



Ducks Nest Farm, Arborfield

Air Quality Assessment

David Wilson Homes Southern

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Basis of Report

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A.1 Traffic Data



1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by David Wilson Homes Southern to undertake an Air Quality Assessment (AQA) to support a hybrid planning application (the 'Proposed Development') at Ducks Nest Farm, Arborfield (the 'Site'). The hybrid planning application comprises the following:

- a. A full application for the change of use of land from agricultural land to provide an area of Suitable Alternative Natural Greenspace (SANG), including the details of associated landscaping, planting, drainage measures, parking, walking routes and other works associated with the creation of the SANG.
- b. An outline application with all matters reserved other than access into the site for a residential development of up to 135 dwellings, open space, internal accesses and parking, drainage measures, landscaping and all other associated works.

The hybrid planning application will be a resubmission of a prior planning application submitted to Wokingham Borough Council (WBC) under application reference: 230532. SLR provided the AQA in support of the previous application (SLR report reference: 410.06551.00025 Rev v1.1, dated September 2022). It is noted that no objections to the previous AQA were raised by WBC's Environmental Protection Officer (EPO) in their consultation response dated 16th March 2023.

The Site currently comprises agricultural land and is situated at the approximate National Grid Reference (NGR): x476120, y166280. The surrounding area comprises:

- Agricultural fields and residential dwellings located directly north of the Site;
- The B3030 Eversley Road immediately to the east of the Site, with commercial properties on the west side of the road and residential dwellings and agricultural land on the east side of the road;
- Observer Way (A327) directly to the south of the Site, with agricultural fields and parkland / scrubland beyond; and
- Residential dwellings along Arborfield Court and woodland to the west of the Site.

Vehicular access to the Site will be via Eversley Road.

1.1 Scope of Assessment

Pre-assessment consultation was undertaken with the EPO at WBC to agree upon the scope and methodology of the AQA¹. The initial scope of the assessment is based on national and local guidance, established best practice and the AQA submitted in support of the previous planning application (application reference: 230532) as agreed with the EPO at the time. As such, the following scope of works, as agreed with the EPO at WBC, has been undertaken:

- Baseline Evaluation – Assessment of existing air quality in the local area;
- Construction Phase Assessment – Identification and assessment of potential air quality impacts associated with the construction phase of the Proposed Development;
- Operational Phase Assessment – Identification and assessment of potential air quality impacts associated with the operational phase of the Proposed Development at existing human and ecological receptors as well as a site suitability assessment to

¹ Email between SLR and the EPO at WBC, dated 17th September and 2nd October 2024.



determine whether future occupants of the Proposed Development will be introduced to an area of poor air quality; and

- Mitigation Measures – Identification of mitigation measures, as appropriate, based on the outcome of the construction and operational phase assessments.

The energy strategy associated with the Proposed Development will incorporate an all-electric approach consisting of air-source heat pumps (ASHP), in compliance with Approved Document Part L: Conservation of Fuel and Power of the Building Regulations². Reference should be made to the submitted energy strategy for further information. As such, an assessment of potential air quality impacts associated with on-site energy systems during the operational phase of the Proposed Development has been scoped out.

² UK Government, Conservation of Fuel and Power: Approved Document L: Available at: <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l>.



2.0 Background Context

2.1 Legislation

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

2.1.1 National Obligations

2.1.1.1 Air Quality Standards

The Air Quality Standards Regulations 2010³ (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation, in order to align and mirror European obligations. The AQSR includes Limit Values which are legally binding ambient concentration thresholds which, however, are only applicable at specific locations (Schedule 1: AQSR)⁴. Carriageways or central reservations of roads, and any location where the public do not have access (e.g. industrial sites), are exempt. On this basis, if a sampling point does not comply with the siting locations, then strict comparison to the AQSR Limit Values cannot be made.

Following the UK's withdrawal from the EU, The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁵ was introduced to mirror revisions to supporting EU legislation. As a result, the fine particulate matter (as PM_{2.5}) Limit Value is 20µg/m³ (to be met by 2020).

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

2.1.1.2 Environment Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023⁶ introduced an annual mean concentration target of 10µg/m³ to be met across England by 2040. Central Government and Devolved Administrations are responsible for meeting this target, however not until 2040. Local Authorities have no responsibility to achieve this target.

2.1.2 Local Obligations

Part IV of the Environment Act 1995 (as amended by the Environment Act 2021) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify the AQS if required. It also established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within its area.

The Air Quality (England) Regulations 2000 (as amended) ('the Regulations') provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in

³ The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

⁴ Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

⁵ The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313, The Stationary Office Limited.

⁶ The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. UK Statutory Instruments 2023 No. 96.



England. PM_{2.5} is not currently cited within the Regulations; Local Authorities are however required to work towards reducing PM_{2.5}.

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

The latest AQS for England was published in 2023⁷. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table A. These are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving – reflective of the Local Planning Authority's duties. The PM_{2.5} AQSR AQAL has, however, also been included for completeness.

Table A: Relevant Ambient AQALs

Pollutant	AQAL (µg/m ³)	Averaging Period
Nitrogen dioxide (NO ₂)	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (as PM ₁₀)	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles (as PM _{2.5})	20	Annual mean
Table Note: The PM _{2.5} AQAL is not prescribed within the Air Quality (England) Regulations 2000/2002 and there is no requirement for local authorities to meet it. Exceedences are only valid at the AQSR specific siting locations (Schedule 1: AQSR).		

Table B: Human Health Relevant Exposure

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

⁷ Defra, Air Quality Strategy: Framework for Local Authority Delivery, (2023).



AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990⁸ sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as, ‘any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance’.

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

Fractions of dust greater than 10µm (i.e. greater than PM₁₀) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.1.4 Ecological Habitats

Ecological habitats vary in terms of their sensitivity, perceived ecological value, geographic importance, and level of protection. Within the UK, there are three types of nature conservation designations: international, national and local designations, which are all provided environmental protection from developments, including from atmospheric emissions, with a greater level of protection afforded to the former, relative to the latter.

The Conservation of Habitats and Species Regulations 2017 (the ‘Habitats Regulations’)⁹ introduces the precautionary principle for protected European sites, i.e. that projects can only be permitted to proceed; having ascertained that there will be no adverse effect on the integrity of the designated site. European sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA). These regulations were subsequently amended in 2019 to make them operable from 1 January 2021 despite the UK’s withdrawal from the EU¹⁰.

Other sites of international significance are Ramsar sites, which are wetlands protected under the 1971 Ramsar Convention¹¹. Many of these sites in the UK were initially selected on the basis of their importance to waterbirds and are therefore also classified as SPAs.

The Wildlife and Countryside Act 1981 (as amended, primarily by The Countryside and Rights of Way (CROW) Act 2000¹²) provides protection to Sites of Special Scientific Interest (SSSI) to ensure that developments are not likely to cause damage. The Act also provides protection to local nature conservation sites, which can be particularly important in providing ‘buffers’ to SSSIs and European sites.

⁸ UK Government, The Environmental Protection Act 1990, (1990). Available at: <http://www.legislation.gov.uk/ukpga/1990/43/contents>.

⁹ UK Government, Statutory Instrument No. 490, The Conservation of Habitats and Species Regulations, (2017).

¹⁰ UK Government, The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations, (2019).

¹¹ Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, (1971).

¹² UK Government, Wildlife and Countryside Act, (1981).



The Environment Act 1995 and the Natural Environment and Rural Communities Act (NERC) 2006¹³ provides an extension to the biodiversity duty set out in the CRoW Act to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity (i.e. ecological designations of local status).

Sites of ecological importance are provided environmental protection with respect to air quality, through the application of standards known as Critical Levels (CLE) and Critical Loads (CLO). The level of protection afforded to an internationally designated site is greater than that afforded to a Local Nature Reserve (LNR) or Ancient Woodland (AW), for example; reflecting the relative sensitivity of the sites as well as their perceived ecological value.

2.2 Policy

2.2.1 National Policy

2.2.1.1 Clean Air Strategy

The 2019 Clean Air Strategy¹⁴ sets out the Government's proposals aimed at delivering cleaner air in England and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.2.1.2 Environmental Improvement Plan 2023

The 2023 Environmental Improvement Plan¹⁵ is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environmental Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution. Goal 2 of the 25YEP is Clean Air – which relates to improving air quality.

2.2.1.3 National Planning Policy Framework

The December 2023 update to the National Planning Policy Framework¹⁶ (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

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

"Chapter 15 - Conserving and Enhancing the Natural Environment

Ground Conditions and Pollution

Para 192: Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, considering 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

¹³ UK Government, Natural Environment and Rural Communities Act, (2006).

¹⁴ Defra, The Clean Air Strategy, (2019).

¹⁵ Defra, Environmental Improvement Plan 2023, (2023).

¹⁶ Ministry of Housing, Communities & Local Government, National Planning Policy Framework, (2023).



possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.”

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG)¹⁷ which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regard to air quality, the PPG states:

“The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant limit values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.”

“Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species).”

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

2.2.2 Local Policy

2.2.2.1 Wokingham Adopted Core Strategy

The Wokingham Borough Local Plan is made up of two documents: the Adopted Core Strategy Development Plan Document (DPD)¹⁸ adopted in January 2010 and the Adopted Managing Development Delivery (MDD)¹⁹ adopted in February 2014. Together, these two documents set out how the Borough will develop up until 2026.

Within the Adopted Core Strategy DPD, the following policies relate to air quality:

“Policy CP1: Sustainable Development

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;*
- 2) Minimise the emission of pollutants into the wider environment; [...]*
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers; [...]*

¹⁷ Ministry of Housing, Communities and Local Government, Planning Practice Guidance Air Quality, (2019).

¹⁸ WBC, Adopted Core Strategy Development Plan Document, (2010).

¹⁹ WBC, Adopted Managing Development Delivery Local Plan, (2014).



“Policy CP3: General Principles for Development

Planning permission will be granted for proposals that:

- c) Have no detrimental impact upon important ecological, heritage, landscape (including river valleys) or geological features or water courses;*
- d) Maintain or enhance the ability of the site to support fauna and flora including protected species; [...].”*

The Adopted MDD does not have any policies relating to air quality.

WBC is in the process of preparing a new Local Plan which will put in place a new planning strategy for the period to 2040. Once adopted, it will replace the current Core Strategy DPD and MDD. However, until the time that the new Local Plan is adopted, the current Adopted Local Plan documents remains in place.

2.3 Assessment Guidance

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

- Department for Environment Food and Rural Affairs (Defra): Local Air Quality Management Technical Guidance (LAQM.TG(22))²⁰;
- Defra: COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021²¹;
- Environmental Policy Implementation Community (EPIC) (previously Environmental Protection UK (EPUK)) and the Institute of Air Quality Management (IAQM): Land-Use Planning and Development Control: Planning for Air Quality²² (the ‘EPIC & IAQM’ guidance);
- Highways England: Design Manual for Roads and Bridges, LA105 - Air Quality²³ (the ‘DMRB LA 105’ guidance);
- IAQM: Guidance on the Assessment of Dust from Demolition and Construction²⁴ (the ‘IAQM Dust’ guidance);
- IAQM: A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites²⁵ (the ‘IAQM Nature’ guidance); and
- IAQM: Use of 2020 and 2021 Monitoring Datasets²⁶.

²⁰ Local Air Quality Management Technical Guidance (22), Published by Defra in partnership with the Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs, (2022).

²¹ Defra and the Greater London Authority, COVID-19: Supplementary Guidance Local Air Quality Management Reporting in 2021, (2021).

²² EPIC (previously EPUK) and IAQM, Land-Use Planning and Development Control: Planning for Air Quality v1.2, (2017).

²³ Highways England, DMRB, LA 105 – Air Quality, (2019).

²⁴ IAQM, Guidance on the Assessment of Dust from Demolition and Construction v2.2, (2024).

²⁵ IAQM, A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v1.1, (2020).

²⁶ IAQM, Use of 2020 and 2021 Monitoring Datasets v1.1, (2023).



3.0 Assessment Methodology

3.1 Construction Phase

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

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

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

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM₁₀; and
- Harm to ecological receptors.

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

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

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

Given the short-term nature of the construction phase and the low volume of vehicle movements that will likely arise (when compared to the operational phase, for which a screening assessment has been undertaken), it is unlikely that significant air quality effects from development related road traffic emissions during the construction phase will arise. Such potential impacts have therefore been scoped out from requiring detailed assessment and effects on air quality are considered to be 'insignificant' in accordance with the applied EPIC & IAQM guidance.

3.2 Operational Phase

3.2.1 Road Traffic Screening Assessment

3.2.1.1 Human Health Impacts

The assessment of air quality effects in relation to development-generated traffic during the operational phase has been undertaken in accordance with EPIC & IAQM guidance.

The EPIC & IAQM guidance provides a series of indicative screening criteria where, if exceeded, further consideration to determine the potential effect on air quality is required. If the Proposed Development is found not to exceed any of the relevant indicative criteria



presented, then a detailed impact assessment is consequently not required. Impacts can therefore be described as having an 'insignificant' effect on local air quality.

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

- A change of Light-Duty Vehicle (LDV) flows of more than 500 as a 24-hour Annual Average Daily Traffic (AADT) outside of an AQMA, and/or more than 100 as a 24-hour AADT inside of or within 200m of an AQMA; and/or
- A change of Heavy-Duty Vehicle (HDV) flows of more than 100 as a 24-hour AADT outside of an AQMA, and/or more than 25 as a 24-hour AADT inside or within 200m of an AQMA.

3.2.1.2 Ecological Receptors

The assessment procedure outlined within the IAQM Nature guidance document has been used in relation to the assessment of sensitive ecological receptors. This initially comprises a screening assessment irrespective of current baseline rates to indicate whether:

- Any sensitive qualifying features are located within 200m of a road link projected to experience developmental-generated vehicle movements; and
- The Proposed Development ('*in-isolation*' for non-European sites and '*in-combination*' with other development for European sites) is likely to generate either >1,000 AADT (total traffic) on a road link and/or >200 HDVs.

The outcomes of the above will determine whether impacts associated with the Proposed Development could result in a 'likely significant effect' on the assessed ecological feature, providing the location of the screened ecological receptor can be validated. If the above conditions are not met, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects can be classed as 'insignificant'. It should be acknowledged, however, that an exceedence of the criteria above does not, of itself, imply damage to a habitat, but rather further assessment and input from an ecologist is required to identify any potential adverse effects.

The JNCC *Guidance on Decision-making Thresholds for Air Pollution* is the accompanying main guidance document to the Technical Report²⁷, which provides an '*assessment in advance*' to determine relevant '*Decision Making Thresholds*' (DMT) (i.e. *de-minimis* values). The DMT applies to '*project-alone*' traffic flows adjacent to European sites, which if not exceeded provides reasonable confidence that the cumulative effects of proposals will not undermine relevant conservation objectives without needing to also assess impacts in-combination with other projects and plans, in accordance with the Habitats Directive.

In terms of road traffic, the DMT is calculated by comparing the increase in traffic flow (resultant of the Proposed Development) against 0.15% of the baseline AADT in the year that the assessment is carried out. If project-alone flows are below this value, it can be concluded that in-combination flows would not undermine relevant conservation objectives and can therefore be considered 'insignificant'.

²⁷ Air Quality Consultants Ltd. 2021. Decision-Making Thresholds for Air Pollution. JNCC Report No. 696 (Technical Report), JNCC, Peterborough, ISSN 0963-8091.



3.2.2 Site Suitability Assessment

3.2.2.1 Road Traffic Emissions Assessment

In order to appropriately assess road traffic impacts associated with the operation of the Proposed Development, detailed dispersion modelling has been undertaken using the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5 dispersion model, focussing on concentrations of NO₂, PM₁₀ and PM_{2.5} for the following scenario:

- 2028 Do Something (2028 DS) – Base flows, including flows associated with committed developments, plus all flows associated with the Proposed Development for the earliest proposed year of opening (2028).

For the above scenario, concurrent emission factors and background pollutant concentrations have been used (2028).

It is widely known that the construction of residential development of this magnitude is undertaken in a phased manner (i.e. units per annum, built to demand). To ensure potential air quality impacts associated with the phased manner of the construction of the Proposed Development are understood, 2028 has been adopted as the full development opening year for the purposes of dispersion modelling (i.e. the earliest date of potential occupation). Use of 2028 as the proposed completion year assumes that the maximum number of operational vehicle trips generated by the Proposed Development will occur upon completion of the first phase (which is theoretically not possible). This approach is believed to be conservative, given the forecast reductions in vehicle emission factors and background pollutant concentrations, generating a greater resultant concentration relative to what may occur in reality. In addition, this also assumes that the Proposed Development will be fully occupied by 2028, and therefore brings forward the date of likely exposure for new residents.

Details of model inputs are discussed in turn, below.

3.2.2.2 Traffic Inputs

Traffic data was provided by SLR Transport and Mobility Planning – the appointed Transport Consultant to the Applicant.

Traffic speeds were modelled at the relevant speed limit for each road. However, where appropriate, the speeds have been reduced to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue, in accordance with LAQM.TG(22). Traffic speeds have been assumed to be consistent across all the modelled scenarios.

The Emissions Factors Toolkit (EFT) version 12.1 developed by Defra²⁸ has been used to determine vehicle emission factors for input into the ADMS-Roads dispersion model.

Gradient adjustment of vehicle emissions has been undertaken using v12.1 of the EFT, which incorporates the latest COPERT emission factors (v5.6).

To inform the spatial extent of the model, road links up to 200m of modelled receptors were included within the dispersion model to facilitate a robust assessment, rather than rely on their individual contributions being represented within the appropriate background datasets.

Details of the traffic flows used in this assessment are provided in Appendix A, whilst the modelled roads in relation to the Site are illustrated in Figure B.

²⁸ Defra, EFT v12.1 (2024). Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>.



3.2.2.3 Meteorological Data

To calculate pollutant concentrations at identified sensitive receptor locations the dispersion model uses sequential hourly meteorological data, including wind direction, wind speed, temperature, cloud cover and stability, which exert significant influence over atmospheric dispersion.

The dispersion modelling has been undertaken using 2023 data from the Farnborough Airport meteorological station. The station is located approximately 15.3km southeast of the Site. It is also the closest and most relevant meteorological station that records all of the parameters necessary for dispersion modelling

LAQM.TG(22) recommends that meteorological data should have a percentage of usable hours greater than 85%. The Farnborough Airport meteorological data includes 8,760 lines of usable hourly data for the year, i.e. 100% usable data and is, therefore, suitable for the dispersion modelling exercise.

A surface roughness value of 0.3m was used to represent the dispersion Site, whereas a surface roughness value of 0.02m was used to represent the meteorological station.

A wind rose for the Farnborough Airport meteorological data is presented in Figure A.



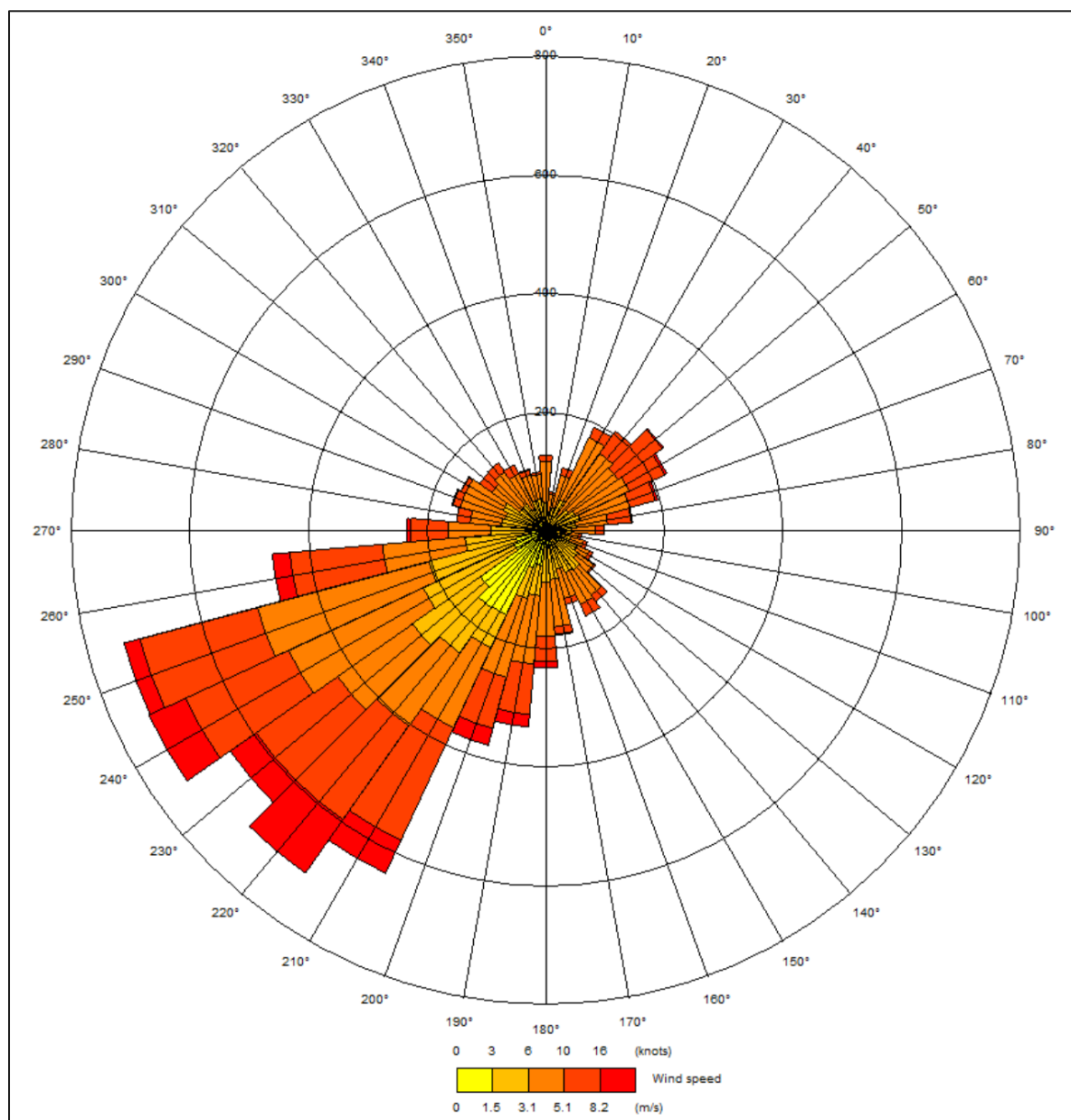


Figure A: Wind Rose for Farnborough Airport Meteorological Data (2023)

3.2.2.4 Background Concentrations

In the absence of available locally representative background monitoring sites, annual mean background concentrations used for the purposes of the assessment have been obtained from the Defra supplied background maps (2018 reference year)²⁹, based on the 1km² grid squares which cover the modelled area. Further detail on these datasets can be found in Section 4.1.3.

No adjustment for background concentration variability with height has been made.

²⁹ Defra Background Maps (2018-Reference). Available at: <http://uk-air.defra.gov.uk/data/laqm-background-home/>.



3.2.2.5 Sensitive Receptors

Human receptors considered in the assessment of emissions from road traffic are shown in Table C, whilst their locations are illustrated in Figure B.

New receptors introduced as a result of the Proposed Development, P1-P5, are selected as the locations of worst-case exposure across the Site, based upon residential parcels indicated on the Illustrative Masterplan³⁰. Receptors SB1-SB7 represent the Site boundary locations where absolute concentrations and road traffic emission contributions are likely to be greatest given their proximity and setting relative to the surrounding road network, presented for informational purposes and assessment of short-term concentrations only (i.e. 1-hour mean NO₂ and 24-hour mean PM₁₀).

All receptors were considered in relation to exposure at breathing height relative to the adjacent modelled road, at ground level, i.e. 1.5m height. Receptor locations represent exposure to the relevant AQALs – in accordance with LAQM.TG(22) presented in Table C.

Table C: Proposed Receptor Locations Considered

Receptor	NGR X (m)	NGR Y (m)	Height (m)
P1	476342	166190	1.5
P2	476340	166101	1.5
P3	476290	166011	1.5
P4	476214	166012	1.5
P5	476142	166073	1.5
SB1	476266	166615	1.5
SB2	476310	166513	1.5
SB3	476341	166414	1.5
SB4	476387	166191	1.5
SB5	476261	165980	1.5
SB6	476147	166045	1.5
SB7	475892	166250	1.5

3.2.2.6 Model Outputs

The background pollutant values discussed in Section 4.1.3 have been used in conjunction with the concentrations predicted by the ADMS-Roads model to calculate predicted total annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} for each respective scenario.

For the prediction of annual mean NO₂ concentrations at receptor locations, the road-NO_x contributions (not adjusted, see below) have been converted to road-NO₂ contributions following the methodology in LAQM.TG(22), using the latest version of Defra's NO_x to NO₂ conversion tool (v8.1)³¹. The traffic mix within the calculator was set to "all other urban UK traffic" and "Wokingham" was selected as the local authority. The modelled NO₂ road contribution was then added to the appropriate NO₂ background concentration value to obtain an overall total annual mean NO₂ concentration.

³⁰ Mosaic Urban Design & Masterplanning, Illustrative Masterplan Drawing Number: 003-V21, (2024).

³¹ Defra, NO_x to NO₂ Calculator v8.1 (2020). Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/>.



For the prediction of short-term NO₂ impacts, LAQM.TG(22) advises that it is valid to assume that exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur where the annual mean NO₂ concentration is <60µg/m³. This approach has thus been adopted for the purposes of this assessment, at relevant receptor locations with an applicable exposure period.

For the prediction of short-term PM₁₀, LAQM.TG(22) provides an empirical relationship between the annual mean and the number of exceedences of the 24-hour mean AQAL for PM₁₀ that can be calculated as follows:

$$\text{No. 24-hour mean exceedences} = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$$

This relationship has thus been adopted to determine whether exceedences of the short-term PM₁₀ AQAL are likely in this assessment.

Verification of the ADMS-Roads assessment has not been undertaken on the basis that there are no suitable verification locations in proximity to the Site. As such, all modelled results presented in the assessment are calculated with no adjustment factor (i.e. an adjustment factor of 1) for NO₂, PM₁₀ and PM_{2.5}. This methodology follows the AQA submitted in support of the previous planning application (see Paragraph 1.0), as agreed with the EPO at WBC¹ at the time of the previous assessment.

3.2.2.7 Assessing Significance

Modelled pollutant concentrations predicted at future receptors have been compared with the relevant AQALs to determine the suitability of the Site for residential use.

As per the EPIC & IAQM guidance, *“where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means”*.

3.2.2.8 Uncertainty

Dispersion modelling is inherently uncertain and is principally reliant on the accuracy and representativity of its inputs.

In addition, there is a widely acknowledged disparity between emission factors and ambient monitoring data³². To help minimise any associated uncertainty when forming conclusions from the results, this assessment has utilised the latest EFT version 12.1 utilising COPERT 5.6 emission factors, and associated tools/datasets published by Defra.

The IAQM published a Position Statement on *‘Dealing with Uncertainty in Vehicle NO_x Emissions Within Air Quality Assessments’* in July 2018³³ within which it was suggested to include a sensitivity test to account for predicted large reductions in NO_x emissions that were not borne out in measured roadside concentrations. However, the latest iterations of the EFT (from version 9 onwards), reflect the real-world NO_x emissions more accurately. As such, the IAQM has withdrawn its position statement saying as such and including:

“It is judged that an exclusively vehicle emissions-based sensitivity test is no longer necessary.

On this basis, the EFT may be used for future year modelling with greater confidence when considering the per vehicle emission, provided that the assessment is verified against measurements made in the year 2016 or later.”

³² Carslaw, et al, Trends in NO_x and NO₂ emissions and ambient measurements in the UK, (2011).

³³ IAQM, Dealing with Uncertainty in Vehicle NO_x Emissions Within Air Quality Assessments, (2018).



Furthermore, as discussed in Section 3.2, the dispersion modelling assessment has utilised 2028 as the full Proposed Development opening year, however in reality only the first phase is expected to be complete at this stage.

On the basis of the above, the application of further sensitivity modelling is not considered relevant or appropriate (i.e. too pessimistic).



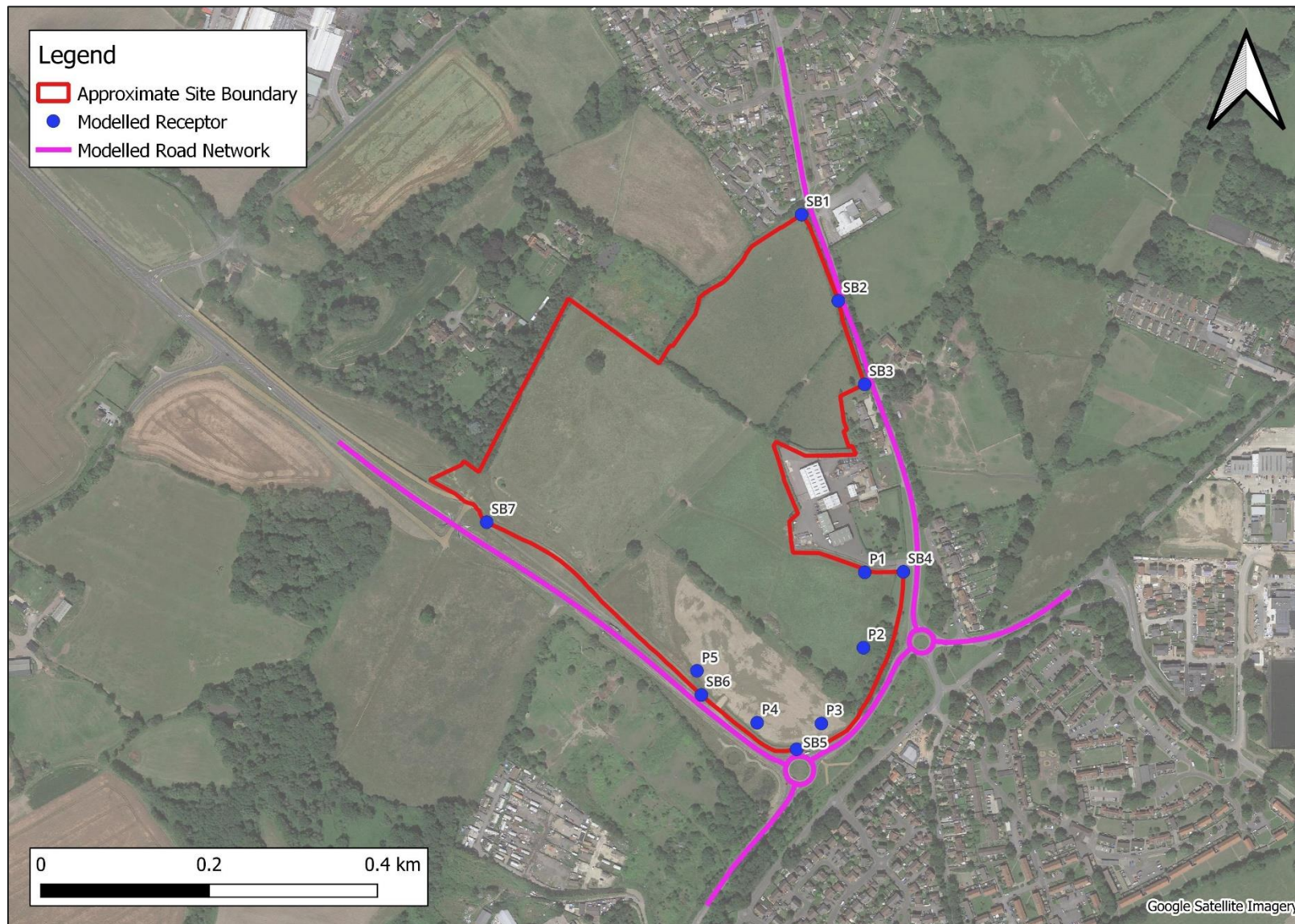


Figure B: Modelled Road Links and Receptors



4.0 Baseline Environment

4.1 Baseline Air Quality

Monitoring data collected during the COVID-19 pandemic (i.e. 2020 and 2021) has not been used to characterise the baseline environment, as pollutant concentrations monitored during 2020 and 2021 are expected to be atypical and not representative of the local environment, and have therefore not been considered as per guidance produced by Defra²¹ and the IAQM²⁶. Further, the IAQM Position Statement states *“the “new-normal” pattern of activity and hence emissions appear to be stabilising. Therefore, ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline”*, thus supporting the use of 2022 data and beyond as appropriate baseline years for the assessment.

4.1.1 LAQM Review and Assessment

WBC, in fulfilment of statutory LAQM requirements, has conducted an on-going exercise to review and assess air quality within its administrative area. The latest available Annual Status Report (ASR) for WBC (not impacted by the COVID-19 pandemic) at the time of writing is the 2024 ASR³⁴. The monitoring data published therein have, therefore, been used for the purpose of informing this assessment.

At present, WBC has declared three AQMAs across their administrative area. All three AQMAs are situated within 10km of the Site, with the closest being located approximately 3.5km to the northwest of the Site (i.e. M4 AQMA, an area encompassing properties along the M4 Motorway, and along part of the A329 where it passes under the M4). All three AQMAs are declared for exceedences of the annual mean NO₂ AQAL, with the M4 AQMA also declared for exceedences of the 1-hour mean NO₂ AQAL.

4.1.2 Review of Air Quality Monitoring

4.1.2.1 Automatic Air Quality Monitoring

Automatic air quality monitoring is currently undertaken by WBC at 1no. location within their administrative area. Monitor CM2 is of ‘roadside’³⁵ monitoring classification, located approximately 5.5km northeast of the Site and located within the Wokingham Town Centre AQMA. Given the separation distance between this monitor and the Site, pollutant concentrations are not anticipated to be representative, and no further consideration has been given to this monitor within this assessment.

No monitors associated with the Automatic Urban and Rural Network (AURN) are located in the vicinity of the Site.

4.1.2.2 Passive Diffusion Tube Monitoring

Passive NO₂ diffusion tube monitoring is currently undertaken by WBC at numerous locations within their administrative area. However, as with the automatic monitors noted above, none of the diffusion tube monitors are situated within Arborfield and the closest monitor is located approximately 4.2km to the east of the Site. Given the separation distance between the WBC monitors and the Site, pollutant concentrations are not anticipated to be

³⁴ WBC, 2024 Air Quality Annual Status Report, (2024).

³⁵ ‘Roadside’ sites are defined by LAQM.TG(22) as: “A site sampling typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases).”



representative, and no further consideration has been given to these monitors within this assessment.

4.1.3 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km² grid square resolution which is routinely used to support LAQM requirements and AQAs. The data sets include annual average concentration estimates for NO_x, NO₂, PM₁₀ and PM_{2.5} using a base year of 2018 (the year in which comparisons between modelled and monitored concentrations are made).

The Defra mapped background concentrations for the base year (2023) and the earliest predicted opening year of the development (2028) are presented in Table D for the grid squares containing the Site. All of the mapped background concentrations presented are 'well-below' the respective annual mean AQALs.

Table D: Defra Mapped Background Pollutant Concentrations

Grid Square (X, Y) (m)	Year	Annual Mean Concentration (µg/m ³)			
		NO _x	NO ₂	PM ₁₀	PM _{2.5}
476500, 166500	2023	12.4	9.5	13.0	8.8
	2028	10.7	8.2	12.7	8.5
476500, 165500	2023	12.4	9.4	13.2	8.9
	2028	10.7	8.2	12.8	8.6
475500, 166500	2023	12.2	9.3	13.2	8.8
	2028	10.6	8.2	12.9	8.5
AQAL		-	40	40	20

4.2 Ecological Receptors

A review of designated ecological sites in proximity to the Site and within 200m of roads that could witness an increase in traffic flows generated by the Proposed Development has been undertaken.

The Thames Basin Heath SPA, at its closest point, is located approximately 3km to the south of the Site. Based on the available road traffic data, as informed by SLR Transport and Mobility Planning, small sections of the SPA are located within 200m of roads where operational phase trip generation could occur.

Furthermore, Longmoor Bog SSSI, Bramshill SSSI, Castle Bottom to Yateley and Hawley Commons SSSI, Longmoor Bog LNR, and various Ancient Woodland are also located within 200m of roads where operational phase trip generation could occur.

As such, a screening assessment against the criteria outlined by the IAQM Nature guidance has been completed (Section 6.1.2).



5.0 Construction Phase Assessment

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

5.1 Construction Dust Assessment

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

5.1.1 Assessment Screening

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

5.1.2 Potential Dust Emissions Magnitude

5.1.2.1 Demolition

The Site currently comprises vacant land with no buildings / structures that require demolition. As such, consideration of impacts associated with demolition activities have been scoped out of the assessment.

5.1.2.2 Earthworks

The total Site area associated with the Proposed Development which require earthworks is estimated to be between 18,000m²-110,000m². It is also estimated that between 5-10 heavy earth-moving vehicles could be active at any one time. As such, the dust emission magnitude for earthworks is therefore considered to be 'medium'.

5.1.2.3 Construction

The total building volume associated with the Proposed Development is estimated to be between 12,000m³-75,000m³. As such, the dust emission magnitude for construction is therefore considered to be 'medium'.

5.1.2.4 Trackout

Construction vehicles are anticipated to access the Site via Eversley Road. No details are available at the time of assessment regarding the number of HDV movements associated with construction works. However, the peak number of predicted outward HDV movements is estimated to be between 20-50 per day. In addition, any unpaved road length is unlikely to be greater than 100m at any one time. As such, the dust emission magnitude for trackout is therefore considered to be 'medium'.

5.1.2.5 Summary

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



Table E: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.3 Sensitivity of the Area

5.1.3.1 Dust Soiling Impacts

There are estimated to be between 10-100 residential (high sensitivity) receptors within 20m of the Site and between 1-10 residential receptors within 20m of the Site access route(s) up to 250m from the Site entrance (assuming that vehicles travel south, along Eversley Road (B3030) when leaving the Site from the main access, towards the A327). This estimation includes the residential dwellings introduced through the phased build out of the Proposed Development which may not be occupied during the construction of the Proposed Development but have been included as part of a robust assessment.

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

5.1.3.2 Human Health Impacts

The maximum 2023 annual mean background PM₁₀ concentration for the 1km² grid squares which cover the Site is estimated to be 13.2µg/m³, based upon mapped background estimates (i.e. falls into the <24µg/m³ class).

Given the above information regarding the number of sensitive receptors within 20m of the Site boundary and within 20m of the identified trackout routes, the sensitivity of the area (including consideration of residential dwellings introduced through the phased build out of the development) with respect to human health impacts is considered to be 'low' in relation to earthworks, construction and trackout.

5.1.3.3 Summary

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

Table F: Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	Medium
Human Health	Low	Low	Low

5.1.4 Risk of Impacts (Unmitigated)

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



Table G: Risk of Dust Impacts (Unmitigated)

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk

5.1.5 Mitigation

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

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



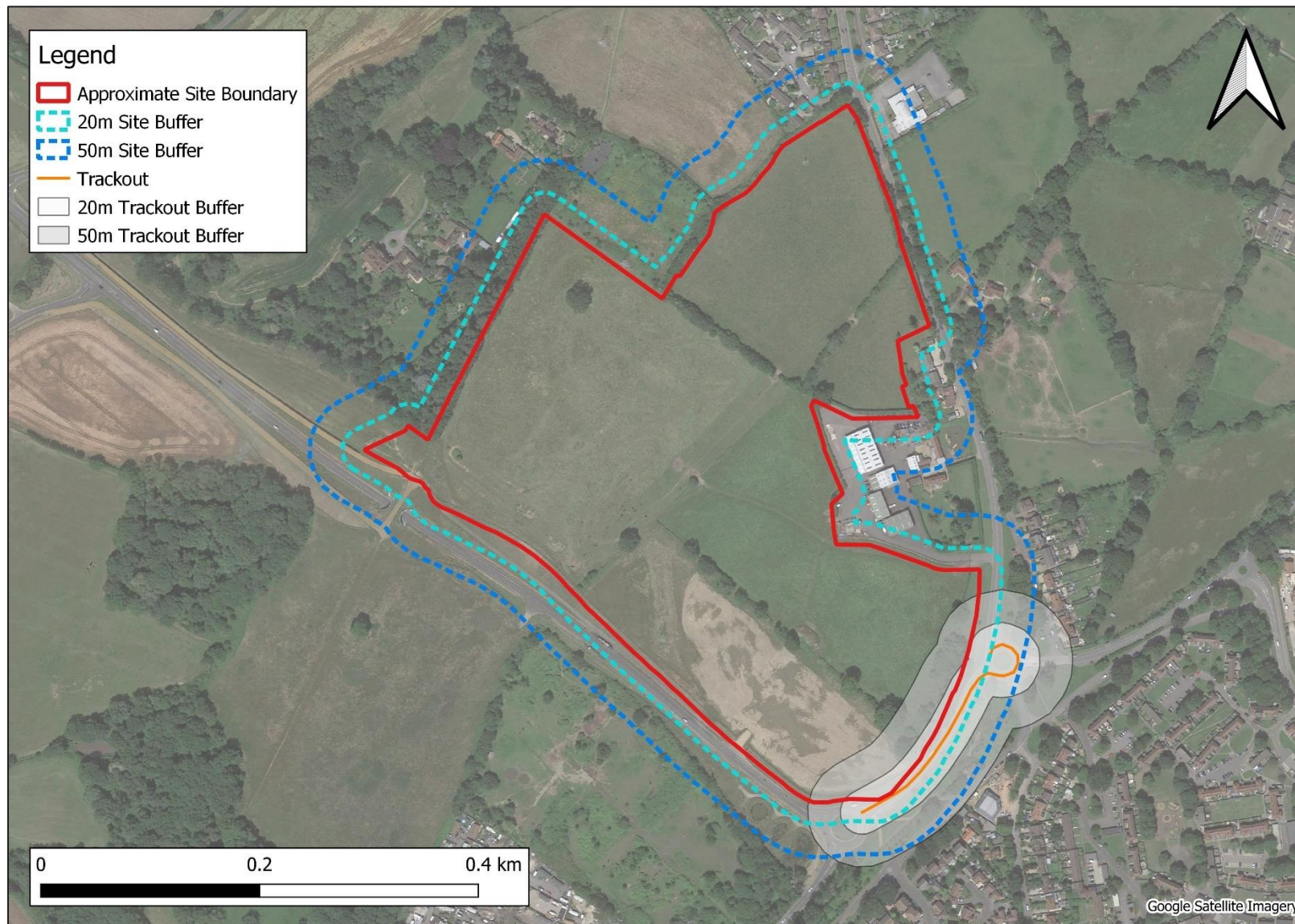


Figure C: Construction Dust Assessment Buffers



6.0 Operational Phase Assessment

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

6.1 Road Traffic Screening Assessment

6.1.1 Human Receptors

SLR Transport and Mobility Planning, the appointed Transport Consultant, has provided operational phase traffic flows for the Proposed Development. It is understood that the Proposed Development will generate a maximum of 287 AADT on any one road link.

Given the use-class of the Proposed Development (i.e. C3, residential), HDV trips are considered to be minimal and, therefore, all trips are anticipated to be LDVs, as confirmed by the Transport Consultant.

Based on the above, operational phase trips generated by the Proposed Development are found to be below the relevant EPIC & IAQM screening criteria outside an AQMA (see Section 3.2.1.1) and, as such, a more detailed assessment is not considered to be required.

It should be noted that the Proposed Development will generate 158 AADT on Shenfield Eastern Relief Road (A327) and 142 AADT on Mill Lane; both of which cross over and under the M4, respectively. The entire stretch of the M4 located within WBC is designated as an AQMA (the 'M4 AQMA') for exceedences of the annual mean and 1-hour mean NO₂ AQALs and is defined as "*An area encompassing properties along the M4 Motorway, and along part of the A329 where it passes under the M4*". However, since the operational phase trips are not predicted to travel on either the M4 or the A329 directly, the more stringent screening criteria for within an AQMA (see Section 3.2.1.1) does not apply. Further, operational phase trips travelling directly on the M4 and A329 are predicted to be below the more stringent screening criteria for within an AQMA (see Section 3.2.1.1).

Overall, road traffic impacts associated with the operation of the Proposed Development can be considered as having an 'insignificant' effect on local air quality with regards to human receptors.

6.1.2 Ecological Receptors

As discussed in Section 4.2, there are several European and non-European designated ecological sites located within 200m of roads where operational phase trip generation could occur, based on the available road traffic data.

In-isolation (i.e. project alone) operational trips generated by the Proposed Development are found to be below the relevant IAQM Nature guidance screening criteria (for non-European sites, i.e. SSSIs, LNRs and AWs; see Section 3.2.1.2). As such, a more detailed assessment for non-European sites is not required and road traffic impacts associated with the operation of the Proposed Development will result in 'no likely significant effect' on non-European sites.

However, operational trips generated by the Proposed Development 'in-combination' are found to be above the relevant IAQM screening criteria (for European sites; see Section 3.2.1.2) in relation to the Thames Basin Heaths SPA. The A327 (south of Bramshill Road) is expected to witness a total of 1,248 AADT when considering the Proposed Development flows 'in-combination' with other committed developments and projects/plans. It is noted the Proposed Development contributes 59 of the 1,248 AADT on this road link. Note, operational trips generated by the Proposed Development 'in-combination' are found to be below the



relevant IAQM screening criteria in relation to the Thames Basin Heaths SPA on the A30 east and west of the A327.

Further, with reference to Section 3.2.1.2, a *de-minimis* threshold (DMT) of 0.15% the existing baseline traffic flow has been established by the JNCC for decision making purposes. If the 'project alone' road traffic contribution is below the stated DMT, then further cumulative assessment (i.e. 'in-combination') is not necessary. Table H below provides details of the DMT calculation and comparison against the developmental traffic.

Table H: DMT Calculations

Existing 2028 Baseline Traffic (Total AADT) ^(A)	DMT (0.15% of Baseline Traffic)	Developmental Generated Traffic (Total AADT)
15,064	23 ^(B)	59
Table Notes: ^(A) As provided by SLR Transport and Mobility Planning, the appointed Transport Consultant. ^(B) Rounded up to the nearest whole number.		

Table H shows that the DMT value for the sections of the A327 within 200m of the Thames Basin Heaths SPA designation is 23 AADT, whereas the Proposed Development is anticipated to generate 59 AADT along this link. As such, further assessment is necessary in accordance with the JNCC guidance.

On the basis of the above, further assessment has been carried out to consider the potential for adverse effects. Reference should be made to the submitted Habitat Risk Assessment (HRA) for further information.

6.2 Site Suitability Assessment

6.2.1 NO₂ Modelling Results

Table I presents the annual mean NO₂ concentrations predicted at all assessed receptor locations for the 2028 DS scenario.

Table I: Predicted Annual Mean NO₂ Concentrations – 2028 DS Scenario

Receptor	Predicted Annual Mean NO ₂ Concentration (µg/m ³)	% Relative to AQAL
P1	9.7	24.3
P2	10.7	26.8
P3	13.3	33.3
P4	12.5	31.3
P5	11.4	28.5
SB1	9.6	24.0
SB2	10.5	26.3
SB3	10.1	25.3
SB4	10.9	27.3



Receptor	Predicted Annual Mean NO ₂ Concentration (µg/m ³)	% Relative to AQAL
SB5	18.4	46.0
SB6	13.7	34.3
SB7	11.4	28.5

The maximum predicted annual mean NO₂ concentration (2028 DS) at all receptors newly introduced by the Proposed Development was at Receptor P3 with a predicted annual mean NO₂ concentration of 13.3µg/m³, representing 33.3% of the AQAL (i.e. 'well-below'). As such, the Site is considered to be suitable for the proposed use and unmitigated effects from air quality would be considered 'not significant'.

Furthermore, the maximum predicted annual mean NO₂ concentration (2028 DS) at the Site boundary locations was at Receptor SB5 with a predicted annual mean NO₂ concentration of 18.4µg/m³, representing 46% of the AQAL (i.e. 'well-below'). On the basis that the Site boundary locations represent the maximum predicted annual mean NO₂ concentrations at the Site, should changes to the current outline development proposals bring residential dwellings closer to the road, NO₂ concentrations at such locations will remain well-below the AQAL.

It is unlikely that an exceedence of the 1-hour mean NO₂ AQAL will occur in reference to the empirical relationship given in LAQM.TG(22) and predicted maximum absolute annual mean NO₂ concentrations across the study area. Effects associated with likely 1-hour mean NO₂ concentrations at all assessed receptor locations are therefore considered to be 'not significant'.

6.2.2 PM₁₀ Modelling Results

Table J presents the annual mean PM₁₀ concentrations predicted at all assessed receptor locations for the 2028 DS scenario.

Table J: Predicted Annual Mean PM₁₀ Concentrations – 2028 DS Scenario

Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)	% Relative to AQAL
P1	13.3	33.3
P2	13.7	34.3
P3	14.9	37.3
P4	14.3	35.8
P5	13.8	34.5
SB1	13.3	33.3
SB2	13.7	34.3
SB3	13.5	33.8



Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)	% Relative to AQAL
SB4	13.8	34.5
SB5	17.7	44.3
SB6	14.6	36.5
SB7	14.0	35.0

The maximum predicted annual mean PM₁₀ concentration (2028 DS) at all receptors newly introduced by the Proposed Development was at Receptor P3 with a predicted annual mean PM₁₀ concentration of 14.9µg/m³, representing 37.3% of the AQAL (i.e. 'well-below'). As such, the Site is considered to be suitable for the proposed use and unmitigated effects from air quality would be considered 'not significant'.

Furthermore, the maximum predicted annual mean PM₁₀ concentration (2028 DS) at the Site boundary locations was at Receptor SB5 with a predicted annual mean PM₁₀ concentration of 17.7µg/m³, representing 44.3% of the AQAL (i.e. 'well-below'). On the basis that the Site boundary locations represent the maximum predicted annual mean PM₁₀ concentrations at the Site, should changes to the current outline development proposals bring residential dwellings closer to the road, PM₁₀ concentrations at such locations will remain well-below the AQAL.

Based upon the maximum predicted annual mean PM₁₀ concentration of 17.7µg/m³ (predicted at Receptor SB5), this equates to <2 days where 24-hour mean PM₁₀ concentrations are predicted to be greater than 50µg/m³. This is below the 35 permitted 24-hour mean concentrations >50µg/m³ prescribed within the 24-hour mean AQAL. Effects associated with likely 24-hour mean PM₁₀ concentrations at all assessed receptor locations are therefore considered to be 'not significant'.

6.2.3 PM_{2.5} Modelling Results

Table K presents the annual mean PM_{2.5} concentrations predicted at all assessed receptor locations for the 2028 DS scenario.

Table K: Predicted Annual Mean PM_{2.5} Concentrations – 2028 DS Scenario

Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)	% Relative to AQAL
P1	8.9	44.5
P2	9.1	45.5
P3	9.7	48.5
P4	9.4	47.0
P5	9.2	46.0
SB1	8.9	44.5
SB2	9.1	45.5



Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)	% Relative to AQAL
SB3	9.0	45.0
SB4	9.2	46.0
SB5	11.1	55.5
SB6	9.6	48.0
SB7	9.1	45.5

The maximum predicted annual mean PM_{2.5} concentration (2028 DS) at all receptors newly introduced by the Proposed Development was at Receptor P3 with a predicted annual mean PM_{2.5} concentration of 9.7µg/m³, representing 48.5% of the AQAL (i.e. 'well-below'). As such, the Site is considered to be suitable for the proposed use and unmitigated effects from air quality would be considered 'not significant'.

Furthermore, the maximum predicted annual mean PM_{2.5} concentration (2028 DS) at the Site boundary locations was at Receptor SB5 with a predicted annual mean PM_{2.5} concentration of 11.1µg/m³, representing 55.5% of the AQAL (i.e. 'well-below'). On the basis that the Site boundary locations represent the maximum predicted annual mean PM_{2.5} concentrations at the Site, should changes to the current outline development proposals bring residential dwellings closer to the road, PM_{2.5} concentrations at such locations will remain well-below the AQAL.



7.0 Mitigation Measures

This section presents any proportionate mitigation measures required for the Proposed Development.

7.1 Construction Dust

As discussed in Section 5.0, construction impacts associated to the Proposed Development would result in the generation of dust and PM₁₀.

In order to control potential impacts, Table L presents a range of mitigation measures which could be applied and align with the IAQM Dust guidance. The measures are grouped into those which are highly recommended and those which are desirable. With the effective application of the dust mitigation measures, residual effects will be 'not significant'.

Table L: Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Highly Recommended	
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Operating Vehicle/Machinery and Sustainable Travel	Ensure all vehicles switch off engines when stationary - no idling vehicles.
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
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.



Site Application	Mitigation Measures
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.



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

7.2 Operational Phase Road Traffic Emissions

In accordance with the human health road traffic screening assessment, road traffic impacts associated with the operation of the Proposed Development can be considered as having an 'insignificant' effect on local air quality with regard to relevant existing human receptors and no mitigation measures are required.

The ecological road traffic screening assessment determined that further assessment is required to consider the potential for adverse effects on the Thames Basin Heaths SPA. Reference should be made to the submitted HRA for further information, including any mitigation requirements.

With regard to the Site suitability assessment, the Proposed Development is considered to be acceptable for the proposed residential use and no mitigation measures are required.

It should be noted that electric vehicle (EV) charging points are to be included as required by Approved Document S to the Building Regulations³⁶.

³⁶ UK Government, Infrastructure for charging electric vehicles: Approved Document S. Available at: <https://www.gov.uk/government/publications/infrastructure-for-charging-electric-vehicles-approved-document-s>.



8.0 Conclusions

SLR Consulting has undertaken an AQA to support a hybrid planning application for the proposed residential development and change of land use at Ducks Nest Farm, Arborfield.

8.1 Construction Phase

A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken following the IAQM guidance.

Following the construction dust assessment, the Site is found to be at worst 'medium risk' in relation to dust soiling effects on people and property, and 'low risk' in relation to human health impacts. Providing effective mitigation measures are implemented, such as those outlined in Section 7.1 of this report, residual effects from dust emissions during the construction phase would be 'not significant'.

Given the short-term nature of the construction phase and the low volume of vehicle movements that will likely arise (when compared to the operational phase, for which a screening assessment has been undertaken), there is predicted to be an 'insignificant' effect on air quality from construction-generated road traffic emissions.

8.2 Operational Phase

The Proposed Development is predicted to generate road traffic flows below the relevant EPIC & IAQM screening criteria on the local road network. As such, road traffic impacts associated with the operation of the Proposed Development can be considered as having an 'insignificant' effect on local air quality with regard to relevant existing human receptors.

The ecological road traffic screening assessment determined that operational trips generated by the Proposed Development in-isolation are found to be below the relevant IAQM screening criteria for non-European sites. As such, road traffic impacts associated with the operation of the Proposed Development will result in 'no likely significant effect' on non-European sites. However, operational trips considered in-combination are found to be above the relevant IAQM screening criteria and JNCC DMT on the A327 (south of Bramshill Road) and further assessment is therefore required to consider the potential for adverse effects on the Thames Basin Heaths SPA. Reference should be made to the submitted HRA for further information, including any mitigation requirements.

The ADMS-Roads dispersion model (v5) was used to determine the likely NO₂, PM₁₀ and PM_{2.5} concentrations at new receptor locations associated with the Proposed Development for the future development year scenario, in accordance with technical guidance presented in LAQM.TG(22). Pollutant concentrations have been compared to the relevant AQALs to establish the suitability of the Site for its proposed residential use. Predicted concentrations of NO₂, PM₁₀ and PM_{2.5} within the Site and at worst-case Site boundary locations are 'well-below' both the long-term and short-term AQALs and, therefore, the Site is considered to be suitable for its proposed use. Unmitigated effects associated with likely exposure of future occupants are considered to be 'not significant'.



Appendix A – Traffic Data Inputs

A.1 Traffic Data

Table M details the traffic data used within the assessment. This includes those links where a ‘screening’ assessment was completed for relevant human and ecological receptors.

Table M: Traffic Data Used Within the Assessment

Link	Road Name	Development Traffic		2023 BC		2028 DS		Speed (kph) (A) (B)
		AADT	% HGV	AADT	% HDV	AADT	% HDV	
1	Arborfield Road (W)	0	0	10,521	2.0	10,965	2.0	n/a
2	Eastern Relief Road (N)	158	0	16,722	4.0	17,587	4.0	n/a
3	Arborfield Road (E)	158	0	25,446	3.0	26,679	3.0	n/a
4	Reading Road (E)	14	0	5,949	4.0	6,214	4.0	n/a
5	Observer Way (N)	172	0	20,096	2.0	26,804	3.0	n/a
6	Observer Way (Central)	179	0	21,766	3.0	21,124	4.0	n/a
7	Swallowfield Road	7	0	2,396	0.0	2,503	0.0	n/a
8	Sindlesham Road	207	0	12,783	1.0	13,537	1.0	n/a
9	School Road	0	0	366	2.0	381	2.0	n/a
10	Barkham Road	73	0	12,843	2.0	13,458	2.0	n/a
11	Eversley Road (N)	235	0	10,221	2.0	10,888	2.0	48
12	Langley Common Road	73	0	12,863	2.0	13,479	2.0	n/a
13	Observer Way (South of Access)	263	0	21,620	3.0	24,364	2.0	80
14	Eversley Road (West of Langley Common Road)	287	0	23,057	2.0	24,319	2.0	64
15	Baird Road	14	0	3,081	1.0	3,967	0.0	n/a
16	Eversley Road (West of Observer Way)	93	0	23,124	2.0	24,194	2.0	80
17	Nine Mile Ride Extension	0	0	9,017	1.0	9,397	1.0	n/a
18	Eversley Road (S)	93	0	22,299	2.0	23,334	2.0	n/a
20	A327 (South of Bramshill Road)	59	0	13,875	4.0	15,123	2.0	n/a
21	A30 (W)	20	0	10,679	4.0	11,150	4.0	n/a
22	A30 (E)	33	0	15,345	4.0	16,026	4.0	n/a

Table Notes:

- (A) Speeds are based upon National Speed Limits. Traffic speeds have been adjusted to take into account queues and congestion in accordance with LAQM.TG(22).
- (B) ‘n/a’ signifies where road links were not used within the assessment and, therefore, speeds were not required for the purpose of the assessment.





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