Homes England

The Housing and Regeneration Agency

West of Ifield, Crawley
Environmental Statement: Volume 1: Main Report

CHAPTER 7: AIR QUALITY
Version 1 - Planning submission

July 2025

7 AIR QUALITY

7.1 Introduction

7.1.1 This chapter of the ES reports on the identification and assessment of likely significant air quality effects to arise from the demolition and construction stage and operational stage of the Proposed Development.

7.1.2 The chapter describes the air quality legislation, policy and guidance framework; the methods used to assess the potential impacts and likely effects; the baseline conditions at the Site and within the study area; the likely air quality effects and the setting out of proposed mitigation measures, where feasible, in respect of any identified likely significant effects; proposed additional mitigation and any enhancement measures where applicable; the significance of residual effects; and inter-project cumulative effects.

7.1.3 The chapter is supported by the following technical appendices in ES Volume 2:

- ES Appendix 7.1: Legislation and Policy Framework;
- ES Appendix 7.2: Dust Risk Assessment Methodology;
- ES Appendix 7.3: Receptors, Traffic Data and Road Network;
- ES Appendix 7.4: Vehicle Emissions Assessment Methodology; and
- ES Appendix 7.5: Assessment of Effects.

7.2 Policy Context and Guidance

7.2.1 The assessment has been informed by the following legislation, policies and published guidance:

- International Legislation:
  - The European Air Quality Framework Directive and Daughter Directives[1,2] which set out a series of limit values for the protection of human health.
- National Legislation and Policy:
  - Part IV of the Environment Act 1995 (as amended)[3];
  - Clean Air Strategy (2019)[4];
  - National Planning Policy Framework (NPPF) (2024)[5];
  - Planning Practice Guidance (PPG) – Air Quality (as amended)[6]; and
  - Environment Act 2021[7].
- Regional Policy and Guidance:
  - Air quality and emissions mitigation guidance for Sussex (2021)[8]

[1] European Air Quality Directive 2004/107/EC. European Air Quality Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

[2] European Commission. Directive 2008/50/EC. Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

[3] Secretary of State, 1995. The Environment Act 1995 Part IV Air Quality. HMSO.

[4] Department for Environment, Food and Rural Affairs (Defra), 2019. Clean Air Strategy.

[5] Ministry of Housing, Communities and Local Government, 2024. National Planning Policy Framework. HMSO.

[6] Ministry of Housing, Communities and Local Government, 2019. Planning Practice Guidance.

[7] Secretary of State , 2021. Environment Act 2021, Chapter 30. HMSO.

[8] Sussex-Air, 2021. Air quality and emissions mitigation guidance for Sussex (2021).

  - West Sussex Breathing Better: Air Quality Plan[9]
- Local Policy:
  - Horsham District Planning Framework[10], in particular policies:
    2 - Strategic Development; and
    24 - Environmental Protection.
    - Rusper Neighbourhood Plan 2018-2031[11], specifically Policy RUS5, which sets out that any development proposal will need to accord with the HDPF policies which seek to minimise air quality impacts and encourage sustainable transport solutions, to avoid any adverse impact on the Ashdown Forest SAC.
- National guidance and industry standards:
  - Air Quality Strategy for England, Scotland, Wales, and Northern Ireland (2007)[12], which implements the European Union's Directives and sets out the air quality objectives (AQOs) and government policy on achieving these objectives;
  - Air Quality Standards (Amendment) Regulations (2016)[13] which amended the Standard Regulations 2010[14];
  - Defra's Local Air Quality Management Technical Guidance (2022) (LAQM.TG(22))[15], which provides advice as to where the national AQOs apply and support to local authorities in carrying out their duties under the Environment Act 1995[16] and subsequent regulations;
  - Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction v2.2 (2024)[17];
  - Environmental Protection UK/IAQM (EPUK/IAQM) Guidance on Land-Use Planning and Development Control: Planning for Air Quality (2017)[18]; and
  - IAQM Guide to the assessment of air quality impacts on designated nature conservation sites (2020)[19].

7.3 Consultation

7.3.1 A first formal Scoping Opinion was provided by Horsham District Council (HDC) in November 2020 (HDC ref: EIA/20/0004) however this opinion was based on the Applicant submitting an outline planning application for the Site. The Applicant then wished to submit a hybrid planning application and it was considered necessary to reassess the scope of the ES for the amended Proposed Development (in the 17th October 2023 EIA Scoping Opinion Request Report). Subsequently, a new scoping opinion was requested and received in November 2023 (HDC ref: EIA/23/0007). Since November 2023, the design of the Proposed Development has

[9] West Sussex County Council, 2020. Breathing Better: Air Quality Plan.

[10] Horsham District Council, 2015. Horsham District Planning Framework.

[11] Rusper Neighbourhood Plan 2018-2031

[12] Department of the Environment, Transport and the Regions (DETR) in Partnership with the Welsh Office, Scottish Office and Department of the Environment for Northern Ireland, 2007. The Air Quality Strategy for England, Scotland, Wales, Northern Ireland. London. HMSO.

[13] Secretary of State, 2016. The Air Quality Standards (Amendment) Regulations 2016. London. HMSO.

[14] Secretary of State, 2010. The Air Quality Standards Regulations 2010. London. HMSO.

[15] Department of the Environment, Food and Rural Affairs (Defra) in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland, 2022. Local Air Quality Management Technical Guidance, LAQM.TG(22). London. HMSO.

[16] Secretary of State, 1995. Environment Act 1995, Part IV.

[17] Stoaling et al, 2024. IAQM Guidance on the Assessment of Dust from Demolition and Construction v2.2, Institute of Air Quality Management. London.

[18] Moorcroft and Barrowcliffe. et al., 2017. Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

[19] Holman et al., 2020. A guide to the assessment of air quality impacts on designated nature conservation sites.

altered slightly with the addition of proposed groundwater abstraction wells, and therefore it was considered necessary to reassess the scope of the ES once again. An additional Scoping Opinion regarding the revised hybrid planning application was adopted on the 15th July 2024 and this is the basis of the assessment undertaken whilst also incorporating the requirements of the earlier scoping opinions where considered applicable.

7.3.2 Table 7.1 summarises the key EIA Scoping Opinion responses and separate consultations that have been undertaken with respect to the air quality assessment.

Table 7.1: Summary of Consultation

Consultee and Form/ Date of Consultation	Summary of Comments	Where in this Chapter Comments are addressed
HDC Environmental Protection Officer. Pre-scoping consultation received 30/05/2019	Construction dust assessment to be scoped into assessment.	A construction dust assessment has been undertaken and reported in the Assessment of Effects in this ES Chapter.
HDC Air Quality Monitoring Officer Scoping Opinion (ES Volume 2 Technical Appendix 2.2) received 30 November 2020	Damage cost calculations are required. Avoid duplication of mitigation secured through other regimes such as travel plans. Impact assessment to include relevant human receptors on major roads into Horsham. Mitigation to include measures to reduce emissions from domestic heating.	Damage cost assessment has been provided in a separate document as part of the hybrid planning application. The assessment has modelled receptors along the A264, A220 and other adjacent minor roads, with the results reported in ES Volume 2 Technical Appendix 7.5. No combustion-based centralised heat and energy plant are planned for the Proposed Development, therefore an assessment of combustion plant emissions has not been undertaken. Domestic heating provision would be electric and therefore there would be no emissions.
Crawley Borough Council (CBC) Comments received by HDC 27 October 2020 in response to Scoping Opinion Request	A conservative approach and precautionary study area are to be followed, particularly relevant in areas where there are existing residential receptors within 200m of the likely routes, or where temporary traffic management schemes will displace traffic onto local roads where increased emissions may have significant impact. Verification sites to be agreed with both CBC and HDC if predicted results from the model differ significantly from measured concentrations.	A conservative approach has been adopted by modelling roads within 250m of worst-case receptors where traffic is predicted to increase significantly and/or pollutant concentrations are already elevated such as in an Air Quality Management Area (AQMA). Completed development modelled scenario considers fully operational traffic flows as well as peak construction traffic. Modelled NO_2 at verification sites used are within 10% of measured concentrations indicating that predicted results do not differ significantly from measured concentrations and therefore did

Table 7.1: Summary of Consultation		
		not need to be agreed with CBC and HDC.
Gatwick Airport Limited Comments received by HDC 28th October 2020 in response to Scoping Opinion Request	The assessment should consider the impacts on the Horley Air Quality Management Area in Reigate and Banstead.	The impacts on the Horley Air Quality Management Area have been considered and reported in the Assessment of Effects in this ES Chapter.
HDC Scoping Opinion 27 November 2023	HDC has recently published the 2023 Annual Status Report (ASR). The developer should use the latest version of the report	Since the last consultation, HDC have published their 2024 ASR. The latest version has been used for the assessment. The updated ASR has been referenced throughout this ES chapter. The monitoring results from the ASR are presented in Section 7.9 Baseline Conditions.
	Monitoring should be considered in the Construction Mitigation Plan. As monitoring forms a vital part of construction, given the scale of the proposed development and the likely high number of road traffic movements generated during the construction phase, a monitoring plan should be included as a measure. Major applications should consider supplementing local authority monitoring with their own monitoring. This would help to increase model certainty and confidence in the results.	The Assessment of Effects (Section 7.10) has identified construction phase monitoring as a mitigation technique for construction dust impacts. The locations of the monitoring would be agreed as part of an approved Detailed Construction Environmental Management Plan (CEMP) which would be submitted at future reserved matter application (RMA) stages. Short term monitoring was considered but not undertaken. Short term monitoring for model verification would not increase model certainty and confidence due to inherent uncertainties in needing to annualise the data and the fact that it is not a long-term data set. The uncertainty in the conclusions of the modelling assessment as a result of changes to the model verification factor are discussed in Section 7.10.
	Modelling: The assessment should be transparent and thus, where reasonable, all input data used, assumptions made, and the methods applied should be detailed in the report (or appendices). Please provide full statistical analyses to give a full picture of the model performance.	Details of the model set up and assumptions and a statistical analysis of the model performance are provided in ES Volume 2 Technical Appendices 7.3, 7.4 and 7.5.
	Refer to *Air Quality and emissions mitigation guidance for Sussex (2021)*	This guidance has been referred to in undertaking damage cost

Table 7.1: Summary of Consultation		
		calculations which are presented in a separate document to the ES.
	There is the potential for Non-Road Mobile Machinery (NRMM) emissions to adversely affect local air quality. The Local Air Quality Management Technical Guidance (TG22 - 7.29) states that the following provides example measures of how NRMM emission from construction sites can be minimised: - Ensure all equipment complies with the appropriate NRMM standards; - Where feasible, ensure further abatement plant is installed on NRMM equipment, e.g. Diesel Particulate Filters (DPFs); - Ensure all vehicles switch off engines when stationary – no idling vehicles; - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible; and - Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph 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).	Appropriate NRMM emission control measures are presented in Section 7.10.
HDC Scoping Opinion 15 July 2024	The 2023 IAQM Assessment of dust from demolition and construction 2023 (V2.1) was withdrawn in light of a number of identified errors. The latest version of the guidance should be used.	The latest version of the guidance has been used in Section 7.10.
	Modelling: The assessment should be transparent and thus, where reasonable, all input data used, assumptions made, and the methods applied should be detailed in the report (or appendices). Please provide full statistical analyses to give a full picture of the model performance.	Details of the model set up and assumptions and a statistical analysis of the model performance are provided in ES Volume 2 Technical Appendices 7.3, 7.4 and 7.5.
	There is the potential for Non-Road Mobile Machinery (NRMM) emissions to adversely affect local air quality. The Local Air Quality Management Technical Guidance (TG22 - 7.29) states that the following provides example measures of how NRMM emission from construction sites can be minimised: - Ensure all equipment complies with the appropriate NRMM standards; - Where feasible, ensure further abatement plant is installed on NRMM equipment, e.g. Diesel Particulate Filters (DPFs);	Appropriate NRMM emission control measures are presented in Section 7.10.

Table 7.1: Summary of Consultation		
	- Ensure all vehicles switch off engines when stationary – no idling vehicles; - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where possible; and - Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph 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).	

7.4 Assessment Scope

7.4.1 The assessment has been undertaken in accordance with relevant air quality guidance and aligns with the methodology outlined in ES Volume 1 Chapter 2: EIA Process and ES Methodology, and more specifically as included in the 2024 Scoping Opinion Request Report (ES Volume 1 Technical Appendix 2.1). The assessment has taken account of all applicable legislation, national, regional and local policy, guidance and the ES Scoping Opinions. Professional judgement has been used to determine the overall significance of effect in accordance with IAQM Guidance.

Technical Scope

7.4.2 Potential emission sources have been identified and assessed in the context of existing air quality and the nature and location of receptors. The main air pollutants of concern regarding impacts on receptors are:

- Dust and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}), typically generated during demolition and construction activities; and
- Nitrogen dioxide (NO_2), PM_{10} and particulate matter with an aerodynamic diameter of less than 2.5 µm ($PM_{2.5}$), typically generated by road traffic.

7.4.3 The technical scope of the assessment has considered the following:

- Demolition and construction stage activity dust impacts and associated effects determined in accordance with the industry standard IAQM Guidance that is used for the assessment of construction dust impacts and effects, identifying appropriate construction mitigation measures based on the determined level of risk; and
- Construction and operational stage road traffic emissions and the associated air quality effects on off-Site human health and ecological receptors using ADMS Roads atmospheric dispersion model following the industry standard EPUK/IAQM Guidance that is used for the assessment of operational stage impacts and effects.

7.4.4 The following have been scoped out of this chapter in accordance with the 2024 Scoping Opinion Request Report (ES Volume 1 Technical Appendix 2.1) and 2024 Scoping Opinion (ES Volume 1 Technical Appendix 2.2):

- Odour - It is considered that the Proposed Development would not give rise to any significant odour impacts and associated odour effects at the construction stage as no significant contamination has been identified during the ground conditions assessment (Phase I Environmental Site Assessment (Ground Conditions) (WOI-HPA-DOC-GCA1-01)).

Any potential odour impacts generated through the movement of materials during the construction stage would be managed by a Detailed CEMP based on the measures detailed in the Outline CEMP (ES Volume 2 Appendix 5.1) and Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001). Odour impacts and associated effects from construction would be temporary and negligible and have therefore not been assessed in this chapter. There are also no significant odour emissions associated with the Proposed Development once it is operational, however, any localised sources of odour will be addressed at the RMA stages.

- Combustion Plant Emissions - No combustion-based centralised heat and energy plant are planned for the Proposed Development, therefore an assessment of combustion plant emissions was not required.

Spatial Scope

7.4.5 The study area for the construction stage dust assessment is defined as up to 250 m from the Site boundary, and 50 m from the routes used by construction vehicles on the public highway up to 500 m from the Site entrances, as per the IAQM Guidance.

7.4.6 For the assessment of construction and operation vehicle emissions of NO_2, PM_{10} and $PM_{2.5}$, the study area for human health receptors is defined as roads within 250 m of those roads which experience a significant increase in development traffic that may lead to adverse effects on local air quality, as per EPUK/IAQM Guidance. EPUK/IAQM Guidance provides the following indicative criteria for when an air quality assessment may be required:

- A change of Light Goods Vehicles (LGVs) flows of more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or more than 500 AADT elsewhere; and
- A change of Heavy Good Vehicles (HGVs) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.

7.4.7 The above criteria are for when an assessment is considered necessary which does not need to be a modelling assessment. The assessment has considered receptors where the above criteria are exceeded but has not modelled all such receptor locations. The assessment has modelled the locations where the impacts from the Proposed Development are likely to be highest and / or where the predicted concentrations are likely to be highest, i.e. the locations where effects are likely to be significant.

7.4.8 For designated nature conservation sites, the criteria for an assessment to be undertaken is a change in traffic of more than 1,000 vehicles per day or 200 heavy duty vehicles (HDVs) on a road within 200 m of a designated nature conservation site, alone or in combination with other developments[20]. In addition to the nitrogen-sensitive ecological receptors set out in the Environmental Statement scoping report (ES Volume 2 Technical Appendix 2.1) Special Protection Areas (SPAs), Special Areas of Conservation Areas (SAC), Sites of Special Scientific Interest (SSSI) and Ramsar sites, Local Nature Reserves (LNRs), Local Wildlife Site (LWs) and Ancient Woodlands (AW) have been considered.

7.4.9 Ecological receptors were modelled along a 200 m transect at 10 m intervals moving away from the closest point on the designated nature conservation site's boundary to the road network for each of the designated nature conservation site scoped-in to the assessment.

7.4.10 The study area is presented in Figure 7.1 below.

[20] Highways England. Design Manual for Roads and Bridges. LA105 Air quality. Revision 0

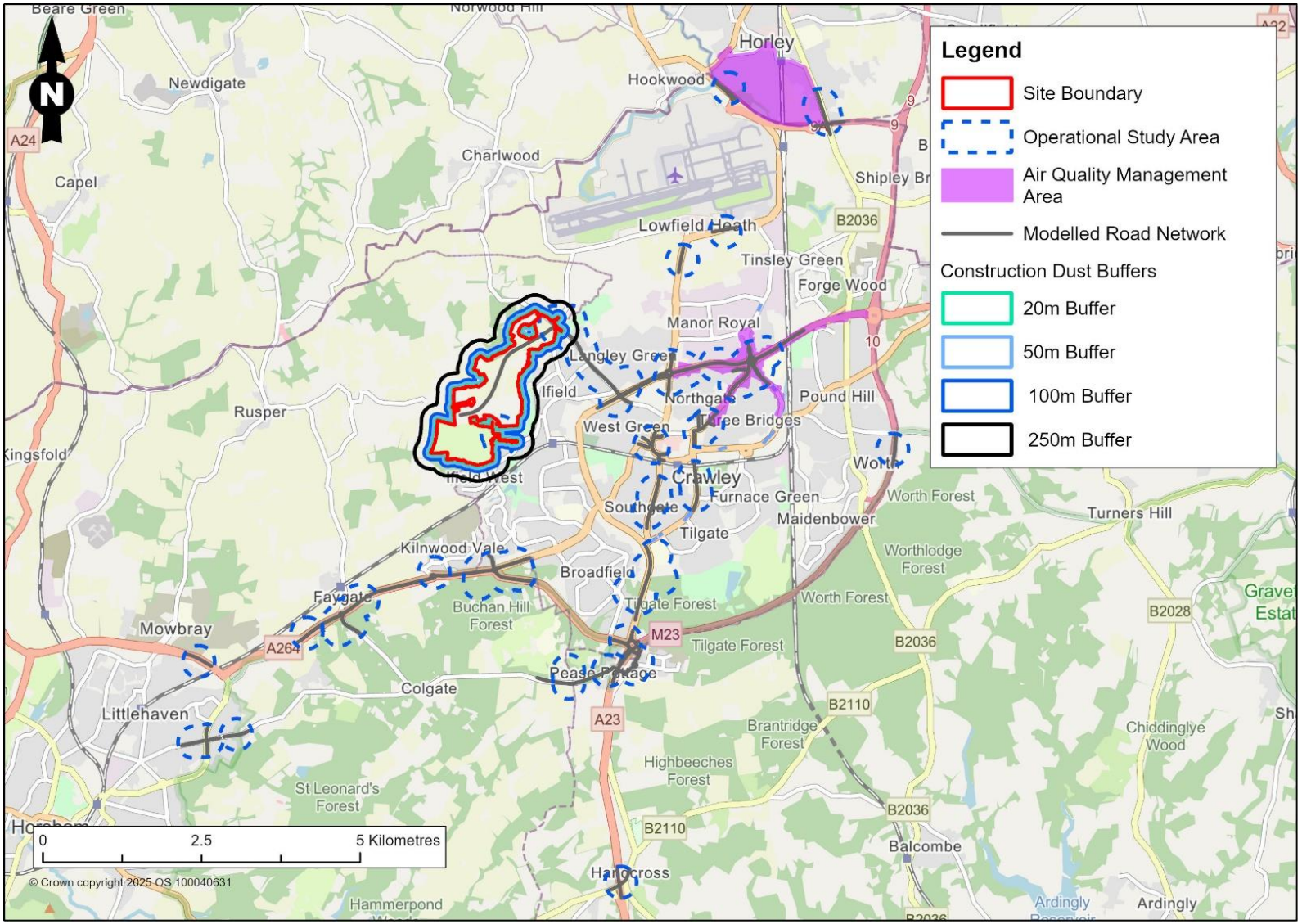

Figure 7.1: Study Area

Temporal Scope

7.4.11 The assessment has considered impacts arising during the demolition and construction stage which would be of expected to be temporary and short to long term (5-15 years) in nature and from the completed development stage which would be expected to be permanent and long-term in nature (i.e., more than 10 years).

7.4.12 The following scenarios have been assessed to determine the impact of Proposed Development traffic:

- Scenario 1: Baseline 2023 for model verification.
- Scenario 2: Do Minimum 2029, Future baseline without operational stage traffic when the Proposed Development is expected to first become operational.
- Scenario 3: Do Something 2029, First year of occupation of the new residential properties assessing operational stage traffic in that year.
- Scenario 4: Do Minimum 2041, Future baseline without completed development stage traffic when the Proposed Development is expected to be fully operational.
- Scenario 5: Do Something 2041, Fully completed development with 2041 completed development traffic.

7.4.13 Model verification has been undertaken for 2023 as this is the latest full year for which monitoring data are available.

7.4.14 Traffic data for the Proposed Development has been prepared and provided by Steer. The traffic data has used 2029 as the 'Opening Year' Scenario. To ensure a consist approach across the ES, this Chapter has used the same traffic data to inform the assessment for traffic flows and air quality. According to the Transport Assessment prepared by Steer (WOI-HPA-DOC-TA-01), the 2029 Scenario has been selected as being the 'Opening Year' as this constitutes the first year of the residential year build-out and represents the occupation of 25 residential dwellings and the operations from the 6FE secondary school. The Proposed Development will be fully completed by 2041.

7.4.15 As well as changes in the quantity of vehicles on the road network over time, vehicle emissions will change due to the introduction of newer vehicles into the vehicle fleet and the take up of electric vehicles. For Scenario 2 and Scenario 3, vehicle emission factors and background concentrations for 2026 have been used for the assessment in order to be conservative. For Scenario 4 and Scenario 5 vehicle emission factors for 2030 have been used, again to provide a conservative assessment of the impact of operational traffic.

7.4.16 Initial construction vehicle access to the Site will be via Rusper Road until the Crawley Western Mult-Modal Corridor (CWMMC) is sufficiently complete to act as a haul road at which point construction traffic will access the Site via Charlwood Road. The initial Site access via Rusper Road is predicted to consist of 28 two way vehicle movements per day and therefore will be below the EPUK/IAQM guidance threshold for an assessment of road traffic to be necessary. Construction traffic flows accessing the Site via Charlwood Road will increase as the Proposed Development is built out and are predicted to peak between 2033 and 2035. Completed development phase traffic will also build up as the Proposed Development is occupied with the maximum operational phase traffic occurring when the Proposed Development is complete. The predicted construction and operational traffic flow build-ups are shown in ES Volume 2 Technical Appendix 7.3..

7.4.17 The peak combination of construction and operational traffic flows is approximately 6,282 AADT in 2035 compared to the completed development flows of 16,218 in 2041 (i.e. approximately 2.6 times lower). The impacts of the completed development traffic flows have been assessed

using 2030 vehicle emission factors and background concentrations, which is an earlier year than when the peak combination of construction and operational traffic will occur. The impacts of the completed development traffic will therefore be higher than the impacts of the peak combination of construction and operational traffic as the assessed traffic volumes are much higher, and the vehicle emission factors and background concentrations are higher. The impacts of construction vehicle flows can therefore be conservatively represented and assessed by consideration of the results of the competed development assessment.

7.5 Baseline Characterisation Method

Desk Study

7.5.1 To establish baseline conditions in the study area, relevant data was reviewed and assessed. Data was obtained from the following sources:

- Air quality monitoring available in the most recent HDC[21] and CBC[22] annual air quality status reports so as to provide data for the surrounding study area which extends outside of the Site boundary;
- National pollution maps published by Defra[23] covering the UK on a 1x1 km grid; and
- Existing nitrogen deposition rates for designated nature conservation sites within the study area were obtained from the Air Pollution Information System website[24].

Field Study

7.5.2 No air quality monitoring was considered necessary for the assessment as good quality monitoring data is available with which to verify the dispersion model. The assessment has used dispersion modelling to assess the impacts of Proposed Development traffic as dispersion modelling is able to take account of predicted changes in the quantity of traffic and their emissions.

7.6 Assessment Method

Methodology

Demolition and Construction Stage

7.6.1 During the demolition and construction stage, the main potential impacts would be dust annoyance and locally elevated concentrations of PM_{10}. The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-Site activities. These impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source. Separation distance is also an important factor as significant dust annoyance is usually limited to within a few hundred metres of its source. This is due to the rapid decrease in concentrations with distance from the source due to dispersion.

7.6.2 Effects of construction dust emissions, unlike other airborne pollutants, cannot be accurately predicted and quantified because they are highly dependent on local weather conditions and mitigation measures implemented at source.

7.6.3 This assessment has followed IAQM Guidance on the assessment of the impacts of construction on air quality. The IAQM assessment methodology considers three separate dust

[21] Horsham District Council, 2024. 2024 Air Quality Annual Status Report.
[22] Crawley Borough Council, 2024. 2024 Air Quality Annual Status Report.
[23] Department for the Environment, Food and Rural Affairs (Defra), 2023. 2021 Based Background Maps for NOx, NO_2, PM_{10} and $PM_{2.5}$.
[24] Air Pollution Information System, 2025. Search by Location. Available at: https://www.apis.ac.uk/

effects and defines their significance according to the sensitivity of the surrounding area, as follows:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

7.6.4 IAQM Guidance recommends that the risk of dust emission magnitude is combined with the sensitivity of the study area to determine the risk of dust impacts from demolition and construction stage activities. The risk of dust arising in sufficient quantities to cause annoyance and/or health impacts is determined using four risk categories: high, medium, low, or negligible.

7.6.5 IAQM Guidance recommends that no assessment of the significance of effects is made without mitigation in place, as mitigation is assumed to be secured by legislation, planning conditions, or required by policy.

7.6.6 With appropriate mitigation in place, the residual effect of construction impacts on air quality is always assessed as **not significant**. The purpose of the construction dust assessment is therefore to identify the appropriate level of mitigation to employ.

7.6.7 Full details of the dust risk assessment methodology are provided in ES Volume 2 Technical Appendix 7.2.

Completed Development Stage

7.6.8 In carrying out the assessment of operational traffic emissions, the scenarios described in the Temporal Scope section have been assessed.

7.6.9 The completed development stage assessment followed EPUK/IAQM Guidance and considered the impact of the Proposed Development on air quality at nearby sensitive human and ecological receptor locations.

7.6.10 The changes to air quality due to traffic emissions have been predicted using the ADMS Roads[25] (Version 5.0.1.3) dispersion model. This model has been extensively validated against both field and laboratory data sets and against monitoring data in cities throughout the UK.

7.6.11 The model requires the user to provide various input data, including meteorological data, AADT flows, the proportion of HDVs (which includes HGVs and buses), road characteristics (including road width and street canyon height, where applicable), vehicle speed, etc. Full details of modelling input data and parameters are provided in ES Volume 2 Technical Appendix 7.3 and ES Volume 2 Technical Appendix 7.4.

7.6.12 The model was run using appropriate and representative meteorological data from Gatwick Airport meteorological station. Traffic emissions were calculated using the Emission Factor Toolkit (EFT) v13.1[26], which utilises nitrogen oxides (NO_x), PM_{10} and $PM_{2.5}$ emission factors from the European Environment Agency COPERT 5 emission tool. The traffic data was entered into the ADMS roads model, along with speed data to provide combined emission rates for each of the modelled road links.

7.6.13 The predicted concentrations of roadside NO_x were converted to roadside NO_2 using the LAQM conversion calculator available from the Defra air quality website[27].

[25] CERC, 2022. ADMS-Roads v5.0.1. Available from: https://www.cerc.co.uk/environmental-software/current-software-versions.html
[26] Department for Environment Food and Rural Affairs. Emissions Factors Toolkit. https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.htm.
[27] Department for Environment Food and Rural Affairs. NO_x to NO_2 calculator. https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc.

7.6.14 The accuracy of the modelled concentrations was verified by comparing the concentrations predicted for the 2023 existing baseline scenario with measured concentrations. Where the model is observed to be under-predicting, the modelled concentrations are adjusted following the methodology outlined in LAQM.TG(22). The sensitivity of the conclusions of the assessment to the model verification factor are discussed in Section 7.10.

Cumulative Stage

7.6.15 It is not possible to undertake a quantitative cumulative assessment for demolition and construction stage traffic emissions, as identifying and estimating the construction programmes / start dates and trip generation of cumulative schemes would lead to a number of potential inaccuracies as this information is not readily available. As such, a qualitative assessment was undertaken based on professional judgement and experience, as is standard practice in EIA. For the consideration of cumulative effects it is assumed that cumulative schemes would employ an appropriate level of mitigation.

7.6.16 The assessment of road traffic effects, Scenarios 2-5 (see para. 7.4.12), has been undertaken taking into account operational traffic. Traffic from the cumulative schemes has been included in the future baseline. Accordingly, a separate cumulative assessment has not been undertaken for the Proposed Development.

7.7 Assessment Criteria

7.7.1 The general criteria used to assess if an effect is significant or not, is set out in ES Volume 1 Chapter 2, and further details specific to air quality are provided herein. The air quality significance criteria have been informed by specific published IAQM Guidance, which differs slightly from that used in other assessments within the ES. The criteria used to assess the significance of impacts and effects, is set out in the following sub-sections. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.

Receptor Sensitivity/Value Criteria

Demolition and Construction Stage

7.7.2 The sensitivity of receptors has been classified as low, medium or high, in accordance with IAQM Guidance criteria set out in Table 7.2. The sensitivity of receptors is used to determine the risk of dust impacts which informs the level of mitigation required; the sensitivity of receptors does not determine the significance of the impacts or effects.

Table 7.2: Receptor Sensitivity Criteria

Sensitivity	Criteria
Low	• The enjoyment of amenity would not reasonably be expected by users; or • The property would not reasonably be expected to be diminished in appearance, aesthetics or value by dust soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; or • Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.
Medium	• The users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • The first occupants moving into residential dwellings on a large-phased housing development; or

Table 7.2: Receptor Sensitivity Criteria	
Sensitivity	**Criteria**
	• The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; or • People exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10}; or • Indicative examples include parks and places of work.
High	• The users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; or • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; or • Members of the public are exposed over a time period relevant to the air quality objective for PM_{10}; or • Indicative examples include dwellings, hospitals, schools, museums and other culturally important collections, medium- and long-term car parks and car showrooms.

Operational Stage

Human Health Air Quality Objectives

7.7.3 The National Air Quality Objectives (NAQOs) are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects on human health (including sensitive sub-groups) or ecosystems. In general, these are concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects. Objectives are policy targets often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

7.7.4 For some pollutants, there is both a long-term (e.g. annual mean) objective and a short-term (e.g. 1-hour mean) objective. These periods reflect the varying impacts on health of differing exposures to pollutants. Long-term objectives are generally lower than short-term objectives owing to the chronic health effects associated with exposure to low concentrations of pollutants for longer periods of time.

7.7.5 The NAQOs relevant for the assessment of road traffic impacts are presented in Table 7.3.

Table 7.3: Human Health National Air Quality Objectives		
Pollutant	**Time Period**	**Objective**
NO_2	Annual Mean	40 µg/m^3
	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
PM_{10}	Annual mean	40 µg/m^3
	24-hour mean	50 µg/m^3 not to be exceeded more than 35 times a year
$PM_{2.5}$	Annual Mean	20 µg/m^3

7.7.6 There are no degrees of sensitivity of receptors to poor air quality, rather, the assessment is based on whether or not members of the public are likely to be present for the proposed averaging period of the objective. This is dependent on the land use at a particular location, i.e. the annual mean objective is applicable at residential properties, schools and hospitals, whilst the short-term objectives apply to locations where members of the public are likely to be present for shorter periods such as commercial buildings, gardens, parks and shopping streets.

7.7.7 The assessment levels have been applied to external air where there is relevant exposure to the public over the associated averaging periods as detailed in Table 7.4 and specified by LAQM.TG(22). The assessment levels have not been applied in indoor workplace locations, to internal air or where people are unlikely to be regularly exposed.

Table 7.4: Locations Where Air Quality Objectives Apply

Averaging Period	Objectives Should Apply at	Objectives Should Generally Not Apply at
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties.
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Impact Magnitude Criteria

Demolition and Construction Stage

Dust Emissions

7.7.8 IAQM Guidance criteria was used to assess the potential risk of impacts to air quality from demolition and construction activities in the absence of mitigation, to identify the level of mitigation required.

7.7.9 The methodology combines the magnitude of dust emissions together with the sensitivity of the receptor to identify low, medium or high risk of dust impacts in the absence of mitigation for the four stages of construction: demolition, earthworks, construction and trackout. The impact magnitude criteria used is outlined in full in ES Volume 2 Technical Appendix 7.2.

Operational Stage

Human Health Impacts

7.7.10 The assessment of the operational impacts on local air quality has used the approach outlined in IAQM/EPUK Guidance which considers the change in air quality as a result of the Proposed Development on existing receptors. The guidance has produced a matrix which is used to determine the impacts at individual receptor locations, as shown in Table 7.5.

7.7.11 The guidance takes into account both the magnitude of change at each receptor and the resulting overall concentration. The absolute concentration at the receptor is also taken into consideration i.e. if the receptor is close to or above the NAQO, marginal changes in magnitude may be determined to be moderate; however if the receptor is less than 75 % of the UK NAQO level marginal changes in magnitude may be determined to be negligible.

Table 7.5: EPUK/IAQM Impact Descriptors for Individual High Sensitivity Receptors

Long-Term Average Concentration at Receptor with Development	Percentage (%) Change in Concentration Relative to Annual Mean NAQO			
	<1	2 - 5	6 - 10	>10
75 % or less of NAQO	Negligible	Negligible	Slight	Moderate
76-94 % of NAQO	Negligible	Slight	Moderate	Moderate
95-102 % of NAQO	Slight	Moderate	Moderate	Substantial
103-109 % of NAQO	Moderate	Moderate	Substantial	Substantial
110 % of more of NAQO	Moderate	Substantial	Substantial	Substantial

Notes:
Where concentrations increase the impact is described as adverse.
Where concentrations decrease the impact is described as beneficial.
% change rounded to nearest whole number, where the % change is less than 0.5 % the impact would be Negligible.

7.7.12 It is difficult to predict impacts on short-term objectives from traffic impacts as the air quality model (as set up for the assessment) does not provide reliable prediction of 1-hour mean NO_2 concentrations. However, research has concluded that exceedances of the 1-hour mean objective are unlikely to occur where annual mean concentrations do not exceed 60 µg/m^3 [28,29]. This relationship was used to assess whether exceedances of the hourly mean objective are likely. Similarly, where PM_{10} annual mean concentrations are below 32 µg/m^3, it is unlikely that the 24-hour mean PM_{10} objective would be exceeded.

Scale of Effect Criteria

Demolition and Construction Stage

7.7.13 The IAQM Guidance on assessing the impacts of construction dust recommends that no assessment of the significance of dust effects is made without mitigation in place, as mitigation is assumed to be secured by industry best practice, planning conditions, legal requirements or required by regulations.

7.7.14 With appropriate mitigation in place, the effect of construction stage dust emission impacts on air quality is always assessed as **not significant** in EIA terms. The purpose of the construction stage dust assessment (as part of this chapter) has therefore been to identify the appropriate level of mitigation to employ, with the resulting effect judged as **not significant**.

[28] Cook, 2008. Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the one-hour mean.
[29] Laxen and Marner, 2003, Analysis of the relationship between one-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites.

Operational Stage

Human Health Impacts

7.7.15 EPUK/IAQM Guidance states that the overall significance of the effect on air quality should be based on professional judgement, considering the predicted impacts at the modelled receptor locations and will need to take into account such factors as:

- The existing and future air quality in the absence of the Proposed 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.

7.7.16 At individual receptor locations, a moderate or substantial impact in accordance with Table 7.5 is judged to be significant, whereas a negligible or slight impact is not significant. The EPUK/IAQM Guidance states that the overall significance of the effect on local air quality is a binary judgement, i.e., the overall effect is either significant or it is not significant, and there are no degrees of significance scale of the overall effect.

7.7.17 In the case of air quality, completed development effects are expected to be long-term.

Ecological Impacts

7.7.18 Design Manual for Roads and Bridges (DMRB) guidance[30] has been used to determine the significance of effect of vehicle emissions associated the Proposed Development, based on the critical load for nitrogen deposition for the habitat (the quantity of pollutant deposited from air to the ground).

7.7.19 Where the critical load is exceeded, the first test is whether the increase in nitrogen deposition is more than 1% of the critical load. If the increase is less than 1% of the critical load, then the increase is not significant.

7.7.20 Where the critical load for nitrogen deposition is exceeded and the development contribution is more than 1% of the critical load, an absolute change of 0.4kgN/ha/year is used as a threshold below which significant effects of road traffic emissions are unlikely. This threshold has been applied for the assessment of effects of road traffic emissions from the Proposed Development.

Nature of Effect Criteria

7.7.21 The nature of the effect has been described as either adverse, neutral or beneficial as follows:

- Beneficial – An advantageous effect to a receptor;
- Neutral – An effect that on balance, is neither beneficial nor adverse to a receptor or equally beneficial and adverse; or
- Adverse – A detrimental effect to a receptor.

7.8 Assumptions and Limitations

7.8.1 There are many components that contribute to the uncertainty in modelled pollutant concentrations. Although the models have been extensively validated against field data sets and their use has gained wide acceptance throughout the UK, no computer-based model is able to totally replicate actual conditions as it is required to simplify real-world conditions into a series of algorithms. The models used in this assessment is also dependent upon several sources of data which will have inherent uncertainties associated with them. The road traffic

[30] Highways England. Design Manual for Roads and Bridges LA105 Air Quality. Revision 0

model uncertainty has been estimated using the root mean square error and is presented in ES Volume 2, Technical Appendix 7.4.

7.8.2 The assessment has relied on data provided by HDC, CBC and Defra to characterise baseline conditions in the vicinity of the Site. It has been assumed that the data has been reported correctly.

7.8.3 Data for ecological sites have been taken from the APIS website[24]. APIS does not provide predictions of future year deposition, therefore the future deposition rates are likely to be worse case as they do not take account of predicted reductions in future UK NO_x emissions.

7.8.4 Traffic data has been provided by the transport consultants, Steer. 2023 data has been used as a baseline as it represents the latest full year of local authority monitoring data that was available at the time that the assessment was undertaken.

7.8.5 It is difficult to predict impacts on short-term objectives from traffic impacts as the air quality model (as set up for the assessment) does not provide reliable prediction of 1-hour mean NO_2 concentrations. The relationship between annual mean concentrations and short-term concentrations was used to assess whether exceedances of the hourly mean objective for NO_2 and PM_{10} are likely.

7.8.6 Traffic emissions were calculated using the latest EFT v13.1, which utilises emission factors from the European Environment Agency COPERT 5.8 emission tool. The assessment has assumed air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient models.

7.8.7 Air Quality Consultants (AQC) has published three studies that support the overall assumption that air quality is anticipated to improve in the future and that the tools and methodology used in this assessment are conservative. For example, in 2022, AQC published a study looking at trends in nitrogen oxides in the UK between 2016 and 2022[31]. The study concluded that there is an overall decreasing trend in NO_x and NO_2 concentrations from 2016, with concentrations remaining well below pre-pandemic levels in 2022, likely due to longer-term changes in emissions and vehicle fleet turnover.

7.8.8 Another study by AQC showed the EFT is most likely to over-predict drive-cycle average NO_x emissions from Euro 6 diesel cars in the future[32].

7.9 Baseline Conditions

Existing Baseline

Local Air Quality Management

7.9.1 HDC has investigated air quality within their jurisdiction as part of responsibilities under the LAQM regime. HDC have declared two air quality management areas (AQMA) due to exceedances of the annual mean NO_2 NAQO.

7.9.2 The Site is not located in an AQMA; the closest AQMA to the Site is located in Crawley Borough (Hazelwick Air Quality Management Area) which is located approximately 1.8 km east of the Site.

7.9.3 The Horley AQMA is approximately 5km north-east of the Site.

[31] Air Quality Consultants, 2022. Trends in UK NOx and NO_2 Concentrations through the COVID-19 Pandemic. Available at: https://www.aqconsultants.co.uk/resources (accessed 12/05/2023).

[32] Air Quality Consultants, 2020. Performance of Defra's Emission Factor Toolkit 2013-2019. Available at: https://www.aqconsultants.co.uk/resources (accessed 12/05/2023).

Air Quality Monitoring

Nitrogen Dioxide

7.9.4 HDC and CBC operate both continuous automatic monitoring and passive diffusion tube monitoring of NO_2 at a number of locations within their jurisdiction. A summary of the closest and most representative monitoring locations in the vicinity of the Site is presented in Table 7.6. All selected monitoring sites are situated in CBC as these are closest to the Site and therefore are the most representative of conditions within the Site (the closest HDC monitoring is approximately 6 km to the south-west of the Site) The locations of the monitoring points are shown in Figure 7.2.

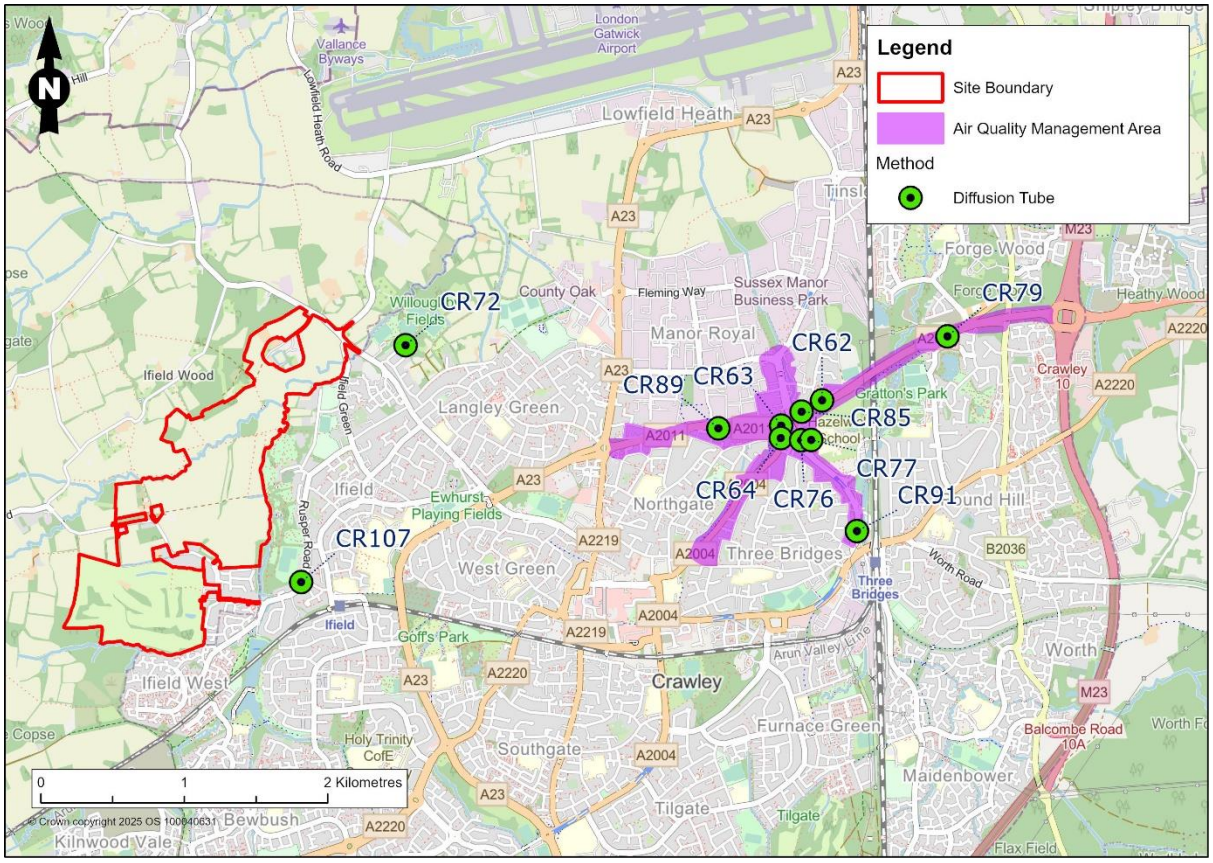

Figure 7.2: Monitoring Locations and AQMAs

Table 7.6: Summary of Measured NO_2 Monitoring Data

Site ID	Site Location	Site Type	Annual Mean NO_2 µg/m³					
			2018	2019	2020	2021	2022	2023
Diffusion Tube								
CR62*	Tinsley Close (10)	Urban Background	38.0	**40.0**	34.0	34.0	35.7	29.0
CR63*	Woodfield Lodge (Roundabout)	Roadside	**52.0**	**49.0**	**42.0**	**42.2**	**45.1**	35.0
CR64*	Woodfield Lodge (Northgate Ave)	Roadside	**40.0**	38.0	30.0	30.6	30.7	26.0
CR72	Burlands	Urban Background	15.0	13.0	11.0	10.9	11.6	9.0
CR76*	Hazelwick Court	Roadside	35.0	35.0	28.0	30.7	29.3	24.0
CR77*	Hazelwick Ave (Bays)	Roadside	35.0	35.0	28.0	30.9	30.9	25.0
CR79*	St Hildas Close	Urban Background	25.0	25.0	20.0	21.2	20.8	17.0
CR85*	Tinsley Lane Flats	Urban Background	30.0	31.0	30.0	28.0	29.7	24.0
CR89*	Dalewood Garden	Urban Background	22.0	22.0	17.0	19.0	17.5	14.0
CR91*	Ocean House, Hazelwick Avenue	Roadside	34.0	32.0	28.0	29.7	28.9	24.0
CR107	Rusper Road	Urban Background	NA	NA	14.0	16.3	15.3	12.0

Notes:
Exceedances of the annual mean NO_2 NAQO are shown in **bold**
* Monitoring site within AQMA

7.9.5 The most recent 2024 Annual Status Report (ASR) available at the time of this assessment showed that the NO_2 annual mean concentrations generally decreased from 2018-2023 in Crawley. There were no exceedances of the annual mean air quality objective for nitrogen dioxide in 2023 and NO_2 concentrations remained below pre-COVID levels for a further year.

7.9.6 Measured annual mean NO_2 concentrations presented in Table 7.6 are typically highest at monitoring locations located within the AQMA. No exceedances of the annual mean NO_2 NAQO were recorded in 2023.

7.9.7 The closest monitoring location to the Site is located within CBC's jurisdiction (CR107), located approximately 300m east of the Proposed Development. Annual mean NO_2 concentrations recorded at this station are well below the annual mean objective of 40 µg/m^3.

7.9.8 Furthermore, the monitoring data outlined in Table 7.6 indicates the 1-hour mean NO_2 NAQO is unlikely to have been exceeded in Crawley as annual mean NO_2 concentrations were below 60 µg/m^3 from 2018-2023.

Particulate Matter

7.9.9 HDC undertake continuous monitoring of PM_{10} at two automatic monitoring stations, the closest of which (Horsham Park Way) is approximately 8.5 km south-west of the Site. Given the distance to the Site, this is not representative of the conditions within the Site.

7.9.10 CBC undertake continuous monitoring of PM_{10} at one automatic monitoring station, CA2 Gatwick East) approximately 5.1 km north-east of the Site. The available PM monitoring data shows that PM_{10} concentrations met all NAQOs between 2019-2023[21].

Defra Predicted Background Maps

7.9.11 Background concentrations are those levels that would be observed away from specific air pollution sources such as roads and industry. Defra provides modelled predictions of background concentrations of air pollutants over the whole of the UK with a grid resolution of 1x1 km.

Table 7.7 details the NO_2, PM_{10} and $PM_{2.5}$ background levels across the Site in 2023. All of the predicted background concentrations are well below the NAQOs.

Table 7.7: DEFRA 2023 Annual Mean Background Concentrations (µg/m^3)

Grid Reference (x, y)	NO_2	PM_{10}	$PM_{2.5}$
524500, 138500	9.3	10.0	6.1
525500, 138500	10.6	10.5	6.3
524500, 137500	9.4	10.8	6.3
523500, 136500	8.7	10.4	6.3
523500, 137500	8.6	10.4	6.1
Objective	**40**	**40**	**20**

Designated Nature Conservation Sites Deposition Rates

7.9.12 The Defra background annual mean concentrations of NO_x for the base year obtained for designated nature conservation sites considered in this assessment are presented in Table 7.8.

7.9.13 The three-year average (2020-2022) nitrogen deposition rates for each of the considered ecological sites sensitive to nitrogen deposition are presented in Table 7.8.

Table 7.8: Baseline NO_x and Nitrogen / Acid Deposition Rates			
Site Name	**Habitats**	**2023 Defra NO_x Background**	**Nitrogen Deposition (kgN/ha/yr)**
Faygate Forest, Ancient Woodland	Broadleaved mixed and yew woodland	11.6	**23.47**
Critical Load			**10-20**
Burchan Hill, Ancient Woodland	Broadleaved mixed and yew woodland	12.5	**23.84**
Critical Load			**10-20**
Punch Copse, Ancient Woodland	Broadleaved mixed and yew woodland	25.2	**24.10**
Critical Load			**10-20**
Rookfield Hill, Ancient Woodland	Broadleaved mixed and yew woodland	11.6	**23.47**
Critical Load			**10-20**
Tillgate Forest, Ancient Woodland	Broadleaved mixed and yew woodland	14.7	**24.06**
Critical Load			**10-20**
Broadfield Forest, LNR	Broadleaved mixed and yew woodland	14.7	**24.06**
Critical Load			**10-20**
Willoughby Fields, LNR	Broadleaved mixed and yew woodland	14.7	**24.01**
Critical Load			**10-20**
Willoughby Fields, LNR	Neutral Grassland*	14.7	13.31
Critical Load			**20-30**
Buchan Country Park, LWS	Broadleaved mixed and yew woodland	12.9	**23.84**
Critical Load			**10-20**
Ewhurst Wood, LWS	Broadleaved mixed and yew woodland	16.9	**24.06**
Critical Load			**10-20**
Buchan Hill Ponds, SSSI	Broadleaved mixed and yew woodland	12.9	**23.8**
Critical Load			**10-20**
Horsham Corner, AW	Broadleaved mixed and yew woodland	12.4	**24.1**
Critical Load			**10-20**
Exceedances Highlighted in **bold**. * soil type identified to determine type of grassland[33].			

7.9.14 The nitrogen deposition critical load is exceeded at each designated nature conservation site with the exception of Willboughby Fields LNR grasslands.

Summary of Baseline Conditions

7.9.15 Monitoring and background data indicate that NO_2 concentrations would be likely well below the long- and short-term human health NAQOs in the study area.

7.9.16 As concentrations fall-off rapidly moving away from an emissions source, such as a main road, some variation in NO_2, PM_{10} and $PM_{2.5}$ concentrations across the Site is expected. Concentrations at the Site are likely to reduce gradually to levels similar to background concentrations as distance from the road network increases.

[33] British Geological Society, 2023. UK Soil Observatory (UKSO). Available at: https://www.bgs.ac.uk/map-viewers/uk-soil-observatory-ukso/

Future Baseline

7.9.17 Air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient models. National policies such as the intention to ban new combustion engine private vehicle sales by 2035[34] will hasten and enforce this process.

7.9.18 Table 7.9 presents the NO_2, PM_{10} and $PM_{2.5}$ background levels at the Site in 2026 and 2030. 2029 has been used as the opening year, as informed by the traffic data and Transport Assessment (WOI-HPA-DOC-TA-01) and the Proposed Development is expected to be fully operational by 2041. 2026 background concentrations provide a conservative prediction of future baseline conditions at the Site for the opening year; 2030 background concentrations provide a conservative prediction of future baseline conditions for the completed development as background concentrations are projected to decrease over time.

Table 7.9: Defra Annual Mean Background Concentrations (µg/m^3)

Grid Reference (x, y)	NO_2	PM_{10}	$PM_{2.5}$
2026			
524500, 138500	8.9	9.8	6.1
525500, 138500	10.2	10.2	6.3
524500, 137500	8.9	10.6	6.3
523500, 136500	8.2	10.1	6.3
523500, 137500	8.2	10.2	6.1
2030			
524500, 138500	8.0	9.4	5.8
525500, 138500	9.2	9.9	6.1
524500, 137500	7.9	10.3	6.0
523500, 136500	7.3	9.8	6.0
523500, 137500	7.3	9.9	5.9
Objective	**40**	**40**	**20**

7.9.19 Table 7.9 indicates background concentrations will be well below the relevant NAQOs across the Site in 2026 and 2030 and by comparison with the data in Table 7.7 confirms a predicted decrease in background concentrations between 2023 and 2030.

7.9.20 The ADMS-Roads model has been run to predict baseline NO_2, PM_{10} and $PM_{2.5}$ concentrations for 2026 and 2041 at existing receptor locations identified in ES Volume 2 Technical Appendix 7.3, the results of which are outlined in ES Volume 2 Technical Appendix 7.5.

Sensitive Receptors

7.9.21 The Site is located in an area with numerous sensitive receptors. Sensitive receptors were chosen to reflect places where members of the public or ecological receptors would receive relevant exposure to long- and short-term pollutant concentrations from road traffic.

[34] Department of Energy Security and Net Zero, 2020, The Ten Point Plan for a Green Industrial Revolution. Available at: https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution (accessed 15/05/2023).

7.9.22 The human health and ecological receptors identified as sensitive to the Proposed Development, and which have been 'scoped-in' to the assessment are summarised ES Volume 2 Technical Appendix 7.3 and shown in Figure 7.3 and Figure 7.4. Existing human health receptors were modelled at 1.5 m representing exposure at ground floor level. Ecological receptors were modelled at 0 m to represent ground level. When identifying sensitive receptors to road traffic emissions, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested, and where there is a combined effect of several road links.

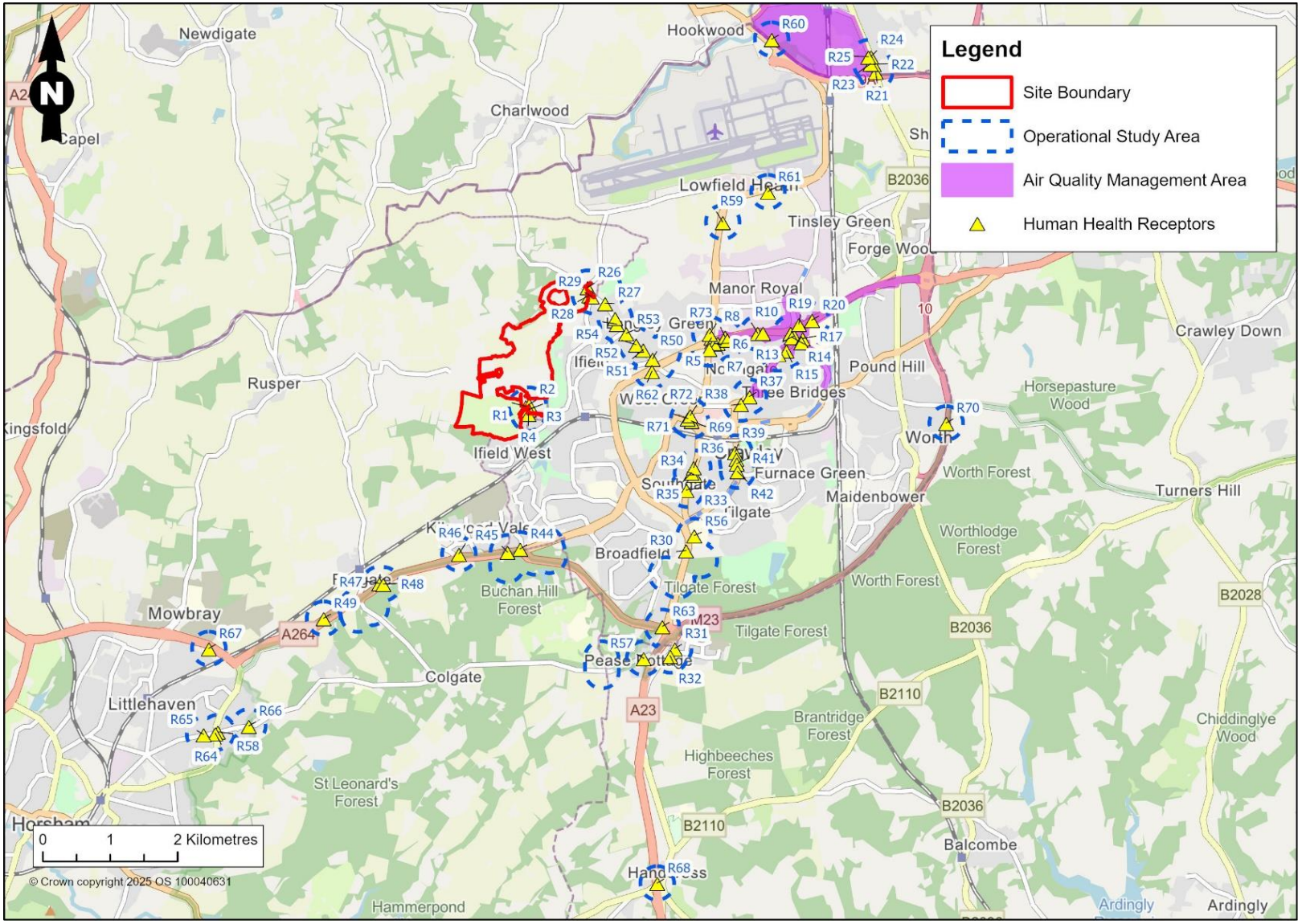

Figure 7.3: Human Health Receptor Locations

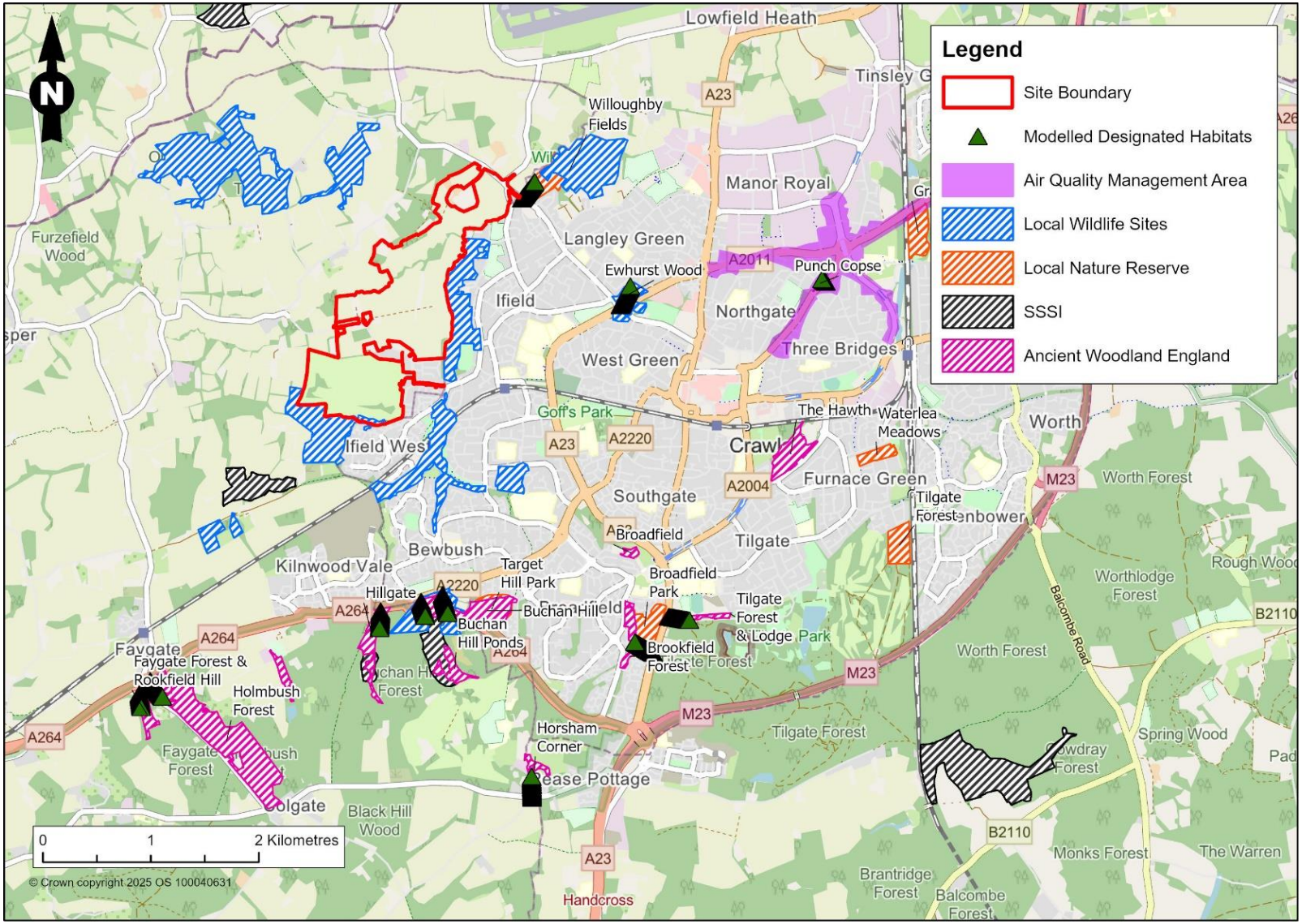

Figure 7.4: Ecological Receptor Locations

7.10 Assessment of Effects

Demolition and Construction Effects

7.10.1 There are numerous off-Site residential properties and ecological sites within 250 m of the Site boundary and within 50 m of the routes proposed to be used by demolition and construction traffic; therefore, following IAQM Guidance, a detailed assessment of construction dust impacts is required.

7.10.2 The risk of potential air quality impacts from demolition, earthworks, construction and trackout (the transport of dust and dirt from the site onto the public road network) was assessed according to IAQM Guidance to identify the appropriate level of mitigation.

7.10.3 The potential dust emission magnitude has been identified for each demolition and construction stage activity as shown in Table 7.10 using the evaluation criteria within the IAQM Guidance (ES Volume 2 Technical Appendix 7.2).

Table 7.10: Dust Emission Impact Magnitude for Proposed Development Works

Activity	Dust Emission Magnitude	Justification
Demolition	Small	Total building volume to be demolished less than 12,000 m^3.
Earthworks	Large	Total site area for earthworks greater than 110,000 m^2.
Construction	Large	Total building volume greater than 75,000 m^3.
Trackout	Large	More than 50 HDV (>3.5 t) maximum outward movements would be expected in any one day.

7.10.4 The next stage of the process was to define the sensitivity of the assessment area to dust soiling, human health and ecological effects. This process combines the sensitivity of the receptor with the distance from the source to determine the overall sensitivity. The sensitivity of the area to dust impacts is provided in Table 7.11 in accordance with IAQM guidance.

Table 7.11: Sensitivity of Study Area to Dust Impacts

Sensitivity to Dust Soiling	Sensitivity to Human Health Impacts	Sensitivity to Ecological Receptors
High: Between 10 and 100 existing residential buildings within 20 m of demolition and construction activities.	**Low:** Between 10 to 100 sensitive receptors within 20 m of the Site. Annual mean PM_{10} concentrations in the study area are well below 24 µg/m^3 in 2019 (ES Volume 2 Technical Appendix 7.5).	**Low:** Local Nature Reserves, Ancient Woodland and Local Wildlife Sites located within 20 m of the Site.

7.10.5 The dust emission magnitude determined in Table 7.10 has been combined with the sensitivity assessment in Table 7.11 to define the risk of impacts for each stage of the Proposed Development works in the absence of mitigation, as shown in Table 7.12.

Table 7.12: Risk of Dust Impacts in Absence of Mitigation at Proposed Development

Sensitivity of Study Area	Dust Emission Magnitude for Each Stage of Works			
	Demolition (Small)	Earthworks (Large)	Construction (Large)	Trackout (Large)
Dust Soiling (High)	Medium	High	High	High
Human Health (Low)	Negligible	Low	Low	Low
Ecological (Low)	Negligible	Low	Low	Low

7.10.6 The overall risk of dust impacts in the absence of mitigation has been assessed as high risk, as this is the highest risk rating assigned in Table 7.12 and therefore represents a worst-case assessment.

7.10.7 IAQM Guidance recommends that no assessment of the significance of demolition and construction stage effects is made without mitigation in place. Therefore, the initial assessment of effects assumes an appropriate level of mitigation, as explained in the methodology section of this chapter. With the implementation of the mitigation measures, the demolition and construction dust and on-Site vehicle emissions effects in the area are considered to be temporary and **not significant**.

7.10.8 A summary of the mitigation measures recommended in the IAQM Guidance to reduce impacts from high risk sites is provided in Table 7.13, these measures would be adopted during the construction stage of the Proposed Development and are included in the OCEMP (ES Volume 2 Technical Appendix 5.1). Air Quality (dust) measures have also been included in the Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001) prepared by Arcadis. This Phase 1 OCEMP is for the detailed component of the Proposed Development, and contains a number of outline activities to manage dust on Site during construction. The mitigation measures will be updated as needed in the detailed CEMP as part of future reserved matters applications.

7.10.9 The mitigation measures for both direct impacts and those from construction traffic are detailed within the OCEMP (ES Volume 2 Technical Appendix 5.1). A Detailed CEMP would be prepared for each phase of the Proposed Development outlining detailed and phase specific mitigation measures, which would be secured through an appropriately worded planning condition at future RMA stages.

Table 7.13: Dust Mitigation Measures for High Risk Sites

Phase	Mitigation Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary in addition to head/regional office contact information.
Dust Management Plan	• Develop and implement a Dust Management Plan (DMP) which would be included as part of the Detailed CEMP, to be approved by HDC.
Site Management	• Record all complaints and incidents in a Site log. • Make the complaints log available to HDC if requested. • Record any exceptional dust incidents on- or off-Site. • Hold regular liaison meetings with other high risk construction sites within 500 m of the Site boundary to ensure plans are co-ordinated and dust emissions are minimised. • Take appropriate measures to reduce emissions in a timely manner, and record the measures taken within the log.
Monitoring	• Undertake daily on and off-Site visual inspections where there are nearby receptors. • Carry out regular inspections to ensure compliance with the DMP and record results in the site logbook. • Increase the frequency of inspections during activities with a high potential to create dust or in prolonged dry weather. • Where considered appropriate dependent on proximity to receptors for a given phase of the Proposed Development, agree dust deposition, dust flux, or real-time

Table 7.13: Dust Mitigation Measures for High Risk Sites	
Phase	**Mitigation Measure**
	PM_{10} continuous monitoring locations with HDC. Baseline monitoring should, if required and possible, commence at least three months before work on Site commences.
Preparing and Maintaining the Site	• Plan Site layout to locate dust generating activities as far as possible from receptors. • Use solid screens around dusty activities and around stockpiles. • Fully enclose the Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period. • Avoid Site runoff of water and mud. • Keep Site fencing barriers and scaffolding clean using wet methods. • Remove dusty materials from Site as soon as possible. • Minimise emissions from stockpiles by covering, seeding, fencing or damping down.
Operating Vehicle/ Machinery and Sustainable Travel	• Ensure vehicles switch of engines when stationary. • Avoid use of generators where possible. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas. • Produce a Construction Logistics Plan (CLP) to manage the sustainable delivery of goods and materials. • Implement a construction stage Travel Plan that supports and encourages sustainable travel.
Operations	• Only undertake cutting, grinding or sawing equipment with suitable dust suppression equipment or techniques. • Ensure adequate water supply for effective dust and particulate matter suppression. • Use enclosed chutes, conveyors and covered skips. • Minimise drop heights of materials. • Ensure suitable cleaning material is available at all times to clean up spills.
Waste Management	• Avoid bonfires.
Measures Specific to Demolition	• Soft strip buildings before demolition. • Ensure effective water suppression during demolition. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.
Measures Specific to Earthworks	• Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil. • Only remove the cover in small areas during work and not all at once.
Measures Specific to Construction	• Avoid concrete scabbling where possible. • Ensure aggregates are stored in bunded areas and are not allowed to dry out. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos.

Table 7.13: Dust Mitigation Measures for High Risk Sites	
Phase	**Mitigation Measure**
	• For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Measures Specific to Trackout	• Use water-assisted dust sweepers to clean access and local roads. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving the Site are appropriately covered. • Inspect on-Site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record inspections of haul roads in a Site log, including any remedial action taken. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system. • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit.

Completed Development Effects

7.10.10 Completed developments impacts on local air quality would primarily arise from exhaust emissions associated with existing vehicle movements generated and as a result of the Proposed Development. Emissions from road traffic are the major contributor to poor air quality within the UK and could potentially contribute to exceedance of the current air quality objectives within the vicinity of the Site. Accordingly, the potential impacts associated with additional vehicle trips generated by the Proposed Development have been considered within this assessment.

7.10.11 The results for the completed development assessment of effects are presented in full in ES Volume 2 Technical Appendix 7.5. This section of the ES presents the results at the three human health receptor locations where pollutant concentrations were predicted to be highest during the operation of the Proposed Development so as to illustrate the highest predicted impacts.

Traffic Emissions: Opening Year

Human Health

7.10.12 The results of the dispersion modelling at human health receptors during the first operational year of the Proposed Development are shown in Table 7.14 to Table 7.16.

Table 7.14: Opening Year Annual Mean NO_2 at Human Health Receptors (µg/m^3)					
Receptor	**Scenario 2 2026 Do Minimum**	**Scenario 3 2026 Do Something**	**Development Traffic Contribution**	**% Change in Concentration Relative NAQO**	**Impact Descriptor**
R13	24.7	25.0	0.08	0.20	Negligible
R19	25.9	26.1	0.15	0.37	Negligible
R20	24.1	24.2	0.15	0.37	Negligible
Objective	**40**		-		

Table 7.15: Opening Year Annual Mean PM_{10} at Human Health Receptors ($\mu g/m^3$)					
Receptor	Scenario 2 2026 Do Minimum	Scenario 3 2026 Do Something	Development Traffic Contribution	% Change in Concentration Relative NAQO	Impact Descriptor
R19	14.9	14.9	0.06	0.14	Negligible
R31	14.7	14.8	0.07	0.18	Negligible
R58	16.0	16.1	0.17	0.42	Negligible
Objective	**40**		-		

Table 7.16: Opening Year Annual Mean $PM_{2.5}$ at Human Health Receptors ($\mu g/m^3$)					
Receptor	Scenario 2 2026 Do Minimum	Scenario 3 2026 Do Something	Development Traffic Contribution	% Change in Concentration Relative NAQO	Impact Descriptor
R13	8.9	8.9	0.02	0.08	Negligible
R19	8.7	8.8	0.03	0.15	Negligible
R58	9.6	9.7	0.09	0.44	Negligible
Objective	**20**		-		

7.10.13 The opening year predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations without and with the Proposed Development in place would be well below the relevant NAQOs at all assessed existing receptor locations. The results demonstrate that even if the model verification factor was doubled, the impacts would remain negligible and are insensitive to the verification factor.

7.10.14 The predicted annual mean NO_2 concentrations at all receptors would be well below 60 $\mu g/m^3$ demonstrating that the 1-hour mean NO_2 objective is unlikely to be exceeded at the modelled receptor locations. Furthermore, the predicted annual mean PM_{10} concentrations at all receptors would be well below 32 $\mu g/m^3$demonstrating that the 24-hour mean PM_{10} objective is unlikely to be exceeded at the modelled receptor locations.

7.10.15 The changes in annual mean NO_2, PM_{10} and $PM_{2.5}$ between the Do Minimum and Do Something scenarios would be below 1% for all receptors and the impact on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations are negligible for all receptors.

7.10.16 The $PM_{2.5}$ results indicate that the 2028 interim target of 12 $\mu g/m^3$ and the long term 2040 target of 10 $\mu g/m^3$ will be met at all modelled receptor locations.

Ecological

7.10.17 The results of the dispersion modelling at ecological receptors are presented in full in ES Volume 2 Technical Appendix 7.5.

7.10.18 The development contribution to nitrogen deposition is above 1% of critical load at one site, Horsham Corner Ancient Woodland at the receptor points 10m from the adjacent road (Horsham Road). The additional nitrogen deposition at this location is significantly less than 0.4kgN/ha/yr (0.14N/ha/yr) and therefore in accordance with DMRB criteria the effect would be **not significant**.

Traffic Emissions: Completed Development

Human Health

7.10.19 The results of the dispersion modelling at human health receptors when the Proposed Developments is fully completed are shown in Table 7.17 to Table 7.19.

Table 7.17: Completed Development Annual Mean NO_2 at Human Health Receptors ($\mu g/m^3$)					
Receptor	Scenario 4 2041 Do Minimum	Scenario 5 2041 Do Something	Development Traffic Contribution	% Change in Concentration Relative NAQO	Impact Descriptor
R13	20.5	20.9	0.39	0.96	Negligible
R19	21.0	21.2	0.24	0.59	Negligible
R20	19.6	19.8	0.11	0.27	Negligible
Objective	40		-		

Table 7.18: Completed Development Traffic Annual Mean PM_{10} at Existing Receptors ($\mu g/m^3$)					
Receptor	Scenario 4 2041 Do Minimum	Scenario 5 2041 Do Something	Development Traffic Contribution	% Change in Concentration Relative NAQO	Impact Descriptor
R13	14.2	14.5	0.24	0.59	Negligible
R19	14.7	14.8	0.15	0.38	Negligible
R58	15.8	16.1	0.37	0.93	Negligible
Objective	40		-		

Table 7.19: Completed Development Traffic Annual Mean $PM_{2.5}$ at Existing Receptors ($\mu g/m^3$)					
Receptor	Scenario 4 2041 Do Minimum	Scenario 5 2041 Do Something	Development Traffic Contribution	% Change in Concentration Relative NAQO	Impact Descriptor
R13	8.6	8.7	0.13	0.64	Negligible
R19	8.5	8.6	0.08	0.40	Negligible
R58	9.3	9.5	0.19	0.97	Negligible
Objective	20		-		

7.10.20 The completed development predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations without and with the Proposed Development in place would be well below the relevant NAQOs at all assessed existing human health receptor locations. The results demonstrate that even if the model verification factor was doubled, the impacts would remain negligible and are insensitive to the verification factor.

7.10.21 The predicted annual mean NO_2 concentrations at all receptors would be well below 60 $\mu g/m^3$ demonstrating that the 1-hour mean NO_2 objective is unlikely to be exceeded at the modelled receptor locations. Furthermore, the predicted annual mean PM_{10} concentrations at all receptors would be well below 32 $\mu g/m^3$demonstrating that the 24-hour mean PM_{10} objective is unlikely to be exceeded at the modelled receptor locations.

7.10.22 The changes in annual mean NO_2, PM_{10} and $PM_{2.5}$ between the Do Minimum and Do Something scenarios would be below 1% for all receptors and the impact on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations are negligible for all receptors for NO_2, PM_{10} and $PM_{2.5}$.

7.10.23 Overall, considering the conservative nature of the assessment combining 2041 traffic data with 2030 emission factors and background concentrations, and the IAQM criteria for assessing significance, the air quality effects of the Proposed Development road traffic on existing human health receptors would be **not significant**.

7.10.24 The $PM_{2.5}$ results indicate that the long term 2040 target of 10 µg/m^3 will likely be met at all modelled receptor locations.

Ecological

7.10.25 The results of the dispersion modelling at ecological receptors when the Proposed Development is completed are presented in full in ES Volume 2 Technical Appendix 7.5. The development contribution to nitrogen deposition is above 1% of critical load at Punch Copse AW, Tillgate Forest, Willoughby Fields LNR and Horsham Corner, with the impacts limited to the immediate vicinity of the roads; the A2004 (10m), the A23 (5m), Northgate Avenue (4m), and Horsham Road (0m) respectively. In all cases the increase in nitrogen deposition is less than 0.4kgN/ha/yr (0.23, 0.12, 0.15 and 0.12kgN/ha/yr respectively) and therefore in accordance with DMRB criteria the effect would be **not significant**.

7.11 Assessment of Residual Effects

Additional Mitigation

Demolition and Construction Stage

7.11.1 IAQM Guidance recommends that no assessment of the significance of construction phase effects is made without mitigation in place, as mitigation is assumed to be secured by legislation, planning conditions, or required by policy. With the implementation of measures included in the OCEMP (ES Volume 2 Technical Appendix 5.1) and Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001), and measures outlined in Table 7.13, no significant adverse effects are predicted, and consequently no additional mitigation is required.

Completed Development Stage

7.11.2 No significant adverse effects are predicted, and consequently no additional mitigation is required.

Enhancement Measures

7.11.3 No enhancement measures are proposed or required in respect of air quality.

Demolition and Construction Residual Effects

7.11.4 As no additional mitigation would be required, the residual construction effects remain as reported in 7.10 Assessment of Effects.

7.11.5 There are no envisaged implications to the concluded residual effects when taking account of severability as the high-risk mitigation measures would be applied to each development plot as they come forward and mitigation wouldn't be contingent on implementation or mitigation of other phases of the Proposed Development.

Completed Development Residual Effects

7.11.6 As no additional mitigation would be required, the residual completed development effects remain as reported in 7.10 Assessment of Effects.

7.11.7 There are no envisaged implications to the concluded residual effects when taking account of severability as the impacts from road traffic associated with individual plots would be less

than the impacts of the completed development traffic which have been assessed using 2030 vehicle emission factors and background concentrations.

7.12 Summary of Residual Effects

7.12.1 Table 7.20 provides a tabulated summary of the outcomes of the air quality assessment of the Proposed Development.

Table 7.20: Summary of Residual Air Quality Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	D I	P T	R IR	St Mt Lt
Demolition and Construction								
Existing off-Site Human Health and Amenity	Dust soiling and PM_{10} concentrations increase due to demolition and construction works.	None required	Not significant	-	D	T	R	St/Mt
Existing off-Site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ concentrations due to demolition and construction vehicle emissions.	None required	Not significant	-	D	T	R	St/Mt
Existing off-Site Designated Nature Conservation Sites	Dust soiling and PM_{10} concentrations increase due to demolition and construction works.	None required	Not significant	-	D	T	R	St/Mt
Existing off-Site Designated Nature Conservation Sites	Change in NO_2, PM_{10} and $PM_{2.5}$ concentrations due to demolition and construction vehicle emissions.	None required	Not significant	-	D	T	R	St/Mt
Completed Development								
Existing off-Site Human Health	Change in NO_2, PM_{10} and $PM_{2.5}$ concentrations due to vehicle emissions.	None required	Not significant	-	D	P	IR	Lt
Existing off-Site Designated Nature Conservation Sites	Change in NO_2, PM_{10} and $PM_{2.5}$ concentrations due to vehicle emissions.	None required	Not significant	-	D	P	IR	Lt

Notes:

* - = Adverse/ + = Beneficial/ +/- Neutral; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term.

** Significant or Not Significant

7.13 Cumulative Effects

Intra-Project Effects

7.13.1 As explained in Chapter 2: EIA Process and ES Methodology, intra-project cumulative effects are discussed in Chapter 14: Cumulative Effects

Cumulative Effects

7.13.2 Demolition and construction stages of approved cumulative schemes within the construction dust study area of 250 m from the Proposed Development are not expected to combine with the demolition and construction stage of the Proposed Development. Significant cumulative effects are unlikely to occur as each scheme is anticipated to employ similar dust mitigation techniques such that the individual demolition and construction stage effects are **not significant**, alone or in combination.

7.13.3 Operational traffic data from committed developments included in the transport model have been included in the future baseline traffic data. The results include the in-combination effects from other developments.

7.13.4 The assessment predicted the combined and additive cumulative concentrations arising from cumulative schemes in the study area in 2029 and 2041. No significant effects on air quality are anticipated as a result of the operation of the Proposed Development.

Inter-Project Effects

7.13.5 Table 7.21 provides a summary of the likely cumulative effects resulting from the Proposed Development and the cumulative developments.

Table 7.21: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
CR/2018/0894/OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2016/0294/OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
DC/16/1677	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2023/0357/OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**

Table 7.21: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
DC/10/1612	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
DC/17/2481	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
EIA/24/0006	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2017/0997 /OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2023/0197 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2014/0415 /ARM	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2021/0174 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2022/0187 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2023/0223 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**

Table 7.21: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
CR/2024/0554 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2022/0707 /CON	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2019/0542 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2022/0407 /OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2022/0055 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2021/0355 /OUT	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2020/0037 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2020/0024 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2020/0192 /RG3	No	Distance between the Proposed Development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**

Table 7.21: Inter-Project Cumulative Effects				
Cumulative Development	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Gatwick Airport – TR020005	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**
CR/2022/0609 /FUL	No	Distance between the Proposed development and the cumulative scheme is more than 250 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were **not significant.**

Demolition and Construction Cumulative Effects

7.13.6 It is unlikely there will be cumulative construction stage effects as the cumulative developments considered in this ES are not within the dust risk assessment study area (more than 250 m from the Site).

Completed Development Cumulative Effects

7.13.7 It is unlikely there will be cumulative completed development effects as traffic flows associated with the cumulative developments have been included in the traffic data used to assess the impact of operational stage traffic emissions on existing off-Site receptors, the effects of which were assessed to be **not significant** at each receptor.

7.14 Summary of Assessment

Background

7.14.1 This chapter has detailed the potential air quality effects due to the demolition and construction, and completed development stages of the Proposed Development. The assessment of demolition and construction, and completed development stages has been undertaken taking into account the relevant national and local guidance and regulations.

Demolition and Construction Effects

7.14.2 During demolition and construction works, there is the potential that emissions of dust arising from the Site could result in a loss of amenity due to dust deposition, and human health impacts due to increased particulate matter concentrations at nearby properties, as well as on-Site occupants of completed phases.

7.14.3 Based on recognised assessment criteria, the demolition and construction works would present a high risk of adverse dust impacts in the absence of appropriate mitigation. With the implementation of suitable mitigation measures set out within the OCEMP (ES Volume 2 Technical Appendix 5.1) and Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001) it is anticipated that dust impacts would be appropriately mitigated resulting in as a minor temporary, adverse effect which would be **not significant**.

7.14.4 Overall, it is considered that the demolition of the existing buildings on the Site and construction of the Proposed Development would result in a non-significant effect on air quality and identified receptors, and as such would not give rise to significant effects on air quality.

Completed Development Effects

7.14.5 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted for a number of worst-case locations representing existing properties adjacent to the road network assessed as part of the study area.

7.14.6 The predicted concentrations would be well below the relevant NAQOs at all of the existing human health receptor locations with the Proposed Development in place and the impact of the Proposed Development road traffic is expected to be **not significant**.

7.14.7 Overall, it is considered that the completed Proposed Development would not give rise to significant effects on air quality,

Cumulative Effects

7.14.8 It is unlikely there will be cumulative construction or completed development stage effects as the cumulative developments considered in this ES are not within the dust risk assessment study area and assessment of the effects of Proposed Development traffic (which considered cumulative scheme flows) indicated there will not be significant air quality effects at the modelled receptors.