7 Air Quality

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:

- Construction phase - an evaluation of the temporary effects from fugitive construction dust and construction vehicle exhaust 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 A list of Appendices for this Chapter are as follows:

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

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

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[1] and objectives[2] 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_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), 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.

[1] 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.

[2] 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

Pollutant	Averaging Period	Objective / Limit Values	Not to be Exceeded More Than
Nitrogen Dioxide (NO_2)	1 hour	200 µg.m^{-3}	18 times per calendar year
	Annual	40 µg.m^{-3}	-
Particulate Matter (PM_{10})	24 Hour	50 µg.m^{-3}	35 times per calendar year
	Annual	40 µg.m^{-3}	-
Particulate Matter ($PM_{2.5}$)	Annual	20 µg.m^{-3}	-
		10 µg.m^{-3} to be met by 31st December 2040*	-

Notes:
*The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets out an annual-mean $PM_{2.5}$ target of 10 µg.m^{-3} 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 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 5.2).

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 at Reserved Matters stage. 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).[3]" 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 once the extended study area traffic data is available.

7.2.7 This assessment does not consider the air quality impacts of dust from any contaminated land or buildings. Ground conditions and contamination was scoped out of the EIA and is not considered to be an issue for the site. On this basis, a detailed contamination assessment has not been undertaken as part of the submission.

Summary of Key Pollutants Considered

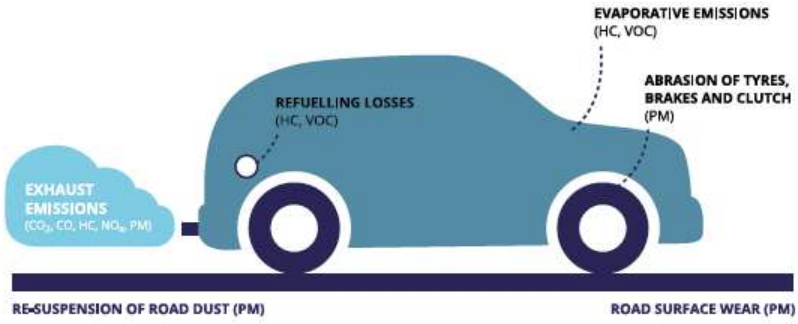
7.2.8 For the construction phase of the Proposed Development a key pollutant is dust, covering both the PM_{10} fraction that is suspended in the air that can be breathed, and the deposited dust that has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects.

7.2.9 For both the construction and operational phases of the Proposed Development, pollutants from road traffic with potential for local air quality impacts are nitrogen oxides (NO_x) and particulate matter (PM_{10}). Emissions of total NO_x from combustion sources comprise nitric oxide (NO) and NO_2. The NO oxidises in the atmosphere to form NO_2. The assessment of impacts from construction vehicle emissions and operational impacts therefore focuses on changes in NO_2 and PM_{10} concentrations. The impact from fine particulate matter, known as $PM_{2.5}$ (a subset of PM_{10}) concentrations has also been considered.

[3] Source: National Planning Policy Guidance, Air Quality

Figure 7.1 Types of Vehicle Emissions[4]

The different types of emissions from vehicles, and a comparison of the relative amounts of selected pollutants released by the latest Euro 6 petrol and diesel vehicles



Construction Phase - Methodology

7.2.10 Dust is the generic term used to describe particulate matter in the size range 1-75 µm in diameter. Particles greater than 75 µm 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_{10} particles, those up to 10 µm 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 µm 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_{10} effects on human

[4] Source: European Environment Agency (2016) Explaining Road Transport Emissions: A Non-technical Guide

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_{10} 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. 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_{10} 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. [5]"*

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'.

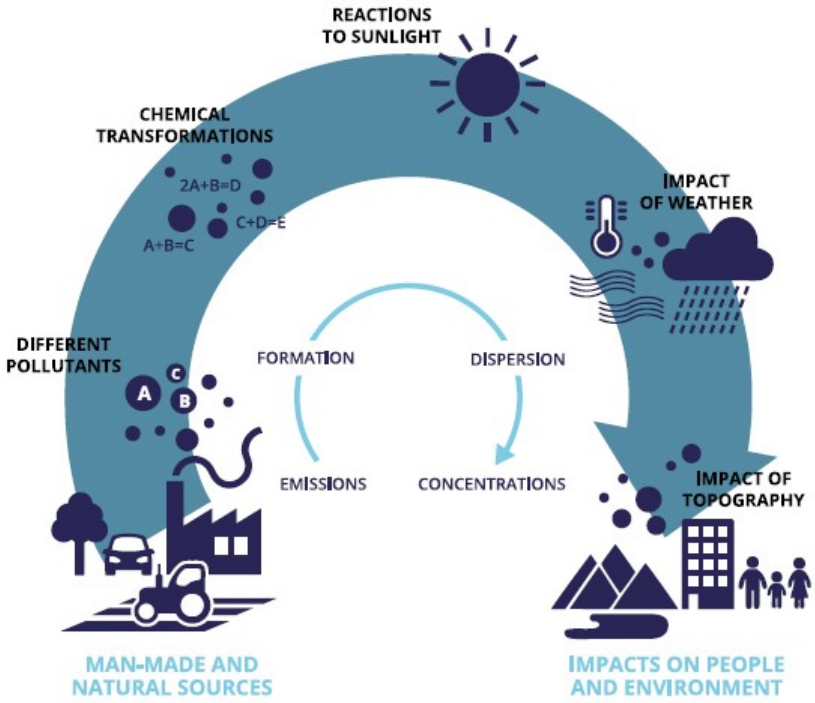
Operational Phase - Methodology

[5] IAQM, Guidance on the assessment of dust from demolition and construction (2024) – Page 4 (Introduction).

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 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[6]



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 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.

[6] Source: European Environment Agency (2016) Explaining Road Transport Emissions: A Non-technical Guide

NO_2 Monitoring Survey

7.2.22 A six-month monitoring survey is currently being undertaken to measure NO_2 concentrations at locations around the Site and study area. This chapter details the atdata collected during the first three months of the monitoring survey, as data for months four to six were not available at the time of writing. An addendum report will be prepared following completion of the monitoring survey, which will contain the full set of monitoring data.

7.2.23 Monitoring of ambient NO_2 concentrations has been undertaken using passive diffusion tubes over a three-month period. Tubes are supplied and analysed by Gradko International, a UKAS accredited laboratory. The diffusion tubes used for the monitoring scheme are prepared using 20% triethanolamine (TEA) absorbent in water, with NO_2 concentrations determined through spectrophotometrical analysis. Diffusion tubes have been deployed as duplicates in order to increase the confidence of the concentrations reported.

7.2.24 The full monitoring scheme will run between 13/05/2025 and 24/11/2025, with each period lasting between four and five weeks.

7.2.25 The monitoring survey and ratification of the results (including annualisation and bias adjustment) from the first three months of monitoring has been undertaken with reference to Defra's Local Air Quality Management Technical Guidance LAQM.TG22. See Appendix 7.3 for further details.

7.2.26 Table 7.2 shows the location of the monitoring diffusion tubes, along with Figure 7.2.4 in Appendix 7.2. Appendix 7.3 presents the diffusion tube data.

Table 7.2 Diffusion Tube Locations

Monitor	X	Y	Distance from Site (km)
1	474432	167743	1.5
2	475888	167749	0.1
3	476828	168474	0.5
4	476321	169045	0.7
5	476508	169610	1.3
6	475040	168001	0.8
7	475230	167466	0.8
8	476164	167221	0.5
9	476471	167817	0.01

Modelled Scenarios

7.2.27 The following scenarios were modelled to represent the year of peak construction, 2032 (as advised by the project transport consultants, i-Trasport). The 2032 scenario includes the operational traffic of 325 dwellings additional to the peak construction traffic flows associated with the Proposed Development:

- Without Development – without the Proposed Development (2032);
- With the Proposed Development only (2032); and

- 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 Valley Garden Village scheme (2032).

7.2.28 The following scenarios were modelled to represent the operational phase. The 2040 scenario includes the operational traffic associated with full occupation of the Proposed Development:

- 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
- 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

7.2.29 Traffic data used in the assessment have been provided by the project's transport consultants, i-Transport. 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 7.3 and Table 7.4. The modelled road links are illustrated in Appendix 7.2.

Table 7.3 Traffic Data Used Within the Assessment – 2032 Model

Road Link ID	Road Link Name	Speed (km.hr^{-1})	Daily Two Way Vehicle Flow					
			Without Development		With Proposed Development		With Full Loddon Valley Garden Village Development	
			Total Vehicles	% HDV	Total Vehicles	% HDV	Total Vehicles	% HDV
1	B3270	112	29492	1	29678	1	30797	1
2	Shinfield Road	48	13396	2	13412	2	14178	2
3	Lower Earley Way	80	26259	1	26418	1	25845	1
4	Hollow Lane	64	7626	<1	7669	<1	8359	<1
5	B3349	48	7446	<1	7476	<1	8015	<1
6	Arborfield Road	48	6470	<1	6572	<1	7684	<1
7	Shinfield Eastern Relief Road	80	10737	3	11013	3	10751	3
8	A327	80	16433	2	16811	2	20440	2
9	Observer Way	64	14981	3	15017	3	14496	3
10	Reading Road	48	770	<1	993	<1	893	<1
11	Church Lane	48	4054	<1	4159	<1	4714	<1
12	Swallowfield Road	48	2459	3	2495	3	2701	3
13	Eversley Road	48	4007	1	4298	1	4010	1
14	School Road	48	248	<1	248	<1	266	<1
15	Sindlesham Road	48	8100	2	8550	2	8791	2
16	Mole Road	64	11903	1	12490	1	10779	1
17	Mill Lane	48	11359	2	11464	2	9295	2
18	King Street Lane (South)	48	17375	1	17604	1	17996	1

19	King Street Lane (North)	48	8021	1	8080	1	8544	1
20	Longdon Road	48	14981	2	15119	2	14496	2
21	Hatch Farm Way	64	14369	2	14502	2	10375	2
22	Internal Access Road	48	-	-	1117	<1	1511	<1
23	Access from Mole Road	48	-	-	802	<1	1848	1
24	Internal Access Road	48	-	-	302	<1	652	<1
25	M4	112	166211	5	166371	5	166045	5

Table 7.4 Traffic Data Used Within the Assessment – 2040 Model

Road Link ID	Road Link Name	Speed (km.hr^{-1})	Daily Two Way Vehicle Flow					
			Without Development		With Gleeson Development		With Gleeson & LGV Development	
			Total Vehicles	% HDV	Total Vehicles	% HDV	Total Vehicles	% HDV
1	B3270	112	31949	1	32111	1	37699	1
2	Shinfield Road	48	14666	2	14688	2	16397	2
3	Lower Earley Way	80	28576	1	28677	1	24254	1
4	Hollow Lane	64	8944	<1	9001	<1	9277	<1
5	B3349	48	8512	<1	8551	<1	10764	<1
6	Arborfield Road	48	7628	<1	7764	<1	10708	<1
7	Shinfield Eastern Relief Road	80	13474	3	13680	3	13639	3
8	A327	80	18389	2	18731	2	22811	2
9	Observer Way	64	17436	3	17484	3	17721	3
10	Reading Road	48	859	<1	995	<1	831	<1
11	Church Lane	48	4865	<1	5005	<1	4399	<1
12	Swallowfield Road	48	2746	3	2794	3	2758	3

13	Eversley Road	48	4260	1	4597	1	4110	1
14	School Road	48	281	<1	281	<1	318	<1
15	Sindlesham Road	48	8637	2	9027	1	9573	2
16	Mole Road	64	13225	1	13759	1	14191	1
17	Mill Lane	48	12507	2	12647	2	11536	2
18	King Street Lane (South)	48	19482	1	19749	1	18638	1
19	King Street Lane (North)	48	8603	1	8682	1	8753	1
20	Longdon Road	48	17436	2	17620	2	17721	2
21	Hatch Farm Way	64	16438	2	16578	2	14368	2
22	Internal Access Road	48	-	-	1489	<1	1771	<1
23	Access from Mole Road	48	-	-	1069	<1	4063	<1
24	Internal Access Road	48	-	-	403	<1	3256	<1
25	M4	112	192655	5	192664	5	192154	4

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

7.2.30 The average speed on each road has been reduced by 10 km.hr^{-1} (or to 20 km.hr^{-1} 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

7.2.31 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

7.2.32 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 Figure 7.2.

Receptors

7.2.33 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).

7.2.34 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 7.5.

Table 7.5 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 public might reasonably be expected to spend one hour or more.	Kerbside sites where the public would not be expected to have regular access.

	Any outdoor locations to which the public might reasonably be expected to spend 1-hour or longer.	

7.2.35 Representative existing sensitive receptors (i.e. outside of the 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 7.6 and shown in Appendix 7.2, Figure 7.1: Modelled Road Links and Receptors.

Table 7.6 Modelled Sensitive Receptors

ID	Description	x	y
1	Residential	473233	169302
2	Residential	473325	168183
3	Residential	473441	167942
4	Residential	473632	167846
5	School	473354	167700
6	Residential	473894	168724
7	Residential	474441	167735
8	Residential	475084	167521
9	Residential	475794	167755
10	Residential	476106	167125
11	Residential	476417	166987
12	Residential	476217	166959
13	Residential	475781	166789
14	Residential	476362	166346
15	Residential	477191	166822
16	Residential	476588	168035
17	Residential	477185	169472
18	Residential	476756	170296
19	Residential	477744	170030
20	Residential	477926	170173
21	Residential	477134	170825
22	Residential	473876	169452
Proposed 1	Residential	475973	167786
Propsoed 2	Residential	476113	167751
Proposed 3	Residential	476270	167779
Proposed 4	Residential	476426	167836
Proposed 5	Residential	476470	167959
Proposed 6	Residential	476228	168032
Proposed 7	Residential	476151	167946

7.2.36 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

7.2.37 Annual-mean NO_x and PM_{10} concentrations have been predicted at representative sensitive receptors using ADMS-Roads, then added to relevant background concentrations. Primary NO in the NO_X emissions is converted to NO_2 to a degree determined by the availability of atmospheric oxidants locally and the strength of sunlight. Annual-mean NO_2 concentrations have been derived from the modelled road-related annual-mean NO_x concentration using Defra's calculator.

Short-Term Pollutant Predictions

7.2.38 In order to predict the likelihood of exceedances of the hourly-mean AQS objectives for NO_2 and the daily-mean AQS objective for PM_{10}, the following relationships between the short-term and the annual-mean values at each receptor have been considered.

Hourly-Mean AQS Objective for NO_2

7.2.39 Research undertaken in support of LAQM.TG22 has indicated that the hourly-mean limit value and objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60 $\mu g.m^{-3}$. The threshold of 60 $\mu g.m^{-3}$ NO_2 has been used as the guideline for considering a likely exceedance of the hourly-mean nitrogen dioxide objective.

Daily-Mean AQS Objective for PM_{10}

7.2.40 The number of exceedances of the daily-mean AQS objective for PM_{10} of 50 $\mu g.m^{-3}$ may be estimated using the relationship set out in LAQM.TG22:

7.2.41 Number of Exceedances of Daily Mean of 50 $\mu g.m^{-3}$ = -18.5 + 0.00145 * (Predicted Annual-mean $PM_{10})^3$ + (206 / Predicted Annual-mean PM^{10} Concentration)

7.2.42 This relationship indicates that the daily-mean AQS objective for PM^{10} is likely to be met if the predicted annual-mean PM_{10} concentration is 31.8 $\mu g.m^{-3}$ or less.

7.2.43 The daily mean objective is therefore not considered further within this assessment if the annual-mean PM_{10} concentration is predicted to be less than 31.5 $\mu g.m^{-3}$.

Fugitive PM_{10} Emissions

7.2.44 Transport PM_{10} and $PM_{2.5}$ 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

7.2.45 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. [7]"

7.2.46 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 7.7 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 7.7 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.

7.2.47 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'*

[7] EPUK & IAQM, Land-Use Planning & Development Control: Planning For Air Quality (2017) – Paragraph 6.1

or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances. [8]"

7.2.48 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 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)

7.2.49 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

7.2.50 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_{10}), alongside effects on human health and ecological habitats, for receptors located within 250 m of onsite construction activities.

7.2.51 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

7.2.52 In accordance with EPUK & IAQM guidance, an assessment of traffic emissions includes all roads which are anticipated to experience the following change 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.

7.2.53 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

7.2.54 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;

[8] EPUK & IAQM, Land-Use Planning & Development Control: Planning For Air Quality (2017) – Paragraph 7.4

- Assessment of the construction and operational impacts of the scheme in 2032 (relating to road traffic emissions), when 325 dwellings are occupied and construction is ongoing; and,
- Assessment of the operational impacts of the scheme when fully operational in 2040 (relating to road traffic emissions).

Consultation

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

Assumptions and Limitations

7.2.56 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).

7.2.57 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.

7.2.58 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.

7.2.59 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.

7.2.60 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.

7.2.61 For the verification and adjustment of NOx/NO_2 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.

7.2.62 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.

7.2.63 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 7.8.

Table 7.8 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 Defra mapped concentration estimates.	The background concentration is the major proportion of the total predicted concentration. 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.
	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.	
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.	

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

7.2.64 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.

7.2.65 As the site-specific NO_2 monitoring scheme is currently ongoing an addendum report will be prepared following completion of the monitoring survey, which will contain the full set of monitoring data. It should be noted that the baseline and impact assessments for the Proposed Development (as presented within this Chapter) will also be updated once the monitoring survey is completed.

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*[9]".

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_2 diffusion tube survey undertaken within the Site and assessment study area (see 7.2.22 to 7.2.26 and 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 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_2 concentrations at a number of urban background locations using passive diffusion tubes. Defra's total annual-mean NO_2 concentration estimates have been collected for the 1 km grid squares of the monitoring sites and are presented alongside the monitored data in Table 7.9.

[9] DEFRA, Local Air Quality Management Technical Guidance (TG22) – Paragraph 7.73.

Table 7.9 Passively Monitored Urban Background and Defra Mapped Annual-Mean NO_2 Concentrations

Monitor Code	Approximate Distance from the Application Site (km)	Concentration (µg.m^{-3})	
		Monitored NO_2	Estimated Defra Mapped
RPS4	0.6	8.4	8.7
RPS5	1.3	8.2	10.6
RPS6	0.85	8.8	8.7

All concentrations have been adjusted for bias

Appropriate Background Concentrations for the Proposed Development

7.3.8 For NO_2, the results from monitoring are generally similar to the range of Defra mapped background concentration estimates (with the exception of RPS5). To ensure the assessment is conservative, the background annual-mean NO_2 concentration has been derived from the 10.6 µg.m^{-3}, estimated by Defra mapped.

7.3.9 In the absence of PM_{10} and $PM_{2.5}$ 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 7.10 summarises the annual-mean background concentrations for NO_2, PM_{10} and $PM_{2.5}$ used in this assessment.

Table 7.10 Summary of Background Annual-Mean (Long-term) Concentrations used in the Assessment

Pollutant	Data Source	Concentration (µg.m^{-3})
NO_2	Defra Mapped (2021)	10.6
PM_{10}		12.6
$PM_{2.5}$		7.3

Future Baseline

7.3.11 Historically the view has been that background traffic-related NO_2 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_2 concentrations did not generally decrease in line with expectations, the most recent monitoring studies indicate ambient traffic-related NO_2 concentrations are now falling.

7.3.12 However, to ensure that the assessment presents conservative results, no reduction in the NO_2 background has been applied for future years .

7.3.13 The future baseline conditions are therefore conservatively predicted to be as in Table 7.10 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) to be secured through a suitably worded planning condition. Note that the DMP and CEMP are not considered as embedded mitigation for the purposes 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;
- Location of proposed sensitive uses (i.e. residential) within the Proposed Development site relative to local pollution sources (e.g. local road network). 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;
- Sustainable Travel Plan which will include measures designed to encourage sustainable travel options for new users of the Proposed Development; and
- 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 7.11.

Table 7.11 Risk Allocation – Source (Dust Emission Magnitude)

Features of the Source of Dust Emissions	Dust Emission Magnitude
Demolition - building over 75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities > 12 m above ground level.	Large

Earthworks – total site area over 110,000 m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds > 6 m in height. **Construction** - total building volume over 75,000 m^3, activities include piling, on-site concrete batching, sand blasting. **Trackout** – over 50 HDV outwards movements in any one day, potentially dusty surface material (e.g. High clay content), unpaved road length > 100 m.	
Demolition - building between 12,000 to 75,000 m^3, potentially dusty construction material and demolition activities 6 - 12 m above ground level. **Earthworks** – total site area between 18,000 to 110,000 m^2, 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. **Construction** - total building volume between 12,000 and 75,000 m^3, use of construction materials with high potential for dust release (e.g. concrete), on-site concrete batching. **Trackout** – 20 - 50 HDV outwards movements in any one day, moderately dusty surface material (e.g. High clay content), unpaved road length 50 – 100 m.	Medium
Demolition - building less than 12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities < 6 m above ground, demolition during winter months. **Earthworks** – total site area less than 18,000 m^2. Soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 3 m in height. **Construction** - total building volume below 12,000 m^3, use of construction materials with low potential for dust release (e.g. metal cladding or timber). **Trackout** – < 20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.	Small

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 7.12, 0 and Table 7.14 show how the sensitivity of the area has been derived for this assessment.

Table 7.12 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors [a]	Distance from the Source (m) [b]			
		<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.
[a] 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.
[b] 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 7.13 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration [a]	Number of Receptors [b, c]	Distance from the Source (m) [b]			
			<20	<50	<100	<250
High	> 32 µg.m^{-3}	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28 - 32 µg.m^{-3}	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24 - 28 µg.m^{-3}	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	< 24 µg.m^{-3}	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	> 32 µg.m^{-3}	>10	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	28 – 32 µg.m^{-3}	> 10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	< 28 µg.m^{-3}	>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.
[a] 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.
[b] 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.
[c] 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.
[d] 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 7.14 Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m) [a]	
	<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.
a Only the highest level of area sensitivity has been recorded.

Risk of Dust Impacts

Source

7.5.6 The volume of the buildings / structures on Site that would be demolished has been estimated to be zero. Therefore, demolition has not been considered any further within this assessment.

7.5.7 The site area is greater than 110,000 m^2. The dust emission magnitude for the earthworks phase is classified as large (as outlined in Table 7.11).

7.5.8 The total volume of the buildings to be constructed would be greater than 75,000 m^3 and the dust emission magnitude for the construction phase is classified as large (as outlined in Table 7.11).

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 (as outlined in Table 7.11).

Table 7.15 Dust Emission Magnitude for Earthworks, Construction and Trackout

Earthworks	Construction	Trackout
Large	Large	Large

Pathway and Receptor - Sensitivity of the Area

7.5.10 All 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 7.16 below.

Table 7.16 Sensitivity of the Surrounding Area for Earthworks and Construction

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	Medium	Approx. two residential properties on Arborfield Church to the west of the site. 1 - 10 high sensitivity receptors located within 20 m of the site boundary (Table 7.12)
Human Health	Low	Approx. two residential properties on Arborfield Church to the west of the site. Background PM_{10} concentrations for the assessment < 24 $\mu g.m^{-3}$. 1 - 10 high sensitivity receptors located within 20 m of the site boundary and PM_{10} concentrations below 24 $\mu g.m^{-3}$ (Table 7.13).
Ecological	Low	Ancient Woodland within 20 m of site boundary (Ancient Woodland classified as low sensitivity, as outlined in Table 7.14 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 Mole Road, Sindlesham Road and the Eastern Relief Road. The sensitivity of the area has been classified and the results are provided in Table 7.17 below.

Table 7.17 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 7.12).
Human Health	Low	Between 10 and 100 residential properties aligning Mole Road and Eastern Relief Road. Background PM_{10} concentrations for the assessment = 14.7 $\mu g.m^{-3}$ 10 – 100 high sensitivity receptors located within 20 m of the roads and PM_{10} concentrations below 24 $\mu g.m^{-3}$ (Table 7.13).
Ecological	Low	There is Ancient Woodland within 20m of the trackout routes (Ancient Woodland classified as low sensitivity, as outlined in Table 7.14 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 7.1.5 and 7.1.6 within Appendix 7.1) to give the Dust Impact Risk. Table 7.18 summarises the Dust Impact Risk for the relevant activities.

Table 7.18 Dust Impact Risk for Earthworks, Construction and Trackout

Source	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	High
Human Health	Low	Low	Low
Ecology	Low	Low	Low
Overall Risk	**Medium**	**Medium**	**High**

7.5.13 Taking the site as a whole, the overall risk is deemed to be medium to high. The 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 **Error! Reference source not found.**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.

Peak of Construction Phase, 2032 – With the Proposed Development Only

7.5.15 This section of the report summarises the future construction / 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 7.6 above. The concentrations predicted at proposed receptors are shown in Table 7.25.

Nitrogen Dioxide (NO_2)

7.5.16 Table 7.19 presents the annual-mean NO_2 concentrations predicted at the façades of existing receptors.

Table 7.19 Predicted Annual-Mean NO_2 Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	13.4	13.4	<1	Negligible
2	11.4	11.4	<1	Negligible
3	11.6	11.6	<1	Negligible
4	11.1	11.1	<1	Negligible
5	11.3	11.3	<1	Negligible
6	11.7	11.7	<1	Negligible
7	11.6	11.7	<1	Negligible
8	10.9	10.9	<1	Negligible
9	11.1	11.1	<1	Negligible
10	11.1	11.1	<1	Negligible
11	10.8	10.8	<1	Negligible
12	11.3	11.3	<1	Negligible
13	11.0	11.0	<1	Negligible
14	11.0	11.0	<1	Negligible
15	10.7	10.7	<1	Negligible
16	11.4	11.5	<1	Negligible
17	11.5	11.6	<1	Negligible
18	11.5	11.5	<1	Negligible
19	12.2	12.2	<1	Negligible
20	12.6	12.6	<1	Negligible
21	11.6	11.6	<1	Negligible
22	16.8	16.8	<1	Negligible
Maximum	**16.8**	**16.8**	-	-
Minimum	**10.7**	**10.7**	-	-

7.5.17 Predicted annual-mean NO_2 concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO_2. 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_2 concentrations are below 60 $\mu g.m^{-3}$, the hourly-mean objective for NO_2 is likely to be met at all existing receptors. The short-term NO_2 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_2 is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Particulate Matter (PM_{10})

7.5.20 Table 7.20 presents the annual-mean PM_{10} concentrations predicted at the façades of existing receptors.

Table 7.20 Predicted Annual-Mean PM_{10} Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.4	14.4	<1	Negligible
2	13.2	13.2	<1	Negligible
3	13.4	13.4	<1	Negligible
4	12.9	12.9	<1	Negligible
5	13.1	13.1	<1	Negligible
6	13.1	13.1	<1	Negligible
7	13.2	13.2	<1	Negligible
8	12.8	12.8	<1	Negligible
9	13.0	13.0	<1	Negligible
10	12.9	13.0	<1	Negligible
11	12.7	12.7	<1	Negligible
12	13.1	13.2	<1	Negligible
13	12.9	12.9	<1	Negligible
14	12.9	12.9	<1	Negligible
15	12.6	12.6	<1	Negligible
16	13.2	13.2	<1	Negligible
17	13.2	13.3	<1	Negligible
18	13.3	13.3	<1	Negligible
19	13.9	13.9	<1	Negligible
20	14.0	14.1	<1	Negligible
21	13.2	13.2	<1	Negligible
22	14.9	14.9	<1	Negligible
Maximum	**14.9**	**14.9**	-	-
Minimum	**12.6**	**12.6**	-	-

7.5.21 Predicted annual-mean PM_{10} concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for 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 PM_{10} concentrations are below 31.5 $\mu g.m^{-3}$, the daily-mean PM_{10} objective is expected to be met at all receptors and the short-term PM_{10} impact is not considered further within this assessment.

7.5.23 Overall, the impact on the surrounding area from PM_{10} is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Fine Particulate Matter ($PM_{2.5}$)

7.5.24 Table 7.21 presents the annual-mean $PM_{2.5}$ concentrations predicted at the façades of existing receptors.

Table 7.21 Predicted Annual-Mean $PM_{2.5}$ Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	8.3	8.3	<1	Negligible
2	7.6	7.6	<1	Negligible
3	7.7	7.7	<1	Negligible
4	7.5	7.5	<1	Negligible
5	7.6	7.6	<1	Negligible
6	7.6	7.6	<1	Negligible
7	7.6	7.6	<1	Negligible
8	7.4	7.4	<1	Negligible
9	7.5	7.5	<1	Negligible
10	7.5	7.5	<1	Negligible
11	7.4	7.4	<1	Negligible
12	7.6	7.6	<1	Negligible
13	7.5	7.5	<1	Negligible
14	7.5	7.5	<1	Negligible
15	7.3	7.3	<1	Negligible
16	7.6	7.6	<1	Negligible
17	7.7	7.7	<1	Negligible
18	7.7	7.7	<1	Negligible
19	8.0	8.0	<1	Negligible
20	8.1	8.1	<1	Negligible
21	7.7	7.7	<1	Negligible
22	8.7	8.7	<1	Negligible
Maximum	**8.7**	**8.7**	**-**	**-**
Minimum	**7.3**	**7.3**	**-**	**-**

7.5.25 Predicted annual-mean $PM_{2.5}$ concentrations in the opening year at the façades of the existing receptors are below the AQS objective for $PM_{2.5}$ at all receptors. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'negligible' across the receptors.

Cumulative Construction Phase, 2032 – Proposed Development and Loddon Valley Garden Village Scheme

7.5.26 This section of the report summarises the future construction / operational-phase air quality impacts of the key pollutants associated with the development traffic of the Proposed Development and wider Loddon Valley Garden Village Scheme at human receptor locations, taking into account the inherent design mitigation only.

Nitrogen Dioxide (NO_2)

7.5.27 Table 7.22 presents the annual-mean NO_2 concentrations predicted at the façades of existing receptors.

Table 7.22 Predicted Annual-Mean NO_2 Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	13.4	13.5	<1	Negligible
2	11.4	11.4	<1	Negligible
3	11.6	11.7	<1	Negligible
4	11.1	11.1	<1	Negligible
5	11.3	11.3	<1	Negligible
6	11.7	11.7	<1	Negligible
7	11.6	11.9	1	Negligible
8	10.9	10.9	<1	Negligible
9	11.1	11.1	<1	Negligible
10	11.1	11.2	<1	Negligible
11	10.8	10.8	<1	Negligible
12	11.3	11.3	<1	Negligible
13	11.0	11.0	<1	Negligible
14	11.0	11.0	<1	Negligible
15	10.7	10.7	<1	Negligible
16	11.4	11.4	<1	Negligible
17	11.5	11.5	<1	Negligible
18	11.5	11.4	<1	Negligible
19	12.2	12.3	<1	Negligible
20	12.6	12.5	<1	Negligible
21	11.6	11.4	1	Negligible
22	16.8	16.8	<1	Negligible
Maximum	**16.8**	**16.8**	**-**	**-**
Minimum	**10.7**	**10.7**	**-**	**-**

7.5.28 Predicted annual-mean NO_2 concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO_2. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is described as ‘negligible’.

7.5.29 As all predicted annual-mean NO_2 concentrations are below 60 $\mu g.m^{-3}$, the hourly-mean objective for NO_2 is likely to be met at all receptors. The short-term NO_2 impact can be considered 'negligible' and is not considered further within this assessment.

7.5.30 Overall, the impact on the surrounding area from NO_2 is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Particulate Matter (PM_{10})

7.5.31 Table 7.23 presents the annual-mean PM_{10} concentrations predicted at the façades of existing receptors.

Table 7.23 Predicted Annual-Mean PM_{10} Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.4	14.5	<1	Negligible
2	13.2	13.2	<1	Negligible
3	13.4	13.5	<1	Negligible
4	12.9	13.0	<1	Negligible
5	13.1	13.2	<1	Negligible
6	13.1	13.1	<1	Negligible
7	13.2	13.3	<1	Negligible
8	12.8	12.8	<1	Negligible
9	13.0	13.0	<1	Negligible
10	12.9	13.0	<1	Negligible
11	12.7	12.7	<1	Negligible
12	13.1	13.1	<1	Negligible
13	12.9	12.9	<1	Negligible
14	12.9	12.9	<1	Negligible
15	12.6	12.6	<1	Negligible
16	13.2	13.1	<1	Negligible
17	13.2	13.2	<1	Negligible
18	13.3	13.2	<1	Negligible
19	13.9	13.9	<1	Negligible
20	14.0	14.0	<1	Negligible
21	13.2	13.1	<1	Negligible
22	14.9	14.8	<1	Negligible
Maximum	**14.9**	**14.8**	**-**	**-**
Minimum	**12.6**	**12.6**	**-**	**-**

7.5.32 Predicted annual-mean PM_{10} concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for 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.

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

7.5.34 Overall, the impact on the surrounding area from PM_{10} is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Fine Particulate Matter ($PM_{2.5}$)

7.5.35 Table 7.24 presents the annual-mean $PM_{2.5}$ concentrations predicted at the façades of existing receptors.

Table 7.24 Predicted Annual-Mean $PM_{2.5}$ Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	8.3	8.4	<1	Negligible
2	7.6	7.6	<1	Negligible
3	7.7	7.8	<1	Negligible
4	7.5	7.5	<1	Negligible
5	7.6	7.6	<1	Negligible
6	7.6	7.6	<1	Negligible
7	7.6	7.7	<1	Negligible
8	7.4	7.4	<1	Negligible
9	7.5	7.5	<1	Negligible
10	7.5	7.5	<1	Negligible
11	7.4	7.4	<1	Negligible
12	7.6	7.6	<1	Negligible
13	7.5	7.5	<1	Negligible
14	7.5	7.5	<1	Negligible
15	7.3	7.3	<1	Negligible
16	7.6	7.6	<1	Negligible
17	7.7	7.6	<1	Negligible
18	7.7	7.6	<1	Negligible
19	8.0	8.0	<1	Negligible
20	8.1	8.1	<1	Negligible
21	7.7	7.6	<1	Negligible
22	8.7	8.6	<1	Negligible
Maximum	**8.7**	**8.6**	-	-
Minimum	**7.3**	**7.3**	-	-

7.5.36 Predicted annual-mean $PM_{2.5}$ concentrations in the opening year at the façades of the existing receptors are below the AQS objective for $PM_{2.5}$ at all receptors. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'negligible' across the receptors.

Assessment of New Population Exposure, 2032 – Proposed Development and Loddon Valley Garden Village Scheme (Site Suitability)

7.5.37 This section of the report summarises the construction / 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.

7.5.38 Table 7.25 presents the annual-mean NO_2, PM_{10} and $PM_{2.5}$ concentrations predicted at the façades of proposed receptors.

Table 7.25 Predicted NO_2, PM_{10} and $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) at Proposed Receptors

Receptor ID	Annual-mean NO_2	Annual-mean PM_{10}	Annual-mean $PM_{2.5}$
Proposed 1	11.3	13.1	7.6
Propsoed 2	11.2	13.0	7.6
Proposed 3	12.1	13.6	7.9
Proposed 4	12.2	13.7	7.9
Proposed 5	10.9	12.8	7.4
Proposed 6	10.9	12.8	7.4
Proposed 7	11.0	12.9	7.5
Maximum	**12.2**	**13.7**	**7.9**
Minimum	**10.9**	**12.8**	**7.4**

7.5.39 The predicted annual-mean NO_2 concentrations range between 10.9 and 12.2 $\mu g.m^{-3}$, well below the annual-mean AQS objective of 40 $\mu g.m^{-3}$ at all receptors. Furthermore, as the annual-mean NO_2 concentration is predicted to be less than 60 $\mu g.m^{-3}$, the hourly-mean AQS objective is expected to be met.

7.5.40 The predicted annual-mean PM10 concentrations range between 12.8 and 13.7 $\mu g.m^{-3}$, well below the annual-mean AQS objective of 40 $\mu g.m^{-3}$ at all receptors. Furthermore, as the annual-mean PM_{10} concentration is predicted to be less than 31.5 $\mu g.m^{-3}$, the daily-mean AQS objective for this pollutant is expected to be met.

7.5.41 Predicted annual-mean $PM_{2.5}$ concentrations range between 7.4 and 7.9 $\mu g.m^{-3}$. Predicted concentrations at all receptors are below the annual-mean AQS objective of 20 $\mu g.m^{-3}$.

Operational Phase, 2040 – With the Proposed Development Only

7.5.42 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 Development taking into account of the inherent design mitigation only.

Nitrogen Dioxide (NO_2)

7.5.43 0 presents the annual-mean NO_2 concentrations predicted at the façades of existing receptors.

Table 7.26 Predicted Annual-Mean NO_2 Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	11.9	11.9	<1	Negligible
2	10.9	10.9	<1	Negligible
3	11.0	11.0	<1	Negligible
4	10.8	10.8	<1	Negligible
5	10.9	10.9	<1	Negligible
6	11.2	11.2	<1	Negligible
7	11.2	11.2	<1	Negligible
8	10.8	10.8	<1	Negligible
9	10.8	10.8	<1	Negligible
10	10.8	10.9	<1	Negligible
11	10.7	10.7	<1	Negligible
12	10.9	10.9	<1	Negligible
13	10.8	10.8	<1	Negligible
14	10.8	10.8	<1	Negligible
15	10.7	10.7	<1	Negligible
16	11.0	11.0	<1	Negligible
17	11.1	11.1	<1	Negligible
18	11.0	11.0	<1	Negligible
19	11.4	11.4	<1	Negligible
20	11.6	11.6	<1	Negligible
21	11.2	11.2	<1	Negligible
22	13.9	13.9	<1	Negligible
Maximum	**13.9**	**13.9**	-	-
Minimum	**10.7**	**10.7**	-	-

7.5.44 Predicted annual-mean NO_2 concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO_2. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is described as 'negligible'.

7.5.45 As all predicted annual-mean NO_2 concentrations are below 60 µg.m^{-3}, the hourly-mean objective for NO_2 is likely to be met at all receptors. The short-term NO_2 impact can be considered 'negligible' and is not considered further within this assessment.

7.5.46 Overall, the impact on the surrounding area from NO_2 is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Particulate Matter (PM_{10})

7.5.47 Table 7.27 presents the annual-mean PM_{10} concentrations predicted at the façades of existing receptors.

Table 7.27 Predicted Annual-Mean PM_{10} Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.5	14.5	<1	Negligible
2	13.2	13.2	<1	Negligible
3	13.5	13.5	<1	Negligible
4	13.0	13.0	<1	Negligible
5	13.2	13.2	<1	Negligible
6	13.2	13.2	<1	Negligible
7	13.2	13.2	<1	Negligible
8	12.8	12.8	<1	Negligible
9	13.0	13.0	<1	Negligible
10	13.0	13.0	<1	Negligible
11	12.7	12.7	<1	Negligible
12	13.1	13.2	<1	Negligible
13	12.9	12.9	<1	Negligible
14	12.9	12.9	<1	Negligible
15	12.6	12.6	<1	Negligible
16	13.2	13.2	<1	Negligible
17	13.3	13.3	<1	Negligible
18	13.3	13.3	<1	Negligible
19	14.0	14.0	<1	Negligible
20	14.2	14.2	<1	Negligible
21	13.3	13.3	<1	Negligible
22	15.1	15.1	<1	Negligible
Maximum	**15.1**	**15.1**	**-**	**-**
Minimum	**12.6**	**12.6**	**-**	**-**

7.5.48 Predicted annual-mean PM_{10} concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for 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.

7.5.49 As all predicted annual mean PM_{10} concentrations are below 31.5 µg.m^{-3}, the daily-mean PM_{10} objective is expected to be met at all receptors and the short-term PM_{10} impact is not considered further within this assessment.

7.5.50 Overall, the impact on the surrounding area from PM_{10} is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Fine Particulate Matter ($PM_{2.5}$)

7.5.51 Table 7.28 presents the annual-mean $PM_{2.5}$ concentrations predicted at the façades of existing receptors.

Table 7.28 Predicted Annual-Mean $PM_{2.5}$ Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	8.4	8.4	<1	Negligible
2	7.7	7.7	<1	Negligible
3	7.8	7.8	<1	Negligible
4	7.5	7.5	<1	Negligible
5	7.6	7.6	<1	Negligible
6	7.7	7.7	<1	Negligible
7	7.7	7.7	<1	Negligible
8	7.4	7.4	<1	Negligible
9	7.5	7.5	<1	Negligible
10	7.5	7.5	<1	Negligible
11	7.4	7.4	<1	Negligible
12	7.6	7.6	<1	Negligible
13	7.5	7.5	<1	Negligible
14	7.5	7.5	<1	Negligible
15	7.3	7.3	<1	Negligible
16	7.6	7.7	<1	Negligible
17	7.7	7.7	<1	Negligible
18	7.7	7.7	<1	Negligible
19	8.1	8.1	<1	Negligible
20	8.2	8.2	<1	Negligible
21	7.7	7.7	<1	Negligible
22	8.8	8.8	<1	Negligible
Maximum	**8.8**	**8.8**	**-**	**-**
Minimum	**7.3**	**7.3**	**-**	**-**

7.5.52 Predicted annual-mean $PM_{2.5}$ concentrations in the opening year at the façades of the existing receptors are below the AQS objective for $PM_{2.5}$ at all receptors. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as ‘negligible’ across the receptors.

Cumulative Operational Phase, 2040 – Proposed Development and Loddon Valley Garden Village Scheme

7.5.53 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 Development and wider Loddon Valley Garden Village Scheme at human receptor locations, taking into account the inherent design mitigation only.

Nitrogen Dioxide (NO_2)

7.5.54 Table 7.29 presents the annual-mean NO_2 concentrations predicted at the façades of existing receptors.

Table 7.29 Predicted Annual-Mean NO_2 Impacts at Existing Receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	11.9	12.0	<1	Negligible
2	10.9	11.0	<1	Negligible
3	11.0	11.1	<1	Negligible
4	10.8	10.9	<1	Negligible
5	10.9	11.0	<1	Negligible
6	11.2	11.2	<1	Negligible
7	11.2	11.3	<1	Negligible
8	10.8	10.8	<1	Negligible
9	10.8	10.8	<1	Negligible
10	10.8	10.9	<1	Negligible
11	10.7	10.7	<1	Negligible
12	10.9	10.9	<1	Negligible
13	10.8	10.8	<1	Negligible
14	10.8	10.8	<1	Negligible
15	10.7	10.7	<1	Negligible
16	11.0	11.1	<1	Negligible
17	11.1	11.1	<1	Negligible
18	11.0	11.0	<1	Negligible
19	11.4	11.3	<1	Negligible
20	11.6	11.6	<1	Negligible
21	11.2	11.1	<1	Negligible
22	13.9	13.8	-<1	Negligible
Maximum	**13.9**	**13.8**	**-**	**-**
Minimum	**10.7**	**10.7**	**-**	**-**

7.5.55 Predicted annual-mean NO_2 concentrations in the opening year at the façades of the existing receptors are below the AQS objective for NO_2. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is described as ‘negligible’.

7.5.56 As all predicted annual-mean NO_2 concentrations are below 60 $\mu g.m^{-3}$, the hourly-mean objective for NO_2 is likely to be met at all receptors. The short-term NO_2 impact can be considered 'negligible' and is not considered further within this assessment.

7.5.57 Overall, the impact on the surrounding area from NO_2 is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Particulate Matter (PM_{10})

7.5.58 Table 7.30 presents the annual-mean PM_{10} concentrations predicted at the façades of existing receptors.

Table 7.30 Predicted Annual-Mean PM_{10} Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	14.5	14.7	<1	Negligible
2	13.2	13.3	<1	Negligible
3	13.5	13.6	<1	Negligible
4	13.0	13.1	<1	Negligible
5	13.2	13.3	<1	Negligible
6	13.2	13.2	<1	Negligible
7	13.2	13.3	<1	Negligible
8	12.8	12.8	<1	Negligible
9	13.0	13.0	<1	Negligible
10	13.0	13.0	<1	Negligible
11	12.7	12.7	<1	Negligible
12	13.1	13.1	<1	Negligible
13	12.9	12.9	<1	Negligible
14	12.9	12.9	<1	Negligible
15	12.6	12.6	<1	Negligible
16	13.2	13.2	<1	Negligible
17	13.3	13.3	<1	Negligible
18	13.3	13.3	<1	Negligible
19	14.0	13.9	<1	Negligible
20	14.2	14.1	<1	Negligible
21	13.3	13.2	<1	Negligible
22	15.1	15.0	<1	Negligible
Maximum	**15.1**	**15.0**	**-**	**-**
Minimum	**12.6**	**12.6**	**-**	**-**

7.5.59 Predicted annual-mean PM_{10} concentrations in the opening year at the façades of the existing receptors are well below the AQS objective for 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.

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

7.5.61 Overall, the impact on the surrounding area from PM_{10} is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

Fine Particulate Matter ($PM_{2.5}$)

7.5.62 Table 7.31 presents the annual-mean $PM_{2.5}$ concentrations predicted at the façades of existing receptors.

Table 7.31 Predicted Annual-Mean $PM_{2.5}$ Impacts at Existing Receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact Descriptor
	Without Development	With Development		
1	8.4	8.5	1	Negligible
2	7.7	7.7	<1	Negligible
3	7.8	7.9	1	Negligible
4	7.5	7.6	1	Negligible
5	7.6	7.7	1	Negligible
6	7.7	7.7	<1	Negligible
7	7.7	7.7	1	Negligible
8	7.4	7.4	<1	Negligible
9	7.5	7.5	<1	Negligible
10	7.5	7.5	<1	Negligible
11	7.4	7.4	<1	Negligible
12	7.6	7.6	<1	Negligible
13	7.5	7.5	<1	Negligible
14	7.5	7.5	<1	Negligible
15	7.3	7.3	<1	Negligible
16	7.6	7.7	<1	Negligible
17	7.7	7.7	<1	Negligible
18	7.7	7.7	<1	Negligible
19	8.1	8.0	<1	Negligible
20	8.2	8.1	<1	Negligible
21	7.7	7.7	<1	Negligible
22	8.8	8.8	1	Negligible
Maximum	**8.8**	**8.8**	-	-
Minimum	**7.3**	**7.3**	-	-

7.5.63 Predicted annual-mean $PM_{2.5}$ concentrations in the opening year at the façades of the existing receptors are below the AQS objective for $PM_{2.5}$ at all receptors. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is categorised as 'negligible' across the receptors.

Assessment of New Population Exposure, 2040 – Proposed Development and Loddon Valley Garden Village Scheme (Site Suitability)

7.5.64 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.

7.5.65 Table 7.32 presents the annual-mean NO_2, PM_{10} and $PM_{2.5}$ concentrations predicted at the façades of proposed receptors.

Table 7.32 Predicted NO_2, PM_{10} and $PM_{2.5}$ Concentrations ($\mu g.m^{-3}$) at Proposed Receptors

Receptor ID	Annual-mean NO_2	Annual-mean PM_{10}	Annual-mean $PM_{2.5}$
Proposed 1	10.9	13.1	7.6
Propsoed 2	10.9	13.0	7.6
Proposed 3	11.5	13.9	8.0
Proposed 4	11.5	14.0	8.1
Proposed 5	10.8	12.9	7.5
Proposed 6	10.9	13.1	7.6
Proposed 7	10.8	13.0	7.5
Maximum	**11.5**	**14.0**	**8.1**
Minimum	**10.8**	**12.9**	**7.5**

7.5.66 The predicted annual-mean NO_2 concentrations range between 10.8 and 11.5 $\mu g.m^{-3}$, well below the annual-mean AQS objective of 40 $\mu g.m^{-3}$ at all receptors. Furthermore, as the annual-mean NO_2 concentration is predicted to be less than 60 $\mu g.m^{-3}$, the hourly-mean AQS objective is expected to be met.

7.5.67 The predicted annual-mean PM_{10} concentrations range between 12.9 and 14.0 $\mu g.m^{-3}$, well below the annual-mean AQS objective of 40 $\mu g.m^{-3}$ at all receptors. Furthermore, as the annual-mean PM_{10} concentration is predicted to be less than 31.5 $\mu g.m^{-3}$, the daily-mean AQS objective for this pollutant is expected to be met.

7.5.68 Predicted annual-mean $PM_{2.5}$ concentrations range between 7.5 and 8.1 $\mu g.m^{-3}$. Predicted concentrations at all receptors are below the annual-mean AQS objective of 10 $\mu g.m^{-3}$.

7.6 Additional Mitigation

Construction Phase

7.6.1 Without mitigation, the resulting construction phase dust impacts risks are considered to be medium to 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 site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked.
- 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 PM10 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 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 dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an 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.

Medium Risk Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable (Desirable).
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable (Desirable).
- Only remove the cover in small areas during work and not all at once (Desirable).

Medium Risk Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible (Desirable).
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery (Desirable).

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 “negligible”. The predicted pollutant concentrations at proposed sensitive human receptors for the Proposed Development are below the AQS objectives.

7.6.4 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 receptors is categorised as “negligible”. The predicted pollutant concentrations at proposed sensitive receptors for the Proposed Development are below the AQS objectives.

7.7.3 The overall residual 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 7.3.11, future changes in baseline conditions would likely reduce the concentrations of pollutants, such as NO_2, 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 i-Transport 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 "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 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 construction and 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 peak construction and operational phases (i.e. 2032 and 2040 respectively), the change in pollutant concentrations at existing sensitive human receptors is categorised as “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 7.33.

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 7.33 Assessor Information

Chapter	Responsibility	Name	Qualifications	Assessor information
Air Quality	RPS	Georgie Coppin	BSc, AMIAQM, AMIEnvSc	Air Quality Consultant with four 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 7.34 Summary of effects

Receptor	Receptor sensitivity	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Construction Phase					
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, earthworks, construction and trackout.	Negligible	Not Significant
Ecological Receptors	Low				
Peak Construction / Operation Phase					
Human Receptors	High	Increase in pollutant concentrations generated by vehicles	No mitigation proposed	Negligible	Not Significant

7.13 Mitigation commitments Summary

Table 7.35 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
Construction Phase				
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
Peak Construction / Operational Phase				
N/A	N/A	N/A	N/A	N/A