



# Land North of Oak Cottage, Boorley Green

## Air Quality Assessment

On behalf of

**McCARTHY STONE**

Project Ref:332611606/300 | Rev: Final | Date: July 2024

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# 1 Introduction

## 1.1 Proposed Development

- 1.1.1 McCarthy Stone (the 'Applicant') has commissioned Stantec to undertake an air quality assessment to support a planning application for a retirement living apartment block and two separate three-bedroom residential dwellings at land north of Oak Cottage, Boorley Green, SO32 2DH' (the 'Site'). The Site is located within the administrative boundary of Eastleigh Borough Council (EBC).
- 1.1.2 The planning application is for 52 apartments, ranging from one to two bedrooms over three storeys, as well as two three-bedroom residential properties, and associated infrastructure and green space (the 'Proposed Development').

## 1.2 Scope of Assessment

- 1.2.1 This report describes existing air quality within the study area, considers the suitability of the Site for residential development and assesses the potential impacts of construction activities and operation of the development on air quality in the surrounding area.
- 1.2.2 The main air pollutants of concern related to construction are dust and fine particulate matter (PM<sub>10</sub>) associated with on-site construction activities and off-site trackout.
- 1.2.3 The main air pollutants of concern during the operational period are NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emissions associated with road traffic.
- 1.2.4 The energy strategy for the Proposed Development is all-electric, utilising mechanical ventilation with heat recovery (MVHR), electric panel heaters and solar photovoltaics, all of which are zero-emission technologies. As no combustion sources are proposed, no potential local air quality impacts are anticipated and the impacts of the energy plant are considered to be not significant. An assessment of combustion emissions has therefore been scoped out of this assessment.
- 1.2.5 The assessment has been prepared taking into account relevant local and national guidance, policy and legislation.
- 1.2.6 A glossary of terms used in this assessment is provided in **Appendix A**.

## 1.3 Consultation

- 1.3.1 Consultation has been carried out between Stantec and EBC in the form of email correspondence with the Environmental Health Department in July 2024. The scope and methodology of the assessment was agreed with the Environmental Health Department at EBC. The latest results from air quality monitoring undertaken by the Council were also obtained.

## 2 Legislation, Policy and Guidance

### 2.1 Air Quality Regulations

- 2.1.1 The Air Quality (England) Regulations 2000 (AQR) defined National Air Quality Objectives (NAQOs, a combination of concentration-based thresholds, averaging periods and compliance dates) for a limited range of pollutants. Subsequent amendments were made to the AQR in 2001 and 2002 to incorporate 'limit values' and 'target values' for a wider range of pollutants as defined in European Union (EU) Directives.
- 2.1.2 These amendments were consolidated by the Air Quality Standards Regulations 2010 (AQSR) (with subsequent amendments most notably in 2016 and for the devolved administrations), which transposed the EU's Directive on ambient air quality and cleaner air for Europe (2008/50/EC) (European Parliament, Council of the European Union, 2008).
- 2.1.3 Following the Transition Period after the UK's departure from the EU in January 2020, the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (and subsequent amendments for the devolved administrations) have amended the AQ Standards Regulations 2010 to reflect the fact that the UK has left the EU. The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 amended the PM<sub>2.5</sub> limit value in the AQSR to 20 µg/m<sup>3</sup>.
- 2.1.4 The relevant NAQOs for this assessment are shown in **Table 2-1**.

Table 2-1 Relevant Air Quality Objectives

| Pollutant         | Time Period  | NAQOs                                                              | Source                    |
|-------------------|--------------|--------------------------------------------------------------------|---------------------------|
| NO <sub>2</sub>   | 1-hour mean  | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year | NAQO and AQSR limit value |
|                   | Annual mean  | 40 µg/m <sup>3</sup>                                               | NAQO and AQSR limit value |
| PM <sub>10</sub>  | 24-hour mean | 50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year  | NAQO and AQSR limit value |
|                   | Annual mean  | 40 µg/m <sup>3</sup>                                               | NAQO and AQSR limit value |
| PM <sub>2.5</sub> | Annual mean  | 20 µg/m <sup>3</sup>                                               | NAQO and AQSR limit value |

- 2.1.5 The NAQOs for NO<sub>2</sub> and PM<sub>10</sub> were to have been achieved by 2005 and 2004 respectively, but also continue to apply in all future years thereafter.
- 2.1.6 The 2019 Clean Air Strategy includes a commitment to set a "*new, ambitious, long-term target to reduce people's exposure to PM<sub>2.5</sub>*" which the Environment Act 2021 commits the Secretary of State to setting. Two PM<sub>2.5</sub> targets were published via The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 and are set out below:
- an annual mean concentration target for PM<sub>2.5</sub> levels in England to be 10 µg/m<sup>3</sup> or below by 2040; and

- a population exposure reduction target for a reduction in PM<sub>2.5</sub> population exposure of 35% compared to 2018 to be achieved by 2040.
- 2.1.7 The Government has published an Environmental Improvement Plan 2023 (Department for Environment, Food and Rural Affairs (DEFRA), 2023a) which sets out the following interim PM<sub>2.5</sub> targets to be met by the end of January 2028:
- the highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m<sup>3</sup> of PM<sub>2.5</sub>; and
  - compared to 2018, the reduction in population exposure to PM<sub>2.5</sub> in the most recent full calendar year must be 22% or greater.

### National Air Quality Plan for NO<sub>2</sub> in the UK

- 2.1.8 The national Air Quality Plan for NO<sub>2</sub> (DEFRA, 2018) sets out how the Government plans to deliver reductions in NO<sub>2</sub> throughout the UK, with a focus on reducing concentrations to below the EU Limit Values throughout the UK within the 'shortest possible time'.
- 2.1.9 The plan requires all local authorities in England which DEFRA identified as having exceedances of the limit values in their areas past 2020 to develop local plans to improve air quality and identify measures to deliver reduced emissions, with the aim of meeting the limit values within their area within "*the shortest possible time*". Potential measures include changing road layouts, encouraging public and private ultra-low emission vehicle (ULEV) uptake, the use of retrofitting technologies and new fuels and encouraging public transport. In cases where these measures are not sufficient to bring about the required change within 'the shortest possible time' then local authorities may consider implementing access restrictions on more polluting vehicles (e.g. Clean Air Zones (CAZs)). A CAZ is defined within the plan as being "*an area where targeted action is taken to improve air quality and resources are prioritised and coordinated in a way that delivers improved health benefits and supports economic growth*" and may be charging or non-charging.

## 2.2 Air Quality Management

### The Air Quality Strategy

- 2.2.1 Part IV of the Environment Act 1995 (Statutory Instrument, 1995) required the Secretary of State to prepare and publish and 'strategy' regarding air quality.
- 2.2.2 The Air Quality Strategy (2007) establishes the policy framework for ambient air quality management and assessment in the UK (DEFRA in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland, 2007). The primary objective of the Air Quality Strategy is to ensure that everyone can enjoy a level of ambient air quality which poses no significant risk to health or quality of life. The Air Quality Strategy sets out the NAQOs and Government policy on achieving these.
- 2.2.3 The Environment Act required an updated Air Quality Strategy and the Air Quality Strategy (DEFRA, 2023b) sets out six priorities including boosting active travel and public transport. The Air Quality Strategy sets out the Government policy on achieving the NAQOs, including the new targets for PM<sub>2.5</sub>.
- 2.2.4 The Clean Air Strategy (2019) aims to lower national emissions of pollutants, thereby reducing background pollution and minimising human exposure to harmful concentrations of pollution. The Strategy aims to create a stronger and more coherent framework for action to tackle air pollution (DEFRA, 2019).

## Local Air Quality Management

- 2.2.5 Part IV of the Environment Act 1995 (Statutory Instrument, 1995) introduced a system of Local Air Quality Management (LAQM) which requires local authorities to regularly and systematically review and assess air quality within their boundary and appraise development and transport plans against these assessments.
- 2.2.6 Where a NAQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) setting out the measures it intends to introduce in pursuit of the NAQOs within its AQMA.
- 2.2.7 The Local Air Quality Management Technical Guidance 2022 ((LAQM.TG(22); (DEFRA, 2022)), issued by the Department for Environment, Food and Rural Affairs for local authorities provides advice as to where the NAQOs apply. These include outdoor locations where members of the public are likely to be regularly present for the averaging period of the objective (which vary from 15 minutes to a year) as summarised in **Table 2-2**.

Table 2-2 Relevant Public Exposure

| Averaging Period             | NAQOs should apply at:                                                                                                                                                                                                                                                                                                                                                                                                    | NAQOs don't apply at:                                                                                                                                                                                                                                                                                         |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Annual mean                  | <p>All locations where members of the public might be regularly exposed</p> <p>For example:<br/>Building façades of residential properties, schools, hospitals, care homes etc</p>                                                                                                                                                                                                                                        | <p>Façades of offices or other places of work where members of the public do not have regular access</p> <p>Hotels, unless people live there as their permanent residence</p> <p>Gardens of residences</p> <p>Kerbside sites</p> <p>Any other location where public exposure is expected to be short term</p> |
| 24-hour mean and 8-hour mean | All locations where the annual mean NAQO would apply, together with hotels and gardens of residences                                                                                                                                                                                                                                                                                                                      | <p>Kerbside sites</p> <p>Any other location where public exposure is expected to be short term</p>                                                                                                                                                                                                            |
| 1-hour mean                  | <p>All locations where the annual mean and 24 and 8-hour mean NAQOs apply as well as:<br/>Kerbside sites</p> <p>Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more.</p> <p>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.</p> | Kerbside locations where the public would not be expected to have regular access                                                                                                                                                                                                                              |

## 2.3 Planning Policy

### National Planning Policy

2.3.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how they are expected to be applied (Department for Levelling Up, Housing and Communities (DLUHC), 2023). The following paragraphs are considered relevant from an air quality perspective.

2.3.2 Paragraph 108 on promoting sustainable transport states:

*"Transport issues should be considered from the earliest stages of plan-making and development proposals, so that: ...*

*d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; ..."*

2.3.3 Paragraph 109 goes on to state:

*"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."*

2.3.4 Paragraph 180 on conserving and enhancing the natural environment states:

*"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 soil, air, water or noise pollution or land stability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans, and..."*

2.3.5 Paragraph 191 within ground conditions and pollution states:

*"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."*

2.3.6 Paragraph 192 states that:

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

2.3.7 Paragraph 193 states that:

*"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".*

### National Planning Practice Guidance

2.3.8 Paragraph 005, Reference 32-005-20191101 (revision date 01.11.2019), of the Planning Practice Guidance (PPG) (DLUHC and Ministry of Housing, Communities & Local Government (MHCLG), 2019) provides guidance on how considerations regarding air quality can be relevant to the development management process as follows:

*"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.*

- *Where air quality is a relevant consideration the local planning authority may need to establish:*
- *The 'baseline' local air quality, including what would happen to air quality in the absence of the development;*
- *Whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and*
- *Whether occupiers or users of the development could experience poor living conditions or health due to poor air quality."*

2.3.9 Paragraph 006, Reference 32-006-20191101 (revision date 01.11.2019), of the PPG identifies what specific air quality issues need to be considered in determining a planning application:

*"Considerations that may be relevant to determining a planning application include whether the development would:*

- *Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; and significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality*

*management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*

- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations; and*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

2.3.10 Paragraph 007, Reference 32-007-20191101 (revision date 01.11.2019), of the PPG provides guidance on how detailed an assessment needs to be:

*"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".*

and

*"The following could form part of assessments:*

*A description of baseline conditions and any air quality concerns affecting the area, and how these could change both with and without the proposed development;*

- *Sensitive habitats (including designated sites of importance for biodiversity);*
- *The assessment methods to be adopted and any requirements for the verification of modelling air quality;*
- *The basis for assessing impacts and determining the significance of an impact;*
- *Where relevant, the cumulative or in-combination effects arising from several developments;*
- *Construction phase impacts;*
- *Acceptable mitigation measures to reduce or remove adverse effects; and*
- *Measures that could deliver improved air quality even when legally binding limits for concentrations of major air pollutants are not being breached."*

2.3.11 Paragraph 008, Reference 32-008-20140306 (revision date 01.11.2019), of the PPG provides guidance on how an impact on air quality can be mitigated:

*"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.*

*Examples of mitigation include:*

- *Maintaining adequate separation distances between sources of air pollution and receptors;*

- *Using green infrastructure, trees, where this can create a barrier or maintain separation between sources of pollution and receptors;*
- *Appropriate means of filtration and ventilation;*
- *Including infrastructure to promote modes of transport with a low impact on air quality (such as electric vehicle charging points);*
- *Controlling dust and emissions from construction, operation and demolition; and*
- *Contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development."*

## Local Planning Policy

### Eastleigh Borough Council Local Plan 2016-2036

2.3.12 The EBC Local Plan 2016-2036 (Adopted 2022) (EBC, 2022), includes policies related to air quality.

2.3.13 Policy DM8, Pollution states that:

*'Development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts through:*

*a. air pollution (including odours or particulate emissions);*

*...2. Development susceptible to particular forms of pollution will not be permitted:*

*a) where it will be adversely affected by such pollution, unless measures can be taken that adequately mitigate the polluting effects; or*

*b) where it would inhibit existing economic or other activities giving rise to acceptable polluting effects...'*

### Eastleigh Borough Council Parking Standards Supplementary Planning Document (Draft)

2.3.14 EBC has produced a parking standards draft supplementary planning document (SPD) (EBC, 2023) which sets out guidelines on provision of electric vehicle (EV) charging spaces for residential developments in the district.

2.3.15 Section 5.1 – Residential Electric and Low Emissions Vehicle Parking and Charging states that:

*"... It is recommended that applicants should design the provision of charging for electric vehicles into residential development in accordance with the following standards:*

- *Residential dwellings – 1 active EV charging point per dwelling (off-street provision)*
- *Residential apartment buildings with 10 or more associated parking spaces – 1 active charging point per dwelling, plus passive provision for all remaining parking spaces*
- *Residential apartment buildings with fewer than 10 associated parking spaces – passive provision as a minimum standard for all parking spaces, with active charging points sought where possible."*

- 2.3.16 This guidance also outlines requirements for the provision of on-site cycle storage at new residential developments.

#### **Eastleigh Borough Council Air Quality Action Plan**

- 2.3.17 EBC has produced an Air Quality Action Plan (AQAP) (EBC, 2020) covering the period 2020-2025, which outlines how EBC plans '*to effectively tackle air quality issues within our control.*' This AQAP replaced three previous AQAPs, which covered separate AQMAs, and covers all AQMAs under the jurisdiction of EBC. The AQAP includes measures such as:

- Updating planning guidance to require EV charging in new developments.
- Updating planning guidance require new developments to employ use of green infrastructure to mitigate air quality impacts.
- Various measures to increase implementation and uptake of active travel behaviours and infrastructure which include, but are not limited to: introduction and expansion of car clubs, annual updates to the EBC travel plan, and improving public awareness of air pollution levels and air quality issues through the EBC website and campaigns.

## **2.4 Assessment Guidance**

- 2.4.1 The primary guidance documents used in undertaking this assessment are detailed below.

#### **DEFRA 'Local Air Quality Management Technical Guidance (LAQM.TG (22))'**

- 2.4.2 DEFRA LAQM.TG(22) was published for use by local authorities in their LAQM review and assessment work (DEFRA, 2022). The document provides key guidance on aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

#### **EPUK-IAQM 'Land-Use Planning & Development Control: Planning for Air Quality**

- 2.4.3 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance to help ensure that air quality is properly accounted for in the development control process (Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM), 2017). 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.

#### **IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'**

- 2.4.4 Guidance on the assessment of dust from demolition and construction has been published by the IAQM (IAQM, 2024). 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.
- 2.4.5 Within the IAQM guidance, an 'impact' is described as a change in pollutant concentrations or dust deposition and an 'effect' is described as the consequence of an impact.

## 3 Methodology

### 3.1 Introduction

- 3.1.1 The assessment methodology detailed in the following sections has been applied to ascertain the potential impacts of emissions to air in order to identify their significance and compliance with policy and regulatory requirements (outlined in **Section 2** of this report), and whether or not additional mitigation is required.
- 3.1.2 This assessment first outlines the existing air quality within the study area, then considers the suitability of the Site for the proposed end-use. It also assesses the impact of construction and operational activities on air quality and sensitive receptors in the study area.

### 3.2 Baseline Air Quality

- 3.2.1 Any exceedances of the limit values along roads within the study area have been identified using the 2020 NO<sub>2</sub> Projections Data published by DEFRA (DEFRA, 2020a). Information on baseline air quality in the study area has been obtained by collating the results of monitoring carried out by EBC and their LAQM reports to identify potential AQMAs. Background concentrations for the study area have been defined using the national pollution maps published by DEFRA which cover the whole country on a 1x1 km grid (DEFRA, 2020b).

### 3.3 Construction Dust Impacts

- 3.3.1 During demolition and construction, dust from on-site activities and off-site trackout by construction vehicles has the potential to impact on sensitive human receptors within the study area. The main potential impacts are loss of amenity (as a result of dust soiling) and deterioration of human health (as a result of increased concentrations of PM<sub>10</sub>).
- 3.3.2 The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source(s).
- 3.3.3 Separation distance is also an important factor. Large dust particles (greater than 30 µm), can be potentially responsible for most dust annoyance, will largely deposit within 100 m of sources. Intermediate particles (10-30 µm) can travel 200-500 m. Consequently, significant dust annoyance is usually limited to within a few hundred metres of its source. Smaller particles (less than 10 µm), which are the predominant fraction that can be potentially responsible for human health impacts largely remain airborne. However, the impact on the short-term concentrations of PM<sub>10</sub> occurs over a shorter distance due to the rapid decrease in concentrations with distance from the source due to dispersion.
- 3.3.4 The assessment of the risk of potential construction dust impacts has been undertaken with reference to relevant guidance (IAQM, 2024). The assessment methodology considers three separate potential dust impacts:
- loss of amenity due to dust soiling;
  - human health effects due to increases in concentrations of PM<sub>10</sub>; and
  - harm to ecological receptors due to increased dust deposition.
- 3.3.5 The first stage of the assessment involves screening to determine if there are sensitive receptors within threshold distances of the activities associated with the construction phase of

the scheme; defined as the study area. No further assessment is required if there are no receptors within the study area.

3.3.6 The IAQM guidance outlines that an assessment is only required in cases where:

- A 'human receptor' is located within:
  - 250 m of the boundary of the Site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the Site entrance(s).
- An 'ecological receptor' is located within:
  - 50 m of the boundary of the Site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the Site entrance(s).

3.3.7 The assessment of potential risk is determined by considering the risk of dust impacts arising from four activities in the absence of mitigation: demolition, earthworks, construction and trackout.

3.3.8 The dust emission class (or magnitude) for each activity, receptor sensitivity and the overall sensitivity of the area are determined using the criteria outlined in **Table B-1** to **Table B-5** in **Appendix B** (based on the IAQM guidance), indicative thresholds and professional judgement. The risk of dust impacts arising is a product of the relationship between the dust emission magnitude and the area sensitivity and is based on the criteria outlined in **Table B-6** (based on the IAQM guidance). The risk of impact is then used to determine the mitigation requirements.

3.3.9 The IAQM guidance recommends that no assessment of the significance of effects is made without mitigation in place, as mitigation is assumed to be secured by planning conditions, legal requirements or required by regulations.

3.3.10 With appropriate mitigation in place, the IAQM guidance indicates that the residual effect dust emissions associated with the demolition and construction can be classified as being 'not significant'.

### 3.4 Demolition and Construction Road Traffic Emission Impacts

3.4.1 The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from demolition and construction traffic generated by the Proposed Development has been determined qualitatively, taking into consideration the screening criteria outlined in the EPUK / IAQM guidance (Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM), 2017) (see **Appendix C**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.

### 3.5 Demolition and Construction Non-Road Mobile Machinery Emission Impacts

3.5.1 The impacts of emissions associated with NRMM during the construction phase of Proposed Development has been undertaken qualitatively, taking into account the following:

- Duration of works;
- Type and number of NRMM to be used on-site;

- Operating hours of NRMM;
- Emissions standard to which NRMM comply;
- Proximity of receptors to NRMM working areas; and
- Existing background pollutant concentrations.

3.5.2 In accordance with DEFRA's LAQM TG.22 (DEFRA, 2022), with suitable controls and site management in place, emissions associated with NRMM and site traffic are considered unlikely to have significant impact on local air quality.

### 3.6 Operational Road Traffic Emission Impacts

3.6.1 The potential for significant impacts on existing sensitive receptors within the study area as a result of emissions from operational traffic generated by the Proposed Development is determined based on the screening criteria outlined in the EPUK / IAQM Guidance (Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM), 2017) (see **Appendix C**) which includes consideration of the volume and composition of traffic generated by the Proposed Development and existing local air quality conditions (i.e. the presence of any declared AQMAs). It should be noted that if traffic from a development exceeds these levels, then it does not necessarily mean that a modelling assessment is necessary, only that the air quality impacts of traffic require more detailed consideration.

3.6.2 Information on the Proposed Development's trip generation has been provided by the Project's transport consultants, Paul Basham Associates.

### 3.7 Site Suitability

3.7.1 An assessment to determine whether there is a potential for exceedances of the relevant NAQOs / limit values at sensitive locations within the Proposed Development has been undertaken qualitatively, taking into account local monitoring, estimated background concentrations, the layout of the Proposed Development and the proximity of worst-case sensitive locations within the Proposed Development to nearby sources of emissions (i.e. the local road network).

## 4 Baseline Environment

### 4.1 Site Context

- 4.1.1 The Site lies to the west of the B3354 Winchester Road, on land opposite the Macdonald Botley Park Hotel and Spa. Immediately to the north and west of the Site is the currently under-construction Boorley Gardens residential development, which is separated from the north of the Site by a public footpath. To the south there are a small number of residential dwellings, and further southwest is an open field. The local area is predominately residential, with the village of Boorley Green to the east of Winchester Road. The Site is currently occupied by a small number of semi-permanent outbuildings and open areas.

### 4.2 Study Area

- 4.2.1 The study area adopted for this assessment is as follows:
- For the construction phase dust assessment, the study area (based on IAQM guidance) is defined as up to 250 m from the site or 50 m from the route of construction vehicles (up to 250 m from the site Entrance).
  - For the construction and operational phase road traffic emissions assessment, the study area (based on EPUK / IAQM guidance) is defined as all roads within 250 m of the site and any other roads which could potentially exceed the screening criteria outlined in **Appendix C**.

### 4.3 Ambient Air Quality

#### Limit Values

- 4.3.1 The study area does not contain any predicted exceedances of a limit values either in 2024 or in future years (DEFRA, 2020a).

#### LAQM

- 4.3.2 EBC has investigated air quality within its area as part of its responsibilities under the LAQM regime. The Site is not located within an Air Quality Management Area (AQMA). The nearest AQMA is located at Botley High Street, approximately 1.5 km south of the Site along the A334, due to exceedances of the annual mean nitrogen dioxide (NO<sub>2</sub>) NAQO. However, there has been a decline in measured NO<sub>2</sub> levels over the past five years during which annual mean NO<sub>2</sub> levels have decreased to below the objective.

#### Local Monitoring Data

##### NO<sub>2</sub>

- 4.3.3 EBC undertakes automatic monitoring of NO<sub>2</sub> concentrations at three locations in the district, the closest of which to the Site is the ES1 monitoring station, located at Southampton Road, Eastleigh, approximately 6 km northwest of the Site. EBC also undertakes monitoring using NO<sub>2</sub> diffusion tubes at a number of locations. The closest diffusion tube monitoring location to the Site, 'PAV', is located approximately 1.4 km southwest at Woodhouse Lane, Hedge End. Monitoring sites located within 3 km of the Site are described in **Table 4-1** and their locations are shown in **Figure 4-1** below. Whilst 2020 and 2021 monitoring results have been included below, it should be noted that these are not considered to be representative of longer-term trends due to COVID-19 restrictions in place during these years.

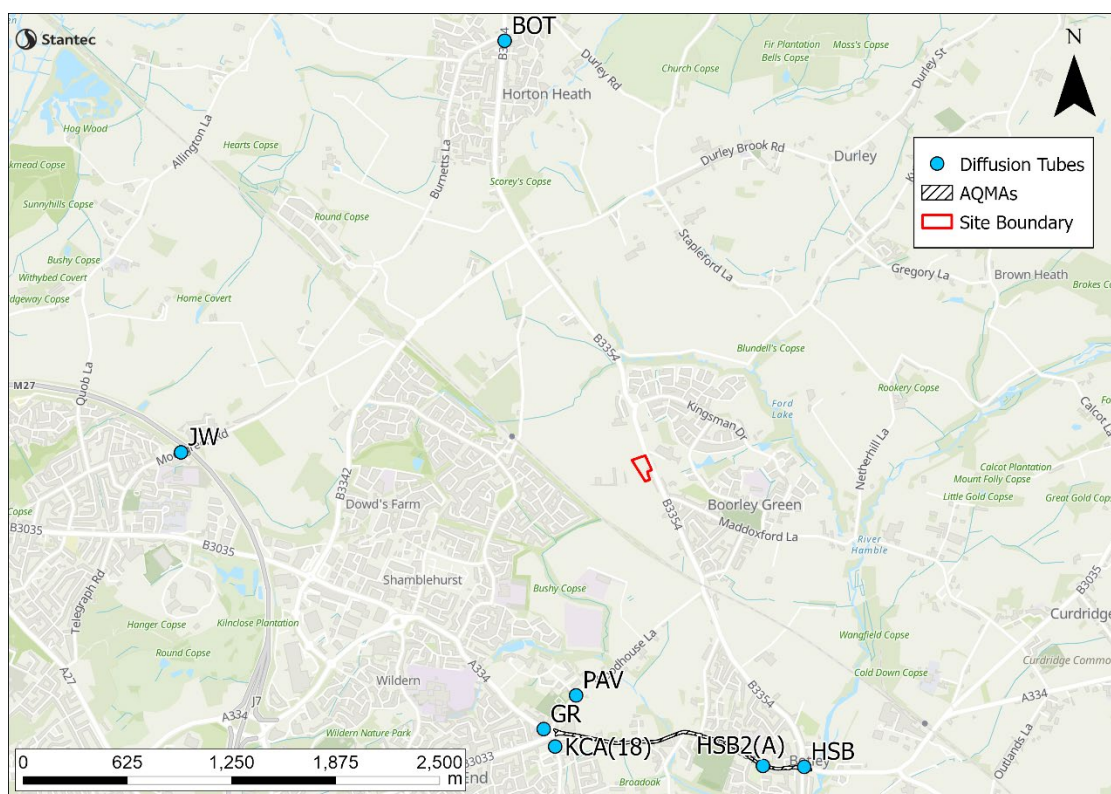


Figure 4-1 Monitoring Locations and AQMAs in the vicinity of the Site. Contains OS Data © Crown Copyright and Database rights 2024. Contains data from OS Zoomstack.

Table 4-1 Measured Annual Mean Concentrations 2019 - 2023

| Diffusion Tube ID                  | Site Type | Within AQMA | Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> ) |      |      |      |      |
|------------------------------------|-----------|-------------|--------------------------------------------------|------|------|------|------|
|                                    |           |             | 2019                                             | 2020 | 2021 | 2022 | 2023 |
| BOT – Botley Road                  | Roadside  | N           | 31.9                                             | 27.6 | 28   | 27.3 | 23.9 |
| GR – Grange Road                   | Roadside  | N           | 26.6                                             | 23.3 | 24   | 23.5 | 21.5 |
| HSB – High Street Botley           | Roadside  | Y           | 31.2                                             | 26.4 | 28.6 | 28.4 | 25.8 |
| HSB2(A) – High Street Botley 2 (A) | Roadside  | Y           | 28.5                                             | 22.6 | 24.7 | 25.3 | 22.6 |
| JW – Jukes Walk                    | Roadside  | N           | 21.3                                             | 16.5 | 17.4 | 18.6 | 16.2 |
| KCA(18) – Kings Copse Avenue (18)  | Roadside  | N           | 28.1                                             | 24.5 | 26.3 | 25.1 | 23   |
| PAV – Pavilion Road                | Roadside  | N           | -                                                | -    | -    | 16.4 | 11.2 |
| <b>NAQO</b>                        |           |             | <b>40</b>                                        |      |      |      |      |

2019 - 2022 data taken from the EBC 2023 Air Quality Annual Status Report (EBC, 2024), 2023 data provided by EBC on request

- 4.3.4 There have been no measured exceedances of the annual mean NO<sub>2</sub> NAQO between 2018-2023 at any of the monitoring locations within 3 km of the Site. At the majority of monitoring locations described in **Table 4-1**, there is a generally decreasing trend in measured concentrations over time which reflects the national trend (Air Quality Consultants, 2022).

- 4.3.5 EBC does not undertake automatic monitoring of NO<sub>2</sub> in proximity to the Site. There have been no measured exceedances of the 1-hour NO<sub>2</sub> NAQO at any automatic monitoring stations within EBC's administrative boundary in any of the past five years.

#### PM<sub>10</sub> and PM<sub>2.5</sub>

- 4.3.6 EBC do not undertake PM<sub>10</sub> monitoring in proximity to the Site. There have been no measured exceedances of the PM<sub>10</sub> annual mean objective at the PM<sub>10</sub> monitoring undertaken by EBC in any of the previous five years.
- 4.3.7 EBC does not undertake any PM<sub>2.5</sub> monitoring within its administrative boundary.

## 4.4 Predicted Background Concentrations

- 4.4.1 Estimated background concentrations for the Site have been obtained from the latest 2018-based national maps provided by DEFRA (DEFRA, 2020b) and are provided in **Table 4-2** for the 'existing' year and anticipated opening year of the Proposed Development.
- 4.4.2 The background concentrations are all well below the relevant NAQOs.

Table 4-2 Estimated Annual Mean Background Concentrations

| Year  | Location | Annual Mean (µg/m <sup>3</sup> ) |                  |                   |
|-------|----------|----------------------------------|------------------|-------------------|
|       |          | NO <sub>2</sub>                  | PM <sub>10</sub> | PM <sub>2.5</sub> |
| 2024  | 450_114  | 11.9                             | 13.3             | 9.1               |
| 2027  | 450_114  | 11.1                             | 13.2             | 9.0               |
| NAQOs |          | 40                               | 40               | 20                |

Note: Projections in the 2018 reference year background maps and associated tools are based on assumptions which were current before the Covid-19 outbreak in the UK. In consequence these tools do not reflect short- or longer-term impacts on emissions in 2020, 2021 and beyond resulting from behavioural change during the national or local lockdowns.

## 5 Predicted Impacts

### 5.1 Construction Dust Impacts

#### Screening Assessment

- 5.1.1 There are a number of existing sensitive human receptors (including residential properties) located within 250 m of the Site boundary and within 50 m of the routes that will be used by demolition and construction vehicles. As such, further assessment of the risk of dust soiling and PM<sub>10</sub> emissions is required.
- 5.1.2 There are no sensitive ecological receptors located within 50 m of the Site boundary or within 50 m of the routes used by demolition and construction vehicles on the public highway. The closest designated ecological site to the Site is located approximately 700 m from the Site boundary. As such, the potential for ecological impacts as a result of dust soiling can be screened out as being 'not significant'.

#### Further Assessment

##### Dust Emission Magnitude

- 5.1.3 The dust emissions magnitude of demolition, earthworks and construction activities and as a result of trackout have been determined in **Table 5-1** below based the criteria shown in **Table B-1, Appendix B**.

Table 5-1: Dust Emissions Magnitudes

| Activity     | Magnitude | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demolition   | Small     | The Site currently includes a small number of semi-permanent structures such as outbuildings, sheds and shipping containers. Demolition activities are not expected to occur more than 10 m above ground and the total building volume demolished will be below 12,000 m <sup>3</sup> . Therefore, the dust emission magnitude of demolition activities is judged to be 'small'.                                                                                             |
| Earthworks   | Small     | Proposed earthworks activities comprise clearance of vegetation, soil preparation and landscaping across an area less than 18,000 m <sup>2</sup> . The soil at the Site is largely classified as slowly permeable, seasonally wet loamy and clayey soils (Cranfield University, 2024), which are considered to be moderately dusty, particularly during periods of dry weather. Based on this, the dust emission magnitude of earthworks activities is judged to be 'small'. |
| Construction | Medium    | The total building volume to be constructed is expected to be between 12,000 m <sup>3</sup> and 75,000 m <sup>3</sup> . Construction materials will comprise a mixture of masonry material including those with a high potential for dust release, such as concrete, as well as those with a lower dust potential such as metals and timber. Based on this, the dust emission magnitude of construction activities is judged to be 'medium'.                                 |

| Activity | Magnitude | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trackout | Medium    | The number of HDVs that will exit the Site will vary depending upon the processes occurring at any one time. There are unlikely to be more than 20 outward HDV movements in any one day, however, due to the nature of the Site, there could be an unpaved road length of between 50 - 100 m in length comprising moderately dusty surface material with clayey and loamy soil at the Site. Based on this, the dust emission magnitude of trackout is judged to be 'medium'. |

## Area Sensitivity

- 5.1.4 The area sensitivity to dust soiling and human health impacts has been determined based on the criteria shown in **Table B-3, Table B-4, Table B-5, Appendix B**. The IAQM demolition and construction band criteria used to determine the sensitivity of the local area is shown in **Figure 5-1** below.

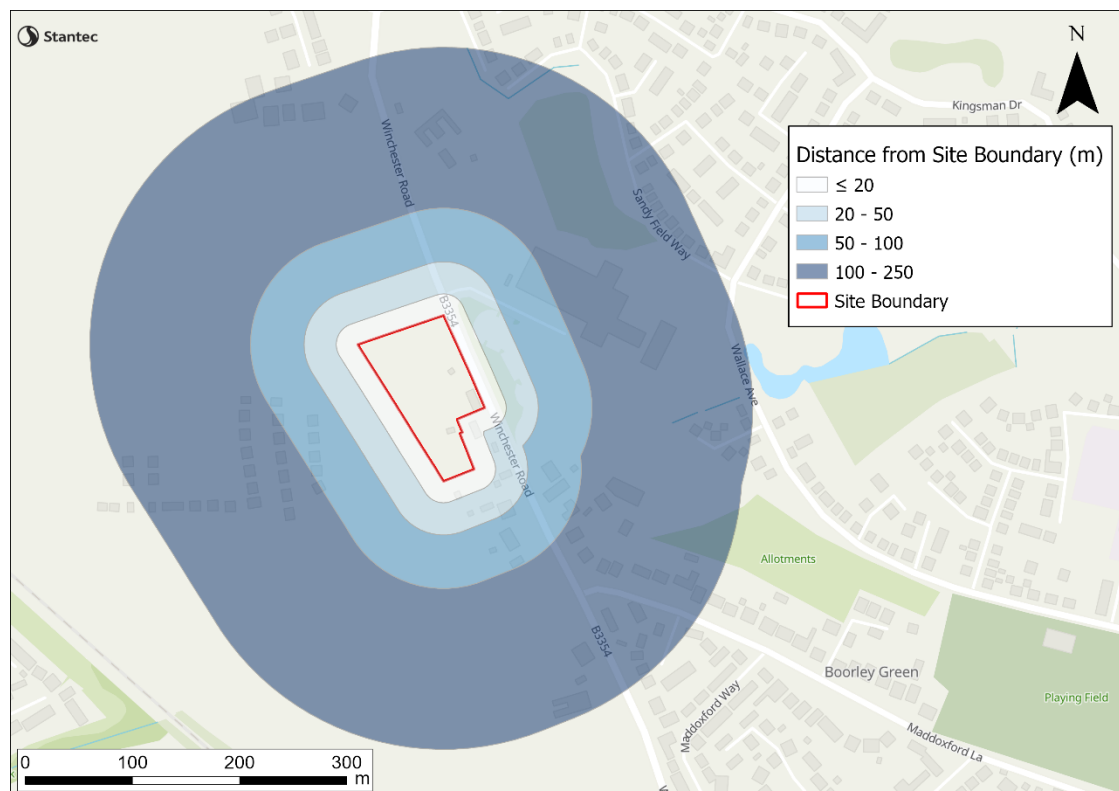


Figure 5-1: IAQM Demolition and Construction Dust band Criteria from the Site boundary. Contains OS Data © Crown Copyright and Database rights 2024. Contains data from OS Zoomstack.

- 5.1.5 Residential properties and their gardens are classed as being 'high sensitivity' receptors to dust soiling, based on the IAQM guidance (IAQM, 2024) (see **Table B-3, Appendix B**). There are currently between under ten residential properties located within 20 m of the Site boundary, however once the build out of the adjacent Boorley Gardens residential is completed, it is considered highly likely that there will be more than ten residences within 20 m of the Site boundary; as such, the sensitivity of the area surrounding the Site to dust soiling is judged to be 'high'.

- 5.1.6 The IAQM guidance indicates that potential impacts of trackout should be considered for sensitive receptors within 50 m of the route used by construction vehicles within a distance of up to 250 m from the Site entrance. As the demolition and construction traffic routing is currently unknown, the worst-case assumption has been made that all main roads may potentially be used by HDVs leaving the Site entrance(s). There are over ten residential properties located within 20 m of roads extending up to 250 m of the Site; as such, the sensitivity to dust soiling of the area surrounding roads along which material may be tracked is judged to be 'high'.
- 5.1.7 The IAQM also defines residential properties and nurseries as being 'high sensitivity' receptors to human health impacts (see **Table B-4, Appendix B**). PM<sub>10</sub> concentrations at existing residential properties within the study area are anticipated to be similar to the maximum of the predicted 2024 PM<sub>10</sub> DEFRA background concentrations at the Site (i.e. 13.3 µg/m<sup>3</sup>). Based on the predicted existing PM<sub>10</sub> concentrations and the number of sensitive receptors within 20 m of the Site boundary and roads along which material may be tracked, the sensitivity to human health impacts of the areas surrounding the Site and the area surrounding roads along which material may be tracked are judged to be 'low'.

### Risk of Impacts

- 5.1.8 The risk of construction dust impacts, without mitigation, have been defined based on the criterion shown in **Table B-5, Appendix B** and are presented in **Table 5-1** below.

Table 5-2 Risk of Construction Dust Impacts without Mitigation

| Potential Impact | Risk            |                 |              |             |
|------------------|-----------------|-----------------|--------------|-------------|
|                  | Demolition      | Earthworks      | Construction | Trackout    |
| Dust Soiling     | Medium Risk     | Low Risk        | Medium Risk  | Medium Risk |
| Human Health     | Negligible Risk | Negligible Risk | Low Risk     | Low Risk    |

## 5.2 Demolition and Construction Road Traffic Emission Impacts

- 5.2.1 At present, detailed information regarding the construction methodology for the development, specific activities and traffic movements is not available. However, a CEMP will outline measures to control and minimise the risk of adverse effects from construction activities. The CEMP will be submitted to EBC for their approval. The CEMP will consider Heavy Goods Vehicles (HGV) and other construction traffic movements, including details of routing and times of day of movements. HGV access will be prevented or minimised, where possible, on traffic sensitive roads, residential streets, congested roads or unsuitable junctions.
- 5.2.2 Vehicle movements associated with access, demolition and construction will vary through the construction programme, with short periods of peak HGV movements associated with demolition and the delivery of materials during the construction phase. However, when the HGV movements are averaged over a full year period (Annual Average Daily Traffic - AADT), these will be significantly lower than peak movements. Together with the implementation of the CEMP the impacts of emissions associated with construction road traffic on local air quality are considered to be temporary and 'not significant'. Moreover, vehicle movements associated with construction are typically significantly lower than the number of vehicle movements associated with operation of the development, which have been taken into account in this assessment.

## 5.3 Demolition and Construction Non-Road Mobile Machinery Emission Impacts

- 5.3.1 At the closest point, construction activities are expected to take place between 10 and 20 m of existing sensitive receptors. DEFRA predicted background concentrations at the Site are below 50% of the NAQO for all pollutants.

- 5.3.2 Site operating hours are assumed to be 8am to 6pm Monday to Friday, and 8am to 1pm Saturday, and works are expected to be carried out over approximately 18 months.
- 5.3.3 In accordance with Part 4 of the IAQM construction dust guidance, all Non-Road Mobile Machinery (NRMM) will need to adhere to the NRMM emissions standards for NO<sub>2</sub> and PM<sub>10</sub> outlined in European Directive 2016/1628 (European Parliament, Council of the European Union, 2016).
- 5.3.4 Considering the above, the impacts of emissions associated with NRMM during the construction phase of the Proposed Development are considered to be 'not significant'.

## 5.4 Operational Road Traffic Emission Impacts

- 5.4.1 Projected traffic generation has been provided by the Project's Transport Consultants, Paul Basham Associates. The Proposed Development will generate approximately 129 annual average daily traffic (AADT), with two being HDVs, during the operational phase. This is below the EPUK / IAQM screening criteria of 500 AADT or 100 HDV AADT for locations outside an AQMA.
- 5.4.2 Given that the nearest accessible point of the High Street Botley AQMA is approximately 2 km away, along the B3354 Winchester Road, it is considered highly unlikely that, even if all traffic associated with the Proposed Development was to travel south, there would be an exceedance of 100 AADT through the AQMA. If a worst-case assumption was to be made that all development traffic would travel through the AQMA, it is not considered likely that there would be significant impacts on local air quality, as measured concentrations at the High Street Botley AQMA (at monitoring locations HSB and HSB2 (A)), were 25.8 µg/m<sup>3</sup> and 22.6 µg/m<sup>3</sup> in 2023, far below the annual mean NAQO.
- 5.4.3 As such, traffic generated by the Proposed Development falls below the EPUK / IAQM screening criteria (see **Appendix C**) and, therefore, the impacts of operational traffic generated by the development on existing sensitive receptors within the study area can be screened out, and considered to be 'not significant', and no additional mitigation is therefore required.

## 5.5 Site Suitability

- 5.5.1 As the Site is for residential use, the annual mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, the 1-hour mean NO<sub>2</sub> and the 24-hour mean PM<sub>10</sub> NAQOs all apply.
- 5.5.2 The annual mean NO<sub>2</sub> concentrations at the local monitoring sites were below the NAQO at all locations in 2022 and there has been a general decrease in concentrations over the last five years. It is therefore highly unlikely that the annual mean NO<sub>2</sub> NAQO will be exceeded within the Site (which is located over 10m back from the road). Measured concentrations at the nearest monitoring locations to the Site are well below 60 µg/m<sup>3</sup>, indicating that the one-hour mean NO<sub>2</sub> NAQO is unlikely to be exceeded within the Site. PM<sub>10</sub> and PM<sub>2.5</sub> are also expected to be well below the NAQO. Background concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are well below the annual mean of NAQOs.
- 5.5.3 The Site is considered suitable for the proposed residential use without the need for site-specific mitigation associated with air quality.

## 6 Mitigation

### 6.1 Construction

6.1.1 The following standard mitigation measures, from the IAQM guidance (IAQM, 2024) are recommended, taking into account the outcomes of the construction dust risk assessment (presented in **Table 5-1**).

Table 6-1 Construction Phase Mitigation Measures

| Category       | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                                                                                                                                                                                            |
| Management     | Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real time PM <sub>10</sub> continuous monitoring and/or visual inspections.                                                                                                               |
|                | Record all dust and air quality complaints, identify cause(s) and take 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- of off-site, and the action taken to resolve the situation in the log book.                                                                                                                                                                                                                                       |
| Monitoring     | Undertake daily on-site and off-site inspections, 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 100 m of the site boundary, with cleaning to be provided if necessary. |
|                | 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 <sub>10</sub> continuous monitoring locations with the local authority. Where possible, commence baseline monitoring at least three months before work on a phase commences.                                                                                                                                                                      |
|                | Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.                                                                                                                                                                                                                                                                              |

| Category                                           | Mitigation Measure                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparing and maintaining the site                 | 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 productions 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.                                                                                                                                                                                                                                                                                                     |
| 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.                                                                                                                                                                                                                                |
|                                                    | Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph 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).                                                                                                                                                                                                                                 |
| 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.                                                                                                                                                                                |
| Waste management                                   | Avoid bonfires and burning of waste materials.                                                                                                                                                                                                                                                                                                                |
| Demolition                                         | Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).                                                                                                                                                                                                     |
|                                                    | Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled,                                                                                     |

| Category     | Mitigation Measure                                                                                                                                                                                                            |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | can produce fine water droplets that effectively bring the dust particles to the ground.                                                                                                                                      |
|              | Avoid explosive blasting, using appropriate manual or mechanical alternatives.                                                                                                                                                |
|              | Bag and remove any biological debris or damp down such material before demolition.                                                                                                                                            |
| Construction | Avoid scabbling (roughening of concrete surfaces) if possible.                                                                                                                                                                |
|              | 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. |
|              | 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 powder materials ensure bags are sealed after use and stored appropriately to prevent dust.                                                                                                      |
| Trackout     | Use water assisted dust sweeper(s) on the site access and local roads, to remove, as necessary, any material trackout out of the site. This may require the sweeper being continuously in use.                                |
|              | Avoid dry sweeping of large areas.                                                                                                                                                                                            |
|              | Ensure vehicles entering and leaving the site 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).                                                                             |
|              | 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 10 m from receptors where possible.                                                                                                                                                       |

## 6.2 Operation

- 6.2.1 The operational impacts of the Proposed Development are considered to be 'not significant' and no additional mitigation is therefore required.

6.2.2 Nonetheless, the following mitigation measures are among those proposed within a Travel Plan produced for the Proposed Development by Paul Basham Associates (Paul Basham Associates, 2024):

- Provision of on-site electric vehicle charging in line with the Buildings Regulations Part S and EBC's parking standards guidance.
- New pedestrian access connection to the existing shared footway/cycleway along the western side of Winchester Road, as well as a pedestrian access connection on the west of the Site between the Proposed Development and the Bellway Homes development.
- Promotion of local active travel and bus routes to residents and staff.
- Appointment of a Travel Plan co-ordinator to monitor progress towards the goals within the Travel Plan.

## 7 Summary and Conclusions

- 7.1.1 The air quality impacts associated with the Proposed Development at Land North of Oak Cottage, Winchester Road, Boorley Green, have been assessed. The Site is located within the administrative boundary of Eastleigh Borough Council.
- 7.1.2 Eastleigh Borough Council has declared four AQMAs due to exceedances of the annual mean NO<sub>2</sub> objective. The Site is not located within the AQMA; the closest AQMA to the Site is the High Street Botley AQMA, approximately 1.5 km south of the Site.
- 7.1.3 The construction activities have the potential to create dust. During construction it is recommended that, in accordance with the IAQM guidance, a package of mitigation measures is put in place to minimise the risk of elevated PM<sub>10</sub> concentrations and dust soiling in the surrounding area. With mitigation in place the construction impacts are judged as being 'not significant'.
- 7.1.4 The increase in road traffic resulting from the Proposed Development is 129 annual average daily traffic, with two heavy duty vehicle trips per day. This is below the EPUK / IAQM screening criteria outside an AQMA. However, if the worst-case assumption is made that all development traffic will travel south and through the High Street Botley AQMA, it is considered that significant impacts are highly unlikely due to measured NO<sub>2</sub> concentrations within this AQMA being far below the NAQOs. Furthermore, monitored concentrations across the past five years are well below the NAQOs at all nearby monitoring locations.
- 7.1.5 Therefore, the potential air quality impacts of the Development, with regards to road traffic, are considered to be 'not significant' and additional mitigation is not required. Nonetheless, a package of mitigation measures to reduce vehicle trips (and therefore associated pollutant emissions) will be implemented through a Travel Plan for the Site (Paul Basham Associates, 2024).
- 7.1.6 Pollutant concentrations at the Site are anticipated to be well below the relevant NAQOs. Therefore, the Site is considered appropriate for the proposed residential use without the need for further air quality mitigation.
- 7.1.7 The Proposed Development is therefore considered to be in accordance with the requirements of the NPPF, and relevant local and national guidance regarding air quality.

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## Appendix A Glossary

| Abbreviations                       | Meaning                                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AADT                                | Annual Average Daily Traffic                                                                                                                                                           |
| AQAP                                | Air Quality Action Plan                                                                                                                                                                |
| AQMA                                | Air Quality Management Area                                                                                                                                                            |
| CAZ                                 | Clean Air Zone                                                                                                                                                                         |
| CEMP                                | Construction Environmental Management Plan                                                                                                                                             |
| DEFRA                               | Department for Environment, Food and Rural Affairs                                                                                                                                     |
| Diffusion Tube                      | A passive sampler used for collecting NO <sub>2</sub> in the air                                                                                                                       |
| EBC                                 | Eastleigh Borough Council                                                                                                                                                              |
| EFT                                 | Emission Factor Toolkit                                                                                                                                                                |
| EPUK                                | Environmental Protection UK                                                                                                                                                            |
| EV                                  | Electric Vehicle                                                                                                                                                                       |
| HDV                                 | Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses                                                             |
| IAQM                                | Institute of Air Quality Management                                                                                                                                                    |
| LA                                  | Local Authority                                                                                                                                                                        |
| LAQM                                | Local Air Quality Management                                                                                                                                                           |
| NAQO                                | National Air Quality Objective as set out in the Air Quality Strategy and the Air Quality Regulations                                                                                  |
| NO <sub>2</sub>                     | Nitrogen Dioxide                                                                                                                                                                       |
| NO <sub>x</sub>                     | Oxides of nitrogen generally considered to be nitric oxide and NO <sub>2</sub> . Its main source is from combustion of fossil fuels, including petrol and diesel used in road vehicles |
| NPPF                                | National Planning Policy Framework                                                                                                                                                     |
| PM <sub>10</sub> /PM <sub>2.5</sub> | Small airborne particles less than 10/2.5 µm in diameter                                                                                                                               |
| PPG                                 | Planning Practice Guidance                                                                                                                                                             |
| Receptor                            | A location where the effects of pollution may occur                                                                                                                                    |
| SPD                                 | Supplementary Planning Document                                                                                                                                                        |

## Appendix B IAQM Dust Guidance (2024) Approach

Table B-1 Dust Emission Magnitude Classification

| Activity     | Dust Emission Magnitude                                                                                                                                             |                                                                                                                                                                                  |                                                                                                                                                                                       |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | Large                                                                                                                                                               | Medium                                                                                                                                                                           | Small                                                                                                                                                                                 |
| Demolition   | Total building volume of >75,000 m <sup>3</sup> , potentially dusty construction material, on-site crushing and screening, demolition activities >12 m above ground | Total building volume of 12,000 – 75,000 m <sup>3</sup> , potentially dusty construction material, demolition activities 6 – 12 m above ground level                             | Total building volume of <12,000 m <sup>3</sup> , construction material with low potential for dust release, demolition activities <6 m above ground, demolition during wetter months |
| Earthworks   | Total site area of >110,000 m <sup>2</sup> , potentially dusty soil type, >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height | Total site area of 18,000 – 110,000 m <sup>2</sup> , moderately dusty soil type, 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3 - 6 m in height | Total site area of <18,000 m <sup>2</sup> , soil type with large grain size, <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height                 |
| Construction | Total building volume >75,000 m <sup>3</sup> , on-site concrete batching, sandblasting                                                                              | Total building volume 12,000 - 75,000 m <sup>3</sup> , potentially dusty construction material, on-site concrete batching                                                        | Total building volume <12,000 m <sup>3</sup> , construction material with low potential for dust release                                                                              |
| Trackout     | >50 HDV outwards movements in any one day, potentially dusty surface material, unpaved road length >100 m                                                           | 20 - 50 HDV outwards movements in any one day, moderately dusty surface material, unpaved road length 50 - 100 m                                                                 | <20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50 m                                                            |

Table B-2 Receptor Sensitivity

| Receptor Sensitivity | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Dust Soiling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Health Effects of PM <sub>10</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ecological Impacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| High                 | <p>An area where:</p> <ul style="list-style-type: none"> <li>Users can reasonably expect enjoyment of a high level of amenity;</li> <li>The appearance, aesthetics or value of their property would be diminished by soiling;</li> <li>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.</li> </ul> <p>Examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.</p> | <p>Locations where members of the public are exposed over a time period relevant to the air quality objective for PM<sub>10</sub> (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day).</p> <p>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.</p>       | <p>Locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling;<br/>OR<br/>Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain.</p> <p>Indicative examples include a Special Area of Conservation designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.</p> |
| Medium               | <p>An area where:</p> <ul style="list-style-type: none"> <li>Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;</li> <li>The appearance, aesthetics or value of their property could be diminished by soiling;</li> <li>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.</li> </ul> <p>Examples include parks and places of work.</p>            | <p>Locations where people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM<sub>10</sub> (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day).</p> <p>Examples include office and shop workers, but will generally not include workers occupationally exposed to for PM<sub>10</sub>, as protection is covered by Health and Safety at Work legislation.</p> | <p>Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; OR<br/>Locations with a national designation where the features may be affected by dust deposition.</p> <p>Indicative example is a Site of Special Scientific Interest with dust sensitive features.</p>                                                                                                                                                                                               |

| Receptor Sensitivity | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                           |                                                                                                                                                                                    |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Dust Soiling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Health Effects of PM <sub>10</sub>                                                                                                        | Ecological Impacts                                                                                                                                                                 |
| Low                  | <p>An area where:</p> <ul style="list-style-type: none"> <li>The enjoyment of amenity would not reasonably be expected;</li> <li>Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;</li> <li>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 pattern of use of the land.</li> </ul> <p>Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.</p> | <p>Locations where human exposure is transient.</p> <p>Examples include public footpaths, playing fields, parks and shopping streets.</p> | <p>Locations with a local designation where the features may be affected by dust deposition.</p> <p>Indicative example is a Local Nature Reserve with dust sensitive features.</p> |

Table B-3 Sensitivity of an Area to Dust Soiling Effects

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

Table B-4 Sensitivity of an Area to Human Health Impacts

| Receptor Sensitivity | Annual Mean PM <sub>10</sub> Concentration | Number of Receptors | Distance from the Source (m) |        |        |        |
|----------------------|--------------------------------------------|---------------------|------------------------------|--------|--------|--------|
|                      |                                            |                     | <20                          | <50    | <100   | <250   |
| High                 | >32 µg/m <sup>3</sup>                      | >100                | High                         | High   | High   | Medium |
|                      |                                            | 10 – 100            | High                         | High   | Medium | Low    |
|                      |                                            | 1 - 10              | High                         | Medium | Low    | Low    |
|                      | 28 - 32 µg/m <sup>3</sup>                  | >100                | High                         | High   | Medium | Low    |
|                      |                                            | 10 – 100            | High                         | Medium | Low    | Low    |
|                      |                                            | 1 - 10              | High                         | Medium | Low    | Low    |
|                      | 24 - 28 µg/m <sup>3</sup>                  | >100                | High                         | Medium | Low    | Low    |
|                      |                                            | 10 – 100            | High                         | Medium | Low    | Low    |
|                      |                                            | 1 - 10              | Medium                       | Low    | Low    | Low    |

| Receptor Sensitivity | Annual Mean PM <sub>10</sub> Concentration | Number of Receptors | Distance from the Source (m) |        |      |      |
|----------------------|--------------------------------------------|---------------------|------------------------------|--------|------|------|
|                      |                                            |                     | <20                          | <50    | <100 | <250 |
| Medium               | <24 µg/m <sup>3</sup>                      | >100                | Medium                       | Low    | Low  | Low  |
|                      |                                            | 10 – 100            | Low                          | Low    | Low  | Low  |
|                      |                                            | 1 - 10              | Low                          | Low    | Low  | Low  |
|                      | >32 µg/m <sup>3</sup>                      | >10                 | High                         | Medium | Low  | Low  |
|                      |                                            | 1 - 10              | Medium                       | Low    | Low  | Low  |
|                      | 28 - 32 µg/m <sup>3</sup>                  | >10                 | Medium                       | Low    | Low  | Low  |
|                      |                                            | 1 - 10              | Low                          | Low    | Low  | Low  |
|                      | 24 - 28 µg/m <sup>3</sup>                  | >10                 | Low                          | Low    | Low  | Low  |
|                      |                                            | 1 - 10              | Low                          | Low    | Low  | Low  |
| Low                  | -                                          | >10                 | Low                          | Low    | Low  | Low  |
|                      |                                            | 1 - 10              | Low                          | Low    | Low  | Low  |
| Low                  | -                                          | ≥1                  | Low                          | Low    | Low  | Low  |

Table B-5 Sensitivity of an Area to Ecological Impacts

| Receptor Sensitivity | Distance from Source (m) |             |
|----------------------|--------------------------|-------------|
|                      | <20                      | <50         |
| High                 | High Risk                | Medium Risk |
| Medium               | Medium Risk              | Low Risk    |
| Low                  | Low Risk                 | Low Risk    |

Table B-6 Risk of Dust Impacts Calculation Matrix

| Sensitivity of Area |        | Dust Emission Magnitude |             |                 |
|---------------------|--------|-------------------------|-------------|-----------------|
|                     |        | Large                   | Medium      | Small           |
| Demolition          | High   | High Risk               | Medium Risk | Medium Risk     |
|                     | Medium | High Risk               | Medium Risk | Low Risk        |
|                     | Low    | Medium Risk             | Low Risk    | Negligible Risk |
| Earthworks          | High   | High Risk               | Medium Risk | Low Risk        |
|                     | Medium | Medium Risk             | Medium Risk | Low Risk        |
|                     | Low    | Low Risk                | Low Risk    | Negligible Risk |
| Construction        | High   | High Risk               | Medium Risk | Low Risk        |
|                     | Medium | Medium Risk             | Medium Risk | Low Risk        |
|                     | Low    | Low Risk                | Low Risk    | Negligible Risk |
| Trackout            | High   | High Risk               | Medium Risk | Low Risk        |
|                     | Medium | Medium Risk             | Medium Risk | Low Risk        |
|                     | Low    | Low Risk                | Low Risk    | Negligible Risk |

## Appendix C EPUK & IAQM Guidance (2017) Screening Criteria

| The Development Will:                                                                   | Indicative Criteria to Proceed to an Air Quality Assessment                                                                                                           |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cause a significant change in LDV traffic flows on local roads with relevant receptors. | A change of LDV flow of: <ul style="list-style-type: none"> <li>• &gt;100 AADT within or adjacent to an AQMA; and</li> <li>• &gt;500 AADT elsewhere.</li> </ul>       |
| Cause a significant change in HDV flows on local roads with relevant receptors.         | A change of HDV flow of: <ul style="list-style-type: none"> <li>• &gt;25 AADT within or adjacent to an AQMA; and</li> <li>• &gt;100 AADT elsewhere.</li> </ul>        |
| Realign roads i.e. changing the proximity of receptors to traffic lanes.                | Where the change is 5 m or more and the road is within an AQMA.                                                                                                       |
| Introduce a new junction or remove an existing junction near to relevant receptors.     | Applies to junctions that cause traffic to significantly change vehicle acceleration / deceleration, e.g. traffic lights, or roundabouts.                             |
| Introduce or change a bus station.                                                      | A change of bus flows of: <ul style="list-style-type: none"> <li>• &gt;25 AADT within or adjacent to an AQMA; and</li> <li>• &gt;100 AADT elsewhere.</li> </ul>       |
| Have an underground car park with extraction system.                                    | The ventilation extract for the car park will be located within 20 m of a relevant receptor; and<br>The car park will have >100 movements per day (total in and out). |

The screening criteria presented is amended from Table 6.2 of the EPUK / IAQM guidance (EPUK / IAQM, 2017). Only the screening criteria relevant to changes in transport (including both traffic and the transport network) are outlined