Home Office Campsfield IRC Site, Kidlington

Report for – Home Office

Air Quality Assessment

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1.0 Introduction

1.1 Overview

1.1.1 Hawkins Environmental Limited has been instructed by Plowman Craven to undertake an air quality assessment for the proposed extension of the former Campsfield House Immigration Removal Centre, situated in the village of Kidlington within the District of Cherwell in Oxfordshire.

1.1.2 During the planning process, it has been identified that the site requires an Air Quality Assessment to determine whether the proposed development would have an adverse impact on local air quality.

1.1.3 Consequently, this assessment has been conducted in line with the latest guidance in order to determine whether the proposed development achieves compliance with national, regional and local planning policy.

1.1.4 This report primarily assesses concentrations of nitrogen dioxide (NO_2), particulate matter of <10 µm diameter (PM_{10}), and particulate matter of <2.5 µm diameter ($PM_{2.5}$). The assessment considers both the constraints that existing air quality may have on the development of the site (site suitability) as well as the impacts of development on local air quality (impact assessment).

1.1.5 This assessment has been undertaken in accordance with the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) guidance Land-Use Planning & Development Control: Planning for Air Quality (January 2017) and the Department for Environment, Food and Rural Affairs' (Defra) Local Air Quality Management Technical Guidance (TG22) (August 2022).

1.1.6 In addition to considering the operational phase of the development, a risk-based assessment of the impact of the demolition and construction phases on local air quality has been conducted in accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction (January 2024).

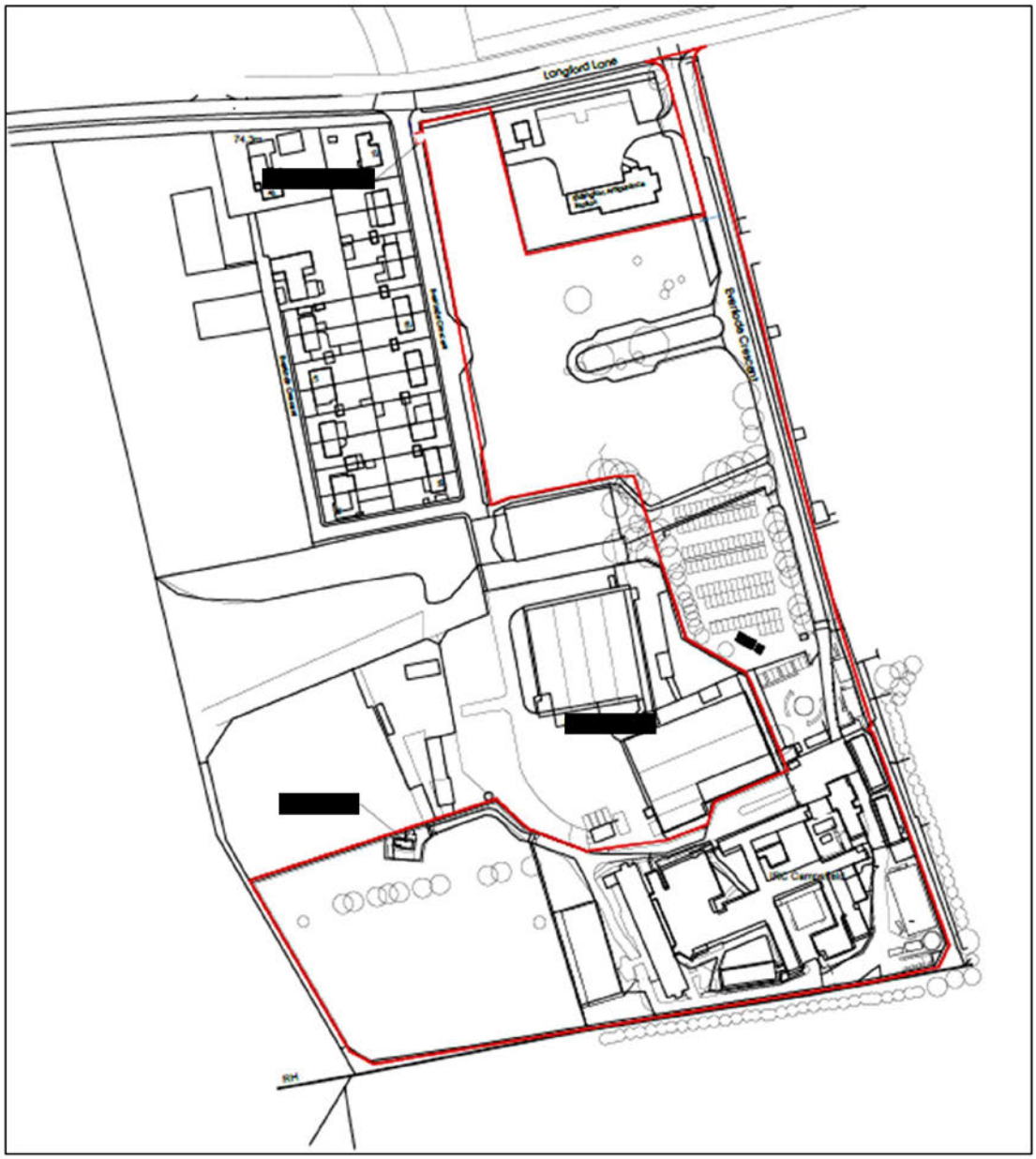
1.1.7 A glossary of terms is detailed in **Appendix 1**.

1.2 Site Description

1.2.1 The proposed development site is located to the north-west of Kidlington Village to the South of Oxford Airport in an area of primarily light industrial and employment uses. The facility is located at the southern end of Evenlode Crescent.

1.2.2 The proposed development entails an extension to the existing site to provide additional accommodation.

1.2.3 A location plan of the proposed site can be seen in **Figure 1.1**.



2.0 Legislation, Planning Policy & Guidance

2.1 Legislation

Environment Act 1995

2.1.1 The Environment Act 1995 is a major piece of primary legislation addressing environmental issues in the UK, including air quality.

2.1.2 The Act established the Environment Agency to regulate pollution, enforce environmental laws, and protect natural resources.

2.1.3 Part IV of the Act focuses on air quality, providing a legal framework for its management and improvement.

2.1.4 Part IV requires the UK government to develop and maintain a National Air Quality Strategy with standards, objectives and measures for improving air quality, and introduced the Local Air Quality Management (LAQM) regime, mandating local authorities to monitor and assess air quality in their areas.The Clean Air for Europe (CAFE) programme revisited the management of Air Quality within the EU and replaced the EU Framework Directive 96/62/EC, its associated Daughter Directives 1999/30/EC, 2000/69/EC, 2002/3/EC, and the Council Decision 97/101/EC, with a single legal act, the Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC.

Air Quality Standards Regulations 2010

2.1.5 The Air Quality Standards Regulations 2010 are a piece of secondary legislation under the Environment Act 1995, which set pollutant concentration limits to protect human health and the environment.

2.1.6 The Regulations contain legally binding Limit Values that must not be exceeded. These are set for individual pollutants (sulphur dioxide, nitrogen dioxide, benzene, lead, PM_{10}, $PM_{2.5}$ and carbon monoxide), specifying a concentration, an averaging time over which it is measured, the number of exceedances allowed per year (if any) and a date by which it must be achieved. Some pollutants have more than one limit value covering different averaging times.

2.1.7 The Regulations also contain Target Values for other pollutants (ozone, arsenic, cadmium, nickel, mercury, polycyclic aromatic hydrocarbons), structured similarly, which while not legally binding, must be met where possible without disproportionate costs.

2.1.8 Derived from Directive 2008/50/EC (the Ambient Air Quality and Cleaner Air for Europe Directive) of the European Parliament, these limits remain in force post-Brexit as retained EU law, ensuring continued protection of air quality.

2.1.9 The UK is bound to these limit values to mitigate harmful effects on health and the environment. The National Air Quality Objectives (NAQOs), as presented in the National Air Quality Strategy, are largely based on these limit values.

2.1.10 The limit values contained in the Air Quality Standards Regulations 2010 (and associated NAQOs in the National Air Quality Strategy) form the basis of this air quality assessment. The limit values are based on an assessment of the health effects of each pollutant and are therefore a good indicator as to whether air quality in the vicinity of a development may be detrimental to human health. The limit values are shown in Table 2.1 below.

Pollutant	Average Period	NAQO Limit Value
Sulphur Dioxide	One Hour	350 µg/m^3 Not to be exceeded more than 24 times per calendar year
	One Day	150 µg/m^3 Not to be exceeded more than 3 times per calendar year
Nitrogen Dioxide	One Hour	200 µg/m^3 Not to be exceeded more than 18 times per calendar year
	Calendar Year	40 µg/m^3
Benzene	Calendar Year	5 µg/m^3
Lead	Calendar Year	0.5 µg/m^3
PM_{10}	One Day	50 µg/m^3 Not to be exceeded more than 35 times per calendar year
	Calendar Year	40 µg/m^3
$PM_{2.5}$	Calendar Year	20 µg/m^3
Carbon Monoxide	Maximum daily running 8-hour mean	10 mg/m^3

Environment Act 2021

2.1.11 The Environment Act 2021 is a further significant piece of primary legislation in the UK that formed part of a new legal framework for environmental protection post-Brexit.

2.1.12 The Act made further provisions for air quality, primarily addressing the issue of fine particulate matter by mandating the setting of new targets for $PM_{2.5}$ concentrations.

2.1.13 It also refined and strengthened the LAQM regime introduced under the Environment Act 1995, provided a legal basis for the introduction of Clean Air Zones, and established the Office for Environmental Protection to protect and improve the environment by holding government and public authorities to account for their environmental policies.

Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

2.1.14 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 are a piece of secondary legislation to protect human health and the environment by setting new legally binding targets on concentrations of $PM_{2.5}$ under the framework set out in the Environment Act 2021, in much the same way that the Environment Act 1995 provided the framework for the Air Quality Standards Regulations 2010. The two Targets are:

- Annual mean concentrations of $PM_{2.5}$ to be 10 $\mu g/m^3$ or lower by 2040.
- Population exposure to $PM_{2.5}$ to be reduced by 35% compared to 2018 levels by 2040.

2.1.15 The two targets are designed to work together to drive actions that both reduce concentrations where it is highest and reduce the pollution that everyone in the country experiences.

2.1.16 It should be noted that the meaning of 'Targets' here is different to that in the Air Quality Standards Regulations 2010, wherein "target values" have specific meaning. Both $PM_{2.5}$ Targets described in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 as set out above are legally binding in the way that "limit values" are in the 2010 Regulations.

Town and Country Planning Act (1990)

2.1.17 The Town and Country Planning Act 1990 is a piece of primary legislation governing land use and development control in England and Wales. It provides the legal framework for planning permissions, enforcement and permitted development rights. Whilst it does not directly set air quality limits, it allows councils to enforce pollution controls through planning conditions, environmental impact assessments (EIA), and enforcement actions.

2.1.18 The Act sets out permitted development rights which allow certain types of development without planning permission, including small home extensions an conversions of offices to residential properties.

2.1.19 The Act states that the vast majority of development (including building new structures, major extensions or alterations, and change of use class) requires planning permission from the relevant local planning authority (LPA). The LPA must then assess the development proposals against local and national planning policies, including those which make provisions for air quality, in order to approve or reject the proposals. If a proposal is rejected by the LPA, the applicant can appeal to the national Planning Inspectorate.

2.1.20 Whilst the Act does not focus solely on air quality, it provides legal mechanisms to ensure new developments do not harm the environment and protect air quality. This includes the requirement for large developments to conduct an EIA (under Section 71A), the ability to grant approval subject to planning conditions, such as air quality damage cost calculations (under Section 70), green belt protection (under Section 336), and the ability to issue enforcement notices if a development is causing harm to public health, the environment or local amenity (under Section 172).

2.2 Planning Policy

National Air Quality Strategy (2023)

2.2.1 As per the legislation of Part IV of the Environment Act 1995, successive governments have produced, maintained and updated air quality policy in the form of various Air Quality Strategy policy papers.

2.2.2 The original National Air Quality Strategy 1997 was the first UK-wide strategy to set standards and objectives for major air pollutants. It was replaced by the Air Quality Strategy for England, Scotland, Wales and Northern Ireland in 2000 with an addendum in 2003, which tightened several of the objectives and introduced a new one for polycyclic aromatic hydrocarbons. A further update came in 2007 with subsequent revisions in 2011, with new objectives for PM2.5.

2.2.3 In April 2023 the UK Government published a document, Air Quality Strategy: Framework For Local Authority Delivery, which supersedes the 2007 Strategy in respect of England only.

2.2.4 Like its predecessors, Air Quality Strategy: Framework For Local Authority Delivery sets out the National Air Quality Objectives (NAQOs). The NAQOs currently mirror the legally binding limit values as set out in the Air Quality Standards Regulations 2010. The NAQOs also currently incorporate the new legally binding $PM_{2.5}$ targets as set out in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.

National Planning Policy Framework (2024)

2.2.5 The National Planning Policy Framework (NPPF) was first published in March 2012 and has undergone regular revision, with the latest version published in December 2024 in response to the proposed reforms to the planning system under the Starmer ministry.

2.2.6 The NPPF sets out England's planning policies and guidance on their application. It guides LPAs in creating Local Plans, which, along with the NPPF itself, inform planning decisions. These local and neighbourhood plans should address community needs and priorities.

2.2.7 The NPPF notes "The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development, and supporting infrastructure in a sustainable manner" (para. 7) and that sustainable development should be delivered with three main objectives: economic; social and environmental (para. 8).

2.2.8 The NPPF supports a presumption in favour of development, unless the adverse impacts of that development outweigh the benefits (para. 10).

2.2.9 Specifically referencing air quality, the NPPF states that "Planning policies and decisions should contribute to and enhance the natural and local environment by… e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality" (para. 187).

2.2.10 The NPPF also states that "Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan" (para. 199).

Planning Practice Guidance

2.2.11 Planning Practice Guidance (PPG) was launched as a series of online guidance documents to support the NPPF, with first Air Quality guidance published on 6th March 2014. It has since undergone regular revision, with the most recent changes in November 2019. It provides guidance on how planning can take account of the impact of new development on air quality.

2.2.12 The air quality PPG notes "Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values" and "It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit".

2.2.13 The PPG goes on to say that "Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species)".

2.2.14 With regards to the content of an air quality assessment, the PPG states "Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

2.3 Best Practice Guidance

Land-Use Planning & Development Control: Planning for Air Quality (2017)

2.3.1 Land-Use Planning & Development Control: Planning for Air Quality, jointly published by the IAQM and Environmental Protection UK (EPUK) in May 2015 and updated in January 2017, serves as a comprehensive guide for integrating air quality considerations into the planning system.

2.3.2 Specific guidance is given on undertaking an air quality assessment for planning, including how to assess both the impacts of existing air quality on a new development, or the impacts of new developments on air quality in their area. It also discusses how to determine the significance of the effects arising from such air quality impacts.

2.3.3 Guidance is also given on screening criteria for different types of assessment, the verification of air quality models, identification of appropriate receptors, and appropriate mitigation measures.

Local Air Quality Management Technical Guidance TG22 (2022)

2.3.4 The LAQM process is a framework under which local authorities are required to review and manage air quality in their areas. It is governed by Part IV of the Environment Act 1995 (see Section 2.1.1) and aims to ensure compliance with the NAQOs.

2.3.5 Local authorities are required to regularly review and assess air quality in their areas. If the review indicates that the NAQOs are being exceeded or are likely to be exceeded, local authorities must designate an AQMA. Once an AQMA has been designated, the local authority is required to develop and implement Action Plans that outline measures to improve air quality, with continuing monitoring, evaluation and reporting required.

2.3.6 Although produced for local authorities tasked with managing air quality in their areas, TG22 provides detailed instructions on how to assess air quality using both monitoring data and modelling techniques, and evaluate whether air quality objectives are being met, and is therefore essential guidance for anyone considering air quality impacts within the planning system.

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

2.3.7 Published in 2014 and most recently amended in 2024, the IAQM Guidance on the Assessment of Dust from Demolition and Construction provides a structured approach to assessing dust risks arising from demolition and construction, and implementing appropriate mitigation measures.

2.3.8 The guidance provides the framework for a qualitative risk assessment of three different dust impacts: disamenity dust soiling, human health do increase PM exposure, and harm to ecological receptors.

2.3.9 The guidance divides activity on construction sites into four categories each of which are considered separately: demolition, earthworks, construction, and trackout. The likely magnitude of dust emission for each activity is combined with the sensitivity of the area (determined by the number of receptors within prescribed distance bands) to determine the risk level from each activity.

2.3.10 Based on the determined risk level, mitigation measures are recommended to be incorporated into a Dust Management Plan which can form part of a broader Construction and Environmental Management Plan. The guidance states that if the recommended mitigation measures are adopted, there will be no overall significant effect.

World Health Organization Air Quality Guidelines (2021)

2.3.11 The World Health Organisation Air Quality Guidelines proposes air quality guideline levels for key air pollutants that pose health risks. The guidelines cover a range of pollutants and suggest threshold levels at which health effects are unlikely to occur, based on the latest scientific evidence.

2.3.12 Due to a substantial increase in scientific evidence since 2005 (the publication of the previous guidelines), the World Health Organisation (WHO) significantly lowered its guideline levels for most air pollutants in its 2021 update, such that they are now more stringent than the legally binding limit values as described in the Air Quality Standards Regulations 2010. Table 2.2 below summarises the WHO Guideline levels.

Pollutant	Average Period	NAQO Limit Value
Nitrogen Dioxide	Calendar Year	10 µg/m^3
	One Day	25 µg/m^3
PM_{10}	Calendar Year	15 µg/m^3
	One Day	45 µg/m^3 (99th percentile)
$PM_{2.5}$	Calendar Year	5 µg/m^3
	One Day	15 µg/m^3 (99th percentile)

3.0 Assessment Methodology

3.1 Methodology Overview

3.1.1 The assessment of air quality considers several different areas, specifically:

- Establishing the baseline conditions at the proposed development site. This entails an evaluation of historic air quality data, the most recent published years' worth of which is used to verify an air quality model for predicting onsite pollutant concentrations at present.

- Constraints of existing air quality on the proposed development. This determines the site's suitability for use. The verified baseline model is updated to model the year of first use, incorporating projected traffic growth, changes in emissions factors, and background concentrations as appropriate. Opening year pollutant concentrations are then compared to the relevant air quality objectives.

- Air quality impacts of the proposed development on local receptors, by means of both emissions from increased traffic and the energy strategy. The future baseline model is updated to reflect these new sources. Impacts are assessed based on both the change caused by the proposed development and the existing air quality at a receptor. It is then determined whether any impacts would lead to significant effects, i.e. to health.

- Impacts from demolition and construction at local receptors. The risk of dust impacts from demolition and construction are assessed qualitatively in terms of their potential to cause effects in terms of disamenity, health or ecology. If the level of construction traffic is sufficient, the impacts of this may be assessed similarly to operational traffic impacts as described in point 3 above.

- Compliance with any local air quality policies as appropriate, for example emissions benchmarking or damage cost analysis.

- Consideration of ecological impacts. This is typically a screening assessment to identify risks of significant adverse effects on European designated sites (Special Protection Area, Special Area of Conservation, or Ramsar site) that could undermine conservation objectives, therefore requiring further detailed examination through an "Appropriate Assessment" under the Habitats Regulations.

3.1.2 The site-specific scoping assessment determines which areas of assessment are relevant to the proposed development. The main methodologies are discussed in the subsections below, along with a description of the identification of receptors and the determination of effect significance.

3.2 Identification of Receptors

3.2.1 Land-Use Planning & Development Control: Planning for Air Quality states that receptor locations should be chosen both within a proposed development (site suitability), as well as on roads significantly affected by it (impact assessment), even if distant to it, and particularly if within, AQMAs.

3.2.2 The guidance notes "These receptors will represent locations where people are likely to be exposed for the appropriate averaging time (dependent on the air quality objective being assessed against).". This is critical as it identifies that sensitivity to air quality is related to the time spent in a location. For example, annual mean objectives should be used to assess anywhere a person may be present for sustained periods over a year, for example dwellings. Although users wouldn't be present for the appropriate averaging time, hospitals and schools would also be assessed against annual mean objectives, owing to the higher sensitivity of their users.

3.2.3 Offices and commercial uses would not usually be assessed against annual objectives, given that most users would be healthy adults who would spend less than 25% of the hours in a year there, however assessment against daily or hourly mean objectives would be necessary. Similarly, hotels may not be assessed against annual mean objectives, however hostels, sheltered accommodation and student accommodation would be considered the same as dwellings, as residents could be expected to stay for several months.

3.3 Baseline and Site Suitability Methodology

3.3.1 To determine the baseline conditions, the following is undertaken:

- A review of the most recent Air Quality Annual Status Reports published by the local planning authority (as required under Local Air Quality Management Regime (see Section 2.3.2), as submitted to the Department for the Environment, Food and Rural Affairs (Defra);
- Determination of whether the site is situated within a designated Air Quality Management Area (AQMA).
- A review of local air quality monitoring data in the area around the proposed development site;
- A review of the Environment Agency's register of industrial sites under the EC Integrated Pollution Prevention and Control Directive (IPPC) to determine whether industrial sources of air pollution could be affecting the site;
- Review of the list of registered Part A2 and Part B permitted premises under the PPC Regulations to determine whether any other sources of air pollution could be affecting the site;

- If required, predict concentrations of air pollutants at the proposed development site in the baseline year and the future baseline year using the ADMS-Roads Dispersion Model (details of which can be seen in Appendix 2, utilising data described in Appendix 3).

3.3.2 The assessment of site suitability is based on the 'future baseline' scenario, which is the year of first occupation or operation of the proposed development. It updates the 'baseline' scenario, i.e. that which is based on the most recent full year of published air quality monitoring data that can be used to create a validated model.

3.3.3 The 'future baseline' updates to the dispersion model include predicted changes in traffic flow between the two years, changes in emissions factors (the amount of pollutant emitted per vehicle-km, which improves in future years as older, more polluting vehicles are removed from the fleet and cleaner engine technologies and alternative fuel vehicles are adopted), and changes in regional background concentrations if appropriate.

3.4 Impact Assessment Methodology

3.4.1 To assess the operational impacts of the proposed development, the 'future baseline' scenario as described above is further updated with the increased traffic flows associated with the proposed development. Any polluting plant associated with the proposed development, such as CHP, is also included. Air pollutant concentrations at nearby sensitive receptors are again modelled using the methodology described in the ADMS-Roads Detailed Dispersion Model.

3.4.2 The resulting impacts (the increase in pollutant concentrations at the modelled receptors) are then assigned a descriptor, based on the criteria given in Land-Use Planning & Development Control: Planning for Air Quality, which are reproduced in Table 3.1 below. The impact is defined not only by the change in pollutant concentration experienced at the receptor, but also by the existing air quality at that location.

Long-Term Average Concentration at Receptor in Assessment Year	% Change in Concentrations Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

3.4.3 The guidance goes on to offer the following explanation (taken from the footnotes of Table 6.3 of the IAQM Guidance):

- "*AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.*

- *The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e.. less than 0.5% will be described as Negligible.*

- *The Table is only designed to be used with annual mean concentrations.*

- *Descriptors for individual receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.*

- *When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.*

- *The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.*

- *It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it*."

3.5 Methodology for Determining Demolition and Construction Effects

3.5.1 The assessment of potential dust impacts from demolition and construction is undertaken in accordance with the IAQM's Guidance on the Assessment of Dust from Demolition and Construction. The guidance outlines a risk-based, five-step methodology for evaluating the significance of construction related air quality impacts:

- Screening: Determine whether a detailed assessment is required. If no sensitive receptors are located within defined distances of the site boundary or the haul routes to be used by construction traffic, further assessment is not necessary.

- Risk Assessment: Assess the risk of dust impacts. The risk is assessed for each of four activities – demolition, earthworks, construction, and trackout; for three different types of receptor sensitivity – the sensitivity of people and property to dust soiling, the sensitivity of people to the health effects of PM10, and the sensitivity of receptors to ecological effects. This involves:

  - Determining the potential dust emission magnitude based on the scale and nature of the works. This is categorised as Large, Medium or Small for each of the four activities described above.

  - Evaluating the sensitivity of the surrounding area. This is categorised as High, Medium or Low for each of the three types of sensitivity described above.

  - Combining these factors to assign a risk level (negligible, low, medium, or high) for each activity.

- Mitigation: Identify appropriate, site-specific mitigation measures based on the risk levels established in Step 2. Local authority requirements and best practice measures should also be incorporated where relevant.

- Residual Effects: Evaluate the effectiveness of the proposed mitigation and determine the significance of any residual dust impacts.

- Reporting: Present the assessment outcomes, including methodology, risk levels, proposed mitigation, and conclusions, within a dust assessment report.

3.6 Significance Criteria

3.6.1 Land-Use Planning & Development Control: Planning for Air Quality provides a framework to assess significance in air quality assessments. As described in the guidance, the "assessment framework for describing impacts can be used as a starting point to make a judgement on significance of effect, but there will be other influences that might need to be accounted for. The impact descriptors set out in Table 6.3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances (Paragraph 7.4)".

3.6.2 The Land-Use Planning & Development Control guidance goes on to state that any significance needs to be assessed using a certain amount of professional judgement and should take into account "the existing and future air quality in the absence of the development; the extent of current and future population exposure to the impacts; and the influence and validity of any assumptions adopted when undertaking the prediction of impacts" (Paragraph 7.7). For example, for a large development, a major adverse impact on a single dwelling might be considered insignificant; however, a minor impact to 100,000 dwellings might be considered to be highly significant. Furthermore, the absolute level of pollutant concentrations are also important in determining significance; for example, a moderate impact to a small group of dwellings might be considered highly significant if the concentrations of NO2 were well in excess of the NAQO level, however, that same moderate impact might be considered insignificant if concentrations were well below the NAQO.

4.0 Scoping

4.1 Overview

4.1.1 Planning Practice Guidance on Air Quality (see Section 2.2.3) states "Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific". This is reiterated in Land-Use Planning & Development Control: Planning for Air Quality (see Section 2.3.1) which provides guidance on screening on whether an air quality assessment is required and what needs to be assessed.

4.2 Impacts of the Local Area on the Development

4.2.1 The IAQM/EPUK Guidance suggests that whether an assessment of the impacts of the local area on the proposed development is required is a matter of judgement, but should take into account:

- *"the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- *the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- *the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO_2), that would cause unacceptably high exposure for users of the new development; and*
- *the presence of a source of odour and/or dust that may affect amenity for future occupants of the development."*

4.3 Impacts of the Development on the Local Area

4.3.1 To determine whether an assessment of the impacts of the development on the local environment is required, the IAQM/EPUK Guidance suggests a two-stage approach. The guidance states that *"The first stage is intended to screen out smaller development and/or developments where impacts can be considered to have insignificant effects. The second stage relates to specific details regarding the proposed development and the likelihood of air quality impacts."*

4.3.2 Figure 4.1 reproduces Stage 1 of the IAQM/EPUK Guidance' two-stage approach. In order to proceed to Stage 2, development needs to meet both one of the criteria in "A", and one of the criteria in "B". If the development fails to meet these criteria, then an air quality assessment looking at the impacts of the development on the local area will not be required.

4.3.3 Figure 4.2 reproduces Stage 2 of the IAQM/EPUK Guidance' two-stage approach. If the development meets the criteria contained within Stage 1, *"more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area."* If the development then meets any of the eight criteria in Stage 2, an assessment of the impacts of the proposed development on the surrounding environment will be required.

Criteria to Proceed to Stage 2

A. If any of the following apply:

- 10 or more residential units or a site area of more than 0.5ha
- more than 1,000 m^2 of floor space for all other uses or a site area greater than 1ha

B. Coupled with any of the following:

- the development has more than 10 parking spaces
- the development will have a centralised energy facility or other centralised combustion process

Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment [a]
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec[a] is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

[a] As a guide, the 5 mg/s criterion equates to a 450 kW ultra low NO_x gas boiler **or** a 30kW CHP unit operating at <95mg/Nm^3. Users of this guidance should quantify the NO_x mass emission rate from the proposed plant, based on manufacturers' specifications and operational conditions.

4.4 Site Specific Scoping Assessment

4.4.1 Although the proposed development is not located within a currently declared AQMA, it does increase the number of high sensitivity receptors; therefore, **an assessment of the impacts of the local area on the development has been included**.

4.4.2 Transport data prepared for the application by indicates a net increase of 347 AADT (337 car, 10 HGV. This does not exceed the Stage 2 criteria above for assessment of impacts outside of an AQMA; therefore, **an assessment of the impacts of the development on the local area is not required**.

5.0 Baseline Conditions

5.1 Air Quality Review and Assessment

5.1.1 Under Part IV of the Environment Act (1995), local authorities are required to carry out a review of air quality within their boundaries according to the prescribed LAQM framework. The findings of this review process are published in an Air Quality Annual Status Report.

5.1.2 LAQM requires local authorities to identify areas that fail to achieve compliance with the National Air Quality Objectives (NAQOs). Where compliance is not achieved, local authorities must designate these areas as Air Quality Management Areas (AQMAs) and also prepare an Air Quality Action Plan (AQAP) which must identify measures to achieve compliance with the NAQOs. When reporting shows consistent compliance with the NAQOs, typically for a five year period, an AQMA can be revoked.

5.1.3 The most recent publicly available Annual Status Report published by Cherwell District Council (published in 2025 based on data collected through 2024) indicates that there are currently two AQMAs declared within the District, in the centres of Banbury and Bicester. The proposed development is therefore not situated within an AQMA.

5.1.4 Concentrations of SO_2, Benzene, Lead and CO are not considered to be an issue within the Borough/District. Consequently, no further consideration is given to these pollutants as it is not considered that they would be of concern at the proposed development site.

5.2 Local Air Quality Monitoring

5.2.1 The District of Cherwell has conducted air quality monitoring, including at one site in the vicinity of the proposed development site, at Langford Lane.

5.2.2 The Langford Lane monitoring location was removed from the monitoring network in the most recent Air Quality Annual Status Report. All current monitoring locations within the district are located at least 10 km from the proposed development site, therefore data from 2019 (the most recent year not affected by COVID-19 lockdowns) from Langford Lane has been used to verify the model.

5.2.3 **Table 5.1** summarises the air quality monitoring data which is displayed graphically in **Figure 5.1**.

Location	Annual Mean Concentrations of NO_2 ($\mu g/m^3$)				
	2015	2016	2017	2018	2019
Langford Lane	21.5	21.7	21.7	21.5	**20.6**

5.3 Industrial Emissions

5.3.1 Both the Environment Agency's register of industrial sites under the EC Integrated Pollution Prevention and Control Directive (IPPC) and the Local Authority's list of registered Part A2 and Part B permitted premises under the Pollution, Prevention and Control Act 1999 and the Environmental Permitting (England and Wales) Regulations 2010 have shown that there are no sites within close proximity of the development site that could be affecting air pollutant levels.

5.4 Baseline Onsite Pollution Concentrations

5.4.1 To understand recent air quality at the proposed development site, as well as to verify the model output against recent real-world data before predicting future concentrations, concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted using an air quality dispersion model for the year 2024, the most recent year for which ratified monitoring data is available.

5.4.2 A description of the modelling process used, including the method to calculate NO_2 from the output NO_x, can be found in Appendix 2.

5.4.3 Input data including traffic flows, meteorological data, background pollutant concentrations, and receptor locations can be found in Appendix 3, along with details of the process used to derive the verification factor applied to the predicted concentrations of NO_x.

5.4.4 Pollutant concentrations have been predicted at two receptor locations across the development site. For each location, concentrations have been calculated at each floor level at which sensitive receptors are proposed, i.e. at ground and first floor height. The locations of these receptors can be seen on the site plan in Appendix 3.

5.4.5 Concentrations have been calculated for a number of representative points across the development site. The locations of these receptor locations can be seen on the site plan in Appendix 3. For each location, concentrations have been calculated at ground floor level (1.5 m). The results of these predictions can be seen in Table 5.2.

Receptor	NO_2 (µg/m^3)	PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)
	Annual Mean	Annual Mean	Days >50 µg/m^3	Annual Mean
Receptor A	12.27	16.88	0.68	11.76
Receptor B	12.23	16.87	0.67	11.76
Receptor C	12.27	16.88	0.68	11.76
Receptor D	12.23	16.87	0.67	11.76
Receptor E	12.33	16.89	0.68	11.77
Receptor F	12.23	16.87	0.67	11.76
Receptor G	12.30	16.89	0.68	11.77
NAQO	**40**	**40**	**35**	**20**

5.4.6 If pollutant concentrations in **Table 5.2** are compared to the National Air Quality Objectives, it can be seen that on the development site in the verification year, concentrations of all pollutants were below the National Air Quality Objectives.

6.0 Impacts of the Local Area on the Development

6.1 Annual Mean Concentrations

6.1.1 To determine the suitability of the site, concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted using an air quality dispersion model for the year 2028, considered to be the year of first occupation of the proposed development.

6.1.2 A description of the modelling process used, including the method to calculate NO_2 from the output NO_x, can be found in Appendix 2.

6.1.3 Input data including traffic flows, meteorological data, background pollutant concentrations, and receptor locations can be found in Appendix 3, along with details of the process used to derive the verification factor applied to the predicted concentrations of NO_x.

6.1.4 Pollutant concentrations have been predicted at two receptor locations across the development site. For each location, concentrations have been calculated at ground floor level (1.5 m). The results of these predictions can be seen in Table 6.1.

Receptor	NO_2 (µg/m^3)	PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)
	Annual Mean	Annual Mean	Days >50 µg/m^3	Annual Mean
Receptor A	8.94	14.89	0.12	9.73
Receptor B	8.92	14.88	0.12	9.73
Receptor C	8.94	14.89	0.12	9.73
Receptor D	8.92	14.88	0.12	9.73
Receptor E	8.98	14.90	0.12	9.74
Receptor F	8.92	14.88	0.12	9.73
Receptor G	8.96	14.89	0.12	9.74
NAQO	**40**	**40**	**35**	**20**

6.1.5 If pollutant concentrations in **Table 6.1** are compared to the National Air Quality Objectives, it can be seen that on the development site during the opening year, concentrations of pollutants are predicted to be below the National Air Quality Objectives.

6.2 NO_2 1-hour Exposure

6.2.1 In order to meet the hourly Air Quality Standard on NO_2, the average hourly concentration of NO_2 must not exceed the hourly objective level of 200 µg/m^3 more than 18 times in one calendar year. If this standard is not met, there would be concern that even short duration exposure to pollutant concentrations could be prejudicial to health, which could be a concern for outdoor amenity spaces associated with the development.

6.2.2 According to research conducted in 2003[1], there is only a risk that the NO_2 1-hour objective (200 µg/m^3) could be exceeded if the annual mean nitrogen dioxide concentration is greater than 60 µg/m^3. At the development site, the worst-case annual mean is 8.98 µg/m^3, therefore hourly exceedances are not expected to occur. Consequently, local short duration pollutant concentrations would not be considered a cause for concern in outdoor amenity spaces associated with the development.

[1] Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003.

7.0 Impacts of the Development on the Local Area

7.1.1 The scoping assessment presented in Section 4.4 of this report identifies that the proposed development does not meet the criteria given in the IAQM Guidance for a full impact assessment, namely due to a low level of predicted vehicle trip generation and a low emission energy strategy.

7.1.2 The impacts on air quality (changes in concentration) at local sensitive receptors as a consequence of the operation and occupation of the proposed development are therefore considered to be “negligible”; and the air quality effects (i.e., to health) of the proposed development are therefore considered to be “not significant”.

8.0 Construction Dust Impact Assessment

8.1 Overview

8.1.1 The main air quality impacts that may arise during construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes; and
- An increase in concentrations of airborne particles (e.g. PM_{10}, $PM_{2.5}$) and nitrogen dioxide due to exhaust emissions from site plant and traffic that can impact adversely on human health.

8.1.2 The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from the site. Most of this PM_{10} is likely to be in the $PM_{2.5-10}$ fraction, known as coarse particles.

8.1.3 It is very difficult to quantify emissions of dust from construction activities. It is, therefore, common practice to provide a qualitative assessment of potential impacts. The Institute of Air Quality Management's *Guidance on the assessment of dust from demolition and construction (February 2014)* contains a complex methodology for determining the significance of construction impacts on air quality. The following sections outline the steps outlined in the IAQM methodology.

8.2 Step 1 – Screening the Need for a Detailed Assessment

8.2.1 The IAQM guidance states that:

8.2.2 *"An assessment will normally be required where there is:*

- *a 'human receptor' within:*
  - *350 m of the boundary of the site; or*
  - *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).*
- *an 'ecological receptor' within:*
  - *50 m of the boundary of the site; or*
  - *50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)."*

8.2.3 There are existing receptors within 350 m of the boundary of the development site and within 50 m of the route used by construction vehicles on the public highway. Therefore, a detailed assessment is required to determine potential dust impacts.

8.3 Step 2 – Assess the Risk of Dust Impacts

8.3.1 The IAQM guidance states that:

8.3.2 *"The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk.*

8.3.3 *A site is allocated to a risk category based on two factors:*

- *the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (STEP 2A); and*
- *the sensitivity of the area to dust impacts (STEP 2B), which is defined as low, medium or high sensitivity.*

8.3.4 *These two factors are combined in STEP 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time."*

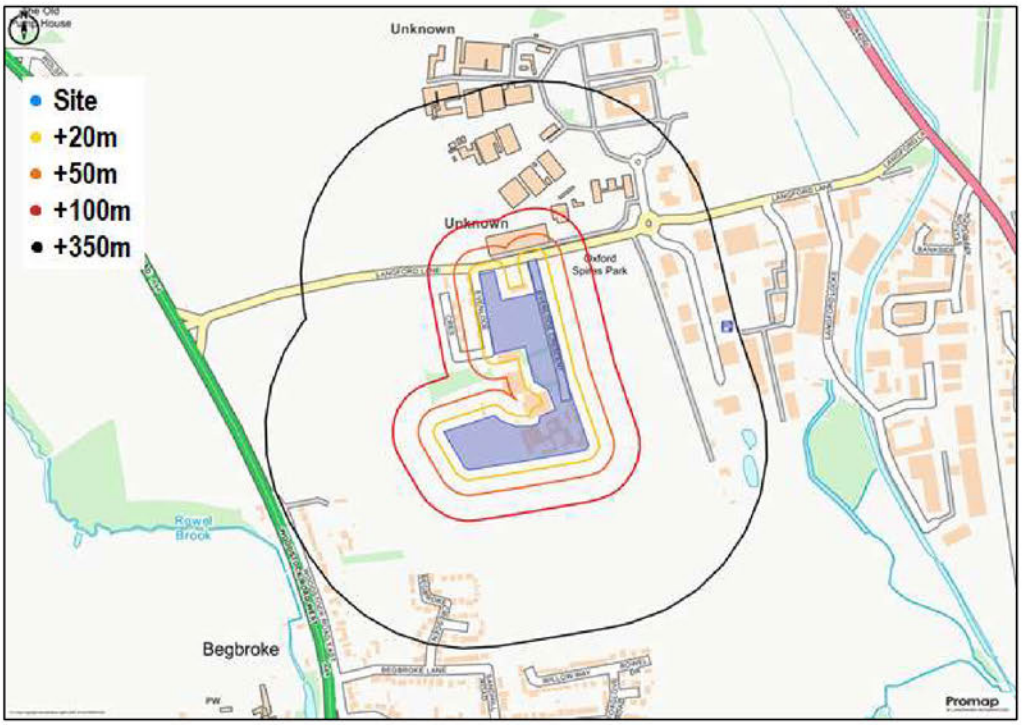
Step 2a – Dust Emission Magnitude

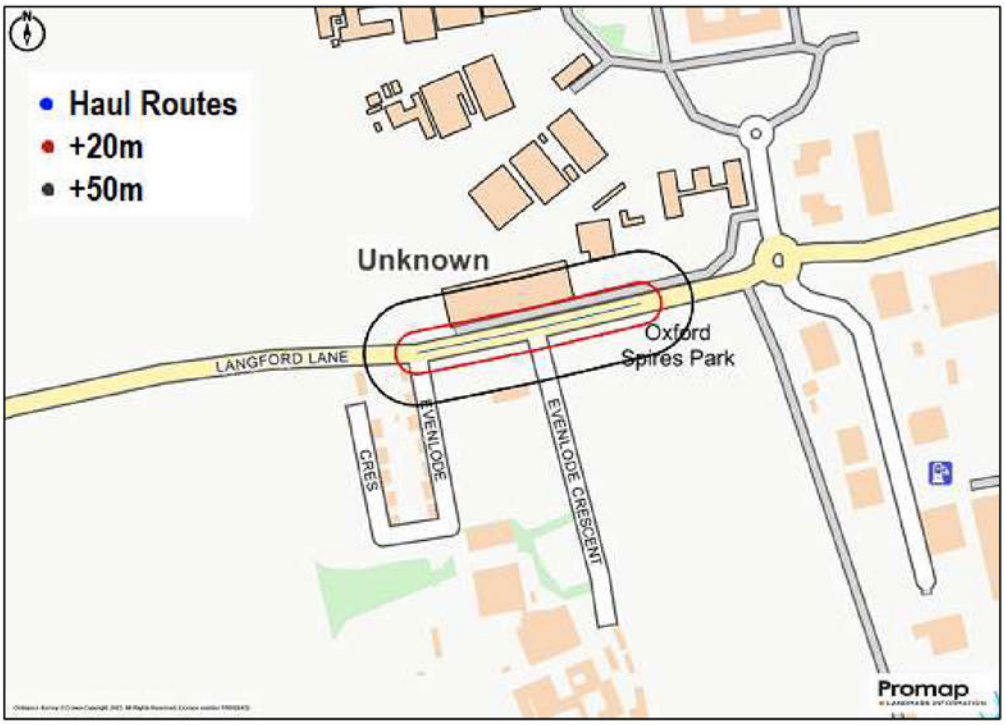
The first step (Step 2a) is therefore to assess the magnitude of the anticipated works. **Table 9.1** summarises the dust emission magnitude for each activity.

Activity	Dust Emission Magnitude	Justification
Demolition	**Small**	*Removal of small temporary buildings only.*
Earthworks	**Small**	*The total site area is less than 2,500 m^2, higher risk processes/materials unlikely.*
Construction	**Small**	*Building volume will be less than 25,000 m^3.*
Trackout	**Small**	*Less than 10 outward HGV movements per day are expected and the sections of unpaved roads will be less than 50 m.*

Step 2b – Sensitivity of the Area

8.3.5 The next step (Step 2b) is therefore to assess the sensitivity of the area that could be affected by the anticipated works. **Figure 9.1** shows the distance bands into which receptors fall as described in the guidance, both from the site (20, 50, 100 and 350 metres) and **Figure 9.2** shows the relevant bands for the associated haul routes (20 and 50 metres).





8.3.6 There are a number of existing dwellings in the area that are considered to be high sensitivity receptors, namely the residential properties on nearby Evenlode Crescent. All such properties are within the 100-350 m band relative to the proposed development. Therefore, the sensitivity to dust soiling effects on people and property is "*low*" for all activities.

8.3.7 The annual mean concentration of PM_{10} is between 24 and 28 µg/m^3; despite the number of high sensitivity receptors outlined above, this results in a *"low"* sensitivity of the area to human health impacts for all activities.

8.3.8 There are no ecological receptors that are considered to be anything greater than low sensitivity receptors within 50 m of the site; this results in a *"low"* sensitivity of the area to ecological impacts for all activities.

8.3.9 **Table 9.2** summarises the sensitivity of the area for each activity.

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

Step 2c – Determining the Risks

8.3.10 The next step (Step 2c) is to assign the level of risk for each activity, based on the receptor sensitivity and the dust emission magnitude. **Table 9.3** summarises the dust risk for each activity.

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

8.4 Step 3 – Site Specific Mitigation

8.4.1 Stage 2 determines that the site is considered to be of *Negligible Risk* in respect of all activities. This is a result of the small scale of works to be carried out and the fact that the nearest sensitive receptors are not in close proximity to the site.

8.4.2 The IAQM guidance provides a list of potential mitigation measures and suggests where these measures are highly recommended, desirable or not required based upon the risk of the site. For all sites that are a *"Low Risk Site"* or higher, a Dust Management Plan is highly recommended and should incorporate the mitigation measures recommended based on the site risk.

8.4.3 Although the assessment has determined that the proposed development site is considered to be of *Negligible Risk*, the list of mitigation measures that the IAQM Guidance considers for *Low Risk Sites* has been provided below as a means of reference for good practice.

8.4.4 The IAQM's Guidance states that the following measures are highly recommended or desirable as mitigation for all low risk sites:

- Communications: Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary.

- Communications: Display the head or regional office contact information.

- Communications: Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LPA. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the Site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

- Site management: Record all dust and air quality complaints, identify the cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.

- Site management: Make the complaints log available to the local authority when asked.

- Site management: 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.

- 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 LPA 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.

- Monitoring: 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.

- Monitoring: 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.

- Preparing and maintaining the Site: Plan Site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.

- Preparing and maintaining the Site: Erect solid screens or barriers around dusty activities (or the Site boundary) that are at least as high as any stockpiles on-site.

- Preparing and maintaining the 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.

- Preparing and maintaining the Site: Avoid Site runoff of water or mud.

- Preparing and maintaining the Site: Keep Site fencing, barriers and scaffolding clean using wet methods.

- Preparing and maintaining the Site: 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.

- Preparing and maintaining the Site: Cover, seed or fence stockpiles to prevent wind whipping.

- Operating vehicle/machinery and sustainable travel: Ensure all vehicles switch off engines when stationary - no idling vehicles.

- Operating vehicle/machinery and sustainable travel: Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

- Operating vehicle / machinery and sustainable travel: Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long-haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)

- 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.

- Operations: Ensure an adequate water supply on the Site for effective dust / particulate matter suppression/mitigation, using non-potable water where possible and appropriate.

- Operations: Use enclosed chutes and conveyors and covered skips.

- Operations: Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

- Operations: 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.

8.4.5 The IAQM Guidance states that the following measures are highly recommended or desirable as mitigation for all low risk sites in relation to 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. Hand held 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.

8.4.6 The IAQM Guidance does not state any measures that are highly recommended or desirable as mitigation for low risk sites in relation to earthworks.

8.4.7 The IAQM's Guidance states that the following measures are highly recommended or desirable as mitigation for all medium risk sites in relation to construction:

- Avoid scabbing (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.

8.4.8 The IAQM's Guidance states that the following measures are highly recommended or desirable as mitigation for all low risk sites in relation 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 continuously in use.

- Avoid dry sweeping of large areas.

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

- Record all inspections of haul routes and any subsequent action in a site log book.

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

8.5 Step 4 – Determining Significant Effects

8.5.1 The site is considered a *"Negligible Risk Site"* overall and a Dust Management Plan is therefore not considered necessary. It is therefore considered that with or without mitigation, residual effects will not be considered significant.

8.6 Step 5 – Dust Assessment Report Summary

8.6.1 Dust and other pollutant emissions from the construction, demolition, earthworks and trackout phases of the construction of the proposed development will see the site designated a "*Negligible Risk Site*" and that residual effects will not be considered significant.

9.0 Mitigation

9.1.1 As a consequence of the proposed development, there will not be a significant increase in pollutant concentrations at nearby sensitive receptors and therefore mitigation is not seen to be necessary.

9.1.2 Similarly, concentrations of all pollutants are below the National Air Quality Objectives at the development site and therefore it is not necessary to implement mitigation to reduce the exposure from NO_2 or any other pollutant to future occupiers of the proposed development.

10.0 Conclusions & Summary

10.1.1 An Air Quality Assessment has been undertaken in accordance with Defra's Local Air Quality Management Technical Guidance (TG22) and the IAQM/EPUK guidance Land-Use Planning & Development Control: Planning for Air Quality (2017), addressing the effects of local air pollutant emissions, and emissions associated with the development proposals.

10.1.2 In addition, a risk-based assessment of the impact of construction on local air quality has been conducted in accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024).

10.1.3 Baseline pollutant concentrations at the proposed development site have been assessed using existing pollutant monitoring data, which has been used to make predictions of pollutant concentrations in future years using dispersion modelling in ADMS-Roads. These predictions have been used to determine the suitability of the site for its proposed use.

10.1.4 Regarding site suitability, modelling shows that at present, and in the opening year of the proposed development (2026), concentrations of all pollutants are below the National Air Quality Objectives.

10.1.5 Regarding the impact of the proposed development, the scoping stage has determined that due to the scale of the development, with limited/no parking provision and no combustion processes relating to the energy strategy, a full assessment of the impacts of the proposed development on local air quality is not required.

10.1.6 With regards to air quality impacts arising from the demolition and construction phases, the proposed development site is considered to be a "Low Risk Site" using the IAQM guidance. However, with risk-appropriate mitigation measures as recommended, residual effects of these impacts will not be considered significant.

10.1.7 Based on the results of the assessments discussed above, which have all been carried out in accordance with the latest guidance, it is considered that the proposed development adheres to national, regional and local planning policy, and therefore that air quality concerns should not be a constraint on the proposed development.

Appendix I – Glossary of Terms

Air Quality Standard/Air Quality Objective: 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 an assessment of the effects of each pollutant on human health including the effects on sensitive subgroups.

Annual mean: The average of the concentrations measured for each pollutant for one year. In the case of the Air Quality Objectives, this is for a calendar year.

Air Quality Management Area (AQMA): An area that a local authority has designated for action, based upon predicted exceedances of Air Quality Objectives.

Concentration: The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant per unit volume of air (for example, microgrammes per cubic metre, $\mu g/m^3$) or a volume of gaseous pollutant per unit volume of air (parts per million, ppm).

Exceedance: A period of time where the concentration of a pollutant is greater than the appropriate Air Quality Objective.

Nitrogen Oxides: Nitric oxide (NO) is mainly derived from road transport emissions and other combustion processes such as the electricity supply industry. NO is not considered to be harmful to health. However, once released into the atmosphere, NO is usually very rapidly oxidised to nitrogen dioxide (NO_2), which is harmful to health. NO_2 and NO are both oxides of nitrogen and together are referred to as nitrogen oxides (NO_x).

Particulate Matter: Fine Particles are composed of a wide range of materials arising from a variety of sources including combustion sources (mainly road traffic), and coarse particles, suspended soils and dust from construction work. Particles are measured in a number of different size fractions according to their mean aerodynamic diameter. Most monitoring is currently focused on PM_{10} (less than 10 microns in diameter), but the finer fractions such as $PM_{2.5}$ (less than 2.5 microns in diameter) is becoming of increasing interest in terms of health effects.

$\mu g/m^3$ micrograms per cubic metre of air: A measure of concentration in terms of mass per unit volume. A concentration of 1 $\mu g/m^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix II – Air Quality Model

In the UK, the Department for Environment, Food & Rural Affairs (Defra) provides guidance on the most appropriate methods to estimate pollutant concentrations as part of Local Air Quality Management (LAQM). The most recent guidance, LAQM Technical Guidance TG22, was published in 2022 and outlines recommended tools and methodologies for air quality modelling.

One of the principal modelling tools endorsed by Defra is ADMS-Roads, a detailed atmospheric dispersion model developed by Cambridge Environmental Research Consultants that simulates how pollutant emissions disperse in the atmosphere. Specifically designed for UK road networks, ADMS-Roads is widely considered one of the most suitable models for predicting the impact of traffic-related air pollution, particularly nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

ADMS-Roads offers a more advanced approach than many other models such as CALINE (used in Breeze Roads), by incorporating state-of-the-art representations of atmospheric processes. Rather than relying on the simplified Pasquill-Gifford stability classes, ADMS-Roads uses the Monin-Obukhov length to more accurately model boundary layer stability. It also includes sophisticated algorithms to account for height-dependent variations in wind speed, turbulence, and atmospheric stability – factors critical to accurate dispersion predictions.

Unlike basic screening models such as the DMRB Method, ADMS-Roads supports the use of hourly, annualised meteorological data, and allows for the modelling of complex features such as terrain, building canyon effects, and varying source and receptor heights.

TG22 also outlines procedures for model verification and adjustment, which involve comparing modelled results with monitored data. Since models like ADMS-Roads predict total oxides of nitrogen (NO_x) rather than NO_2 directly, observed NO_2 concentrations from diffusion tubes or continuous monitors must be converted to NO_x to enable valid comparisons. Defra provides a standard method for converting between NO_2 and NO_x, which accounts for local and regional variations in NO_x, NO_2 and ozone (O_3), as well as changes in the proportion of NO_x emitted directly as NO_2 (known as f-NO_2).

Background pollutant concentration maps, regularly updated by Defra, are used to estimate the remaining contribution from road traffic. By comparing the monitored and modelled road-traffic-related NO_x contributions, an adjustment factor can be derived and applied to improve model accuracy. A well-verified ADMS-Roads model should typically produce predictions within ±10% of measured concentrations.

The software version used in this assessment is the latest published version of ADMS-Roads, version 5.0.1, which was released by CERC in February 2022.

Appendix III – Modelling Procedure and Input Data

Model Input Data

Traffic flows in the vicinity of the site have been obtained from the Department for Transport's traffic database for the year 2019. High traffic growth factors have been applied to this data to predict traffic flows for the proposed opening year (2026).

Since lower traffic speeds increase emissions from vehicles, it is necessary to take into account the reduction in traffic speeds around junctions. TG22 suggests that "there is no simple factor that can be applied to the average speed to calculate a speed applicable to congested periods" and that one should exercise professional judgement when taking into account congestion and decreasing speeds around junctions. However, in the absence of any more detailed site-specific information, TG22 does suggest that that "For a busy junction, assume that traffic approaching the junction slows to an average of 20kph …(for) approach distances of approximately 25m". This is the approach adopted at this site.

All road links within 200 m of a receptor have been included in the model. Road widths have been modelled in accordance with OS mapping data. However, based on observations, road widths are adjusted to take into account any restrictions to flow, such as parked cars.

Since road-traffic emissions on roads with significant gradients (>2.5%) can increase significantly, especially in relation to HGVs, significant gradients are taken into account in the modelling. At this site, road gradient effects were not considered to be significant.

The wake effects of traffic induced turbulence have been included in the modelling as standard. This takes into account the fact that increased traffic volumes and speeds produce more turbulence, which has effects on dispersion.

Input road links, traffic flows, the percentage of Heavy Goods Vehicles (HGVs) and traffic speeds are shown below.

Road	AADT 2019	AADT 2026	% HGV	Speed km/h
Langford Lane 1	11998	13119	3.7	96
Langford Lane 2	11998	13119	3.7	48
Evenlode Crescent 1	889	972	1.6	20
Evenlode Crescent 2	889	972	1.6	32

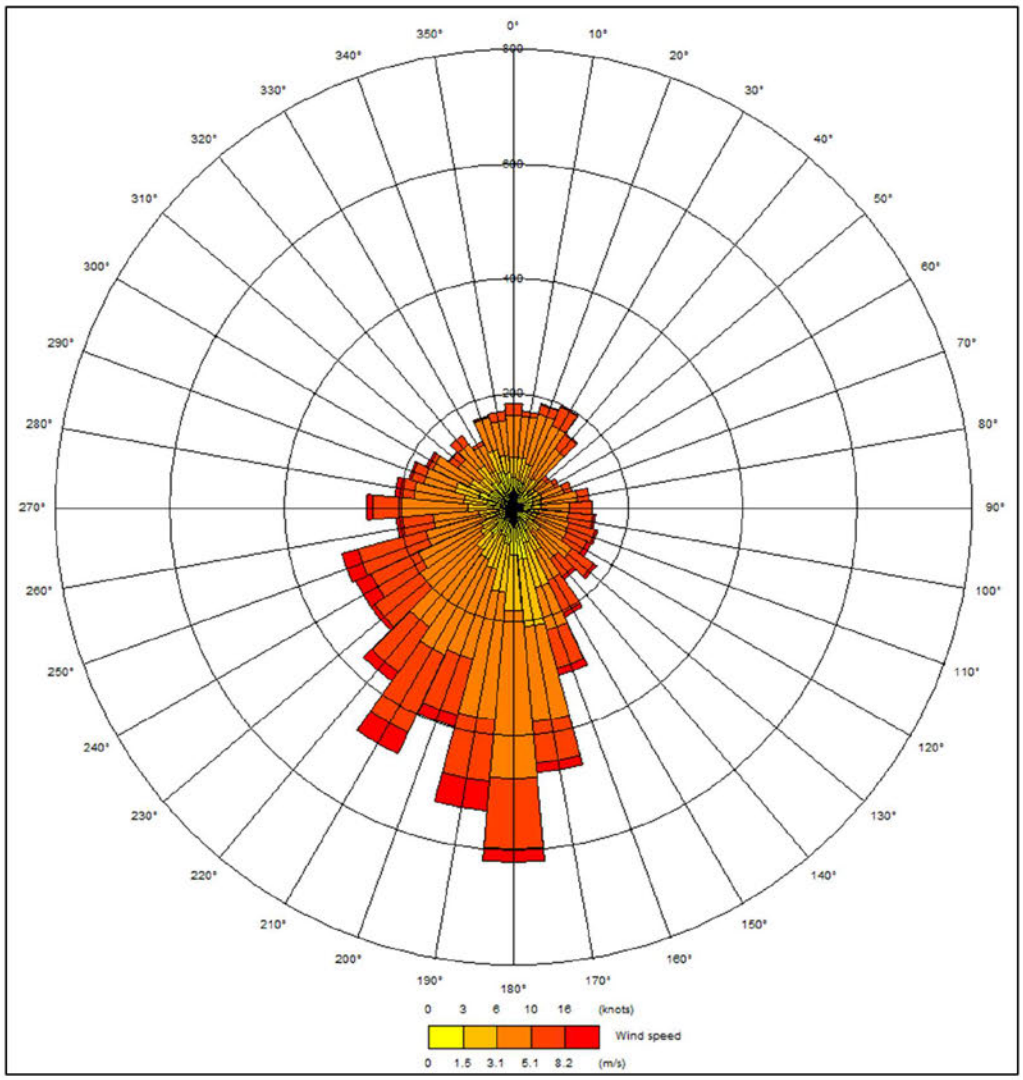
Meteorological Data

TG22 suggests that a single year's meteorological data will be sufficient to predict air pollution concentrations.

Meteorological data was obtained from RAF Benson for 2019 (Surface Station Number 3658 - ICAO airport code EGUB – 62 m above sea level). It is considered that this weather station is likely to be representative of conditions within the area local to the development site.

Data was collected in accordance with internationally accepted weather observation techniques, specifically the METAR weather format, which is an internationally recognised standardised weather format commonly used in the aviation industry. The meteorological data consists of hourly sequential data of wind speed, wind direction, surface temperature, precipitation rate and cloud cover data. In line with the standards, all data is passed through numerous quality control checks. At this site, the data was over 99% complete, with very little missing data.

The Meteorological data was used for both model verification and future year scenarios. The figure below shows the wind rose data used in the modelling.



Advanced Modelling Parameters

The following modelling parameters have been used in the ADMS-Roads Model:

Parameter	Value	Justification
Latitude	51.83˚	Latitude of site
Surface Roughness Note 1	0.5 m	Suburban
Minimum Monin-Obukhov Length	30 m	Recommended for towns and cities
Surface Albedo	0.23	The default for non-snow-covered ground
Priestley-Taylor Parameter	1.0	Model default

Note 1: A surface roughness of 0.2 has been applied to the meteorological measurement site, as it is considered to be a less built up area than the proposed development site.

Emissions Factors

The model utilises emission factors contained within EFT v12.1, published in August 2024. This represents the most up to date emissions factors available for the verification year, which in this case was 2019. The Emissions Factors Toolkit (EFT) is published by Defra and the Devolved Administrations to assist local authorities in carrying out Review and Assessment of local air quality as part of their duties under the Environmental Act 1995. It can be used by anyone to predict pollution concentrations at a given point, in conjunction with a detailed dispersion model.

The EFT provides emission rates for 2018 through to 2040 and takes into consideration data from the National Atmospheric Emissions Inventory (NAEI) such as fleet composition based on European emission standards from pre-Euro I to Euro 6/VI (including Euro 6 subcategories) and scaling factors reflecting improvements in the quality of fuel and some degree of retrofitting.

The EFT allows users to calculate road vehicle pollutant emission rates for NO_x, PM_{10}, $PM_{2.5}$ and CO_2 for a specified year, road type, vehicle speed and vehicle fleet composition. EFT v12.1 uses the latest COPERT 5.6 NO_x and PM emissions factors, updated from COPERT 5.3. The EFT is updated regularly to reflect changes in vehicle fleet composition and emissions factors.

Street Canyons

ADMS-Roads is designed to be used to model concentrations at different locations assuming that there are no obstacles to air flow. Dispersion modelling in urban areas is difficult due to the presence of buildings, trees, walls, etc. that modify the wind flow and alter the dispersion of traffic emissions. This is especially the case in so called 'street canyons', where buildings, or other obstacles, can trap pollutants and restrict dispersion. ADMS-Roads includes additional modules to account for the restricted dispersion.

Although street canyons have been defined as narrow streets where the height of buildings on both sides of the road are greater than the road width, there are numerous examples whereby broader streets may be considered as street canyons. It also does not require buildings on both sides of a road to restrict dispersion. A wall or a bank with trees will also affect dispersion, as will overhanging trees.

Background concentrations influence pollutant levels within street canyons when the air mass at rooftop level moves into the canyon, leading to increased ventilation and flushing of the polluted air from the traffic. Similarly, gaps between buildings allow increased wind flows to enter the canyon and can re-circulate pollutants away from the junctions but causing increased concentrations further away. The opposite effect may occur if the gap is at a junction, where road traffic emissions are carried into the canyon, resulting in higher concentrations.

The concentrations depend of the wind direction with respect to the orientation of the street canyon; when the wind is perpendicular to the road higher concentrations occur on the leeward side. Wind blowing along a road will reduce concentrations as it ventilates the canyon. In reality, street canyons in are generally not regular in shape, the buildings on opposite sides of the road are of different heights, the width varies along the street and there are gaps between buildings.

LAQM.TG22 states "*Where a street can be partially classified as a street canyon, for example, where there are gaps in between buildings, monitoring in such locations may indicated elevated concentrations. It is therefore recommended that local authorities consider these links as street canyons; otherwise predicted concentrations are likely to be under-estimated*" (paragraph 7.413).

At this site, street canyon effects were not considered to be significant.

Background Concentrations of Air Pollutants

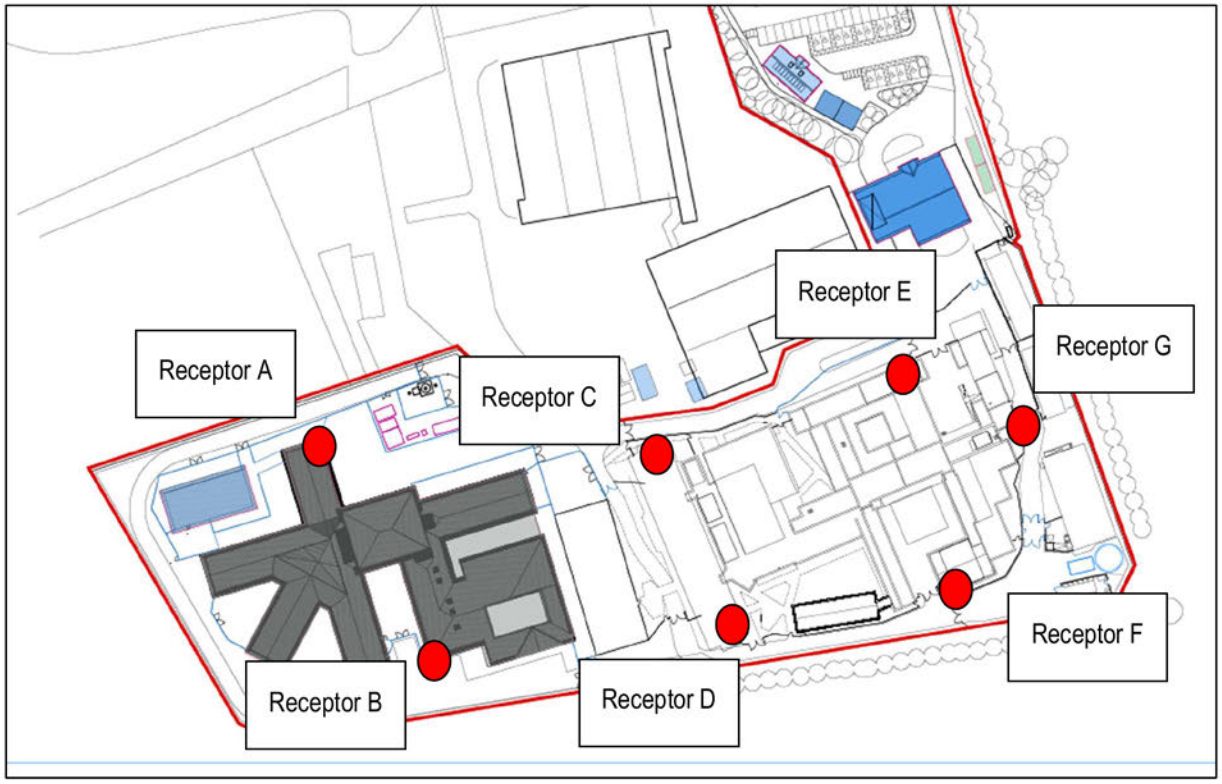
Background concentrations of air pollutants for the modelling were obtained from the UK National Air Quality Information Archive, in accordance with Local Air Quality Management Technical Guidance TG22. The Archive contains background values for the UK at 1 km^2 resolution.

Background concentrations of 12.12 $\mu g/m^3$, 16.85 $\mu g/m^3$ and 11.75 $\mu g/m^3$ of NO_2, PM_{10} and $PM_{2.5}$ respectively were determined for the 1 km^2 grid square centred at 447500 214500 for 2019; with 2026 concentrations of 8.85 $\mu g/m^3$, 14.86 $\mu g/m^3$, and 9.72 $\mu g/m^3$ respectively.

In order to avoid 'double counting', major road sources within the grid square identified were removed from the total background as they have been explicitly modelled as part of the assessment.

Receptor Locations

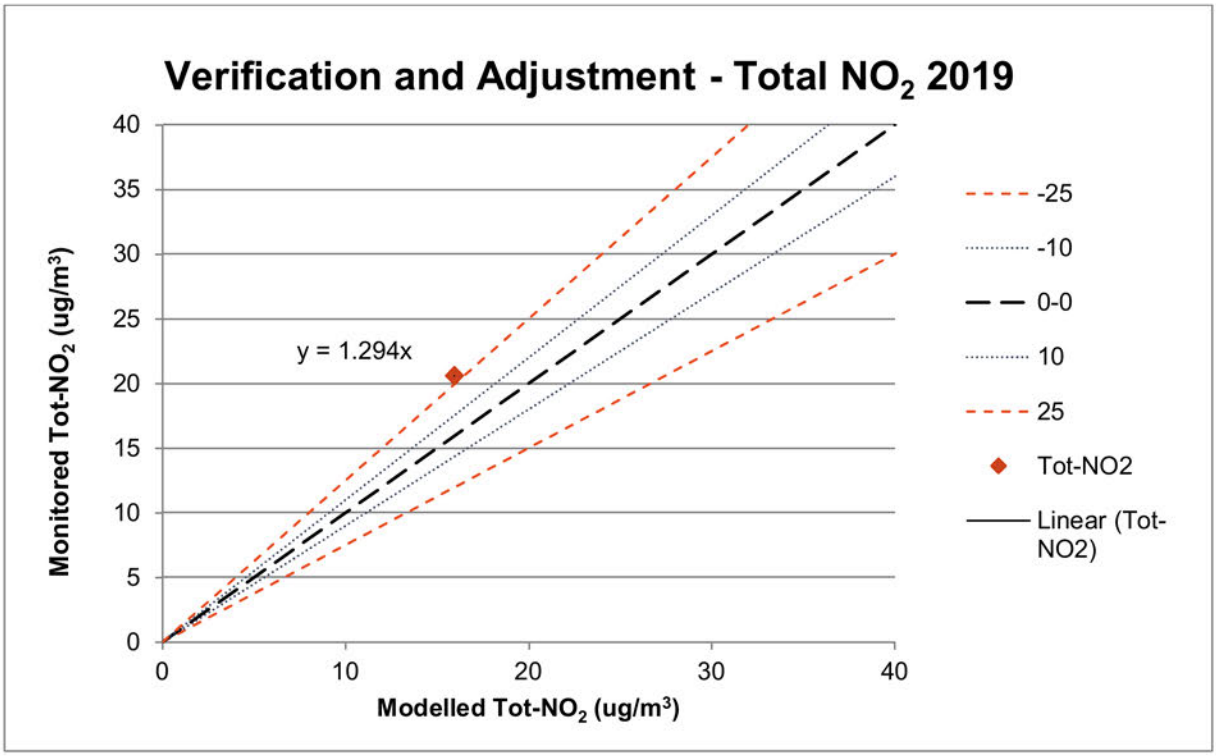
The site plans below shows the locations of the sample sensitive receptor locations used within the modelling:

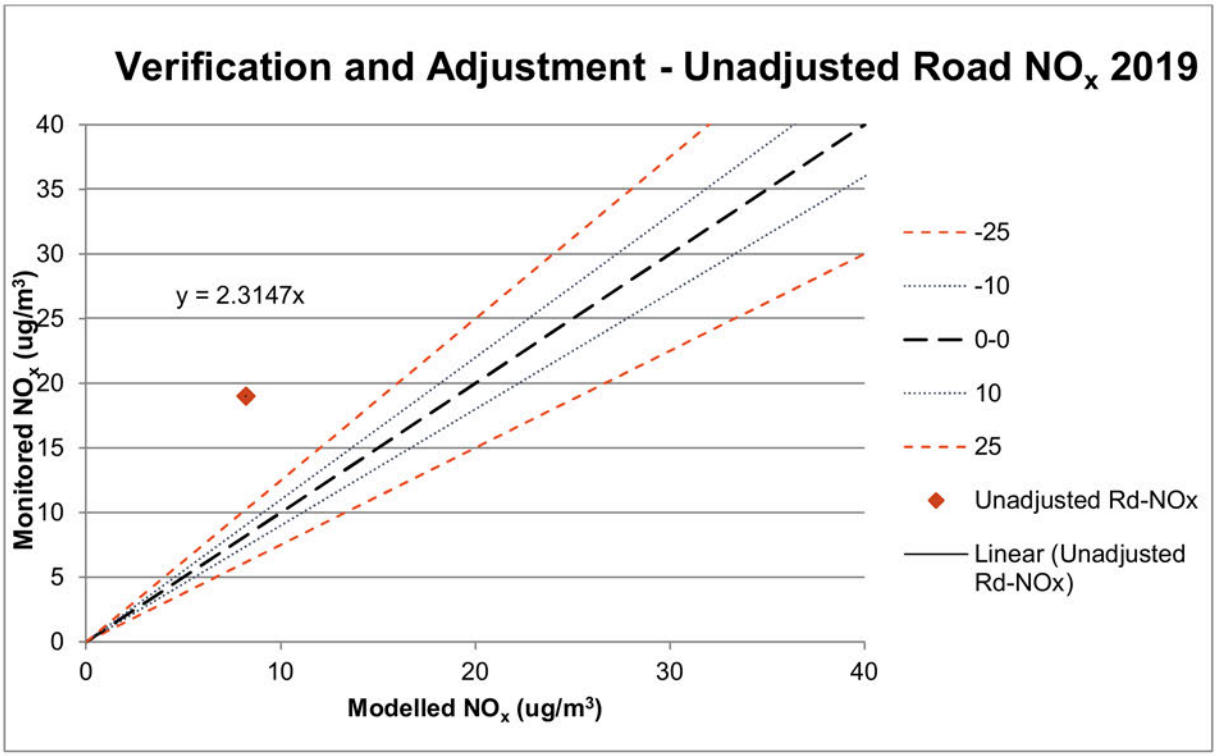


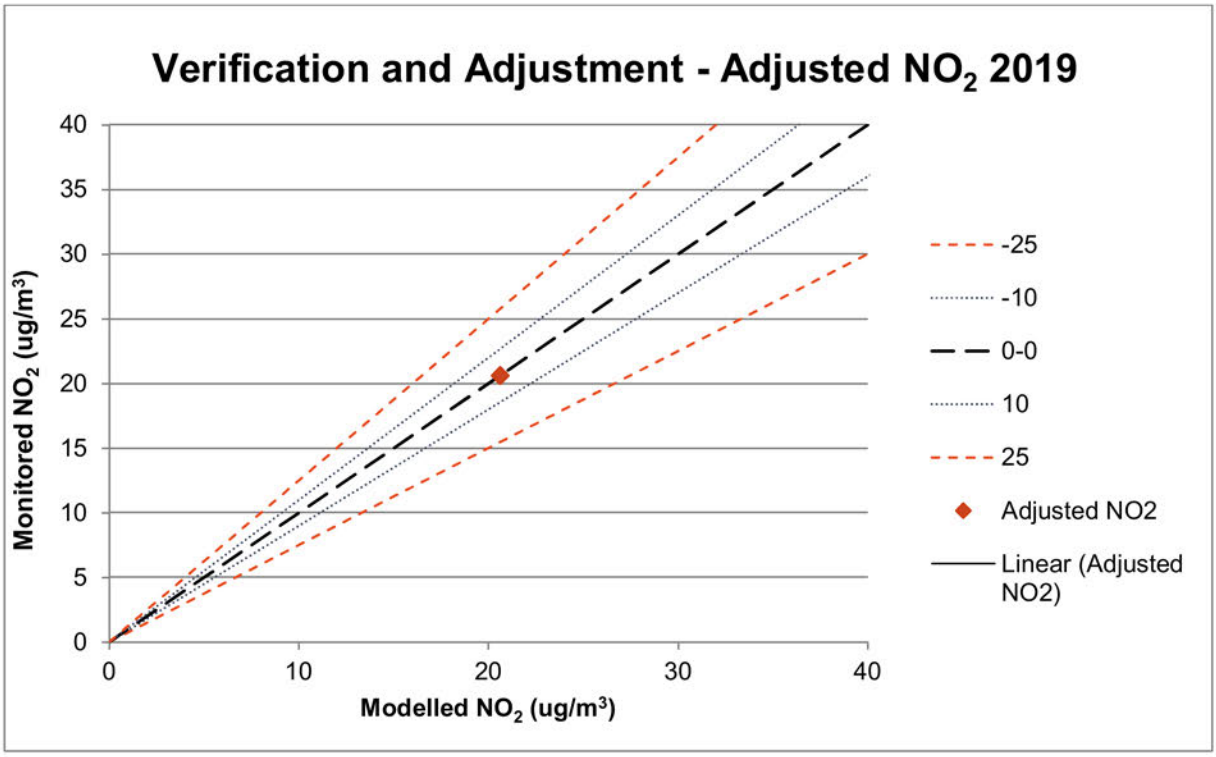
Verification and Adjustment

Verification of the air pollutant model was carried out in accordance with LAQM Technical Guidance TG22 using the data from the diffusion tube located in the vicinity of the site for 2019. The exercise required the modelling of the diffusion tube location for 2019 and comparing the modelled results with the monitoring results. The verification data is summarised below and shows that pollutant concentrations where underpredicted using the model; therefore, an adjustment factor of 1.9749 was applied to the model contribution of NO_x.

	Modelled Rds NO_x	Modelled Tot-NO_2	Monitored Tot-NO_2	%Diff Mod/Mon Tot-NO_2	Modelled Rd-NO_x	Monitored Rd-NO_x	NO_x ADJ Corr1	Adj Mod Rd-NO_x	Adj Mod Tot-NO_2	Monitored Tot-NO_2	%Diff Mod/Mon Adj Tot-NO_2
Langford Lane	8.20	15.92	20.6	-22.72	8.20	18.97	2.31	18.97	20.6	20.60	0.00000


Verification and Adjustment - Total NO2 2019
Monitored Tot-NO2 (ug/m3)
Modelled Tot-NO2 (ug/m3)
y = 1.294x
0
5
10
15
20
25
30
35
40
-25
-10
0-0
10
25
Tot-NO2
Linear (Tot-NO2)


Verification and Adjustment - Unadjusted Road NOx 2019
Monitored NOx (ug/m3)
Modelled NOx (ug/m3)
y = 2.3147x
0
5
10
15
20
25
30
35
40
-25
-10
0-0
10
25
Unadjusted Rd-NOx
Linear (Unadjusted Rd-NOx)


Verification and Adjustment - Adjusted NO2 2019
Monitored NO2 (ug/m3)
Modelled NO2 (ug/m3)
0
5
10
15
20
25
30
35
40
0
10
20
30
40
-25
-10
0-0
10
25
Adjusted NO2
Linear (Adjusted NO2)

Model Uncertainty

TG22 recommends the use of statistical parameters to assess uncertainty in the verified model. The table below describes the three parameters it recommends and the corresponding value for the verified model at this site.

Parameter	Value	Description
Correlation Coefficient	N/A	Used to measure the linear relationship between predicted an observed data. The ideal value (an absolute relationship) is 1.
Root Mean Square Coefficient	0.0	RMSE defines the average error/uncertainty of the model verification and is in the same units as the model outputs (µg/m^3). Values should be <10µg/m^3 or ideally <4µg/m^3 where concentrations are near the AQO. The ideal value is 0µg/m^3.
Fractional Bias	0.0	Identifies if the model shows a systematic tendency to over/under predict concentrations. The ideal value is 0 and range between +/- 2. Negative values suggest an over prediction whilst positive values suggest under prediction.

TG22 notes that the Correlation Coefficient is a less reliable indicator when validating with a small dataset; therefore, for sites such as this validated with smaller datasets, the Root Mean Square Coefficient is the main parameter used.

However, as the model has only been verified against one monitoring location, all statistical parameters are, by default, ideal. This hides a level of uncertainty in the model which is impossible to quantify given the lack of additional data points with which to verify the model.

The model should very accurately predict concentrations in the immediate vicinity of the monitoring location and given the proximity of the proposed development site to this location, the conditions at the proposed site are expected to be representative and the level of uncertainty is expected to be low.

The model has been robustly built with particular consideration given to the distances between roads and the monitoring/receptor locations.

PM_{10} Exceedances

The number of exceedances of 50 µg/m^3 as a 24-hour mean PM_{10} concentration has been calculated from the modelled total annual mean concentration following the relationship advised by Defra:

$A = -18.5 + 0.00145\ B^3 + 206/B$

where A is the number of exceedances of 50 µg/m^3 as a 24-hour mean PM_{10} concentration and B is the annual mean PM_{10} concentration.

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