

Land off Keresforth Road, Dodworth – Air Quality Note

Introduction

An air quality assessment was undertaken in 2018¹ in support of a previous planning application on the northern part of the development site (application reference: 2018/0456). The assessment quantitatively assessed the impacts of additional road traffic emissions generated by the proposed development on existing sensitive receptors in Dodworth and along key roads towards Barnsley. It also predicted the likely air quality conditions at proposed receptors within the development itself, taking account of emissions from vehicles using the adjacent M1 motorway. The assessment identified no significant air quality effects at existing receptors and predicted conditions within the development to also be acceptable for the proposed residential use. A construction dust risk assessment was also completed, as well as a calculation of damage costs, in line with Barnsley Metropolitan Borough Council's (BMBC) Air Quality and Emissions Good Practice Planning Guidance².

Due to the increased size of the proposed development, a new air quality assessment will be undertaken to assess the impacts of additional road traffic emissions on existing receptors. The new assessment will also provide an updated assessment of the acceptability of air quality conditions at proposed receptors within the development site, as well as an updated construction dust risk assessment and damage cost calculations.

This note presents the latest baseline air quality data for the area surrounding the development site and sets out the scope and methodology of the air quality assessment, which will be undertaken in due course.

Baseline Conditions

BMBC operates three automatic monitoring stations within its area, the closest of which (CM2) is located approximately 650 m to the northeast of the proposed development, and monitors nitrogen dioxide (NO₂) concentrations. The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes, including seven within approximately 650 m of the proposed development, adjacent to the A628 (Figure 1). Results for the years 2016 to 2020³, taken from BMBC's 2021 Annual Status Report⁴, are summarised in Table 1.

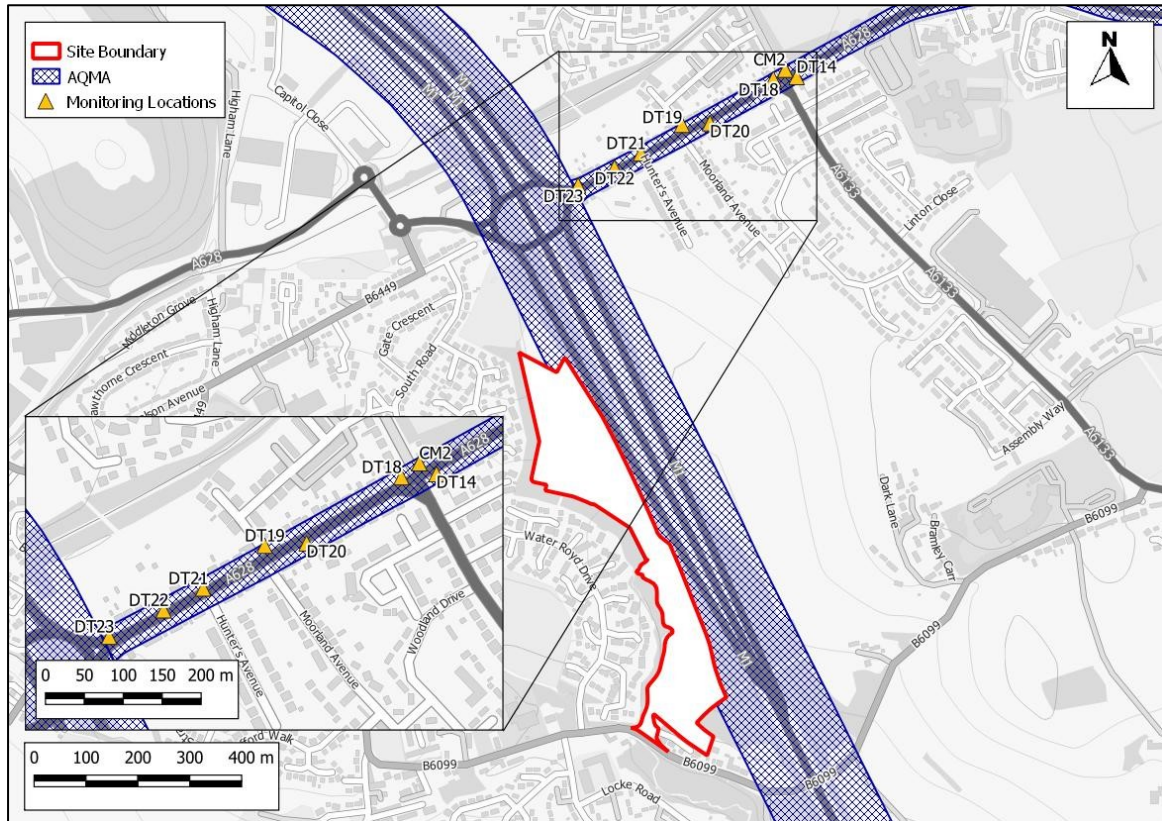
¹ Redmore Environmental (2018) Air Quality Assessment Keresforth Road, Dodworth

² Barnsley Metropolitan Borough Council (2021) Air Quality Emissions Good Practice Planning Guidance.

³ 2020 results are presented for completeness, however, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the considerable impact of the COVID-19 pandemic on traffic volumes and thus pollutant concentrations.

⁴ Barnsley Metropolitan Borough Council (2021) 2021 Air Quality Annual Status Report (ASR)

Figure 1: Monitoring Locations and AQMA



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Exceedances of the annual mean NO_2 objective were recorded at four sites in 2019; the 1-hour mean objective has been met in all recent years. Concentrations have reduced at all monitoring sites between 2016 and 2019.

PM_{10} concentrations measured at roadside automatic monitoring site CM1⁴, approximately 3.5 km east of the proposed development, have been well below the relevant objectives in all recent years (data not presented).

Table 1: NO₂ Monitoring Results 2016-2020

Site ID	Site Type	Location	2016	2017	2018	2019	2020
Annual Mean NO₂ (µg/m³)							
CM2	Roadside	Barnsley A628	36.0	35.0	32.0	32.0	25.0
DT14	Roadside	Dodworth Rd	49.2	44.4	39.4	40.5	26.6
DT18	Roadside	Dodworth Rd West	36.9	34.1	27.6	30.3	16.2
DT19	Roadside	Crown Hill Rd	28.1	28.7	25.7	27.2	18.1
DT20	Roadside	Dodworth Rd	43.4	40.9	37.0	39.6	29.3
DT21	Roadside	Dodworth Rd	51.1	49.1	45.8	46.2	29.5
DT22	Kerbside	Dodworth Rd	52.7	50.0	44.2	48.1	32.6
DT23	Roadside	Dodworth Rd	50.0	52.0	43.4	47.0	28.9
Objective			40				
No. of Hours > 200 µg/m³							
CM2	Roadside	Barnsley A628	2	4	0	0	0
Objective			18				

^a Exceedances of the objective are shown in **bold**.

^b Concentrations have been averaged for three co-located diffusion tubes.

BMBC has declared six Air Quality Management Areas (AQMA) for exceedances of the annual mean NO₂ objective. The proposed development lies partially within an AQMA which encompasses an area of land up to 100 m from the centre of the main carriageway of the M1. The proposed development is also located close to Barnsley AQMA no.2A, which encompasses properties alongside the A628 between the M1 and Town End roundabout, Barnsley; the nitrogen dioxide monitoring sites for which data are presented in Table 1 all lie within this AQMA (Figure 1).

Receptors

A demolition and construction dust risk assessment will consider the potential for impacts on existing sensitive receptors located within 350 m of the proposed development site boundary, and within 50 m of the routes anticipated to be used by demolition and construction vehicles up to 500 m from the proposed development site entrance(s). These will be identified based upon the distance bandings set out in the Institute of Air Quality Management (IAQM) guidance⁵ and will consider all existing locations within these bandings that are identified by the IAQM guidance as being sensitive to dust impacts. Receptors in the area are likely to include residential dwellings and schools (high sensitivity receptors) as well as offices, shops and community centres (medium sensitivity receptors).

⁵ IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction v1.1

For the operational assessment, receptor locations (both existing and future sensitive locations) will be identified based on detailed maps, satellite imagery and plans of the proposed development. The receptors will be identified to represent worst-case locations where the air quality objectives apply. As defined in Box 1.1 of Defra's Local Air Quality Management Technical Guidance TG(16)⁶, receptors that are considered to be sensitive to the annual mean objectives include residential properties, schools, hospitals, whilst the short-term objectives apply at hotels and places where members of the public have regular access (such as retail, community facilities and public realm), where they may spend an hour or more. The air quality objectives do not apply at places of work (e.g. offices). The proposed development comprises residential dwellings which represent relevant exposure to both the annual mean and short-term objectives.

Methodology

The potential impacts from dust generated during the demolition and construction phase of the proposed development will be considered using the approach presented in the IAQM Guidance⁵ for assessing impacts from demolition and construction activities. Appropriate mitigation measures will be recommended based on the outcome of the construction dust assessment and the IAQM Guidance. The Guidance is clear that, with appropriate mitigation in place, the residual effects will normally be 'not significant'.

The number of demolition and construction vehicles (including heavy duty vehicles (HDVs)) that will be generated during the demolition and construction phase of the proposed development will be considered in the context of the guidance from IAQM and Environmental Protection UK (EPUK & IAQM)⁷. It is anticipated that the volume of traffic associated with the demolition and construction of the proposed development will fall below the screening criteria for carrying out a detailed assessment; thus, the impacts of emissions from the demolition and construction traffic will be assessed qualitatively.

For the operational assessment, the increase in road traffic generated by the proposed development once operational will initially be screened against thresholds set out in guidance from EPUK/IAQM⁷. Where the additional number of vehicles generated by the proposed development is greater than 100 Light Duty Vehicles (LDV; cars and vans) and/or 25 HDV as an Annual Average Daily Traffic (AADT) flow on roads within an AQMA, or by more than 500 LDV and/or 100 HDV on roads outside of an AQMA, the assessment will quantify the increases in pollutant concentrations and determine the significance of impacts associated with operational traffic generated by the proposed development at sensitive receptor locations. If increases in traffic are below the screening thresholds, it can be concluded that the impacts on local air quality are 'not significant'. Should this be the case, then only an exposure assessment (the 'opening year – with development' future scenario) will be modelled in order to predict future air quality conditions for future residents of the proposed development.

⁶ Defra (2021) Local Air Quality Management Technical Guidance (TG16) April 2021. Available: <https://iaqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf>.

⁷ Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2, IAQM, London, Available: <http://iaqm.co.uk/guidance/>.

It is anticipated, however, that the volume of traffic associated with the operation of the proposed development will exceed the screening thresholds for carrying out a detailed assessment, and therefore the dispersion model ADMS-Roads will be used to quantify the impacts that road traffic emissions (associated with existing and development-generated road traffic) will have on air quality at existing and proposed receptor locations.

The scenarios that will be considered as part the assessment will include:

- Current baseline scenario (2019 – to correspond to the most recent year of data unaffected by COVID restrictions);
- First year of opening without the proposed development; and
- First year of opening with the proposed development.

An important element of the modelling study will be to verify the model output against measured results. This will be undertaken by identifying suitable roadside air quality monitoring locations, and an adjustment factor will be determined in line with the methodology set out in Defra's TG(16)⁶ guidance document.

Background pollutant concentrations will be determined using data derived from the background maps published by Defra⁸. The background maps will be calibrated against suitable background monitoring sites near to the proposed development, where available.

Meteorological data will be taken from Emley Moor meteorological station, which is the nearest and most representative meteorological site to the proposed development. Meteorological data for 2019 will be used in the dispersion model to match the latest year of suitable local monitoring data.

Traffic data for the assessment will be provided by the appointed Transport Consultant.

The potential for an overall significant air quality effect associated with the operation of the proposed development at existing receptors will be determined following the EPUK / IAQM guidance⁷, and mitigation measures proportionate to the outcome of the assessment will be recommended to ensure that residual effects are not significant. Where the assessment finds that future residents will be exposed to concentrations which exceed the statutory air quality objectives in the year of opening, mitigation measures will be recommended to ensure future occupants of the proposed development are exposed to acceptable air quality.

⁸ Defra (2021) Local Air Quality Management (LAQM) Support Website, [Online], Available: <http://laqm.defra.gov.uk/>.