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Redrow Homes

BLOWER'S WOOD, HEMPSTEAD

Air Quality Assessment





Redrow **Homes**

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Air Quality Assessment

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EXECUTIVE SUMMARY

WSP has been commissioned by Redrow Homes to prepare an air quality assessment to support the planning application for a proposed residential development at Blower's Wood, Hempstead.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the proposed development. For both phases the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed.

The assessment of construction phase impacts associated with fugitive dust and fine particulate matter (PM₁₀) emissions has been undertaken in line with the relevant Institute of Air Quality Management guidance. This identified that there is a Medium Risk of dust soiling impacts and a Low Risk of increases in particulate matter concentrations due to construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases would be significantly reduced. The residual effects of the construction phase on air quality are classed as 'negligible' (not significant).

Once operational, the proposed development will generate road traffic movements on the local road network. Exhaust emissions associated with these vehicles will have an impact on local air quality (including concentrations of nitrogen dioxide (NO₂) and particulate matter) in the immediate surrounding area and adjacent to those road links used by development traffic. However, the Site is not located in or near an Air Quality Management Area and the level of trip generation associated with the proposed development is predicted to be lower than the screening criteria contained within Medway Council's Air Quality Planning guidance and relevant assessment screening criteria published by other recognised bodies. Therefore, a detailed air quality assessment has not been undertaken. Instead, qualitative commentary has been provided, which concludes that the proposed development is not likely to have a measurable significant effect on air quality at nearby sensitive receptors.

The proposed development will introduce new sensitive receptors into the area. It is acknowledged that air quality conditions within the Site will be influenced by emissions from road traffic using Hoath Way, Maidstone Road, and the M2. However, the Site is located upwind of these road sources and the proposed residential properties will be set back within the Site and at least 120m from the motorway. Therefore, the influence of road traffic emissions will be reduced. No Air Quality Management Areas have been designated near to the Site and there are existing residential properties located closer to the M2. Consequently, pollutant concentrations within the Site will be acceptable for the proposed end use.

In line with the requirements of Medway Council's Air Quality Planning Guidance, an emissions mitigation assessment was completed. This concluded that mitigation equivalent to £31,302 should be provided within the Site. A range of mitigation measures are proposed for the development, which will be of benefit to air quality. These include provision of electric vehicle charging facilities for each dwelling, safe and secure cycle parking and storage, a Residential Travel Plan (which will include measures to promote active and sustainable transport and reduce vehicle trips associated with the development), and tree planting within the Site. The cost of the mitigation proposed is expected to exceed the costs calculated from the emissions mitigation assessment, and therefore no further mitigation is required.

1. INTRODUCTION

- 1.1.1. WSP has been commissioned by Redrow Homes (the 'Applicant') to carry out an assessment of the potential air quality impacts arising from the proposed development at Blowers Wood, Hempstead, hereafter referred to as the 'Proposed Development' or 'Site'.
- 1.1.2. The Site lies within the administrative boundary of the Medway Council (MC) and comprises a parcel of previously undeveloped land (approximately 3.8 ha) situated to the northwest of junction 4 of the M2 motorway. It is bordered to the east by the A278 Hoath Way, to the south by Maidstone Road, and lies approximately 0.12km north of the M2.
- 1.1.3. It is proposed to develop the Site for residential use comprising 88 dwellings (a mix of 25% affordable flat / maisonette units and 75% private dwellings), together with associated parking, access, open space and landscaping. Access will be provided from Maidstone Road. The location of the Site is illustrated on **Figure 1-1** below and a copy of the indicative site layout is provided in **Appendix A**.

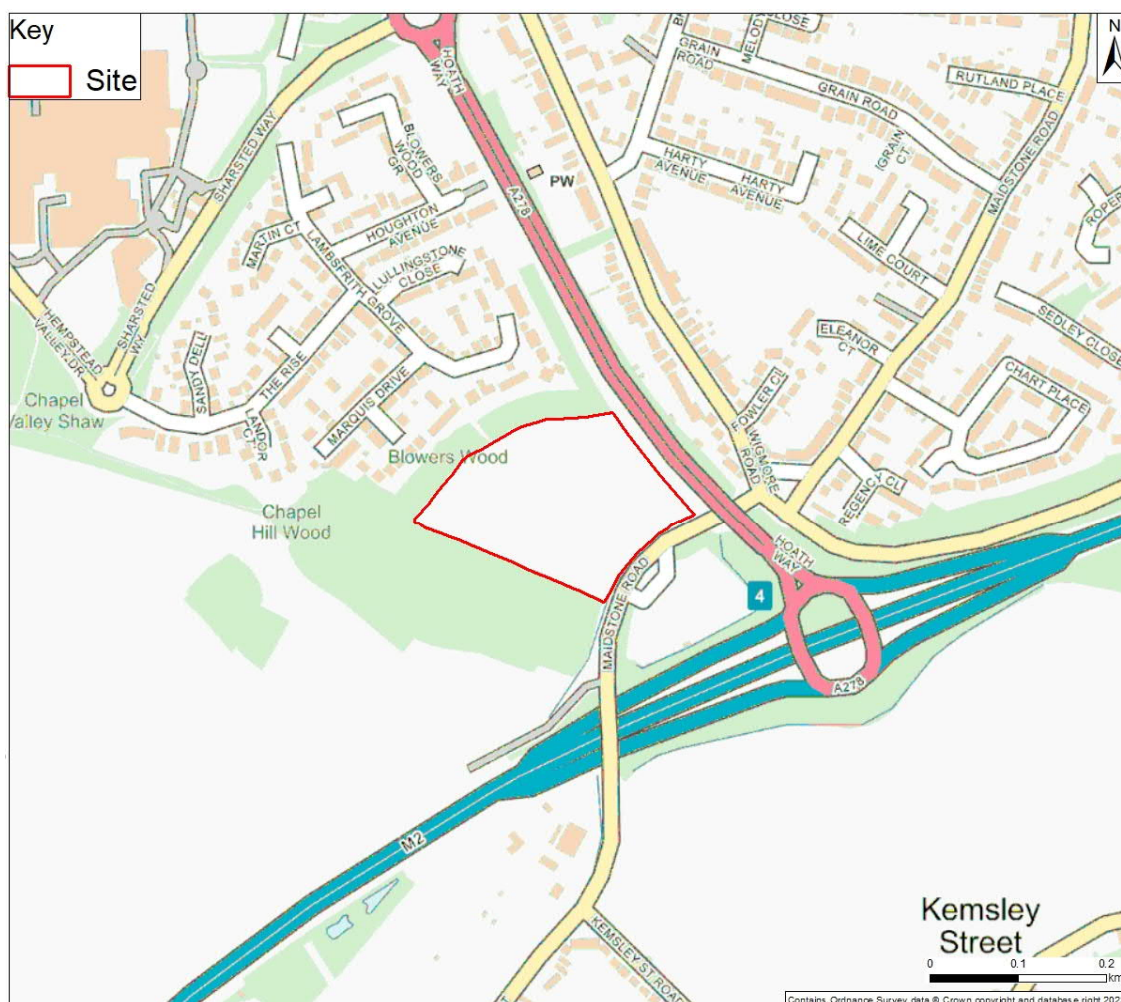


Figure 1-1 - Site Location Plan

- 1.1.4. This report presents the findings of an assessment of the potential air quality impacts of the Proposed Development during both the construction and operational phases. For both phases, the type, source and significance of potential impacts are identified, and the measures that should be employed to minimise these described.
- 1.1.5. A glossary of terms used in this report is provided in **Appendix B**.

2. LEGISLATION, POLICY & GUIDANCE

2.1. AIR QUALITY LEGISLATION & POLICY

2.1.1. A summary of the relevant air quality legislation and policy is provided below.

UK AIR QUALITY STRATEGY

- 2.1.2. The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS)¹. The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation².
- 2.1.3. The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C₆H₆), 1,3 butadiene (C₄H₆), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulphur dioxide (SO₂), ozone (O₃), and polycyclic aromatic hydrocarbons (PAHs).
- 2.1.4. The air quality standards are pollutant concentrations measured over a given period of time that are considered acceptable based on scientific knowledge about the effects of each pollutant on health and the environment.
- 2.1.5. The air quality objectives are policy-based targets for achieving the standards set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. As such, some objectives involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given time period.
- 2.1.6. The AQS contains a framework for considering the effects of a finer group of particles known as 'PM_{2.5}' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM₁₀. Local Authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area.

AIR QUALITY REGULATIONS

- 2.1.7. Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000³ and the Air Quality (England) (Amendment) Regulations 2002⁴ for the purpose of Local Air Quality Management (LAQM).
- 2.1.8. These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

"...the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present..."

¹ Department for Environment, Food and Rural Affairs (DEFRA) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

² The UK formally left the EU on 31st January 2020 and new air quality legislation for the UK will be brought forward in due course. The Air Quality (Miscellaneous Amendment and Revocation of Retained Direct EU Legislation) (EU Exit) Regulations 2018 (SI 2018/1407) (see Regulation 5) makes changes to retained direct EU legislation relating to air quality, to ensure that it continues to operate effectively.

³ The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928

⁴ The Air Quality (England) (Amendment) Regulations 2002- Statutory Instrument 2002 No.3043

- 2.1.9. The Air Quality Standards Regulations 2010⁵ transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM₁₀, PM_{2.5} and NO₂. The limit values for NO₂ and PM₁₀ are the same concentration levels as the relevant AQS objectives and the limit value for PM_{2.5} is a concentration of 25µg/m³. However, Regulation 2 of the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁶ updates the Air Quality Standards Regulations 2010 to include a limit value for PM_{2.5} of 20µg/m³ from 2020. At the time that the Air Quality Standards Regulations 2010 were made the limit value for this pollutant was under review by the European Commission.
- 2.1.10. For many parts of the UK, the primary pollutants of concern are those relating to road traffic emissions and, to a lesser extent, heating and commercial sources. The key pollutants of concern are, therefore, typically NO₂, PM₁₀ and PM_{2.5}.
- 2.1.11. A summary of the standards and objectives relevant to these pollutants is provided in Table 1. For NO₂ and PM₁₀, there are both long-term (annual mean) and short-term (24-hour or 1 hour mean) standards. These periods reflect the varying impacts on health of differing levels of exposure to these pollutants.

Table 1 - Relevant Air Quality Standards and Objectives

Pollutant	Applies to	Objective / Limit Value	Measured as
Nitrogen dioxide (NO ₂)	UK	40µg/m ³	Annual Mean
		200µg/m ³ not to be exceeded more than 18 times a year	1-hour Mean
Particulate Matter (PM ₁₀)	UK (except Scotland)	40µg/m ³	Annual Mean
		50µg/m ³ not to be exceeded more than 35 times a year	24-hour Mean
Particulate Matter (PM _{2.5})	UK (except Scotland)	20µg/m ³	Annual Mean

ENVIRONMENTAL PROTECTION ACT 1990 - CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

- 2.1.12. Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

“Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”; and

“Any accumulation or deposit which is prejudicial to health or a nuisance”.

⁵ The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001

⁶ The Environmental (Miscellaneous Amendments) (EU Exit) Regulations 2020 - Statutory Instrument 2020 No.000

- 2.1.13. Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.
- 2.1.14. There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

ENVIRONMENT ACT 1995

- 2.1.15. Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving the air quality objectives in the future.

ENVIRONMENT ACT 2021

- 2.1.16. The Environment Act 2021⁷, published in November 2021, provides a new framework for environmental protection within the UK. It aims to ensure that environmental standards are maintained and that improvements are achieved (specifically in relation to air quality, water, waste and resources, nature and biodiversity) and bridges the gaps in legislation resulting from the UK's departure from the EU. The Environment Act 2021 does not replace the Environment Act 1995, but it does make amendments in order to strengthen environmental protections. In relation to air quality, the Environment Act 2021 includes a legally binding duty on Government to bring forward at least two new air quality targets for PM_{2.5} into secondary legislation by 31st October 2022.
- 2.1.17. The draft Regulations⁸ laid before parliament, but yet to be approved, include the following proposed target objectives:
- Annual Mean Concentration Target ('concentration target') - a maximum concentration of 10µg/m³ to be met across England by 2040; and

POPULATION EXPOSURE REDUCTION TARGET ('EXPOSURE TARGET') - A 35% REDUCTION IN POPULATION EXPOSURE BY 2040 (COMPARED TO A BASE YEAR OF 2018). CLEAN AIR STRATEGY

- 2.1.18. Defra published the Government's Clean Air Strategy in 2019⁹. This sets out measures, which aim to reduce emissions from all sources of air pollution, making air healthier to breathe, protecting nature and boosting the economy. The Strategy also proposes tough new goals to cut public exposure to airborne particulate matter, as per the recommendation made by the WHO.

⁷ UK Government (1995) Environment Act 1995. [Online] <https://www.legislation.gov.uk/ukpga/1995/25/contents>

⁸ The Environmental Targets (Fine Particulate Matter) (England) Regulations 2022. Draft Statutory Instrument 2022 No. Available at: <https://www.legislation.gov.uk/ukdsi/2022/9780348242959>

⁹ Defra (January, 2019). Clean Air Strategy 2019.

- 2.1.19. Furthermore, the Strategy confirms that the Government will set new legislation to *'create a stronger and a more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanism.'* New enforcement powers will also be given at a national and local level, across all sectors of society.

2.2. PLANNING POLICY

- 2.2.1. A summary of the national, regional and local planning policy relevant to the Proposed Development and air quality is provided below.

NATIONAL PLANNING POLICY

National Planning Policy Framework

- 2.2.2. The Government's overall planning policies for England are described in the National Planning Policy Framework¹⁰. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:
- *'... meeting the needs of the present without compromising the ability of future generations to meet their own needs*
- 2.2.3. One of the three overarching objectives of the NPPF is that the planning system should seek *'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.'*
- 2.2.4. In relation to air quality, the following paragraphs in the document are relevant:
- Paragraph 55, which states *'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.'*
 - Paragraph 104, which relates to the need to consider transport related issues at the earliest stages of plan making and development proposals, so that *'...c) opportunities to promote walking, cycling and public transport use are identified and pursued; d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains...'*
 - Paragraph 105, which states *'...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....';*
 - Paragraph 174, which states *'Planning policies and decisions should contribute to and enhance the natural and local environment by: ...e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable*

¹⁰ Ministry of Housing, Communities and Local Government (July 2021) National Planning Policy Framework.

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 185, which states '*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development....*'; and
- Paragraph 186, which states '*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.*'.

LOCAL PLANNING POLICY

Medway Local Plan 2003

2.2.5. MDC's current local plan¹¹ was adopted on the 14th May 2003. Policies of relevance to air quality and the Proposed Development are summarised below.

2.2.6. Policy BNE2 'Amenity Protection', states:

"All development should secure the amenities of its future occupants, and protect those amenities enjoyed by nearby and adjacent properties. The design of the development, should have regard to:

- (i) Privacy, daylight, and sunlight; and*
- (ii) Noise, vibration, light, heat, smell and airborne emissions consisting of fumes, smoke, soot, ash, dust and grit; and*
- (iii) Activity levels and traffic generation.*

2.2.7. Policy BNE24 'Air Quality' states:

"Development likely to result in airborne emissions should provide a full and detailed assessment of the likely impact of these emissions. Development will not be permitted when it is considered that unacceptable effects will be imposed on the health, amenity or natural environment of the surrounding area, taking into account the cumulative effects of other proposed or existing sources of air pollution in the vicinity."

2.3. GUIDANCE

2.3.1. A summary of the publications referred to in the undertaking of this assessment is provided overleaf.

¹¹ Medway Council (2003) Medway Local Plan Adopted 14th May 2003. Available at: https://www.medway.gov.uk/info/200149/planning_policy/146/current_planning_policies/3

LOCAL AIR QUALITY MANAGEMENT REVIEW AND ASSESSMENT TECHNICAL GUIDANCE

- 2.3.2. The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities outside of their London Boroughs in their review and assessment work¹². This guidance, referred to in this document as LAQM.TG22, has been used where appropriate in the assessment prepared herein.

NATIONAL PLANNING PRACTICE GUIDANCE – AIR QUALITY

- 2.3.3. This guidance¹³ provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

GUIDANCE ON THE ASSESSMENT OF DUST FROM DEMOLITION AND CONSTRUCTION

- 2.3.4. This document¹⁴ published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

MEDWAY COUNCIL AIR QUALITY PLANNING GUIDANCE

- 2.3.5. MC has published their own Air Quality Planning Guidance¹⁵ in conjunction with the Kent and Medway Air Quality Partnership to provide a consistent approach to addressing air quality within the planning system. The guidance provides advice on when an air quality assessment is likely to be required, the general approach that should be followed, and the types of mitigation measures that should be implemented to minimise potential impacts during construction and operation. The guidance also provides a methodology for undertaking an Emissions Mitigation Assessment (i.e., damage cost calculations) to determine the value of the mitigation and/or compensation required.

LAND-USE PLANNING & DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

- 2.3.6. Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published joint guidance¹⁶ that also offers comprehensive advice on when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of

¹² Defra (2022) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG22

¹³ Ministry of Housing, Communities & Local Government (November 2019). National Planning Practice Guidance

¹⁴ Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction

¹⁵ Medway Council (2016) Air Quality Planning Guidance (Revised November 2021)

¹⁶ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality

any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

3. SCOPE & METHODOLOGY

3.1. SCOPE

3.1.1. The scope of the assessment has been determined through completion of the following tasks:

- Review of the MDC's latest review and assessment report¹⁷ and air quality data for the area surrounding the Site;
- Review of any additional air quality data available from Defra¹⁸ and neighbouring Maidstone Borough Council^{19,20};
- Review of information on existing industrial and authorised processes in the area available from the Environment Agency (EA)²¹ and MC's public register²²;
- A review of the scheme drawings / proposed site layout;
- Desk study to identify locations of nearby receptors (human and ecological) that may be sensitive to changes in local air quality due to the Proposed Development;
- Review of the vehicle trip generation and distribution data for the Proposed Development and the local road network, as provided by GTA Civils and Transport, the Project Transport Consultants; and
- Consideration of the screening criteria and assessment approach contained within the Medway Council Air Quality Planning Guidance¹⁵.

3.1.2. The scope of the assessment includes consideration of the potential impacts of the Proposed Development on local air quality resulting from:

- Dust and particulate matter generated by on-site activities during the construction phase;
- Short-term changes in local pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant; and
- Long-term changes in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational.

3.2. CONSULTATION

3.2.1. A consultation request was submitted to the Environmental Health Officer (EHO) at MC in December 2022 outlining the proposed approach to the assessment. A response was received from the EHO on the 13th of January 2023. This advised that as the Proposed Development would be considered a major development (exceeding 50 residential units) and provide more than 100 parking spaces, a detailed assessment, to include an Emissions Mitigation Assessment, be undertaken for the application. Subsequent to this, a summary of the trip generation and distribution data for the Proposed Development was provided to the EHO to demonstrate that the trip generation would fall

¹⁷ Medway Council (2022) 2022 Air Quality Annual Status Report (ASR)

¹⁸ Defra Local Air Quality Management (LAQM) Support Pages. Available at: <http://laqm.defra.gov.uk/>

¹⁹ Maidstone Borough Council (2020) 2020 Air Quality Annual Status Report (ASR)

²⁰ Maidstone Borough Council (2022) 2022 Air Quality Annual Status Report (ASR)

²¹ <https://environment.data.gov.uk/public-register/view/search-industrial-installations>

²² Medway Council's Public Register of Industrial Processes Available at:
https://www.medway.gov.uk/downloads/download/351/public_register_of_industrial_processes

below MC's other stage two screening criteria (see Section 6 of this report for more details) and below screening criteria published by other relevant bodies. As such, it was considered there was adequate evidence to show the Proposed Development is unlikely to have a significant effect on local air quality at nearby receptors, and that detailed modelling could be scoped out. Rather a qualitative assessment would be completed along with the requested Emissions Mitigation Assessment. No further response was received.

4. BASELINE CONDITIONS

4.1. REVIEW & ASSESSMENT & AIR QUALITY MANAGEMENT AREAS

- 4.1.1. MC has declared four AQMAs within their administrative area due to exceedances of the national air quality objective for annual mean NO₂ concentrations, attributable to road traffic. The Site is not located in or near any of these AQMAs; the nearest is located approximately 3.3km northeast of the Site in Rainham. The other AQMAs are located in Central Medway, Pier Road Gillingham, and Four Elms Hill Chattenden.

AIR QUALITY ACTION PLAN

- 4.1.2. The MDC published its latest Air Quality Action Plan²³ (AQAP) in 2015. The AQAP identifies twelve key measures to reduce NO₂ concentrations within the AQMAs and improve air quality. These measures are:

- Improving Movement of Freight;
- Encouragement of Public Transport Use;
- Improvement in Taxi Emissions;
- Traffic Management;
- Promotion of Cycling and Walking;
- Eco-Driving;
- Procurement;
- Travel Planning;
- Car Sharing;
- Development Planning;
- Promotion of health and air quality awareness; and
- Feasibility Studies and Funding.

4.2. LOCAL EMISSION SOURCES

TRANSPORT EMISSIONS

- 4.2.1. The Site is located in an area where air quality is mainly influenced by emissions from road transport. The M2 (located 0.12km to the south of the Site), A278 Hoath Way (to the east) and Maidstone Road (which runs parallel to the southern site boundary) will therefore represent the key influences on air quality conditions within the Site itself.

INDUSTRIAL EMISSIONS

- 4.2.2. A review of the Environment Agency's industrial permit public register confirms that there are no large-scale Part A1²⁴ industrial pollution sources located within the vicinity of the Site (or within a 5km radius).

²³ [Medway Air Quality Action Plan 2015 | Medway Council](#) [online] Accessed December 2022

²⁴ Large-scale industrial processes emitting to land, air and/or water and regulated by the Environment Agency

- 4.2.3. In relation to smaller Part A2 and Part B processes²⁵, regulated by the local authority, no processes have been identified within the immediate surrounding area. The nearest is an 'unloading of petrol at storage service station' process located near Hempstead Valley Shopping Centre, off Sharsted Road approximately 0.6km northwest of the Site. However, given the distance from the Site and the presence of other buildings and trees / woodland between this process and the Site, it will not have any impact on the air quality at the Proposed Development.

4.3. DEFRA MAPPED BACKGROUND POLLUTANT CONCENTRATIONS

- 4.3.1. Estimated background pollutant concentrations for the whole of the UK are available to download from the national maps provided on the Defra website²⁶. For NO₂, PM₁₀ and PM_{2.5}, estimates are available for all years between 2018 and 2030, at a grid resolution of 1x1km grid squares.
- 4.3.2. Table 2 summarises the background pollutant concentrations of NO₂, PM₁₀ and PM_{2.5} relevant to the Site and immediate surrounding area for 2023 and the year of first opening (2024).

Table 2 - Background Concentrations (µg/m³)

Grid Square (centre on O.S. Grid Reference)	Annual Mean Concentration (µg/m ³)					
	NO ₂		PM ₁₀		PM _{2.5}	
	2023	2024	2023	2024	2023	2024
579500, 163500	13.4	12.8	15.4	15.2	10.4	10.2
579500,162500	15.2	14.5	16.8	16.6	10.7	10.6

- 4.3.3. The annual mean background concentrations are well below the relevant air quality standards for all pollutants. Inherent within the background maps is the assumption that pollutant concentrations will reduce over time, with the largest improvements likely to be for NO₂ (rather than PM₁₀ or PM_{2.5}). Background concentrations for the opening year are therefore lower than for 2022.

4.4. LOCAL AUTHORITY AIR QUALITY MONITORING DATA

- 4.4.1. MC undertakes air quality monitoring using both automatic and passive (i.e. diffusion tubes) monitoring techniques at a number of roadside and background locations within their administrative area.

AUTOMATIC MONITORS

- 4.4.2. There are currently two automatic monitors operating in MC's administrative area. The nearest is the Chatham Roadside automatic monitor, located approximately 4.5km north-northwest of the Site. Given the distance from the Site and the variations in setting, results from this monitor will not be representative of conditions at the Site. However, recent results for this monitor are summarised in Table 3 below to provide an indication of pollutant concentrations and trends in the wider area.

²⁵ This would relate to smaller industrial processes regulated by the Local Authority, including Part A2 processes (which may release to land, air and water) or Part B processes (which only release to air).

²⁶ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

Table 3 - Local Authority Automatic Air Quality Monitoring Data

Site (X,Y)	Type	Distance to Site (km)	Pollutant	Monitored Concentration ($\mu\text{g}/\text{m}^3$) / Result				
				2017	2018	2019	2020	2021
CHAT (525808, 170122)	Roadside	4.5	Annual Mean NO_2	25.7	25.4	23.4	18.4	19.0
			No. Hrs $\text{NO}_2 > 200 \mu\text{g}/\text{m}^3$	0	0	0	0	0
			Annual Mean PM_{10}	21.6	23.7	23.0	22.0	17.0
			No. Days $\text{PM}_{10} > 50 \mu\text{g}/\text{m}^3$	7	11	14	7	0
			Annual Mean $\text{PM}_{2.5}$	14.1	15.2	13.7	11.0	12.0

4.4.3. The results from the CHAT monitor show that concentrations of all pollutants are well below the respective long-term and short-term air quality standards and objectives.

4.4.4. The data also indicates an overall downward trend in concentrations over time. However, the data presented for 2020, and to some extent for 2021, should be treated with some caution as the monitored concentrations will have been significantly influenced by a reduction in transport emissions due to the travel restrictions imposed during the COVID-19 pandemic. The 2020 and 2021 monitored concentrations are therefore likely to be lower than would otherwise have been observed. Nevertheless, MC's 2022 ASR comments that "...ignoring 2020 concentrations, a downward trend in annual mean concentrations can be observed at most monitoring sites since 2017."

PASSIVE MONITORING DATA

4.4.5. Whilst MC carries out passive diffusion tube monitoring, none of these diffusion tubes are located within a 3km radius of the Site. The nearest relevant monitoring site is Maid105, a diffusion tube operated by Maidstone Borough council. This tube is located approximately 2.8km west-southwest of the Site but also approximately 20m from the mainline carriageway of the M2 motorway (between junctions 3 and 4) are presented in Table 4. Data is only available up to 2019. The location of this monitor relative to the Site is illustrated on **Figure 4-1** overleaf.

Table 4 - Local Authority Air Quality Monitoring Data

Site ID	Site Name	Site Type	Distance to Site (km)	Annual Mean NO_2 Concentration ($\mu\text{g}/\text{m}^3$)*				
				2015	2016	2017	2018	2019
Maid105	Near Harp Farm Road, Maidstone	Roadside	2.8	-	24.7	24.1	21.5	19.6

- 4.4.6. The data in Table 4 shows that between 2015 and 2019, annual mean NO₂ concentrations recorded at this Site were well below the objective (40µg/m³). Furthermore, the concentrations indicated an overall downward trend (i.e., an improvement) in concentrations over the period 2016 to 2019.

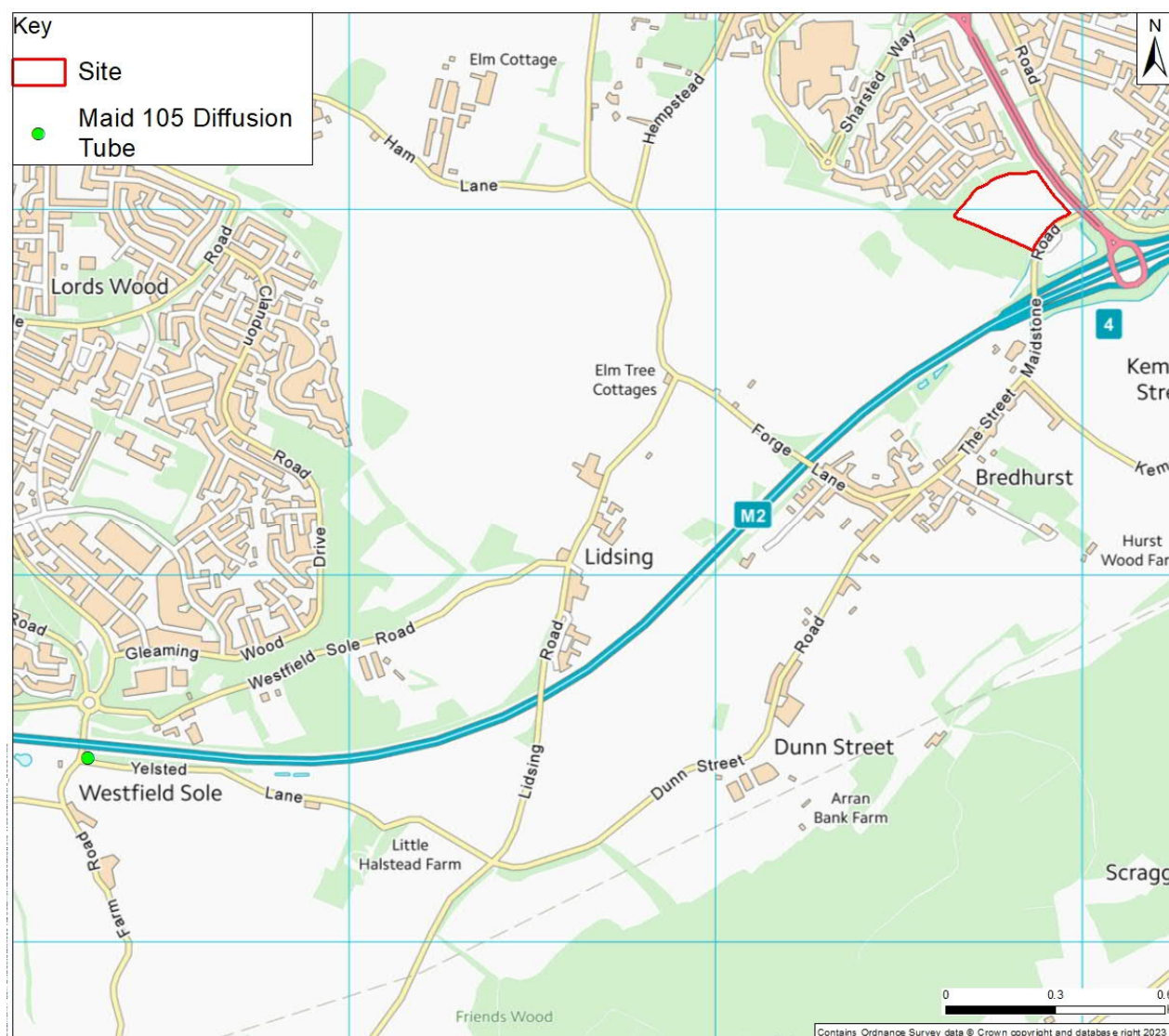


Figure 4-1 – Nearest Monitoring Site

4.5. SUMMARY

- 4.5.1. The Site is located in an area where the main influence on air quality will be emissions from road traffic on the local road network. From a review of the background maps and recent monitoring data, it is concluded that concentrations of NO₂, PM₁₀ and PM_{2.5} are likely to be below the respective objectives within the Site. In the absence of the Proposed Development, it is anticipated that conditions within the Site would remain relatively unchanged by 2024 from the current situation. If anything, it is anticipated that vehicle emissions and background concentrations will improve over time such that pollutant concentrations within the Site are likely to reduce in the future.

5. CONSTRUCTION PHASE ASSESSMENT

5.1. ASSESSMENT METHODOLOGY

DUST AND PARTICULATE EMISSIONS FROM ON-SITE CONSTRUCTION ACTIVITIES

- 5.1.1. During the construction phase, activities undertaken within the Site will generate release of dust and particulate matter.
- 5.1.2. Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited near the source of emission. Dust is therefore unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through loss of amenity or perceived damage caused, although this is usually temporary.
- 5.1.3. The smaller particles of dust (less than $10\mu\text{m}$ in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released; this includes a finer fraction, known as $\text{PM}_{2.5}$ (particles with an aerodynamic diameter less than $2.5\mu\text{m}$). Due to their small size, they remain suspended in the atmosphere for a longer period of time than the larger dust particles and can therefore be transported by wind over a wider area. PM_{10} and $\text{PM}_{2.5}$ are also small enough to be drawn into the lungs during breathing which, particularly in sensitive members of the public, could have a potential impact on health.
- 5.1.4. A qualitative assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} ²⁷ during the construction phase has been undertaken using the assessment methodology published by the IAQM¹⁴, the available information for this phase of the Proposed Development provided by the Client and Project Team, and, professional judgement.
- 5.1.5. The IAQM methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition; earthworks; general construction activities and track-out²⁸. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.
- 5.1.6. The IAQM assessment is undertaken where there are:
- 'Human receptors' within 350m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or

²⁷ According to the IAQM guidance, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. $\text{PM}_{2.5-10}$) with just 10-15% expected to comprise $\text{PM}_{2.5}$. The IAQM guidance therefore focusses on PM_{10} for the purposes of assessment.

²⁸ Track-out is the transportation of dust and dirt from the construction site onto the public road network by construction vehicles, where it may be deposited and then re-suspended by vehicles using the road network

- 'Ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

5.1.7. It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

5.1.8. Human receptors have been identified within 350m of the Site boundary and have therefore been considered within the assessment. In addition, impacts on the Blowers Wood Ancient Woodland, which lies within 50m of the Site boundary, have also been assessed.

5.1.9. A summary of the IAQM assessment methodology is provided in **Appendix C**.

5.1.10. The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

EXHAUST EMISSIONS FROM CONSTRUCTION TRAFFIC AND PLANT

5.1.11. In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the Site and in the vicinity of the Site itself.

5.1.12. At the time of writing, detailed information on the type and number of vehicles and plant associated with the construction phase was not available. A qualitative assessment of their potential impact on local air quality (and any construction plant) has been undertaken using professional judgement, experience of working on other schemes of a similar size and nature, and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the Proposed Development.
- Existing traffic levels on the local road network.
- The type, number and proximity of sensitive receptors to the Site and along the likely routes to be used by construction vehicles.
- The likely duration of the construction phase and the nature of the construction activities undertaken.

5.1.13. The significance of residual effects associated with construction traffic and plant has been determined using professional judgement and the principles outlined in the EPUK & IAQM joint guidance 'Land-Use Planning and Development Control: Planning for Air Quality'.

5.2. ASSESSMENT OF EFFECTS

DUST AND PM₁₀ ARISING FROM ON-SITE ACTIVITIES

5.2.1. Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:

- Site clearance and preparation;
- Preparation of temporary access/egress to the Site and haulage routes;
- Earthworks;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Site;

- Exhaust emissions from site plant;
- Construction of buildings, roads and areas of hardstanding, alongside fabrication processes;
- Internal and external finishing and refurbishment; and
- Site landscaping after completion.

5.2.2. The Proposed Development is expected to be built out at a rate of around 50 units per year, therefore the overall construction programme will be less than two years. Subject to obtaining planning consent, it is therefore expected to become operational in 2024.

5.2.3. The majority of pollutant releases are likely to occur during the 'working week', which is taken to be:

- Monday to Friday: 08:00hrs to 18:00hrs;
- Saturday: 08:00hrs to 13:00hrs; and
- Sundays and Bank Holidays: Closed.

5.2.4. However, for some potential release sources (e.g., exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Assessment of Potential Dust Emission Magnitude

5.2.5. The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

5.2.6. The Site comprises an area of previously undeveloped land / green space. As such, no demolition activities will be required.

Earthworks

5.2.7. The total area of the Site is approximately 3.83 ha (38,300m²) and the developable area of the Site is 2.37ha (23,700m²). As the Site area exceeds 10,000m² it would therefore be classed as 'large' according to the IAQM guidance. Earthworks activities will include soil stripping, material excavation and handling, stockpiling etc. The exact volume of material that will be moved is unknown but is estimated to be between 20,000 and 100,000 tonnes. No material will be transported off-site. Given the rate of construction, it is estimated that on average less than five heavy earth moving vehicles will be active at any one time. Overall, the potential dust emission magnitude is classed as 'medium' for earthwork activities.

Construction

5.2.8. The Proposed Development will include the construction of 88 dwellings. The total volume of the proposed buildings will fall within the IAQM range of 25,000 and 100,000m³. Traditional brick and block construction materials will be used for the buildings and roads will be a combination of block paving and asphalt, which are all potentially dusty construction materials. The overall dust emission magnitude for construction activities is therefore classed as 'medium'.

Trackout

5.2.9. Detailed information on the number of HDVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. Based on the size of the Site, the nature of works proposed, and the proposed rate of construction, it is estimated

that at its peak the Site could generate between 10 and 50 outward HDV movements in any one day but on average it is likely to be less than 10 outward trips. Unpaved construction routes could exceed 100m. Overall, the potential dust emission magnitude is classed as 'medium' for trackout.

- 5.2.10. Table 5 provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	N/A
Earthworks	Medium
Construction Activities	Medium
Trackout	Medium

Assessment of Sensitivity of the Study Area

- 5.2.11. **Figure 5-1** (overleaf) shows the area of the Site and all land uses within a 350m radius and the various intermediary distances considered in the IAQM construction assessment guidance (i.e. 20m, 50m 100m and 200m).
- 5.2.12. Given the location of the Site on the outskirts of Gillingham the key receptors are the existing residential properties located within the residential areas to the north and east of the Site, the nearest of which are located approximately 40m from the Site boundary. There are also a number of small commercial and retail uses located within these areas. Receptors to the south and southwest of the Site are limited and include a carpenters/construction company and two residential properties located between 250m and 320m to the south. Wigmore coach park and ride (car park) also lies approximately 35m south/southeast of the Site, although it is understood that this is now closed / no longer in use.
- 5.2.13. According to the IAQM guidance, residential properties would be considered 'high sensitivity' receptors for both dust and particulate matter. Places of work, where public exposure would be shorter-term, would be classed as 'medium sensitivity' for dust and PM₁₀.
- 5.2.14. The prevailing wind direction at the Site is expected to be from the southwest. Therefore, receptors located to north and east of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction stage. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source.
- 5.2.15. Taking all of the above into consideration, as there are no existing human receptors within 20m of the Site boundary and more than 10 (but less than 100) high sensitivity receptors within 50m of the Site boundary, the overall sensitivity of the surrounding area to an increase in dust deposition is classed as 'medium'. It is noted that there is the potential for newly constructed properties within the Site to be completed and occupied whilst construction activities are ongoing elsewhere within the Site. These 'high sensitivity receptors' may also be affected by dust and particulate releases. However, it is considered unlikely that more than 10 properties would be regularly occupied and lie

within 20m of dust generating activities. As such, the overall sensitivity of the area to dust remains 'medium'.

- 5.2.16. With regards to the human health effects of PM₁₀, background concentrations for this pollutant are less than 24µg/m³ (see Table 2) and there are no receptors within 20m of the Site. The overall sensitivity of the surrounding area to changes in ambient PM₁₀ concentrations is therefore classed as 'low'.

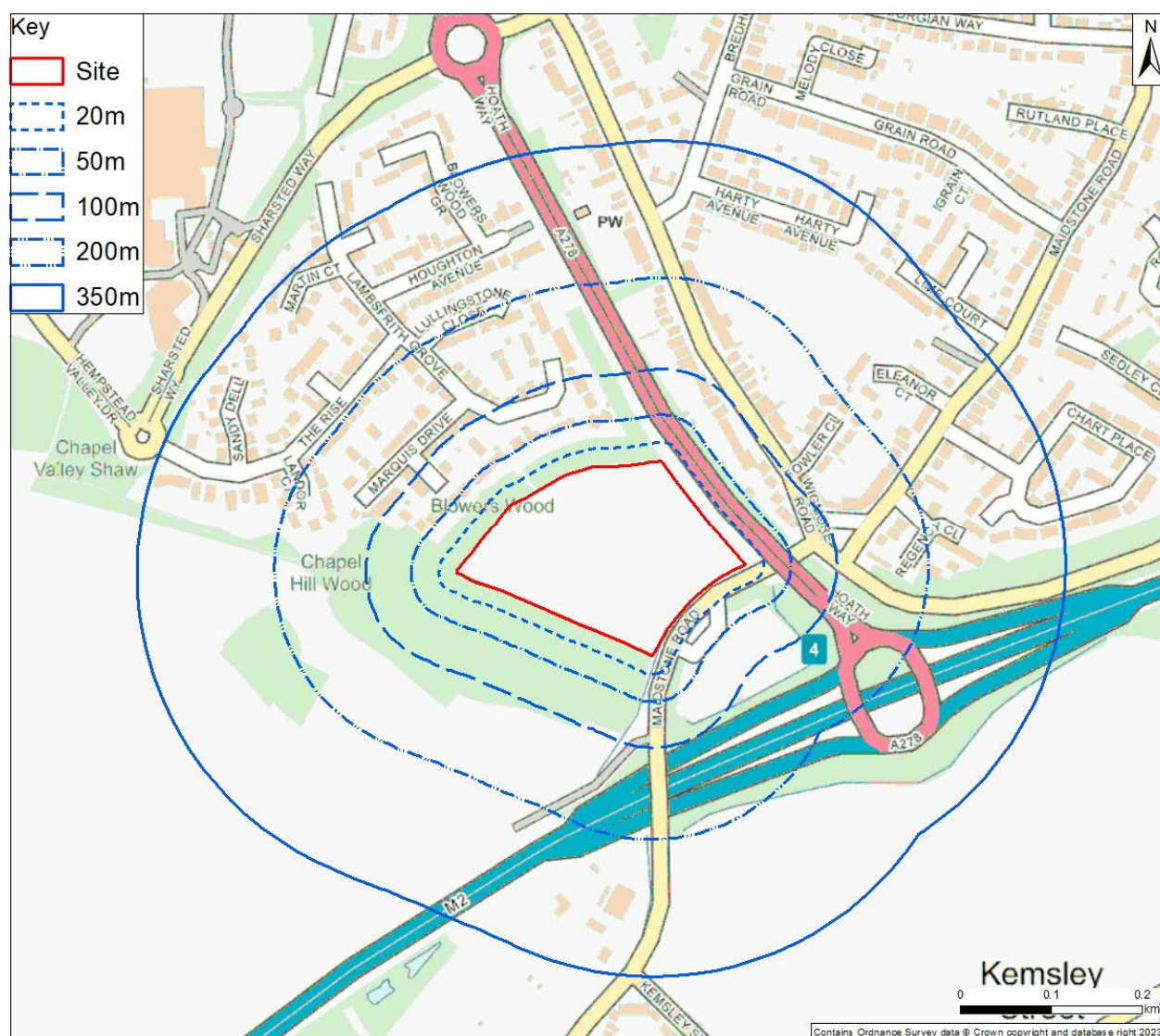


Figure 5-1 – Area of Potential Dust Deposition during Construction (Prior to Mitigation)

- 5.2.17. For track-out, it is anticipated construction vehicles will enter the Site via the proposed access on Maidstone Road after travelling on the M2 (leaving at junction 4) or Hoath Way. The key receptors within 50m of the access roads, up to 500m of the site access, include less than 10 residential and/or commercial properties within 50m of Maidstone Road and more than 10 (but less than 100) receptors, within 50m of Hoath Road and Wigmore Road. The overall sensitivity of the area to track-out is therefore classed as 'medium' for dust and 'low' for PM₁₀.

- 5.2.18. Finally, Blowers Wood Ancient Woodland lies immediately adjacent to the northern site boundary, although a 15m buffer is allowed for within the masterplan between the woodland and the location of the proposed properties. Adopting a conservative approach to the assessment, the sensitivity of the woodland is classed as 'medium' for dust.

Risk of Impacts

- 5.2.19. The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. Table 6 below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 6 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium Risk	Medium Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk
Ecological Receptors	N/A	Medium Risk	Medium Risk	Low Risk

CONSTRUCTION VEHICLES & PLANT

- 5.2.20. The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via the proposed access on Maidstone Road, after travelling on the M2 or via Hoath Way.
- 5.2.21. Due to the size of the Site and scale of the site preparation and construction activities that will be undertaken, it is anticipated that construction traffic will be low. It is estimated that at its peak, the Site could generate between 10 and 50 HDVs per day. However, on average this is likely to be lower (i.e. <10 HDVs per day). Additional car and Light Duty Vehicle (LDV) movements will also be generated (due to daily movements of site staff, small deliveries, equipment transfer etc) however these are expected to be limited and represent a very small increase in the context of the existing traffic levels on the surrounding road network. Furthermore, construction vehicle trip generation will vary from day to day depending on the activities taking place and will be temporary for the duration of the construction works, which in itself will be short-term. Emissions from construction vehicles will therefore not result in a long-term impact on local air quality.
- 5.2.22. Final details of the exact plant and equipment likely to be used on Site will be determined by the appointed contractor. Based on the available information from the Project Team it is likely to comprise: 9t front tipped cabbed dumper truck; 360 degree excavator, 30t dump trucks, tracked dozer, twin drum ride on roller. The number of plant and their location within the Site will be variable over the construction period depending upon the area being worked.
- 5.2.23. Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, the likely numbers of construction vehicles and plant that

will be used, and the existing traffic flows on the surrounding roads, the impacts are therefore considered to be of negligible significance according to the assessment significance criteria.

5.3. MITIGATION

DUST AND PM₁₀ ARISING FROM ON-SITE ACTIVITIES

- 5.3.1. Overall, the assessment identified the Site as a 'medium' risk site for earthworks and construction activities and a low-risk site for trackout, prior to mitigation. Recommended mitigation measures appropriate to the identified levels of risk are summarised below and should be implemented by the appointed contractor.

General Communication

- Consideration should be given to the development and implementation of a stakeholder communications plan that includes community engagement prior to the commencement of work on Site.
- The name and contact details of the person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

General Dust Management

- A Dust Management Plan (DMP), which should include the dust and PM₁₀ control measures outlined in this report as a minimum, and may include measures to control other emissions, should be developed and implemented, and approved by the Local Authority.

Site Management

- All dust and air quality complaints should be recorded in a log-book and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the local authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on-site or offsite should also be recorded, and then the action taken to resolve the situation recorded in the log-book.

Monitoring

- Regular on-site and off-site visual inspections (up to 100m away) should be carried out for the duration of works to check for visible dust emissions near to the site boundary and deposition of dust or soiling of property (for example on street furniture, cars windowsills etc). It is recommended that at least one visual inspection be undertaken per day. However, the frequency of inspections should be increased during periods of dry weather, periods of high or prolonged winds, and when activities with an increased risk of dust generation are taking place. The surveys should include site access routes, to ensure dust deposition associated with track-out is kept to a minimum.
- The outcomes of the surveys should be clearly recorded in a log that should be kept on site and made available to the local authority when requested. A record of any additional mitigation measures implemented to prevent or minimise dust and particulate emissions (e.g. the use of additional water sprays or dampening measures) should be included within the log. Remedial measures / cleaning of soiled surfaces should be carried out if necessary.

Preparing and maintaining the site

- Plan the site layout so that machinery and dust causing activities are located away from receptors (existing and proposed), as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover appropriately.
- Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Where practicable, only remove the cover in small areas during work and not all at once.
- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from the nearest sensitive receptors (which would include the Blowers Wood AW), taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Where practicable, implement a wheel washing system or use water spray 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.
- Inspect on-site haul routes for integrity and instigate repairs as soon as practicable.
- Record all inspections of haul routes and any subsequent remedial action in a site log-book.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in frequent use.
- Avoid dry sweeping of large areas.
- Access gates to be located at least 10m from receptors where possible.

CONSTRUCTION VEHICLES & PLANT

Operating vehicle/machinery and sustainable travel

5.3.2. To minimise the effect of exhaust emissions associated with construction traffic and plant, the following measures should also be implemented:

- All construction plant and equipment should be maintained in good working order.
- Ensure all vehicle operators 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.
- Identified routes for construction traffic should be agreed with the local authority prior to the commencement of works to reduce the likelihood of construction vehicles passing along sensitive roads.
- Timing of large-scale vehicle movements to avoid peak hours on the local road network would also be beneficial.
- Consider implementing a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.
- Site staff should be encouraged to travel to Site by sustainable modes of transport whenever possible during the construction phase (i.e. via public transport, cycling, walking, and car-sharing).

RESIDUAL EFFECTS

- 5.3.3. The residual effects of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above and good site practice will be negligible.
- 5.3.4. The residual effects of emissions to air from construction vehicles and plant on local air quality will remain negligible.

5.4. LIMITATIONS & ASSUMPTIONS

- 5.4.1. The construction phase assessment is subject to the following limitations and assumptions:
- Due to the limited details on the construction methods and programme, the assessment has been completed using the information that is available and professional judgement on the likely scale of activity and sensitivity of the receiving environment.
 - Detailed information relating to the specific number, type and routing of construction vehicles was not available at the time of the assessment. As such, professional judgement was used to qualitatively assess potential local air quality effects associated with these emissions.
 - Address Base data was not utilised during the construction phase assessment to estimate receptor counts as they are low in number. Instead, sensitive receptors / receptor counts were identified using GIS, Google Maps and Google Street View.

6. OPERATIONAL PHASE

6.1. ASSESSMENT METHODOLOGY

ROAD TRAFFIC IMPACTS

- 6.1.1. During the operational phase, the Proposed Development will generate road traffic movements on the surrounding road network. Exhaust emissions from these vehicles (notably those with petrol and diesel engines) will contribute to local pollutant concentrations, particularly at locations near to the Site and along the roads used by development traffic.
- 6.1.2. The key pollutants of concern will be concentrations of NO₂, PM₁₀ and PM_{2.5}, given road traffic is a major source of these pollutants and their concentrations tend to be close to, or in exceedance of, the objectives in urban locations. Indeed, as noted in Section 4 of this report, MC has declared four AQMAs due to elevated annual mean NO₂ concentrations, with road traffic cited as the primary source.
- 6.1.3. In terms of locations that are sensitive to pollutants emitted from engine exhausts, these will include places where members of the public are likely to be regularly present over the period of time prescribed in the AQS. This will typically include residential properties, schools and hospitals. For the short-term objectives, this may also include hotels, residential gardens, play areas etc. The objectives do not generally apply at places of work or locations where members of the public do not have regular access.
- 6.1.4. MC's Air Quality Planning Guidance includes criteria for determining when a development has the potential to generate a significant effect on air quality and where further assessment (which may include detailed dispersion modelling) is likely to be required. This guidance includes the following steps:

Screening Checklist 1

- 6.1.5. The initial screening stage is to determine whether the development is a major scheme and/or if it is located in or near to an AQMA. A summary of the screening questions and the responses relevant to the Proposed Development are provided in Table 7.

Table 7 - Screening Checklist 1

Screening Checklist	Proposed Development	Recommendation
Q1. Is the Proposed Development categorised as a major sized development? For residential use the relevant screening criteria for Major developments include: - Residential institutions such as nursing homes > 50 beds - Residential institutions such as hostels, homeless centres > 400 residents - Residential institutions such as boardings schools > 150 students - Residential dwellings and houses > 50 units	Yes. The Proposed Development is for 88 residential dwellings and car parking for more than 100 vehicles. It would also generate more than 100 two-way trips per day. As such, it would be classed as a 'major scheme'.	If yes. Proceed to checklist 2. If No, go to Q2.

In addition to: - Any development generating 30 or more two-way vehicle movements in an hour - Any development generating 100 or more two-way trips per day - Any development proposing 100 or more parking spaces - Any development in a location where transport infrastructure is inadequate		
Q2. Is the Proposed Development within, or close to, an AQMA?	No. The Proposed Development is not in or near an AQMA.	If Yes. Go to checklist 2. If No (to Q1 and Q2), no action required.

6.1.6. As the Proposed Development would be classed as a 'Major Scheme', it is necessary to proceed to the stage 2 screening checklist.

Screening Checklist 2

6.1.7. A summary of the screening questions for Checklist 2 and the responses relevant to the Proposed Development are provided in Table 8.

Table 8 - Screening Checklist 2

Screening Checklist	Proposed Development	Action
Q3. Does the development require an Environmental Impact Assessment?	No.	If any question is answered YES, standard mitigation will apply and the need for an air quality assessment and/or mitigation assessment should be confirmation with the Environmental Protection Team. If all questions answered No and the development is a major development, standard mitigation will apply and an emissions mitigation assessment is required. If all questions are answered no and the development is not a major development or the Environmental
Q4. Will the development likely become a large-scale major development, either on its own or cumulatively with planning committed developments) (i.e. where the number of residential units to be constructed is >200 or 1,000sqm of industrial, retail or commercial floor space).	No.	
Q5. Is there vehicle parking in the development? >100 spaces outside an AQMA or >50 within or adjacent to an AQMA	Yes. A total of 179 parking spaces will be provided.	
Q6. For existing roads with >10,000AADT does the development: - Introduce extra vehicle movements >5% - Likely to cause congestion	No. See Paragraph 6.1.8 to 6.1.12 (and Table 9) for further details. The data in Table 9 shows that the Proposed Development is forecast to generate a total of 435 trips per day, of which none will be HDVs.	

- Introduce >15 extra Heavy Duty Vehicle (HDV) movements per day.		Protection Team determines there is no need an air quality assessment and/or emissions mitigation assessment, standard mitigation will apply.
Q7. Will the development introduce new sensitive receptors into an AQMA?	No. The Site is not in or near an existing AQMA.	
Q8. Are there any other proposed development in the vicinity of this development which could have a cumulative effect on air quality?	There are believed to be no significant committed developments proposed in the immediate vicinity of the Site.	
Q9. Is the development introducing biomass energy / heating plant into an urban environment?	No. The Proposed Development will not include any biomass or combustion plant into the area. It is understood that each property will include a ground source air heat pump, which will not generate any emissions to air.	
Q10. Is the development likely to impact on sensitive environments (i.e. SSSIs, National Parks etc).	There are no European or Internationally designated sites, National Nature Reserves or Local Nature Reserves located within the relevant screening distances²⁹. The Queensdown Warren Site of Special Scientific Interest (SSSI) is located approximately 2.1km east of the Site and 160m from the M2 (east of junction 4). However, as shown in Table 9, the change in traffic flows due to the Proposed Development here is below relevant screening criteria²⁹. Blowers Wood, to the north of the Site, is designated as an Ancient Woodland. There is the potential for the woodland to be impacted by dust deposition during construction and mitigation will be in place. During the operational phase, trip generation on Hoath Way is forecast to be low and is unlikely to have a significant impact on the woodland. There are other Ancient Woodlands located within 200m of the M2, east and west of J4. They will already be subject to high traffic volumes and likely elevated baseline levels of nitrogen deposition. The change in traffic flows due to the Proposed Development is small in comparison to	

²⁹ Holman et al (2020). *A guide to the assessment of air quality impacts on designated nature conservation sites version 1.1*, Institute of Air Quality Management, London

	existing traffic flows (<0.18% change) and below the aforementioned screening criteria.	
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Trip Generation

- 6.1.8. Trip generation and distribution data for the Proposed Development has been provided by the Project Transport Consultants (GTA) and is summarised in Table 9.

Table 9 – Comparison of Daily Trip Generation for the Existing and Proposed Development

Road Link	Baseline Annual Average Daily Traffic (AADT) Flows	Proposed Development Trips (AADT)	Change as % of AADT	Comment
Maidstone Road, West of the Site	n/a	88	n/a	Trip generation is less than the IAQM/EPUK screening criteria of 500AADT for cars and light duty vehicles for locations outside of an AQMA.
Maidstone Road, East of the Site	n/a	347	n/a	
Wigmore Road	n/a/	325	n/a	
Hoath Way	33,746	186	0.55%	Trip generation below Medway Council's criteria of 5% for roads with an existing traffic flow of less than 10,000 AADT and below the relevant IAQM/EPUK screening criteria.
M2 East of Junction 4	75,097	42	0.06%	
M2 West of Junction 4	81,328	146	0.18%	
Notes: Baseline AADT flows based on 2019 DfT Data				

- 6.1.9. The existing AADT flows on the M2 and Hoath Way exceed 10,000AADT and the data shows that the number of vehicle movements generated on these road links due to the Proposed Development would be well below 5% of the existing traffic flows.
- 6.1.10. Given the nature of the Proposed Development, all development traffic is expected to comprise cars and LDVs. No new or additional Heavy Duty Vehicle trips are forecast (as any refuse collections trips would be infrequent and already be operating on the local road network). Furthermore, the additional traffic would not be expected to significantly reduce speeds or increase congestion (see Transport Assessment for further details).
- 6.1.11. It is worth noting that the EPUK & IAQM joint guidance¹⁶ also includes screening criteria for determining when a development has the potential to generate a significant impact on local air quality and when further assessment (such as detailed modelling) is likely to be required. In relation

to traffic generation, the guidance includes the following criteria for locations outside of an AQMA, neither of which are met:

- A change in car / LDV flows of 500 AADT or more.
- A change in HDV flows of 100 AADT or more.

6.1.12. Therefore, whilst the car parking criteria (in Table 8) would be exceeded, the trip generation and distribution data for the Proposed Development would be below both the MC and EPUK/IAQM screening criteria. As such, it is considered unlikely that it would result a significant adverse effect on local air quality. Therefore, a detailed modelling exercise is not considered necessary.

EXPOSURE OF FUTURE SITE USERS

- 6.1.1. The Proposed Development will introduce new sensitive receptors into the area. It is acknowledged that air quality conditions within the Site will be primarily influenced by emissions from road traffic using Hoath Way, Maidstone Road, and the M2 motorway. However, the Site is located upwind of these road links and the proposed residential properties will be set back within the Site and will be at least 120m from the M2 (slip roads), 35m from Hoath Way, and at least 12m from Maidstone Road. The influence of road traffic will thus be reduced since the contribution of road traffic emissions to local pollutant concentrations rapidly declines as the distance from the road increases³⁰. The greatest reduction is typically observed within the first 25m.
- 6.1.2. Furthermore, the Site is not located in or near an existing AQMA and there are existing residential properties located closer to the M2, indicating that there are no exceedances of the air quality objectives at locations closer to the M2. Whilst MC do not undertake any monitoring in the immediate vicinity of the Site, results from a diffusion tube located within neighbouring Maidstone Borough Council's administrative area, which lies within 20m of the motorway (see Table 4) indicate that annual mean NO₂ concentrations were well below the objective in all years for which data was available. On this basis, it is considered that pollutant concentrations within the Site will be below the air quality standards and that the air quality is acceptable for the proposed use.

6.2. MITIGATION

EMISSIONS MITIGATION ASSESSMENT

- 6.2.1. In accordance with MC's Air Quality Planning Guidance, as the Proposed Development constitutes a 'major scheme', an Emissions Mitigation Assessment is required to calculate the 'damage cost' associated with the transport emissions generated by the development and to estimate the value or level of mitigation required to reduce or offset the potential effect on health and/or the local environment.
- 6.2.2. The damage cost calculations have been undertaken using Defra's Air Quality Appraisal: Damage Cost Guidance (and supporting toolkit)³¹ and with reference to the guidance published by MC.
- 6.2.3. Details of the damage cost calculations are provided below. The increase in vehicle trips per day due to the Proposed Development (as provided by GTA Civil's, the Project Transport Consultants) is

³⁰ DMRB Volume 11 Section 3 Part 1 (HA 207/07) Environmental assessment. Environmental assessment techniques. Air quality (Withdrawn – Old Version of a newer document)

³¹ Defra Air Quality Appraisal: Damage Cost Guidance. Available online: <https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance>

435 trips per day. Given the nature of the Proposed Development, all development trips are forecast to be cars and light duty vehicles.

- 6.2.4. Emissions of NO_x and PM_{2.5} (in kg per annum) associated with these trips have been calculated using Defra's most recent Emission Factor Toolkit (EFT) V11³². In line with MC's guidance, emissions were calculated for a five-year appraisal period (from the opening year of 2024 to 2028, inclusive), using a speed of 50 km/h, and an average distance of 10 km/trip. The results were then converted to tonnes per annum. The summary of the emissions is provided in Table 10 below.

Table 10 – Calculated Change in Emissions Associated with the Proposed Development*

Appraisal Year	Daily Trip Generation ¹	% HDVs	Annual Emissions (tonnes/year)	
			NO _x	PM _{2.5}
2024	435	0	0.0499	0.0312
2025			0.0498	0.0311
2026			0.0496	0.0310
2027			0.0495	0.0309
2028			0.0495	0.0309

* The MC guidance requires developers to calculate total damage costs for PM₁₀ emissions. The Defra Damage Cost Guidance advises that in order to monetise PM₁₀ emissions, appraisers must adjust their PM₁₀ emissions to PM_{2.5} and then monetise those using the PM_{2.5} damage costs. The Damage Costs Appraisal Toolkit provides a PM_{2.5}/PM₁₀ conversion factor of 0.624 which has been used here.

- 6.2.5. Defra's Air Quality Appraisal: Damage Costs Toolkit³¹ has then been used to calculate the resultant emissions mitigation costs based on the EFT outputs.
- 6.2.6. The calculated damage costs, based on the central present value and applying the 'Road Transport Urban Big' sector costs as stipulated within MC's guidance, are summarised in the table below.

Table 11 – 5-year Damage Cost Values

Pollutant Name	Central Present Value
NO _x (Road Transport)	£16,299
PM _{2.5} (Road Transport)	£15,003
Total	£31,302

- 6.2.7. **Table 11** shows that the 5-year exposure cost value is estimated to be **£31,302** (based on the Central Present Value). This value represents the amount of money that should be spent on mitigation to offset the emissions to air associated with road traffic generated by the Proposed Development.

³² Defra (2021) Emissions Factor Toolkit V.11. Available online [Emissions Factors Toolkit | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/eft/)

DEVELOPMENT DESIGN AND PROPOSED MITIGATION

- 6.2.8. The vehicle trip generation associated with the Proposed Development is considered to be low in the context of existing traffic flows on the surrounding road network and with reference to relevant screening criteria¹⁶. Although exhaust emissions from these vehicles will contribute to local pollutant concentrations, the additional emissions will not have a significant adverse impact on air quality at nearby sensitive receptors.
- 6.2.9. No on-site combustion plant / emission sources are proposed. It is proposed that most of the individual units will be served by air source heat pumps to meet hot water and heating needs. The exceptions will be the maisonettes / flats which will have electric heating. Therefore, no onsite building emissions will arise.
- 6.2.10. The Site is located on the edge of an existing residential area and within walking and cycling distance of a range of retail, commercial and community uses (including the nearby Hempstead Town Centre and Rainham) and public transport links, which provide connections to the wider area. A public footpath (GB40) runs directly through the Site and will be retained as part of the development proposals (with a slight diversion to the route). The greatest benefits with regards to local air quality will therefore be through the promotion of sustainable and active transport measures, the reduction of single-occupancy journeys, and the use of low emission vehicles.
- 6.2.11. Parking will be provided within the Proposed Development in accordance the MC's parking standards and will include a total of 179 spaces, of which 142 will be allocated spaces, 13 will be unallocated, and 24 will be for visitors. In accordance with MC's guidance, each house will have individual active electric vehicle charging facilities installed.
- 6.2.12. Covered and secured cycle parking is also proposed at the Site in accordance with Medway's Parking standards and will include:
- For the private dwellings: A minimum of one space per dwelling, provided within a storage unit or locker within the garden.
 - For the maisonettes/flat units: A communal cycle and bin store will be provided adjacent to the shared car parking area providing 1 cycle space for each of the units.
- 6.2.13. A Framework Travel Plan has been outlined in draft by the appointed Transport Consultants, which sets out potential measures that could be implemented at the Site to promote the use of public transport / sustainable transport choices by future site users and reduce the number of vehicle trips generated by the Proposed Development. It is expected that this plan will be further developed into a full Residential Travel Plan at an appropriate time (and likely secured through a planning condition). Further details are provided within the Transport Statement (and accompanying reports) submitted in support of the application. Some of the measures that are likely to be included within the Travel Plan include:
- Appointment of a Travel Plan Co-ordinator, to oversee the implementation and progress of the Travel Plan, and to act as a point of contact for site users.
 - Provision of a Travel Welcome Pack for residents which will include appropriate literature, such as:
 - Promotional material on the environmental and health benefits of using sustainable transport and active transport, including walking and cycling.

- Information on local transport links, including the location of walking and cycling routes, bus stops and bus services etc.
- Bus and rail maps and timetables.
- Dedicated notice board/s in a readily accessible location, displaying details of the Travel Plan, maps of public transport routes/timetables, details of promotional events (e.g. bike to work days etc).
- Bespoke travel planning or information website.
- Displaying route disruption notices and alternative routes, where essential maintenance is in place.

6.2.14. It is also recommended that the developer facilitates access to high quality and high-speed broadband service, to enable working and shopping from home.

6.2.15. Finally, the masterplan includes for a minimum 15m buffer along the north-western edge of the Site to provide separation between the Ancient Woodland and the proposed residential uses. The planting of new trees is also proposed along the margins of the Site, to further enhance the buffer to the Ancient Woodland and provide additional screening between the properties and the surrounding area.

7. CONCLUSIONS

- 7.1.1. The report presents the outcomes of a qualitative air quality assessment for the proposed residential development at Blower's Wood, Hempstead. The report considers the potential impact of the Proposed Development on air quality during both the construction and operational phases.
- 7.1.2. To inform the assessment, a desk-study was undertaken to determine the existing baseline conditions in the vicinity of the Site. This identified that the Proposed Development is located within an area where the air quality is primarily influenced by emissions from road transport, in particular the M2 motorway and A278 Hoath Way, which lie in close proximity to the Site. Although MC has designated a number of AQMAs due to exceedances of the air quality standard for annual mean NO₂ concentrations, the Site itself is not located in or near to an AQMA.
- 7.1.3. A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a Medium Risk of dust soiling impacts and a Low Risk of increases in particulate matter concentrations due to construction activities. However, through good site practice and the implementation of suitable mitigation measures, it should be possible to effectively prevent and/or minimise releases of dust and particulates such that the residual effect on nearby receptors will not be significant. Similarly, with the adoption of best practice measures, the residual effects of emissions to air from construction vehicles and plant on local air quality will not be significant.
- 7.1.4. Once it becomes operational, the Proposed Development will generate traffic movements on the local road network. Exhaust emissions of NO₂, PM₁₀ and PM_{2.5} arising from these vehicles will contribute to local pollutant concentrations near to the Site and those road links used by development traffic. A qualitative assessment of the potential impact of the Proposed Development on local air quality has been undertaken using trip generation and distribution data for the proposed Development and with reference to the MC's Air Quality Planning Guidance and screening criteria published by EPUK and the IAQM. This concluded that trip generation associated with the Proposed Development is low in comparison to the existing traffic flows on the local road network and below the aforementioned screening criteria. As such, the Proposed Development is not expected to have a significant adverse effect on local air quality at nearby receptors and detailed assessment is not required.
- 7.1.5. Given the nature of the Proposed Development, it will introduce new receptors into the area. It is acknowledged that air quality conditions within the Site will be influenced by emissions from road traffic using Hoath Way, Maidstone Road, and the M2. However, the Site is located upwind of these road sources and the proposed residential properties will be set back within the Site at least 120m from the motorway, 35m from Hoath Way, and 12m from Maidstone Road. Therefore, the influence of road traffic emissions on local air quality at the location of the proposed properties will be reduced. No AQMAs have been designated near to the Site and there are existing residential properties located closer to the M2. On this basis, pollutant concentrations within the Site will be acceptable for the proposed end use.
- 7.1.6. In line with the requirements of MC's Air Quality Planning Guidance an Emissions Mitigation Assessment was completed. This concluded that mitigation equivalent to £31,302 should be provided within the Site.

- 7.1.7. A range of mitigation measures are proposed for the development, which will be of benefit to air quality. These include:
- Provision of one active electric vehicle charging point for each dwelling proposed.
 - Provision of at least one safe and secure cycle parking space for each dwelling.
 - A Residential Travel Plan, which will include measures to promote active and sustainable travel to and from the Site, which will in turn help to reduce the level of traffic generated by the Proposed Development and the associated vehicle emissions.
 - Tree planting.
- 7.1.8. The cost of the mitigation proposed is expected to exceed the costs calculated from the emissions mitigation assessment, and therefore no further mitigation is required.

Appendix A

SITE LAYOUT



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NOTES

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KEY

- Application Site Boundary
- Potential Vehicular Access
- 15m Buffer to Ancient Woodland
- Affordable Rented Dwelling
- First Homes Dwelling
- Market Dwelling
- Proposed Attenuation Feature
- Existing Public Right of Way (PROW)
- New Diverted PROW
- Approximate size and location of proposed foul water pumping station with 15m offset
- Approximate size and location of proposed sub-station

P21 15/11/2022 Updated as per latest tracking info. HJL KMN

P20 01/11/2022 Minor amendments. HJL KMN

P19 26/10/2022 Amended as per latest tracking info. HJL KMN

rev	date	description	dm	chk

masterplanning

environmental assessment

landscape design

urban design

ecology

architecture

arboriculture

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client

Redrow Homes

project

Blowers Wood,

Maidstone Road, Kent

drawing title

Site Layout

scale

1:500 @ A1

dm

HJL

chk

KMN

date created

09 March 2022

project number

10745

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P21

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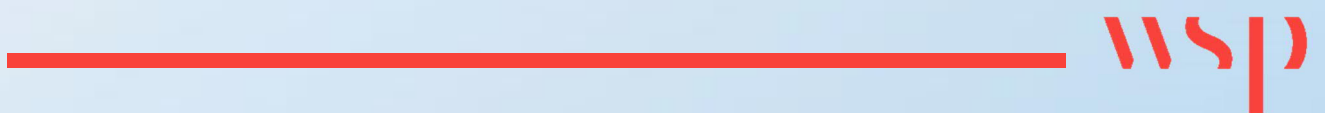
10745-FPCR-ZZ-XX-DR-A-0001

Project Code Originator Date - Local Type Role - Drawing Number

File: L110745\10745\ARCH\Drawings\10745-FPCR-ZZ-XX-DR-A-0001-P21 Site Layout.vwx

Appendix B

GLOSSARY

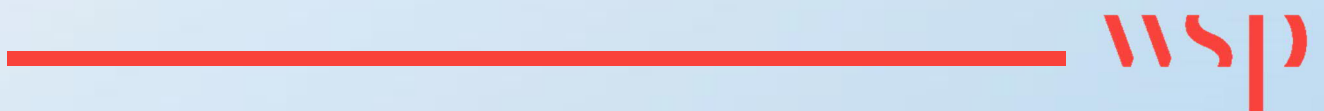


Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modeled results to account for uncertainties in the model
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
ASR	Annual Status Report
Conservative	Tending to over-predict the impact rather than under-predict.
Defra	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials
Emission rate	The quantity of a pollutant released from a source over a given period of time.
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
GLA	Greater London Authority
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management.

Term	Definition
MC	Medway Council
Minor roads	Non A roads of Motorways.
NO ₂	Nitrogen dioxide.
NO _x	Nitrogen oxides.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
µg/m ³ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m ³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix C

IAQM CONSTRUCTION ASSESSMENT
METHODOLOGY



STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- 'Human receptors' within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- 'Ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table 2A: Definitions of Dust Emission Magnitudes

Dust Emission Magnitude	Activity
Large	Demolition >50,000m ³ building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m ² site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m ³ building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	Demolition 20,000 - 50,000m ³ building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m ² site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved
	Construction 25,000 - 100,000m ³ building volume, dusty material e.g. concrete, on site concrete batching

Dust Emission Magnitude	Activity
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads
Small	Demolition <20,000m ³ building demolished, non-dusty material (e.g metal cladding), <10m above ground level, work during wetter months
	Earthworks <2,500m ² site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m ³ , non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 2Ba: Sensitivity of the Area to Dust Soiling Effects

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

Table 2Bb: Sensitivity of the Area to Human Health Impacts

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

Table 2Bc: Sensitivity of the Area to Ecological Impacts

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

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2C: Risk of Dust Impacts

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3 –SITE SPECIFIC MITIGATION

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.



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