10 AIR QUALITY

10.1 INTRODUCTION

10.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development on the environment with respect to air quality. It describes the assessment methodology; the baseline conditions at the Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce and offset any significant adverse effects; and the likely residual effects after these measures have been employed.

10.1.2 This chapter (and its associated figures and appendices) has been completed by M-EC and is intended to be read as part of the wider Environmental Statement (ES).

10.1.3 The Chapter is necessarily technical in nature, and therefore a glossary of air quality terminology is presented within **Appendix 10.1- Air Quality Terms.**

10.1.4 A full list of the associated appendices for the Air Quality chapter are listed below:

- Appendix 10.1- Air Quality Terms
- Appendix 10.2 – Traffic Data
- Appendix 10.3 – Receptor Location Plan
- Appendix 10.4 – Verification
- Appendix 10.5 - Modelled Pollutants
- Appendix 10.6 – Dust Risk Assessment Procedure
- Appendix 10.7 – Air Quality Control Measures for Low, Medium and High Risk Sites

10.2 ASSESSMENT APPROACH

Assessment of Significance

10.2.1 The level of significance of each likely effect is determined through a combination of the magnitude of impact and the sensitivity of the receptor.

10.2.2 Table 10.1 is based on the IAQM guidance and shows how magnitude and sensitivity are combined to significance of effect.

TABLE 10.1: SIGNIFICANCE MATRIX

Magnitude of Change	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor to Moderate	Negligible
Low	Moderate	Minor to Moderate	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Methodology

Construction

10.2.3 During construction, the main potential air quality impact is the generation of dust from on-site activities and increase in nitrogen dioxide (NO_2) and particulate matter (PM_{10}) concentrations from plant and road vehicles. The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the site.

10.2.4 Dust is a generic term covering particles of different compositions. The most common impacts relevant to this assessment are deposited dust from larger particles (disamenity dust) and increased ambient PM_{10} and $PM_{2.5}$ (smaller particles up to 10 microns and 2.5 microns in diameter), which can lead to adverse health effects.

10.2.5 There are no UK air quality standards which define the point at which the amount of deposited dust, or dust episode frequency, will lead to disamenity. Additionally, there is no specific guidance relating to the assessment of construction dust nuisance within Government documents. Consequently, assessment of dust and air quality impact from construction works upon nearby sensitive receptors has been undertaken with reference to procedures contained within the Institute of Air Quality Management's 'Guidance on the assessment of dust from demolition and constriction' 2016. Where potential impact are identified then site-specific mitigation measures propionate to the level of risk are proposed.

Operation

10.2.6 The assessment has been undertaken with reference to guidance set out within DEFRA's LAQM.TG(16), the IAQM and EPUK's' Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017 (v1.2)'.

10.2.7 The assessment has been undertaken using the atmospheric modelling package ADMS-Roads Extra Version 5.0, developed by Cambridge Environmental Research Consultants (CERC), to establish air pollutant concentrations at the proposed development.

10.2.8 ADMS-Roads has been used to disperse emissions of NO_x and PM_{10} from local road source and derive resultant road contributions to the concentrations of these pollutants at specific existing receptor locations. When added to the background concentration, this provided an indication of the results air quality at each receptor.

10.2.9 The ADMS-Roads model requires the input of background pollutant concentration data, hourly traffic flows, annual average vehicle speed, vehicle classification broken down into light and heavy duty vehicles (LDV/HDV), information on the type of road and meteorological data (model inputs are discussed in turn later)

10.2.10 Current Guidance has led to some changes in the way in which NO2 concentrations should be modelled. In accordance with LAQM.TG(16) the ADMS-Roads model has been used to derive road-based concentrations of NOx at specific receptor locations. To convert the modelled road-based NOx to annual NO_2 the 'NOx to NO_2' calculator (Version 8.1) (available from https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.htm#NOxNO2calc) has been applied to all modelled results.

Assessment Scenarios

10.2.11 The assessment seeks to establish air pollutant concentrations at identified receptor locations as shown in **Appendix 10.3- Receptor Location Plan.** The following scenarios have been included in the assessment:

- 2019 Verification (using 2022 traffic data)
- 2025 Scenario 1(2025 Sc1) (Future Base Year)
- 2025 Scenario 2 (2025 (Sc2) (Sc1 + Committed Developments)
- 2025 Scenario 3 (2025 Sc3) (Sc1 + Proposed Developments)
- 2025 Scenario 4 (2025 Sc4) (Sc2 + Proposed Developments)
- 2040 Scenario 1(2040 Sc1) (Future Base Year)
- 2040 Scenario 2 (2040 (Sc2) (Sc1 + Committed Developments)
- 2040 Scenario 3 (2040 Sc3) (Sc1 + Proposed Developments)
- 2040 Scenario 4 (2040 Sc4) (Sc2 + Proposed Developments)

10.2.12 The 2025 and 2040 future year scenarios have been modelled using 2025 and 2040 traffic flow data, together with 2022 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year due to fleet composition and technological changes. Using 2022 data therefore provides a conservative case for the 2025 and 2040 scenarios.

Local Road Network

10.2.13 Local road sources have been input into the model using the interface between ADMS-Roads and the ADMS-Roads' mapper, which enables roads to be input according to their geographic location using OS base mapping of the local area. Road/carriageway widths have been informed from OS base and aerial mapping.

Traffic Data & Emissions

10.2.14 To inform emissions from each road source included within the model, traffic flows for the local road network have been provided by the transport consultants, DTA Transport Planning Consultants.

10.2.15 Traffic flow data, %HGV and average speed assumptions for each road source and for each assessment scenario are provided in Appendix 10.2 for information.

10.2.16 Emissions rates have been derived from the traffic flow data using the latest Emission Factor Toolkit (EFT), Version 11.0, published by Defra and the devolved administrations in November 2021. The EFT is incorporated within ADMS-Roads.

Receptor Locations

10.2.17 For the purpose of an Air Quality Assessment, sensitive receptors can be thought of as areas within 200m of the roadside where people may be subject to change in air quality. Beyond 200m from the roadside, atmospheric dispersion (and chemistry) effect render emissions from road traffic negligible.

10.2.18 The assessment has considered the potential impact of emissions from development-related traffic upon NO_2 and PM_{10} concentrations at individual receptor locations.

10.2.19 Receptor locations identified for the assessment have been selected due to their proximity to road links. Receptor locations are shown on the Receptor Location Plan provided in Appendix 10.3.

Background Concentrations

10.2.20 Background concentrations of NO_2, NO_X, and PM_{10} have been obtained from the 2018-based maps available on the Defra website (https://uk-air.defra.gov.uk/data/laqm-background-homel) which provide estimated background pollutant concentrations for each 1kmx1km grid square in the UK. The projections in the 2018 LAQM background maps are based on assumptions which were current before the COVID-19 outbreak in the UK. In consequence, these maps do not reflect short or longer term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

10.2.21 As the background maps provide data for individual pollutant sectors, those sectors relating to road traffic have been removed to avoid double counting of road emissions. As only total background concentrations are provided for NO_2, the NO_2 map has been adjusted using the online NO_2 Adjustment for NO_x Sector Removal Tool (Version 8.0), https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxsector.

Verification

10.2.22 To determine how well the model is performing and to correct any over or under estimation of pollutant concentrations, LAQM.TG(16) recommends a verification process that should be applied. Verification involves a comparison between predicted and measured 'road traffic contributions' at one or more local sites and adjustment of the modelled concentrations if necessary.

10.2.23 Modelled pollutant concentrations have been verified against Cherwell District Council's (CDC)2019 NO_2 monitoring results, as shown in Table 10.2 below.

Table 10.2 CDC Monitoring Data Used in Verification

CDC Site ID	Type	Grid Reference	2019 Annual Mean NO_2 ($\mu g/m^3$)
Hennef Way	Diffusion Tube	446535, 241721	77.5
Stroud Close	Diffusion Tube	446334, 241676	23.5
North Bar	Diffusion Tube	445352, 240774	34.6
Horse Fair	Diffusion Tube	445351, 240578	38.6

Details of the verification process and verification factors are included in **Appendix 10.4- Verification**

Legislative and Policy Framework

Environment Act 1995

10.2.24 Part IV of the Environment Act 2021 (the Act) requires UK government and devolved administrations to produce a national air quality strategy containing standards, objectives and measures for ameliorating ambient air quality and to continually review these policies.

10.2.25 The Act also provides a legislative framework for a system of Local Air Quality Management (LAQM). This system is an integral part of delivering the UK's air quality obligations.

10.2.26 Under the LAQM regime, responsible authorities are required to carry out a regular review and assessment (R&A) of air quality in their area against defined national objectives, which have been prescribed in regulations for the purposes of LAQM. Where it is found these objectives are unlikely to be met, responsible authorities must designate Air Quality Management Areas (AQMA) and implement Air Quality Action Plans (AQAPs) to tackle the problems.

10.2.27 Provisions in the Act are largely enabling and allow responsible authorities the power to take forward local policies to suit their own needs. Local circumstance will also determine the content of the local air quality policy, designation of AQMAs and the content of AQAPs.

The National Air Quality Strategy

10.2.28 Due to the transboundary nature of air pollution, it is appropriate to have an overarching strategy with common aims covering all parts of the UK. For this reason, the National Air Quality Strategy (NAQS) is presented as a joint UK Government and devolved administrations document.

10.2.29 The most recent NAQS was published in July 2011 and established a framework for further air quality improvements across the UK. The NAQS sets out standards and objectives which have been established in order to measure the improvement of air quality.

10.2.30 The NAQS is a statement of policy intentions or policy targets and as such there is no legal requirement to meet these objectives except in so far as these mirror any equivalent legally binding 'limit values' in EU legislation.

10.2.31 With minimal exception, the objectives have been met across the UK for all pollutants except particulate matter (PM_{10}) and nitrogen dioxide (NO_2). These pollutants are directly related to road traffic pollution and many of the areas that breach the objectives (designated AQMAs) are located close to major road sources.

10.2.32 There are a wide range of terms and concepts used in international, national and local air quality policy and legislation and the NAQS discusses air quality in terms of Standards and Objectives.

10.2.33 Standards are the concentrations of pollutants in the atmosphere which can be broadly taken to achieve a certain level of environmental quality. The standards are based on assessment of the effects of each pollutant on human health including the effects on sensitive sub groups and ecosystems.

10.2.34 Objectives are policy targets often expressed as a maximum ambient concentration not to be exceeded either without exception or with a permitted number of exceedances within a given timescale.

National Planning Policy Framework

10.2.35 The latest National Planning Policy Framework (NPPF), issued by the Ministry of Housing, Communities and Local Government in 2021, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

10.2.36 Paragraph 174 of the NPPF advises that, planning policies and decisions should contribute to and enhance the natural and local environment by "...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, taking into account relevant information such as river basin management plans".

10.2.37 Further, paragraph 186 advises 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."

National Planning Policy Guidance

10.2.38 The National Planning Practice Guidance (NPPG) provides guiding principles on how planning can take account of new development on air quality.

10.2.39 Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns may arise if the development is likely to generate an air quality impact in the area, or the development is likely to adversely impact upon the implementation of air quality strategies and action plans, and/or lead to a breach of EU legislation.

10.2.40 When deciding whether air quality is relevant to a planning application, considerations include whether the development would:

- Significantly affect traffic in the immediate vicinity of the proposed development or further afield.
- Introduce new point sources of air pollution.
- Expose people to existing sources of air pollutants, for example building new homes.
- Give rise to potentially unacceptable impact (such as dust) during construction.
- Affect biodiversity.

Legislation

10.2.41 The NAQS Objectives are transposed into UK legislation by a series of Regulations including, for England, the Air Quality (England) Regulations 2000, the Air Quality (England) Amendment Regulations 2002, and the Air Quality (England) Amendment Regulations 2004.

10.2.42 In addition, the UK has a legislative requirement to meet air quality limit values for key pollutants defined at a European level by European Council Directives.

- Directive 2008/50/EC on ambient air quality and cleaner air for Europe; and
- Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and PAH.

10.2.43 These Directives are transposed into UK legislation by the Air Quality Standards Regulations 2010.

10.2.44 Table 10.3 summarises the national objectives and European 'limit value' obligations for PM_{10} and NO_2, the key transport-related pollutants of concern in the UK.

Table 10.3 Summary of Air Quality Objectives

Pollutant	Air quality Objectives Concentration (µg/m³)	Averaging Period
Nitrogen Dioxide (NO_2)	200	1-hour mean; not to be exceeded more than 18 times a year
	40	Annual mean
Particulate Matter with an aerodynamic diameter of less than 10 microns (PM_{10})	50	24-hour mean; not to be exceeded more than 35 times a year

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning for Air Quality 2017

10.2.45 Having established the likely change in pollutant concentrations arising from the 'do something' assessment scenarios, the potential local air quality impact of the proposed development has been described using the approach set out in the IAQM and EPUK 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017.

10.2.46 EPUK Guidance suggests a two-stage process to be followed in the assessment:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts.

10.2.47 The Air Quality methodology and significance criteria has been informed by specific published IAQM guidance which differs from that used in other assessments within the ES as detailed in Chapter 2: Methodology.

10.2.48 For air quality impacts on the surrounding area (i.e. existing receptors), a practical way of assigning a meaningful description to the degree of an impact is to express the magnitude of incremental change as a proportion of the relevant assessment level and then to examine this change in the context of the new total concentration and its relationship with the assessment criterion. The suggested IAQM/EPUK framework for describing the impacts on the basis set out above is shown in Table 10.4 below.

Table 10.4 Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration 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

*AQAL = Air Quality Assessment Level 40 µg/m3

10.2.49 The human-health impact descriptors in Table 10.4 apply at individual receptors. The EPUK & IAQM guidance states that the impact descriptors "are not, of themselves, a clear and un ambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it maybe 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.".

Local Air Quality Management

10.2.50 LAQM requires local authorities to undertake a regular Review and Assessment of air quality. Previous guidance (pre-2016) dictated three types of assessment a local authority could carry out.

10.2.51 The first was an Updating and Screening Assessment (USA), undertaken every three years. A USA considered the changes that had occurred in pollutant emissions and sources since the last round of Review and Assessment that may affect air quality. The USA was then followed by either a Detailed Assessment or a Progress Report.

10.2.52 A Detailed Assessment was required when the USA identifies a risk of exceeding an air quality objective at a location of relevant public exposure, and the objective is to determine whether it is necessary to declare an AQMA. If the USA does not identify any risk, then a Progress Report was prepared annually in the intervening years between USAs, to maintain continuity in the LAQM process.

10.2.53 The LAQM system changed in 2016, providing a more streamlined approach and a greater emphasis on action planning to bring forward improvements in air quality and to include local measures as part of EU reporting requirements. As part of the changes to LAQM, from 2016 Annual Status Reports (ASR) will replace all other reports, except Action Plans, to reduce the burden of the reporting cycle.

Scoping Criteria

10.2.54 As the development will generate additional vehicle movements on the local road network, the prediction and assessment of key road traffic-related pollutants NO_2 and PM_{10} at the proposed development and existing receptors will be required.

10.2.55 The proposed methodology is based on guidance set out within Defra's Local Air Quality Management (IAQM) Technical Guidance 2016 and EPUK's 'Land-Use Planning and Development Control: Planning for Air Quality 2017'.

10.2.56 Accordingly, the Air Quality Assessment considers the following potential effects:

- The impact on existing receptors within the AQMA (Hennef Way) and Banbury due to increases in traffic movements from the proposed development; and
- Consider impact of construction dust on existing nearby receptors within 350m of the site boundary.

Limitations to the Assessment

Construction

10.2.57 At this stage the full extent of the construction area and nature of work to be undertaken is not known. The assessment has assumed that construction phases will be undertaken directly at the site boundaries providing a worse case scenario, as it is likely the main construction areas will be located further into the site.

Operation

10.2.58 Due to the Covid-19 pandemic and lockdowns 2019 monitored concentrations had to be used for verification, however 2019 traffic data was not available for the required roads, thus 2022 data has been used for verification, which could have led to uncertainty within the verification process.

10.2.59 The DEFRA provided background concentrations and emissions are assumptions and are known to be optimistic in future years, so the assessment has been undertaken using both 2022 and future year background concentrations and emissions.

10.3 BASELINE CONDITIONS

Site Description and Context

10.3.1 The Sensitive Receptors outlined in the previous section are those appropriate for this assessment chapter.

10.3.2 The Site is adjacent to previously accepted similar usage developments.

10.3.3 The proposed development site is surrounded by the A361 to the west and the A422 to the south, with open fields to the north and east. The Site is located approximately 550m to the east of an existing Air Quality Management Air (AQMA) located along Hennef Way. The main sources of emissions will be from road traffic impacts on the surrounding network.

Baseline

10.3.4 Baseline air quality refers to existing concentration of relevant air pollutants that are already present, in this case PM_{10} and NO_2. PM_{10} is emitted from various sources, included road traffic, industry, domestic, agricultural and natural sources. NO_2 is a key road traffic-related pollutant.

10.3.5 The most recent CDC LAQM report is the 2020 Annual Statues Report (ASR). The council operates a network of NO_2 diffusion monitoring sites in their area. and there are four Air Quality Management Areas (AQMAs), declared for exceedances of the relevant annual mean objective for NO_2 concentrations. The nearest AQMA to the proposed development is Hennef Way.

10.3.6 The ASR includes 2015-2019 monitoring data from the NO_2 diffusion tube network . There has been a general decline in NO_2 concentrations, especially within he Hennef Way AQMA with concentrations reducing from 74.6 to 72.1 $\mu g/m^3$. However, this is still in exceedance of annual mean objective and indicative of likely exceedances of the 1-hour mean objective.

10.3.7 Predicted annual mean NO_2 and PM_{10} concentrations for the future baselines of 2025 and 2040 at identified receptors are shown in **Appendix 10.5 – Modelled Pollutants**.

10.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction Phase

10.4.1 Nuisance dust impacts are likely to be temporary and episodic (most noticeable during dry windy conditions) and would not persist beyond completion of construction.

10.4.2 Where dust raising activities are present for 12 months or more, dust complaints are considered to be very likely for those closest receptors to the site that lie between 10-30m from the site boundary. There are currently residential dwellings and commercial premises that fall within 20m of the site boundary, therefore, appropriate dust mitigation measures will be required to minimize dust emissions from the Site on these uses.

10.4.3 In addition, the qualitative dust assessment criteria in **Appendix 10.6- Dust Risk Assessment** indicates that existing premises adjacent to the Site will lie within the zone for potentially significant effects for soiling and ambient concentrations of PM_{10}.

10.4.4 Applying IAQM risk assessment procedures as set out in **Appendix 10.6- Dust Risk Assessment**, requires an assessment where there are sensitive receptors within 350m of the site boundary of the works and/or within 100m of the routes used by construction vehicles on the public highway up to 500m from the site entrance. The existing commercial and leisure facilities described above fall within the 350m zone, which triggers the initial screening criterion.

10.4.5 The stages considered by the dust risk assessment are presented in Table 10.5 The assessments and conclusions are based upon the classifications for a 'small' construction site for demolition and a 'large' site for 'earthworks' and 'construction', because the total working area for the various activities meets the relevant criteria. Distances from the main dust generating areas to the closest receptors are approximately 20m. There are no known ecological areas within 50m of the works.

10.4.6 Due to the overall size of the site, it is possible that the number of heavy duty vehicles visiting the site/day may exceed 50, and the distances of unpaved roads on the site are likely to be greater than 100m, therefore, the Site is classified as large in relation to the risk of dust being tracked out of the Site.

Table 10.5 Dust Risk Assessment

Step	Considerations	Demolition	Earthworks	Construction	Track-out
2a	Scale/nature of works	Small	Large	Large	Large
2b	Sensitivity of Area:				
	To dust soiling	Low	Low	Low	Low
	To PM_{10} health effects	Low	Low	Low	Low
	To ecological effects	Low	Low	Low	Low
2c	Risk of impacts	Negligible	Low Risk	Low Risk	Negligible

10.4.7 The assessments in Table 10.5 and the IAQM matrices have been used to define the site specific mitigation requirements for the construction phases and the overall risk assessment for dust from the construction works is summarised in Table 10.6.

Table 10.6 Summary Dust Risk Table to Define Site-Specific Mitigation

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	Negligible	Negligible	Negligible
Earthworks	Low Risk Site	Low Risk Site	Negligible

Construction	Low Risk Site	Low Risk Site	Negligible
Track-out	Low Risk Site	Low Risk Site	Negligible

10.4.8 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, the earthworks, construction and track-out phases would present a 'Low Risk', whilst the demolition phase would present a 'Negligible Risk'.

10.4.9 Similarly with regard to PM_{10} effects, the risk assessment indicates that on the basis of no mitigation being present, the earthworks, construction and track-out phases would present a '**Low Risk'** to health, whilst the demolition phase would again present a '**Negligible Risk'**.

Operation

Nitrogen Dioxide (NO_2)

10.4.10 The modelled baseline concentrations showed that there were exceedances of the annual mean objective level for NO_2 concentrations at one receptor location, along Hennef Way (Location of council monitor). There were no other exceedances at any other receptor location.

10.4.11 The modelled annual mean concentrations are presented in **Appendix 10.5-Modelled Pollutants.** With traffic generated by development, i.e. the do-something scenario in 2025 and 2040, does not lead to any new exceedances of the NO_2 objective level and the incremental change due to traffic generated by development is small ranging between 0.16 µg/m^3 and 2.12 µg/m^3 in 2025, and 0.16 µg/m^3 and 1.65 µg/m^3 in 2040, which would not have a significant impact upon current local air quality.

10.4.12 The impact significance in accordance with the EPUK/IAQM guidance is also presented in **Appendix 10.5-Modelled Pollutants** for each receptor, the concentrations have been assessed in accordance with the criteria set out in Table 10.4. With the exception of Hennef Way, the impact due to development is classed as '**Negligible**' for all receptors, none of the changes exceed x% of the AQAL

10.4.13 For the neighbouring AQMA, annual mean NO_2 concentrations for the do-nothing scenario, i.e. without proposed development, already exceed the objective level at a number of receptor locations. These comprise the council monitoring location along Hennef Way, with annual mean NO_2 concentrations of 61.71 µg/m^3 in 2025 and 66.92 µg/m^3 in 2040.

10.4.14 Where the ambient concentrations exceed 40 µg/m^3, the impact due to development is classified as '**Substantia**l', although this classification is due to the local condition within the AQMA, i.e. baseline concentrations already being above 40 µg/m^3, rather than any direct impact of development traffic. None of the changes exceed 4% of the AQAL.

10.4.15 With regard to the 1-hour mean objective LAQM.TG(16) advises that, 'previous research carried out on behalf of Defra and the Devolved Administrations identified a relationship between the annual mean and the 1-hour mean objective, such that exceedances of the latter were considered unlikely where the annual mean was below 60 µg/m^3'. As the results in **Appendix 10.5- Modelled Pollutants** indicate annual mean concentrations of NO^2 will remain well below 60 µg/m^3, at all but the Hennef Way monitoring location, it is considered that the NO_2 1-hour objective will not be exceeded at any sensitive receptor locations, for any development scenario.

10.4.16 It is noted that the 2025 and 2040 future year scenario has been modelled using 2025 and 2040 traffic flow data, together with 2022 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year, as new Euro standards and UK fleet turnover are assumed. Using 2022 data therefore provides a conservative case for the 2025 and 2040 scenarios. In reality, pollutant concentrations may be lower.

10.4.17 Further models runs have been undertaken using the 2025 and 2030[1] background and emissions data, and the results are presented in **Appendix 10.5- Modelled Pollutants**. In these scenarios, concentrations within the AQMA reduce significantly, with annual mean concentrations for the do-something situation being 47.65 µg/m^3 in 2025 and 35.43 µg/m^3 in 2040.

10.4.18 The impact due to development is still classed as '**Substantia**l' in 2025, however reduces to '**Sligh**t' for 2040. All other receptors are still classed as '**Negligible**'.

10.4.19 It should be noted that after 2030 there will be a ban on the sale of new full petrol and diesel vehicles.

Particulate Matter (PM_{10})

10.4.20 The modelled annual mean concentrations of PM_{10} are also presented in **Appendix 10.5 – Modelled Pollutants**. The results indicate that annual mean PM_{10} concentrations are predicted to remain below the objective for all receptor locations and for all scenarios. The incremental change due to traffic generated by development is small ranging between 0.02 µg/m^3 and 0.83 µg/m^3 in 2025 and 0.08 µg/m^3 and 0.84 µg/m^3 in 2040, which would not have a significant impact upon local air quality.

10.4.21 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as '**Negligible**' at all receptors. With the exception of Hennef Way which is classified as '**Slight**', and none of the changes exceed 2% of the AQAL.

10.5 MITIGATION AND ENHANCEMENT

Additional Mitigation

Construction

10.5.1 Construction Mitigation has been specified based on the assessment undertaken in section 10.4

10.5.2 The relevant mitigation presented in **Appendix 10.7- Air Quality Control Measures for Low, Medium and High Risk Sites** appropriate for 'Low Risk' site would be routinely included in the site's dust management plan for the relevant phase of construction. Key measures known to minimize dust emissions and represent good practice guidance are summarized in Table 10.7.

Table 10.7 Key Dust Mitigation Measures

Aspect	Mitigation Measures	How measure would be secured		
		By Design	By S.106	By Condition
Site Planning	No Bonfires			x

[1] Predicted background concentrations and emissions do not go further than 2030

	Plan site layout – machinery and dust causing activities should be located away from sensitive receptors			x
Construction Traffic	All vehicles should switch off engines when not in active use – no idling vehicles			x
	Wash or clean all vehicles effectively before leaving the site if close to sensitive receptors			x
	All loads entering and leaving site to be covered			x
	No site runoff of water or mud			x
	All non-road mobile machinery (NRMM) to use ultra low sulphur tax-exempt diesel (ULSD) where available			x
Demolition Works	Use water as dust suppressant			x
	Cutting equipment to use water as suppressant or suitable local exhaust ventilation systems			x
	Securely cover skips and minimize drop heights			x
Site Activities	To employ best practicable means in the control of dust			x
	Minimise dust generation activities			x
	Use water as dust suppressant where possible			x
	Keep stockpiles for the shortest possible times			x
Site Management	Appointment of a site agent whose contact details are provided to the LPA's Environmental Health Department and local residents prior to construction works starting.			x
	Agent to provide immediate response to any complaints by logging details of complaint and investigating source of complaint to establish			x

	whether routine mitigation measures have been properly implemented. If necessary, appropriate steps to be taken to mitigate against any adverse effects, and details of actions to be logged.			

Operational

10.5.3 To assist in offsetting incremental creep in pollutant emissions, a number of sustainable travel measures should be considered, these are as follows:

- Electric Vehicle charging - complaint with Policy EVI8 of the Oxfordshire Electric Vehicle Infrastructure Strategy, which was adopted in 2021. This requires 25% of all new car parking areas to provide EV chargers;
- Monitored Travel Plan;
- Measures to support public transport infrastructure and promote use; and
- Measures to support cycling and walking infrastructure.

10.6 CUMULATIVE AND IN-COMBINATION EFFECTS

10.6.1 The results in **Appendix 10.5- Modelled Pollutants** show that the proposed development and the committed developments will lead to increases in annual mean NO2 concentrations at some receptors.

10.6.2 Development-related traffic in 2025 and 2040 in Scenario 4 will result in a 'Substantial' change for receptors along Hennef Way and all other receptors will result in a 'Negligible' change for cumulative effects for NO_2 emissions.

10.6.3 With regard to PM_{10} Development-related in 2025 and 2040 in Scenario 4 will result in negligible cumulative effects at all receptors.

10.6.4 Construction impacts tend to be localised, i.e. worse effect arise for dwelling close to the construction activities. With suitable mitigation measures implemented for each development site, no significant cumulative effects are expected.

10.7 SUMMARY

Introduction

10.7.1 An Air Quality assessment has been carried out to assess the effects of both construction and operation of the Proposed Development on the Application Site and surrounding area.

Baseline Conditions

10.7.2 The most recent CDC ASR includes 2015-2019 monitoring data from the NO2 diffusion tube network. There has been a general decline in NO_2 concentrations, especially within he Hennef Way AQMA with concentrations reducing from 74.6 to 72.1 $\mu g/m^3$. However, this is still in exceedance of annual mean objective and indicative of likely exceedances of the 1-hour mean objective.

10.7.3 Predicted annual mean NO_2 and PM_{10} concentrations for the future baselines of 2025 and 2040 at identified receptors are shown in **Appendix 10.5 – Modelled Pollutants**.

Likely Significant Effects

10.7.4 There would be the potential for some temporary effects due to dust emissions during the initial construction phases, most particularly for those existing dwellings located close to the western boundary of the Application Site, but such effects would be mitigated through appropriate controls agreed with the LPA and be limited to minor adverse effects

10.7.5 As a worst-case assessment, the 2025 and 2040 future year has been modelled using the future year traffic flow data, and 2022 background and emissions data, to account for current uncertainty in future year predictions.

10.7.6 In this situation, annual mean NO_2 concentration are predicted to not lead to any new exceedances of the NO_2 objective level and the incremental change due to traffic generated by development is small ranging between 0.16 µg/m3 and 1.73 µg/m3 in 2025 and 0.17 µg/m3 and 1.59 µg/m3 in 2040, which would not have a significant impact upon current local air quality.

10.7.7 The impact significance in accordance with the EPUK/IAQM guidance is also presented in Appendix 10.5 for each receptor, the concentrations have been assessed in accordance with the criteria set out in Table 10.4. With the exception of Hennef Way, the impact due to development is classed as '**Negligible**' for all receptors, none of the changes exceed x% of the AQAL

10.7.8 For the neighbouring AQMA, annual mean NO_2 concentrations for the do-nothing scenario, i.e. without proposed development, already exceed the objective level at a number of receptor locations. These comprise the council monitoring location along Hennef Way, with annual mean NO_2 concentrations of 59.61 µg/m^3 in 2025 and 64.91 µg/m^3 in 2040.

10.7.9 Where the ambient concentrations exceed 40 µg/m^3, the impact due to development is classified as '**Substantia**l', although this classification is due to the local condition within the AQMA, i.e. baseline concentrations already being above 40 µg/m^3, rather than any direct impact of development traffic, none of the changes exceed 4% of the AQAL.

10.7.10 The modelled annual mean concentrations of PM_{10} are also presented in **Appendix 10.5- Modelled Pollutants**. The results indicate that annual mean PM_{10} concentrations are predicted to remain below the objective for all receptor locations and for all scenarios. The incremental change due to traffic generated by development is small ranging between 0.02 µg/m^3 and 0.67 µg/m^3 in 2025 and 0.03 µg/m^3 and 0.62 µg/m^3 in 2040, which would not have a significant impact upon local air quality.

10.7.11 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as '**Negligible**' at all receptors. With the exception of Hennef Way which is classified as '**Slight**', and none of the changes exceed 2% of the AQAL.

Mitigation and Enhancement

10.7.12 Mitigation measures have been proposed to minimise the potential effects associated with increased air pollutant concentrations.

Conclusion

10.7.13 The Proposed Development at the Application Site is acceptable with the mitigation measures identified which would ensure there would be no significant residual effects on air quality, which is considered acceptable in EIA terms

Table 10.8: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Existing Receptors	Dust and emissions from constructure activities	Temporary	Low	Low	Local	Minor	Provide best practise measures to controlling dust and emissions during construction phases	Negligible
Operation								
Hennef Way (AQMA)	Increase in vehicle movements and pollutant concentrations	Permanent	High	Low	Local	Moderate	Encourage sustainable travel measures through EV charging, travel plans, public transport, walking and cycling infrastructure	Minor
Existing Receptors	Increase in vehicle movements and pollutant concentrations	Permanent	Low	Low	Local	Minor	Encourage sustainable travel measures through EV charging, travel plans, public transport, walking and cycling infrastructure	Negligible

Notes:

* Enter either: Permanent or Temporary / Direct or Indirect

** Only enter a value where a sensitivity v magnitude effects has been used – otherwise 'Not Applicable'

*** Enter either: International, European, United Kingdom, Regional, County, Borough/District or Local

**** Enter either: Major / Moderate / Minor / Negligible AND state whether Beneficial or Adverse (unless negligible)