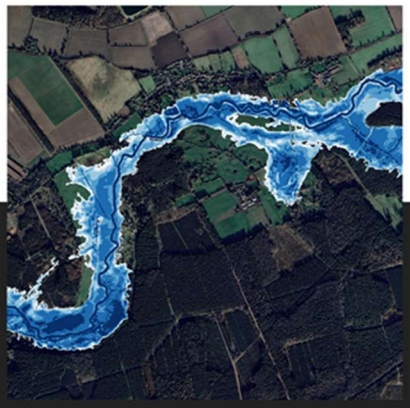

Welbeck Strategic Land II LLP

LAND AT COOMBE FARM, SAYERS COMMON

Air Quality Assessment

Independent, multidisciplinary engineering and environmental consultants

LAND AT COOMBE FARM, SAYERS COMMON

Air Quality Assessment

Document Reference: TR/VL/P25-3564/04

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Date: October 2025

DOCUMENT AND QUALITY CONTROL

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Draft Issue October 2025	Tara Rasoul, PhD, AMIEnvSc, AMIAQM	Paul Zanna, BSc (Hons)	Paul Zanna, BSc (Hons)	

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Create Consulting Engineers Limited (CCE) have been appointed by Welbeck Strategic Land II LLP to undertake an Air Quality Assessment (AQA) in support of the proposed development at land at Coombe Farm, Sayers Common.

1.2 The outline planning application (with all matters reserved except for access) comprising a residential development of up to 210 dwellings (Use Class C3); with associated access, landscaping, amenity space, drainage and associated works. The proposed operational year of the development is expected to be 2039.

1.3 The proposed development lies within the jurisdiction of Mid Sussex District Council (MSDC), located between the A23 to the east and the B2118 to the west, in a rural area. The red line boundary is shown in Figure 1.1.

Assessment Scope

1.4 This report considers potential air quality impacts associated with both the construction and operation of the development. Likely changes to local air quality resulting from the proposed development have been evaluated against the UK Air Quality Objectives (AQOs). Where necessary, mitigation measures are proposed to minimise the development's impact on local air quality.

1.5 During the construction phase, the proposed development has the potential to generate dust and particulate matter (PM_{10}). This has been assessed in accordance with IAQM 2024 guidance.

1.6 Vehicle movements generated during the operation of the development will give rise to NO_2, PM_{10} and $PM_{2.5}$ emissions which will have potential impacts to worsen air quality within the area. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions and assess potential effects as a result of the proposals.

1.7 The proposed heating and boiler systems for the development are unknown at this stage and therefore have not been assessed within this report.

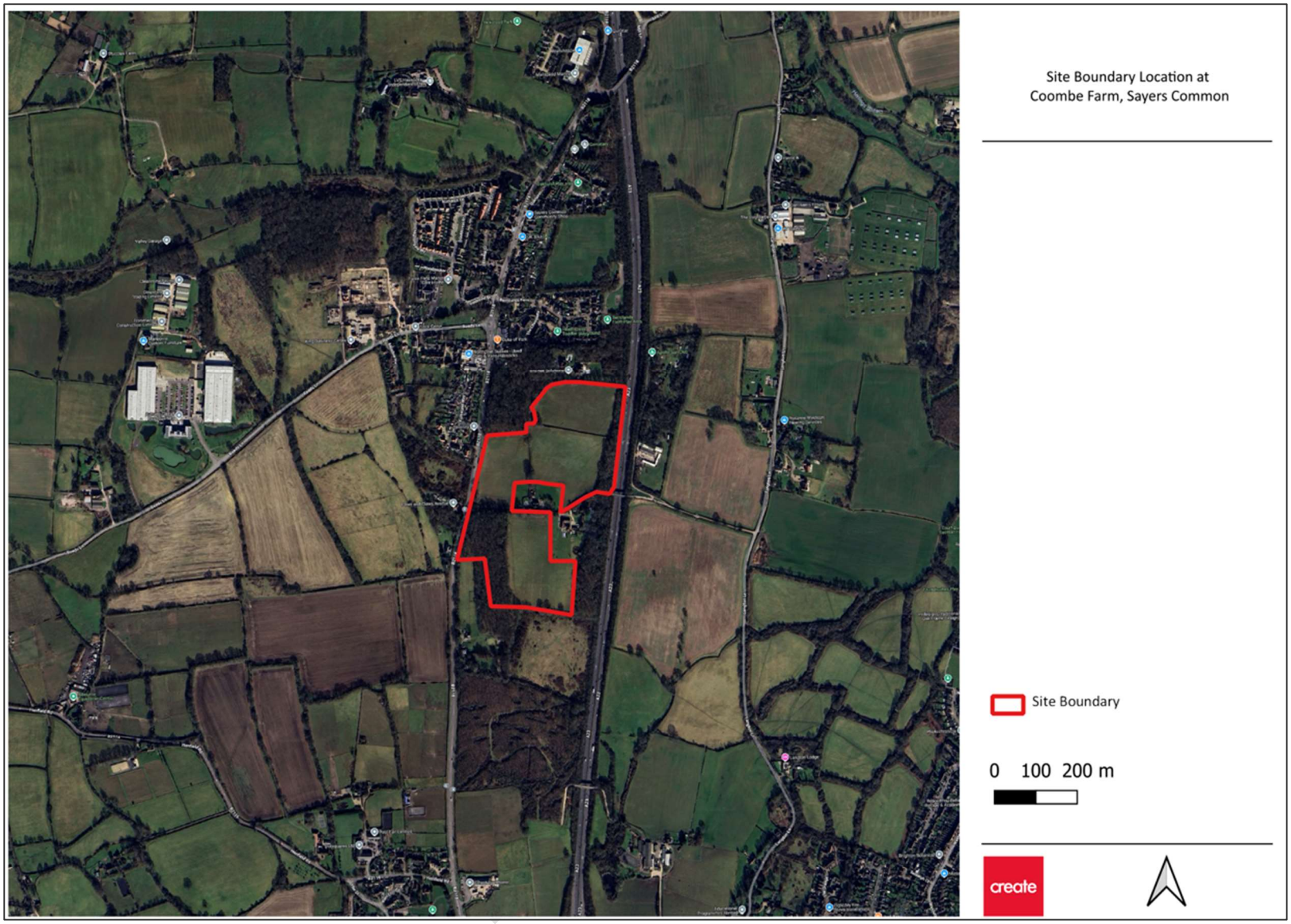

Figure 1.1: Red Line Boundary

2.0 LEGISLATION AND POLICY CONTEXT

Environment Act 2021

2.1 The Environment Act 1995 is being updated to include several changes that aim to improve air quality in England. These changes include a requirement for the Secretary of State to review the National Air Quality Strategy every five years, as well as a requirement for annual reports to be made to Parliament on the progress made towards achieving air quality objectives. Additionally, changes are being made to the way Air Quality Management Areas (AQMAs) are designated and managed.

2.2 The Environment Act 2021 established a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation.

2.3 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 set a new target for $PM_{2.5}$ in ambient air to reduce air pollution's environmental and health impacts. These Regulations come into force on the day after the day on which they are made:

> *The annual mean concentration target is that by the end of 31st December 2040 the annual mean level of $PM_{2.5}$ in ambient air must be equal to or less than 10 µg/m³ ("the target level").*

2.4 The Environmental Improvement Plan 2023 for England set interim targets by January 2028:

> *An annual average of 12 µg/m³ for $PM_{2.5}$ is not exceeded at any monitoring station.*

2.5 The above targets are not intended to be applied retrospectively to planning applications submitted before the regulations came into effect. However, this assessment will be undertaken in consideration of the new $PM_{2.5}$ legislation, ensuring that it is appropriately factored into the air quality assessment process.

2.6 Table 2.1 details the current AQOs in relation to the proposed development and this assessment.

Pollutant	Air Quality Objectives	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m³	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m³	Annual mean
Particulate Matter (PM_{10})	50 µg/m³	24-hour mean not to be exceeded more than 35 times per year
	40 µg/m³	Annual mean
Particulate Matter ($PM_{2.5}$)	20 µg/m³	Annual mean
	Interim target by 2028 12 µg/m³	
	Legally binding target by 2040 10 µg/m³	

Table 2.1: Air Quality Objectives (England)

National Planning Policy Framework 2024

2.7 The National Planning Policy Framework (NPPF), paragraph 199, states that:

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

2.8 Paragraph 200 states:

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

Local Planning Policy

Local Plan

Mid Sussex District Plan 2014 – 2031 (Adopted March 2018)

2.9 The Local Plan is a significant document for the Council and residents of Mid Sussex. It sets the policies for the town's future development and will shape the area up to 2031 by providing a framework for new development, employment growth, infrastructure, and measures to protect the countryside.

2.10 The policies relating to air quality are detailed below:

"DP29: Noise, Air and Light Pollution

Strategic Objectives: 3) To protect valued landscapes for their visual, historical and biodiversity qualities; and 12) To support sustainable communities which are safe, healthy and inclusive.

Evidence Base: Data held by Environmental Health, Air Quality Action Plan – Stonepound Crossroads, Hassocks.

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Air Pollution:

- *It does not cause unacceptable levels of air pollution,*
- *Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels,*
- *Development proposals (where appropriate) are consistent with Air Quality Management Plans.*

The degree of the impact of noise and light pollution from new development or change of use is likely to be greater in rural locations, especially where it is in or close to specially designated areas and sites."

Key Guidance Documents

Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

2.11 This guidance provides advise, methodology and criteria to assess the dust impacts that arise from construction activities. This assessment evaluates the impact of dust soils and human health impacts during the demolition, earthworks, construction and trackout activities.

2.12 The methodology is replicated in Appendix A of this report.

Land Use Planning and Development Control: Planning for Air Quality (EPUK-IAQM, 2017)

2.13 This guidance includes a method for screening the requirement for an air quality impact assessment and whether a detailed assessment is required. The methodology is reproduced in Appendix B of this report.

Local Air Quality Management Technical Guidance (LAQM.TG22)

2.14 This technical guidance is used by local authorities in their review and assessment work. LAQM is a statutory process through which local authorities are required to monitor, assess, and take actions to improve local air quality.

2.15 Within this guidance, Box 1.1 contains examples where air quality objectives should apply. Annual mean objectives for NO_2 and PM_{10} should apply at locations where members of the public might be regularly exposed, including building façades of residential properties, school, hospitals and care homes.

2.16 The following impacts should be assessed with the consideration of cumulative effects from other planned or proposed developments within the area:

- Impact of the proposed development upon the local air quality; and
- The impact of local air quality on the receptors using the development.

2.17 The methodology is reproduced in Appendix B of this report.

3.0 BASELINE CONDITIONS

3.1 Baseline data was gathered from the following sources:

- MSDC's 2025 Air Quality Annual Status (ASR) Report,
- DEFRA's UK AIR website, and
- DEFRA's national air quality background maps 2021.

Local Air Quality Management

Air Quality Management Areas

3.2 As required by the Environment Act (1995), MSDC has undertaken a review and assessment of air quality within their administrative area. This process concluded that annual mean concentrations of NO_2 are below the relevant AQOs at all monitored locations. As such, no AQMAs are currently declared, with the former Stonepound Crossroads AQMA in Hassocks having been revoked in December 2024 following sustained compliance.

3.3 The site is therefore not located within an AQMA. Accordingly, there is no potential for the proposed development to expose future site users to elevated pollutant concentrations or to cause a deterioration in local air quality. This is considered further within this assessment.

Air Quality Monitoring Data

3.4 MSDC undertook automatic (continuous) monitoring at one site and passive (diffusion tubes) monitoring at 35 sites across the district during 2024.

3.5 The automatic monitoring site (MSAQ43) is located in East Grinsted, approximately 23.7 km northeast of the site, and is therefore not considered further in this assessment.

3.6 There are no diffusion tube monitoring sites in close proximity to the proposed development. The nearest sites, MSAQ26 and MSAQ27, are approximately 1.8 km and 2.37 km from the site, respectively, and their results are presented in Table 3.1.

3.7 As shown in Table 3.1, monitored annual NO_2 concentrations did not exceed the AQOs from 2019 to 2024, and the concentrations show an overall decline over the monitoring years.

Site ID	Site Name	NGR		Site Type	Annual Mean NO_2 Concentrations (µg/m³)					
		X	Y		2019	2020	2021	2022	2023	2024
MSAQ26	High Street Hurstpierpoint	528289	116395	Suburban	21.5	16.1	16.8	16.8	15.3	14.8
MSAQ27	Telegraph Pole London Road Hickstead	526870	120238	Suburban	19.3	13.3	14.7	15.4	13.0	12.0

Table 3.1: Diffusion Tube Monitoring Result

Mapped Background Pollution

3.8 Predictions of background pollutant concentrations on a 1km-by-1km grid basis have been produced by DEFRA for the entire of the UK to assist Local Authorities (LAs) in their Review and Assessment of air quality.

3.9 The proposed development site is in grid squares NGR: 526500, 118500. The predicted background concentrations for the baseline year (2024) and for 2039, when the development is expected to be fully completed and occupied, are presented in Table 3.2.

Pollutant	Predicted Background Concentration (µg/m³)	
	2024	2039
NO_X	10.92	7.03
NO_2	8.47	5.38
PM_{10}	10.45	9.54
$PM_{2.5}$	6.10	5.27

Table 3.2: DEFRA Predicted Background Concentrations

3.10 As shown in Table 3.2, background concentrations in 2024 and 2039 are predicted to remain well below the AQOs.

4.0 CONSTRUCTION PHASE ASSESSMENT

4.1 A qualitative assessment of the air quality impact during the construction phase was carried out in accordance with the methodology outlined within the Institute of Air Quality Management's *"Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)"*.

4.2 The methodology for this assessment is detailed in Appendix A.

Sensitive Receptors

4.3 A sensitive receptor is defined as any location that may be affected by changes in air quality as a result of a development. These have been defined for construction dust impacts in the following Sections.

4.4 Two residential properties are located immediately to the west of the site boundary. Based on the criteria shown in Table A2, Appendix A, the sensitivity of the receiving environment to potential dust impacts is considered high for human receptors. This was because users would expect to enjoy a high level of amenity.

4.5 Ecological receptors were analysed using Magic Maps website which provides authoritative geographic information about the natural environment from across the government. This application is managed by Natural England.

4.6 The review showed that there are no internationally or nationally designated sites, including Sites of Special Scientific Interest (SSSIs), Ramsar Sites, Special Areas of Conservation (SACs), or Special Protection Areas (SPAs) within 50 metres of the site boundary, within 50 metres of construction vehicle routes on the public highway, or within 250 metres of the site entrance. These designations have therefore been screened out and are not considered further in this report.

Construction and Trackout Sensitive Receptors

4.7 Receptors sensitive to potential dust impacts during all construction activities were identified from a desk-top study of the area up to 250 m from the development boundary. These are summarised in Table 4.1.

Distance from Site Boundary (m)	Approximate Number of High Sensitivity Receptors
Less than 20	1 - 10
Less than 50	1 - 10
Less than 100	10- 100
Less than 250	More than 100

Table 4.1: Construction Activities Dust Sensitive Receptors

4.8 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area within 250 m of the site entrance and within 50 m of the roads used by construction vehicles. These are summarised in Table 4.2.

4.9 The exact construction vehicle access routes are not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. It is expected,

however, that the B2118 will be used to access the site, with relevant improvement works undertaken as required.

Distance from Site Access Route (m)	Approximate Number of High Sensitivity Receptors
Less than 20	1- 10
Less than 50	10- 100

Table 4.2: Trackout Activities Dust Sensitive Receptors

Additional Factors

4.10 The wind direction is predominantly from southwesterly, as shown in Figure 5.3. As such, receptors to the northeast are mostly affected by dust emissions.

4.11 A review of MSDC planning portal shows that there are no approvals for large scale developments in close proximity to the proposed development site boundary.

4.12 The development will be constructed over several phases, where the localised impact on nearby receptors will keep changing. It is not expected that one set of receptors will be subjected to construction activities and dust for more than two years. Therefore, the long-term dust impact on receptors will be low.

Sensitivity of the Surrounding Area

4.13 Sensitive receptors have been assessed based on distance from the source and annual mean PM_{10} concentrations within the area. This has been used to determine the sensitivity of the surrounding area to demolition, earthworks, construction and trackout activities.

4.14 Table 4.3 shows the sensitivity of the surrounding area in relation to dust soiling, human health impacts and ecological impacts for each of the construction activities.

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

Table 4.3: Sensitivity of the Surrounding Area

Construction Phase Assessment

4.15 The undertaking of activities such as excavation, ground works, cutting, construction and storage of materials have the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.

4.16 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

4.17 There is currently no data available on the construction-based activities. Therefore, professional judgement has been used to assess each activity.

Demolition

4.18 The site is vacant, and no demolition will take place; therefore, dust risk from demolition has not been considered further.

Earthworks

4.19 Earthworks will primarily involve excavating material, haulage, as well as site levelling and landscaping. The British Geological Survey website informs that the soil type lying beneath the site is Weald Clay Formation - Mudstone. The total site area is more than 110,000 m^2. It is expected that more than 10 HGVs will be active at any one time. Height of bunds is expected to be up to 6 m.

4.20 In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from earthworks is therefore large.

Construction

4.21 The construction activities will involve the erection of up to 210 units with associated infrastructure. The total construction volume will between over 75,000 m^3. Various materials will be used for the construction of dwellings including concrete, timber, metals and/or cladding. It is unknown if on-site concrete batching and/or sandblasting will take place and therefore have been included in this assessment.

4.22 In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from construction works is therefore large.

Trackout

4.23 Trackout activities will include vehicles accessing and leaving the site with new construction materials and site waste. Unpaved road is expected to be more than 100 m. Given the underlying Weald Clay Formation – a fine-grained mudstone – trackout materials are likely to include clay, silt, and fine sand, all of which can generate dust when dry and disturbed. The number of HGV movements per day is expected to be more than 50 movements.

4.24 In accordance with the criteria outlined in Table A1, the magnitude of potential dust emissions from trackout activities is therefore large.

Risk of Impacts

4.25 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 4.4 provides a summary of the risk of impacts for the proposed development. The highest risk category identified for each construction activity has been used to determine the level of mitigation required.

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	-	High	High	High
Human Health	-	Low	Low	Low

Table 4.4: Summary of Potential Unmitigated Dust Risks

4.26 As indicated in Table 4.4, the highest dust risk from earthworks, construction, and trackout activities is considered high for dust soiling and low for human health. Therefore, the overall dust risk level for these activities is considered high for all non-specified activities.

4.27 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phases.

Mitigation and Residual Effects

4.28 The IAQM guidance provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development site as summarised in Table 4.5.

4.29 The mitigation measures can be reviewed prior to the commencement of construction works incorporated into the existing the strategies as applicable.

4.30 Assuming the relevant mitigation measures outlined in Table 4.5 are implemented, the residual effect from all dust generating activities is predicted to be not significant, in accordance with the IAQM guidance.

Guidance	Mitigation Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. • Display the head or regional office information. • Develop and implement a Dust Management Plan (DMP).
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book. • Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring	• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the

Guidance	Mitigation Measure
	local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and Maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/ Machinery and Sustainable Travel	• Ensure all on-road vehicles comply with the requirements the Local Planning Authority • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). • Implement a Travel Plan that supports and encourages sustainable travel. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
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.

Guidance	Mitigation Measure
	• 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.
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once.
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 power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10 m from receptors where possible.

Table 4.5: Fugitive Dust Mitigation Measures

5.0 DISPERSION MODEL ASSESSMENT INPUTS

5.1 To assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site and at existing sensitive receptor locations near the development site, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

5.2 Dispersion modelling was undertaken using the ADMS-Roads Extra dispersion model (version 5.1.0). ADMS-Roads Extra is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

Input Data

5.3 The model requires input data that details the following parameters:

- Emission Factors;
- Traffic Flow Data;
- Diurnal Profiling;
- Meteorological data;
- Roughness length;
- Monin-Obukhov length;
- Background Concentrations;
- Verification Factor; and
- Sensitive Receptor Locations.

Emission Factors

5.4 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (Version 13.1) released in March 2025.

Traffic Flow Data

5.5 Two scenarios have been modelled:

- S1 – Completion year (2039) without the development
- S2 – Completion year (2039) with the development and committed developments

5.6 Traffic data for the A23 were obtained from The Department for Transport's (DfT's) Traffic Count Website.

5.7 The DfT Matrix web tool enables the user to view and download traffic flows on every link of the A-road and motorway network in Great Britain for the years 1999 to 2024. It should be noted that the DfT matrix is referenced in DEFRA guidance LAQM.TG22 as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable representation of traffic flows in the vicinity of the site.

5.8 Traffic data for all other modelled road links were provided by the project's Transport Consultant, Paulbasham Associate.

5.9 The modelled road links are illustrated in Figure 5.1. The traffic data used in the modelling scenarios are summarised in Tables 5.1 and 5.2.

5.10 Growth factors provided by the Trip End Model Presentation Program (TEMPRO) Version 8.1 software package were applied to convert the 2024 traffic flow data for the A23 to 2039, representing the development completion year. The applied growth factor was 1.0848.

5.11 Vehicle speeds were estimated based on the free flow 'potential' of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards.

5.12 In accordance with the modelling methodology, different speeds for road links have been used for the base plus development traffic approaching at busy junctions and delays during peak/off peak. The road widths and mean vehicular speeds remained the same across all modelling scenarios.

Link ID	Road Link	Average Road Width (m)	Mean Vehicle Speed (km/h)	
			LDV	HGV
L1	A23, North of B2118	15	113	97
L2	A23, South of B2118	15	113	97
L3	B2118 North of Mill Lan	4	48	40
L4	Mill Lane	3	32	24
L5	Reeds Lane	5	96	80
L6	Albourne Road	5	48	40
L7	Henfield Road	5	113	97
L8	B2118 South of Albourne Rd	8	48	40
L9	Between Albourne and Henfield Road	11	48	40
L10	North of Henfield Road	8	64	56
L11	North of the Site	10	48	40
L12	South of the Site	8	113	97
L13	North of Reeds Lane	4	48	40
L14	Between North of Reeds Lane and Roundabout	5.5	48	40

Table 5.1: Traffic Links Used in Modelling Scenarios

Link ID	S1		S2	
	24-hour AADT Flow	HDV %	24-hour AADT Flow	HDV %
L1	3228	5	3502	5
L2	53293	5	57812	5
L3	48	0	48	0
L4	4680	4	7476	4
L5	2088	2	3287	2
L6	2143	6	2834	6
L7	2313	2	2545	2
L8	3449	3	5587	3

Link ID	S1		S2	
	24-hour AADT Flow	HDV %	24-hour AADT Flow	HDV %
L9	9633	3	14200	3
L10	5898	5	8096	5
L11	3598	4	6871	4
L12	7299	4	12371	4
L13	4809	4	7465	4
L14	4415	4	7005	4

Table 5.2: Traffic Data Input into Modelling Scenarios

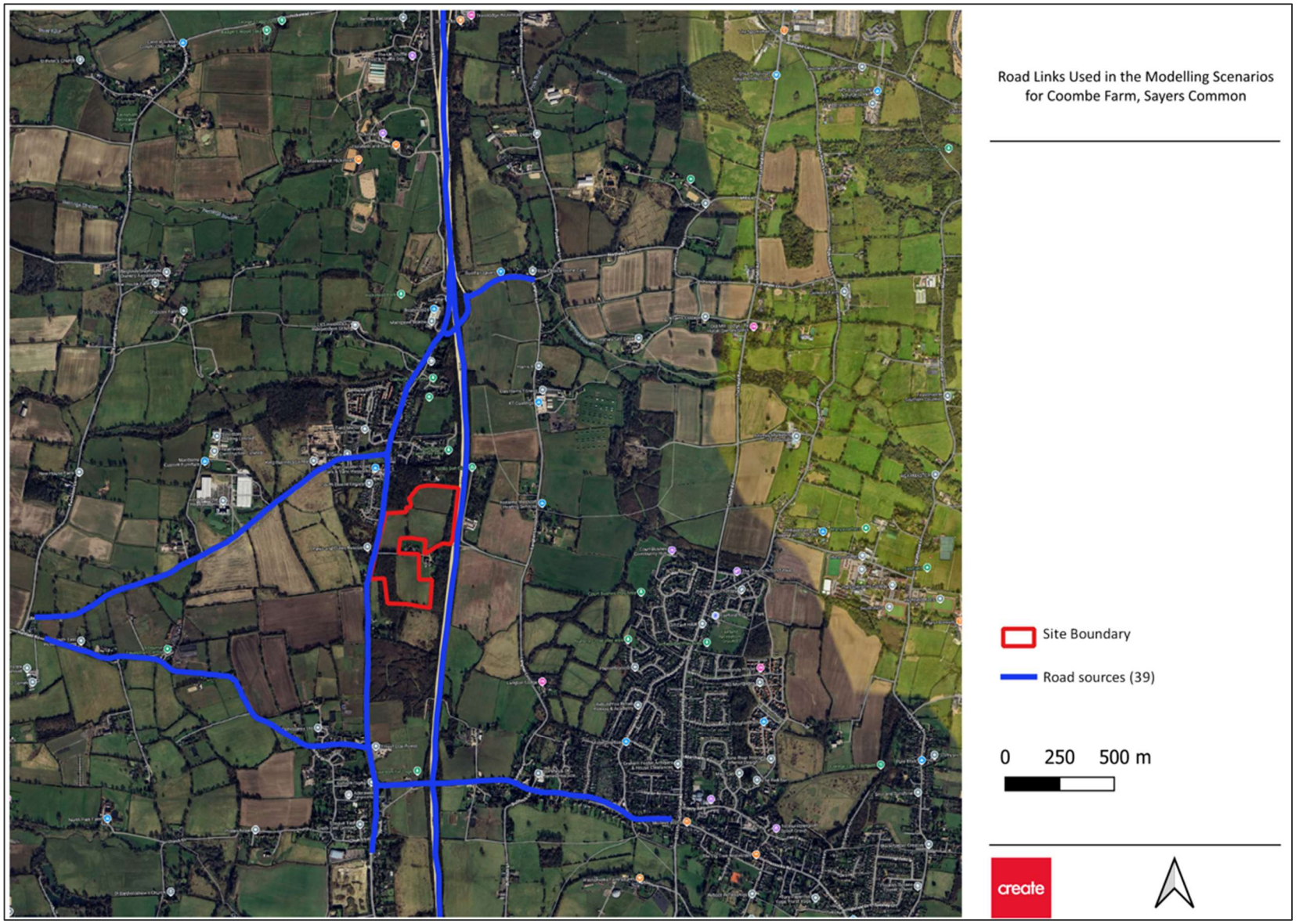

Figure 5.1: Modelled Road Links

Diurnal Profiling

5.13 A 2024 national diurnal profile was added to all scenarios to evaluate the distribution of traffic across the week within the model. A representation of the profile is shown in Figure 5.2.

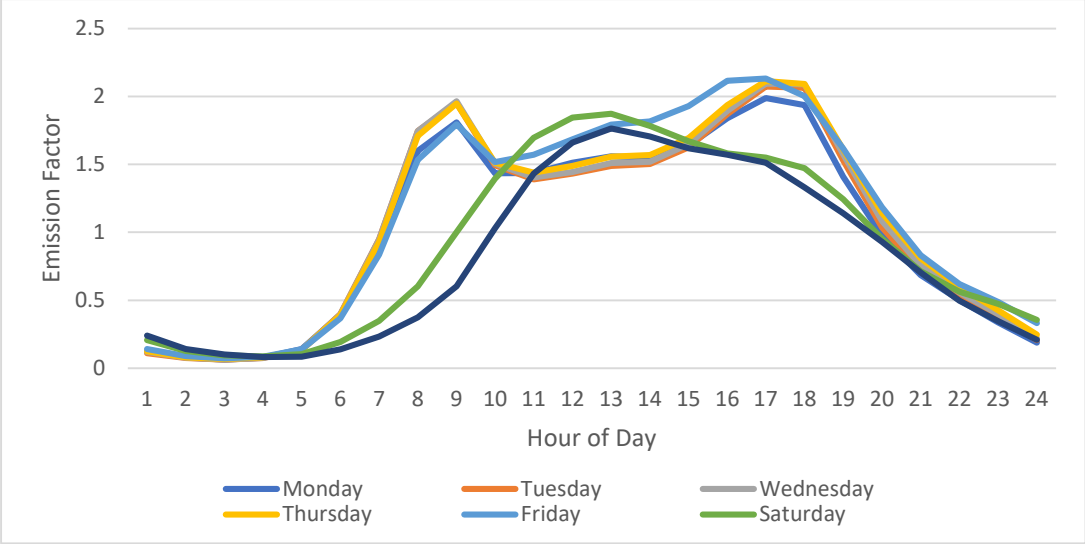

Figure 5.2: 2024 National Diurnal Profile

Meteorological Data

5.14 Hourly sequential meteorological data, including wind direction, wind speed, temperature, cloud cover and relative humidity — all of which significantly influence atmospheric dispersion — have been used in the model in 10-degree sectors. Raw data were provided by the Visual Crossing and processed for use in ADMS.

5.15 Meteorological data used for this assessment cover the period from 1st January 2024 to 31st December 2024 (inclusive). A wind rose for the site for 2024 is provided in Figure 5.3.

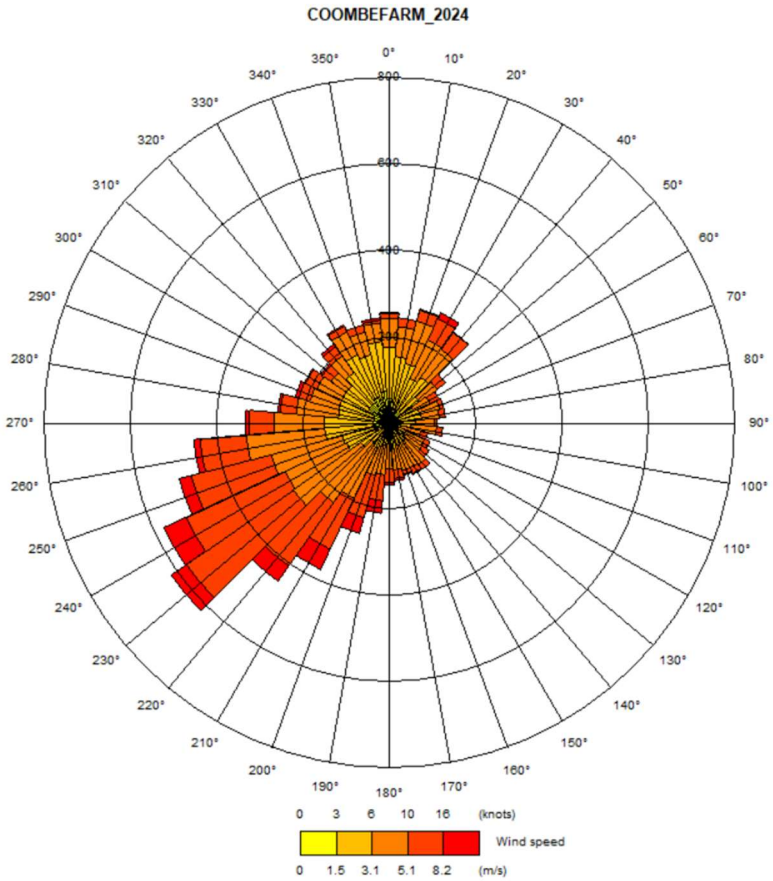

Figure 5.3: 2024 Wind Rose for Coombe Farm

Roughness Length

5.16 A roughness length (z0) of 0.2 m was used for the dispersion and meteorological sites. This value is considered appropriate for the morphology of the assessment areas, which is suggested within ADMS-Roads Extra as being suitable for 'Agricultural areas'.

Monin-Obukhov Length

5.17 A minimum Monin-Obukhov length of 10 m was used for the dispersion and meteorological sites. This value is considered appropriate for the nature of the assessment area and is suggested within ADMS-Roads Extra as being suitable for ''Small towns <50,000''.

Background Concentrations

5.18 DEFRA's background maps were used to provide background concentrations in the model. Concentrations used within the model are as follows:

- NO_2 annual concentration of 8.47 µg/m^3;
- PM_{10} annual concentration of 10.45 µg/m^3; and
- $PM_{2.5}$ annual concentration of 6.10 µg/m^3.

5.19 Background concentrations for 2024 were utilised in preference to the development's commencement year, 2039. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operational phase of the proposals.

Verification Factor

5.20 The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations.

5.21 The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and
- Uncertainties associated with monitoring data, including locations

5.22 Model verification was not undertaken due to the absence of suitable monitoring sites in proximity to the proposed development that accurately represent the site's environmental conditions. The nearest monitoring sites — MSAQ26 on High Street, Hurstpierpoint, approximately 1.8 km from the site, and MASQ27 near the A2300, approximately 2.37 km from the site — are situated in suburban environments and are not representative of the site. Consequently, the modelling results have not been adjusted and reflect predicted concentrations based on standard input parameters for the local area.

Sensitive Receptor Locations

5.23 Sensitive existing receptors were selected based on their proximity to road links expected to be affected by the proposed development, as detailed in Table 5.3 and Figure 5.4. These receptors were modelled at a height of 1.5 m to represent ground-level exposure.

Receptor	Address	Easting (x)	Northing (y)
R1	18 High St, Hurstpierpoint, Hassocks	527898	116516
R2	5 High St, Hurstpierpoint, Hassocks	527833	116532
R3	4 Orchard Way, Hurstpierpoint, Hassocks	527600	116634
R4	Residential Apartment on Albourne Road	527480	116651
R5	1460 Albourne Road, Hurstpierpoint, Hassocks	527260	116705
R6	4 London Rd, Albourne, Hassocks	526607	116463
R7	Residential units on Henfield Road, B2116	526460	116850
R8	A cottage at the corner of Henfield Road and The Street	526360	116842
R9	Residential unit on B2118	526642	117932
R10	Residential unit on B2118	526662	118060
R11	Residential unit on Reeds Lane	526545	118170
R12	2 Reeds Lane	526438	118147
R13	21 B2118, Sayers Common, Hassocks	526688	118307
R14	27 Dunlop Cl, Sayers Common, Hassocks	526709	118349
R15	Residential unit on B2118	526773	118529
R16	Residential unit on B2118	526908	118703.36

Table 5.3: Sensitive Receptor Locations

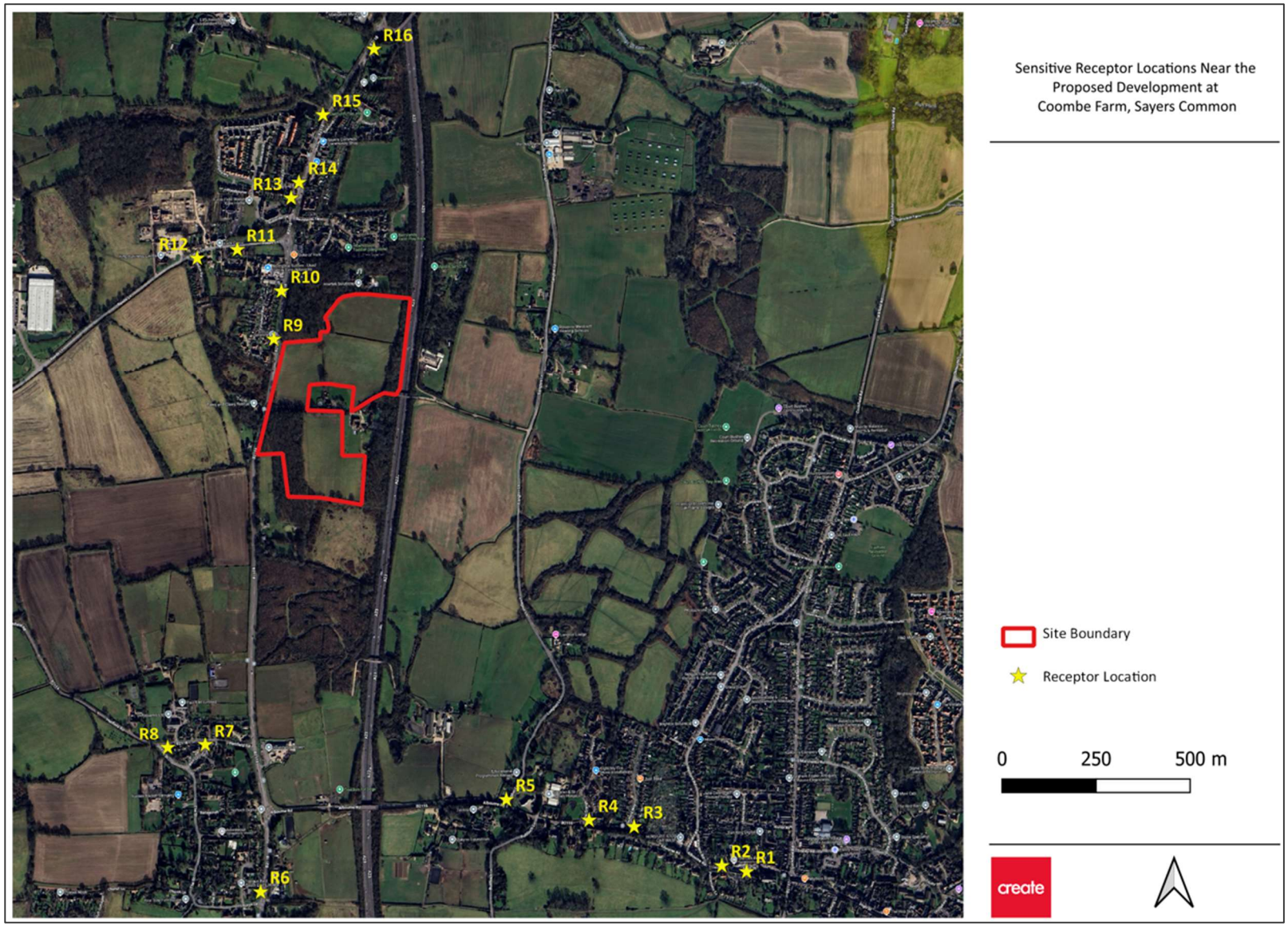

Figure 5.4: Sensitive Receptor Locations

6.0 DISPERSION MODELLING ASSESSMENT

6.1 Vehicle movements associated with the operation of the proposed development will generate exhaust emissions on the local and regional road networks. Dispersion modelling was carried out for the expected operational year of 2039 to estimate annual concentrations of NO_2, PM_{10}, and $PM_{2.5}$ across the site and at existing sensitive receptors. The assessment considered the following scenarios:

- S1 – Completion year (2039) without the development; and
- S2 – Completion year (2039) with the development and committed developments.

6.2 Sensitive receptors were modelled along the site boundary and at selected existing receptors located along road links anticipated to be affected by the proposed development. Receptors were modelled at a height of 1.5 m to represent ground floor level.

6.3 Predicted pollutant concentrations for the development's operational year (S2) are presented in Figures 6.1 to 6.3.

6.4 Figures 6.1 to 6.3 show that predicted annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations across the site boundary are well below the relevant AQOs for the operational year 2039. Predicted $PM_{2.5}$ concentrations are also below the legally binding target of 10 µg/m³. Future site users will therefore not be exposed to pollutant concentrations exceeding the AQOs or target limits, and the site is considered suitable for development without the need for mitigation measures.

Nitrogen Dioxide (NO_2) Impacts at Receptor Locations

6.5 In accordance with the assessment criteria the annual mean NO_2 concentrations were predicted for S1 and S2 scenarios at sensitive receptor locations. The results are summarised in Table 6.1.

Sensitive Receptor	Predicted Annual Mean NO_2 Concentration (µg/m³)		
	S1	S2	Change
R1	8.69	8.70	0.0100
R2	8.68	8.69	0.0100
R3	8.73	8.74	0.0100
R4	8.76	8.77	0.0100
R5	8.90	8.91	0.0100
R6	8.76	8.80	0.0400
R7	8.72	8.76	0.0400
R8	8.68	8.71	0.0300
R9	9.09	9.22	0.1300
R10	8.86	8.95	0.0900
R11	8.67	8.71	0.0400
R12	8.64	8.68	0.0400
R13	8.73	8.77	0.0400
R14	8.75	8.80	0.0500
R15	8.75	8.81	0.0600
R16	9.00	9.08	0.0800

Table 6.1: Predicted Annual Mean NO_2 Concentrations for S1 and S2

6.6 As indicated in Table 6.1, predicted annual mean NO_2 concentrations are well below the AQO at all modelled sensitive receptor locations. There are small changes in concentration with the development in place.

6.7 Impacts on the Air Quality Assessment Level (AQAL) for the predicted annual mean NO_2 concentrations at the human sensitive receptor locations are summarised in Table 6.2.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	0.1149	21.75	Negligible
R2	0.1151	21.73	Negligible
R3	0.1144	21.85	Negligible
R4	0.1140	21.93	Negligible
R5	0.1122	22.28	Negligible
R6	0.4545	22.00	Negligible
R7	0.4566	21.90	Negligible
R8	0.3444	21.78	Negligible
R9	1.4100	23.05	Negligible
R10	1.0056	22.38	Negligible
R11	0.4592	21.78	Negligible
R12	0.4608	21.70	Negligible
R13	0.4561	21.93	Negligible
R14	0.5682	22.00	Negligible
R15	0.6810	22.03	Negligible
R16	0.8811	22.70	Negligible

Table 6.2: Predicted NO_2 Impacts as a Result of the Development

6.8 Overall, as indicated in Table 6.2, the significance of impacts of annual mean NO_2 concentrations as a result of the development was predicted to be negligible at all receptor locations, in accordance with EPUK-IAQM guidance.

6.9 Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM.TG22 if annual mean NO_2 concentrations are below 60 $\mu g/m^3$ then it is unlikely that the 1-hour AQO will be exceeded. As such, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO_2 across the modelled site.

6.10 It should also be noted that background NO_2 levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above ground floor level are acceptable in regard to pollutant exposure across all receptor locations and have not been assessed further.

Particulate Matter (PM_{10}) Impacts at Receptor Locations

6.11 In accordance with the assessment criteria the annual mean PM_{10} concentrations were predicted for S1 and S2 scenarios at sensitive receptor locations. The results are summarised in Table 6.3.

Sensitive Receptor	Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)		
	S1	S2	Change
R1	10.72	10.75	0.0211
R2	10.68	10.70	0.0174
R3	10.71	10.73	0.0183
R4	10.72	10.74	0.0179
R5	10.81	10.83	0.0211
R6	10.72	10.81	0.0919
R7	10.70	10.76	0.0610
R8	10.67	10.72	0.0527
R9	10.94	11.19	0.2569
R10	10.89	11.11	0.2218
R11	10.69	10.79	0.1016
R12	10.65	10.74	0.0889
R13	10.71	10.81	0.1002
R14	10.76	10.88	0.1209
R15	10.75	10.86	0.1171
R16	10.94	11.13	0.1909

Table 6.3: Predicted Annual Mean PM_{10} Concentrations for S1 and S2

6.12 As indicated in Table 6.3, predicted annual mean PM_{10} concentrations are well below the AQO at all the modelled sensitive receptor locations. There are small changes in concentration with the development in place.

6.13 Impacts on the AQAL for the predicted annual mean PM_{10} concentrations at sensitive receptor locations are summarised in Table 6.4.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	0.1966	26.86	Negligible
R2	0.1622	26.75	Negligible
R3	0.1703	26.82	Negligible
R4	0.1671	26.85	Negligible
R5	0.1944	27.07	Negligible
R6	0.8503	27.03	Negligible
R7	0.5671	26.91	Negligible
R8	0.4912	26.81	Negligible
R9	2.2948	27.98	Negligible
R10	1.9960	27.78	Negligible
R11	0.9419	26.97	Negligible
R12	0.8274	26.85	Negligible
R13	0.9268	27.02	Negligible
R14	1.1117	27.20	Negligible
R15	1.0781	27.16	Negligible
R16	1.7145	27.83	Negligible

Table 6.4: Predicted PM_{10} Impacts as a Result of the Development

6.14 As indicated in Table 6.4, impacts on annual mean PM_{10} concentrations as a result of the development were predicted to be negligible at all receptor locations, in accordance with EPUK-IAQM guidance.

6.15 Similar to NO_2 concentrations, it should also be noted that background PM_{10} levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above ground floor level are considered to be acceptable in regard to pollutant exposure across all receptor locations and have not been assessed further.

Particulate Matter ($PM_{2.5}$) Impacts at Receptor Locations

6.16 In accordance with the assessment criteria the annual mean $PM_{2.5}$ concentrations were predicted for S1 and S2 scenarios at sensitive receptor locations. The results are summarised in Table 6.5.

Sensitive Receptor	Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
	S1	S2	Change
R1	6.25	6.26	0.0114
R2	6.23	6.24	0.0094
R3	6.25	6.26	0.0099
R4	6.25	6.26	0.0097
R5	6.30	6.32	0.0115
R6	6.25	6.30	0.0495
R7	6.24	6.27	0.0332
R8	6.22	6.25	0.0286
R9	6.37	6.50	0.1374
R10	6.34	6.46	0.1191
R11	6.23	6.28	0.0547
R12	6.21	6.26	0.0480
R13	6.24	6.30	0.0538
R14	6.27	6.33	0.0649
R15	6.26	6.33	0.0629
R16	6.37	6.47	0.1023

Table 6.5: Predicted Annual Mean $PM_{2.5}$ Concentrations

6.17 As indicated in Table 6.5, predicted annual mean $PM_{2.5}$ concentrations are well below the legally binding target, 10 µg/m³ AQO at all modelled sensitive receptor locations. There are small changes in concentration with the development in place and this is not considered significant.

6.18 The impacts on the AQAL for predicted annual mean $PM_{2.5}$ concentrations at sensitive receptor locations, with respect to the legally binding target of 10 µg/m³ AQO, are summarised in Table 6.6.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	0.1820	62.63	Negligible
R2	0.1503	62.39	Negligible
R3	0.1581	62.56	Negligible
R4	0.1555	62.63	Negligible

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R5	0.1825	63.16	Negligible
R6	0.7853	63.01	Negligible
R7	0.5290	62.73	Negligible
R8	0.4571	62.51	Negligible
R9	2.1127	65.03	Negligible
R10	1.8434	64.60	Negligible
R11	0.8703	62.84	Negligible
R12	0.7674	62.60	Negligible
R13	0.8539	62.96	Negligible
R14	1.0251	63.34	Negligible
R15	0.9935	63.26	Negligible
R16	1.5811	64.73	Negligible

Table 6.6: Predicted $PM_{2.5}$ Impacts as a Result of the Development

6.19 As indicated in Table 6.6, impacts on annual mean $PM_{2.5}$ concentrations as a result of the development were predicted to be negligible at all receptor locations, in accordance with EPUK-IAQM guidance.

6.20 Similar to NO_2 and PM_{10} concentrations, it should also be noted that background $PM_{2.5}$ levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above ground floor level are lower than those modelled within the assessment.

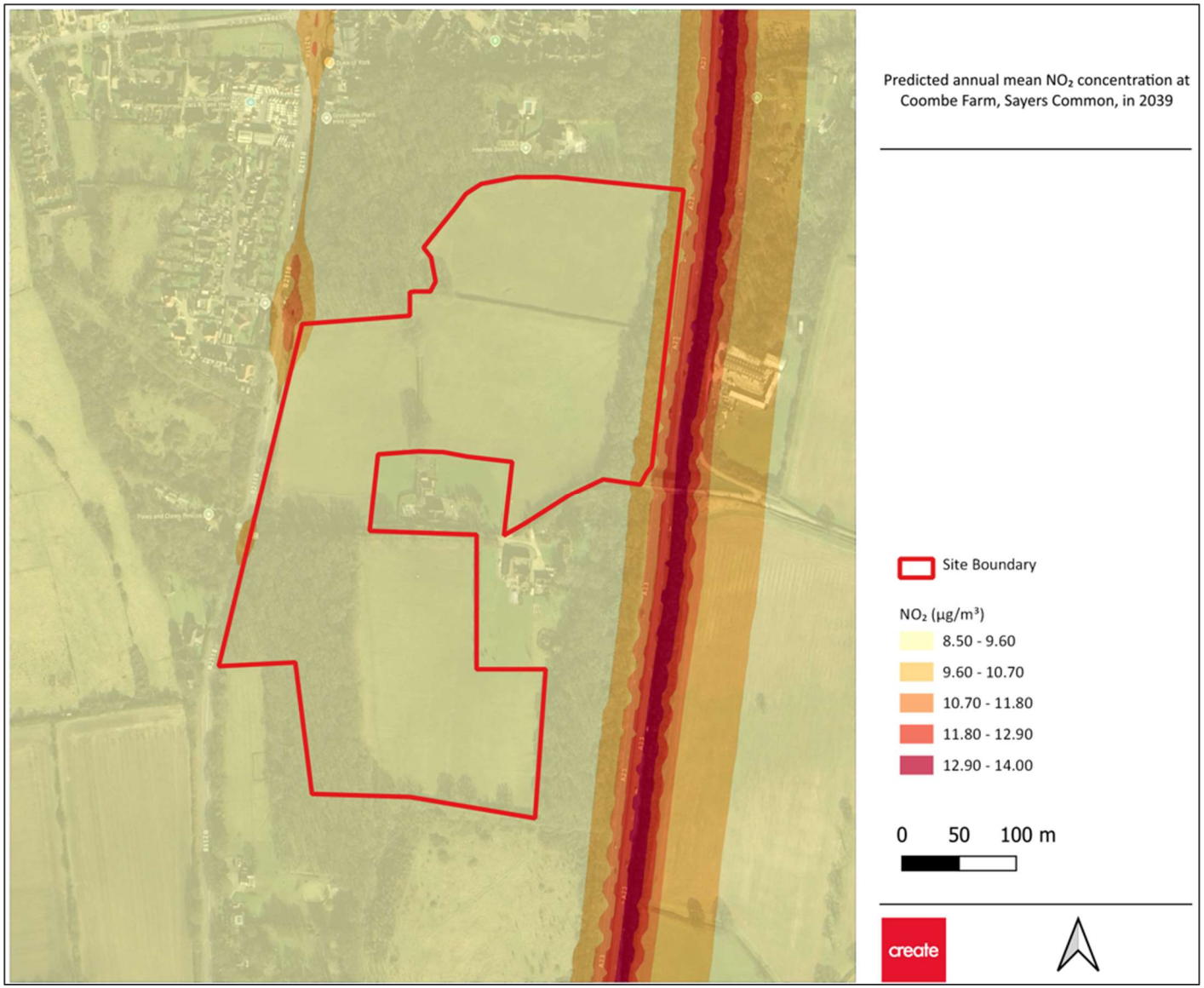

Figure 6.1: Predicted Annual Mean NO_2 Concentrations for S2

Figure 6.2: Predicted Annual Mean PM_{10} Concentrations for S2

Figure 6.3: Predicted Annual Mean $PM_{2.5}$ Concentrations for S2

7.0 BEST PRACTICE MEASURES

Construction Phase

7.1 An Air Quality Dust Management Plan has been undertaken to assess the potential for dust and associated health impacts from demolition and construction activities. In line with IAQM guidance, potential mitigation measures have been identified to minimise impacts during the construction phase. The assessment identified a high dust risk from earthworks, construction, and trackout activities. Accordingly, mitigation measures are required and have been adapted for the development site, as summarised in Table 4.5.

7.2 These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan which is suggested as a planning condition post determination.

Operational Phase

7.3 The modelled results show predicted annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations across the site boundary and at all existing receptor locations are below the relevant AQOs in 2039, when the development is completed. Additionally, the development is expected to have a negligible impact at all receptor locations, in accordance with EPUK-IAQM guidance.

7.4 The development is therefore considered suitable for the proposed use without the implementation of mitigation techniques for air quality.

7.5 Potential best practice mitigation options to further reduce operational effects are listed below, suggested by IAQM. It is acknowledged that this is not an exhaustive list but sets out a range of mitigation measures which could be implemented as the development progresses:

- At least 1 Electric Vehicle point per 10 dwellings – This shall be based on the best technology available at the time of planning approval;
- A Welcome Pack available to all residents online and as a booklet, containing information and incentives to encourage the use of sustainable transport modes; and
- Car club provision within the Development or support given to local car club/Electric vehicle car clubs.

7.6 Implementation of these measures would further reduce the potential impacts associated with the development.

8.0 CONCLUSIONS

8.1 Create Consulting Engineers Limited have been appointed by Welbeck Strategic Land II LLP to undertake an Air Quality Assessment (AQA) in support of the proposed development at land at Coombe Farm, Sayers Common.

8.2 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by demolition and trackout activities was predicted to be negligible**.**

8.3 The modelled results show predicted annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations across the site boundary and at all existing receptor locations are below the relevant AQOs in 2039, when the development is completed. Additionally, the development is expected to have a negligible impact at all receptor locations, in accordance with EPUK-IAQM guidance.

8.4 Additional mitigation measures are detailed in Section 7 to further reduce pollutant concentrations further. Based on the assessment results, air quality is not considered a constraint to granting planning consent for the proposed development.

9.0 DISCLAIMER

9.1 Create Consulting Engineers Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

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10.0 REFERENCES

10.1 2025 Air Quality Annual Status Report (ASR). Mid Sussex District Council (June 2025)

10.2 *Air emissions risk assessment for your environmental permit.* Environment Agency & Department for Environment, Food and Rural Affairs (2023)

10.3 *Clean Air Strategy* 2019. Department for Environment, Food and Rural Affairs (2019)

10.4 *Environment Act 1995*. Environment Agency, Scottish Environment Protection Agency (1995)

10.5 *Environment Act 2021.* Secretary of State, The Welsh Ministers (2021)

10.6 *Mid Sussex District Pla 2014-2031*: Mid Sussex District Council (Adopted March 2018)

10.7 *Land-Use Planning and Development Control*: *Planning for Air Quality*. EPUK & IAQM, Moorcroft, Barrowcliffe. et al (2017)

10.8 *Local Air Quality Management Technical Guidance* (LAQM.TG22*).* Department for Environment, Food and Rural Affairs (2022)

10.9 *National Planning Policy Framework*. Ministry of Housing, Communities and Local Government (2024)

10.10 *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1). Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2007)*

APPENDIX A

Construction Phase Assessment Methodology

There is the potential for fugitive dust emissions to occur as a result of construction activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management's "*Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)*", 2024.

Construction Phase Assessment

Activities on the construction site have been divided into four types to reflect their different potential impacts. These are:

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

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects.

The assessment steps are detailed below.

STEP 1

STEP 1 screens the requirement for a more detailed assessment. An assessment will normally be required where there is:

- a 'human receptor' within:
  - 250 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

- an 'ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

STEP 2

STEP 2 assesses the risk of potential dust impacts separately for demolition, earthworks, construction and trackout activities. Each activity is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (STEP 2A); and
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (STEP 2B).

The two factors are combined in STEP 2C to determine the risk of dust impacts without mitigation applied.

STEP 2A defines the potential magnitude of dust emission through the demolition phase. The relevant criteria are summarised in Table A1.

Magnitude	Activity	Criteria
Large	Demolition	• Total volume of building to be demolished 50,000m^3 • Potential dusty construction material (e.g concrete) • Onsite crushing and screening • Demolition activities more than 20m above ground
	Earthworks	• Total site area greater than 10,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Duty Vehicle (HDV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m
Medium	Demolition	• Total volume of building to be demolished 20,000m^3 – 50,000m^3 • Potential dusty construction material, • Demolition activities 10-20m above ground level
	Earthworks	• Total site area 2,500m^2 to 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	• Total building volume 25,000m^3 to 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 10 to 50 HDV trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Demolition	• Total volume of building to be demolished less than 20,000m^3 • Construction material with low potential for dust release (e.g metal cladding, or timber) • Demolition activities less than 10m above ground level • Demolition during wetter months

Magnitude	Activity	Criteria
	Earthworks	• Total site area less than 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 10 HDV trips per day • Surface material with low potential for dust release • Unpaved road length less than 50m

Table A1: Potential Dust Emission Magnitude

Step 2B defines the sensitivity of the area. The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Sensitivity	Examples		
	Dust Soiling Effects	**Health Effects of PM_{10}**	**Ecological Effects**
High	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).[c] • Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• Locations with an international or national designation and the designated features may be affected by dust soiling; or • Locations where there is a community of a particularly dust sensitive species, such as vascular species included in the red data list for Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.

Sensitivity	Examples		
	Dust Soiling Effects	**Health Effects of PM_{10}**	**Ecological Effects**
Medium	• Users would expect[a] to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.	• Locations where the people exposed are workers[d], and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to pm10, as protection is covered by health and safety at work legislation.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity	Examples		
	Dust Soiling Effects	Health Effects of PM_{10}	Ecological Effects
Low	• The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks[b] and roads.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local nature reserve with dust sensitive features.

Table A2: Sensitivity of Different Types of Receptors

NOTES:

a. People's expectations will vary depending on the existing dust deposition in the area.

b. Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with a workplace or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

c. This follows Defra guidance as set out in LAQM.TG(22).

d. The air quality objectives and limit values do not apply to people in the workplace, although, such people can be affected by exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers.

e. There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

Ecological Receptors: The advice of an ecologist should be sought to determine the need for an assessment of dust impacts on sensitive habitats and plants. A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e. Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

The guidance also provides the following additional factors to consider when determining the sensitivity of an area:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant
- The season during which the works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in this document.

The sensitivity of the area to dust soiling effects on people and property is shown in Table A3.

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

Table A3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Table A4 outlines the sensitivity of the area to human health impacts.

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			> 20	> 50	> 100	> 250
High	>32 µg/m³ (>18 µg/m³ in Scotland)	>100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 – 32 µg/m³ (16 – 18 µg/m³ in Scotland)	>100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 – 28 µg/m³ (14 – 16 µg/m³ in Scotland)	>100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	<24 µg/m³ (>18 µg/m³ in Scotland)	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
High	>32 µg/m³ (>18 µg/m³ in Scotland)	>10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			> 20	> 50	> 100	> 250
Medium	28 – 32 µg/m³	>10	Medium	Low	Low	Low
	(16 – 18 µg/m³ in Scotland)	1 - 10	Low	Low	Low	Low
	24 – 28 µg/m³	>10	Low	Low	Low	Low
	(14 – 16 µg/m³ in Scotland)	1 - 10	Low	Low	Low	Low
	<24 µg/m³	>10	Low	Low	Low	Low
	(>18 µg/m³ in Scotland)	1 - 10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table A4: Sensitivity of the Area to Human Health Impacts

Table A5 outlines the sensitivity of the area to ecological impacts.

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table A5: Sensitivity of the Area to Ecological Impacts

STEP 2C combines the dust emission magnitude (STEP 2A) with the sensitivity of the area (STEP 2B) to determine the risk of unmitigated impacts. Tables A6 to A9 provide a method of assigning the level of risk for each activity. This is used to determine the level of mitigation that must be applied. Where the risk category is 'negligible', no mitigation measures beyond those required by legislation will be required.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table A6: Risk of Dust Impacts from Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table A7: Risk of Dust Impacts from Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table A8: Risk of Dust Impacts from Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table A9: Risk of Dust Impacts from Trackout

STEP 3

The dust risk categories for each of the four activities determined in STEP 2C should be used to define the appropriate, site-specific, mitigation measures to be adopted. For those mitigation measures that are general, the highest risk category should be applied.

For those cases where the risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required, however, additional mitigation measures may be applied as part of good practice. Where a local authority has issued guidance on measures to be adopted at demolition/ construction sites, these should also be taken into account.

STEP 4

Once the appropriate dust mitigation measures have been identified in STEP 3, the final step is to determine whether there are significant effects arising from the construction phase of a proposed development.

For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that the conclusion of no significant effect is robust.

APPENDIX B

Operational Phase Assessment Methodology

This section details the methodology and criteria used to assess the operational phase assessment in conjunction with EPUK-IAQM and LAQM.TG22 guidance.

Operational Phase Assessment

The proposed development includes sensitive land uses. As such, the proposed development has the potential to introduce the poor quality of air in the area and worsen the current local air quality.

Detailed dispersion modelling is therefore to be undertaken to quantify NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site and determine suitability for the proposed use, using the following scenarios:

- Completion Year Without the Development, 2039(S1); and
- Completion Year With the Development, 2039 (S2).

The S1 scenario represents anticipated traffic data for the baseline year without the development.

The S2 (i.e., with development) scenario represents anticipated traffic data with the addition of predicted variations in traffic flow patterns as a result of the proposals and committed flows from the community, in 2039.

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, background concentrations for 2024 were utilised within the dispersion model. The use of 2039 traffic data with 2024 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

Receptors potentially sensitive to changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations were identified within 200 m of the affected highway network in accordance with the guidance provided within the IAQM guidance on the likely limits of pollutant dispersion from road sources. LAQM.TG22 provides the following examples of where annual mean AQOs should apply:

- Residential properties;
- Schools;
- Hospitals; and
- Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria are shown in Tables A3 to A5 in Appendix A.

A desk-top study was undertaken to identify any existing and future sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment.

The sensitive receptors are identified in Section 4 and represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the proposed development that have not been individually identified above.

The following factors may provide some assistance in determining the overall significance of a development:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;

- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- The extent to which an objective is exceeded e.g. an annual mean NO_2 concentration of 41 µg/m^3 should attract less significance than an annual mean of 51 µg/m^3.

These factors were considered, and an overall significance determined for the impact of operational phase road traffic emissions.

It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

The criteria shown in Table B1, is adapted from the EPUK-IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality with sensitivity descriptors included to allow comparisons of various air quality impacts.

Long Term Average Concentration	% Change in Concentration Relative to AQO			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Table B1: Operational Traffic Exhaust Emissions – Assessment of Impacts

It should be noted that changes of up to 0.5% will be described as negligible in accordance with the EPUK-IAQM guidance.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table B1, the EPUK-IAQM document states that this framework is to be used as a starting point to make a judgement on significance of effect, but other influences might need to be accounted for.

Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances.

The descriptors of impact significance for the annual mean concentration for both NO_2 and PM_{10} that take account of the magnitude of changes for the proposed development based on guidance from EPUK-IAQM are shown in Table B2 below.

Total Concentration Related to Objective/Limit Value	Change in Concentration		
	Small	Medium	Large
	Increase with Scheme		
Above Objective/Limit Value with Scheme (>40 µg m^{-3})	Minor Adverse	Moderate Adverse	Major Adverse
Just Below Objective/Limit Value with Scheme (36-40 µg m^{-3})	Minor Adverse	Moderate Adverse	Moderate Adverse

Total Concentration Related to Objective/Limit Value	Change in Concentration		
	Small	Medium	Large
Increase with Scheme			
Below Objective/Limit Value with Scheme (30-36 µg m^{-3})	Negligible	Minor Adverse	Minor Adverse
Well Below Objective/Limit Value with Scheme (<30 µg m^{-3})	Negligible	Negligible	Minor Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (>40 µg m^{-3})	Minor Beneficial	Moderate Beneficial	Major Beneficial
Just Below Objective/Limit Value with Scheme (36-40 µg m^{-3})	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (30-36 µg m^{-3})	Negligible	Minor Beneficial	Minor Beneficial
Well Below Objective/Limit Value with Scheme (<30 µg m^{-3})	Negligible	Negligible	Minor Beneficial

Table B2: Impact Descriptors for Changes to Annual Mean Concentration of NO_2 and PM_{10}

Once the magnitude of the change has been established, the impact at each relevant receptor needs to be described. The impact magnitude at each receptor location can be described using the changes stated above as Negligible, Minor, Moderate or Major, as either Adverse or Beneficial, and either Temporary or Permanent.

The overall significance should be described separately for both the impact of emissions related to the proposed development on existing receptors, and for the impacts of emissions from existing source(s) on new exposure being introduced from the proposed development.

Welbeck Strategic Land II LLP

LAND AT COOMBE FARM, SAYERS COMMON

Air Quality Assessment

The information contained within this report and any appendices or supporting information provided are to be treated as confidential.

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