BARNBURGH VIEW, GOLDTHORPE, PHASE 3

Proposed Residential Development

Air Quality Assessment

Prepared for: Gleeson Developments Ltd

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1.0 INTRODUCTION

SLR Consulting Ltd (SLR) has been commissioned by Gleeson Developments Ltd to undertake an Air Quality Assessment to support the planning application for Phase 3 of a proposed residential development at land known as Barnburgh View, Goldthorpe (the 'Application Site'). Phase 3 of the proposed development consists of the construction of 69No. C3 use class residential dwellings (the 'Proposed Development').

This assessment describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing in the area. It then presents the potential impacts resulting during the construction phase, 'baseline appraisal / exposure assessment' and operational phase of the scheme and an evaluation of the significance of the effects.

1.1 Scope

Pre-assessment discussion[1] was undertaken with Barnsley Metropolitan Borough Council (BMBC) in order to agree upon the extent and methodology of the Air Quality Assessment. The following scope of works has been undertaken as part of this Air Quality Assessment as proposed and agreed with BMBC:

- Baseline evaluation – Assessment of existing air quality in the local area;
- Construction phase assessment – Identification and assessment of potential air quality impacts and effects associated with the construction phase of the proposed scheme, primarily dust impacts and suspended particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10});
- Exposure assessment – screening assessment of potential air quality constraints at the site following BMBC guidance as part of a baseline site-suitability review;
- Operational phase screening assessment of operational phase vehicle movements; and
- Mitigation measures – Identification of appropriate mitigation measures for incorporation within the 'design' based upon the above proposed scope.

1.2 Structure of Report

The remainder of this report is structured as follows:

- Section 2 describes the relevant legislation and guidance referred to in the assessment, and describes the assessment methodology;
- Section 3 presents the assessment methodology;
- Section 4 characterises the baseline environment in the vicinity of the Application Site from an air quality perspective;
- Section 5 presents the construction phase assessment, proposed mitigation and determination of the significance of effect;
- Section 6 presents the baseline site-suitability review as part of an 'exposure' assessment;
- Section 7 presents the operational phase traffic screening assessment;
- Section 8 presents the proposed mitigation measures; and

[1] E-mail correspondence between SLR Consulting Ltd and Chris Shields, Environmental Protection Officer within Barnsley Metropolitan Borough Council, dated 14th July 2020.

- Section 9 concludes the assessment.

2.0 RELEVANT AIR QUALITY LEGISLATION AND GUIDANCE

2.1 Air Quality Strategy

The United Kingdom Air Quality Strategy (UK AQS) 2007 for England, Scotland, Wales and Northern Ireland[2] sets out the Government's policies aimed at delivering cleaner air in the United Kingdom (UK). It sets out a comprehensive strategic framework within which air quality policy will be taken forward in the short to medium term, and the roles that Government, industry, the Environment Agency (EA), local government, business, individuals and transport have in protecting and improving air quality.

2.2 Air Quality Standards

The Air Quality Standards Regulations 2010 (the regulations) transpose the Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation. The regulations include Limit Values, Target Values, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed Air Quality Assessment Levels (AQAL) throughout this report). Those relevant to this Air Quality Assessment are presented within Table 2-1.

Table 2-1
Relevant Air Quality Strategy Standards and Objectives

Pollutant	Standard (µg/m^3)	Measured As	Equivalent percentile
Nitrogen Dioxide (NO_2)	40	Annual Mean	-
	200	1-hour Mean	99.79th percentile of 1-hour means (equivalent to 18 1-hour exceedences)
PM_{10} (gravimetric)	40	Annual Mean	-
	50	24-hour mean	90.41th percentile of 24-hour means (equivalent to 35 24-hour exceedences)
Particulate matter within an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$) (gravimetric)	25	Annual Mean	-

2.2.1 Applicable Public Exposure

In accordance with the Department for Environment, Food and Rural Affairs' (DEFRA) technical guidance on Local Air Quality Management (LAQM.TG(16)), the AQALs should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. A summary of relevant exposure for the objectives presented in Table 2-1 are shown below in Table 2-2.

[2] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA. July 2007.

Table 2-2
Relevant Public Exposure

Objective Averaging Period	Relevant Locations	Objectives should apply at	Objectives should not apply at
Annual Mean	Where individuals are exposed for a cumulative period of 6-months in a year	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	Where individuals might reasonably be expected to spend one hour or longer	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

2.3 Local Air Quality Management

Section 82 of the Environment Act 1995 (Part IV) requires Local Authorities (LA) to periodically review and assess the quality of air within their administrative area. The reviews have to consider the present and future air quality and whether any AQALs prescribed in regulations are being achieved or are likely to be achieved in the future.

Where any of the prescribed AQALs are not likely to be achieved the authority concerned must designate an Air Quality Management Area (AQMA). For each AQMA the LA has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the AQAL. As such, LAs, have formal powers to control air quality through a combination of LAQM and by use of their wider planning policies.

2.4 General Nuisance Legislation

Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance.

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.

2.5 Planning Policy

2.5.1 National Policy

The 2019 update to the National Planning Policy Framework (NPPF) describes the policy context in relation to pollutants including air pollutants:

> *'Para 170: Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of […] air […] pollution […]. Development should, wherever possible, help to improve local environmental conditions such as air […] quality […]'*
>
> *'Para 180: Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.'*

Specifically, in terms of development with regards to air quality:

> *'Para 181: 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) 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"*

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that "*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). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.*"

The policies within the NPPF and accompanying PPG in relation to air pollution are considered within this Air Quality Assessment.

2.5.2 Local Policy

The BMBC Local plan was adopted on 3rd January 2019 and is the current planning strategy for the Borough. The Local Plan covers a range of topics such as the need to achieve economic, social and environmental sustainability, sets out the strategic objectives and policies for development. Following the adoption of the Local Plan, BMBC has produced new and updated supplementary planning documents which are inclusive of the BMBC *Air Quality and*

Emissions Good Practice Planning Guidance.

Within the Adopted Local Plan, the following policies relate to air quality:

> *"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."*

These policies contained within the BMBC Adopted Local Plan relating to air quality are addressed within this assessment.

2.6 Assessment Guidance

2.6.1 Barnsley Metropolitan Borough Council – Air Quality and Emissions Good Practice Planning Guidance

The *Air Quality and Emissions Good Practice Planning Guidance*[3] has been adopted by BMBC for air quality assessments and as such it is addressed within this assessment.

The guidance provides an approach to integrating air quality considerations into land-use planning policies that can influence the reduction of road transport emissions and is aimed at assisting BMBC to achieve the EU Air Quality Directive Limit Values.

As part of the guidance, the classification of the development is required to determine the appropriate level of

[3] Barnsley MBC Air Quality and Emissions Good Practice Planning Guidance, March 2020.

assessment, whereby schemes are classified as either 'minor', 'medium' or 'major'. Following the appropriate level of assessment, requirements for mitigation are outlined based upon the classification of the scheme.

2.6.2 DEFRA 'LAQM.TG(16)'

DEFRA Local Air Quality Management Technical Guidance[4] (LAQM.TG(16)) was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.6.3 Environmental Protection UK and Institute of Air Quality Management Guidance

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance[5] to help ensure that air quality is properly accounted for in the development control process. It clarifies when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

2.6.4 Design Manual for Roads and Bridges

The Design Manual for Roads and Bridges (DMRB) (LA 105) considers the following 'traffic scoping criterion' to determine where air quality impacts of a project require assessment:

- Annual average daily traffic (AADT) >= 1,000; or
- Heavy duty vehicle (HDV) AADT >=200; or
- A change in speed band; or
- A change in carriageway alignment by >=5m.

The above 'traffic scoping criterion' is required to be applied to all areas covered by the extent of traffic data, termed the 'traffic reliability area'. Where roads meet the above criterion, they are defined as the 'affected road network'. Where the above 'traffic scoping criterion' are met, there is a requirement to identify areas that are likely to be sensitive to changes in air quality identified as:

1. Monitored exceedances of air quality thresholds;
2. Air Quality Management Areas;
3. Areas identified by Defra as exceeding EU limit values; and/or
4. Designated habitats.

The DMRB[6] considers any receptor within 200m of a road source to be potentially affected by that operation and require assessment where the 'traffic scoping criterion' is met.

If none of the roads in the network meet any of the traffic / alignment criteria or there are no properties or relevant Designated Sites near the affected roads, then an air quality assessment can be 'scoped out'.

[4] DEFRA Local Air Quality Management Technical Guidance (2016).

[5] Environmental Protection UK and Institute of Air Quality Management, 'Land-Use Planning and Development Control: Planning for Air Quality', v1.2 2017.

[6] DMRB, LA 105 – Air Quality, Highways England, 2019.

2.6.5 Construction and Demolition Dust Guidance

Guidance on the assessment of dust from demolition and construction has been published by the IAQM[7]. The guidance provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities in order to identify appropriate mitigation measures that are defined within further IAQM guidance.

[7] Institute of Air Quality Management (IAQM), Guidance on the assessment dust from demolition and construction (2016).

3.0 ASSESSMENT METHODOLOGY

3.1 Construction Phase Dust Assessment

The assessment has been undertaken with reference to IAQM '*Guidance on the assessment of dust from construction and demolition*'. 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
- track-out.

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 to determine if there are sensitive receptors within threshold distances of the site activities associated with the construction phase of the scheme. No further assessment is required if there are no receptors within a certain distance of the works; 350m for human receptors and 50m for designated ecological receptors.

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and expert judgement. 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 mitigation requirements

Descriptors for magnitude of impact and impact significance used in this assessment of construction phase dust are as presented in Appendix A.

3.2 Construction Road Traffic Emissions Screening

Construction-generated traffic can have the potential to impact local air quality within the vicinity of the site, as well as haul routes used.

Construction generated traffic should be compared against the relevant screening criteria presented in EPUK-IAQM guidance, to identify road links requiring further assessment. However, specifics relating to construction generated traffic (such as volume) are typically unavailable for the completion of the Air Quality Assessment.

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, for which a full assessment has been undertaken), there is not considered to be any potential for significant air quality effects from development related road traffic emissions during the construction phase. Such potential impacts have therefore been scoped out from requiring detailed assessment based on their negligible impact.

3.3 Development Classification

The assessment has been undertaken in accordance with the requirements of the BMBC *Air Quality and Emissions Good Practice Planning Guidance* (2020) which initially requires for the 'development type classification' to be identified.

The classification of the development is initially determined based on adapted criteria from the Department for Transport (DfT) which depend on the area of the proposed land use (i.e. residential, retail, office etc.; in relation to residential the threshold criteria is >50 units) and the following additional criteria:

- any development generating 30 or more two-way vehicle movements in any hour;
- any development generating 100 or more two-way vehicle movements per day;
- any development proposing 100 or more parking spaces;
- any relevant development proposed in a location where local transport infrastructure is inadequate; or
- any relevant development proposed in a location adjacent to an AQMA.

Any development that is below these criteria is classified as 'minor'; developments that meet the criteria are classified as 'medium' unless they also meet the following additional criteria, in which case they are classified as 'major':

- where the proposed development falls within the Town and Country Planning (Environmental Impact Assessment) (England and Wales Regulations 2011 and includes air quality and/or transport as a specific likely impact;
- proposals located within an AQMA;
- proposals that could increase the existing traffic flow on roads >10,000 AADT by 5% or more;
- proposals that increase traffic by 5% or more on road canyons with an AADT > 5,000;
- proposals that could introduce of significantly alter congestion (DfT congestion) and includes the introduction of substantial road infrastructure changes;
- proposals that reduce average speeds by more than 10 kph;
- proposals that include additional HGV movements by more than 10% of total trips;
- where significant demolition works are proposed; and/or
- where significant construction works are proposed.

Based on the above thresholds, the Application Site is considered to be classified as 'medium'. As such, the assessment has been undertaken to quantify the potential impact and effect on air quality arising from road vehicle emissions associated with change in development trips during the operational phase of the scheme, with reference to the following documents:

- Local Air Quality Management Technical Guidance (LAQM.TG(16));
- DMRB, LA 105 – Air Quality, Highways England (2019);
- BMBC *Air Quality and Emissions Good Practice Planning Guidance,* (March 2020); and
- Land-Use Planning and Development Control: Planning for Air Quality (v1.2, 2017) – EPUK-IAQM.

3.4 Baseline Review – Exposure Assessment

An 'exposure assessment' has been undertaken following the BMBC *Air Quality and Emissions Good Practice Planning Guidance* to determine whether future occupants of the scheme are likely to be exposed to existing levels of poor air quality.

3.5 Traffic Emissions Assessment

3.5.1 Screening Assessment

The traffic emissions screening assessment has been undertaken on the basis of the EPUK-IAQM guidance. The guidance includes indicative criteria to define what constitutes a 'significant' increase in traffic movements to determine when a quantitative assessment of traffic emissions may be required. 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. The indicative criteria are:

- a change in Light Duty Vehicle (LDV) (LDV as defined by the DMRB as <3.5 tonnes) flow of more than 500 Annual Average Daily Traffic (AADT) outside of an AQMA;
- a change in LDV flow of more than 100 AADT within or adjacent to an AQMA;
- a change in Heavy Duty Vehicle (HDV) (HDV as define by the DMRB >3.5 tonnes) flow of more than 100 AADT outside of an AQMA; and/or
- a change in HDV flow of more than 25 AADT within or adjacent to an AQMA.

4.0 BASELINE ENVIRONMENT

4.1 Location

The Application Site is located to the south of Goldthorpe, Barnsley, at the approximate National Grid Reference (NGR): x446607, y403782. The Application Site is bounded by:

- existing residential dwellings immediately to the north and east;
- open agricultural land immediately to the south; and
- allotment spaces immediately to the west.

Primary vehicular access to the Application Site will be via a new access point off West Moor Croft.

4.2 Sensitive Receptors

4.2.1 Construction Dust Receptors

The main receptors likely to be affected by the generation of construction dust are those existing receptors within approximately 350m of the development site boundary and/or within 50m of the route(s) used by vehicles on the public highway, up to 500m from the site entrance(s)[8]. However, for those receptors sited in a downwind location from the development site boundary, potential dust impacts may be witnessed at a distance of greater than 350m on occasion under worst case conditions.

Reference should be made to Drawing AQ1 for an illustration of buffer zones of all sensitive receptors with the potential to be impacted upon by construction phase dust in accordance with the stated IAQM assessment methodology.

4.2.2 Ecological Receptors

A review using the Magic web-based mapping service[9] was undertaken to identify any designated sites of ecological or nature conservation importance required for consideration within the assessment. For the construction phase assessment this includes any ecological designation within 50m of the Application Site boundary, or 50m of any road projected to witness construction phase road traffic movements, that could potentially be affected by dust from the construction phases of the proposed development.

A search within 50m of the development boundary / road projected to witness construction phase road traffic movements identifies no receptors. The closest ecological designation to the Application Site is the Denaby Ings Site of Special Scientific Interest (SSSI) located approximately 3.9km south east of the Application Site and therefore unaffected by the Proposed Development.

4.3 Baseline Air Quality

4.3.1 Local Authority Review and Assessment

As required under Section 82 of the Environment Act (1995) (Part IV), BMBC has conducted an ongoing exercise to review and assess air quality within their administrative area.

[8] IAQM, Guidance on the assessment dust from demolition and construction v1.1, 2016.

[9] Natural England, www.magic.gov.uk, accessed July 2020.

This process has indicated that annual mean NO_2 concentrations are above, and likely to remain above the AQAL at locations of relevant public exposure within BMBC's administrative area. As such, 6 AQMAs have been declared throughout the Council's area:

- Barnsley AQMA No. 1 – An area along the M1 between Junction 35a and Junction 38, including Haigh, Darton, Cawthorne Dike, Higham, Dodworth, Gilroyd Rockley, Birdwell, and Tankersley. The area extends 100m either side of the central reservation;
- Barnsley AQMA No. 2 – An area encompassing the A628 from junction 37 of the M1 to Town End roundabout, including part of Summer Lane from Town End roundabout to Wharncliffe Street;
- Barnsley AQMA No. 4 – An area encompassing the southbound carriageway of the A61 Harborough Hill Road from the PC World gyratory to the southbound slip road of the A61 near to its junction with Queens Road;
- Barnsley AQMA No. 5 – An area encompassing the junction of Rotherham Road and Burton Road;
- Barnsley AQMA No. 6 – Incorporating the A616 road through Langsett; and
- Barnsley AQMA No. 7 – Incorporating the southbound carriageway of the A61 Sheffield Road adjacent to the junction with the A6133 Cemetery Road.

The Application Site is not located within close proximity of any declared AQMA within BMBC. However, the Application Site is located in close proximity to the Hickleton AQMA which is located within the area of jurisdiction of Doncaster Council (DC). The Hickleton AQMA is located 1.8km north east of the Application Site.

Therefore, additional vehicle trips associated with the development have the potential to impact upon pollutant concentrations and the designation of the AQMA and any potential for future revocation. Consideration of effects on the Hickleton AQMA has been made in the screening assessment of operational phase road-traffic exhaust emissions associated with the development.

All other Air Quality Strategy pollutants were below the relevant AQALs at locations of relevant public exposure, and as such no further AQMAs have been declared within the Council's administrative area.

4.3.2 Automatic Air Quality Monitoring

The UK Automatic Urban and Rural Network (AURN) is a countrywide network of air quality monitoring stations operated on behalf of the DEFRA. Monitoring data for AURN sites is available from the UK Air Information Resource (AIR) website.

The closest AURN monitor to the Application Site is the Doncaster A630 Cleveland Street AURN (NGR: x457249, y402747) located approximately 10.8km east of the Application Site. The Doncaster A630 Cleveland Street AURN is classified as an 'Urban Traffic' monitor, defined as: "*Sites in an urban area at least 25 metres from the edge of major junctions and no more than 10 metres from the kerbside*". Given the location of the Doncaster A630 Cleveland Street AURN monitor relative to the distance from the Application Site, the Doncaster A630 Cleveland Street AURN is not considered to be representative of background concentrations at the Application Site. Therefore, the Doncaster A630 Cleveland Street AURN has not been considered within the context of this assessment.

BMBC operates three automatic monitoring across its administrative area as part of their commitment to LAQM. The closest automatic monitor to the Application Site is station ID 'CM1 Barnsley A635 Roadside' (NGR: x436298, y405691), classified as a 'roadside' monitor, defined as: '*A site sampling typically within one to five metres of the kerb of a busy road'.* The 'CM1 Barnsley A635 Roadside' monitor is located approximately 11.6km west of the Application Site and monitors only PM_{10}. Given the separation distance and different conditions at the automatic monitoring location relative to the Application Site, 'CM1 Barnsley A635 Roadside' monitor is not considered to be

representative of conditions experienced at the Application Site, and therefore has not been considered further within the context of this assessment.

4.3.3 Passive Diffusion Tube Monitoring

Passive diffusion tube monitoring is currently undertaken by BMBC at numerous locations throughout the Council's area as part of their commitment to LAQM. The diffusion tubes are located in areas which are deemed to require further assessment of NO_2 concentrations. Following a review of the latest available BMBC Air Quality Annual Status Report, it was identified that no diffusion tube monitoring was undertaken within the vicinity of the site during 2019.

The Application Site is within close proximity of the LA boundary of DC and the aforementioned Hickleton AQMA. The Hickleton AQMA is located 1.8 km from the Application Site and is deemed an area in which further assessment of NO_2 concentrations is required. Passive diffusion tube monitoring has been undertaken within this AQMA by DC, however due to its declaration as an AQMA whereas the Application Site is not within an AQMA, these monitoring locations are not considered representative of baseline Air Quality conditions at the Application Site and therefore have not been considered further within this assessment.

4.3.4 DEFRA Mapped Background Concentrations

Background pollutant concentration data on a 1km x 1km spatial resolution is provided by DEFRA through the UK Air Information Resource (AIR) website and is routinely used to support LAQM and Air Quality Assessments.

Mapped background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were downloaded for the grid square containing the Application Site based upon the 2017 base year DEFRA update (published in May 2019)[10], as shown in Table 4-1. Mapped background concentrations are presented for 2018.

Table 4-1
DEFRA 2018 Mapped Background Concentrations – Grid Square x446500, y403500

Pollutant	Mapped Background Concentration (µg/m³)
NO_2	12.0
PM_{10}	12.4
$PM_{2.5}$	7.34

4.4 Meteorology

In relation to construction dust the generation, release and dispersion of fugitive dust are particularly dependent upon weather conditions and the nature of the handled material. The prevailing meteorological conditions at any site would be dependent upon many factors including its location in relation to macroclimatic conditions as well as more site specific, microclimatic conditions. The most important climatic parameters governing the emission and magnitude of impact of dust are:

- wind direction which determines the broad transport of the emission and the direction in which it is dispersed; and
- wind speed will affect ground level emissions by increasing the initial dilution of pollutants in the emission; it will also affect the potential for dust entrainment.

[10] Background mapping data for local authorities – http://uk-air.defra.gov.uk/data/laqm-background-home, accessed July 2020.

Rainfall is also an important climatological parameter in the generation of dust; sufficient amounts of rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)[11] rainfall greater than 0.2mm per day is sufficient to suppress dust emissions.

4.4.1 Wind Speed and Direction Data

The most comparable observation station to the Application Site is Robin Hood (Doncaster Sheffield) Airport, located approximately 19.4km south-east of the Application Site. A wind rose is presented in

Figure 4-1.

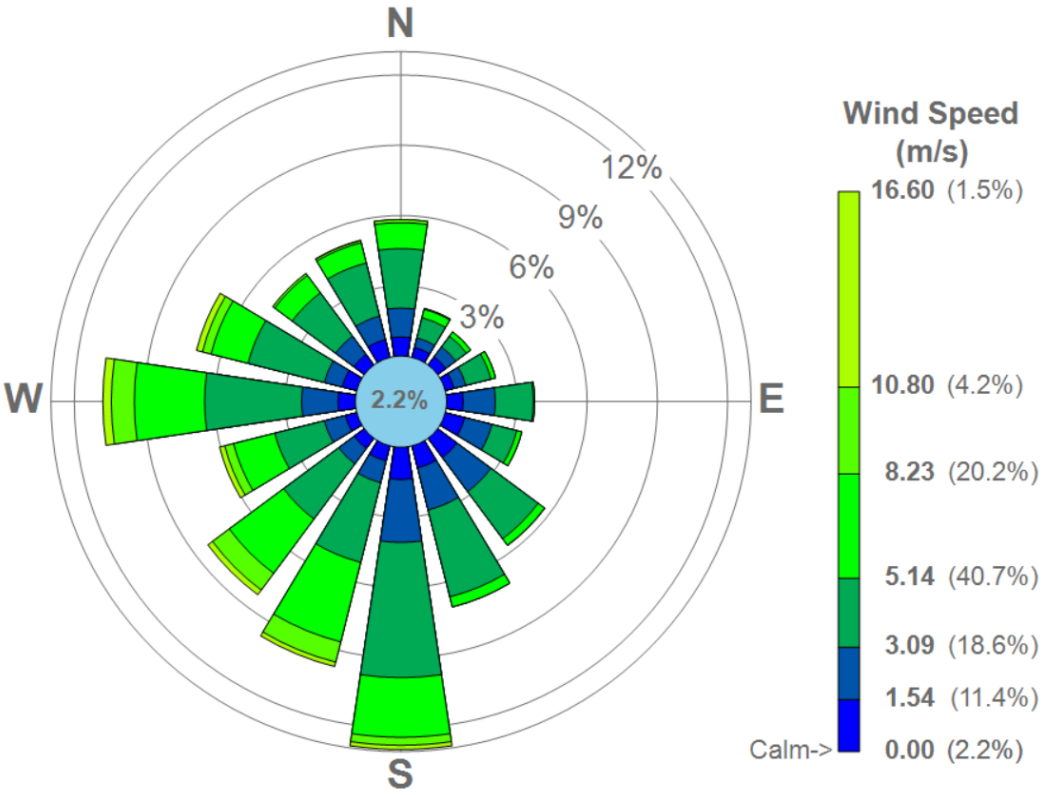


Figure 4-1
Wind rose for Robin Hood (Doncaster Sheffield) Airport (2019)

4.5 DEFRA PCM

The BMBC *Air Quality and Emissions Good Practice Planning Guidance* states that DEFRA's National Pollutant Climate Mapping (PCM) GIS website[12] should be used to ascertain if the development is located within 20m of roads at or above the relevant national objective. The closest road to the Application Site with a mapped roadside NO_2 concentration in 2018 is the A6023 (Manvers Way). This is located approximately 2.9km south west of the Application Site. The NO_2 roadside concentration on A6023 Manvers Way is 24.0 µg/m^3 in 2018.

[11] Arup & Ove Arup Environmental. Environment Effects of Surface Mineral Workings. DoE, October 1995.

[12] https://uk-air.defra.gov.uk/data/gis-mapping, accessed July 2020.

Figure 4-2
DEFRA PCM Mapping Output

5.0 ASSESSMENT OF DUST EFFECTS AND SIGNIFICANCE: CONSTRUCTION PHASE

This section presents the potential air quality impacts and effects associated with the construction of the development in terms of dust and vehicle emissions.

5.1 Construction Dust Assessment

Construction activities will include:

- material export and import;
- temporary stockpiling of materials;
- groundwork for foundations and services;
- construction of buildings;
- landscaping works; and
- vehicle movements (with the potential to track-out material from site).

The following subsections provide a consideration of potential construction dust and conclude with a determined emission class and risk category, from each of the categories identified by the IAQM Guidance.

5.1.1 Assessment Screening

As shown in Drawing AQ1, there are 'human receptors' within 350m of the Application Site but no designated habitat sites within 50m of the Application Site boundary or within 50m of the Application Site entrance / 500m of the roads anticipated to witness construction traffic movements. Therefore, an assessment of construction dust on ecological receptors can be screened out from this assessment but an assessment of construction dust at human receptors is required.

5.1.2 Potential Dust Emissions Magnitude

The most significant potential source of dust emissions during construction would be the earthworks and construction activities. Dust is potentially generated by the action of heavy vehicles (bulldozer, front-end loader, hydraulic excavator, and dump trucks), as well as by the movement of the vehicles on potentially dusty surfaces. Handling and storage of construction materials (aggregates / hard core), haulage across unsurfaced areas are also potential sources of dust generation.

The potential dust emission magnitude for each activity is described in Table 5-1.

Table 5-1
Potential Dust Emission Magnitude

Activity	Comments	Dust Emission Magnitude
Demolition	The Application Site is currently vacant greenfield, with no existing buildings / structures. Therefore, there are no buildings or structures to be demolished, and the demolition phase does not require consideration.	N/A
Earthworks	The proposals comprise the development of 69No. residential dwellings and associated infrastructure. Site earthworks are required over an area	Large

Activity	Comments	Dust Emission Magnitude
	greater than 10,000m^2 with assumed soil types representing a high-risk potential for suspension when dry due to small particle size. Due to the site's current vacant use allowing for ease of future development, between 5 – 10 heavy earth moving vehicles are considered to be required on Application Site at once. Given the size of the site, it is estimated that construction phase activities will occur over a period of greater than one year. Therefore, some earthworks activities will occur over 'summer' months, corresponding to lower periods of rainfall and reduced potential for natural dust suppression. For the purpose of this assessment and to provide a worst-case assumption, it has been assumed that earthworks associated with site preparation and landscaping would run concurrently with construction works. Therefore, dust emission magnitude is calculated to be 'large'.	
Construction	The total building volume associated with the proposed residential development is predicted to be between 25,000 and 100,000m^3. Construction will be as standard brick masonry with concrete foundations. These materials have a high potential for dust generation. No concrete batching or piling is required as part of the construction works. It is estimated that construction phase activities will occur over a period of greater than one year. Therefore, some earthworks activities will occur over 'summer' months, corresponding to lower periods of rainfall and reduced potential for natural dust suppression. For the purpose of this assessment and to provide a worst-case assumption, it has been assumed that earthworks associated with site preparation and landscaping would run concurrently with construction works. Therefore, dust emission magnitude is calculated to be 'large'.	Large
Trackout	Construction vehicles will most likely access the site via the existing highway network from the east (onto West Moor Croft). No details are available at the time of assessment on the number of additional HDV movements associated with construction works in each phase, however, given the scale and nature of works required, there is considered to be 10-50HDV outward movements in any worst-case day. Due to the size of the site the unpaved road length is considered to be between 50-100m. Therefore, dust emission magnitude is calculated to be 'medium'.	Medium

5.1.3 Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentration; and

- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

The sensitivity of the area and the factors considered are presented in Table 5-2.

Table 5-2
Sensitivity of the Area

Sensitivity to:	Comments	Sensitivity
Dust Soiling Impacts	The surroundings predominantly comprise existing residential dwellings, that are classified as of high sensitivity to dust soiling. There are between 10 – 100 high sensitivity receptors within 20m of the Application Site boundary, inclusive of Phase 1 and 2 of the Barnburgh View developments.	High
Human Health Impacts	The background PM_{10} concentration for the maximum 1km^2 grid square containing the development (x446500, y403500) is estimated to be 12.4µg/m^3, based upon 2018 mapped background estimates presented in Table 4-1 (i.e. falls into the <24µg/m^3 class) and there are between 10 – 100 high sensitivity receptors within 20m of the Application Site boundary inclusive of Phase 1 and 2 of the Barnburgh View developments.	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 the table below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table 5-3
Risk of Dust Impacts

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling Impacts	n/a	High Risk	High Risk	Medium Risk
Human Health Impacts	n/a	Low Risk	Low Risk	Low Risk

5.1.5 Construction Phase Mitigation

Potential dust effects during the construction phase considered to be temporary in nature. The impacts are determined to be temporary as they will only potentially occur throughout the construction phase and short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine.

In order to control potential impacts, the mitigation measures presented within Table 5-4 are recommended. With the effective application of the dust mitigation measures it is considered that the overall effect at all receptors will be 'not significant'.

Table 5-4
Construction Dust Mitigation Measures

Site Application	Mitigation Measures
General Dust Management	Record all dust and air quality complaints and take appropriate measures to reduce emissions
	Record any exceptional; incidents that cause dust off site
	Undertake daily visual inspection of dust soiling and dust generation and record in site log (available for the local authority if requested)
	Ensure an adequate supply of water is available onsite for effective dust suppression
	Use enclosed chutes and conveyors and cover skips
	Minimise drop heights from conveyors, loading shovels and other material handling equipment
	Impose a site speed limit of 10mph on unpaved haul roads
	Ensure all vehicles engines are switched off when stationary
	Plan site layout so machinery is located away from receptors as far as possible
	Enclose specific operations where there is a high potential for dust production
	Avoid site runoff of water or mud
	Keep site fencing, barriers and scaffolding clean using wet methods
	Remove material that have the potential to produce dust from the site as soon as possible
Earthworks	Re-vegetate earthworks and soil stockpiles to stabilise surfaces as soon as practicable
	Cover stockpiles if not vegetated and only remove in small areas during work
	Avoid double handling of material
	Cease operations during high winds in the direction of sensitive receptors
Construction	Avoid scabbling (roughing of concrete surfaces) if possible
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out
Trackout	Use water assisted dust sweepers on the access and local roads to removed tracked out material is necessary
	Avoid dry sweeping large areas
	Ensure vehicles entering and leaving sire are covered to prevent escape of materials during transport

Site Application	Mitigation Measures
	Implementation of wheel washing system with hard surfacing between facility and public road
	Access gates to be located at least 10m from receptors where possible

5.2 Construction Phase – Vehicular Pollutants

Information on traffic movements anticipated during construction works was unavailable for the completion of the Air Quality Appraisal. However, the development quantum is not anticipated to result in a significant increase in movements above the EPUK-IAQM criterion. The duration of movements will be short-term in nature and are not considered further within the context of this assessment. Therefore, in accordance with the criterion presented within EPUK-IAQM guidance, additional road vehicle trips during the construction phase of the scheme '*can be considered to have insignificant effects*' on air quality.

6.0 BASELINE SITE SUITABILITY REVIEW

This section presents a review of the BMBC Air Quality and Emissions Good Practice Planning Guidance 'Exposure Assessment' in consideration with the Application Site, for the purposes of identifying requirements for mitigation to be embedded into the scheme design.

6.1 BMBC Air Quality and Emissions Good Practice Planning Guidance – Exposure Assessment

The BMBC Air Quality Technical Planning Guidance includes a requirement for an 'exposure assessment' to determine whether future occupants of the scheme are likely to be exposed 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;
- the proposal is one of the following land-use types: and/or
    - Hotels (C1); residential institutions (C2) or dwelling houses (C3);
    - Homes of Multiple Occupations (C4); or
    - Non-residential institutions (D1).
- the proposal is within the areas identified on Map 1 within the BMBC *Air Quality and Emissions Good Practice Planning Guidance.*

In consideration of the above criterion:

- the Application Site is not located within or adjacent (i.e. within 200m) to an AQMA, as discussed within Section 4.3.1;
- the Application Site is not located within 20m of a road above the annual mean roadside NO_2 AQAL as presented within Section 4.5; and
- the Application Site is a C3 use-class Proposed Development, however, it is not located adjacent to a road where the baseline traffic flow is in excess of 10,000 AADT as identified from Map 1.

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

6.2 Significance of Air Quality Impacts

The EPUK-IAQM guidance[13] considers a number of factors for the determination of significance of predicted air quality impacts.

To determine the significance of predicted air quality impacts based upon a site-suitability assessment, such as that undertaken as part of this assessment, the EPUK-IAQM guidance states:

> *"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."*

[13] EPUK-IAQM, 'Land-Use Planning and Development Control: Planning for Air Quality', v1.2 2017.

As the 'exposure assessment' indicates no requirement to quantify air pollutant concentrations at the Application Site and no requirement for mitigation measures to make the scheme acceptable, the overall effect is considered 'not significant'.

7.0 OPERATIONAL PHASE SCREENING ASSESSMENT

This section presents the potential air quality impacts associated with the operational phase of the development.

7.1 Trip Generation

Additional vehicle movements associated with the Application Site will generate additional emissions, including NO_2 and PM_{10}, on the local and regional road network.

As part of the proposals, traffic associated with the development is proposed to access the site from West Moor Croft to the east of the Application Site.

TPS Transport Consultants are the appointed transport consultant to the applicant.

Predicted trip generation was provided based on the proposed C3 use-class of the development. The trips are predicted to be LDVs (i.e. cars) and HDVs. The trip generation for the scheme is displayed in Table 7-1. No trip distribution data was provided, however it has been confirmed by TPS that of the trip generation shown within Table 7-1, a maximum of 62 AADT (59 LDVs and 3 HDVs) will route through the Hickleton AQMA.

It is noted that the quoted trip generation was based upon a previous iteration of the Proposed Development which sought the development of 71No. units. Therefore, the trip generation associated with the development of 69No. units will be correspondingly lower.

Table 7-1
Trip Generation

Scheme	Total Trip Generation (AADT)	LDV Trip Generation (AADT)	HDV Trip Generation (AADT)
Barnburgh View, Phase 3 (69No. units, C3 use)	324	308	16

7.2 Screening Assessment – Consideration of Potential Impacts

In accordance with the EPUK-IAQM Guidance, developments located outside of AQMA require consideration of potential air quality impacts where additional development trips are in excess of 500 AADT as LDV trips or 100 AADT as HDV trips. As shown in Table 7-1, the total trip generation does not exceed the 500 AADT LDV or 100 AADT HDV criteria.

Furthermore, change in development trips within or adjacent to an AQMA require consideration of potential air quality impacts where development trips are in excess of 100 AADT as LDV trips or 25 AADT as HDV trips. It has been confirmed by the appointed transport consultant that the total trip generation with potential to route through the DC declared Hickleton AQMA, does not exceed the 100 AADT LDV or 25 AADT HDV criteria.

Therefore, in accordance with the criterion presented within EPUK-IAQM guidance, additional road vehicle trips during the operational phase of the scheme '*can be considered to have insignificant effects*' on air quality.

8.0 MITIGATION

This section presents any mitigation measures required during the construction and operational phases of the development in order to reduce the potential impact of the predicted effect.

8.1 Construction Dust Phase

Construction Phase mitigation measures are detailed within Section 5 and Table 5-4. With the effective application of the dust mitigation measures it is considered that the overall effect at all receptors will be 'not significant'.

8.2 Construction Phase Road Traffic Emissions

Potential air quality impacts associated with construction phase road traffic emissions (principally HDV movements) have been screened out for further assessment with associated impacts on air quality predicted to result in an 'insignificant' effect. Therefore, mitigation measures are not considered to be required.

8.3 Construction Phase NRMM Emissions

NRMM and plant should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately and any problem rectified. In addition, the following controls should apply to NRMM:

- all NRMM should use fuel equivalent to ultralow sulphur diesel;
- all NRMM should comply with either the current or previous EU Directive Staged Emission Standards;
- all NRMM should be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting);
- the on-going conformity of plant retrofitted with DPF, to a defined performance standard; and
- implementation of fuel conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded, ensure equipment is properly maintained to ensure efficient fuel consumption.

Successful implementation of the above mitigation measures would ensure that emissions from the construction phase and NRMM used during construction are 'not significant'.

8.4 Operational Phase

The screening assessment of vehicle emissions associated with the operation of the Application Site predicted an unmitigated insignificant effect on air quality due to the associated vehicle movements being below the relevant EPUK-IAQM screening criteria for both LDVs and HDVs.

However, in accordance with the BMBC *Air Quality Technical Planning Guidance*, as the Proposed Development is classified a 'medium' scheme 'Type 1' and 'Type 2' mitigation measures should be included as part of the development.

As Type 1 mitigation, in accordance with the BMBC *Air Quality Technical Planning Guidance* and the BMBC *Sustainable Travel Supplementary Planning Document (March 2020),* electric vehicle (EV) charging will be provided for the scheme, with a 100% provision rate for all units with dedicated parking.

As Type 2 mitigation, TPS (transport consultants to the applicant) have created a Travel Plan for the development which includes a number of mitigation measures would help to improve air quality in the locale by reducing reliance upon car movements to and from site. These measures include:

- a travel plan coordinator to monitor, communicate with BMBC and ensure successful uptake of the measures outlined as part of the travel plan;
- provision of a travel information leaflet, free personalised journey planning for each household, an annual residents newsletter and promotion of discounts with sustainable travel providers to residents;
- footpath and cycle path connectivity to the surrounding area and amenities to encourage walking / cycling above car travel;
- a cycle strategy of promotion of local free cycle training, promotion of the South Yorkshire Love to Ride scheme and discounts for residents at Halfords cycle shops;
- provide details on public transport in the area, including timetables and bus stop locations in proximity to the Application Site;
- provide details on car-sharing schemes in the local area;
- promotion of eco-driving; and
- provide details of electric car charging points within the area.

9.0 CONCLUSIONS

SLR Consulting has undertaken an assessment of potential air quality impacts associated with phase 3 of a proposed residential development for 69No. units on land at Barnburgh View, Goldthorpe, Barnsley.

A qualitative assessment of the potential dust impacts during the construction of the development has been undertaken. Through good practice and implementation of appropriate mitigation measures, it is expected that the release of dust would be effectively controlled and mitigated, with resulting impacts considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature.

Due to the low additional number of HDV trips anticipated during the construction phase of the development, there is predicted to result in an 'insignificant' effect on air quality from road vehicle emissions. Furthermore, emissions from plant / NRMM on-site is predicted to result in a 'not significant' impact on air quality.

The results of the Operational Phase Screening Assessment indicate that additional development trips associated with the Application Site are below the EPUK-IAQM criteria for further assessment at roads within the study area within BMBC and additionally within the DC declared Hickleton AQMA and therefore a further detailed assessment was determined not to be required. On the basis of the above, the additional vehicle trips associated with the Application Site are predicted to result in an 'insignificant' effect in accordance with the stated EPUK-IAQM guidance The 'exposure assessment' screening indicates no likely exceedances at the Application Site and therefore the overall effect is considered to be 'not significant' in accordance with EPUK-IAQM guidance.

As such, it is considered that air quality does not represent a material constraint to the development proposals, which conform to the principles of National Planning Policy Framework and the accompanying Planning Practice Guidance, the relevant policies of BMBC's Local Plan and BMBC's *Air Quality and Emissions Technical Planning Guidance.*

DRAWINGS

446000
446500
447000
404000
403500

350m
100m
50m
20m

N

0 100 200 300 400 500
Metres

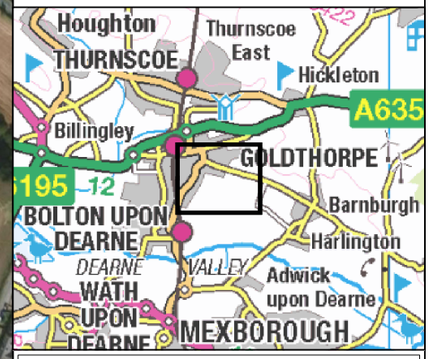
LEGEND

Site Boundary

Buffer from Site Boundary (20/50/100/350m)

Trackout

Trackout 50m Buffer



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BARNBURGH VIEW, GOLDTHORPE, PHASE 3

AIR QUALITY

SITE SETTING AND CONSTRUCTION PHASE BUFFER ZONES

DRAWING AQ1

Scale 1:5,000 @ A3

Date JULY 2020

03044.00169.0001.0 Site Setting and Construction Phase Buffer Zones

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix A – Construction Dust Assessment Methodology

Predicting Risk

The assessment of risk is determined by considering the predicted change in conditions as a result of the development. The risk category for potential dust effects arising from site works is defined into 4No. potential activities:

- demolition;
- earthworks;
- construction; and
- trackout.

The determination of risk categories presented above are based upon the descriptors presented within IAQM: Guidance on the assessment of dust from demolition and construction.

Sensitivity of Receptor

To determine the significance of dust effects associated with the construction phase of the development, an evaluation of the sensitivity of the surrounding area is required. Receptors can demonstrate different sensitivities to changes in their environment, and are classified as detailed within Table A-1.

Quoted distances to the nearest receptor are from the dust emission sources. Where this is not known, receptor distances are determined from the site boundary. The risk category is based upon the distance of site works to the nearest receptor.

Table A-1
Methodology for Defining Sensitivity to Dust Effects

Sensitivity of Area	Examples		
	Human Receptors		Ecological Receptors [A]
	Dust Soiling Effects	Health Effects of PM_{10}	
High	• users can reasonably expect an enjoyment of a high level of amenity; or • the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.	• locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• locations with an international or national designation and the designated features may be affected by dust soiling; or • locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level	• locations where the people exposed are workers, and exposure is over a time period relevant to the air quality	• locations where there is a particularly important plant species, where its dust

	of amenity as in their home; or • the appearance, aesthetics or value of their property could be diminished by soiling; or • the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Indicative examples include parks and places of work.	objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	sensitivity is uncertain or unknown; or • locations with a national designation where the features may be affected by dust deposition. Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	• the enjoyment of amenity would not reasonably be expected; or • property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or • there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal	• locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	• locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with dust sensitive features.

	• pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.		

Notes:

(A) Only applicable if ecological habitats are present which may be sensitive to dust effects.

Assessment of Impact Significance – Dust Effects

Table A-2 to Table A-4 illustrate how the sensitivity of the area may be determined for dust soiling, human health and ecosystem impacts, respectively. The highest level of sensitivity from each table should be recorded.

Table A-2
Sensitivity of Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 – 100	Medium	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	<1	Low	Low	Low	Low

Table A-3
Sensitivity of Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m^3	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	28 – 32µg/m^3	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	24 – 28µg/m^3	>100	High	Medium	Low	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	<24µg/m^3	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Medium	>32µg/m^3	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 – 32µg/m^3	>10	Medium	Low	Low	Low	Low

		1 – 10	Low	Low	Low	Low	Low
	24 – 28µg/m^3	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	<24µg/m^3	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Low	-	1	Low	Low	Low	Low	Low

Table A-4
Sensitivity of Area to Ecological Impacts

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

Note:
(A) For trackout, the stand-offs should be measured from the side of the roads used by construction traffic.

Defining the Risk of Impact

Table A-5 to Table A-8 illustrates how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts with no mitigation measures applied.

Table A-5
Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table A-6
Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A-7
Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A-8
Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

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