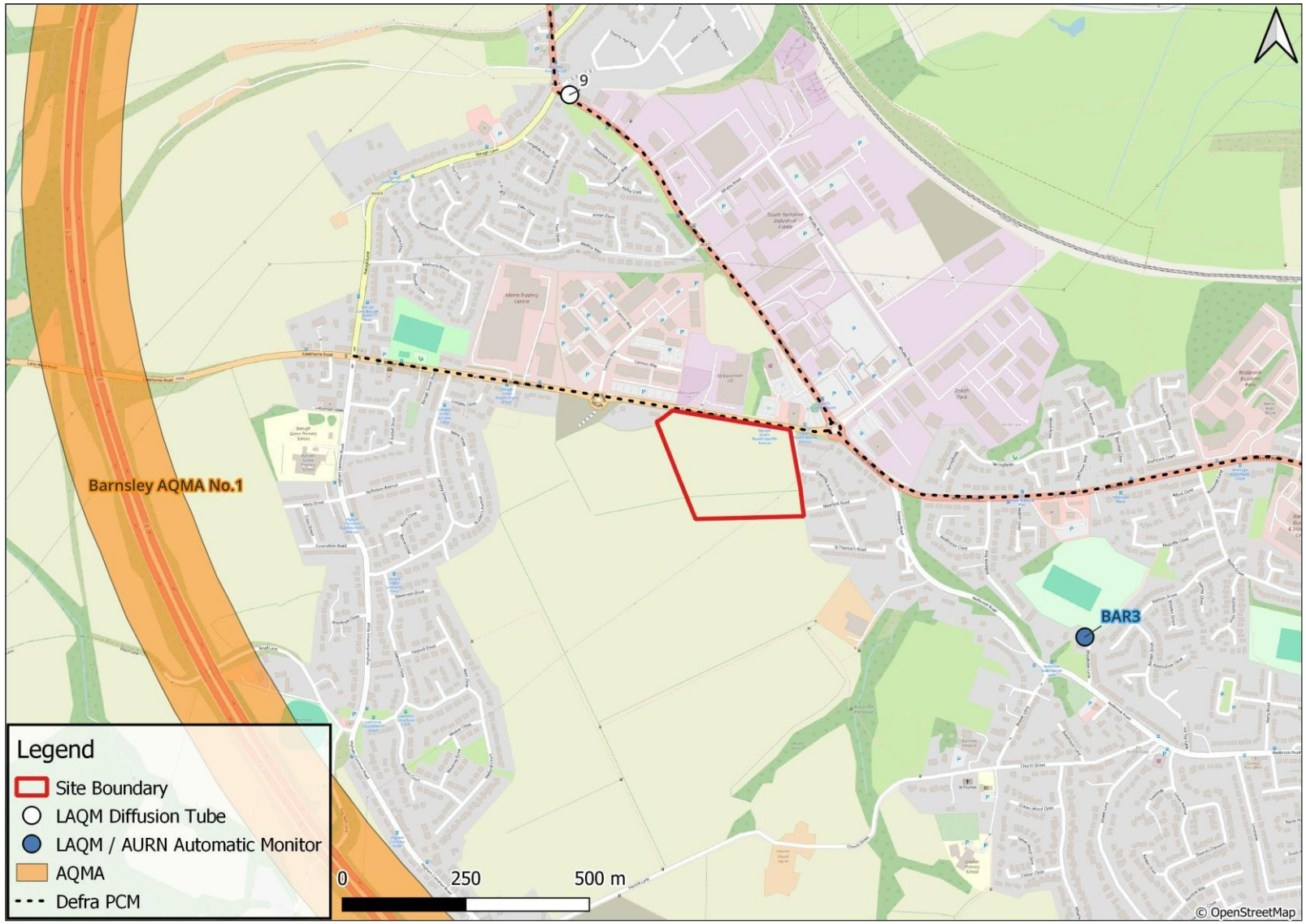


Figure 1: Site Setting & Baseline Datasets

4.0 Baseline Environment

4.1 LAQM Review and Assessment

BMBC, in fulfilment of statutory requirements, has conducted an on-going exercise to review and assess air quality within their administrative area. The latest publicly available LAQM report for BMBC at the time of writing is the 2023 Air Quality Annual Status Report[21] (ASR) (the '2023 ASR').

BMBC currently has five declared AQMAs within their administrative area, three of which have been declared due to exceedences of the annual mean NO_2 AQAL only (i.e. AQMAs No.1, No.2A & 4), whilst AQMAs No.6 & No.7 have been declared for exceedences of both the annual mean and the 1-hour mean NO_2 AQALs. The nearest AQMA to the Site is AQMA No.1, which at its closest extent is located approximately 900m to the south-west and spanning around to the north-west of the Site (see Figure 1). AQMA No.1 is described as *'an area encompassing residential properties one hundred metres either side of the central reservation of the M1 motorway in Barnsley'*.

Within BMBC's 2023 ASR, there is discussion around revoking the AQMA No.1:

> *"The Council is considering and collating the evidence for the revocation of AQMA 1. AQMA 1 covers parts of the M1 and extends to 100 m either side of the motorway carriageway. The case for revocation is based on monitoring data showing compliance with the Air Quality Objective for NO_2 for several years. Barnsley Council previously postponed the revocation process as a proposed "Smart Motorway" was planned for the stretch of M1 passing though the Borough; however, an announcement by the UK Government in April 2023 stated that "plans for new smart motorways will be cancelled in recognition of the current lack of public confidence felt by drivers and cost pressures" and so the Council is revisiting the case."*

Figure A.1.1 of BMBC's 2023 ASR shows the trends in annual mean NO_2 concentrations within AQMA No.1 over the period 2018 to 2022. It is evident that monitored concentrations within AQMA No.1 have remained below 90% of the AQAL across 2018 and 2022, with the greatest monitored annual mean NO_2 concentration of 33.4µg/m^3 being monitored in 2019 at diffusion tube 30 (located 7.2km to the south of the Site). All monitoring locations across the five years have remained 'well-below (i.e. <75% of the AQAL) the AQAL.

Further AQMAs are present within the centre of Barnsley, namely AQMA No.2A (located approximately 1.7km to the south of the Site), AQMA No.4 (located approximately 3.1km to the south-east of the Site) and AQMA No. 7 (located approximately 3.6km to the south-east of the Site).

Consideration of impacts at these AQMAs is made as part of the road traffic emissions assessment (Section 7.0).

4.2 Review of Air Quality Monitoring

4.2.1 Automatic Air Quality Monitoring

BMBC undertook automatic monitoring at three locations within their administrative area during 2022. The nearest automatic monitor to the Site is the BAR3 monitor, located

[21] Barnsley Metropolitan Borough Council, Air Quality Annual Status Report 2023, October 2023.

approximately 620m to the south-east of the Site and of an 'urban background'[22] classification. Given the classification of this monitor and its proximity to the Site, it is considered appropriate to assume that pollutant concentrations at locations set back from Barugh Green Road across the Site (i.e. background concentrations) are comparable to those monitored.

The above-mentioned automatic monitor is also affiliated with the Automatic Urban and Rural Network (AURN) (the 'Barnsley Gawber AURN' UK-AIR ID: UKA00353) and is the closest of the AURN monitors to the Site.

Further details of the BAR3 / Barnsley Gawber AURN monitor (hereafter referred to as the 'BAR3' automatic monitor) and its associated monitored pollutant concentrations are presented in Table D to Table G. It should be noted that the data presented has been obtained from the UK-AIR website[23]. This allows for the presentation of more recent data than that presented within the BMBC 2023 ASR, plus monitored concentrations of PM_{10} and $PM_{2.5}$ which began being monitored at BAR3 on 6th April 2023. The data has been verified up to 1st October 2024. Any data beyond this date has only undergone 'preliminary verified' QA/QC checks.

Table D: LAQM Automatic Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Height (m)	Within AQMA	Distance and Direction to Site (m)
		X	Y			
BAR3	Urban Background	432524	407478	2.0	No	620, SE

Table E: LAQM Automatic Monitoring: NO_2 Results

Monitoring Location	2024 Data Capture (%)	Annual Mean NO_2 Concentration (µg/m³)				
		2020 (A)	2021 (A)	2022	2023	2024
BAR3	97.7	11.9	12.7	12.8	11.6	11.1
		1-hour Means >200µg/m³ (B)				
		0	0	0	0	0

Table Notes:

(A) As per guidance published by Defra[16] and the IAQM's Position Statement[20], monitoring results obtained in 2020 and 2021 are likely to be atypical due to the impacts of the COVID-19 pandemic. The IAQM's Position Statement[20] further states "*the 2022 (or later year) monitoring data is likely to represent a post-pandemic baseline*".

(B) 18 1-hour mean concentrations in excess of 200µg/m³ are permitted.

As shown in Table E, BAR3 has not exceeded the annual mean NO_2 AQAL (40µg/m³) between 2020 and 2024. A maximum recorded concentration of 12.8µg/m³ was recorded in 2022, representing 32% of the AQAL. In 2024, the annual mean NO_2 concentration at BAR3 was 11.1µg/m³, representing 27.8% of the AQAL (i.e. 'well-below' (<75% of the AQAL)).

During 2022, the first year considered to represent a 'post COVID-19 pandemic baseline', there was a slight increase in annual mean NO_2 concentration in comparison to 2020, but this has gradually decreased in subsequent years.

[22] Urban Background site defined by LAQM.TG(22) as: *"An urban location distanced from sources and therefore broadly representative of city-wide background conditions".*

[23] https://uk-air.defra.gov.uk/networks/site-info?uka_id=UKA00353, accessed January 2025.

There have been no 1-hour mean concentrations in excess of 200µg/m^3 BAR3 since 2020.

As such, it is possible to conclude that urban background locations within the vicinity of BAR3 (i.e. including locations set back from Barugh Green Road at the Site) have shown compliance with both the annual mean and 1-hour mean NO_2 AQALs between 2020 and 2024.

Table F: LAQM Automatic Monitoring: PM_{10} Results

Monitoring Location	2024 Data Capture (%)	Annual Mean PM_{10} Concentration (µg/m^3)				
		2020 (A)	2021 (A)	2022	2023 (B)	2024
BAR3	99.8	-	-	-	11.5	11.4
		24-hour Means >50µg/m^3 (C)				
		-	-	-	0	0

Table Notes:

(A) As per guidance published by Defra[16] and the IAQM's Position Statement[20], monitoring results obtained in 2020 and 2021 are likely to be atypical due to the impacts of the COVID-19 pandemic. The IAQM's Position Statement[20] further states "*the 2022 (or later year) monitoring data is likely to represent a post-pandemic baseline*".

(B) Particulate matter monitoring began at BAR3 on 6th April 2023. Data capture for PM_{10} during 2023 was 73.5%.

(C) 35 24-hour mean concentrations in excess of 50µg/m^3 are permitted.

As shown in Table F, BAR3 did not exceeded the annual mean PM_{10} AQAL (40µg/m^3) during 2023 and 2024. In 2024, there was a slight decrease in monitored concentrations, with an annual mean PM_{10} concentration of 11.4µg/m^3, representing 28.5% of the AQAL (i.e. 'well-below').

During 2023 and 2024, there were zero 24-hour mean PM_{10} concentrations in excess of 50µg/m^3, compared to the 35 permitted across the calendar year. It is noted, however, that the 2023 data capture does not meet the required LAQM.TG(22) thresholds for analysis and so compliance with the 24-hour mean PM_{10} AQAL should be viewed with caution, as specific pollution episodes may have been missed. Despite this, the 2024 data capture is sufficient and does not show an exceedence of the 24-hour mean PM_{10} AQAL.

As such, it is possible to conclude that urban background locations within the vicinity of BAR3 (i.e. including locations set back from Barugh Green Road at the Site) showed compliance with both the annual mean and 24-hour mean PM_{10} AQALs during 2023 and 2024.

Table G: LAQM Automatic Monitoring: $PM_{2.5}$ Results

Monitoring Location	2024 Data Capture (%)	Annual Mean $PM_{2.5}$ Concentration (µg/m^3)				
		2020 (A)	2021 (A)	2022	2023 (B)	2024
BAR3	99.7	-	-	-	6.9	7.1

Table Notes:

(A) As per guidance published by Defra[16] and the IAQM's Position Statement[20], monitoring results obtained in 2020 and 2021 are likely to be atypical due to the impacts of the COVID-19 pandemic. The IAQM's Position Statement[20] further states "*the 2022 (or later year) monitoring data is likely to represent a post-pandemic baseline*".

(B) Particulate matter monitoring began at BAR3 on 6th April 2023. Data capture for $PM_{2.5}$ during 2023 was 73.6%.

As shown in Table G, BAR3 did not exceeded the annual mean $PM_{2.5}$ AQAL (20µg/m^3) during 2023 or 2024. In 2024, there was a slight increase in monitored concentrations, with an annual mean $PM_{2.5}$ concentration of 7.1µg/m^3, representing 35.5% of the AQAL (i.e. 'well-below'). It is possible that this slight increase in concentration is due to the increased data capture, compared to that of 2023.

As such, it is possible to conclude that urban background locations within the vicinity of BAR3 (i.e. including locations set back from Barugh Green Road at the Site) showed compliance with the annual mean $PM_{2.5}$ AQAL during 2023 and 2024.

4.2.2 Passive Diffusion Tube Monitoring

Passive NO_2 diffusion tube monitoring is currently undertaken by BMBC within the Site locale and wider authority area.

The details and results of the monitoring location of relevance to this assessment are presented in Table H and Table I, respectively, whilst also shown in Figure 1. All monitoring data presented has been ratified by BMBC.

Table H: Local NO_2 Diffusion Tube Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Height (m)	Within AQMA?	Distance and Direction to Site (m)
		X	Y			
DT9	Kerbside (A)	431482	408572	2.8	No	670, N

Table Notes:

(A) Kerbside site defined by LAQM.TG(22) as: "*A site sampling within one metre of the kerb of a busy road*".

Table I: Local NO_2 Diffusion Tube Monitoring Sites: Results

Site ID	2022 Data Capture %	Annual Mean NO_2 Concentration (µg/m^3)				
		2018	2019	2020 (A)	2021 (A)	2022
DT9	100	27.7	31.7	19.2	20.0	21.2

Table Notes:

(A) As per guidance published by Defra[16] and the IAQM's Position Statement[20], monitoring results obtained in 2020 and 2021 are likely to be atypical due to the impacts of the COVID-19 pandemic. The IAQM's Position Statement[20] further states "*the 2022 (or later year) monitoring data is likely to represent a post-pandemic baseline*".

As shown in Table H and Table I, there is only one monitoring location considered to be of relevance to this assessment: DT9. The 2022 annual mean NO_2 concentration at DT9 was 21.2µg/m^3, representing 53% of the AQAL (i.e. 'well-below').

Overall, there has been a downward trend in annual mean NO_2 concentrations at DT9 between 2018 and 2022. Despite this, there was an increase in annual mean NO_2 concentration in 2019 compared to 2018, which subsequently dropped again in 2020 (likely as a consequence of the COVID-19 pandemic) with concentrations gradually increasing into 2022. However, the post-pandemic annual mean NO_2 concentration (i.e. 2022) is 10.5µg/m^3 less (i.e. 26.3% of the AQAL) than pre-pandemic (i.e. 2019) concentrations.

This downward trend in monitored concentrations is highlighted within BMBC's 2023 ASR, which states:

> *"There have been inter-year fluctuations of NO_2 concentrations, but there is a general downward trend"*

The empirical relationship given in LAQM.TG(22) states that exceedences of the 1-hour mean NO_2 AQAL is unlikely to occur where annual mean concentrations are <60µg/m^3. This indicates that an exceedence of the 1-hour mean AQAL was unlikely to have occurred at the above location in between 2018 and 2022.

4.3 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include annual average concentration estimates for NO_2, PM_{10} and $PM_{2.5}$ using a base year of 2021 (the year in which comparisons between modelled and monitoring are made).

The Defra mapped background concentrations for the base years (2022 and 2024; corresponding to the data available for the BAR3 automatic monitor and BMBC 2023 ASR) and the earliest anticipated opening year of the development (2029) are presented in Table J.

All of the mapped background concentrations presented are “well-below” the respective annual mean AQALs.

Table J: Defra Mapped Background Pollutant Concentrations

Grid Square (X, Y) (m)	Year	Annual Mean Concentration (µg/m^3)		
		NO_2	PM_{10}	$PM_{2.5}$
431500, 407500	2022	8.6	11.6	6.3
	2024	8.0	11.5	6.2
	2029	6.6	11.1	5.9
AQAL		***40***	***40***	***20***

4.4 Defra’s Pollutant Climate Mapping Model

Defra’s Pollutant Climate Mapping (PCM) model is a collection of models designed to fulfil part of the UK's AQSR requirements to report on the concentrations of particular pollutions in the atmosphere. The latest PCM model data, released by Defra in 2020, has modelled concentrations incorporating Defra’s 2018 action plan (2018 reference year), up until 2030 taking into account the anticipated uptake of cleaner vehicles, along with other policy interventions. Concentrations reported by the PCM assume roadside locations, typically at a 4m separation distance.

The nearest PCM link to the Site (Census ID: 802077567 – see Figure 1) is located along the Barugh Green Road, immediately adjacent to the northern Site boundary. The roadside annual mean NO_2 concentration reported in relation to this PCM link are: 13.9µg/m^3 in 2022; 12.3µg/m^3 in 2024; and 9.6µg/m^3 in 2029 (the predicted opening year). All PCM roadside annual mean NO_2 concentrations are ‘well-below’ the AQAL (40µg/m^3).

5.0 Construction Phase Assessment

This section presents the potential air quality impacts and effects associated with the construction of the Proposed Development.

5.1 Construction Dust Assessment

Where figures relating to area and volume of the Site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1.1 Assessment Screening

There are 'human receptors' within 250m of the Site but no designated habitat sites within 50m of the Site boundary or up to 250m of the Site entrance(s) / 50m of the roads anticipated to witness construction traffic movements. Therefore, an assessment of construction dust on human receptors, only, is required.

5.1.2 Potential Dust Emissions Magnitude

5.1.2.1 Demolition

The Site currently comprises partially wooded open green space, with no buildings or structures which require demolition. As such, impacts associated with demolition have been scoped out of this assessment.

5.1.2.2 Earthworks

The total area of the Site is approximately 48,700m^2. Site earthworks are therefore required over an area between 18,000m^2 – 110,000m^2. In addition, according to Magic[24], the main surface texture class of the underlying soil is regarded to be 'loamy', which is considered to have a moderate dust generating potential.

The dust emission magnitude for earthworks is therefore considered to be 'medium'.

5.1.2.3 Construction

The proposals constitute a total of c.155 dwellings. The total building volume associated with the Proposed Development is predicted to be >12,000m^3. However, in recognition of the phased construction of residential schemes, the total building volume associated with the Proposed Development is considered likely to be <75,000m^3 at any given time. Building materials are anticipated to be as standard brick masonry.

As such, the dust emission magnitude for construction is therefore initially considered to be 'medium'.

5.1.2.4 Trackout

Construction vehicles will access the Site from Barugh Green Road. Given the scale and nature of works required, there are anticipated to be a maximum 20 – 50 HDV outward movements in any worst-case day. Due to the size of the Site, the unpaved road length may be 50 – 100m at any given time.

Therefore, the dust emission magnitude for earthworks is considered to be 'medium'.

[24] https://magic.defra.gov.uk/MagicMap.aspx.

5.1.2.5 Summary

A summary of the potential dust emission magnitude for each of the activities is displayed in Table K.

Table K: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	N/A
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.3 Sensitivity of the Area

5.1.3.1 Dust Soiling Impacts

Overall, there are anticipated to be 10 – 100 residential properties (highly sensitive receptors) within 20m of the Site boundary.

Furthermore, there are believed to be 10 – 100 residential receptors within 20m of sections of the Site access within 250m of the Site entrance.

The sensitivity of the area with respect to dust soiling effects on people and property in relation to earthworks, construction and trackout is therefore considered to be 'high'.

5.1.3.2 Human Health Impacts

The maximum background PM_{10} concentration for the $1km^2$ grid square which covers the development (x431500, y407500) is estimated to be 11.6µg/m³, based upon 2022 mapped background estimates (i.e. falls into the <24µg/m^3 class).

Given the above information regarding the number and nature of surrounding receptors within specified screening distances of the Site boundary, the sensitivity of the area with respect to human health impacts in relation to earthworks, construction and trackout is considered to be 'low'.

5.1.3.3 Summary

A summary of the sensitivity of the area defined for each potential impact is displayed in Table L, whereas the spatial densities of receptors discussed in relation to the Site boundary are illustrated in Figure 2.

Table L: Sensitivity of the Area

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

5.1.4 Risk of Impacts (Unmitigated)

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined in Table M below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table M: Risk of Dust Impacts (Unmitigated)

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium Risk	Medium Risk	Medium Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

5.1.5 Mitigation

Following the construction dust assessment, the Site is found to be at worst 'medium risk' in relation to dust soiling effects on people and property and 'low risk' in relation to human health impacts (Table M). However, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

Nonetheless, commensurate with the above designation of dust risk, mitigation measures as identified by IAQM guidance are required to ensure that any potential impacts arising from the construction phase of the Proposed Development are reduced and, where possible, completely removed. In accordance with IAQM guidance, providing effective mitigation measures are implemented, such as those outlined in Section 7.1, construction dust effects are considered to be 'not significant'.

Figure 2: Construction Dust Buffers

6.0 Exposure Assessment

This section presents a review of monitoring data and the BMBC Guidance in consideration with the Proposed Development, for the purposes of identifying requirements for mitigation to be embedded into the scheme design.

6.1 BMBC Guidance – Exposure Assessment

The BMBC Guidance requires an 'exposure assessment' to determine whether future occupants of the scheme are likely to be exposure to existing levels of poor air quality. An 'exposure assessment' is required if the development meets any of the following criteria:

- The proposal is adjacent to or within an AQMA;
- The proposal is in a location 20m from roads at or above the relevant national objective highlighted on the Defra GIS modelled maps[25] and is one of the following Land Use Types;
  - C1 to C3;
  - C4 (Homes of Multiple Occupation); or
  - D1 in table1.
- And the Proposal is within the areas identified on Map 1 [of the BMBC Guidance] (this includes the area within or adjacent to an AQMA; applicable roads; and includes roads at or above the relevant national objective highlighted on the Defra GIS modelled maps.

In consideration of the above criterion:

- The Site is not located within or adjacent to an AQMA as discussed in Section 4.1;
- The Proposed Development is for C3 use-class but is not located within 20m of a road above the annual mean roadside NO_2 AQAL as presented within Section 4.4; and
- The Proposed Development is located within areas identified on Map 1 of the BMBC Guidance as being adjacent to a road with baseline trips >10,000 AADT. However, with reference to the Department for Transport (DfT) Count ID 77567[26], Barugh Green Road was predicted to witness 8,359 AADT during 2023. Furthermore, with reference to DfT Count ID 77567, Barugh Green Road has not exceeded 10,000 AADT since, at least, the year 2000 (when the count point was first instigated).

Therefore, based upon the above there is no requirement to quantify air pollutant concentrations at the Site and no requirement for mitigation measures to make the scheme acceptable.

Overall, the findings of the exposure assessment show the Site is suitable for the proposed residential use, and no further assessment is required. Effects associated with the likely exposure of future occupants in relation to NO_2, PM_{10} and $PM_{2.5}$ concentrations are considered to be 'not significant' in reference to the stated EPIC & IAQM guidance and no further mitigation measures are required.

[25] http://uk-air.defra.gov.uk/data/gismapping.

[26] https://roadtraffic.dft.gov.uk/manualcountpoints/77567, accessed January 2025.

7.0 Operational Phase Assessment

This section presents the potential air quality impacts and effects associated with the operational phase of the Proposed Development.

TPS Transports Consultants Ltd (TPS), the appointed transport consultant, has provided the Proposed Development's trip generation predicted as 24-hour AADT total and distributed trips, as presented in Table N.

Based on the dataset provided by TPS, the Proposed Development is predicted to generate 698 AADT as total vehicles, with a worst-case assumption of 5% HDV. TPS has confirmed that the HDV generation is likely to be substantially less than 5% but at the time of writing are unable to provide quantitative data to show otherwise. Despite this, the below discussion and conclusions would remain the same.

Table N: Proposed Development Trip Generation

Link ID & Name		Within to an AQMA?	Total AADT	LDV AADT	HDV AADT
1	Barugh Green Road west of access	N	102	97	5
2	Higham Common Road	N	58	55	3
3	A635 Cawthorne Road	N	36	34	2
4	B6328 Barugh Lane	N	8	8	0
5	Barugh Green Road east of access	N	596	566	30
6	A635 Wilthorpe Road	N	451	428	23
7	Whaley Road	N	0	0	0
8	A637 Claycliffe Road	N	145	138	7

In accordance with the EPIC & IAQM guidance, developments not located within or adjacent to an AQMA require consideration of potential air quality impacts where additional development trips are in excess of 500 LDV as a 24-hour AADT. For developments located within or adjacent to an AQMA, the more stringent criteria of 100 LDV as a 24-hour AADT is applicable. However, as detailed within the EPIC & IAQM guidance, the '*indicative criteria for assessment'* are precautionary and should be treated as *indicative*:

> *"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality. […]*
>
> *Where an air quality assessment is identified as being required, then this may take the form of either a Simple Assessment or a Detailed Assessment […]. In other words, exceeding a screening criterion […]* [the 'indicative criteria for assessment'] *does not automatically lead to the requirement for a Detailed Assessment. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. […]*

> *If none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect."*

As shown in Table N, Link 5 is marginally above the *indicative criteria for assessment*.

The limited extent of road which is predicted to witness development trips in excess of the *criteria* (i.e. 566 LDVs) covers Barugh Green Road (east of Site access), before dropping below the criteria beyond the A635 Wilthorpe Road / A637 Claycliffe Road roundabout. The length of this section of road is approximately 180m, with approximately 10 dwellings adjacent to it. Beyond Link 5, the predicted development trips fall to 138 LDVs (Link 8) and 428 LDVs (Link 6); HDVs are below the *criteria* across all Links.

As discussed in Section 4.2.2, the nearest BMBC air quality monitoring location to the Site is DT9, located approximately 670m to the north. The absence of further monitoring locations within the Site locale indicates that BMBC do not consider this area to be at risk of breaching the respective AQALs, in respect to its LAQM commitments.

Nonetheless, DT9 monitored a 2022 annual mean NO_2 concentration of 21.2µg/m^3 (representing 53% of the AQAL). DT9 is located adjacent to the A637, which is considered to have a similar baseline traffic flow than that on Link 5[27]. It would, therefore, be considered reasonable to assume that at locations adjacent to Link 5 at a similar setback distance from the kerb as DT9 (i.e. 1.5m), the 2022 annual mean NO_2 concentration would be similar to that monitored by DT9, given the similar baseline traffic flows and spatial proximity. However, the nearest receptor to Link 5 is setback approximately 16.5m from the kerbside, therefore allowing for the assumption that annual mean NO_2 concentrations at these receptors would be substantially *less than* that monitored at DT9, given the widely acknowledged fact that pollutant concentrations decrease with distance from the road. In accordance with the DMRB, the further setback from the kerb of the road a receptor is, there is a correspondingly lower road traffic emission contribution compared to receptors which are located closer to the road. This, therefore, indicates a lower likelihood of impact and marginal increase in concentrations.

With a 47% headroom between DT9's 2022 annual mean NO_2 concentration and the AQAL, it is considered that the 66 LDVs which exceed the *indicative criteria for assessment* (which if not met "*can be considered as having an insignificant effect"*) in this location would not result in any adverse impacts. In addition, it is widely accepted that pollutant concentrations are forecast to drop in future years (as demonstrated in Section 4.3 and Table J), likely resulting in an even greater headroom in 2029 (i.e. the predicted opening year of the Proposed Development).

It is further noted that the Proposed Development is situated adjacent to the wider MU1 site allocation, for which a hybrid planning application has been submitted to BMBC, as discussed in Section 1.0 (BMBC planning reference: 2021/1090). Whilst the application remains pending, a review of Chapter 12 (Air Quality) of the associated Environmental Statement (ES) has been undertaken. This has highlighted that through the assessment processes, pollutant concentrations were predicted at a receptor location adjacent to Link 5 (labelled as ESR13 within the ES reporting), for a series of scenarios. The predicted concentrations at ESR13 for the 2019 base year and the 2026 and 2033 fully built out scenarios have been replicated in Table O below.

[27] The Department for Transport (DfT) traffic count point ID: 47420 recorded 8,565 total vehicles as a 24-hour AADT in 2022 on the A637. This is compared to DfT traffic count point ID: 77565 which recorded 8,216 total vehicles as a 24-hour AADT in 2022 on Barugh Green Road.

Table O: Predicted Pollutant Concentrations at Receptor Location Adjacent to Link 5

Receptor	2019 Base Year			2026 Opening Year: Full residential and Employment Use, with Link Road			2033 Opening Year: Full residential and Employment Use, with Link Road		
ESR13	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
	22.98	11.43	7.45	16.94	10.88	6.96	14.71	10.92	6.97

As presented in Table O, there is substantial headroom between the predicted pollutant concentrations and their respective AQALs across all scenarios at Receptor ESR13, further demonstrating that 66 LDVs which exceed the *indicative criteria for assessment* in this location would not result in any adverse impacts. Note, the predicted future concentrations presented above are inclusive of the wider MU1 allocation.

As presented in Table N, predicted distributed development trips on all remaining links are below the *indicative criteria for assessment*. In addition, it has been confirmed by TPS that predicted development trips will fall below the 100 LDV / 25 HDV *criteria* prior to reaching any of the wider the AQMAs within Barnsley.

As such, road traffic emission impacts associated with the operation of the Proposed Development can be considered as having an 'insignificant' effect on human receptors at all locations based upon the extent of distributed trips, and no further assessment is considered to be required.

8.0 Mitigation Measures

This section presents any proportionate mitigation measures required during the construction and operational phases of the Proposed Development.

8.1 Construction Dust

As discussed in Section 5.0, construction impacts associated to the Proposed Development would result in the generation of dust and PM_{10}.

In order to control potential impacts, Table P presents a range of mitigation measures which could be applied and align with the IAQM guidance. With the effective application of the dust mitigation measures, residual effects will be 'not significant'.

It is noted that the IAQM Dust guidance refers to "*for construction as a whole, it is recommended that the average $PM_{2.5}$ content of PM_{10} should be assumed to be 10%*". Therefore, it is considered that the application of mitigation measures which are targeted specifically in relation to PM_{10} and dust soiling would also result in a consequential and beneficial reduction in $PM_{2.5}$ emissions and impacts.

Table P: Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Highly Recommended	
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Construction	Ensure 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 ensure that appropriate additional control measures are in place.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Operating Vehicle/Machinery and Sustainable Travel	Ensure all vehicles 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.

Site Application	Mitigation Measures
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.
	Ensure an adequate water supply on the site for effective dust/particulate matter 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.
	Ensure 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.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	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 as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Site Application	Mitigation Measures
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.
Waste Management	Avoid bonfires and burning of waste materials.
Desirable	
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
	Only remove the cover in small areas during work and not all at once.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
Operating Vehicle/Machinery and Sustainable Travel	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

8.2 Operational Phase

In accordance with the EPIC & IAQM guidance, road traffic impacts associated with the operation of the Proposed Development can be considered as having an ‘insignificant’ effect on local air quality. Furthermore, the Proposed Development is found to be suitable for residential purposes in accordance with the Exposure Assessment undertaken in Section 6.0, with site-suitability effects concluded to be ‘not significant’. As such, long-term scheme-specific mitigation measures in relation to operational effects arising from road traffic emissions are therefore not considered to be necessary.

Nonetheless, in accordance with the BMBC Guidance, all ‘minor’ and ‘medium’ proposals are expected to implement the ‘Type 1’ and ‘Type 2’ mitigation measures detailed within the guidance document, as follows:

Type 1

- 1 charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking).

Avant has committed to providing each dwelling with an electric vehicle (EV) charge point commensurate with the requirements of Approved Document S: Infrastructure for Charging

Electric Vehicles of the Building Regulations[28]. The specific detail for such will come forward post-planning as a building control requirement.

Type 2

- Travel Plan including agreed mechanisms for discouraging high emission vehicle use and encouraging modal shift (i.e. public transport, cycling and walking) as well as the uptake of low emission fuels and technologies;
- Improved pedestrian links to public transport stops;
- New or improved bus stop infrastructure including shelters, raised kerbing, information displays;
- Provision of subsidised or free public transport ticketing;
- Site layout designed to encourage walking;
- Cycle paths to link to local cycle network; and
- Improved convenient and segregated cycle paths to link to local cycle network.

A Travel Plan has been produced by the appointed transport consultant to the Applicant. Within the Travel Plan there are a number of measures aimed to encourage the occupants to use more sustainable modes of transport to and from the Site. These measures would subsequently have a knock-on effect in terms of reducing road traffic emissions from personal car use. The measures within the Travel Plan are as follows:

- Prepare Sustainable Travel Website;
- Prepare Sustainable Travel Guide;
- Annual Sustainable Travel Newsletter;
- Personal Journey Planning;
- Provision of Cycle Storage;
- Provision of EV Charging Points;
- Promotion of Cycle Support;
- Appointment of Travel Plan Coordinator;
- Baseline Traffic Counts and Reporting; and
- Annual Traffic Counts and Reporting.

Furthermore, Avant has committed to providing Air Source Heat Pumps (ASHP) to provide hot water and space heating in all new developments, replacing the need for gas boilers and removing the associated on-site combustion emission contributions.

[28] https://www.gov.uk/government/publications/infrastructure-for-charging-electric-vehicles-approved-document-s.

9.0 Conclusions

SLR has been commissioned by Avant to undertake an Air Quality Assessment to accompany the planning application for c.155 residential units and associated infrastructure, on land to the south of Barugh Green Road, Barugh Green, Barnsley.

9.1 Construction Phase

A qualitative assessment of the potential dust impacts during the construction of the development has been undertaken following IAQM guidance. Following the construction dust assessment, the Site is found to be at worst 'Medium Risk' in relation to dust soiling effects on people and property, and 'Low Risk' in relation to human health impacts.

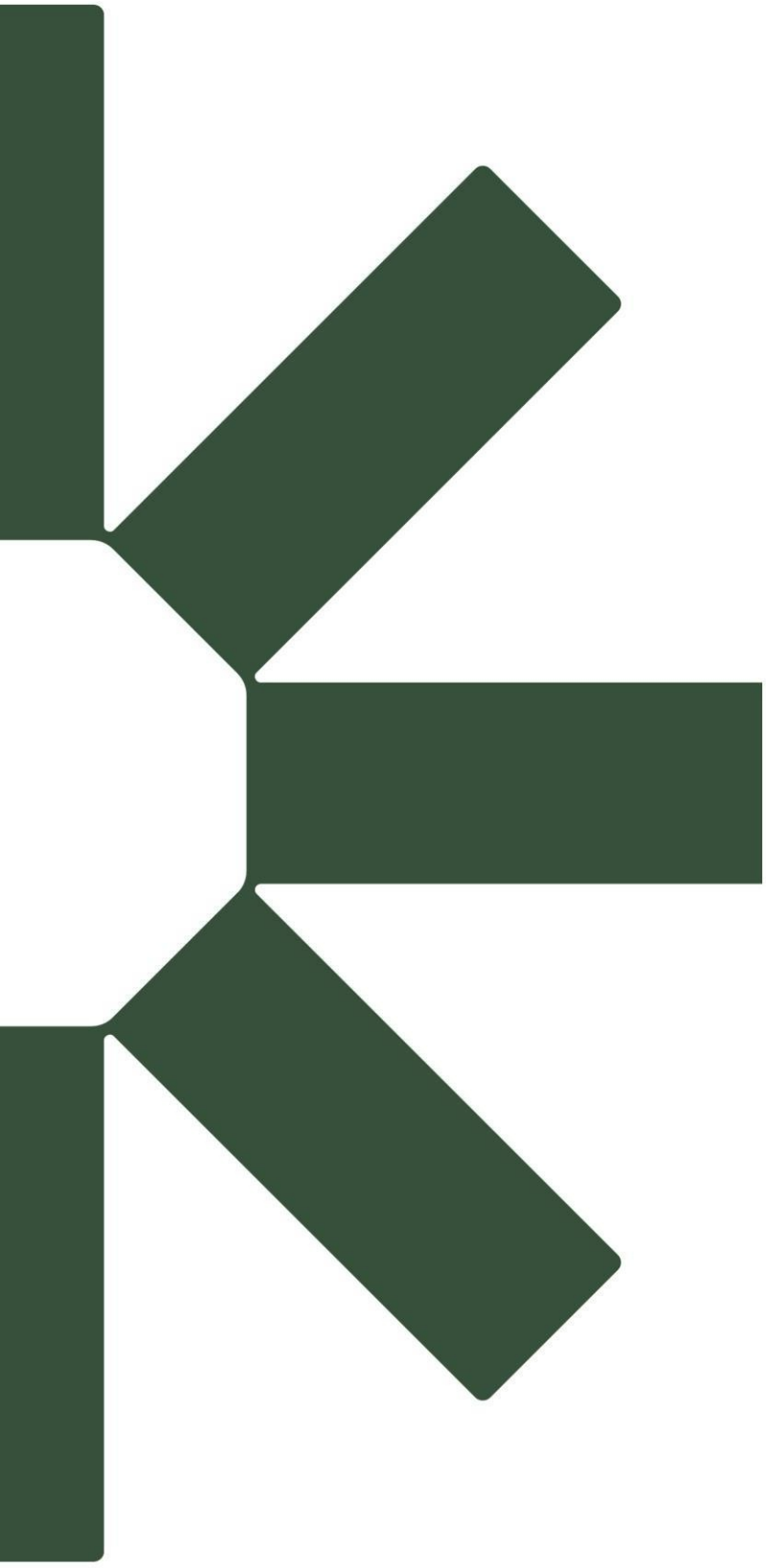
Providing effective mitigation measures are implemented, such as those outlined in Table P of this report, residual impacts from dust emissions during the construction phase are deemed to be 'not significant'.

Given the short-term nature of the construction phase and the comparatively low volume of vehicle movements that will likely arise when compared to the operational phase, there is predicted to be an 'insignificant' effect on air quality from construction-generated road traffic emissions.

9.2 Operational Phase

The Proposed Development is expected to generate road traffic volumes marginally above the relevant EPIC & IAQM indicative criteria for assessment at one limited area. However, given factors such as the limited extent of roads and the marginal volumes above the criteria, setting of receptors relative to the kerbside of the road, and the considerable headroom between previously modelled concentrations and the AQAL, it is considered that road traffic impacts associated the operation of the Proposed Development will have an 'insignificant' effect on local air quality.

An Exposure Assessment has been undertaken in accordance with the BMBC Guidance. The findings of the exposure assessment show the Site is suitable for the proposed residential use. Effects associated with the likely exposure of future occupants in relation to NO_2, PM_{10} and $PM_{2.5}$ concentrations are considered to be 'not significant' in reference to the stated EPIC & IAQM guidance and no further mitigation measures are required.



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