

## 7 Air Quality

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### 7.1 Introduction

7.1.1 This Chapter of the ES has been produced by RPS Consulting Services Ltd.

7.1.2 This air quality assessment covers the following aspects associated with the Proposed Development (see Chapter 3 for the description of development):

- Construction phase - an evaluation of the temporary effects from fugitive construction dust emissions; and the
- Operational phase – an evaluation of
  - the impacts and effects of the development traffic on the local area.
  - the impacts and effects on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the site for its proposed uses.

7.1.3 The Chapter is accompanied by the following appendices:

- 7.1 – Detailed Construction Dust Assessment Methodology
- 7.2 – Figures
- 7.3 – Model Verification
- 7.4 – Diffusion Tube Monitoring Survey Results

7.1.4 This Chapter sets out the policy and legislative context for the assessment. The methods and criteria used to assess potential air quality effects have also been described. The baseline air quality conditions have been established taking into account Defra estimates, local authority documents and the results of any local monitoring. The results of the assessment of air quality impacts have been presented. A conclusion has been drawn on the significance of the residual construction-phase effects and the residual operational-phase effects.

### Policy Context and Legislation

#### ***Local Planning Policy***

7.1.5 The *Wokingham Borough Local Development Framework* includes the *Adopted Core Strategy Development Plan Document* (January 2010) and the *Wokingham Borough Local Development Plan Adopted Managing Development Delivery Local Plan* (February 2014). These documents set out policies up to 2026. The *Wokingham Borough Local Development Framework Adopted Core Strategy Development Plan Document* includes the following policy relevant 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 may impact upon the amenity of future occupiers.'*

7.1.6 The Local Plan Update 2023-2040 will replace the current Core Strategy and guide where and how growth will take place in the borough in the years up to 2040. Emerging Policy HC6: Air Pollution and Air Quality part of the emerging local plan states:

1. *'Development proposals should maintain, and where possible improve air quality.*
2. *Development proposals should consider the prevailing air quality and potential impacts upon air quality arising from airborne particulates, dust and odour associated with the construction and operation of a proposal (including vehicular traffic).*
3. *Air Quality Assessments can demonstrate how prevailing air quality and potential impacts upon air quality have been considered and how air quality will be maintained at an acceptable standard through avoidance and mitigation measures. Development proposals are likely to require an Air Quality Assessment where:*
  - a) *The site is located within an Air Quality Management Area (AQMA);*
  - b) *The development has the potential to impact on air quality within an AQMA either on its own or in combination with other development;*
  - c) *It has the potential to impact on the implementation of Air Quality Action Plans or Local Air Quality Strategies, either on its own or in combination with other development;*
  - d) *The site is located within or close to an urban area that is known to experience higher levels of airborne particulates from vehicle emissions;*
  - e) *The site is within proximity to a source of air pollution which could present a significant risk to human health, protected species, or irreplaceable habitats; or*
  - f) *The type of development would mean its occupiers would be particularly sensitive to air pollution, such as schools, health care establishments or specialist accommodation.'*

Emerging Policy HC10: Odour, Fumes, and Dust part of the emerging local plan states:

1. *'Development proposals must demonstrate how the impacts of odour, fumes, and dust have been addressed to protect sensitive receptors, including existing and proposed dwellings and other sensitive land uses during both construction and operational phases. Factors such as the direction of prevailing winds and the location of and proximity to neighbouring sensitive receptors including housing, should influence the site layout and design of development.*
2. *Development proposals that are likely to result in unpleasant odours, fumes and dust must be carefully designed to include on-site mitigation and actively reduce impacts on nearby land uses. This includes development proposals that would intensify or substantially alter an existing industrial or agricultural use.*
3. *Proposals for new residential development must consider odour, fumes, and dust emitted from existing land uses and implement appropriate mitigation to protect the amenity of future occupiers.'*

### **National Policy**

7.1.7 The National Planning Policy Framework (NPPF) is a material consideration for local planning authorities and decision-takers in determining applications. At the heart of the NPPF, is a presumption in favour of sustainable development. For determining planning applications, this means approving development proposals if they accord with an up-to-date local development plan, unless material considerations indicate otherwise. If the development plan does not contain relevant policies, or the policies are out of date, then planning permission should be granted unless the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development, or any adverse impacts would significantly outweigh the benefits.

7.1.8 The NPPF sets out three overarching objectives to achieve sustainable development. The relevant objective in the context of this air quality assessment is:

*“an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution and mitigating and adapting to climate change, including moving to a low carbon economy” (Paragraph 8c)*

7.1.9 Under the heading ‘Promoting sustainable transport’, the NPPF states:

*“The planning system should actively manage patterns of growth in support of these objectives. 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. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.” (Paragraph 110)*

7.1.10 Under the heading ‘Conserving and enhancing the natural environment’, the NPPF states:

*“Planning policies and decisions should contribute to and enhance the natural and local environment by:*

...

*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 instability. 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; ...” (Paragraph 187)*

*“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.” (Paragraph 199)*

*National Planning Practice Guidance (NPPG)*

- 7.1.11 The National Planning Practice Guidance (NPPG) was issued on-line on 6 March 2014 and is updated periodically by government as a live document. The last major update was on 1 November 2019. The Air Quality section of the NPPG describes the circumstances when air quality, odour and dust can be a planning concern, requiring assessment.
- 7.1.12 The NPPG advises that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity. The NPPG states that when deciding whether air quality is relevant to a planning application, considerations could 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; or 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;*
  - *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value” (Paragraph: 006, Reference ID: 32-006-20191101).*
- 7.1.13 The NPPG provides advice on how air quality impacts can be mitigated and notes *“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.” (Paragraph: 008, Reference ID: 32-008-20191101)*

*Clean Air Strategy (2019)*

7.1.14 On 14 January 2019, Defra published the '*Clean Air Strategy 2019*'. The report sets out actions that the Government intends to take to reduce emissions from transport, in the home, from farming and from industry, with the former two being most relevant to the Proposed Development.

### ***Legislative Context***

7.1.15 The Environment Act 1995, as amended by the Environment Act 2021, established the requirement for the Government and the devolved administrations to produce a National Air Quality Strategy (AQS) for improving ambient air quality, the first being published in 1997 and having been revised several times since, with the latest published in 2007. The Strategy sets UK air quality standards<sup>1</sup> and objectives<sup>2</sup> for the pollutants in the Air Quality Standards Regulations plus 1,3-butadiene and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. There is no legal requirement to meet objectives set within the UK AQS except where equivalent limit values are set within the Air Quality Standards Regulations.

7.1.16 The 1995 Environment Act also established the UK system of Local Air Quality Management (LAQM), that requires local authorities to go through a process of review and assessment of air quality in their areas, identifying places where objectives are not likely to be met, then declaring Air Quality Management Areas (AQMAs) and putting in place Air Quality Action Plans to improve air quality. These plans also contribute, at local level, to the achievement of the limit values in the Air Quality Standards Regulations.

7.1.17 The Air Quality Standards Regulations 2010, amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 sets limit values for ambient air concentrations for the main air pollutants: particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), lead (Pb) and benzene, certain toxic heavy metals (arsenic, cadmium and nickel) and polycyclic aromatic hydrocarbons (PAHs).

7.1.18 These limit values are legally binding on the Secretary of State. The Government and devolved administrations operate various national ambient air quality monitoring networks to measure compliance and develop plans to meet the limit values.

7.1.19 The limit values and objectives relevant to this assessment are summarised in Table 7.1. Where the limit values and the AQS objectives differ, the more stringent has been used.

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<sup>1</sup> Standards are concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. Standards, as the benchmarks for setting objectives, are set purely with regard to scientific evidence and medical evidence on the effects of the particular pollutant on health, or on the wider environment, as minimum or zero risk levels.

<sup>2</sup> Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of time, by a certain date.

**Table 7.1 Summary of Relevant Air Quality Limit Values and Objectives**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Objective / Limit Values</b>	<b>Not to be Exceeded More Than</b>
Nitrogen Dioxide (NO <sub>2</sub> )	1 hour	200 µg.m <sup>-3</sup>	18 times per calendar year
	Annual	40 µg.m <sup>-3</sup>	-
Particulate Matter (PM <sub>10</sub> )	24 Hour	50 µg.m <sup>-3</sup>	35 times per calendar year
	Annual	40 µg.m <sup>-3</sup>	-
Particulate Matter (PM <sub>2.5</sub> )	Annual	20 µg.m <sup>-3</sup>	-
		10 µg.m <sup>-3</sup> to be met by 31 <sup>st</sup> December 2040*	-

Notes:

\*The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets out an annual-mean PM<sub>2.5</sub> target of 10 µg.m<sup>-3</sup> to be met by the end of 2040.

## 7.2 Assessment methodology

### Predicting effects

#### *Matters scoped out*

- 7.2.1 The Proposed Development is a mixed use, residential led scheme and will not incorporate any centralised combustion sources. On this basis, emissions from onsite centralised combustion sources have been scoped out of further consideration. This was agreed within the EIA scoping opinion (Appendix 5.1 of this ES).
- 7.2.2 The Proposed Development will not include any sources of odour. The EIA scoping opinion included the following: *'In respect of odour, it is acknowledged that the site has no sources of odour or emissions from centralised combustion sources and as such, this can be scoped out at this stage. There are localised odour sources from the agricultural activities although due to the phasing and relocation of the dairy herd means that these can likely be scoped out.'* On this basis, odour has not been considered any further within this assessment.
- 7.2.3 Notwithstanding the above, it is acknowledged that a sewage pumping station will be located onsite (subject to a separate planning application). At this stage, it is understood that pumping station will be situated at a distance well over 20m from the nearest habitable building. This accords with Thames Water guidance, Local Practices to Support Code for Adoption Sewerage Pumping Stations (December 2023). Therefore, no further consideration has been made relating to nuisance odour from the pumping station.

#### *Scope of assessment*

- 7.2.4 Neither the NPPF nor the NPPG is prescriptive on the methodology for assessing air quality effects or describing significance; practitioners continue to use guidance provided by Defra and non-governmental organisations, including Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM). However, the NPPG does advise 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. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is*

*commissioned (Paragraph 007, Reference ID: 32-007-20191101).<sup>3</sup>* It lists a number of areas that might be usefully agreed at the outset.

7.2.5 This air quality assessment covers the elements recommended in the NPPG. The approach is consistent with the EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality document, the IAQM Guidance on the assessment of dust from demolition and construction, and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM.TG22. It includes the key elements listed below:

- assessment of the existing air quality in the study area (existing baseline) and prediction of the future air quality without the development in place (future baseline), using official government estimates from Defra, publicly available air quality monitoring data for the area, and relevant Air Quality Review and Assessment (R&A) documents;
- a qualitative assessment of likely construction-phase impacts with mitigation and controls in place; and
- a quantitative prediction of the future operational-phase air quality impact with the development in place (with any necessary mitigation), encompassing
  - the impacts of the development traffic on the local area.
  - the impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the site for its proposed uses.

7.2.6 At this stage, an assessment of the effects of the operational phase on ecological sensitive receptors and surrounding Air Quality Management Areas (AQMAs) has not been undertaken. If required, this will be included as an addendum to the ES Chapter.

7.2.7 This assessment does not consider the air quality impacts of dust from any contaminated land or buildings. If contaminated land is identified on the Site, the impacts will be assessed in other technical discipline reports as part of the planning application.

#### ***Summary of Key Pollutants Considered***

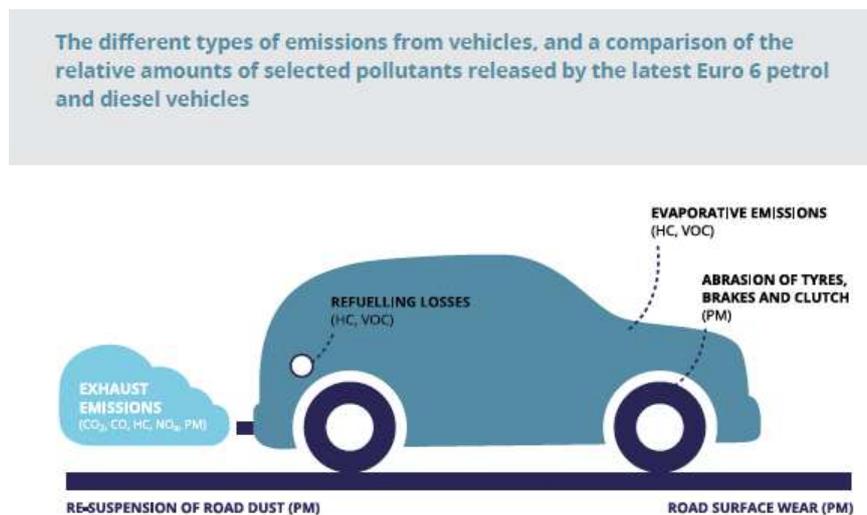
7.2.8 For the construction phase of the Proposed Development the key pollutant is dust, covering both the PM<sub>10</sub> fraction that is suspended in the air that can be breathed, and the deposited dust that has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects.

7.2.9 For the operational phase of the Proposed Development, the main pollutants from road traffic with potential for local air quality impacts are nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM<sub>10</sub>). Emissions of total NO<sub>x</sub> from combustion sources comprise nitric oxide (NO) and NO<sub>2</sub>. The NO oxidises in the atmosphere to form NO<sub>2</sub>. The assessment of operational impacts therefore focuses on changes in NO<sub>2</sub> and PM<sub>10</sub> concentrations. The impact from fine particulate matter, known as PM<sub>2.5</sub> (a subset of PM<sub>10</sub>), concentrations has also been considered.

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<sup>3</sup> Source: National Planning Policy Guidance, Air Quality

## Figure 7.1 Types of Vehicle Emissions<sup>4</sup>



### Construction Phase - Methodology

7.2.10 Dust is the generic term used to describe particulate matter in the size range 1-75  $\mu\text{m}$  in diameter. Particles greater than 75  $\mu\text{m}$  in diameter are termed grit rather than dust. Dusts can contain a wide range of particles of different sizes. The normal fate of suspended (i.e. airborne) dust is deposition. The rate of deposition depends largely on the size of the particle and its density; together these influence the aerodynamic and gravitational effects that determine the distance it travels and how long it stays suspended in the air before it settles out onto a surface. In addition, some particles may agglomerate to become fewer, larger particles; whilst others react chemically.

7.2.11 The effects of dust are linked to particle size and two main categories are usually considered:

- PM<sub>10</sub> particles, those up to 10  $\mu\text{m}$  in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and
- Dust, generally considered to be particles larger than 10  $\mu\text{m}$  which fall out of the air quite quickly and can soil surfaces (e.g. a car, window sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.

7.2.12 The IAQM Guidance on the assessment of dust from demolition and construction sets out 250 m as the distance from the site boundary and 50 m from the site traffic route(s) up to 250 m of the entrance, within which there could potentially be nuisance dust and PM<sub>10</sub> effects on human receptors. For sensitive ecological receptors, the corresponding distances are 50 m in both cases. These distances are set to be deliberately conservative.

7.2.13 The Air Quality Standards Regulations sets concentration-based limit values and objectives for the PM<sub>10</sub> suspended particle fraction, but no statutory or official numerical air quality criterion for dust annoyance has been set at a UK, European or World Health Organisation (WHO) level.

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<sup>4</sup> Source: European Environment Agency (2016) Explaining Road Transport Emissions: A Non-technical Guide

Construction dust assessments have tended to be risk based, focusing on the appropriate measures to be used to keep dust impacts at an acceptable level.

7.2.14 The IAQM dust guidance aims to estimate the impacts of both PM<sub>10</sub> and dust through a risk-based assessment procedure. The IAQM dust guidance document states: *“The magnitude of impacts depend on the mitigation measures adopted. Therefore the emphasis in this document is on classifying the risk of dust impacts from a site, which will then allow mitigation measures commensurate with that risk to be identified.”*

7.2.15 The IAQM dust guidance provides a methodological framework, but notes that professional judgement is required to assess effects: *“This is necessary, because the diverse range of projects that are likely to be subject to dust impact assessment means that it is not possible to be prescriptive as to how to assess the impacts. Also a wide range of factors affect the amount of dust that may arise, and these are not readily quantified.”*<sup>5</sup>

7.2.16 Consistent with the recommendations in the IAQM dust guidance, a risk-based assessment has been undertaken for the Proposed Development, using the well-established source-pathway-receptor approach:

- The dust impact (the change in dust levels attributable to the development activity) at a particular receptor will depend on the magnitude of the dust source and the effectiveness of the pathway (i.e. the route through the air) from source to receptor.
- The effects of the dust are the results of these changes in dust levels on the exposed receptors, for example annoyance or adverse health effects. The effect experienced for a given exposure depends on the sensitivity of the particular receptor to dust (as discussed in Appendix 7.1). An assessment of the overall dust effect for the area as a whole has been made using professional judgement taking into account both the change in dust levels (as indicated by the Dust Impact Risk for individual receptors) and the absolute dust levels, together with the sensitivities of local receptors and other relevant factors for the area.

7.2.17 The detail of the dust assessment methodology is provided in Appendix 7.1.

7.2.18 The dust risk categories that have been determined for each of the four activities (demolition, earthworks, construction and trackout) have been used to define the appropriate site-specific mitigation measures based on those described in the IAQM dust guidance. The guidance states that provided the mitigation measures are successfully implemented, the resultant effects of the dust exposure will normally be ‘not significant’.

### ***Operational Phase - Methodology***

#### ***Atmospheric Dispersion Modelling of Pollutant Concentrations***

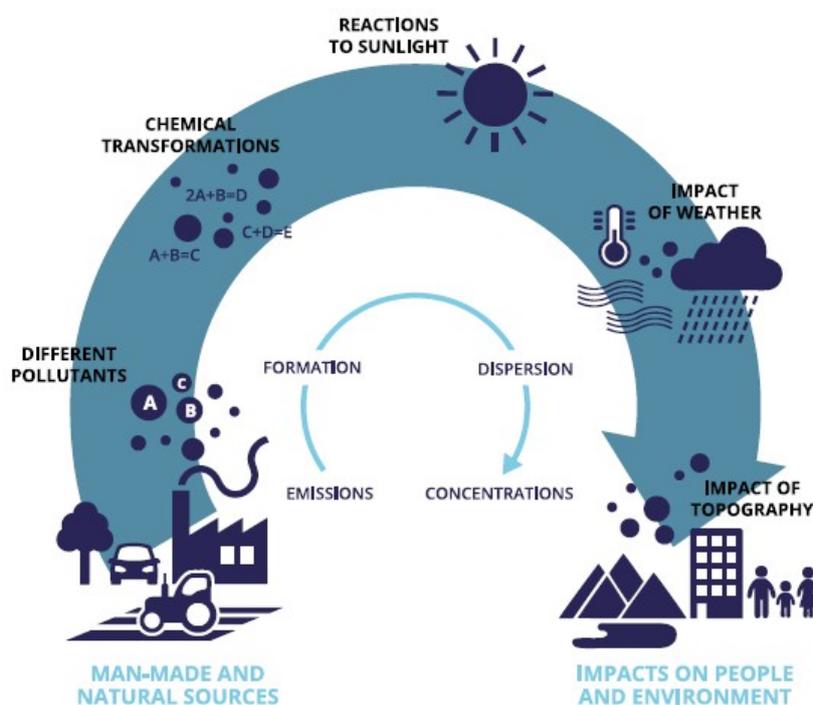
7.2.19 In urban areas, pollutant concentrations are primarily determined by the balance between pollutant emissions that increase concentrations, and the ability of the atmosphere to reduce and remove pollutants by dispersion, advection, reaction and deposition. An atmospheric dispersion model is used as a practical way to simulate these complex processes; such a model requires a range of input data, which can include emissions rates, meteorological data and local

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<sup>5</sup> IAQM, 2024, Guidance on the assessment of dust from demolition and construction.

topographical information. The model used and the input data relevant to this assessment are described in the following sub-sections.

**Figure 7.2 Air Pollution: From Emissions to Exposure<sup>6</sup>**



7.2.20 The atmospheric pollutant concentrations in an urban area depend not only on local sources at a street scale, but also on the background pollutant level made up of the local urban-wide background, together with regional pollution and pollution from more remote sources brought in on the incoming air mass. This background contribution needs to be added to the fraction from the modelled sources, and is usually obtained from measurements or estimates of urban background concentrations for the area in locations that are not directly affected by local emissions sources. Background pollution levels are described in detail in Section 7.3.

7.2.21 The ADMS-Roads model has been used in this assessment to predict the air quality impacts from changes in traffic on the local road network. This is a version of the Atmospheric Dispersion Modelling System (ADMS), a formally validated model developed in the UK by Cambridge Environmental Research Consultants Ltd (CERC) and widely used in the UK and internationally for regulatory purposes.

**Modelled Scenarios**

7.2.22 The following scenarios were modelled:

- Without Development – without the Proposed Development in the first year that the Proposed Development is expected to be fully operational, 2040;
- With the Proposed Development only, in the first year that the Proposed Development is expected to be fully operational, 2040; and

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<sup>6</sup> Source: European Environment Agency (2016) Explaining Road Transport Emissions: A Non-technical Guide

- With the full Loddon Valley Garden Village development (i.e. the Proposed Development in addition to the other development parcels which will comprise the entirety of the Loddon Garden Village scheme), in the first year that the Proposed Development is expected to be fully operational, 2040.

### ***Model Input Data***

#### Traffic Flow Data

7.2.23 Traffic data used in the assessment have been provided by the project's transport consultants, ALP. It is understood that the transport model utilised to provide the traffic data applied within this air quality assessment includes consideration of a range of cumulative developments, both external and internal to the Loddon Valley Garden Village scheme (see Chapter 17 Transport and Access for more detail). The traffic flow data provided for this assessment are summarised in Table 7.2. The modelled road links are illustrated in Appendix 7.2.

**Table 7.2 Traffic Data Used Within the Assessment**

Link ID	Road Link Name	Speed (km.hr <sup>-1</sup> )	Daily Two Way Vehicle Flow					
			Without Development, 2040		With the Proposed Development, 2040		With the Proposed Development and Loddon Valley Garden Village Development, 2040	
			Total Vehicles	% HDV	Total Vehicles	% HDV	Total Vehicles	% HDV
612	Basingstoke Road	48	11776	2	13905	2	14028	2
11671	Eastern Relief Road	112	14266	3	17889	2	18095	2
11671b	Eastern Relief Road	65	14266	3	17889	2	17889	2
555	Roundabout North of University Bridge	20	19419	2	19841	1	20047	1
540	Shinfield Road	48	14666	2	16358	2	16397	2
560	Whiteley Wood Lane	48	31949	1	37217	1	37699	1
10772	Arborfield Road	48	7628	0	10393	0	10708	0
10774	Reading Road/ Arborfield Road	64	18389	2	22290	2	22811	2
11614	Lower Earley Way North	80	30647	1	32264	1	32347	1
309	Lower Earley Way South	80	22556	1	23464	1	23538	1
1102	A3290	64	34219	3	35066	3	35478	3
9101	Reading Road Roundabout	20	16901	7	19406	3	19511	3
9088	A329 Reading Road N	48	26293	3	27293	3	27713	3
2521	Wharfdale road E	48	26042	0	26603	0	26796	0
1142	Winnersh Triangle Roundabout	20	16187	3	16829	3	17000	3
2148	A329 Reading Road Middle	48	10555	2	11799	2	11799	2
285	Robin Hood Lane /King Street Lane N	48	10092	1	10995	1	11087	1
308	Meldreth Way	48	6189	0	7125	0	7173	0
113	Basingstoke Road Roundabout	20	26357	3	27169	1	27265	1
395	M4	112	105949	4	106893	4	107002	4
582	Church Lane (Three mile cross)	48	11922	2	12373	2	12399	2
613	Hyde End Road	64	8512	1	10563	1	10764	1

616	Basingstoke Road	48	9849	4	11163	3	11272	3
489	Shinfield Road	48	11326	2	11849	2	11867	2
11652	Observer Way	80	16559	3	21198	2	21307	2
1165	#N/A	97	1975	0	2011	0	2011	0
449	Langley Common Road	64	14755	1	16890	1	17087	1
468	Langley Common Road	64	13532	1	14050	1	14164	1
11609	Eversley Road	48	17854	2	19000	2	19245	2
11542	Beech Hill Road	64	5286	0	6076	0	6094	0
11610	Eversley Road	64	17780	1	18565	1	18771	1
471	Church Lane	48	4885	1	5229	0	5365	0
675	Park Lane	48	3972	0	4728	0	4772	0
676	Nine Mile Ride	48	7136	1	7933	1	7977	1
407	Eversley Road	48	16730	2	18121	2	18344	2
454	Church Road	48	4746	0	5400	0	5400	0
494	Elm Road	48	13298	2	14382	2	14500	2
1460	Elm Lane	48	14358	1	15580	1	15751	1
10447	Chalfont Way	48	17149	1	18216	1	18334	1
1467	Rushey Way	48	12849	1	13355	1	13500	1
320	Rushey Way	48	14825	3	15494	1	15494	1
11680	Hatch Farm Way	80	17436	2	21689	2	22333	2
1148	A329 (M)	112	62919	3	64588	2	64877	2
1114	A329 (M)	112	26540	2	27389	2	27389	2
307	Wokingham Road	48	19072	3	19788	4	19806	4
303	Loddon Bridge Road	48	15548	1	16353	1	16471	1
280	Reading Road	48	20131	2	20836	2	21156	2
1134	A329	80	19428	3	20090	3	20256	3
459	Shinfield Road	20	17376	1	17967	1	17998	1
11672	Hawthorn Road	48	1382	0	1895	0	1904	0
10787	Mole Road	81	13253	1	13483	0	14083	0
264	Mole Road	48	10727	1	11456	1	11920	1

265	New Road Sindlesham	48	6485	3	6350	1	6889	1
302	#N/A	64	19072	3	19788	4	19806	4
448	Eversley Road	48	7062	1	7457	1	7856	1
460	Sindlesham Road	83	8637	1	9104	1	9573	1
10425	Wheatsheaf Close	82	10802	0	11458	0	11572	0
10800	Arborfield Roundabout	20	4765	2	5145	1	5382	1
984	Basingstoke Road	20	29345	4	30237	3	30333	3
9038	Imperial Way Roundabout	20	7420	6	7799	4	7821	4
9064	Three Mile Cross Interchange	20	5844	1	7312	1	7426	1
9066	Three Mile Cross Interchange	20	7326	1	8850	1	8964	1
978	Three Mile Cross Interchange	20	27621	4	28666	3	28762	3
9042	Three Mile Cross Interchange	20	20853	2	21031	3	21062	3
8739	South of M4 J11 Roundabout	20	24321	2	24084	2	24115	2
12112	Mill Lane	48	6485	1	12670	1	13677	1
105	M4	112	112885	5	112749	5	112758	5
9072	M4 Slip Road	112	15993	1	16884	1	16967	1
114	M4 Slip Road	112	27710	2	27237	2	27268	2

Notes:

HDV = Heavy Duty Vehicle - vehicles greater than 3.5 t gross vehicle weight including buses

LDV = Light Duty Vehicle

7.2.24 The average speed on each road has been reduced by 10 km.hr<sup>-1</sup> (or to 20 km.hr<sup>-1</sup> for roads where the AADT > 10,000) to take into account the possibility of slow-moving traffic near junctions and at roundabouts in accordance with LAQM.TG22.

Vehicle Emission Factors

7.2.25 The modelling has been undertaken using Defra’s 2025 emission factor toolkit (version 13) which draws on emissions generated by the European Environment Agency (EEA) COPERT 5.8 emission calculation tool.

Meteorological Data

7.2.26 ADMS-Roads requires detailed meteorological data as an input. The most representative observing station for the region of the study area that supplies all the data in the required format is Farnborough, approximately 17 km southwest of the Application Site. Meteorological data from that station for 2024 have been used within the dispersion model. The wind rose is presented in Appendix 7.2.

Receptors

7.2.27 The air quality assessment predicts the impacts at locations that could be sensitive to any changes (see Appendix 7.1 for further details relating to dust).

7.2.28 For assessing human-health impacts from pollutants, such sensitive receptors should be selected where the public is regularly present and likely to be exposed over the averaging period of the objective. LAQM.TG22 provides examples of exposure locations for pollutants and these are summarised in Table 7.3.

**Table 7.3 Examples of Where Air Quality Objectives Apply**

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual-mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building’s façades), or any other location where public exposure is expected to be short-term.
Daily-mean	All locations where the annual-mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building’s façade), or any other location where public exposure is expected to be short-term.
Hourly-mean	All locations where the annual and 24 hour mean would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the	Kerbside sites where the public would not be expected to have regular access.

	<p>public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend 1-hour or longer.</p>	
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7.2.29 Representative existing sensitive receptors (i.e. outside of the Proposed Development site) for this assessment have been selected at properties and buildings where the annual mean averaging periods apply (i.e. locations of regular public exposure) and pollutant concentrations and/or changes in pollutant concentrations are anticipated to be greatest, as listed in Table 7.4 and shown in Appendix 7.2.

**Table 7.4 Modelled Sensitive Receptors**

ID	Description	x	y
1	Residential	472537	168701
2	Residential	473265	169193
3	School	473241	169760
4	Residential	473364	170374
5	Residential	475651	169924
6	Residential	476638	171398
7	Residential	476949	171400
8	Residential	477891	170775
9	Residential	478161	170595
10	Residential	478123	170155
11	Residential	477564	169860
12	Residential	477625	166921
13	Residential	476468	166128
14	Residential	476230	166917
15	Residential	477020	169245
16	Residential	476997	170090
17	Residential	476589	168035
18	Residential	474483	167783
19	Residential	473909	167861
20	Residential	473641	167846
21	School	473290	167506
22	Residential	471505	166655
23	Residential	471439	166298
24	Residential	471580	167854
25	Residential	471380	168658
26	Residential	471432	168463
27	Residential	473734	168789
28	Residential	473665	168722
29	Residential	472236	168226
30	Residential	471314	166119
31	Residential	471450	166116
32	School	475587	164297
33	Residential	476237	165034

ID	Description	x	y
34	Residential	478335	164635
35	Residential	477558	164687
36	Residential	477155	165772
37	School	473761	170011
38	Residential	473772	169840
39	Residential	474086	170270
40	Residential	473868	170721
41	Residential	473809	170973
42	Residential	476261	170810
43	Residential	476501	171602
44	Residential	478518	171517
45	Residential	479154	169865
46	Residential	477334	169816
47	Residential	477485	169693
48	Residential	477334	169816
49	Residential	477485	169693
Proposed 1	Residential	475855	168919
Proposed 2	School	475978	168640
Proposed 3	Residential	476408	169518
Proposed 4	Residential	475557	168287
Proposed 5	Residential	474864	167589
Proposed 6	Residential	475197	168009
Proposed 7	Residential	476225	168432
Proposed 8	Residential	475882	169214
Proposed 9	School	475356	168100
Proposed 10	Residential	475382	168327

7.2.30 The annual, daily and hourly-mean AQS objectives apply at the front and rear façades of all residential properties and at schools. The approaches used to predict the concentrations for these different averaging periods are described below.

#### ***Long-Term Pollutant Predictions***

7.2.31 Annual-mean NO<sub>x</sub> and PM<sub>10</sub> concentrations have been predicted at representative sensitive receptors using ADMS-Roads, then added to relevant background concentrations. Primary NO in the NO<sub>x</sub> emissions is converted to NO<sub>2</sub> to a degree determined by the availability of atmospheric oxidants locally and the strength of sunlight. Annual-mean NO<sub>2</sub> concentrations have been derived from the modelled road-related annual-mean NO<sub>x</sub> concentration using Defra's calculator.

### ***Short-Term Pollutant Predictions***

- 7.2.32 In order to predict the likelihood of exceedances of the hourly-mean AQS objectives for NO<sub>2</sub> and the daily-mean AQS objective for PM<sub>10</sub>, the following relationships between the short-term and the annual-mean values at each receptor have been considered.

#### Hourly-Mean AQS Objective for NO<sub>2</sub>

- 7.2.33 Research undertaken in support of LAQM.TG22 has indicated that the hourly-mean limit value and objective for NO<sub>2</sub> is unlikely to be exceeded at a roadside location where the annual-mean NO<sub>2</sub> concentration is less than 60 µg.m<sup>-3</sup>. The threshold of 60 µg.m<sup>-3</sup> NO<sub>2</sub> has been used as the guideline for considering a likely exceedance of the hourly-mean nitrogen dioxide objective.

#### Daily-Mean AQS Objective for PM<sub>10</sub>

- 7.2.34 The number of exceedances of the daily-mean AQS objective for PM<sub>10</sub> of 50 µg.m<sup>-3</sup> may be estimated using the relationship set out in LAQM.TG22:
- 7.2.35 Number of Exceedances of Daily Mean of 50 µg.m<sup>-3</sup> =  $-18.5 + 0.00145 * (\text{Predicted Annual-mean PM}_{10})^3 + (206 / \text{Predicted Annual-mean PM}_{10} \text{ Concentration})$
- 7.2.36 This relationship indicates that the daily-mean AQS objective for PM<sub>10</sub> is likely to be met if the predicted annual-mean PM<sub>10</sub> concentration is 31.8 µg.m<sup>-3</sup> or less.
- 7.2.37 The daily mean objective is therefore not considered further within this assessment if the annual-mean PM<sub>10</sub> concentration is predicted to be less than 31.5 µg.m<sup>-3</sup>.

### ***Fugitive Particulate Emissions***

- 7.2.38 Transport PM<sub>10</sub> and PM<sub>2.5</sub> emissions arise from both the tailpipe exhausts and from fugitive sources such as brake and tyre wear and re-suspended road dust. Improvements in vehicle technologies are reducing particulate exhaust emissions; therefore, the relative importance of fugitive particulate emissions is increasing. Current official vehicle emission factors for particulate matter include brake dust and tyre wear which studies suggest may account for approximately one-third of the total particulate emissions from road transport; but not re-suspended road dust (which remains unquantified).

### **Significance Criteria for Development Impacts on the Local Area**

- 7.2.39 The EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality document advises that:

*“The significance of the effects arising from the impacts on air quality will depend on a number of factors and will need to be considered alongside the benefits of the development in question. Development under current planning policy is required to be sustainable and the definition of this includes social and economic dimensions, as well as environmental. Development brings opportunities for reducing emissions at a wider level through the use of more efficient technologies and better designed buildings, which could well displace emissions elsewhere, even if they increase at the development site. Conversely, development can also have adverse consequences for air quality at a wider level through its effects on trip generation.”<sup>7</sup>*

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<sup>7</sup> Source: EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality

7.2.40 When describing the air quality impact at a sensitive receptor, the change in magnitude of the concentration should be considered in the context of the absolute concentration at the sensitive receptor. Table 7.5 provides the EPUK & IAQM approach for describing the long-term air quality impacts at sensitive human-health receptors in the surrounding area (note that Table 7.5, as well as the Table Notes, have been taken from the EPUK & IAQM planning guidance document).

**Table 7.5 Impact Descriptors for Individual Sensitive Receptors**

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level			
	1	2-5	6-10	>10
75 % or less of AQAL	Negligible	Negligible	Slight	Moderate
76 -94 % of AQAL	Negligible	Slight	Moderate	Moderate
95 - 102 % of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109 % of AQAL	Moderate	Moderate	Substantial	Substantial
110 % or more than AQAL	Moderate	Substantial	Substantial	Substantial

Notes:

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, limit value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as negligible.
3. The table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement. For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

7.2.41 The human-health impact descriptors above apply at individual receptors. The EPUK & IAQM guidance states that the impact descriptors *"are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it maybe that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances."*<sup>8</sup>

7.2.42 Professional judgement by a competent, suitably qualified professional is required to establish the significance associated with the consequence of the impacts. This judgement takes into

<sup>8</sup> Source: EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality

account the extent of the current and future population exposure to the impacts and the influence and/or validity of any assumptions adopted during the assessment process.

#### ***Significance Criteria for New Population Exposure (Site Suitability)***

7.2.43 The EPUK & IAQM guidance considers an exceedance of an air quality objective at a building façade to be a significant adverse effect unless provision is made to reduce the resident's or occupant's exposure by some means.

### **Geographic Scope**

#### ***Construction Phase Dust Assessment***

7.2.44 Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management (IAQM), 2024) indicates that there could potentially be annoyance from dust and particulate matter (PM) with a diameter of 10 micrometres or smaller (PM<sub>10</sub>), alongside effects on human health and ecological habitats, for receptors located within 250 m of onsite construction activities.

7.2.45 As such, the air quality study area has been defined with respect to construction dust and covers an area up to 250 m around the Site, and 250 m from construction site entrances. In accordance with IAQM guidance (IAQM, 2024), receptors are considered within 20 m, 50 m, 100 m, and 250 m distance categories.

#### ***Operational Phase Traffic Emissions Assessment***

7.2.46 In accordance with EPUK & IAQM guidance, an assessment of traffic emissions includes all roads which are anticipated to experience the following changes in traffic volume:

- Outside of an AQMA: over 500 Light Duty vehicles (LDVs) or over 100 Heavy Duty Vehicles (HDVs).
- Inside of an AQMA: over 100 LDVs or over 25 HDVs.

7.2.47 The location and geographic extent of the air quality study area used to inform the air quality assessment is presented in Appendix 7.2. The study area focusses on roads within the locale surrounding the Site. Sensitive ecological receptors and surrounding AQMAs have not been included within the assessment and will be considered by way of an addendum to the ES, where required.

### **Temporal Scope**

7.2.48 The air quality assessment considers impacts and effects associated with the Proposed Development over time through the consideration of the following scenarios:

- Assessment of the effects of construction dust throughout the construction phase 2026/27 – 2040; and
- Assessment of the operational impacts of the scheme when fully operational in 2040.

### **Consultation**

7.2.49 The method and scope for the air quality assessment was agreed with WBC during the EIA scoping exercise (see Chapter 5, Appendix 5.1 and 5.2).

## Assumptions and Limitations

- 7.2.50 All air quality assessment tools, whether models or monitoring measurements, have a degree of uncertainty associated with the results. The choices that the practitioner makes in setting-up the model, choosing the input data, and selecting the baseline monitoring data will decide whether the final predicted impact should be considered a central estimate, or an estimate tending towards the upper bounds of the uncertainty range (i.e. tending towards worst-case).
- 7.2.51 The atmospheric dispersion model itself contributes some of this uncertainty, due to it being a simplified version of the real situation: it uses a sophisticated set of mathematical equations to approximate the complex physical and chemical atmospheric processes taking place as a pollutant is released and as it travels to a receptor. The predictive ability of even the best model is limited by how well the turbulent nature of the atmosphere can be represented.
- 7.2.52 Each of the data inputs for the model, listed earlier, will also have some uncertainty associated with them. Where it has been necessary to make assumptions, these have mainly been made towards the upper end of the uncertainty range informed by an analysis of relevant, available data.
- 7.2.53 The atmospheric dispersion model used for this assessment, ADMS Roads, has been validated by its supplier and is widely used by professionals in the UK and overseas. A site-specific verification (calibration) provides additional certainty and is particularly important when air quality levels are close to exceeding the objectives/limit values.
- 7.2.54 LAQM.TG22 requires that local authorities verify the results of any detailed modelling undertaken for the purposes of fulfilling their R&A duties. Model verification refers to the checks that are carried out on model performance at a local level. Modelled concentrations are compared with the results of monitoring. Where there is a disparity between modelled and monitored concentrations, the first step is to review the appropriateness of the data inputs to determine whether the performance of the model can be improved. Once reasonable efforts have been made to reduce the uncertainties in the data inputs, an adjustment may be established and applied to reduce any remaining disparity between modelled and monitored concentrations. No adjustment factor is deemed necessary where the modelled concentrations are within 25% of the monitored concentrations.
- 7.2.55 For the verification and adjustment of NO<sub>x</sub>/NO<sub>2</sub> concentrations for R&A purposes, it is recommended that the comparison involves a combination of automatic and diffusion monitoring, rather than a single automatic monitor. This is to ensure any adjustment factor derived is representative of all locations modelled and not unduly weighted towards the characteristics at a single site. Where only diffusion tubes are used for the model verification, the study should consider a broad spread of monitoring locations across the study area to provide sufficient information relating to the spatial variation in pollutant concentrations.
- 7.2.56 Local Authorities generally implement a broad spread of monitoring, particularly in areas that are known to be sensitive to changes in air quality. Consequently, Local Authorities are usually able to verify the models they use for R&A purposes; however for individual developments, there is less likely to be a broad range of monitoring locations within the relevant study area. Therefore, a site-specific diffusion tube monitoring study was undertaken across the study area (see Appendix 7.4), the results of which have been used within the model verification study for the Proposed Development and is included within Appendix 7.3.
- 7.2.57 The main components of uncertainty in the total predicted concentrations, made up of the background concentration and the modelled fraction, include those summarised in Table 7.6.

**Table 7.6 Approaches to Dealing with Uncertainty used Within the Assessment**

Concentration	Source of Uncertainty	Approach to Dealing with Uncertainty	Comments
Background Concentration	Characterisation of current baseline air quality conditions	The background concentration used within the assessment is the most conservative value from a comparison of measured and/or Defra mapped concentration estimates.	The background concentration is the major proportion of the total predicted concentration.
	Characterisation of future baseline air quality (i.e. the air quality conditions in the future assuming that the development does not proceed)	The future background concentration used in the assessment is the same as the current background concentration and no reduction has been assumed. This is a conservative assumption as, in reality, background concentrations are likely to reduce over time as cleaner vehicle technologies form an increasing proportion of the fleet.	The conservative assumptions adopted ensure that the background concentration used within the model contributes to the result being towards the top of the uncertainty range, rather than a central estimate.
Fraction from Modelled Sources	Traffic flow estimates	Traffic flows provided have been derived from a strategic traffic model.	The modelled fraction is a minor proportion of the total predicted concentration.  The modelled fraction is likely to contribute to the result being between a central estimate and the top of the uncertainty range.
	Traffic speed estimates	Estimated traffic speeds have been used within the model ). The modelled speed has been reduced in congested areas to take account of slow-moving and queuing traffic.	
	Road-related emission factors – projection to future years	The most recently published emission factors have been used within the modelling and these are based on the current and best understanding of the variation in emission factors in future years.	
	Meteorological Data	Uncertainties arise from any differences between the conditions at the met station and the development site, and between the historical met years and the future years. These have been minimised by using meteorological data collated at a representative measuring site. The model has been run for a full year of meteorological conditions. This means that the conditions in 8,760 hours have been considered in the assessment.	
	Receptors	Receptor locations have been identified where concentrations are anticipated to be highest or where the greatest changes are expected.	
	Dispersion Modelling	The model predictions have been compared with monitored concentrations. The model outputs have been adjusted accordingly.	

Concentration	Source of Uncertainty	Approach to Dealing with Uncertainty	Comments
		The fractional bias indicates that the adjusted model is working well.	

7.2.58 The analysis of the component uncertainties indicates that, overall, the predicted total concentration is likely to be towards the top of the uncertainty range rather than being a central estimate. The actual concentrations that will be found when the Proposed Development is operational are unlikely to be higher than those presented within this Chapter and are more likely to be lower.

## 7.3 Baseline conditions

### Current Baseline

7.3.1 The background concentration often represents a large proportion of the total pollution concentration, so it is important that the background concentration selected for the assessment is realistic. National Planning Practice Guidance and EPUK & IAQM guidance highlight public information from Defra and local monitoring studies as potential sources of information on background air quality. LAQM.TG22 recommends that Defra mapped concentration estimates are used to inform background concentrations in air quality modelling and states that: *“Where appropriate these data can be supplemented by and compared with local measurements of background, although care should be exercised to ensure that the monitoring site is representative of background air quality”*<sup>9</sup>.

7.3.2 For this assessment, the background air quality has been characterised by drawing on information from the following sources:

- Defra maps, which show estimated pollutant concentrations across the UK in 1 km grid squares;
- published results of local authority Review and Assessment (R&A) studies of air quality, including local monitoring and modelling studies;
- results of a site-specific NO<sub>2</sub> diffusion tube survey undertaken within the Site and assessment study area (Appendix 7.4).

7.3.3 A detailed description of how the baseline air quality has been derived for this Proposed Development site is summarised in the following paragraphs.

### Review and Assessment Process

7.3.4 WBC has produced an Air Quality Action Plan (2017 - 2026) was produced in March 2018 and outlines actions to be taken to further improve air quality within the borough. Actions include increased provision of EV charging, improvement of cycle routes and roadside emission testing, detecting and fining of polluting vehicles.

7.3.5 Wokingham Borough Council (WBC) has designated an AQMA covering a section of Wokingham town centre, which comprises the only active AQMA within the borough. This is located approximately 4 km east of the Site. The AQMA located adjacent to the Site, which

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<sup>9</sup> Source: Local Air Quality Management Technical Guidance (TG22).

covered a section of the M4, was revoked in January 2025, suggesting that air quality in this area is improving.

### Local Background Monitoring

- 7.3.6 Monitors at background locations measure concentrations away from the local influence of emission sources and are therefore broadly representative of residential areas within large conurbations. Monitoring at local background locations is considered an appropriate source of data for the purposes of describing baseline air quality for the Site .
- 7.3.7 RPS monitored NO<sub>2</sub> concentrations at a number of urban background locations using passive diffusion tubes. Defra’s total annual-mean NO<sub>2</sub> concentration estimates have been collected for the 1 km grid squares of the monitoring sites and are presented alongside the monitored data in Table 7.7.

**Table 7.7 Passively Monitored Urban Background and Defra Mapped Annual-Mean NO<sub>2</sub> Concentrations**

Monitor Code	Approximate Distance from the Application Site (km)	Concentration (µg.m <sup>-3</sup> )	
		Monitored NO <sub>2</sub>	Estimated Defra Mapped
RPS10	Within Application Boundary	8.2	8.7
RPS11		7.4	10.6
RPS12		10.9	10.6
RPS18		7.7	8.7

All concentrations have been adjusted for bias

### *Appropriate Background Concentrations for the Proposed Development*

- 7.3.8 For NO<sub>2</sub>, the Defra mapped background concentration estimates are generally similar to the range of the results from the monitoring. Monitor RPS12 measured the highest concentration of the range of monitoring locations and also exceeded the Defra estimates. To ensure the assessment is conservative, the background annual-mean NO<sub>2</sub> concentration has been derived from the 10.9 µg.m<sup>-3</sup>, monitored at this site.
- 7.3.9 In the absence of PM<sub>10</sub> and PM<sub>2.5</sub> monitoring at this site, the largest background annual-mean concentration across the study area has been derived from the Defra mapped background concentration estimate.
- 7.3.10 Table 7.8 summarises the annual-mean background concentrations for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> used in this assessment.

**Table 7.8 Summary of Background Annual-Mean (Long-term) Concentrations used in the Assessment**

Pollutant	Data Source	Concentration (µg.m <sup>-3</sup> )
NO <sub>2</sub>	RPS Monitored (2025)	10.9
PM <sub>10</sub>	Defra Mapped (2021) <sup>10</sup>	14.7

<sup>10</sup> Source: Defra - Background Mapping Data for Local Authorities (<https://uk-air.defra.gov.uk/data/laqm-background-home>).

Pollutant	Data Source	Concentration ( $\mu\text{g.m}^{-3}$ )
PM <sub>2.5</sub>		8.0

### Future Baseline

7.3.11 Historically, the view has been that background traffic-related NO<sub>2</sub> concentrations in the UK would reduce over time due to the progressive introduction of improved vehicle technologies and increasingly stringent limits on emissions. After a prolonged period through the last decade where background annual-mean NO<sub>2</sub> concentrations did not generally decrease in line with expectations, the most recent monitoring studies indicate ambient traffic-related NO<sub>2</sub> concentrations are now falling.

7.3.12 However, to ensure that the assessment presents conservative results, no reduction in the NO<sub>2</sub> background has been applied for future years.

7.3.13 The future baseline conditions are therefore conservatively predicted to be as in Table 7.8 above.

## 7.4 Inherent design mitigation

7.4.1 The mitigation measures considered inherent within the design of the Proposed Development for the air quality assessment are as follows:

- Dust Management Plan (DMP), as part of a Construction Environmental Management Plan (CEMP) submitted with the application as appendix 3.7. Note that the DMP and CEMP are not considered as embedded mitigation for purpose of the impact assessment on the basis that the assessment will inform what specific measures need to be included within documents like the DMP and CEMP; and
- Location of proposed sensitive uses (i.e. residential and schools) within the Proposed Development relative to local pollution sources (e.g. M4). The Land Use Parameter Plan provides details pertaining to the proposed location of these uses within the Site and their proximity to the local road network (including the M4).
- Sustainable Travel Plan which will include measures designed to encourage sustainable travel options for new users of the Proposed Development.
- Electric vehicle charging infrastructure to be installed within the Proposed Development.

## 7.5 Potential effects prior to additional mitigation

### Construction Phase

#### Construction Dust

- 7.5.1 The type of activities that could cause fugitive dust emissions are: demolition; earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site.
- 7.5.2 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.
- 7.5.3 The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions). The following assessment, using the IAQM methodology, predicts the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is “not significant”.

#### Source

- 7.5.4 The IAQM dust guidance gives examples of the dust emission magnitudes for demolition, earthworks and construction activities and trackout. These example dust emission magnitudes are based on the site area, building volume, number of HDV movements generated by the activities and the materials used. These example magnitudes have been combined with details of the period of construction activities to provide the ranking for the source magnitude that is set out in Table 7.9

**Table 7.9 Risk Allocation – Source (Dust Emission Magnitude)**

Features of the Source of Dust Emissions	Dust Emission Magnitude
<p><b>Demolition</b> - building over 75,000 m<sup>3</sup>, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities &gt; 12 m above ground level.</p> <p><b>Earthworks</b> – total site area over 110,000 m<sup>2</sup>, potentially dusty soil type (e.g. clay), &gt;10 heavy earth moving vehicles active at any one time, formation of bunds &gt; 6 m in height.</p> <p><b>Construction</b> - total building volume over 75,000 m<sup>3</sup>, activities include piling, on-site concrete batching, sand blasting.</p> <p><b>Trackout</b> – over 50 HDV outwards movements in any one day, potentially dusty surface material (e.g. High clay content), unpaved road length &gt; 100 m.</p>	Large
<p><b>Demolition</b> - building between 12,000 to 75,000 m<sup>3</sup>, potentially dusty construction material and demolition activities 6 - 12 m above ground level.</p> <p><b>Earthworks</b> – total site area between 18,000 to 110,000 m<sup>2</sup>, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 3 - 6 m in height.</p> <p><b>Construction</b> - total building volume between 12,000 and 75,000 m<sup>3</sup>, use of construction materials with high potential for dust release (e.g. concrete), on-site concrete batching.</p> <p><b>Trackout</b> – 20 - 50 HDV outwards movements in any one day, moderately dusty surface material (e.g. High clay content), unpaved road length 50 – 100 m.</p>	Medium

<p><b>Demolition</b> - building less than 12,000 m<sup>3</sup>, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities &lt; 6 m above ground, demolition during winter months.</p> <p><b>Earthworks</b> – total site area less than 18,000 m<sup>2</sup>. Soil type with large grain size (e.g. sand), &lt; 5 heavy earth moving vehicles active at any one time, formation of bunds &lt; 3 m in height.</p> <p><b>Construction</b> - total building volume below 12,000 m<sup>3</sup>, use of construction materials with low potential for dust release (e.g. metal cladding or timber).</p> <p><b>Trackout</b> – &lt; 20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length &lt; 50 m.</p>	Small
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7.5.5 The IAQM methodology combines consideration of the pathway and receptor (outlined in Appendix 7.1) to derive the 'sensitivity of the area'. Table 7.10, Table 7.11, Table 7.12 show how the sensitivity of the area has been derived for this assessment.

**Table 7.10 Sensitivity of the Area to Dust Soiling Effects on People and Property**

Receptor Sensitivity	Number of Receptors <sup>a</sup>	Distance from the Source (m) <sup>b</sup>			
		<20	<50	<100	<250
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

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.  
<sup>a</sup> The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.  
<sup>b</sup> For trackout, the distances have been measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

**Table 7.11 Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration <sup>a</sup>	Number of Receptors <sup>b, c</sup>	Distance from the Source (m) <sup>b</sup>			
			<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
	< 24 µg.m <sup>-3</sup>	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low

		1-10	Low	Low	Low	Low
Medium	> 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
	< 28 µg.m <sup>-3</sup>	>1	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.  
<sup>a</sup> This refers to the background concentration derived from the assessment of baseline conditions later in this report. The concentration categories listed in this column apply to England, Wales and Northern Ireland but not to Scotland.  
<sup>b</sup> The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.  
<sup>c</sup> For high sensitivity receptors with high occupancy (such as schools or hospitals), the approximate number of occupants has been used to derive an equivalent number of receptors.  
<sup>d</sup> For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

**Table 7.12 Sensitivity of the Area to Ecological Impacts**

Receptor Sensitivity	Distance from the Source (m) <sup>a</sup>	
	<20	<50
High	High	High
Medium	Medium	Medium
Low	Low	Low

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout and for each designated site.  
<sup>a</sup> Only the highest level of area sensitivity has been recorded. Local Wildlife Sites are considered to be of low sensitivity due to their local status and designation.

***Risk of Dust Impacts***

Source

- 7.5.6 The volume of the buildings / structures on the Site that would be demolished has been estimated to be greater than 75,000 m<sup>3</sup> <sup>11</sup>. The dust emission magnitude for the demolition phase is therefore classified, using the IAQM dust guidance, as large (Table 7.9).
- 7.5.7 The Site area is 397.4 hectares. As this is greater than 110,000 m<sup>2</sup>, the dust emission magnitude for the earthworks phase is classified as large (Table 7.9).
- 7.5.8 The total volume of the buildings to be constructed would be greater than 75,000 m<sup>3</sup> and the dust emission magnitude for the construction phase is classified as large (Table 7.9).
- 7.5.9 Assuming that the maximum number of outwards movements in any one day is greater than 50 HDVs, the dust emission magnitude for trackout would be classified as large (Table 7.9).

<sup>11</sup> Although the level of demolition has been set at 20,809m<sup>2</sup>, this has been taken as a worst case scenario to allow for any future increase in demolition activity, if necessary.

**Table 7.13 Dust Emission Magnitude for Demolition, Earthworks, Construction and Trackout**

Demolition	Earthworks	Construction	Trackout
Large	Large	Large	Large

Pathway and Receptor - Sensitivity of the Area

7.5.10 All demolition, earthworks and construction activities are conservatively assumed to occur within the entirety of the site boundary. As such, receptors at distances within 20 m, 50 m, 100 m and 250 m of the Site boundary have been identified and are illustrated in Appendix 7.2. The sensitivity of the area has been classified and the results are provided in Table 7.14 below.

**Table 7.14 Sensitivity of the Surrounding Area for Demolition, Earthworks and Construction**

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	Approx. fifteen residential properties on Witcham Close and Bassett Close to the north of the Site. Two residential properties on Copse Barnhill Lane to the east. Multiple residential properties on Church Lane to the south of the Site.  >100 high sensitivity receptors located within 20 m of the Site boundary ( Table 7.10).
Human Health	Medium	Approx. fifteen residential properties on Witcham Close and Bassett Close to the north of the Site. Two residential properties on Copse Barnhill Lane to the east. Multiple residential properties on Church Lane to the south of the Site.  Background PM <sub>10</sub> concentrations for the assessment < 24 µg.m <sup>-3</sup> .  >100 high sensitivity receptors located within 20 m of the site boundary and PM <sub>10</sub> concentrations below 24 µg.m <sup>-3</sup> (Table 7.11).
Ecological	Low	There are a number of Local Wildlife Sites within the Site and within 20m of the Site boundary (Local Wildlife Sites classified as low sensitivity, as outlined in Table 7.12 and Appendix 7.1), No other ecological designated sites were identified.

7.5.11 The Dust Emission Magnitude for trackout is classified as large and trackout may occur on roads up to 250 m from the Site. The major routes within 250 m of the Site to be used by construction vehicles are Arborfield Road, Eastern Relief Road and Mole Road. The sensitivity of the area has been classified and the results are provided in Table 7.15.

**Table 7.15 Sensitivity of the Surrounding Area for Trackout**

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	Between 10 and 100 residential properties aligning Mole Road and Eastern Relief Road.  10 – 100 high sensitivity receptors located within 20 m of the roads (Table 7.10).
Human Health	Medium	Between 10 and 100 residential properties aligning Mole Road and Eastern Relief Road.  Background PM10 concentrations for the assessment = 14.7 µg.m-3  10 – 100 high sensitivity receptors located within 20 m of the roads and PM10 concentrations below 24 µg.m-3 (Table 7.11).
Ecological	Low	There are a number of Local Wildlife Sites within the Site and within 20m of the trackout roads (Local Wildlife Sites classified as low sensitivity, as outlined in (Table 7.12 and Appendix 7.1). No other ecological designated sites were identified.

7.5.12 The Dust Emission Magnitude has been considered in the context of the Sensitivity of the Area (Tables A.5 and A.6) to give the Dust Impact Risk. Table 7.16 summarises the Dust Impact Risk for the four activities.

**Table 7.16 Dust Impact Risk for Demolition, Earthworks, Construction and Trackout**

Source	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	High	Medium	Medium	Medium
Ecology	Medium	Low	Low	Low
<b>Overall Risk</b>	<b>High</b>	<b>High</b>	<b>High</b>	<b>High</b>

7.5.13 Taking the Site as a whole, the overall risk is deemed to be high. The additional mitigation measures appropriate to a level of risk for the site as a whole and for each of the phases are set out in Section 7.6.

7.5.14 See Appendix 7.1. for more detail on the assessment approach and methodology, which varies from conventional EIA significance criteria. The applied methodology conforms with IAQM guidance for the assessment of construction dust.

### Operational Phase - With the Proposed Development only

7.5.15 This section of the report summarises the future operational-phase air quality impacts of the key pollutants associated with the development traffic of the proposed scheme at human receptor locations, taking into account of the inherent design mitigation only. The modelled receptors are outlined in Table 7.4 above. The concentrations predicted at proposed receptors are shown in Table 7.23.

#### *Nitrogen Dioxide (NO<sub>2</sub>)*

7.5.16 Table 7.17 presents the annual-mean NO<sub>2</sub> concentrations predicted at the façades of existing receptors.

**Table 7.17 Predicted Annual-Mean NO<sub>2</sub> Impacts at Existing Receptors**

Receptor ID	Concentration (µg.m <sup>-3</sup> )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.4	14.5	0	Negligible
2	11.9	11.9	0	Negligible
3	11.2	11.2	0	Negligible
4	11.5	11.6	0	Negligible
5	11.6	11.6	0	Negligible
6	11.5	11.5	0	Negligible
7	12.1	12.1	0	Negligible
8	12.2	12.2	0	Negligible
9	12.2	12.2	0	Negligible
10	12.9	13.0	0	Negligible
11	11.7	11.7	0	Negligible
12	11.4	11.4	0	Negligible
13	11.6	11.7	0	Negligible
14	11.2	11.2	0	Negligible
15	11.6	11.6	0	Negligible
16	13.8	13.9	0	Negligible
17	11.3	11.3	0	Negligible
18	11.3	11.3	0	Negligible
19	11.5	11.6	0	Negligible
20	11.1	11.2	0	Negligible
21	11.3	11.4	0	Negligible
22	11.6	11.8	0	Negligible
23	11.3	11.3	0	Negligible
24	11.5	11.5	0	Negligible
25	12.0	12.0	0	Negligible
26	11.6	11.6	0	Negligible
27	11.3	11.3	0	Negligible
28	11.2	11.2	0	Negligible
29	11.5	11.5	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
30	11.1	11.2	0	Negligible
31	11.2	11.2	0	Negligible
32	11.0	11.0	0	Negligible
33	11.5	11.5	0	Negligible
34	11.1	11.1	0	Negligible
35	11.0	11.0	0	Negligible
36	11.1	11.1	0	Negligible
37	11.6	11.6	0	Negligible
38	11.5	11.5	0	Negligible
39	11.5	11.5	0	Negligible
40	11.5	11.5	0	Negligible
41	11.4	11.4	0	Negligible
42	11.5	11.5	0	Negligible
43	11.9	11.9	0	Negligible
44	11.8	11.8	0	Negligible
45	11.4	11.4	0	Negligible
46	11.4	11.5	0	Negligible
47	11.3	11.3	0	Negligible
48	11.4	11.5	0	Negligible
49	11.3	11.3	0	Negligible
<b>Maximum</b>	<b>14.4</b>	<b>14.5</b>	-	-
<b>Minimum</b>	<b>11.0</b>	<b>11.0</b>	-	-

7.5.17 Predicted annual-mean NO<sub>2</sub> concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO<sub>2</sub>. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is described as 'negligible'.

7.5.18 As all predicted annual-mean NO<sub>2</sub> concentrations are below 60  $\mu\text{g.m}^{-3}$ , the hourly-mean objective for NO<sub>2</sub> is likely to be met at all existing receptors. The short-term NO<sub>2</sub> impact can be considered 'negligible' and is not considered further within this assessment.

7.5.19 Overall, the impact on the modelled existing receptors from NO<sub>2</sub> is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

**Particulate Matter (PM<sub>10</sub>)**

7.5.20 Table 7.18 presents the annual-mean PM<sub>10</sub> concentrations predicted at the façades of existing receptors.

**Table 7.18 Predicted Annual-Mean PM<sub>10</sub> Impacts at Existing Receptors**

Receptor ID	Concentration (µg.m <sup>-3</sup> )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	18.8	19.1	1	Negligible
2	15.8	15.9	0	Negligible
3	15.1	15.1	0	Negligible
4	15.8	16.0	0	Negligible
5	15.5	15.5	0	Negligible
6	15.4	15.4	0	Negligible
7	16.4	16.5	0	Negligible
8	16.7	16.8	0	Negligible
9	16.4	16.5	0	Negligible
10	16.5	16.6	0	Negligible
11	15.9	16.0	0	Negligible
12	15.5	15.5	0	Negligible
13	15.9	16.0	0	Negligible
14	15.3	15.3	0	Negligible
15	15.6	15.6	0	Negligible
16	17.1	17.3	0	Negligible
17	15.1	15.1	0	Negligible
18	15.2	15.3	0	Negligible
19	15.6	15.8	0	Negligible
20	15.1	15.2	0	Negligible
21	15.3	15.4	0	Negligible
22	16.0	16.4	1	Negligible
23	15.4	15.5	0	Negligible
24	15.8	15.8	0	Negligible
25	15.7	15.7	0	Negligible
26	15.4	15.4	0	Negligible
27	15.1	15.2	0	Negligible
28	15.0	15.1	0	Negligible
29	15.7	15.7	0	Negligible
30	15.1	15.1	0	Negligible
31	15.2	15.3	0	Negligible
32	14.9	14.9	0	Negligible
33	15.9	15.9	0	Negligible
34	15.1	15.1	0	Negligible
35	14.9	14.9	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
36	15.1	15.1	0	Negligible
37	16.0	16.0	0	Negligible
38	15.6	15.6	0	Negligible
39	15.7	15.8	0	Negligible
40	15.9	16.0	0	Negligible
41	15.5	15.6	0	Negligible
42	15.6	15.7	0	Negligible
43	16.2	16.3	0	Negligible
44	15.5	15.5	0	Negligible
45	15.6	15.6	0	Negligible
46	15.3	15.5	1	Negligible
47	15.2	15.2	0	Negligible
48	15.3	15.5	1	Negligible
49	15.2	15.2	0	Negligible
<b>Maximum</b>	<b>18.8</b>	<b>19.1</b>	-	-
<b>Minimum</b>	<b>14.9</b>	<b>14.9</b>	-	-

7.5.21 Predicted annual-mean  $\text{PM}_{10}$  concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for  $\text{PM}_{10}$ . When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'negligible' at all receptors.

7.5.22 As all predicted annual mean  $\text{PM}_{10}$  concentrations are below  $31.5 \mu\text{g.m}^{-3}$ , the daily-mean  $\text{PM}_{10}$  objective is expected to be met at all existing receptors and the short-term  $\text{PM}_{10}$  impact is not considered further within this assessment.

7.5.23 Overall, the impact on the modelled existing receptors from  $\text{PM}_{10}$  is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

***Fine Particulate Matter (PM<sub>2.5</sub>)***

7.5.24 Table 7.19 presents the annual-mean PM<sub>2.5</sub> concentrations predicted at the façades of existing receptors.

**Table 7.19 Predicted Annual-Mean PM<sub>2.5</sub> Impacts at Existing Receptors**

Receptor ID	Concentration (µg.m <sup>-3</sup> )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	10.4	10.5	2	Moderate
2	8.7	8.7	0	Negligible
3	8.2	8.3	0	Negligible
4	8.7	8.7	1	Negligible
5	8.5	8.5	0	Negligible
6	8.4	8.4	0	Negligible
7	9.0	9.0	0	Negligible
8	9.1	9.2	0	Negligible
9	9.0	9.0	1	Negligible
10	9.1	9.2	1	Negligible
11	8.7	8.7	0	Negligible
12	8.5	8.5	0	Negligible
13	8.7	8.7	1	Negligible
14	8.3	8.4	0	Negligible
15	8.5	8.5	0	Negligible
16	9.5	9.6	1	Slight
17	8.3	8.3	0	Negligible
18	8.3	8.4	1	Negligible
19	8.5	8.6	1	Negligible
20	8.2	8.3	1	Negligible
21	8.3	8.4	1	Negligible
22	8.8	8.9	2	Slight
23	8.4	8.4	0	Negligible
24	8.6	8.6	0	Negligible
25	8.6	8.6	0	Negligible
26	8.4	8.4	0	Negligible
27	8.3	8.3	0	Negligible
28	8.2	8.2	0	Negligible
29	8.6	8.6	0	Negligible
30	8.2	8.3	0	Negligible
31	8.3	8.4	0	Negligible
32	8.1	8.1	0	Negligible
33	8.7	8.7	0	Negligible
34	8.2	8.3	0	Negligible
35	8.1	8.1	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
36	8.2	8.2	0	Negligible
37	8.7	8.8	0	Negligible
38	8.5	8.5	0	Negligible
39	8.6	8.6	0	Negligible
40	8.7	8.7	0	Negligible
41	8.5	8.5	0	Negligible
42	8.6	8.6	0	Negligible
43	8.9	8.9	0	Negligible
44	8.5	8.5	0	Negligible
45	8.5	8.5	0	Negligible
46	8.4	8.5	1	Negligible
47	8.3	8.3	0	Negligible
48	8.4	8.5	1	Negligible
49	8.3	8.3	0	Negligible
<b>Maximum</b>	<b>10.4</b>	<b>10.5</b>	-	-
<b>Minimum</b>	<b>8.1</b>	<b>8.1</b>	-	-

7.5.25 Predicted annual-mean  $\text{PM}_{2.5}$  concentrations in the opening year at the façades of the existing receptors are below the AQS objective of  $10 \mu\text{g.m}^{-3}$  for  $\text{PM}_{2.5}$  at all receptors, barring Receptor 1. The impact descriptor of receptors 16 and 22 are described 'slight' due to the change in concentration in the context of the overall predicted concentration, however concentrations at both receptors fall below the  $10 \mu\text{g.m}^{-3}$  AQS objective. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'moderate' to 'negligible' across the receptors.

7.5.26 Overall, the impact on the modelled existing receptors from  $\text{PM}_{2.5}$  is considered to be 'moderate to negligible', using the criteria adopted for this assessment and based on professional judgement.

### **Cumulative Operational Phase -- Proposed Development and Loddon Valley Garden Village**

7.5.27 This section of the report summarises the future operational-phase air quality impacts of the key pollutants associated with the development traffic of the proposed University of Reading scheme (i.e. Proposed Development) along with the Loddon Valley Garden Village Scheme at human receptor locations.

**Nitrogen Dioxide (NO<sub>2</sub>)**

7.5.28 Table 7.20 presents the annual-mean NO<sub>2</sub> concentrations predicted at the façades of existing receptors.

**Table 7.20 Predicted Annual-Mean NO<sub>2</sub> Impacts at Existing Receptors**

Receptor ID	Concentration (µg.m <sup>-3</sup> )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.4	14.5	0	Negligible
2	11.9	11.9	0	Negligible
3	11.2	11.2	0	Negligible
4	11.5	11.6	0	Negligible
5	11.6	11.6	0	Negligible
6	11.5	11.5	0	Negligible
7	12.1	12.1	0	Negligible
8	12.2	12.2	0	Negligible
9	12.2	12.2	0	Negligible
10	12.9	13.0	0	Negligible
11	11.7	11.7	0	Negligible
12	11.4	11.4	0	Negligible
13	11.6	11.7	0	Negligible
14	11.2	11.2	0	Negligible
15	11.6	11.6	0	Negligible
16	13.8	13.9	0	Negligible
17	11.3	11.3	0	Negligible
18	11.3	11.3	0	Negligible
19	11.5	11.7	0	Negligible
20	11.1	11.2	0	Negligible
21	11.3	11.4	0	Negligible
22	11.6	11.8	0	Negligible
23	11.3	11.3	0	Negligible
24	11.5	11.5	0	Negligible
25	12.0	12.0	0	Negligible
26	11.6	11.6	0	Negligible
27	11.3	11.3	0	Negligible
28	11.2	11.2	0	Negligible
29	11.5	11.5	0	Negligible
30	11.1	11.2	0	Negligible
31	11.2	11.2	0	Negligible
32	11.0	11.0	0	Negligible
33	11.5	11.5	0	Negligible
34	11.1	11.1	0	Negligible
35	11.0	11.0	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
36	11.1	11.1	0	Negligible
37	11.6	11.6	0	Negligible
38	11.5	11.5	0	Negligible
39	11.5	11.5	0	Negligible
40	11.5	11.6	0	Negligible
41	11.4	11.4	0	Negligible
42	11.5	11.5	0	Negligible
43	11.9	11.9	0	Negligible
44	11.8	11.8	0	Negligible
45	11.4	11.4	0	Negligible
46	11.4	11.5	0	Negligible
47	11.3	11.3	0	Negligible
48	11.4	11.5	0	Negligible
49	11.3	11.3	0	Negligible
<b>Maximum</b>	<b>14.4</b>	<b>14.5</b>	-	-
<b>Minimum</b>	<b>11.0</b>	<b>11.0</b>	-	-

7.5.29 Predicted annual-mean NO<sub>2</sub> concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO<sub>2</sub>. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is described as ‘negligible’.

7.5.30 As all predicted annual-mean NO<sub>2</sub> concentrations are below 60  $\mu\text{g.m}^{-3}$ , the hourly-mean objective for NO<sub>2</sub> is likely to be met at all existing receptors. The short-term NO<sub>2</sub> impact can be considered ‘negligible’ and is not considered further within this assessment.

7.5.31 Overall, the impact on the modelled existing receptors from NO<sub>2</sub> is considered to be ‘negligible’, using the criteria adopted for this assessment and based on professional judgement.

**Particulate Matter (PM<sub>10</sub>)**

7.5.32 Table 7.21 presents the annual-mean PM<sub>10</sub> concentrations predicted at the façades of existing receptors.

**Table 7.21 Predicted Annual-Mean PM<sub>10</sub> Impacts at Existing Receptors**

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	18.8	19.1	1	Negligible
2	15.8	15.9	0	Negligible
3	15.1	15.1	0	Negligible
4	15.8	16.0	0	Negligible
5	15.5	15.6	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
6	15.4	15.4	0	Negligible
7	16.4	16.5	0	Negligible
8	16.7	16.8	0	Negligible
9	16.4	16.5	0	Negligible
10	16.5	16.6	0	Negligible
11	15.9	16.0	0	Negligible
12	15.5	15.5	0	Negligible
13	15.9	16.0	0	Negligible
14	15.3	15.3	0	Negligible
15	15.6	15.6	0	Negligible
16	17.1	17.3	1	Negligible
17	15.1	15.1	0	Negligible
18	15.2	15.3	0	Negligible
19	15.6	15.8	1	Negligible
20	15.1	15.2	0	Negligible
21	15.3	15.4	0	Negligible
22	16.0	16.4	1	Negligible
23	15.4	15.5	0	Negligible
24	15.8	15.8	0	Negligible
25	15.7	15.7	0	Negligible
26	15.4	15.4	0	Negligible
27	15.1	15.2	0	Negligible
28	15.0	15.1	0	Negligible
29	15.7	15.7	0	Negligible
30	15.1	15.2	0	Negligible
31	15.2	15.3	0	Negligible
32	14.9	14.9	0	Negligible
33	15.9	16.0	0	Negligible
34	15.1	15.1	0	Negligible
35	14.9	14.9	0	Negligible
36	15.1	15.1	0	Negligible
37	16.0	16.1	0	Negligible
38	15.6	15.6	0	Negligible
39	15.7	15.8	0	Negligible
40	15.9	16.0	0	Negligible
41	15.5	15.6	0	Negligible
42	15.6	15.7	0	Negligible
43	16.2	16.3	0	Negligible
44	15.5	15.5	0	Negligible
45	15.6	15.6	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
46	15.3	15.5	1	Negligible
47	15.2	15.3	0	Negligible
48	15.3	15.5	1	Negligible
49	15.2	15.3	0	Negligible
<b>Maximum</b>	<b>18.8</b>	<b>19.1</b>	-	-
<b>Minimum</b>	<b>14.9</b>	<b>14.9</b>	-	-

7.5.33 Predicted annual-mean  $\text{PM}_{10}$  concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for  $\text{PM}_{10}$ . When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'negligible' at all receptors.

7.5.34 As all predicted annual mean  $\text{PM}_{10}$  concentrations are below  $31.5 \mu\text{g.m}^{-3}$ , the daily-mean  $\text{PM}_{10}$  objective is expected to be met at all existing receptors and the short-term  $\text{PM}_{10}$  impact is not considered further within this assessment.

7.5.35 Overall, the impact on the modelled existing receptors from  $\text{PM}_{10}$  is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

#### ***Fine Particulate Matter ( $\text{PM}_{2.5}$ )***

7.5.36 Table 7.22 presents the annual-mean  $\text{PM}_{2.5}$  concentrations predicted at the façades of existing receptors.

**Table 7.22 Predicted Annual-Mean  $\text{PM}_{2.5}$  Impacts at Existing Receptors**

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	10.4	10.5	2	Moderate
2	8.7	8.7	0	Negligible
3	8.2	8.3	0	Negligible
4	8.7	8.7	1	Negligible
5	8.5	8.5	0	Negligible
6	8.4	8.4	0	Negligible
7	9.0	9.0	0	Negligible
8	9.1	9.2	1	Negligible
9	9.0	9.0	1	Negligible
10	9.1	9.2	1	Negligible
11	8.7	8.8	1	Negligible
12	8.5	8.5	0	Negligible
13	8.7	8.8	1	Negligible
14	8.3	8.4	0	Negligible

Receptor ID	Concentration ( $\mu\text{g.m}^{-3}$ )		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
15	8.5	8.5	0	Negligible
16	9.5	9.6	1	Slight
17	8.3	8.3	0	Negligible
18	8.3	8.4	1	Negligible
19	8.5	8.7	1	Negligible
20	8.2	8.3	1	Negligible
21	8.3	8.4	1	Negligible
22	8.8	8.9	2	Slight
23	8.4	8.4	1	Negligible
24	8.6	8.6	0	Negligible
25	8.6	8.6	0	Negligible
26	8.4	8.4	0	Negligible
27	8.3	8.3	0	Negligible
28	8.2	8.2	0	Negligible
29	8.6	8.6	0	Negligible
30	8.2	8.3	0	Negligible
31	8.3	8.4	0	Negligible
32	8.1	8.1	0	Negligible
33	8.7	8.7	0	Negligible
34	8.2	8.3	0	Negligible
35	8.1	8.1	0	Negligible
36	8.2	8.3	0	Negligible
37	8.7	8.8	0	Negligible
38	8.5	8.6	0	Negligible
39	8.6	8.6	0	Negligible
40	8.7	8.7	1	Negligible
41	8.5	8.5	0	Negligible
42	8.6	8.6	0	Negligible
43	8.9	8.9	0	Negligible
44	8.5	8.5	0	Negligible
45	8.5	8.5	0	Negligible
46	8.4	8.5	1	Negligible
47	8.3	8.3	0	Negligible
48	8.4	8.5	1	Negligible
49	8.3	8.3	0	Negligible
<b>Maximum</b>	<b>10.4</b>	<b>10.5</b>	-	-
<b>Minimum</b>	<b>8.1</b>	<b>8.1</b>	-	-

7.5.37 Predicted annual-mean PM<sub>2.5</sub> concentrations in the opening year at the façades of the existing receptors are below the AQS objective of 10 µg.m<sup>-3</sup> for PM<sub>2.5</sub> at all receptors, barring Receptor 1. The impact descriptor of receptors 16 and 22 are described 'slight' due to the change in concentration in the context of the overall predicted concentration, however concentrations at both receptors fall below the 10 µg.m<sup>-3</sup> AQS objective. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'moderate' to 'negligible' across all receptors.

7.5.38 Overall, the impact on the modelled existing receptors from PM<sub>2.5</sub> is considered to be 'moderate' to 'negligible', using the criteria adopted for this assessment and based on professional judgement.

#### ***Assessment of New Population Exposure (Site Suitability)***

7.5.39 This section of the report summarises the operational-phase air quality impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the site for its proposed uses.

7.5.40 Table 7.23 presents the annual-mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations predicted at the façades of proposed receptors.

**Table 7.23 Predicted NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> Concentrations (µg.m<sup>-3</sup>) at Proposed Receptors**

Receptor ID	Annual-mean NO <sub>2</sub>	Annual-mean PM <sub>10</sub>	Annual-mean PM <sub>2.5</sub>
Proposed 1	11.4	15.9	8.7
Proposed 2	11.2	15.3	8.4
Proposed 3	11.5	15.6	8.5
Proposed 4	11.2	15.4	8.4
Proposed 5	11.7	16.1	8.8
Proposed 6	11.1	15.2	8.3
Proposed 7	10.9	14.8	8.1
Proposed 8	11.1	14.9	8.1
Proposed 9	11.2	15.4	8.4
Proposed 10	11.0	14.9	8.1
<b>Maximum</b>	<b>11.7</b>	<b>15.9</b>	<b>8.7</b>
<b>Minimum</b>	<b>10.9</b>	<b>14.8</b>	<b>8.1</b>

7.5.41 The predicted annual-mean NO<sub>2</sub> concentrations range between 10.9 and 11.7 µg.m<sup>-3</sup>, well below the annual-mean AQS objective of 40 µg.m<sup>-3</sup> at all receptors. Furthermore, as the annual-mean NO<sub>2</sub> concentration is predicted to be less than 60 µg.m<sup>-3</sup>, the hourly-mean AQS objective is expected to be met.

7.5.42 The predicted annual-mean PM<sub>10</sub> concentrations range between 14.8 and 15.9 µg.m<sup>-3</sup>, well below the annual-mean AQS objective of 40 µg.m<sup>-3</sup> at all receptors. Furthermore, as the annual-mean PM<sub>10</sub> concentration is predicted to be less than 31.5 µg.m<sup>-3</sup>, the daily-mean AQS objective for this pollutant is expected to be met.

7.5.43 Predicted annual-mean PM<sub>2.5</sub> concentrations range between 8.1 and 8.7 µg.m<sup>-3</sup>. Predicted concentrations at all receptors are below the annual-mean AQS objective of 10 µg.m<sup>-3</sup>.

## 7.6 Additional Mitigation

### Construction Phase

- 7.6.1 Without mitigation, the resulting construction phase dust impacts risks are considered to be high. The IAQM dust guidance states that with the following highly recommended dust mitigation measures in place, the residual effect will normally be “*not significant*”, and recommends the mitigation is secured by, for example, planning conditions, a legal obligation, or by legislation.
- 7.6.2 The below mitigation measures should be applied during each phase of construction for the Proposed Development and will be secured within the CEMP.

### 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

### Dust Management Plan

- Develop and implement a 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 (all mitigation measures outlined in this section are highly recommended). The desirable measures should be included as appropriate for the Site. The DMP may include monitoring of dust. It should be noted that the inclusion of a DMP document is in an embedded measure for the Proposed Development (see 7.4.1) and that the measures outlined within this section of the ES chapter should be included within the DMP to ensure that relevant site-specific measures have been adopted.

### 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 off-site, and the action taken to resolve the situation in the log book.
- Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

### 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 the site boundary, with cleaning to be provided if necessary.

- Carry out regular dust soiling checks of surfaces such as street furniture, cars and window-sills within 100 m of site boundary.
- 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. Commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. A shorter monitoring period or concurrent upwind and downwind monitoring may be agreed by the local authority. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

#### ***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. Use screening intelligently where possible – e.g. locating site offices between potentially dusty activities and the receptors.
- Erect solid screens or barriers around the site boundary.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean.
- 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.
- Depending on the duration that stockpiles will be present and their size - cover, seed, fence or water 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 un-surfaced 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)
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

### ***Construction 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.
- Use enclosed chutes, conveyors and covered skips, where practicable.
- 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.

### ***High Risk Measures Specific to 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, 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.

### ***High Risk Measures Specific to Earthworks***

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers 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.

### ***High Risk Measures Specific to 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 overflowing during delivery.

### ***High Risk Measures Specific to Trackout***

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as soon as practicable 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 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).
- 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.

### **Operational Phase**

- 7.6.3 The change in pollutant concentrations at existing sensitive human receptors is categorised as “moderate to negligible”. The predicted pollutant concentrations at proposed sensitive human receptors for the Proposed Development are below the AQS objectives.
- 7.6.4 As the moderate adverse impact is restricted to one receptor location only (i.e. receptor 1) for concentrations of PM<sub>2.5</sub>, with all other receptors and pollutants being predicted to experience a slight or negligible impact, alongside the application of a conservative approach whereby no improvement in background air quality has been taken into consideration, the overall air quality effect is considered to be “not significant” for human receptors using professional judgement. On that basis, no mitigation measures are considered necessary.

## **7.7 Residual effects**

### **Construction Phase**

- 7.7.1 Following the implementation of the construction mitigation measures outlined in Section 7.6, and their adoption within the DMP / CEMP, the significance of the residual effect is considered to be negligible.

### **Operational Phase**

- 7.7.2 The change in pollutant concentrations at existing sensitive human receptors is categorised as “moderate to negligible”. The predicted pollutant concentrations at proposed sensitive human receptors for the Proposed Development are below the AQS objectives.
- 7.7.3 As the moderate adverse impact is restricted to one receptor location only (i.e. receptor 1) for concentrations of PM<sub>2.5</sub>, with all other receptors and pollutants being predicted to experience a slight or negligible impact, alongside the application of a conservative approach whereby no

improvement in background air quality has been taken into consideration, the overall air quality effect is considered to be “not significant” for human receptors using professional judgement.

## **7.8 Implications of Climate Change**

- 7.8.1 As discussed in 7.3.13, future changes in baseline conditions would likely reduce the concentrations of pollutants, such as NO<sub>2</sub>, experienced by existing and proposed receptors. It is considered unlikely that climate change will reverse this projected future improvement of baseline air quality.

## **7.9 Cumulative effects**

### **Construction Phase**

- 7.9.1 Cumulative dust effects arising from construction activities could be experienced where construction activities from the Proposed Development, in combination with neighbouring construction sites, overlap at an affected receptor. During the construction phase, there is the potential for cumulative effects with Loddon Valley Garden Village as well as the wider nearby committed developments.
- 7.9.2 All relevant developments which are considered to pose a risk of cumulative effects will have had to undertake a construction dust risk assessment separately relating to their own site activities and associated risks, with the recommendation of site-specific mitigation to reduce residual effects to ‘not significant’. With the effective implementation of appropriate dust suppression / mitigation measures at all relevant overlapping construction sites (adhered to as part of a DMP / CEMP), the risk of cumulative dust effects is considered to be minimal and as a result, no significant effects are anticipated. Residual cumulative effects are, therefore, assessed as ‘negligible’ and ‘not significant’.

### **Operational Phase**

#### ***Loddon Valley Garden Village Strategic Development Location***

- 7.9.3 During the operational phase, cumulative effects have been considered to the extent that the traffic from the full Loddon Valley Garden Village developments has been included in the traffic data provided for this assessment.

#### ***Wider Committed Development***

- 7.9.4 During the operational phase, cumulative effects have been considered to the extent that the traffic from other wider development has also been included in the traffic data provided by ALP for this assessment. The other developments included within the traffic data provided are described in Chapter 17 Transport and Access of this ES.
- 7.9.5 The change in pollutant concentrations at existing sensitive human receptors is categorised as “moderate to negligible”. The predicted pollutant concentrations at proposed sensitive human receptors for the Proposed Development are below the AQS objectives. The overall residual air quality effect is considered to be “not significant” at human receptors using professional judgement.

## 7.10 Summary

7.10.1 The impacts assessed in this air quality assessment include the following.

- The potential impact of dust soiling on dust sensitive receptors arising from demolition, earthworks, construction and trackout.
- The impact of an increase in suspended particulate matter on sensitive human receptors arising from dust emissions generated by onsite construction activities.
- The ecological impact arising from dust emissions generated by onsite construction activities.
- The impact of vehicle emissions on human receptors from existing and proposed (i.e. within the Proposed Development) road links during operation.

7.10.2 Overall, it is concluded that there will be no residual significant effects arising from the Proposed Development during the construction phase in relation to dust emissions, provided that suitable site-specific mitigation measures are implemented as part of the DMP and CEMP.

7.10.3 Moreover, with the effective implementation of appropriate dust suppression / mitigation measures at all relevant overlapping construction sites, the risk of cumulative dust effects is considered to be minimal and as a result no significant effects are anticipated.

7.10.4 During the operational phase (i.e. by 2040), the change in pollutant concentrations at existing sensitive human receptors is categorised as “moderate to negligible” as a result of vehicle emissions associated with the Proposed Development. The predicted pollutant concentrations at proposed sensitive human receptors for the Proposed Development are below the AQS objectives. The overall residual air quality effect at human receptors is considered to be “not significant” using professional judgement.

7.10.5 A summary of effects is set out in Table 7.25.

## 7.11 References

- Defra, 2010, The Air Quality Standards Regulations.
- The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.
- Defra, 2007, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 2.
- Communities and Local Government, February 2025, National Planning Policy Framework.
- EPUK & IAQM, January 2017, Land-Use Planning & Development Control: Planning For Air Quality.
- IAQM, 2024, Guidance on the assessment of dust from demolition and construction.
- IAQM, 2020, A guide to the assessment of air quality impacts on designated nature conservation sites.
- Defra, 2022, Local Air Quality Management Technical Guidance, 2022 (LAQM.TG22).
- British Standard Institute, 1983, BS 6069:Part 2:1983, ISO 4225-1980 Characterization of air quality. Glossary.
- <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/list-of-available-tools/>.
- Drawn from Defra Maps at <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>.
- IAQM, 2012, Air Quality Monitoring in the Vicinity of Demolition and Construction Sites.

## 7.12 Assessor information

**Table 7.24 Assessor Information**

Chapter	Responsibility	Name	Qualifications	Assessor information
Air Quality	RPS	Georgie Coppin	BSc, AMIAQM, AMIEnvSc	Air Quality Consultant with 4 years' experience in residential development and dispersion modelling.
		Dr. Steven Lees	BSc (Hons), PhD, MIAQM, MIEnvSc	Associate Air Quality Consultant with 12 years' experience in air quality.

**Table 7.25 Summary of effects**

Receptor	Receptor sensitivity	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
<b>Construction Phase</b>					
Human Health and Property	High	Increase in suspended particulate matter and deposited dust generated by construction activities.	Mitigation measures related to communications, site management, monitoring, preparing and maintaining the site, operating vehicles/ machinery, construction operation, waste management, demolition, earthworks, construction and trackout.	Negligible	Not Significant
Ecological Receptors	Low				
<b>Operation Phase</b>					
Human Receptors	High	Increase in pollutant concentrations generated by vehicles during operation	No mitigation proposed	Moderate to Negligible	Not Significant

### 7.13 Mitigation commitments Summary

**Table 7.26 Summary for Securing Mitigation**

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
<b>Construction Phase</b>				
Human Health, Property and Ecological Designations	Prevention and reduction of dust and fine particulate matter emissions and deposition during the construction phase by way of site-specific dust control mitigation measures (in accordance with IAQM guidance).	DMP / CEMP	Contractor	LPA
<b>Operation Phase</b>				
N/A	N/A	N/A	N/A	N/A