

AIR QUALITY ASSESSMENT

Reddam House, Bearwood Road

Produced by XCO₂ for Inspired Education Holdings Ltd

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EXECUTIVE SUMMARY

An assessment has been undertaken to quantify the potential impacts on local air quality associated with the construction and operation of the proposed development at Reddam School, Sindlesham. Based on the results of the assessment, it is considered that redevelopment of the site would not cause a significant impact on local air quality.

During the construction phase, the site has the potential to generate dust nuisance beyond the application boundary. However, through the implementation of a Dust Management Plan, the impacts can be effectively minimised and are unlikely to be significant.

The proposed development will generate a small number of additional trips during the construction and operational phases, however the impact on local air quality is anticipated to be negligible.

A review of local air quality data and Defra background maps indicates that existing pollutant concentrations at the Site are well below the relevant air quality standards and objectives for the protection of health. The proposed development will not, therefore, introduce new exposure to poor air quality.

INTRODUCTION

This report presents an assessment of the potential impact on local air quality of the construction and operation of a proposed development on Bearwood Road, Sindlesham, RG41 5BG. The Site falls within the administrative boundary of Wokingham Borough Council (WBC).

The proposed development comprises the demolition of existing outhouses and erection of a two-storey boarding house, associated plant equipment, new landscaping and highways works and other associated works. The Site location and proposed layout are presented in Figure 1 and Figure 2, respectively.

The proposed development is not located within an Air Quality Management Area (AQMA). The nearest designated area is approximately 900m north of the Site, and was declared due to measured exceedances of the annual mean NO₂ objective at locations in close proximity to the M4.

An assessment has been undertaken to determine the potential impact on local air quality during both the construction and operational phases of the development, with recommendations made for mitigation where appropriate.

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 Site Location

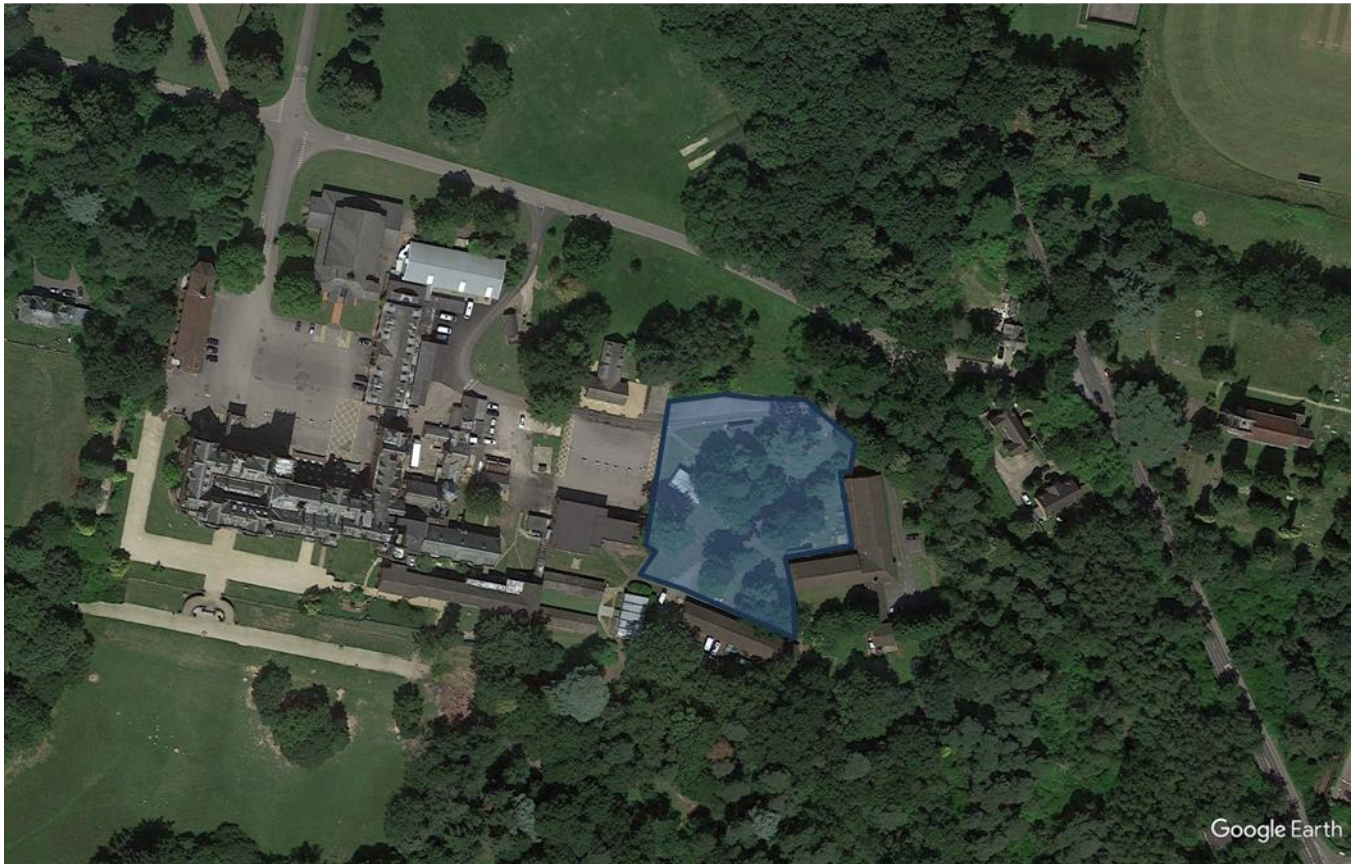


Figure 1: Site Location



Figure 2: Proposed Site Layout

POLICY CONTEXT

An overview of the relevant policy drivers for the assessment is provided in the following section.

NATIONAL LEGISLATION

THE NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework NPPF¹ sets out the Government's policies for planning and how these should be applied. With regards to air quality, paragraph 192 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*".

NATIONAL AIR QUALITY STANDARDS AND OBJECTIVES

The assessment of potential air quality impacts associated with the proposed development has been evaluated with respect to the current air quality standards and objectives for the protection of human health, as set out in the Air Quality Regulations 2010² and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020³.

In the context of the proposed development, the key pollutants of concern are nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}), which, in the Wokingham area, are primarily associated with road traffic emissions and construction works.

It is widely accepted that there is no safe level for PM_{2.5} and on 31st January 2023, the Government published an Environmental Improvement Plan⁴, which includes an Annual Mean Concentration Target (AMCT) of 10 µg/m³, to be achieved by the end of 2040. The Plan also includes an interim target of 12 µg/m³, to be achieved by the end of January 2028. The 10 µg/m³ target for PM_{2.5} has been adopted into UK law via the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023⁵.

The Air Quality Standards and Objectives for NO₂, PM₁₀ and PM_{2.5} that are applicable in England, are presented in Table 1 overleaf.

¹ Department for Communities and Local Government, National Planning Policy Framework, December 2024

² The Air Quality Standards Regulations 2010, Statutory Instrument 2010 No. 1001

³ The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument 2020 No. 000

⁴ Environmental Improvement Plan 2023, Defra, January 2023

⁵ Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, Statutory Instrument 2023 No. 96

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Table 1: National Air Quality Standards and Objectives

Pollutant	Averaging Period	Objective	To be achieved by and maintained thereafter
NO ₂	1-hour	200 µg/m ³ , not to be exceeded more than 18 times per calendar year (a)	31 December 2005
	Annual	40 µg/m ³	
PM ₁₀	24-hour	50 µg/m ³ , not to be exceeded more than 35 times per calendar year (b)	31 December 2004
	Annual	40 µg/m ³	
PM _{2.5}	Annual	20 µg/m ³	2020
	Annual	12 µg/m ³ (interim target)	31 January 2028
	Annual	10 µg/m ³ (target)	31 December 2040
(a) Equivalent to the 99.8 th percentile of 1-hour means.			
(b) Equivalent to the 90.4 th percentile of 24-hour means.			

LOCAL AIR QUALITY MANAGEMENT

The framework for Local Air Quality Management (LAQM) in the UK was introduced by the Environment Act 1995⁶. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values. Where an exceedance is identified, the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s). The LAQM delivery framework for local authorities in England is set out in Defra's 2023 Air Quality Strategy⁷.

LOCAL POLICY

WOKINGHAM BOROUGH COUNCIL LOCAL AIR QUALITY MANAGEMENT

WBC carries out frequent review and assessments of air quality within the area and produces annual reports in accordance with the requirements of Defra.

There are currently three designated AQMA's in the Borough:

- M4;
- Twyford Crossroads; and
- Wokingham Town Centre.

All three AQMA's have been declared due to measured exceedances of the annual mean air quality objective for NO₂.

⁶ Part IV of the Environment Act 1995

⁷ Air Quality Strategy Framework for local authority delivery, Defra, April 2023

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Historically, routine monitoring of NO₂ concentrations within the Borough found several locations where the air quality objectives were exceeded. Consequently, in 2003 the Council declared the entire borough an AQMA and produced an Air Quality Action Plan outlining their commitment to improving local air quality.

WBCs Air Quality Action Plan⁸ outlines a wide range of measures to improve air quality in the Borough between 2017 and 2026. Actions have been developed within eight key areas:

- Alternatives to private vehicle use
- Freight and delivery management
- Policy guidance and development control
- Promoting low emission transport
- Promoting travel alternatives
- Public information
- Transport planning and infrastructure – speed reductions in key locations, highway
- Traffic management

The effectiveness of the AQAP is evaluated by the Councils ongoing air quality monitoring programme.

WOKINGHAM ADOPTED CORE STRATEGY

The Wokingham Core Strategy⁹ current sets out strategic objectives and policies for development in the Borough. The strategy does not include any specific policies relating to air quality.

WOKINGHAM BOROUGH EMERGING LOCAL PLAN 2023 – 2040 (NOT YET ADOPTED)

Policy H6 of the Proposed Submission Plan¹⁰ 'Air pollution and air quality' states:

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

⁸ Wokingham Borough Council Air Quality Action Plan 2018, Wokingham Borough Council, March 2018

⁹ Wokingham Borough Adopted Core Strategy Development Plan Document, Wokingham Borough Council, January 2010

¹⁰ Wokingham Borough Local Plan Update 2023 – 2040 Proposed Submission Plan

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- f) *The type of development would mean its occupiers would be particularly sensitive to air pollution, such as schools, health care establishments or specialist accommodation.*

METHODOLOGY

This section outlines the assessment methodology, taking into account all relevant national and local policies and technical guidance relating to air quality.

CONSTRUCTION DUST

A Construction Dust Risk Assessment has been undertaken in accordance with the Mayor of London's The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (SPG)¹¹. The SPG recommends the use of the latest guidance issued by the Institute of Air Quality Management (IAQM) and therefore the potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been assessed in accordance with version 2.2 of the IAQM construction dust guidance¹², which was released in January 2024. A full description of the construction dust methodology is provided in Appendix A.

A detailed assessment of dust impacts is required where there are human receptors within:

- 250m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 250m from the site entrance(s).

For ecological impacts, a detailed assessment is required if there are dust sensitive habitat sites within

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 250m from the site entrance(s).

The methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors and the anticipated magnitude of the dust emission due to:

- Demolition;
- Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements).

The assessment of dust risk is also based on professional judgement, considering factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

¹¹ The Mayor of London. The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (July 2014)

¹² Guidance on the assessment of dust from demolition and construction, IAQM, v2.2, January 2024

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CONSTRUCTION TRAFFIC

The Environmental Protection UK (EPUK)/ IAQM planning guidance¹³, states that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HDV) of more than 25 vehicles; and/or
- There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

In the context of these screening criteria, LGV refers to vehicles under 3.5 tonnes (e.g., cars and vans) and HDV refers to vehicles above 3.5 tonnes.

Construction traffic will contribute to existing traffic levels on the surrounding road network. However, based on the scale of the proposed development, the temporary increase in traffic will be well below the above thresholds and the impact on air quality will be negligible.

OPERATIONAL TRAFFIC

The proposed development is a boarding house. The number of trips generated during the operational phase will be minimal and consequently a transport assessment has not been undertaken to support the assessment. The operational trip generation will be well below the IAQM/ EPUK thresholds for a detailed assessment and the impact on local air quality of the additional emissions is therefore expected to be negligible.

EXPOSURE ASSESSMENT

A qualitative review of local air quality monitoring data and Defra mapped concentrations has been undertaken to determine whether onsite mitigation will be required to protect future occupants from exposure to poor air quality.

BUILDING EMISSIONS

The energy strategy for the proposed development proposes a 100% electric scheme incorporating ASHP and PV. There will be no combustion emissions associated with the site and therefore no impact on local air quality from combustion.

¹³ Land-use Planning and Development Control: Planning for Air Quality, Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land use planning and development control process, January 2017.

BASELINE AIR QUALITY AND EXPOSURE ASSESSMENT

LOCAL AIR QUALITY MONITORING

NITROGEN DIOXIDE

WBC currently operate two automatic air quality monitoring stations (AQMS) measuring roadside NO₂ concentrations. The sites are in Wokingham Town Centre and Twyford and are therefore not considered relevant to the assessment.

Ambient NO₂ concentrations are, however, also measured via a network of passive diffusion tubes. Details of the monitoring sites that are in closest proximity to the proposed development are presented in Table 2. The location of the tubes is shown in Figure 3 overleaf.

Table 2: Diffusion Tube Monitoring Sites near the Proposed Development

Site ID	Location	Type	Easting	Northing
WOK11	Direction Grp, Robinhood Lane,	Roadside	478133	170598
WOK70	Longdon Rd, Winnersh	Roadside	478011	170135
WOK71	38 King St Lane, Winnersh	Roadside	477907	170191
WOK98	309 Reading Road	Roadside	478611	170225
WOK602	Green Lane	Roadside	478739	170107
WOK846	4 Hatch Farm Cottages	Roadside	477131	170019
WOK 861	Mill Lane (by bridge)	Roadside	476997	170107
WOK 891	6 Budd Grove	Roadside	477498	170218

A summary of annual mean NO₂ concentrations measured between 2019 and 2023 is presented in Table 3. The data indicate that compliance with the objective of 40 µg/m³ at all locations over the five-year period. A significant decline in concentrations occurred in 2020, due to travel restrictions imposed by the Government during the Covid-19 pandemic. However, despite a recovery in traffic movements (see Figure 4), NO₂ concentrations in the area have remained well below pre-pandemic levels.

Measurements across the UK¹⁴ have shown that the 1-hour NO₂ objective is unlikely to be exceeded if the annual mean concentration is below 60 µg/m³. The 2023 NO₂ concentrations are less than 35% of this threshold and therefore an exceedance of the short-term objective in the area is expected to be unlikely.

¹⁴ D Laxen and B Marner: Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites, July 2003

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Table 3: Annual Mean NO₂ Concentrations Measured by Diffusion Tube

Site ID	2019	2020	2021	2022	2023
WOK11	32.0	20.9	20.3	23.9	20.7 (a)
WOK70	25.5	16.8	16.1	17.4 (a)	17.9 (a)
WOK71	31.9	21.2	21.4	22.6	19.9 (a)
WOK98	25.4	16.5	15.3	16.1	15.0
WOK602	21.2	13.4	15.6	17.7	15.2
WOK846	21.6	14.0	15.2	16.2	14.6
WOK 861	23.2	14.9	14.8	17.8	15.8
WOK 891	22.2	14.3	16.9	18.5	17.4

(a) Data capture < 90%

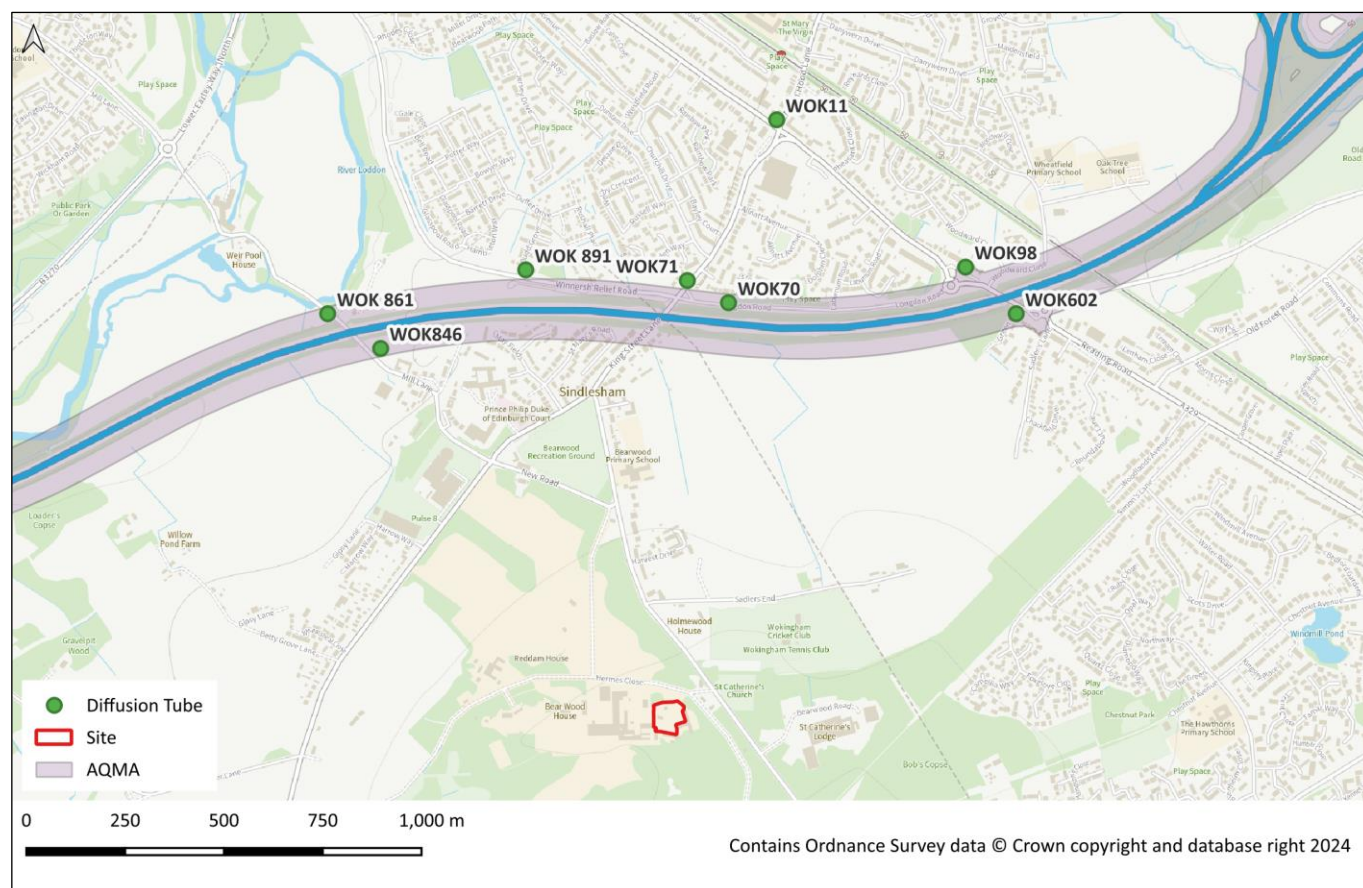


Figure 3: Location of Diffusion Tube Monitoring Sites

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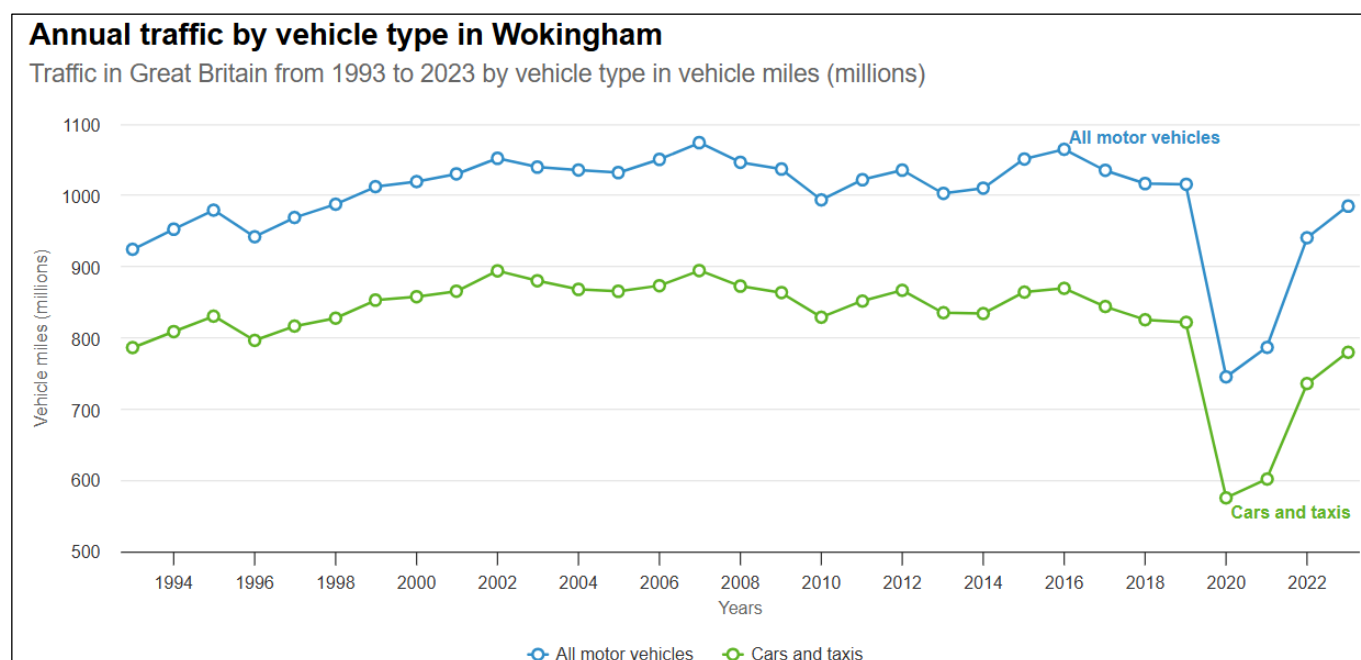


Figure 4: Annual Traffic by Vehicle Type in Wokingham¹⁵

PARTICULATE MATTER

Monitoring of ambient PM₁₀ and PM_{2.5} concentrations is not undertaken by WBC. The nearest particulate monitoring sites are in Reading and the data are therefore not considered relevant to the assessment.

AIR QUALITY AT THE PROPOSED DEVELOPMENT

A review of the National Atmospheric Emissions Inventory (NAEI) Point Source Database¹⁶ indicates that there are no significant commercial or industrial air emission sources in the area that are likely to significantly affect air quality at the proposed development.

The area has experienced a significant improvement in air quality in recent years and the local monitoring data indicates that NO₂ concentrations at roadside locations are well within the relevant air quality standards.

The Site is within the grounds of Reddam House School and the proposed new building will be located over 80m from the nearest road (Bearwood Road). Pollutant concentrations at the Site are therefore expected to be considerably lower than those measured at roadside locations and close to background level.

In the absence of a local background monitoring site, annual mean background NO₂, PM₁₀ and PM_{2.5} concentrations have been obtained from the Defra UK Background Air Pollution maps¹⁷. These 1km grid resolution maps are derived from a complex modelling exercise that takes into account emissions inventories and measurements of ambient air

¹⁵ <https://roadtraffic.dft.gov.uk/local-authorities/113>

¹⁶ <https://naei.energysecurity.gov.uk/data/maps/emissions-point-sources>

¹⁷ <https://uk-air.defra.gov.uk/data/laqm-background-home>

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pollution from both automated and non-automated sites. The latest background maps were issued in November 2024 and are based on 2021 monitoring data, with projections for future years.

A summary of the 2024 mapped background concentrations at the Site is presented in Table 4. The mapped concentrations are well below the air quality standards and the risk of an exceedance at the proposed development is considered to be negligible.

Table 4: 2024 Mapped Background Concentrations at the Proposed Development

Pollutant	Annual Mean (µg/m³)	Air Quality Standard (µg/m³)
NO ₂	9.0	40
PM ₁₀	12.2	40
PM _{2.5}	7.3	20 (12 / 10)

CONSTRUCTION DUST RISK ASSESSMENT

The precise behaviour of the dust, its residence time in the atmosphere and the distance it may travel before being deposited, will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust is naturally suppressed by rainfall.

A wind rose for the meteorological station at Farnborough (2023) is presented in Figure 5, which shows that the prevailing wind is from the southwest. Receptors to the northeast of the Site are, therefore, most likely to experience dust impacts during the construction phase.

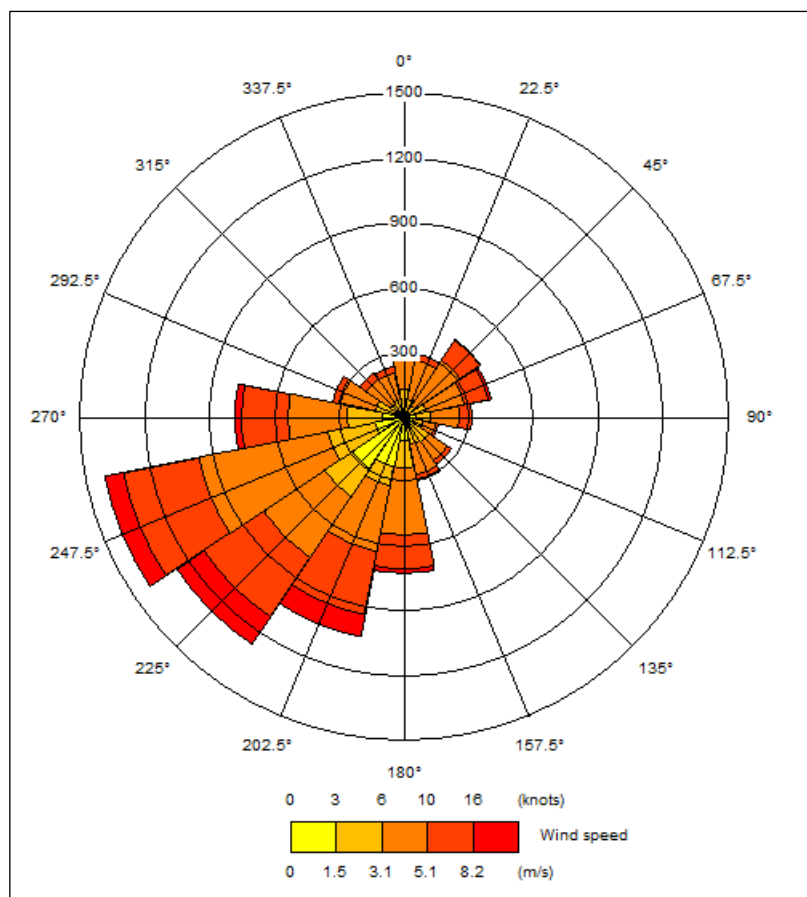


Figure 5: Wind Rose London City Airport

SENSITIVITY OF THE AREA TO DUST IMPACTS

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the construction area and existing PM₁₀ concentrations (i.e., the potential for additional dust to result in an exceedance of the short or long-term air quality objectives).

The area that has the potential to be affected by dust generated on Site is indicated in Figure 6. The Site is located within the grounds of Reddam School and due to the potential close proximity of students, the area is considered to be of 'high' sensitivity to dust soiling effects from all sources.

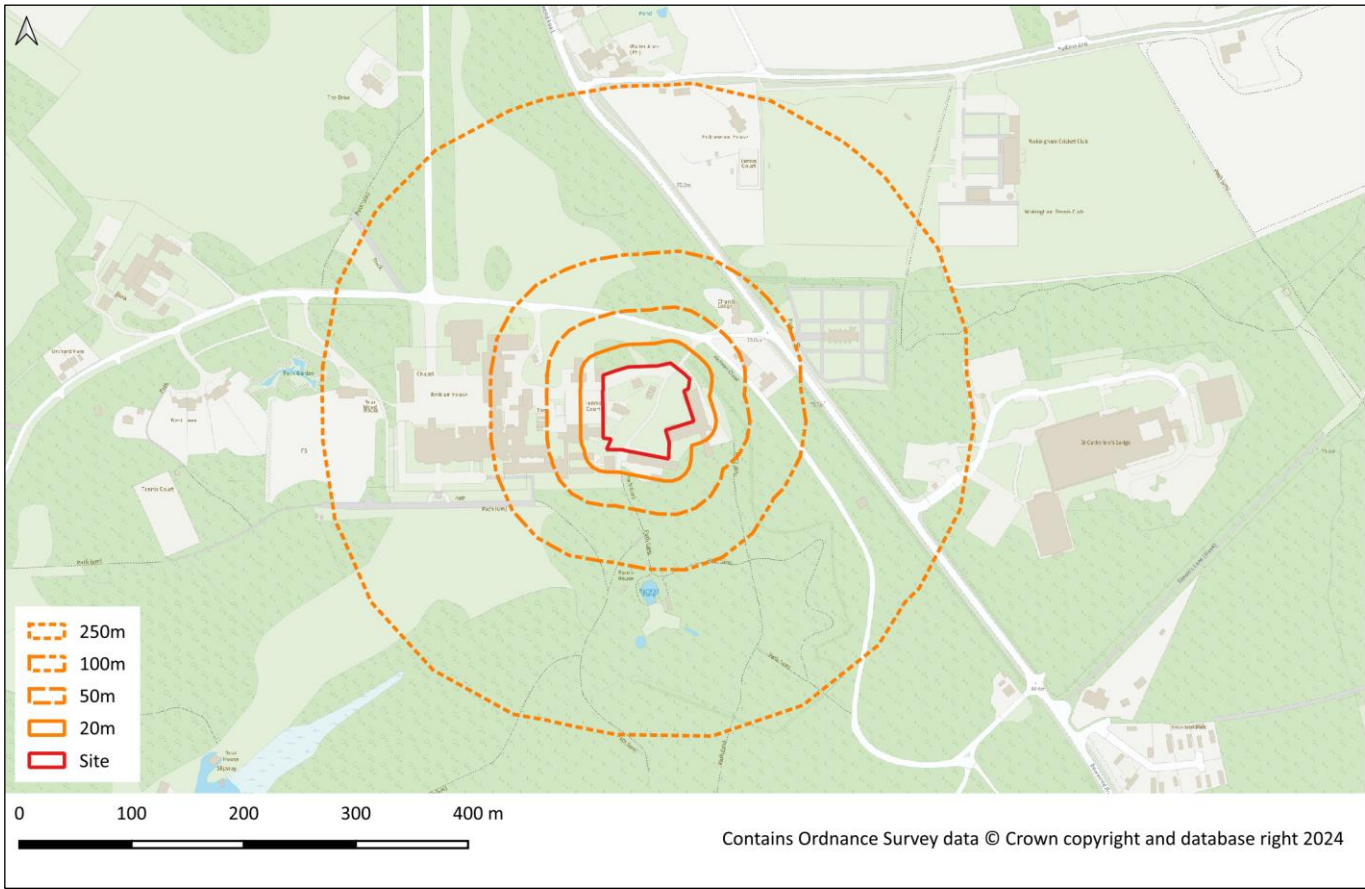


Figure 6: Dust Buffers

Based on the mapped data, PM₁₀ concentrations in the area are unlikely to exceed 24 µg/m³, the lowest threshold for the assessment of dust impacts on human health. However, based on the surrounding school use, the sensitivity of the area to human health impacts is ‘medium’.

A summary of the sensitivity of the area to dust impacts is presented in Table 5. There are no dust sensitive habitat sites within 50m of the Site and therefore the sensitivity of the area to ecological impacts is ‘negligible’.

Table 5: Sensitivity of the Area to Dust Impacts

Potential Impact /Source	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Medium	Medium	Medium	Medium
Ecological	Negligible	Negligible	Negligible	Negligible

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DUST EMISSION MAGNITUDE

The magnitude of the potential dust emission from earthworks, construction and trackout, has been evaluated using the criteria in Table A5 of Appendix A and is presented in Table 6.

Table 6: Evaluation of Dust Emission Magnitude

Dust Source	Proposed Development	Dust Emission Magnitude
Demolition	The existing single-storey structures on Site will be demolished prior to the construction phase. The total building volume is less than 1000m ³ and crushing and screening of the demolition material on-site is unlikely.	Small
Earthworks	The site area is <6,000 m ² . Based on the scale of the works, there are unlikely to be more than 1-2 earth-moving vehicles in operation on site at any one time or sufficient space for long-term stockpiling of dusty materials. British Geological Survey (BGS) mapping ¹⁸ indicates that the area is underlain by bedrock from the London Clay Formation (clay, silt, and sand). The UK Soil Observatory (UKSO) ¹⁹ indicates a clay and silt rich subsoil, which is considered moderately dusty.	Medium
Construction	The proposed construction volume is <12,000m ³ , however concrete will be used on site, which is potentially dusty. On-site concrete batching is unlikely.	Medium
Trackout	Based on the scale of the proposed works, less than 10 outward HDV movements are expected on any one day. There are existing areas of hard standing within the Site boundary and therefore road going vehicles are unlikely to travel over unmade ground.	Small

ASSESSMENT OF DUST RISK PRIOR TO MITIGATION

A summary of the potential risk of dust impacts prior to mitigation is presented in Table 7.

Table 7: Risk of Dust Impacts Prior to Mitigation

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Low
Human Health	Low	Low	Low	Low
Ecological	Negligible	Negligible	Negligible	Negligible

¹⁸ <https://geologyviewer.bgs.ac.uk/>

¹⁹ <https://mapapps2.bgs.ac.uk/ukso/home.html>

MITIGATION

The following mitigation measures will be required during the construction and operational phases to minimise the air quality impacts arising from the development.

CONSTRUCTION PHASE

In accordance with the IAQM guidance, based on the risk of dust impacts during the construction phase (see Table 7), the 'Highly Recommended' measures detailed in Table 8 should be incorporated into a Dust Management Plan for the proposed development. The 'Desirable' measures should also be considered for inclusion, where appropriate.

The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is expected to be negligible.

Table 8: Mitigation Measures to be Incorporated into the Dust Management Plan for the Proposed Development

Mitigation Measure	Highly Recommended	Desirable
Communication		
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	✓	
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	✓	
Display the head or regional office contact information.	✓	
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 logbook.	✓	
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 windowsills 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 local authority when asked.	✓	
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	✓	
Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.	✓	
Preparing and maintaining the site		

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Mitigation Measure	Highly Recommended	Desirable
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	✓	
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	✓	
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	✓	
Avoid site runoff of water or mud.	✓	
Keep site fencing, barriers and scaffolding clean using wet methods.	✓	
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	✓	
Operating vehicle/machinery and sustainable travel		
Ensure all vehicles switch off engines when stationary - no idling vehicles.	✓	
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	✓	
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.		✓
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.	✓	
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.	✓	
Demolition		
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).		✓
Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	✓	
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	✓	
Bag and remove any biological debris or damp down such material before demolition.	✓	

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Mitigation Measure	Highly Recommended	Desirable
Earthworks		
Re-vegetate exposed areas and soil stockpiles to stabilise surfaces. Where this is not possible, use hessian and/or mulches.		✓
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 covered to prevent escape of materials during transport.		✓
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).		✓

OPERATIONAL PHASE

The review of air quality monitoring data for the area indicates compliance with the current air quality standards and objectives for NO₂, PM₁₀ and PM_{2.5} at the proposed development. The data also indicates compliance with the 2028 and 2040 concentration targets for PM_{2.5}. Mitigation is therefore not required to protect future occupants from poor air quality.

The proposed development will not significantly affect local air quality and therefore no additional operational mitigation measures are required.

SUMMARY AND CONCLUSIONS

An assessment has been undertaken to assess the potential impacts on local air quality associated with the construction and operation of the proposed development.

Releases of dust and PM₁₀ are likely to occur during site activities and due to the close proximity of school students to the proposed works, the sensitivity of the area to potential impacts is assessed as medium to high. However, through good site management and the implementation of best practice dust control, the impact of dust and PM₁₀ releases can be effectively mitigated, and the resultant impacts are expected to be negligible.

The scale of the proposed development is small and therefore the temporary increase in traffic during the construction phase will not exceed the IAQM/EPUK thresholds for a detailed assessment of impacts on air quality. Similarly, the proposed development is a school boarding house and will generate minimal additional traffic during the operational phase. Traffic-related impacts on air quality are therefore expected to be negligible.

A review of local air quality monitoring data and Defra mapped background data indicates that existing pollutant concentrations are well within the current air quality objectives at the Site. The proposed development will not, therefore, introduce new exposure to poor air quality.

The energy strategy for the proposed development is 100% electric and therefore there will be no combustion emissions associated with the site and no impact on local air quality.

Based on the results of the assessment and with the implementation of the recommended construction phase mitigation measures, it is considered that air quality would not pose a constraint to the redevelopment of the site as proposed.

APPENDIX A – CONSTRUCTION DUST RISK ASSESSMENT METHODOLOGY

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Table A1: Receptor Sensitivity

Receptor Sensitivity	Human Health	Dust Soiling	Ecological (f)
High	- locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (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) (a) - 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.	- 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 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 (g). - 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.
Medium	- locations where the people exposed are workers (b), and exposure is over a time period relevant to the air quality objective for PM₁₀ (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	- users would expect (d) to enjoy a reasonable level of amenity, but would not reasonably expect (d) 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 (d) 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 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.

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Low	- locations where human exposure is transient (c) - indicative examples include public footpaths, playing fields, parks and shopping streets.	- the enjoyment of amenity would not reasonably be expected (d); or - property would not reasonably be expected (d) to be diminished in appearance, aesthetics or value by soiling; or • there is transient exposure, where the people or property would reasonably be expected (d) 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 (e) and roads.	- 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.
(a) This follows Defra guidance as set out in LAQM.TG22. (b) Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM₁₀. 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. For this reason, workers have been included in the medium sensitivity category. (c) 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. (d) People's expectations will vary depending on the existing dust deposition in the area. (e) 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 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. (f) 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. (g) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.			

The sensitivity of the area, as a whole, is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM₁₀ concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts, respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

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Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3: Sensitivity of the Area to Health Impacts from Dust

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration (µg/m ³)	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table A4: Sensitivity of the Area to Ecological Impacts from Dust

Receptor Sensitivity	Distance from the Source (m)
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AIR QUALITY ASSESSMENT

	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as 'Small', 'Medium' or 'Large' depending on the scale of the proposed works as detailed in Table A5.

Table A5: Dust Emission Magnitude

Source	Large	Medium	Small
Demolition	- Total building volume >75,000m³ - Potentially dusty material (e.g., concrete) - Onsite crushing and screening - Demolition activities >12m above ground level.	- Total building volume 12,000 - 75,000m³ - Potentially dusty material - Demolition activities 6 - 12m above ground level.	- Total building volume <12,000m³ - Construction material with low potential for dust release (e.g., metal cladding or timber) - Demolition activities <6m above ground level - Demolition during wetter months
Earthworks	- Total site area >110,000m² - Potentially dusty soil type (e.g., clay) - >10 heavy earth moving vehicles active at any one time. - Formation of bunds >6m in height	- Total site area 18,000 - 110,000m² - Moderately dusty soil type (e.g., silt) - 5-10 heavy earth moving vehicles active at any one time. - Formation of bunds 3 - 6m in height	- Total site area <18,000m² - Soil type with large grain size (e.g., sand) - <5 heavy earth moving vehicles active at any one time. - Formation of bunds <3m in height
Construction	- Total building volume >75,000m³ - On site concrete batching - Sandblasting	- Total building volume 12,000 - 75,000m³ - Potentially dusty construction material (e.g., concrete) - On site concrete batching	- Total building volume <12,000m³ - Material with low potential for dust release (e.g., metal cladding or timber)
Trackout	- >50 HDV movements in any one day (a) - Potentially dusty surface material (e.g., high clay content) - Unpaved road length >100m	- 20 - 50 HDV movements in any one day (a) - Moderately dusty surface material (e.g., silt) - Unpaved road length 50 - 100m	- <20 HDV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m
(a) HDV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes			

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6 and A7.

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Table A6: Risk of Dust Impacts from Demolition

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

Table A7: Risk of Dust Impacts from Earthworks, Construction and Trackout

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

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