



Columbia Threadneedle Investment Ltd

LYONS FARM RETAIL PARK

Air Quality Assessment



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EXECUTIVE SUMMARY

WSP has been commissioned by Columbia Threadneedle Investment Limited to undertake an air quality assessment to support the planning application for the proposed development of a new retail unit at Lyon Farm Retail Park. The proposals include the opportunity to create a new Class A1 retail premises suitable for a retail occupier.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed. The methodology followed in this qualitative study was discussed and agreed with the Environmental Health Officer of Worthing Council, with a quantitative assessment of operational traffic emissions impacts to follow in an addendum.

Worthing Council monitoring data and the Department for Environment Food and Rural Affairs' modelled background pollutant concentrations show that air quality at the Site is considered to be good within the context of air quality standards and current land use.

For the construction phase, an assessment of potential impacts associated with fugitive dust and fine particulate matter (PM₁₀) emissions has been undertaken in line with the relevant Institute of Air Quality Management guidance. This identified that there is a Medium risk of dust soiling impacts and a Medium risk of increases in particulate matter concentrations due to construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases would be significantly reduced. The residual construction phase air quality impacts were determined to be negligible (no significant effects).

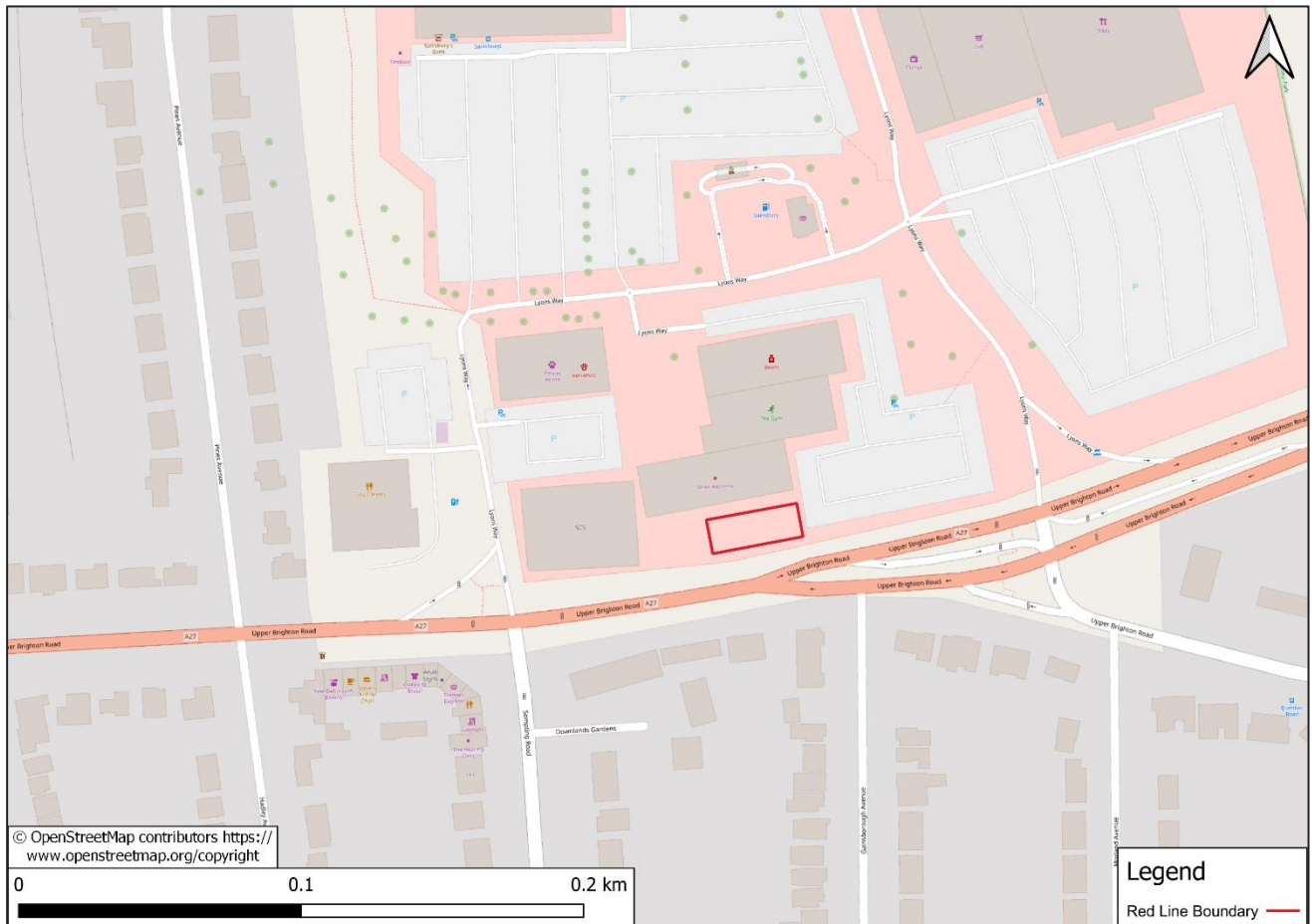
Indicative vehicle movements associated with the operation of the proposed development, provided by the Project Transport Consultant (WSP), exceed the EPUK / IAQM guidance criteria for a quantitative assessment. Therefore, assessment of operational traffic emissions cannot be scoped out at this stage and a detailed assessment will be undertaken and submitted as part of an addendum.

The results of the air quality assessment demonstrate that the development proposals comply with national and local policy for air quality based on this qualitative assessment of construction. A further detailed assessment of operational traffic will be completed as part of an addendum report.

1. INTRODUCTION

- 1.1.1. WSP has been commissioned by Columbia Threadneedle Investment Limited to carry out an assessment of the potential air quality impacts arising from the proposed development at Lyons Farm Retail Park, hereafter referred to as the 'Site'.
- 1.1.2. The Site lies within the administrative boundary of Worthing Borough Council (WBC) and is situated to the north of Worthing. It is bordered to the north and west by other units on Lyons Farm Retail Park, to the east by a car park and to the south by the A27. It is proposed to develop the Site for commercial use (the 'Proposed Development') . It covers in the region of 4000 ft² of land currently comprising green space within the development of Lyons Farm Retail Unit. The location of the Site is shown in Figure 1-1.

Figure 1-1 - Site Location



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

2. LEGISLATION, POLICY & GUIDANCE

2.1. LEGISLATION

2.1.1. The following legislation is relevant to the assessment presented herein:

- The Environmental Protection Act 1990, Part III concerning prevention of statutory nuisance due to emissions from demolition/construction site activities by using Best Practicable Means¹.
- The Environment Act 1995, Part IV giving requirements for a National Air Quality Strategy (AQS) and Local Air Quality Management (LAQM) duties for local authorities^{2,3}. Where a local authority determines that one or more objective(s) is/are not likely to be met then it is required to declare one or more Air Quality Management Area (AQMA) and draw up an Action Plan to improve air quality.
- The Environment Act 2021, Schedule 11 includes amendments to Part IV of the Environment Act 1995 concerning the LAQM framework⁴. This is to strengthen the LAQM framework and enable greater cooperation at local level, bringing more organisations into the process of improving air quality.
- The Air Quality (England) Regulations 2000 (as amended 2002)^{5,6}, setting ambient air quality objectives as given in the National Air Quality Strategy.
- The Air Quality Standards Regulations 2010 (as amended 2016)^{7,8}, setting mandatory limit and target values (amongst other things) for ambient air pollutants to be met at national level. Where exceedance of any limit is determined, the Secretary of State must draw up and implement an Air Quality Plan (which may require a Clean Air Zone) to bring about compliance within the shortest possible time.
- Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁹, includes an amendment to the Air Quality Standards Regulations 2010 limit value for PM_{2.5} to 20µg/m³.

¹ Environmental Protection Act 1990 [online]. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/resources>. Accessed on 9th July 2025.

² Environment Act 1995 [online]. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents>. Accessed on 9th July 2025.

³ Department for Environment, Food and Rural Affairs (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1) [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf. Accessed on 9th July 2025.

⁴ Environment Act 2021 [online]. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/schedule/11/enacted>. Accessed on 9th July 2025.

⁵ The Air Quality (England) Regulations 2000 [online]. Available at: <https://www.legislation.gov.uk/uksi/2000/928/contents/made>. Accessed on 9th July 2025.

⁶ The Air Quality (England) (Amendment) Regulations 2002 [online]. Available at: <https://www.legislation.gov.uk/uksi/2002/3043/contents>. Accessed on 9th July 2025.

⁷ The Air Quality Standards Regulations 2010 [online]. Available at: <https://www.legislation.gov.uk/uksi/2010/1001/contents/made>. Accessed on 9th July 2025.

⁸ The Air Quality Standards (Amendment) Regulations 2016 [online]. Available at: <https://www.legislation.gov.uk/uksi/2016/1184/contents/made>. Accessed on 9th July 2025.

⁹ The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 – Statutory Instrument No.1313 [online]. Available at: <https://www.legislation.gov.uk/uksi/2020/1313/regulation/1/made>. Accessed on 9th July 2025.

- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023¹⁰, which brings into law the following new long-term targets for PM_{2.5}:
 - Annual mean concentration target for a maximum concentration of 10µg/m³ to be met across England by 2040; and
 - Population exposure reduction target for a 35% reduction in population exposure by 2040 (compared to a base year of 2018).
- The Environmental Improvement Plan 2023¹¹, which sets out the following additional interim targets for PM_{2.5}, to be achieved by the end of January 2028:
 - The highest annual mean concentration in the most recent full calendar year must not exceed 12µg/m³ of PM_{2.5}.
 - Compared to 2018, the reduction in population exposure to PM_{2.5} in the most recent full calendar year must be 22% or greater.

2.1.2. A summary of the air quality standards (AQS) (objectives, limit values and targets) relevant to these pollutants is provided in **Table 2-1**. For NO₂ and PM₁₀, there are both long-term (annual mean) and short-term (24-hour or 1-hour mean) standards. These periods reflect the varying impacts on health of differing levels of exposure to these pollutants.

Table 2-1 - Relevant UK AQS Objectives

Pollutant	Standard (µg/m ³)	Objective	Objective
Nitrogen dioxide (NO ₂)	40	Annual mean	Limit value not to be exceeded
	200	1-hour (hourly) mean	Not to be exceeded more than 18 times a year
Particulate matter less than 10 micrometres in diameter (PM ₁₀)	40	Annual mean	Limit value not to be exceeded
	50	24-hour (daily) mean	Not to be exceeded more than 35 time a year
Particulate matter less than 2.5 micrometres in diameter (PM _{2.5})	20	Annual mean	Limit value not to be exceeded.
	12	Annual mean	Interim target concentration not to be exceeded by the end of January 2028.
	10	Annual mean	Target concentration not to be exceeded by the end of 2040.

¹⁰ HM Government (2023), Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 [online]. Available at: <https://www.legislation.gov.uk/uksi/2023/96/contents/made>. Accessed on 9th July 2025.

¹¹ HM Government (2023), Environmental Improvement Plan 2023 – First Revision of the 25 Year Environment Plan [online] Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf. Accessed on 9th July 2025.

$\mu\text{g}/\text{m}^3$ = microgram per cubic metre

2.2. POLICY

2.2.1. The following policy documents are also relevant to the air quality assessment:

- The Clean Air Strategy¹² published by Department for Environment Food and Rural Affairs (Defra) in 2019. This sets out the measures which aim to reduce emissions from all sources of air pollution, making air healthier to breathe, protecting nature and boosting the economy. Targets for action include road traffic to reduce ambient NO_2 concentrations, and domestic coal and wood burning to improve ambient $\text{PM}_{2.5}$ concentrations.
- The UK Air Quality Strategy¹³, published by the UK Government in 2007, predates the Clean Air Strategy. This provides a framework for reducing air pollution in the UK with the aim of meeting the objectives and mandatory limit values set by the Air Quality Regulations (detailed above).
- The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations¹⁴ was published by Defra in 2017. This sets out roles and responsibilities and measures for bringing NO_2 levels within the mandatory limit values in the shortest possible time.
- The Government's overall planning policies for England are described in the National Planning Policy Framework (NPPF)¹⁵;
- The Environmental Improvement Plan 2023¹⁶ sets out goals to achieve clean air in the UK by cutting air pollution overall through tackling key sources of emissions and specific hotspots and reducing ammonia emissions;
- The Air Quality Strategy Framework for Local Authority Delivery (for England) 2023¹⁷ sets out a framework to guide local authorities towards achieving the long-term air quality goals, including the new targets for $\text{PM}_{2.5}$; and,
- Worthing Borough Council: Local Plan 2020 – 2036 (Adopted 28th March 2023)¹⁸ where the following policies have been considered:

¹² Department for Environment, Food and Rural Affairs (2019). Clean Air Strategy 2019 [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf. Accessed on 9th July 2025.

¹³ Department for Environment, Food and Rural Affairs (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1) [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf. Accessed on 9th July 2025.

¹⁴ Department for Environment, Food and Rural Affairs (2017). UK plan for tackling roadside nitrogen dioxide concentrations Detailed plan [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf. Accessed on 9th July 2025.

¹⁵ Ministry of Housing, Communities and Local Government, (2023). National Planning Policy Framework [online]. Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf. Accessed on 9th July 2025.

¹⁶ Environmental Improvement Plan 2023 - First Revision of the 25 Year Environment Plan [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf. Accessed: 14th July 2025

¹⁷ Department for Environment, Food and Rural Affairs (2023). Air Quality Strategy: Framework For Local Authority Delivery [online]. Available at: <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery#:~:text=Under%20the%20Local%20Air%20Quality,are%20likely%20to%20breach%20limits>. Accessed: 14th July 2025.

¹⁸ Worthing Borough Council (2023). Local Plan 2020 – 3026 [online]. Available at: <https://www.adur-worthing.gov.uk/media/Media,169486.smxx.pdf>. Accessed on 25th June 2025.

- Policy S020: Provide an integrated, safe and sustainable transport system to improve air quality, reduce congestion and promote active travel
 - SP3 Healthy Communities: New developments must improve environmental resilience and reduce contributors to poor health and mitigating their risks, such as those associated with air quality to reduce inequalities and address climate justice;
 - DM15 Sustainable Transport & Active Travel: ensure new development contributes to the mitigation of air pollution, particularly in Air Quality Management Areas.
 - DM22 Pollution: Developments will not contribute to, be put at risk from or be adversely affected by unacceptable levels of air pollution. Mitigation measures will be implemented to minimise and offset the impact of the development. Air quality assessments will be undertaken in line with the Air Quality Action Plan for developments within the Worthing AQMA.
- Worthing Borough Council Air Quality Action Plan 2024 – 2029¹⁹ states the actions WBC will take to improve air quality mainly through four broad topics:
- Priority 1: Reduce the impact of traffic on air quality and congestion.
 - Priority 2: Reduction in the Council's air quality impacts
 - Priority 3: Public engagement, participation and awareness to support healthier lifestyles for residents
 - Priority 4: Planning and guidance for future growth impacts

2.3. GUIDANCE

2.3.1. The following guidance documents have been referred to in the undertaking of the air quality assessment:

- Institute of Air Quality Management (IAQM): Guidance on the Assessment of Dust from Demolition and Construction²⁰;
- Environmental Protection UK (EPUK)/IAQM: Land Use Planning and Development Control - Planning for Air Quality²¹;
- Defra: Local Air Quality Management Technical Guidance LAQM.TG(22)²²;
- IAQM: A guide to the assessment of air quality impacts on designated nature conservation sites²³;
- Defra: PM_{2.5} Targets: Interim Planning Guidance²⁴;

¹⁹ Worthing Borough Council (2024). Air Quality Action Plan 2024 – 2029 [online]. Available at: <https://www.adur-worthing.gov.uk/media/Media.138133.smxx.pdf> . Accessed on 25th June 2025.

²⁰ Institute of Air Quality Management (Version 2.2 Updated January 2024). Guidance on the Assessment of Dust from Demolition and Construction [online]. Available at: <https://iaqm.co.uk/guidance/>. Accessed on 9th July 2025.

²¹ Environmental Protection UK & Institute of Air Quality Management (2017). Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London [online]. Available at: <https://iaqm.co.uk/guidance/>. Accessed on 9th July 2025.

²² Department for Environment, Food and Rural Affairs , (2022). Local Air Quality Management Technical Guidance LAQM.TG(22) [online]. Available at: <https://iaqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>. Accessed on 9th July 2025.

²³ Institute of Air Quality Management (2020). A guide to the assessment of air quality impacts on designated nature conservation sites [online]. Available at: <https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf>. Accessed on 9th July 2025.

²⁴ Department for Environment, Food and Rural Affairs (2024). PM_{2.5} Targets: Interim Planning Guidance [online]. Available at: <https://uk-air.defra.gov.uk/pm25targets/planning> . Accessed on 14th July 2025.

- The Government's National Planning Practice Guidance (NPPG) 2019²⁵; and,
- Air Quality and Emissions Mitigation Guidance for Sussex Guidance²⁶ provides clarity on interpreting the relevant Local Plan Policies, advice for developers and consultants on how to assess and mitigate any impacts on air quality and detail a consistent approach for all.

²⁵ Ministry of Housing, Communities and Local Government, (2019). National Planning Policy Guidance [online]. Available at: <https://www.gov.uk/guidance/air-quality--3> . Accessed on 14th July 2025.

²⁶ Sussex Air (2021). Air quality and emissions mitigation guidance for Sussex (2021) [online]. Available at: <https://www.midsussex.gov.uk/media/5608/sussex-aq-guidance-2021.pdf> . Accessed on 25th June 2025.

3. SCOPE, CONSULTATION & METHODOLOGY

3.1. CONSULTATION

3.1.1. This section summarises the consultation process undertaken with WBC in the preparation of this assessment.

Table 3-1 - Summary of consultation

Body / organisation	Summary of consultation	Summary of outcomes of consultation
WBC	WSP issued an outline of the proposed scope and methodology of the air quality assessment via email on 26 th June 2025.	The Environmental Health Officer (EHO) at WBC agreed with the qualitative scope and methodology presented. It was requested that quantitative modelling would be undertaken as the Site is located in an AQMA, this assessment will be presented in an addendum to this report.

3.2. SCOPE

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

- Consultation with the EHO at WBC to agree the scope of the assessment and the methodology to be applied;
- Review of WBC's latest review and assessment reports²⁷ and air quality data for the area surrounding the Site, including Defra background mapping data²⁸;
- Review of data from the Environment Agency (EA) website²⁹ and WBC's public register for authorised process³⁰, to identify the presence of any industrial pollutant sources in the vicinity of the Site;
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality. This included consideration of data regarding ecological receptors available from the Government's MAGIC³¹ website and the Air Pollution Information System (APIS) website³²;
- Review of the masterplan for the Proposed Development to establish the location of new sensitive receptors; and,

²⁷ Adur District & Worthing Borough Councils. 2024 Air Quality Annual Status Report (2024) [online]. Available at: <https://www.adur-worthing.gov.uk/media/Media,172003,smxx.pdf>. Accessed on 25th June 2025.

²⁸ Department for Environment, Food and Rural Affairs (2024). 2021-based background maps for NO_x, NO₂, PM₁₀, and PM_{2.5} [online]. Available at: <https://uk-air.defra.gov.uk/data/laqm-background-home>. Accessed on 9th July 2025.

²⁹ Environment Agency (2024). Pollution inventory [online]. Available at: <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory>. Accessed on 9th July 2025.

³⁰ WBC (2022). Public Register of Permitted and Revoked Installations Environmental Permitting Regulations 2016 [online]. Available at: <https://www.adur-worthing.gov.uk/media/Media,98148,smxx.pdf>. Accessed on 25th June 2025.

³¹ Multi-Agency Geographic Information for the Countryside (MAGIC) website [online]. Available at: <https://magic.defra.gov.uk/>. Accessed on 9th July 2025.

³² Air Pollution Information System (APIS) [online]. Available at: <http://www.apis.ac.uk/>. Accessed on 9th July 2025.

- Review of the traffic data provided by WSP Transport Consultant.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

- 3.2.2. The elements shown in **Table 3-2** are not considered to give rise to likely significant effects as a result of the Proposed Development and have therefore not been considered within the assessment.

Table 3-2 - Elements scoped out of the assessment

Element scoped out	Phase	Justification
Changes to exposure of NO ₂ , PM ₁₀ and PM _{2.5} at nearby sensitive receptors as a result of construction vehicles on the local road network	Construction	The greatest impact on air quality due to emissions from vehicles associated with the construction phase will be in the areas immediately adjacent to the Site access. It is likely that construction traffic will access the Site via A27. Due to the size of the Site, it is considered likely that the construction traffic will be low in comparison to the existing traffic flows on these roads. Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are considered to be not significant.
Changes to exposure of NO ₂ , PM ₁₀ and PM _{2.5} at nearby sensitive receptors as a result of construction vehicles and plant at the construction site	Construction	Final details of the exact plant and equipment likely to be used on Site will be determined by the appointed contractor. It is considered likely to comprise dump trucks, tracked excavators, diesel generators, asphalt spreaders, rollers, compressors and trucks. The number of plant and their location within the Site are likely to be variable over the construction period. Emissions will cease at the end of the construction period. As per Section 7.3 of LAQM.TG(22)²², with suitable controls and site management, on-site plant and vehicles are unlikely to make a significant impact on local air quality. Therefore, quantitative analysis of this element is scoped out and a qualitative summary will be provided.
Changes to exposure of dust/PM ₁₀ for ecological designated sites	Construction	No designated sites are present within 250m of the red line boundary or 250m of site entrances, as defined within the IAQM guidance ²⁰ .
Changes in NO _x , ammonia or nitrogen deposition for designated sites as a result of changes to ambient NO ₂ concentrations	Operation	It is presumed that there are no designated sites present within 200m of the Affected Road Network as defined in IAQM guidance ²³ , however, this will be confirmed in the addendum report.

ELEMENTS SCOPED INTO THE ASSESSMENT

- 3.2.3. The elements shown in **Table 3-3** are considered to have the potential to give rise to likely significant effects during construction/operation of the Proposed Development and have therefore been considered within the assessment.

Table 3-3 - Elements scoped in to the assessment

Element scoped in	Phase	Justification
Changes to exposure of dust/particulate matter less than 10µm (PM ₁₀) for human receptors	Construction	Receptors are present within the assessment screening distances as defined within the IAQM guidance ²⁰ .
Changes to exposure of NO ₂ , PM ₁₀ and PM _{2.5} for human receptors resulting from operational traffic emissions*	Operation	The transport consultant has confirmed that the predicted number of operational phase annual average daily trips associated with the operational Proposed Development will exceed the EPUK/IAQM guidance criteria ²¹ , air quality impacts as a result of operational phase road emissions will be assessed.
Emissions Mitigation Assessment*	Operational	The development is located within Worthing AQMA and is necessary as defined in Sussex AQ Guidance ²⁶ .
*Elements that will be submitted within an addendum to this report		

- 3.2.4. An addendum will be prepared to include:
- Changes to exposure of NO₂, PM₁₀ and PM_{2.5} for human receptors from operational traffic emissions; and
 - Completion of Emissions Mitigation Assessment.

3.3. METHODOLOGY

BASELINE CONDITIONS

- 3.3.1. A desk-based assessment was undertaken to determine the baseline conditions in the surrounding area of the Site.
- 3.3.2. The following data sources were used during the baseline assessment:
- WBC Annual Status Report 2024²⁷;
 - Defra air quality background maps (2021)²⁸; and
 - Environment Agency's Pollution Inventory²⁹ & WBC Pollution Inventory³⁰.

CONSTRUCTION PHASE

Construction Phase Dust Emissions

- 3.3.3. During the construction phase, activities undertaken within the Site will generate releases of dust and particulate matter, which may have an impact on local air quality and nearby sensitive receptors.

- 3.3.4. Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited near to the source of emission. Dust is therefore unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.
- 3.3.5. The smaller particles of dust (less than $10\mu\text{m}$ in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released; this includes a finer fraction, known as $\text{PM}_{2.5}$ (with an aerodynamic diameter less than $2.5\mu\text{m}$). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM_{10} and $\text{PM}_{2.5}$ are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health. However, it is worth noting that, according to the IAQM guidance²⁰, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. $\text{PM}_{2.5-10}$) with just 10-15% expected to comprise $\text{PM}_{2.5}$. The IAQM guidance therefore focusses on PM_{10} for the purposes of assessment.
- 3.3.6. A qualitative assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM²⁰; the available information for this phase of the Proposed Development provided by the Client and Project Team; and, professional judgement.
- 3.3.7. The IAQM methodology²⁰ assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.
- 3.3.8. A summary of the IAQM assessment methodology is provided in **Appendix B**.

Construction Phase Exhaust Emissions

- 3.3.9. In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the Site and in the vicinity of the Site itself. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:
- The number and type of construction traffic and plant likely to be generated by this phase of the Development;
 - The number and proximity of sensitive receptors to the Site and along the likely routes to be used by construction vehicles; and

- The likely duration of the construction phase and the nature of the construction activities undertaken.

Selection of Sensitive Receptors

- 3.3.10. Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development. These will include locations sensitive to an increase in dust deposition and PM₁₀ exposure as a result of on-site construction activities.
- 3.3.11. The IAQM assessment²⁰ is undertaken where there are:
- 'Human receptors' within 250m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or
 - 'Ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- 3.3.12. It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.
- 3.3.13. Human receptors have been identified within 250m of the Site boundary and have therefore been considered within the assessment. No ecological receptors are present within the defined distances.

3.4. SIGNIFICANCE CRITERIA

CONSTRUCTION PHASE

- 3.4.1. The IAQM assessment methodology²⁰ recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.
- 3.4.2. For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO₂ and particulate matter, the significance of residual effects has been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance²¹, which are described below.

3.5. LIMITATIONS & ASSUMPTIONS

- 3.5.1. As final information for the construction phase of the Proposed Development was not available professional judgement has been used in the completion of this part of the assessment.

4. BASELINE CONDITIONS

4.1. WBC'S REVIEW & ASSESSMENT OF AIR QUALITY

- 4.1.1. WBC has declared one Air Quality Management Area (AQMA), the Worthing Grove Lodge/Lyons Farm AQMA. This AQMA encompasses the eastern end of Crockhurst Hill from the eastern boundary of Durrington Cemetery towards Offington Corner Roundabout leading onto the Sompting Bypass, up to and including the Downlands Retail Centre, and Lyons Way and was declared in 2010 and amended in 2014 for exceedances of the NO₂ annual mean health-based standards, which is set at an annual mean concentration of 40µg/m³. The Site is located within this AQMA.
- 4.1.2. WBC published its Air Quality Action Plan (AQAP) in 2024. This details a number of action points proposed to reduce concentrations of NO₂ within its administrative area, mainly along the A27. Key measures include smarter traffic flow, cleaner council fleets, active travel routes, tighter planning controls, public engagement and a potential Low Emission Zone

4.2. LOCAL EMISSION SOURCES

- 4.2.1. The Site is located in an area where air quality is mainly influenced by emissions from road transport using the A27.
- 4.2.2. The Environment Agency's website indicates there is one Part A1³³ process within 2km of the Site, a pharmaceutical manufacturing processes approximately 780m southeast of the Site boundary. There are three Part A2/B³⁴ industrial pollution sources within 2km of the Site^{29,30}, all of which are ranked as a low risk. It is not documented that any of these processes have made any notifiable releases to air, i.e. above limits prescribed in their authorisation. They are therefore unlikely to have any significant influence on air quality in the vicinity of the Site.

4.3. LOCAL AUTHORITY AIR QUALITY MONITORING DATA

- 4.3.1. Concentrations of roadside NO₂ and PM_{2.5} measured in the vicinity of the Site by WBC are provided in **Table 4-1** to **Table 4-2** and **Figure 4-1**.

Table 4-1 - Local Authority Roadside NO₂ Monitoring Data²⁷

Site ID	Site Name	Distance to Site (km)	Annual Mean NO ₂ Concentration (µg/m ³)*				
			2019	2020	2021	2022	2023
N24*	152 Upper Brighton Road	<0.1	23.5	18.4	20.1	29.2	26.2
N66*	Sompting Road	0.1	-	29.8	24.9	21.5	23.5

³³ Large scale industrial processes requiring authorisation from the Environment Agency.

³⁴ Small scale industrial processes requiring authorisation from the Local Authority.

Site ID	Site Name	Distance to Site (km)	Annual Mean NO ₂ Concentration (µg/m ³)*				
			2019	2020	2021	2022	2023
N29*	Downlands Parade	0.1	29.9	25.6	24.2	26.0	22.7
N5*	First Avenue	0.7	28.3	24.5	23.0	21.5	21.2
WT2*	Grove Lodge, Worthing	1.0	32.9	26.0	27.6	25.4	23.4
N44A, N44B, N44C*	AQMS O/S 21 Upper Brighton Road	1.0	36.1	31.1	29.8	27.8	26.1
N30A*	Grove Lodge Cottages	1.0	56.6	45.1	44.4	44.7	41.0
N39*	SW of Roundabout, Grove lodge	1.1	28.5	24.1	23.7	24.4	20.9
N71	King Street	1.4	-	-	11.7	11.8	11.5
Notes: * Indicates a site within an AQMA Bold text indicated results over the AQO of 40 µg/m ³							

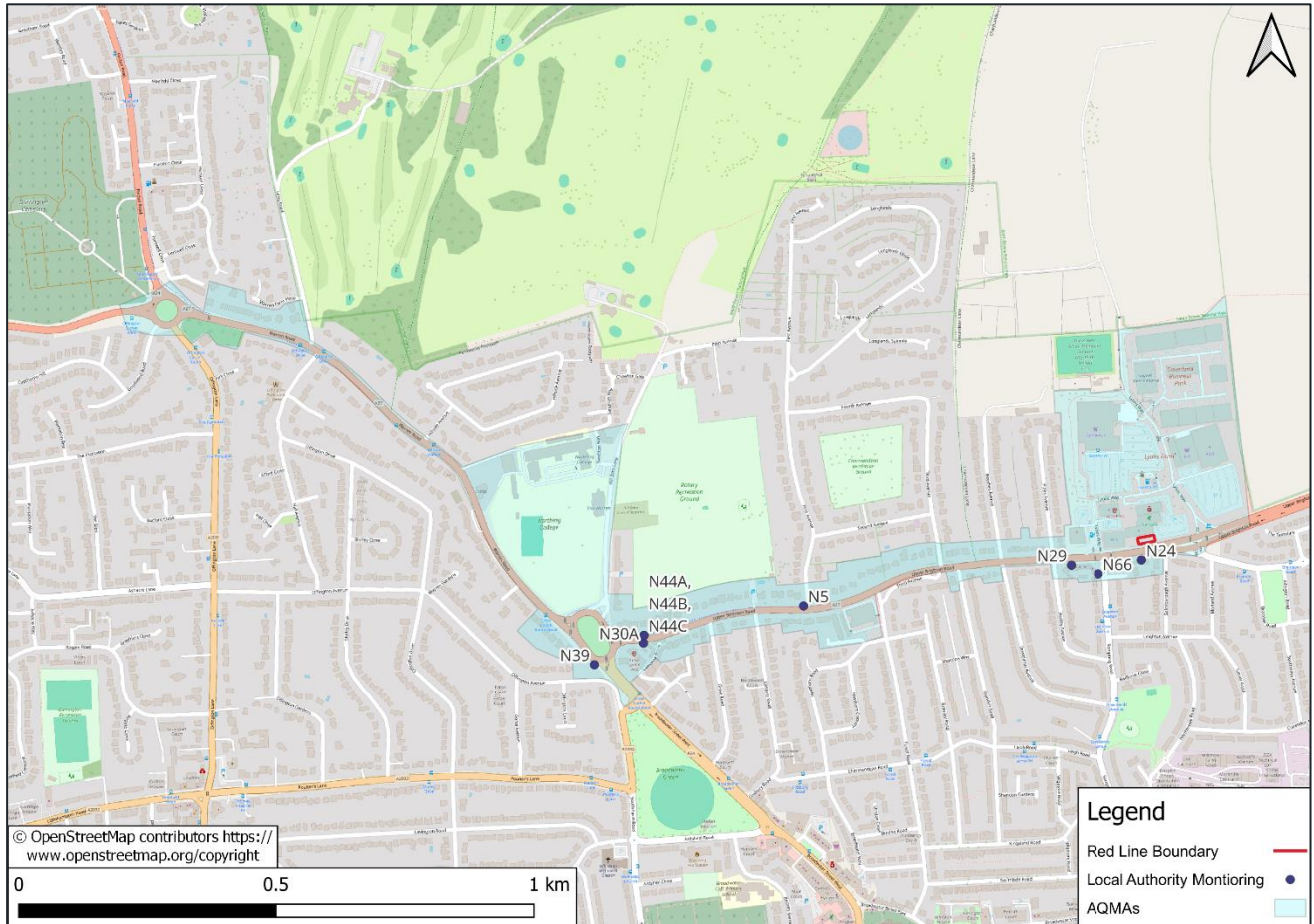
- 4.3.2. From 2019 to 2023, one monitoring location, N30A, exceeded the annual mean NO₂ objective. This site is located approximately 1km from the Site, within the declared AQMA, and has seen a decrease in emissions over the last five years. The three closest monitoring locations (N24, N66 and N29) are all within 0.1km of the site and have recorded no exceedances of the annual mean NO₂ objective in the last five years.
- 4.3.3. Concentrations at all of these locations during 2020 and 2021 were generally slightly lower than previous years due to the effect that Covid-19 lockdowns had on traffic flows. There is a general downward trend of NO₂ concentrations for every monitoring location within 2km of the Site between 2019 and 2023.

Table 4-2 - Local Authority PM_{2.5} Monitoring Data²⁷

Site ID	Site Name	Distance to Site (km)	Annual Mean PM _{2.5} Concentration (µg/m ³)*				
			2019	2020	2021	2022	2023
WT2*	Grove Lodge, Worthing	1.0	9.9	8.0	8.7	8.8	8.7

- 4.3.4. **Table 4-2** shows that PM_{2.5} concentrations are well below the current AQO of 20 µg/m³ and below the 2040 target of 10 µg/m³ at WT2, which is approximately 1km west of the Site.

Figure 4-1 - Roadside Local Authority Monitoring Locations within 1.5km of the Site



4.4. BACKGROUND AIR QUALITY DATA

- 4.4.1. The DEFRA website²⁸ publishes estimates of background pollutant concentrations for each 1km grid square across the UK. These estimates are derived through the extrapolation and interpolation of empirical measurements and modelled dispersion of both road traffic and industrial emissions. Within each grid square, the background concentrations comprise contributions from various sources, including roads and industry, located within and around that specific area.
- 4.4.2. **Table 4-3** summarises the background pollutant concentrations of NO₂, PM₁₀ and PM_{2.5} for 2024 that were utilised in the assessment. The Site sits solely in grid square 515500, 105500. All of the annual mean background concentrations are well below the relevant objectives.

Table 4-3 - Background Concentrations ($\mu\text{g}/\text{m}^3$)

Grid Square (centre on O.S. Grid Reference)	NO₂ ($\mu\text{g}/\text{m}^3$)	PM₁₀ ($\mu\text{g}/\text{m}^3$)	PM_{2.5} ($\mu\text{g}/\text{m}^3$)
515500, 105500	9.5	11.3	6.6

4.5. SUMMARY

- 4.5.1. Overall, the baseline air quality at the site can be considered good with headroom for development. All local monitoring within the vicinity of the Proposed Development is below the relevant AQOs, although it is noted that there are exceedances of the annual mean NO₂ AQO 1km to the west of the Site. None of the identified industrial permitted installations are seen as high risk nor have exceeded their permit threshold and therefore do not give cause for concern.

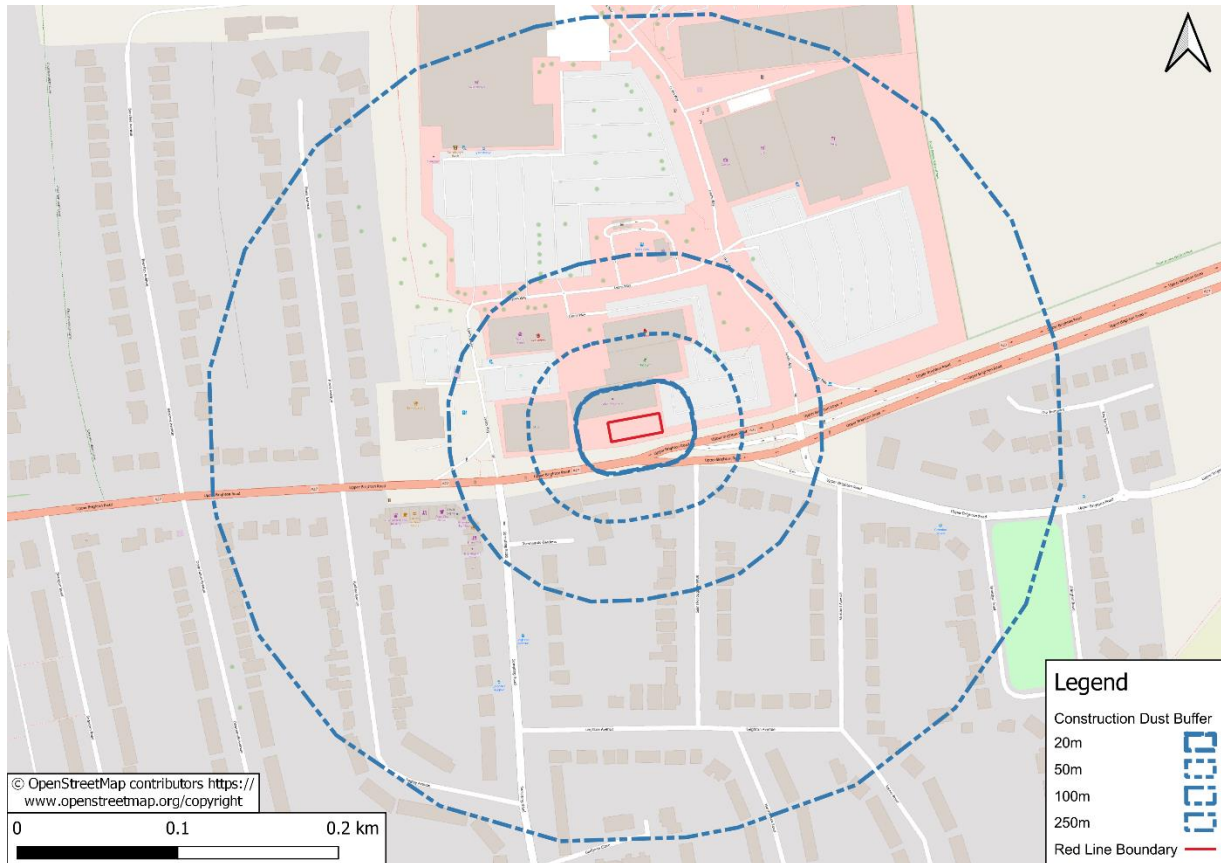
5. ASSESSMENT OF IMPACTS

5.1. CONSTRUCTION PHASE

DUST AND PM₁₀ ARISING FROM ON-SITE ACTIVITIES

- 5.1.1. Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:
- Site clearance and preparation;
 - Preparation of temporary access/egress to the Site and haulage routes;
 - Earthworks;
 - Materials handling, storage, stockpiling, spillage and disposal;
 - Movement of vehicles and construction traffic within the Site;
 - Use of crushing and screening equipment/plant;
 - Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
 - Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
 - Internal and external finishing and refurbishment; and
 - Site landscaping after completion.
- 5.1.2. The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.
- 5.1.3. **Figure 5-1** shows the construction dust area around the Site.

Figure 5-1 - Construction Dust Study Area



ASSESSMENT OF POTENTIAL DUST EMISSION MAGNITUDE

- 5.1.4. The IAQM assessment methodology²⁰ has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

- 5.1.5. No demolition activities will occur at the Site as part of the construction phase of the Proposed Development. Therefore, consideration of the impact of this source on dust soiling and ambient PM₁₀ is not required.

Earthworks

- 5.1.6. The total area of the Site is less than 18,000m², the soil type is silt and is therefore not very dusty as it has a medium grain size. It is also estimated that less than 5 heavy earth moving vehicles will be active at any one time, and that the formation of bunds with a height of less than 3m is likely to occur. It is expected that the majority of the earthwork activities will take place during spring. Therefore, the potential dust emission magnitude is considered to be **small** for earthwork activities.

Construction

- 5.1.7. The total volume of buildings to be constructed on the Site is will be less than 12,000m³ with construction materials likely to have potential for releasing dust. There will be no on-site concrete batching or sandblasting and the construction duration is expected to be relatively short. Therefore, the potential dust emission magnitude is considered to be **small** for construction activities.

Trackout

- 5.1.8. Based on the traffic information provided by the Client, there will be between 20 and 50 HDV (>3.5t) outward movements in any one day travelling on surface materials with low potential for dust release, with unpaved roads within Site at a distance of less than 50m. Therefore, the potential dust emission magnitude is considered to be **medium** for trackout.
- 5.1.9. **Table 5-1** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5-1 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Not applicable
Earthworks	Small
Construction	Small
Trackout	Medium

Assessment of Sensitivity of the Study Area

- 5.1.10. The prevailing wind direction is from the southwest. Therefore, receptors located to the northeast of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.
- 5.1.11. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. This area mainly comprises commercial buildings, with the nearest residential properties 30m from the Site boundary to the south. There are approximately 12 high sensitivity receptors, within 50m of the site, therefore the sensitivity of the area to dust soiling effects on people and property are classified as medium.
- 5.1.12. There are also sensitive residential receptors along construction routes within 250m of the Site that may be sensitive to trackout. Background PM₁₀ levels are predicted to be well below the annual mean objective (**Table 4-3**).
- 5.1.13. Taking the above into account and following the IAQM assessment methodology²⁰, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 5-2**.

Table 5-2 - Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Not applicable	Medium	Medium	Medium
Human Health	Not applicable	Low	Low	Low

Risk of Impacts

- 5.1.14. 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 5-3** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 5-3 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Not applicable	Low	Low	Medium
Human Health	Not applicable	Negligible	Negligible	Low

Construction Vehicles & Plant

- 5.1.15. The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via the A27. Due to the size of the Site, it is considered likely that the construction traffic will be low in comparison to the existing traffic flows on these roads.
- 5.1.16. Final details of the exact plant and equipment likely to be used on Site will be determined by the appointed contractor. The number of plant and their location within the Site are likely to be variable over the construction period.
- 5.1.17. Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are therefore considered to be not significance according to the assessment significance criteria.

6. MITIGATION & RESIDUAL EFFECTS

6.1. MITIGATION

6.1.1. Based on the assessment results, mitigation will be required. Recommended mitigation measures are given in **Table 6-1** below.

Table 6-1 - Construction Phase Dust and Air Emissions Mitigation Measures

Mitigation Measure	Recommendation
Communications	
A stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented	Highly Recommended
The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed	Highly Recommended
Dust Management	
A Dust Management Plan (DMP), which may include measures to control other emissions, in addition to the dust and PM ₁₀ mitigation measures given in this report, should be developed and implemented, and approved by the Local Authority. The DMP may include a requirement for monitoring of dust deposition, dust flux, and/or visual inspections	Highly Recommended
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	Highly Recommended
Make the complaints log available to the local authority when asked	Highly Recommended
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	Highly Recommended
Monitoring	
Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary	Desirable
The frequency of site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions	Highly Recommended

Mitigation Measure	Recommendation
Preparing and maintaining the site	
Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable	Highly Recommended
Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site	Highly Recommended
Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period	Highly Recommended
Avoid site runoff of water or mud	Highly Recommended
Keep site fencing, barriers and scaffolding clean using wet methods	Highly Recommended
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover appropriately	Highly Recommended
Where practicable, cover, seed or fence stockpiles to prevent wind whipping	Highly Recommended
Operating vehicle/machinery and sustainable travel	
Ensure all vehicle operators switch off engines when stationary - no idling vehicles	Highly Recommended
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable	Highly Recommended
A maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas should be imposed (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)	Desirable
A Construction Logistics Plan should be produced to manage the sustainable delivery of goods and materials	Highly Recommended
A Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) should be considered	Desirable
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	Highly Recommended

Mitigation Measure	Recommendation
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate	Highly Recommended
Use enclosed chutes and conveyors and covered skips	Highly Recommended
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate	Highly Recommended
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	Highly Recommended
Waste management	
Avoid bonfires and burning of waste materials	Highly Recommended
Measures Specific to Earthworks	
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable	Desirable
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable	Desirable
Where practicable, only remove the cover in small areas during work and not all at once	Desirable
Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up	Highly Recommended
Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings	Highly Recommended
Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction	Highly Recommended
During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up	Highly Recommended
Measures Specific to Construction	
Avoid scabbling (roughening of concrete surfaces) if possible	Desirable
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place	Highly Recommended

Mitigation Measure	Recommendation
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery	Desirable
For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust	Desirable
All construction plant and equipment should be maintained in good working order and not left running when not in use	Highly Recommended
Measures Specific to 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 in frequent use	Highly Recommended
Avoid dry sweeping of large areas	Highly Recommended
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport	Highly Recommended
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable	Highly Recommended
Record all inspections of haul routes and any subsequent action in a site log book	Highly Recommended
Where practicable, hard surfaced haul routes should be installed, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned	Highly Recommended
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Highly Recommended
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	Highly Recommended
Access gates to be located at least 10m from receptors where possible	Highly Recommended

- 6.1.2. Detailed mitigation measures to control construction traffic should be discussed with WBC to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

6.2. RESIDUAL EFFECTS

- 6.2.1. The residual effect of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above and good site practice is considered to be not significant.

7. CONCLUSIONS

- 7.1.1. A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology.
- 7.1.2. Air quality at the Site is considered to be good within the context of air quality standards (**Table 2-1**) and current land use. WBC monitoring data for the period 2019 to 2023 inclusive shows that there has been one site that measured exceedances of the annual mean NO₂ standard at locations within 2km of the Site but this location is approximately 1 km from the Site. All monitoring data that was completed at locations much closer to the Site (including measurements taken at approximately 100m) has not recorded any exceedances of the annual mean NO₂ standard. Defra's background pollutant concentrations (**Table 4-1**) show that concentrations in the current year (2023) are below their respective annual mean objectives within the grid squares encompassing the Site.
- 7.1.3. The assessment identified that there is a medium risk of dust soiling impacts and a low level of risk for increases in particulate matter concentrations due to construction activities. However, through good site practice and the implementation of suitable mitigation measures, the residual effects of dust and PM₁₀ generated by construction activities would be **not significant**.
- 7.1.4. The air quality effects from the operational development will be assessed in an addendum to this report.
- 7.1.5. Furthermore, it is considered that the development proposals comply with national and local policy for air quality.

Appendix A

GLOSSARY



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

Term	Definition
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
Minor roads	Non A roads of Motorways.
NO ₂	Nitrogen dioxide.
NO _x	Nitrogen oxides.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
µg/m ³ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m ³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
WBC	Worthing Borough Council

Appendix B

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY



STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- ‘Human receptors’ within 250m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or
- ‘Ecological receptors’ within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

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

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

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

Table 2A: Definitions of Dust Emission Magnitudes

Dust Emission Magnitude	Activity
Large	Demolition Total building volume >75,000m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level
	Earthworks Total site area >110,000m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height
	Construction Total building volume >75,000m ³ , on site concrete batching, sandblasting
	Trackout >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m
Medium	Demolition Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material, demolition activities 6-12m above ground level
	Earthworks Total site area 18,000m ² – 110,000m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height
	Construction Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching

Dust Emission Magnitude	Activity
	Trackout 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m
Small	Demolition Total building volume <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months
	Earthworks Total site area <18,000m ² , 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 <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

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

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

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<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 2Bb: Sensitivity of the Area to Human Health Impacts

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

Table 2Bc: Sensitivity of the Area to Ecological Impacts

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

STEP 2C – DEFINE THE RISK OF IMPACTS

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

Table 2C: Risk of Dust Impacts

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



STEP 3 –SITE SPECIFIC MITIGATION

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

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

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



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