

Oaklands College & Land south of Sandpit Lane, St Albans

Air Quality Impact Assessment

October 2025





Oaklands Blossom and Oaklands College, St Albans

Air Quality Assessment

Taylor Wimpey North Thames

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Table of Contents

1.0 Introduction	1
1.1 Scope of Assessment.....	2
2.0 Background Context	3
2.1 Legislation	3
2.2 Policy	6
2.3 Assessment Guidance.....	8
3.0 Assessment Methodology	10
3.1 Construction Phase	10
3.2 Operational Phase – Human Receptors	10
3.3 Operational Phase – Ecological Receptors.....	18
4.0 Baseline Environment	25
4.1 LAQM Review and Assessment	25
4.2 Review of Air Quality Monitoring.....	25
4.3 Defra’s Pollution Climate Mapping Model	28
4.4 Defra Mapped Background Concentrations	28
5.0 Construction Phase Assessment	31
5.1 Construction Dust Assessment.....	31
6.0 Operational Phase Assessment	37
6.1 Road Traffic Emissions Assessment – Human Receptors	37
6.2 Road Traffic Emissions Assessment – Ecological Receptors	43
7.0 Mitigation Measures	46
7.1 Construction Dust.....	46
7.2 Operational Phase.....	49
8.0 Conclusions	50
8.1 Construction Phase	50
8.2 Operational Phase.....	50

Tables in Text

Table A: Relevant Ambient AQALs	4
Table B: Human Health Relevant Exposure	5
Table C: Receptor Locations Considered.....	14
Table D: Impact Descriptor Matrix for Receptors.....	16
Table E: Local NO ₂ Diffusion Tube Monitoring Sites: Details	25
Table F: Local NO ₂ Diffusion Tube Monitoring Sites: Results.....	27
Table G: PCM Modelled Annual Mean NO ₂ Concentrations	28
Table H: Defra Mapped Background Pollutant Concentrations.....	29



Table I:	Potential Dust Emission Magnitude	32
Table J:	Sensitivity of the Area	33
Table K:	Risk of Dust Impacts (Unmitigated).....	34
Table L:	Predicted Annual Mean NO ₂ Concentrations & Impacts.....	37
Table M:	Predicted Annual Mean PM ₁₀ Concentrations & Impacts	38
Table N:	Predicted Annual Mean PM _{2.5} Concentrations & Impacts.....	39
Table O:	Predicted Annual Mean NO ₂ Concentrations & Impacts.....	40
Table P:	Predicted Annual Mean PM ₁₀ Concentrations & Impacts	41
Table Q:	Predicted Annual Mean PM _{2.5} Concentrations & Impacts.....	42
Table R:	Review of Ecological Designations	43
Table S:	Review of Proposed Development Trips	44
Table T:	Construction Dust Mitigation Measures.....	46
Table U:	Traffic Data Used within the Assessment – Full Application.....	A-1
Table V:	Traffic Data Used within the Assessment – Full + Outline Application.....	A-1
Table W:	Local Monitoring Data Available for Model Verification	B-1
Table X:	NO _x / NO ₂ Model Verification – Initial Comparison (2.975).....	B-2
Table Y:	NO _x / NO ₂ Model Verification – Further Comparison (2.955).....	B-4
Table Z:	NO _x / NO ₂ Model Verification – Domain A (2.638)	B-6
Table AA:	NO _x / NO ₂ Model Verification – Domain B (3.705)	B-7

Figures in Text

Figure A:	Wind Rose for the 2023 NWP Meteorological Data.....	13
Figure B:	Modelled Road Network & Full Receptors 1.....	19
Figure C:	Modelled Road Network & Full Receptors 2.....	20
Figure D:	Modelled Road Network & Full + Outline Receptors 1	21
Figure E:	Modelled Road Network & Full + Outline Receptors 2	22
Figure F:	Modelled Road Network & Full + Outline Receptors 3	23
Figure G:	Modelled Road Network & Verification.....	24
Figure H:	Baseline Context	30
Figure I:	Construction Dust Assessment Buffers – Full Application	35
Figure J:	Construction Dust Assessment Buffers – Outline Application	36
Figure K:	Roads within 200m from Ecological Designations.....	45
Figure L:	Modelled vs. Monitored Road-NO _x Contribution – Initial Comparison (2.975)...	B-3
Figure M:	Modelled vs. Monitored Road-NO _x Contribution – Further Comparison (2.955)	B-5
Figure N:	Modelled vs. Monitored Road-NO _x Contribution – Domain A (2.638).....	B-6
Figure O:	Modelled vs. Monitored Road-NO _x Contribution – Domain B (3.705).....	B-8



1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by Taylor Wimpey North Thames to undertake an Air Quality Assessment (AQA) to support a hybrid planning application for a proposed mixed-use development at Oaklands College (the 'Proposed Development') on land south of Sandpit Lane, St Albans (the 'Site').

The full development description for the hybrid planning application is as follows:

"A Hybrid planning application for a severable phased development comprising:

- Full planning application for the construction of homes (use class C3); new local centre and community facility (use classes E(a to f) and F); a children's home (use class C2); demolition and renovation of existing college buildings; construction of new college buildings (use class F1.); the creation of Active Travel Routes including footpaths for walking, cycling and equestrian activities; removal and planting of trees; along with the laying out of green infrastructure (including publicly accessible open space) and habitat creation; drainage infrastructure, earthworks, new means of access and alterations to existing access points.*
- Outline planning application (access only, all other matters reserved) for the construction new homes (use class C3); new extra care home dwellings (use class C2); land for the construction of a new primary school (use class F.1); demolition and renovation of existing college buildings; construction of new college buildings (use class F1.); the construction of new sports facilities and pitches; the creation of Active Travel Routes including footpaths for walking, cycling and equestrian activities; removal and planting of trees; new energy centre; new recycling facilities; new car parking facilities; along with the laying out of green infrastructure and habitat creation; drainage infrastructure, earthworks, pedestrian and cycle routes, alterations to existing access points.*
- The phasing of the development is indicative allowing different phases to commence at different times and independently (severable) from each other. The outline phases are the subject of parameter plans and design codes."*

The Site currently comprises two main areas:

- Land referred to as 'Oaklands Blossom'; and
- Oaklands College and its associated facilities and sports pitches, referred to as 'Oaklands College'.

The entire Site is situated at the approximate National Grid Reference (NGR): x518350, y207820. The Site falls within the administrative area of St Albans City & District Council (SACDC). The surrounding area comprises:

- Sandpit Lane directly to the north, with residential properties beyond;
- Agricultural land and woodland to the immediate east, with Oaklands Lane and residential properties beyond, and a concrete plant and quarry located c. 270m to the east;
- The A1057 Hatfield Road directly to the south with residential and commercial properties beyond; and
- Agricultural land, woodland and residential properties to the immediate west with a number of schools and playing fields beyond.



Vehicles will access the Site via the new access on Sandpit Lane to the north, and the existing accesses on Oaklands Lane to the east and the A1057 Hatfield Road to the south.

1.1 Scope of Assessment

Pre-assessment consultation was undertaken with the Environmental Health Officer (EHO) at SACDC to agree the methodology of the AQA¹. However, at the time of writing no response to the proposed scope of works has been received.

Notwithstanding, the scope of the assessment is based on national and local guidance, as well as established best practice. On this basis, the following scope of works has been undertaken:

- Baseline Evaluation – Assessment of existing air quality in the local area;
- Construction Phase Assessment – Identification and assessment of potential air quality impacts associated with the construction of the Proposed Development;
- Operational Phase Assessment – Identification and assessment of potential air quality impacts associated with the operation of the Proposed Development at existing human and ecological receptors, as well as a site suitability assessment to determine whether future on-site accommodation will be acceptable; and
- Mitigation Measures – Identification of mitigation measures, as appropriate, based on the outcome of the construction and operational phase assessments.

Given this application is a ‘hybrid’ planning application, the full and outline application elements of the Proposed Development have been assessed separately and cumulatively where required in accordance with the above scope of works.

¹ Email correspondence from SLR to the SACDC EHO, dated 20th August 2025.



2.0 Background Context

2.1 Legislation

A dual set of regulations, applicable to National and Local Government separately are currently operable within the UK.

2.1.1 National Obligations

2.1.1.1 Air Quality Standards

The Air Quality Standards Regulations 2010² (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation, in order to align and mirror European obligations. The AQSR includes Limit Values which are legally binding ambient concentration thresholds which, however, are only applicable at specific locations (Schedule 1: AQSR)³. Carriageways or central reservations of roads, and any location where the public do not have access (e.g. industrial sites), are exempt. On this basis, if a sampling point does not comply with the siting locations, then strict comparison to the AQSR Limit Values cannot be made.

Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁴ was introduced to mirror revisions to supporting EU legislation. As a result, the fine particulate matter (as PM_{2.5}) Limit Value is 20µg/m³ (to be met by 2020).

The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government who undertake assessments on an annual basis. Local Authorities have no statutory obligation to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

In response to persistent exceedences, the Government published its 2017 plan⁵ for reducing roadside nitrogen dioxide (NO₂) concentrations in order to achieve compliance in the shortest time possible. This has resulted in the introduction of Clean Air Zones across England. However, SACDC were not identified as required to conduct a feasibility study to achieve compliance.

2.1.1.2 Environment Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023⁶ introduced an annual mean concentration target of 10µg/m³ to be met across England by 2040. Central Government and Devolved Administrations are responsible for meeting this target, however not until 2040. Local Authorities have no responsibility to achieve this target.

² The Stationary Office Limited (TSOL), The Air Quality Standards Regulations (England) 2010, Statutory Instrument No. 1001.

³ Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

⁴ TSOL, The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313.

⁵ Department of Environment, Food and Rural Affairs (Defra), UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations, (2017).

⁶ TSOL, The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. Statutory Instruments 2023 No. 96.



2.1.2 Local Obligations

Part IV of the Environment Act 1995⁷ (as amended by the Environment Act 2021) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify this as necessary. It also established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within their administrative area.

The Air Quality (England) Regulations 2000 (as amended) ('the Regulations') provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England.

PM_{2.5} is not currently cited within the Regulations; however Local Authorities are required to work towards reducing PM_{2.5} as per the AQS. To support this, Defra issued the '*PM_{2.5} Targets: Interim Planning Guidance*'⁸ which Local Authorities are encouraged to consider when determining planning applications, to ensure national obligations are considered.

The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (referred to as '*relevant exposure*'). Table B provides an indication of those locations. If any objective is unlikely to be met, the Local Authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) to improve air quality.

The latest AQS for England was published in 2023⁹. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table A.

Table A: Relevant Ambient AQALs

Pollutant	AQAL (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (PM ₁₀)	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles (PM _{2.5})	20	Annual mean
<p>Note: The PM_{2.5} AQAL is not prescribed within the Air Quality (England) Regulations 2000/2002 and there is no requirement for local authorities to meet it. Exceedences are only valid at the AQSR specific siting locations (Schedule 1: AQSR).</p>		

⁷ His Majesty's Stationary Office (HMSO), The Environment Act 1995, (1995).

⁸ Defra, PM_{2.5} Targets: Interim Planning Guidance, (2024).

⁹ Defra, Air Quality Strategy: Framework for Local Authority Delivery, (2023).



Table B: Human Health Relevant Exposure

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990¹⁰ sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as, ‘*any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*’.

Section 79 requires that, where a complaint of a statutory nuisance is made to it by a person living within its area, a Local Authority must take steps as are reasonably practicable to investigate the complaint. Proposed developments which result in the introduction of future sensitive receptors are however subject to the Agent of Change principle to ensure potential interactions with the existing environment and operations are assessed and mitigated to minimise restrictions being placed on existing businesses.

Fractions of dust greater than 10µm (i.e. greater than PM₁₀) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.1.4 Ecological Habitats

Ecological habitats vary in terms of their sensitivity, perceived ecological value, geographic importance, and level of protection. Within the UK, there are three types of nature conservation designations: international, national and local designations, which are all provided environmental protection from developments, including from atmospheric emissions, with a greater level of protection afforded to the former, relative to the latter.

The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way (CRoW) Act 2000)¹¹ provides protection to Sites of Special Scientific Interest (SSSI) to ensure that developments are not likely to cause damage. The Act also provides a protection to local nature conservation sites, which can be particularly important in providing ‘buffers’ to SSSIs and European sites.

The Environment Act 1995 and the Natural Environment and Rural Communities Act (NERC) 2006¹² provides an extension to the biodiversity duty set out in the CRoW Act to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity (i.e. ecological designations of local status).

¹⁰ HMSO, The Environmental Protection Act 1990, (1990).

¹¹ HMSO, Wildlife and Countryside Act, (1981).

¹² HMSO, Natural Environment and Rural Communities Act, (2006).



Sites of ecological importance are provided environmental protection with respect to air quality, through the application of standards known as Critical Levels (CLe) and Critical Loads (CLo). The level of protection afforded to an internationally designated site is greater than that afforded to a nationally and locally designated site (e.g. Ancient Woodland (AW) and Local Nature Reserves (LNR)); reflecting the relative sensitivity of the sites as well as their perceived ecological value.

2.2 Policy

2.2.1 National Planning Policy Framework

The December 2024 update to the National Planning Policy Framework¹³ (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

In specific relation to air quality policy, the document states:

“Chapter 15 – Conserving and Enhancing the Natural Environment

Ground Conditions and Pollution

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

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG)¹⁴ which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regard to air quality, the PPG states:

“The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.”

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

¹³ Ministry of Housing, Communities & Local Government, National Planning Policy Framework, (2024).

¹⁴ Ministry of Housing, Communities and Local Government, Planning Practice Guidance: Air Quality, (2019).



proposed development would be particularly sensitive to poor air quality in its vicinity.”

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that “*Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific [...] Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact*”.

2.2.2 Local Policy

2.2.2.1 St Albans District Local Plan

The St Albans District Local Plan¹⁵ was adopted in November 1994 and sets out the Council’s vision and strategy for the district. The policies contained within the Local Plan expired in September 2007 unless saved (in whole or in part) following a Direction from the Secretary of State. However, there are no policies relevant to air quality.

SACDC is in the process of preparing a new Local Plan which will put in place a new planning strategy for the period to 2041. The Draft Local Plan¹⁶, published in September 2024, is currently at Regulation 19 Public Consultation stage. Once adopted, it will replace the current Local Plan. While no material weight is applied to the policy content of the new Local Plan, the following policies relate to air quality:

“Strategic Policy SP8 – Transport Strategy

The Council will prioritise the use of active and sustainable transport modes and deliver accessibility improvements to the transport and highways network by: [...]

- f) *Requiring new development to assess future air quality impacts from transport, where necessary, including funding contributions to wider schemes that will mitigate the impact of the scheme being proposed where appropriate [...]*”

“HW1 – Air and Noise Pollution

Development proposals, including those for new residential dwellings, schools, nurseries and care homes and other uses which are noise and pollution sensitive, or in areas which may exceed national legislative air quality pollution limits, must carry out suitable assessments for noise / air pollution. Proposals which are found to be affected by noise or air pollution must demonstrate suitable mitigation, including as required:

- a) *Maintaining distances between road and other sources of noise and air pollution (including odour pollution) and people;*
- b) *Using green infrastructure, in particular trees, where this can create a barrier or maintain separation between sources of pollution and receptors;*
- c) *Appropriate means of filtration, ventilation and soundproofing on affected buildings;*
- d) *Effective control of dust and emissions from construction, operation and demolition;*

¹⁵ SACDC, City and District of St Albans District Local Plan Review 1994, (2020).

¹⁶ SACDC, Draft Local Plan 2041, Regulation 19 Publication, (2024).



- e) *Use of optimal layout and orientation to promote avoidance of elevated pollution without mitigation which will reduce the level of mitigation where necessary;*
- f) *Air quality and / or noise assessments at the earliest stage of development.*

Development proposals that would generate new noise and air pollution in proximity to residential and other noise-sensitive uses must demonstrate and put in place measures to avoid or mitigate any such impacts.”

“Strategic Policy SP13 – Health and Wellbeing

The Council aims to improve people’s health and wellbeing and encourage them to adopt a healthy lifestyle through non-clinical initiatives. The overall priorities are to:

- o *Improve physical health and wellbeing;*
- o *Improve mental health and wellbeing; and*
- o *Reduce inequalities*

These priorities will be sought through relevant policies throughout this Plan, and in particular the Council supports pursuing the following:

- a) *Improved walking and cycle infrastructure to allow people to move around more easily using active modes of travel, so reducing air pollution and increasing levels of everyday exercise;*

[...]

- n) *Considering the impacts of pollution and microclimates, and designing schemes to reduce any potential negative outcomes;*

[...]”

Part of the Site is draft allocation within the Draft Local Plan as ‘B4 – East St Albans’ which is located in the portion immediately south of Sandpit Lane. The draft allocation is for “Primarily residential 472 units (indicative) (additional to adjoining permission”, but also includes requirements for extra-care facilities, primary and secondary schools, local centre, etc. Further information can be found within the Draft Local Plan.

2.3 Assessment Guidance

This assessment has been carried out in accordance with the principles contained within the guidance documents below.

- Defra: Local Air Quality Management Technical Guidance (LAQM.TG(22))¹⁷;
- Defra: PM_{2.5} Targets, Interim Planning Guidance⁸ (the ‘PM_{2.5} IPG’);
- Environmental Policy Implementation Community (EPIC) and the Institute of Air Quality Management (IAQM): Land-Use Planning and Development Control: Planning for Air Quality¹⁸ (the ‘EPIC & IAQM’ guidance);
- IAQM: Guidance on the Assessment of Dust from Demolition and Construction¹⁹ (the ‘IAQM Construction Dust’ guidance);

¹⁷ Local Air Quality Management Technical Guidance (22), Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, (2025).

¹⁸ EPIC & IAQM, Land-Use Planning and Development Control: Planning for Air Quality v1.2, (2017).

¹⁹ IAQM, Guidance on the Assessment of Dust from Demolition and Construction v2.2, (2024).



- IAQM: A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites²⁰ (the 'IAQM Nature' guidance); and
- National Highways: Design Manual for Roads and Bridges, LA 105 - Air Quality (vertical barriers)²¹ (the 'DMRB guidance').

²⁰ IAQM, A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v1.1, (2020).

²¹ National Highways, DMRB LA 105 – Air Quality (vertical barriers), (2024).



3.0 Assessment Methodology

3.1 Construction Phase

3.1.1 Construction Dust Assessment

A construction dust assessment has been undertaken with reference to the IAQM Construction Dust guidance. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM₁₀; and
- Harm to ecological receptors.

The first stage of the assessment involves a screening review to determine if there are sensitive receptors within threshold distances of the site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- Human receptor is located within 250m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement by a technically competent assessor. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

Given the short-term nature of the construction phase and the low volume of vehicle movements that will likely arise when compared to the operational phase, it is unlikely that significant air quality effects from construction traffic will arise. These effects have therefore been scoped out of the assessment, which is a standard approach for a scheme of this nature and scale, and effects on air quality are considered to be 'insignificant' in accordance with the applied EPIC & IAQM guidance.

3.2 Operational Phase – Human Receptors

3.2.1 Detailed Road Traffic Emissions Assessment

In order to appropriately assess road traffic emission impacts associated with the operation of the Proposed Development, detailed dispersion modelling has been undertaken using the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5 dispersion model, focussing on concentrations of NO₂, PM₁₀ and PM_{2.5} for the following scenarios:

- 2023 Base Case (2023 BC) – Base flows for the model verification exercise;



- Full:
 - 2028 Do Minimum (2028 Full DM) – Future baseline (inclusive of any relevant committed development flows) corresponding to the earliest potential opening year of the full elements of the Proposed Development;
 - 2028 Do Something (2028 Full DS) – ‘Full Do Minimum’ flows, plus traffic generated by the full elements of the Proposed Development at full occupancy;
- Full + Outline:
 - 2030 Do Minimum (2030 Outline DM) – Future baseline (inclusive of any relevant committed development flows corresponding to the earliest potential opening year of the outline elements of the Proposed Development; and
 - 2030 Do Something (2030 Outline DS) – ‘Outline Do Minimum’ flows, plus traffic generated by the full + outline elements of the Proposed Development at full occupancy.

For the above scenarios, concurrent emission factors and background pollutant concentrations have been used.

Details of model inputs are discussed in turn below and traffic data input is presented in Appendix A.

3.2.2 Traffic Inputs

Traffic data was provided by Evoke Transport, the project’s transport consultant.

To inform the spatial extent of the model, changes in traffic volumes on the local road network were compared to the ‘indicative criteria for assessment’ provided by EPIC & IAQM guidance. These are as follows:

- Outside of an AQMA:
 - A change of Light-Duty Vehicle (LDV) flows of >500 as 24-hour Annual Average Daily Traffic (AADT); and/or
 - A change of Heavy-Duty Vehicle (HDV) flows of >100 as 24-hour AADT.
- Within, or within 200m of, an AQMA:
 - A change of LDV flows of >100 as 24-hour AADT; and/or
 - A change of HDV flows of >25 as 24-hour AADT.

For those links where distributed operational phase Proposed Development trips fall below the EPIC & IAQM indicative criteria for assessment, it can be concluded that at adjacent receptor locations trips will result in an ‘insignificant’ effect on air quality.

Where available, neighbouring road links (i.e. links within 200m of a modelled receptor) were also included within the dispersion model to facilitate a robust assessment, rather than rely on their individual contributions being represented within the appropriate background datasets. Further to this, the model includes road links adjacent to the Site to allow for assessment of site-suitability in relation to sensitive receptors introduced by the Proposed Development.

Traffic speeds were modelled at the relevant speed limit for each road. However, where appropriate, the speeds have been reduced to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue, in accordance with LAQM.TG(22). Traffic speeds have been assumed to be consistent across all the modelled scenarios.



The Emissions Factors Toolkit (EFT) version 13.1 developed by Defra²² has been used to determine vehicle emission factors for input into the ADMS-Roads dispersion model.

Full details of the traffic flows used in this assessment are provided in Appendix A, whilst the modelled roads in relation to the Site are presented in Figure B to Figure G.

3.2.3 Meteorological Data

The nearest synoptic meteorological station, Rothamsted, is located approximately 6km north-west of the Site. However, Rothamsted does not provide wind speed or direction data. As such, 2023 Numerical Weather Prediction (NWP) meteorological data centred on the Site has been utilised. The NWP data includes 8,760 lines of usable hourly data for the year (i.e. 100%) and is therefore suitable for the dispersion modelling exercise.

The determination of surface roughness utilised the CORINE (Coordination of Information on the Environment) Land Cover dataset from the European Environment Agency's Copernicus Land Monitoring Service²³. A surface roughness value of 0.5m was used to represent the locale of the Site (corresponding closest to 'parkland, open suburbia').

A wind rose for the 2023 NWP meteorological data is presented in Figure A.

²² Defra, EFT v13.1, (2025). Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>.

²³ Copernicus, CORINE Land Cover. Available at: <https://land.copernicus.eu/en/products/corine-land-cover>.



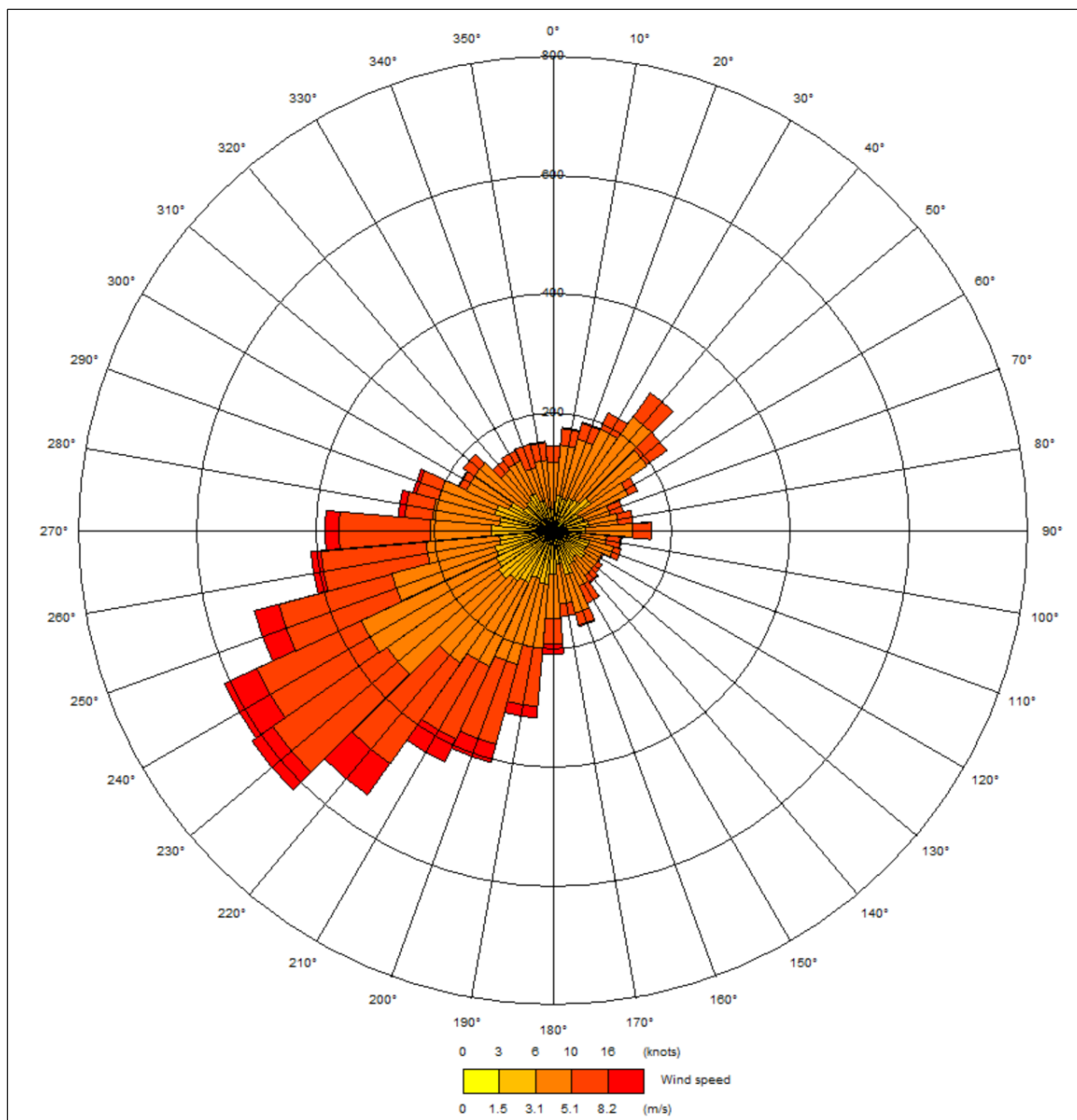


Figure A: Wind Rose for the 2023 NWP Meteorological Data

3.2.4 Background Concentrations

Annual mean background concentrations used for the purposes of the assessment have been obtained from the Defra supplied background maps (2021 reference year)²⁴, based on the 1km grid squares which cover the modelled area. Further detail on these datasets can be found in Section 4.4.

To avoid double counting of potential background sources already contained within the ADMS-Roads dispersion model, relevant sources were removed from the appropriate background map grid square. This was limited to the removal of 'Primary A-Road in'.

²⁴ Defra, Background Mapping data for local authorities - reference year of 2021. Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>.



As the relationship between NO₂ and NO_x is not linear, the NO₂ Adjustment for NO_x Sector Removal Tool²⁵ has been used - in accordance with LAQM.TG(22).

These background datasets represent ground level concentrations. No adjustment for background concentration variability with height has been made.

3.2.5 Sensitive Receptors

Human receptors considered in the assessment of emissions from road traffic are shown Table C and , whilst their locations are illustrated in Figure B to Figure F.

For the full element, receptors F-ER1 to F-ER13 are representative of worst-case exposure locations at existing receptors within the locale of the Site, relative to the affected road network discussed. New receptors introduced as a result of the full elements of the Proposed Development, F-PR1 to F-PR3, are selected as the locations of worst-case exposure across the full application area of the Site, based upon the Masterplan²⁶.

For the outline element, receptors O-ER1 to O-ER20 are representative of worst-case exposure locations at existing receptors within the locale of the Site, relative to the affected road network discussed. One new receptor introduced as a result of the outline elements of the Proposed Development, O-ER1, is selected as the location of worst-case exposure across the outline application area of the Site, based upon the Masterplan²⁶. The new receptors introduced as a result of the full elements of the Proposed Development, F-PR1 to F-PR3 are treated as existing receptors in the assessment of road traffic emissions impacts for the outline model scenarios.

Receptors were considered in relation to exposure at breathing height for adults relative to the adjacent modelled road at ground and 1st floor level where relevant (i.e. 1.5m and 4.5m).

Receptor locations represent relevant exposure to the annual mean AQALs – in accordance with LAQM.TG(22) presented in Table B.

Table C: Receptor Locations Considered

Receptor ID	NGR (m)		Height (m)
	X	Y	
Full Element			
<i>Existing Receptors</i>			
F-ER1	517842	208505	1.5
F-ER2	517432	208269	1.5
F-ER3	517365	208291	1.5
F-ER4	517248	208232	1.5
F-ER5	517186	208200	1.5
F-ER6	517171	208169	1.5
F-ER7	516944	208163	1.5
F-ER8	514733	207087	4.5
F-ER9	514738	207099	4.5

²⁵ Defra, NO₂ Adjustment for NO_x Sector Removal Tool v9.0, (2024). Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-adjustment-for-nox-sector-removal-tool/>

²⁶ BM3, Drawing Number: D-150, (08.2025).



Receptor	NGR (m)		Height (m)
	ID	X	
F-ER10	514770	207075	4.5
F-ER11	514769	207089	4.5
F-ER12	514684	207074	4.5
F-ER13	514694	207061	4.5
Proposed Receptors			
F-PR1	517961	208463	1.5
F-PR2	517932	208464	1.5
F-PR3	517731	208402	1.5
Outline Element			
Existing Receptors			
O-ER1	517842	208505	1.5
O-ER2	517432	208269	1.5
O-ER3	517365	208291	1.5
O-ER4	517248	208232	1.5
O-ER5	517186	208200	1.5
O-ER6	517171	208169	1.5
O-ER7	516944	208163	1.5
O-ER8	514733	207087	4.5
O-ER9	514738	207099	4.5
O-ER10	514770	207075	4.5
O-ER11	514769	207089	4.5
O-ER12	514684	207074	4.5
O-ER13	514694	207061	4.5
O-ER14	516643	208083	1.5
O-ER15	515997	208025	1.5
O-ER16	515939	208001	1.5
O-ER17	515381	207944	1.5
O-ER18	515239	207963	1.5
O-ER19	517989	208514	1.5
O-ER20	518167	208494	1.5
F-PR1	517961	208463	1.5
F-PR2	517932	208464	1.5
F-PR3	517731	208402	1.5
Proposed Receptor			
O-PR1	517853	208430	1.5



3.2.6 Model Outputs

Background pollutant concentrations discussed in Section 4.4 have been used in conjunction with the concentrations predicted by the ADMS-Roads model to calculate predicted total annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} for each respective scenario.

For the prediction of annual mean NO₂ concentrations for all modelled scenarios at receptor locations, the road-NO_x contributions (adjusted as per Appendix B) have been converted to total NO₂ following the methodology in LAQM.TG(22) using the latest version of Defra’s NO_x to NO₂ calculator (v9.1)²⁷. The traffic mix within the calculator was set to “All non-urban UK traffic” and “St Albans” was selected as the local authority for the modelled verification sites and modelled receptors. The modelled NO₂ road contribution was then added to the appropriate NO₂ background concentration value to obtain an overall total annual mean NO₂ concentration.

For the prediction of short-term NO₂ impacts, LAQM.TG(22) advises that it is valid to assume that exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur where the annual mean NO₂ concentration is <60µg/m³. This approach has thus been adopted for the purposes of this assessment, at relevant receptor locations with an applicable exposure period.

For the prediction of short-term PM₁₀, LAQM.TG(22) provides an empirical relationship between the annual mean and the number of exceedences of the 24-hour mean AQAL for PM₁₀ that can be calculated as follows:

$$\text{No. 24-hour mean exceedences} = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$$

This relationship has thus been adopted to determine whether exceedences of the short-term PM₁₀ AQAL are likely in this assessment.

Verification of the ADMS-Roads assessment has been undertaken as per Appendix B. All results presented in the assessment are calculated following the process of model verification. Zonal verification was undertaken to account for observed differences in the performance of the dispersion model.

3.2.7 Assessing Significance

Guidance for determining operational phase effects associated with air quality is provided by EPIC & IAQM.

3.2.7.1 Existing Receptors

When describing the developmental impact at a specific existing receptor, the resultant total concentration as well as the magnitude of change in relation to respective AQALs are both considered – using the approach detailed in Table D.

Table D: Impact Descriptor Matrix for Receptors

Long Term Average Concentration at Receptor in Assessment Year	Change in Concentration relative to AQAL			
	1% (A)	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate

²⁷ Defra, NO_x to NO₂ Calculator v9.1, (2024). Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-adjustment-for-nox-sector-removal-tool/>.



Long Term Average Concentration at Receptor in Assessment Year	Change in Concentration relative to AQAL			
	1% ^(A)	2-5%	6-10%	>10%
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Note: ^(A) Changes <0.5% will be described as Negligible.				

Following derivation of impacts at all receptor locations assessed, the overall significance of the developmental ‘effect’ is determined based upon consideration, as necessary, of the following factors:

- The existing and future air quality in the absence of the Proposed Development;
- The extent of current and future population exposure to the impacts;
- The worst-case assumptions adopted when undertaking the prediction of impacts; and
- The extent to which the Proposed Development has adopted best practice to eliminate and minimise emissions.

3.2.7.2 Proposed Receptors

To determine the significance of predicted air quality impacts based upon a site-suitability assessment, the EPIC & IAQM guidance states:

“Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means.”

In line with this, modelled pollutant concentrations predicted at future receptors have been compared with the relevant AQALs to determine whether further consideration is required or whether effects can be considered ‘not significant’.

3.2.8 Uncertainty

Dispersion modelling is inherently uncertain and is principally reliant on the accuracy and representativity of its inputs. In acknowledgement of this, the ADMS-Roads dispersion model has been verified with the latest monitoring data published by SACDC (see Section 4.2). Details of the verification exercise are shown in Appendix B. Following verification, all model output statistical parameters (used to evaluate model performance and uncertainty) are within Defra’s LAQM.TG(22) prescribed tolerances.

In addition, historically there is a widely acknowledged disparity between emission factors and ambient monitoring data²⁸. To help minimise any associated uncertainty when forming conclusions from the results, the assessment has utilised the latest suite of air quality assessment tools released by Defra. This includes the EFT (version 13.1) utilising COPERT 5.8 emission factors.

While the datasets used reflect best-available information, disparities may still arise between nationally derived projections (which assume ongoing improvements in air quality) and actual local conditions. It is therefore important to review local monitoring data to confirm whether local trends align with national projections, thereby validating their use.

²⁸ Carslaw, et al., Trends in NO_x and NO₂ emissions and ambient measurements in the UK, (2011).



As detailed in Section 4.0, local monitoring data indicates a consistent reduction in annual mean NO₂ concentrations at roadside locations within the study area. Consequently, the use of national emission factors and projected background concentrations to simulate future conditions is considered appropriate, especially as the dispersion model has been calibrated using local monitoring data.

Nevertheless, to maintain a conservative approach, 2028 and 2030 have been selected as the future assessment year for the full and outline elements of the Proposed Development, respectively, representing full occupancy for both. In reality, full occupancy is expected to occur at a later date, when air quality conditions are anticipated to have improved further. Assessing maximum operational traffic flows under 2028 and 2030 conditions therefore provides precautionary scenarios. Actual pollutant concentrations are therefore expected to be lower than those predicted.

Given the above, further sensitivity modelling is not considered relevant or appropriate.

3.3 Operational Phase – Ecological Receptors

3.3.1 Road Traffic Emissions Screening Assessment

The assessment procedure outlined within the IAQM Nature guidance document has been used in relation to the assessment of sensitive ecological receptors, in conjunction with the DMRB guidance. The IAQM Nature guidance initially comprises a screening assessment irrespective of current baseline rates to indicate whether:

- Any sensitive qualifying features are located within 200m of a road link projected to experience developmental-generated vehicle movements; and
- The Proposed Development (project-alone for national and local sites) is likely to generate either >1,000 AADT (total traffic) and/or >200 HDV on a road link.

The outcomes of the above will determine whether impacts associated with the Proposed Development could result in '*no likely significant effect*' on the assessed ecological feature – providing the location of the screened ecological receptor can be validated.

If the above conditions are not met, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects can be classed as 'insignificant'.



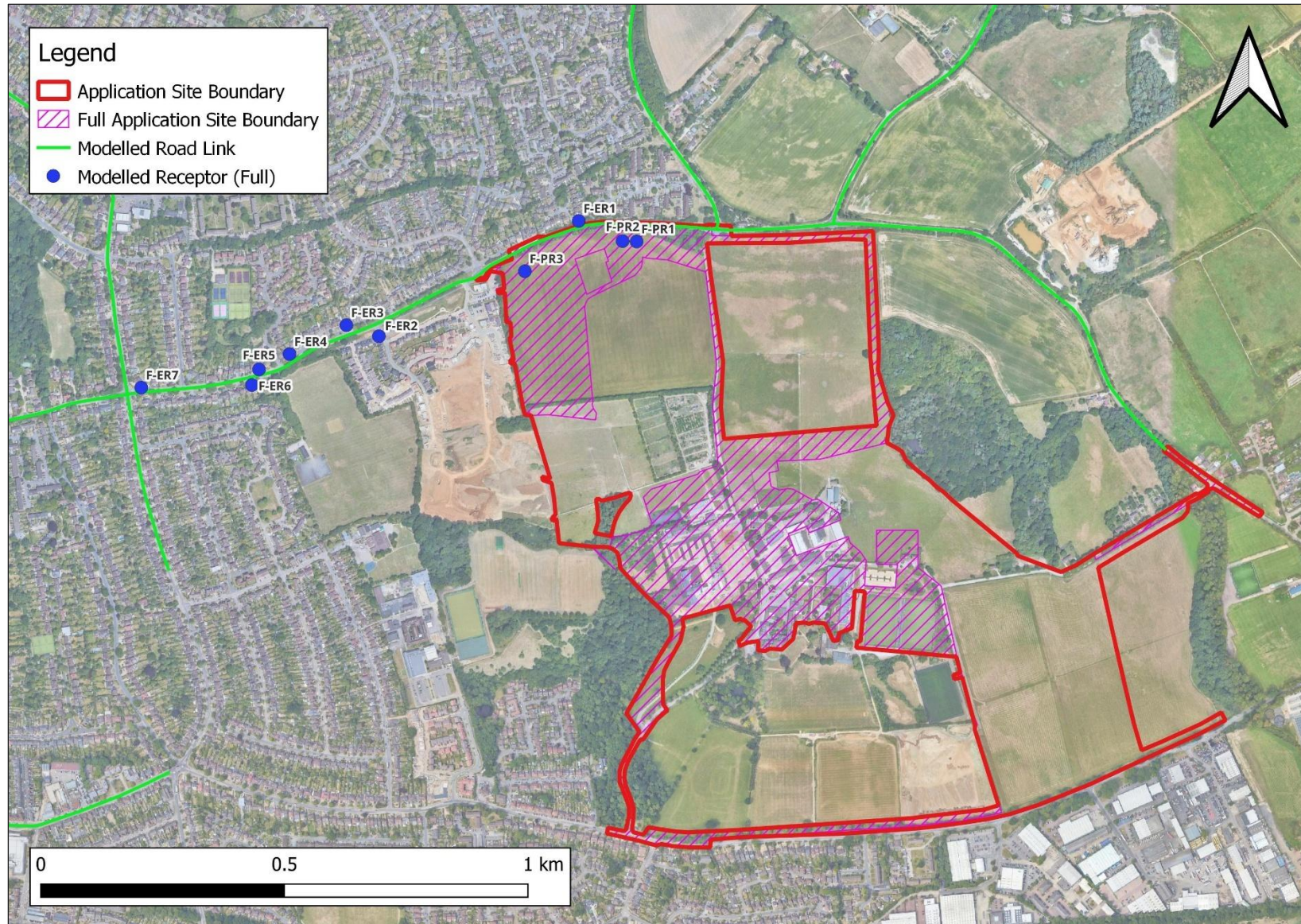


Figure B: Modelled Road Network & Full Receptors 1



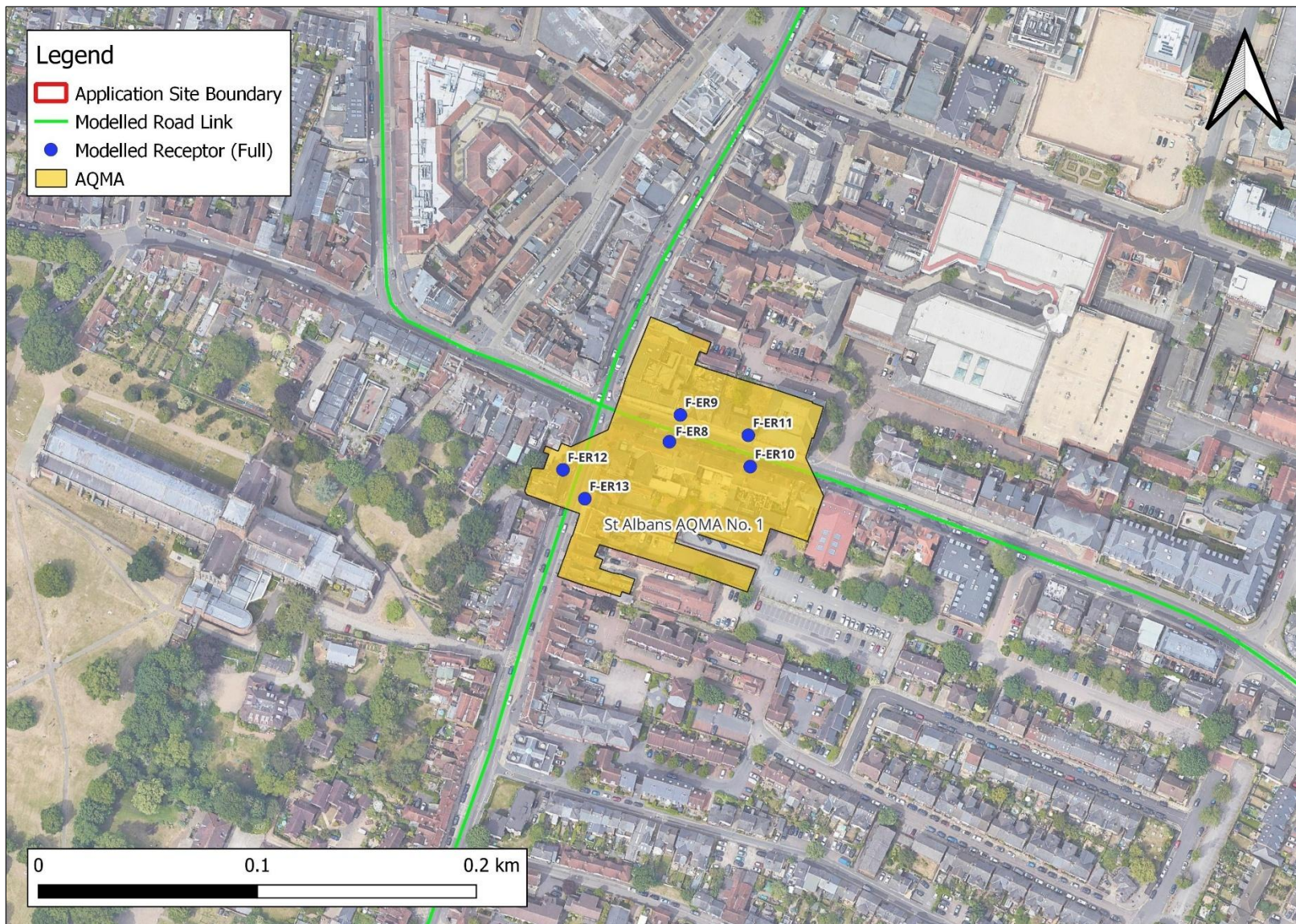


Figure C: Modelled Road Network & Full Receptors 2



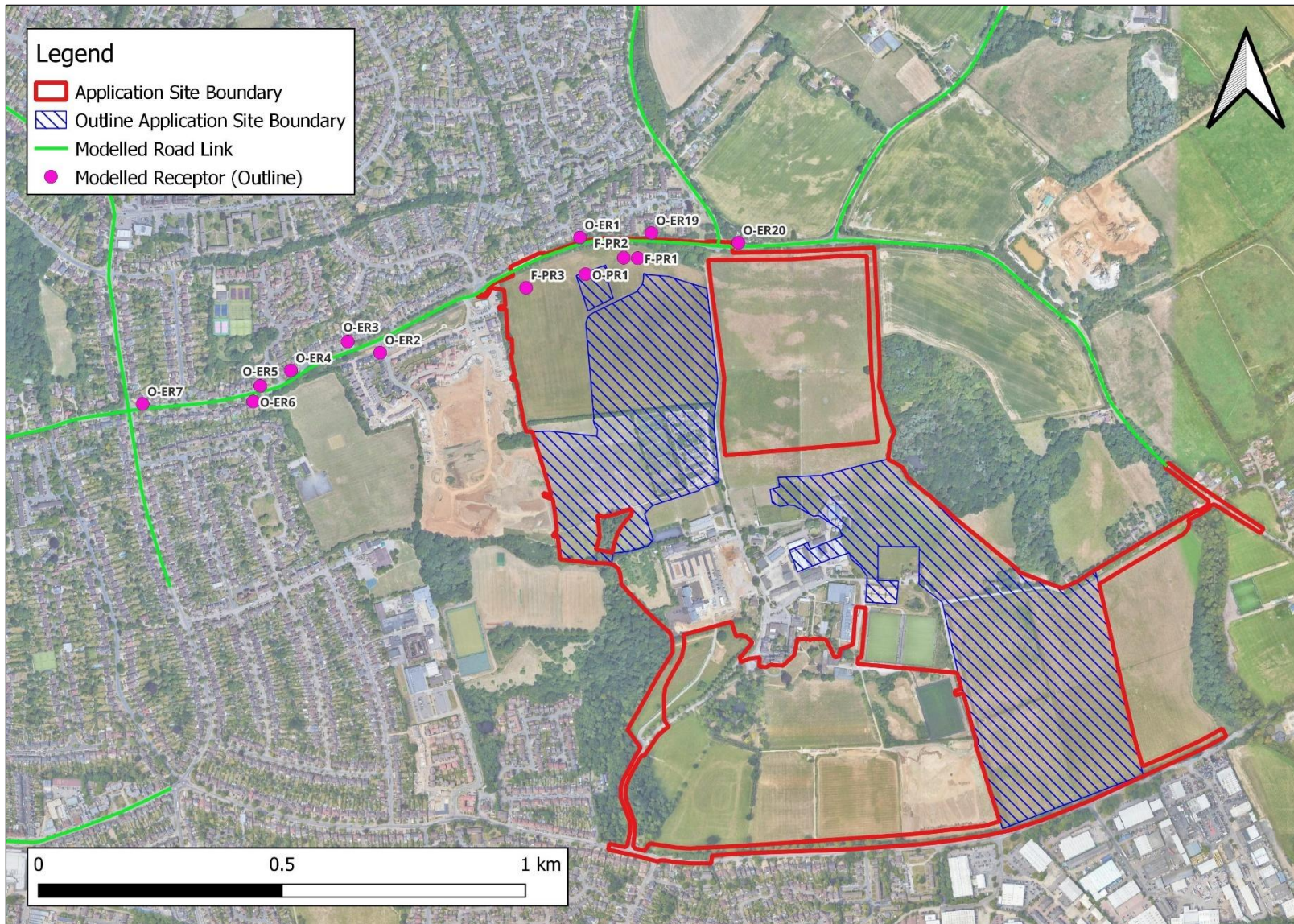


Figure D: Modelled Road Network & Full + Outline Receptors 1





Figure E: Modelled Road Network & Full + Outline Receptors 2



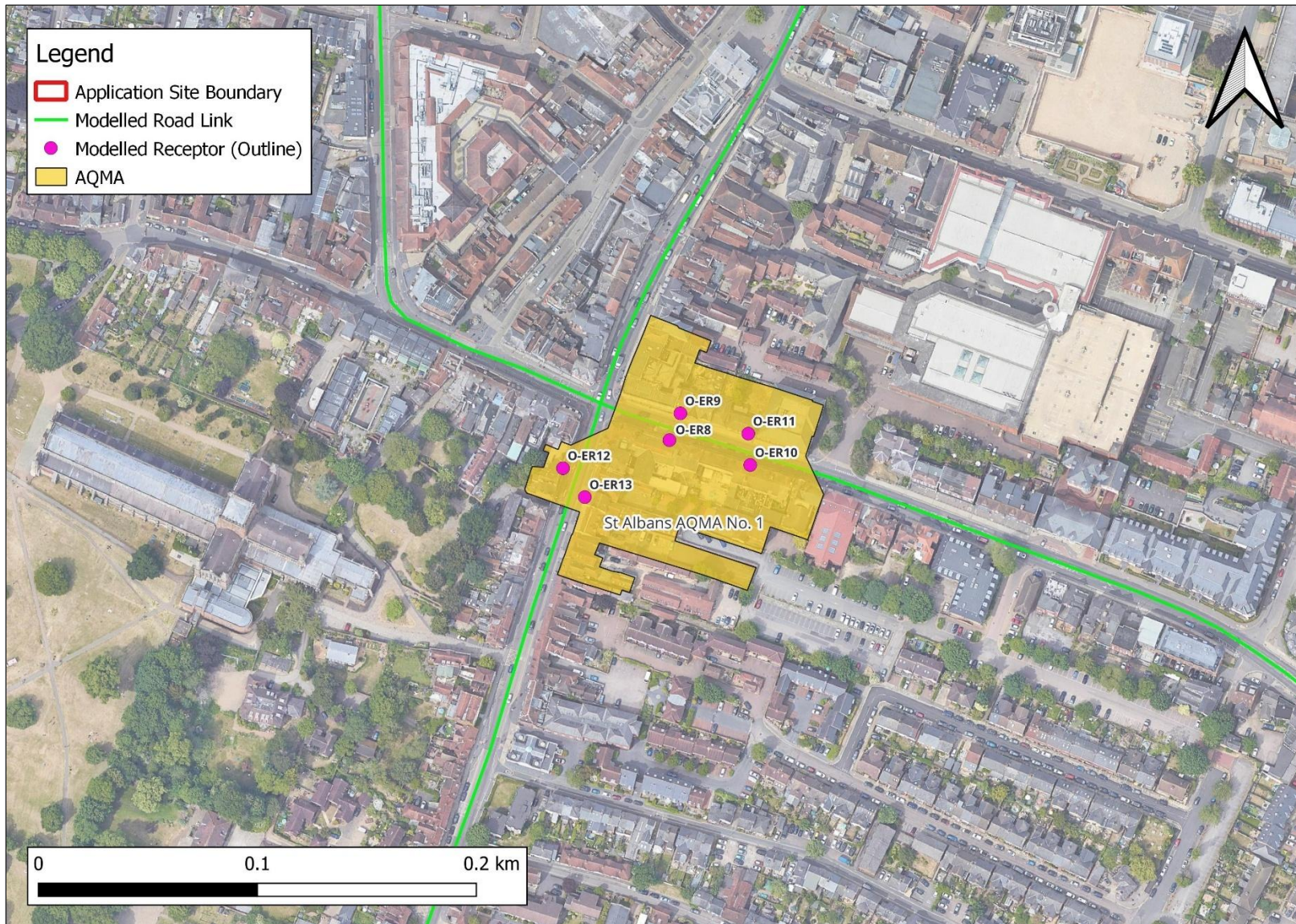


Figure F: Modelled Road Network & Full + Outline Receptors 3





Figure G: Modelled Road Network & Verification



4.0 Baseline Environment

Pollutant concentrations monitored during 2020 and 2021 (i.e. affected by the COVID-19 pandemic) are expected to be atypical and not representative of the local environment. However, this data has been presented for completeness.

4.1 LAQM Review and Assessment

The latest publicly available LAQM report for SACDC at the time of writing is the 2024 Air Quality Annual Status Report²⁹ (ASR) (inclusive of 2019 – 2023 monitoring datasets).

At present, SACDC currently has one declared AQMA within its administrative area, the 'St Albans AQMA No. 1, located approximately 3km west of the Site, as shown in Figure H. This AQMA was declared in 2004 due to exceedences of the annual mean NO₂ and PM₁₀ 24-hour mean AQALs at locations of relevant exposure and is described as 'The area comprising of odd numbers 1-7 London Road, 1-11c Holywell Hill and even numbers London Road, St Albans'.

4.2 Review of Air Quality Monitoring

4.2.1 Automatic Air Quality Monitoring

Automatic pollutant monitoring is not currently undertaken by SACDC.

The closest automatic monitor to the Site is WHNOX operated by Welwyn Hatfield Borough Council (WHBC), located approximately 3.2km to the east of Site. WHNOX is situated adjacent to the A1001 Comet Way and approximately 25m from the A1(M), a major road link with high traffic flows. Given the setting of this monitor and the separation distance from the Site, pollutant concentrations are not anticipated to be representative of baseline conditions at the Site. LAQM automatic monitoring has not been considered further within this assessment.

No monitors associated with the Automatic Urban and Rural Network (AURN) are located within 10km of the Site. The AURN monitoring network has therefore not been considered further within this assessment.

4.2.2 Diffusion Tube Monitoring

Passive NO₂ diffusion tube monitoring is currently undertaken by SACDC at numerous locations within its administrative area.

The details and results of the monitoring locations closest to the Site are presented in Table E and Table F, respectively, whilst their locations are illustrated in Figure H. All monitoring data presented has been ratified by SACDC.

Table E: Local NO₂ Diffusion Tube Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Height (m)	Approximate Distance (km) to Site
		X	Y		
SA169	Roadside ^(A)	516887	207702	2.5	0.9
SA120	Kerbside ^(B)	520053	206618	2.3	1.3
SA114	Urban Background ^(C)	516549	207391	2.5	1.3

²⁹ SACDC, 2024 Air Quality Annual Status Report, (2024).



Site ID	Site Type	NGR (m)		Height (m)	Approximate Distance (km) to Site
		X	Y		
SA150	Kerbside ^(B)	516590	207276	2.3	1.3
SA168	Roadside ^(A)	516144	207318	2.5	1.7
SA167	Roadside ^(A)	515990	207769	2.5	1.8
SA165	Roadside ^(A)	515316	207719	2.5	2.4
SA140	Kerbside ^(B)	515185	207070	2.5	2.7
SA166	Roadside ^(A)	515144	206984	2.5	2.7
SA101	Roadside ^(A)	515105	207476	2.7	2.7
SA149	Roadside ^(A)	515067	206946	2.6	2.8
SA135	Kerbside ^(B)	515060	206866	2.5	2.8
SA164	Roadside ^(A)	515024	207071	2.5	2.8
SA157	Kerbside ^(B)	514840	207613	2.4	2.9
SA136	Kerbside ^(B)	514883	207422	2.3	2.9
SA146	Urban Background ^(C)	514856	207353	2.6	3.0
SA144	Kerbside ^(B)	514833	207347	2.6	3.0
SA147	Urban Background ^(C)	514818	207357	2.5	3.0
SA161	Kerbside ^(B)	514787	207069	2.5	3.1
SA143	Kerbside ^(B)	514752	207094	2.6	3.1
SA138	Kerbside ^(B)	514701	207082	2.6	3.2
SA156	Roadside ^(A)	514602	207674	2.4	3.2
SA162	Roadside ^(A)	514596	207338	2.5	3.2
SA148	Kerbside ^(B)	514705	207119	2.4	3.2
SA160	Roadside ^(A)	514682	207060	2.4	3.2
SA137	Kerbside ^(B)	514684	207105	2.5	3.2
SA134	Kerbside ^(B)	514648	206919	2.6	3.3
SA163	Roadside ^(A)	514646	206942	2.5	3.3
SA133	Kerbside ^(B)	514606	206801	2.4	3.3

Notes:

- ^(A) Roadside site classification defined by LAQM.TG(22) as: "a site sampling typically within one to five metres of the kerb of a busy road".
- ^(B) Kerbside site classification defined by LAQM.TG(22) as: "a site sampling typically within one metre of the kerb of a busy road".
- ^(C) Urban background site classification defined by LAQM.TG(22) as: "An urban location distanced from sources and therefore broadly representative of city-wide background conditions, e.g. urban residential areas".



Table F: Local NO₂ Diffusion Tube Monitoring Sites: Results

Site ID	2023 Data Capture %	Annual Mean NO ₂ Concentration (µg/m ³)				
		2019	2020	2021	2022	2023
SA169	59.6	-	-	-	13.1	12.4
SA120	92.3	29.8	20.2	20.7	20.3	18.5
SA114	100	27.2	20.7	23.1	22.5	19.1
SA150	100	31.5	21.9	20.5	20.7	20.1
SA168	100	-	-	-	21.4	20.5
SA167	100	-	-	-	20.4	18.2
SA165	100	-	-	-	25.1	23.3
SA140	100	26.3	17.3	18.3	18.1	16.4
SA166	100	-	-	-	20.9	16.9
SA101	100	29.1	19.3	21.3	21.1	19.9
SA149	100	30	20.2	21.6	23.5	19.9
SA135	100	32.8	20.1	23	22.5	21
SA164	100	-	-	-	22.5	17.5
SA157	100	40.8	29.1	32.1	29.1	27.9
SA136	90.4	45.6	25.3	38.6	34.2	32.4
SA146	65.4	29.6	19	21.6	21.7	20.2 (A)
SA144	84.6	38.2	28.7	30.4	29	28.5
SA147	100	39.7	24.4	25.7	24.5	23.7
SA161	100	38.7	23.9	23.1	27.9	23.2
SA143	92.3	40.8	25.6	26.2	28.2	24.4
SA138	100	43.6	27.5	29.5	31.6	28.1
SA156	100	35.9	24.9	26.9	26.4	23.4
SA162	100	-	-	-	22.3	18.8
SA148	100	49	35.8	38.4	35.6	34.4
SA160	100	54.7	36.7	39.2	39.4	36.3
SA137	65.4	41.8	25.7	24.8	31.4	27.1
SA134	100	36.4	20.9	23	23.9	21.3
SA163	100	-	-	-	36.1	32.8
SA133	100	33.4	21.5	25.2	25.1	22.4
Note: (A) The presented monitored concentration has been annualised by SACDC in accordance with LAQM.TG(22).						

As shown in Table F, annual mean NO₂ concentrations above the AQAL (40µg/m³) were recorded at monitors SA136, SA137, SA138, SA143, SA148, SA157 and SA160 in 2019. There were no exceedences of the annual mean NO₂ AQAL in 2023, however monitored 2023 annual mean NO₂ concentrations were within 10% of the AQAL (i.e. >36 µg/m³) at



SA160. Given the ‘roadside’ classification of SA160 within the St Albans AQMA No.1, annual mean NO₂ concentrations are likely to be elevated.

Where data is available, there is a downward trend in annual mean NO₂ concentrations over the presented period across all diffusion tube monitors, demonstrating local improvements in NO₂ concentrations at key roadside locations, correlating with national projections.

The empirical relationship given in LAQM.TG(22) states that exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur where annual mean concentrations are <60µg/m³. This indicates that an exceedence of the 1-hour mean AQAL was unlikely to have occurred at the diffusion tube monitoring locations.

4.3 Defra’s Pollution Climate Mapping Model

The Pollution Climate Mapping (PCM) model³⁰ is a collection of models which provides base and future projections of annual mean pollutant concentrations across the UK. The PCM model provides NO₂ concentrations predicted at roadside locations for major roads in the UK. These modelled predictions relate to receptor locations situated 4m from the road at a height of 2m and therefore exhibit roadside conditions where concentrations are expected to decline with further distance from the road source.

The latest dataset includes semi-empirical roadside annual average concentration estimates for NO₂ using a base year of 2018 (the year in which comparisons between modelled and monitored concentrations are made).

The 2023, 2028 and 2030 annual mean NO₂ concentrations predicted for road links adjacent to the Site and within the road traffic assessment study area are presented in Table G and illustrated in Figure H.

Predicted annual mean NO₂ concentrations for 2023, 2028 and 2030 are all ‘well-below’ the AQAL.

Table G: PCM Modelled Annual Mean NO₂ Concentrations

Road Link	Census ID	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		2023	2028	2030
A1057 Hatfield Road	802078321	16.1	12.2	11.8
A1081 Harpenden Road	802078322	15.2	12.2	11.4
A1081 St. Peter’s Street	802036176	20.2	15.8	14.7
A4147 Folly Lane	802037132	17.3	13.7	12.8
A1081 St. Peter’s Street (High Street)	802016168	18.6	14.3	13.3
A5183 Verulam Road	802047965	15.4	12.4	11.7
A1081 London Road	802046181	18.0	14.0	13.0
A5183 Holywell Hill	802006149	16.8	13.0	12.0

4.4 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution. The latest datasets include annual average

³⁰ Defra, Pollution Climate Mapping. Available at: <https://uk-air.defra.gov.uk/research/air-quality-modelling?view=modelling>.



concentration estimates for NO_x, NO₂, PM₁₀ and PM_{2.5} using a reference year of 2021 (the year in which comparisons between modelled and monitored concentrations are made).

The Defra mapped background concentrations for the modelled base year (2023) and the earliest predicted opening year of the full and outline elements of the Proposed Development (2028 and 2030) are presented in Table H below.

All mapped background concentrations presented are 'well-below' (i.e. <75%) the respective annual mean AQALs.

Table H: Defra Mapped Background Pollutant Concentrations

Grid Square (X, Y) (m)	Year	Annual Mean Concentration (µg/m ³)			
		NO _x	NO ₂	PM ₁₀	PM _{2.5}
518500, 207500 South-east of the Site	2023	13.3	10.2	13.0	7.7
	2028	10.8	8.4	12.5	7.2
	2030	9.9	7.7	12.4	7.1
518500, 208500 North-east of the Site and Receptor O-ER20	2023	13.4	10.2	13.2	7.6
	2028	11.2	8.7	12.7	7.1
	2030	10.3	8.0	12.5	7.0
517500, 207500 South-west of the Site	2023	13.9	10.6	13.1	8.1
	2028	11.2	8.7	12.6	7.6
	2030	10.2	7.9	12.4	7.4
517500, 208500 North-west of the Site and Receptors F-ER1 to F-ER6, F-PR1 to F-PR3, O- ER1 to O-ER6, O-ER19 and O-PR1	2023	13.4	10.3	13.1	8.0
	2028	10.9	8.5	12.6	7.5
	2030	9.9	7.7	12.4	7.4
519500, 207500 East of the Site	2023	14.0	10.7	13.0	7.6
	2028	11.6	8.9	12.5	7.1
	2030	10.6	8.2	12.3	7.0
516500, 208500 Receptors F-ER7, O-ER7 and ER14	2023	13.9	10.6	12.8	8.0
	2028	11.3	8.8	12.3	7.6
	2030	10.3	8.0	12.1	7.4
514500, 207500 Receptors F-ER8 to F-ER13 and O-ER8 to O-ER13	2023	16.0	12.1	13.6	8.3
	2028	12.8	9.8	13.1	7.8
	2030	11.5	8.9	12.9	7.6
515500, 208500 Receptors O-ER15 and O-ER16	2023	15.0	11.4	13.1	8.2
	2030	11.4	8.8	12.4	7.5
515500, 207500 Receptors O-ER17 and O-ER18	2023	16.4	12.3	13.4	8.3
	2030	12.2	9.4	12.7	7.6
AQAL		-	40	40	20



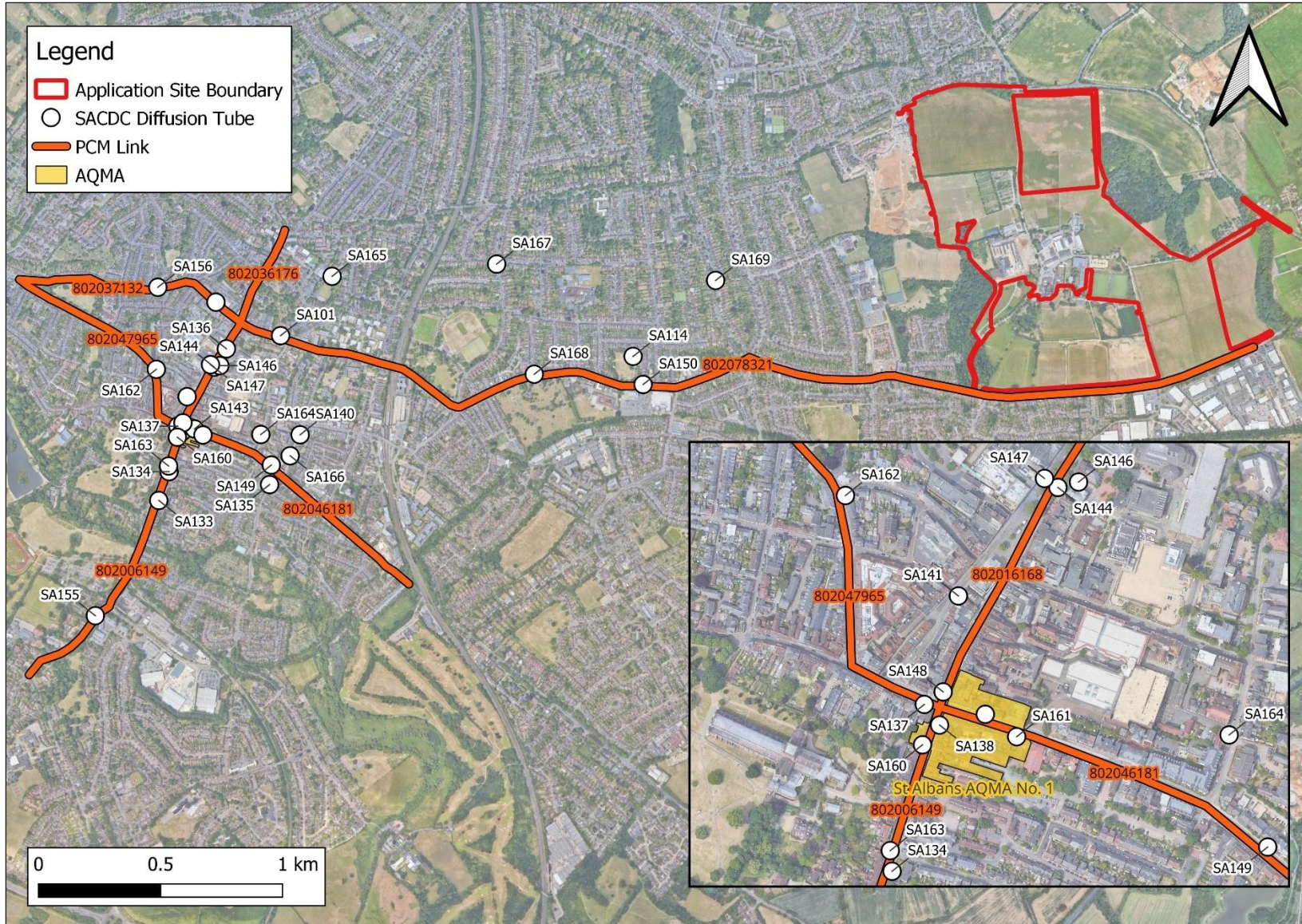


Figure H: Baseline Context



5.0 Construction Phase Assessment

This section presents the potential air quality impacts and effects associated with the construction phases of the full and outline elements of the Proposed Development.

5.1 Construction Dust Assessment

Where figures relating to area and volume of the Site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM Construction Dust guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1.1 Assessment Screening

There are human receptors within 250m of the Site and within 50m of the roads up to 250m from the Site exits anticipated to witness construction traffic movements. Similarly, designated habitat sites are within 50m of the Site and within 50m of the same roads. Therefore, an assessment of construction dust on both human and ecological receptors is required.

Reference should be made to Figure I and Figure J for presentation of relevant construction phase receptors / buffer zones associated with the full and outline elements of the Proposed Development.

5.1.2 Potential Dust Emission Magnitudes

5.1.2.1 Demolition

The Site currently comprises agricultural land, along with the existing college grounds which include various sports pitches and buildings, some of which require demolition, which is expected to occur in the first year of construction works at the Site.

For the full and outline elements, a total building volume of 12,000-75,000m³ will require demolition. Materials to be demolished include brick and concrete which have a high potential for dust release. The dust emission magnitude for demolition is therefore considered to be 'medium'.

5.1.2.2 Earthworks

The total area of the Site estimated to require earthworks is >110,000m² and it is estimated that >10 heavy earth moving vehicles could be active at one time. Each of the full and outline elements individually represent an area of >110,000m² which require earthworks and >10 active heavy earth moving vehicles that could be active at one time. However, due to the phasing of construction works across the 9-year period from 2026 to 2034, the area requiring earthworks is expected to be 18,000-110,000m² at any point during construction and require 5-10 heavy earth moving vehicles. The dust emission magnitude for earthworks is therefore considered to be 'medium'.

5.1.2.3 Construction

The total building volume associated with the Proposed Development is estimated to be >75,000m³, with each of the full and outline elements individually representing >75,000m³. Materials used for construction are expected to include brick and concrete which have a high potential for dust release. However, due to the phasing of construction works across the 9-year period from 2026 to 2034, the total building volume is estimated to be 12,000-75,000m³ at any point during construction. The dust emission magnitude for construction is therefore considered to be 'medium'.



5.1.2.4 Trackout

Construction vehicles are expected to access the Site via three access points, via Sandpit Lane, Hatfield Road and Oaklands Lane, and construction vehicles are expected to access both the full and outline elements via all three accesses. No details are available at the time of assessment regarding the number of HDV movements associated with construction works. However, the peak number of predicted outward HDV movements is estimated to be 20-50 per day via each access and there will be no overlap between the distance buffer zones associated with each access / egress. The unpaved road length is likely to be 50-100m any given time. The dust emission magnitude for trackout is therefore considered to be 'medium'.

5.1.2.5 Summary

A summary of the potential dust emission magnitude for each of the activities is displayed in Table I.

Table I: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Medium
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.3 Sensitivity of the Area

5.1.3.1 Dust Soiling Impacts

The construction of the full and outline elements is expected to occur over a 9-year period from 2026 to 2034, however the duration of construction of the outline elements could be subject to change and possible elongation. Therefore, there is the potential for earlier phases to be built-out and occupied during the phased construction period, and thus become a sensitive receptor to potential impacts from construction activity associated with later phases. This sequencing and presence of on-site receptors has been considered in the overall determination of sensitivity. It is noted that this precautionary approach has the potential to overestimate sensitivity and subsequent mitigation requirements.

There are estimated to be >100 'high' sensitivity receptors (i.e. residential properties and pupils³¹ associated with the operation of Oaklands College) within 20m of the Site. Furthermore, there are estimated to be >100 'high' sensitivity receptors (i.e. residential dwellings) within 20m of the Site access routes up to 250m from each of the Site exits.

The sensitivity of the area with respect to dust soiling effects on people and property is therefore considered to be 'high' in relation to demolition, earthworks, construction, and trackout.

³¹ These figures include a conservative estimate of the likely number of pupils associated with Oaklands College within the relevant distance bands; the IAQM Construction Dust guidance directs to apply the >100 receptor category to reflect a school / educational facility.



5.1.3.2 Human Health Impacts

The maximum background PM₁₀ concentration for the 1km² grid squares which cover the Site is estimated to be 13.2µg/m³, based upon 2023 mapped background estimates (i.e. falls into the <24µg/m³ class).

Given the above information regarding the number and nature of surrounding receptors within specified screening distances, the sensitivity of the area with respect to human health impacts is therefore considered to be 'medium' in relation to demolition, earthworks, construction and trackout.

5.1.3.3 Ecological Impacts

The Home Wood AW is within 20m of the full elements of the Site and within 50m of the outline elements of the Site, and within 20m of the trackout route along Hatfield Road up to 250m from the Site exit. However, no demolition associated with either the full or outline elements is expected to occur within 50m of Home Wood AW and therefore consideration of impacts associated with demolition activities on Home Wood AW has been scoped out.

The AW designation is considered to be of 'low' sensitivity to ecological impacts in accordance with the IAQM Construction Dust guidance.

The sensitivity of the area with respect to ecological impacts is therefore considered to be 'low' in relation to earthworks, construction and trackout.

5.1.3.4 Summary

A summary of the sensitivity of the area defined for each potential impact is displayed in Table J, whereas the spatial densities of receptors discussed in relation to the Site and access routes are illustrated in Figure I.

Table J: Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Medium	Medium	Medium	Medium
Ecological	n/a	Low	Low	Low

5.1.4 Risk of Impacts (Unmitigated)

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined in Table K below to determine the risk of impact which is used to inform the selection of appropriate mitigation.



Table K: Risk of Dust Impacts (Unmitigated)

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	Medium Risk	Medium Risk
Human Health	Medium Risk	Medium Risk	Medium Risk	Medium Risk
Ecological	n/a	Low Risk	Low Risk	Low Risk

5.1.5 Mitigation

Following the construction dust assessment, the Site is found to be at worst:

- Medium risk in relation to dust soiling effects on people and property;
- Medium risk in relation to human health impacts; and
- Low risk in relation to ecological impacts.

However, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

As a consequence of the identified dust risk, best practice mitigation measures as identified by IAQM Construction Dust guidance are required to minimise or eliminate potential impacts. These are outlined in Section 7.1. Provided these measures are effectively implemented, the residual effects are considered 'not significant'.



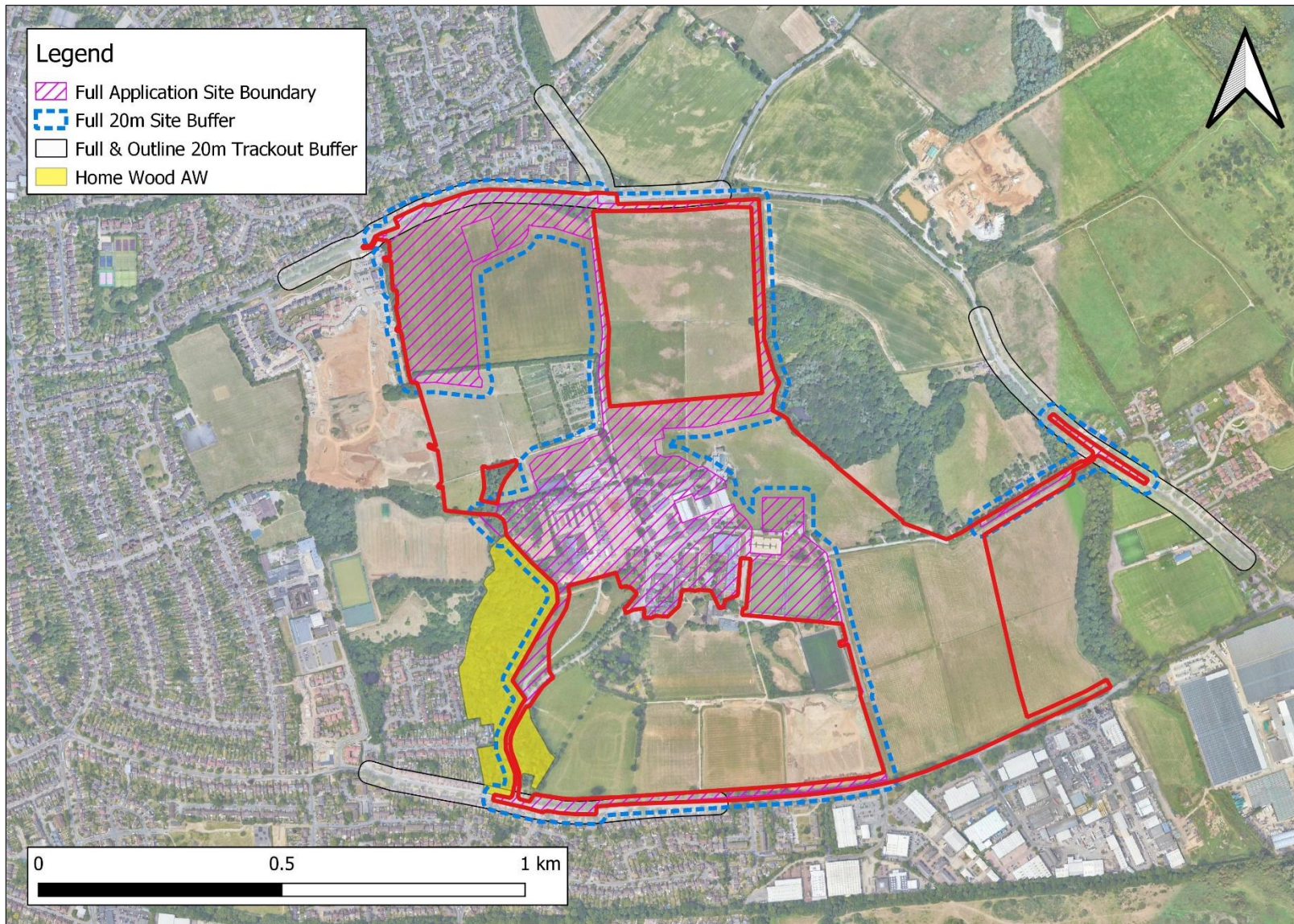


Figure I: Construction Dust Assessment Buffers – Full Application



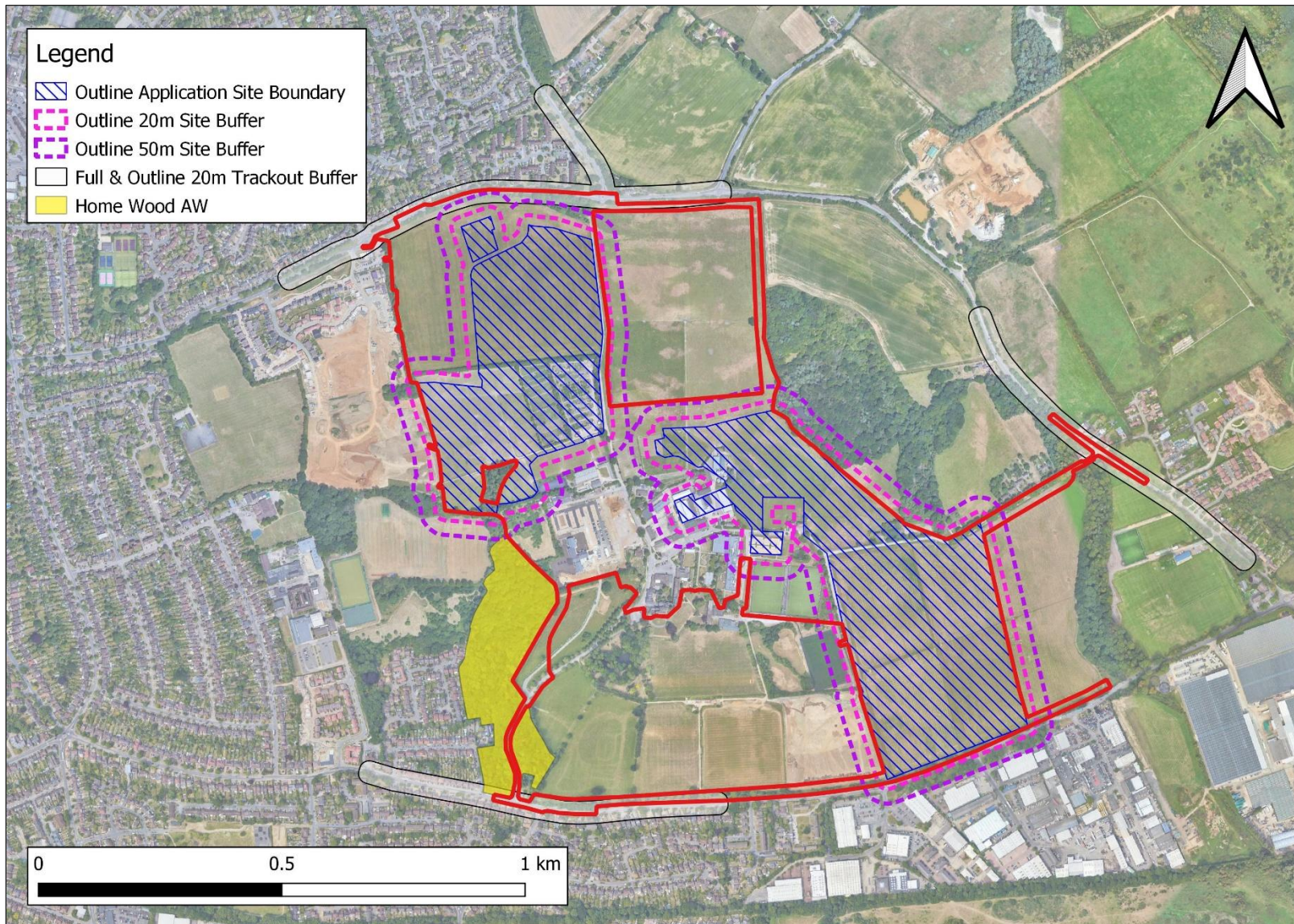


Figure J: Construction Dust Assessment Buffers – Outline Application



6.0 Operational Phase Assessment

This section presents the potential air quality impacts and effects associated with the operational phases of the full and full + outline elements of the Proposed Development.

6.1 Road Traffic Emissions Assessment – Human Receptors

6.1.1 Full Elements

6.1.1.1 NO₂ Modelling Results

Table L presents the annual mean NO₂ concentrations predicted at all assessed receptor locations for the 2023 BC, 2028 DM and 2028 DS scenarios.

Table L: Predicted Annual Mean NO₂ Concentrations & Impacts

Receptor	Predicted Annual Mean NO ₂ Concentration (µg/m ³)			% Change of AQAL	% of 2028 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2028 DM	2028 DS			
Existing Receptors						
F-ER1	17.7	13.0	13.1	0.4	32.8	Negligible
F-ER2	14.7	11.1	11.2	0.2	28.0	Negligible
F-ER3	16.1	11.9	12.0	0.3	30.0	Negligible
F-ER4	16.9	12.4	12.5	0.3	31.3	Negligible
F-ER5	19.4	13.9	14.1	0.4	35.3	Negligible
F-ER6	16.9	12.4	12.5	0.3	31.3	Negligible
F-ER7	28.0	19.2	19.4	0.5	48.5	Negligible
F-ER8	28.6	20.0	20.0	<0.1	50.0	Negligible
F-ER9	25.9	18.2	18.2	<0.1	45.5	Negligible
F-ER10	28.6	19.9	20.0	<0.1	50.0	Negligible
F-ER11	25.5	18.0	18.0	<0.1	45.0	Negligible
F-ER12	27.5	19.5	19.6	0.3	49.0	Negligible
F-ER13	26.2	18.6	18.7	0.2	46.8	Negligible
Proposed Receptors						
F-PR1	-	-	10.3	-	25.8	-
F-PR2	-	-	10.4	-	26.0	-
F-PR3	-	-	10.3	-	25.8	-

The outcomes are as follows:

- The impacts of the full elements of the Proposed Development on annual mean NO₂ concentrations are 'negligible' at all existing receptors;
- There are no predicted exceedences of the annual mean NO₂ AQAL at any existing or proposed receptor; and
- Exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur, in accordance with the empirical relationship given in LAQM.TG(22).



Based on the above, effects associated with NO₂ concentrations at the assessed receptor locations are therefore considered 'not significant'.

6.1.1.2 PM₁₀ Modelling Results

Table M presents the annual mean PM₁₀ concentrations predicted at all assessed receptor locations for the 2023 BC, 2028 DM and 2028 DS scenarios.

Table M: Predicted Annual Mean PM₁₀ Concentrations & Impacts

Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)			% Change of AQAL	% of 2028 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2028 DM	2028 DS			
Existing Receptors						
F-ER1	15.3	14.7	14.7	0.2	36.8	Negligible
F-ER2	14.4	13.9	13.9	0.1	34.8	Negligible
F-ER3	14.9	14.3	14.4	0.1	36.0	Negligible
F-ER4	15.2	14.6	14.6	0.2	36.5	Negligible
F-ER5	16.0	15.4	15.5	0.2	38.8	Negligible
F-ER6	15.2	14.6	14.6	0.2	36.5	Negligible
F-ER7	17.4	16.6	16.7	0.3	41.8	Negligible
F-ER8	18.7	17.8	17.8	<0.1	44.5	Negligible
F-ER9	17.8	17.0	17.0	<0.1	42.5	Negligible
F-ER10	18.7	17.8	17.8	<0.1	44.5	Negligible
F-ER11	17.7	16.9	16.9	<0.1	42.3	Negligible
F-ER12	18.2	17.4	17.5	0.1	43.8	Negligible
F-ER13	17.8	17.0	17.1	0.1	42.8	Negligible
Proposed Receptors						
F-PR1	-	-	13.5	-	33.8	-
F-PR2	-	-	13.5	-	33.8	-
F-PR3	-	-	13.4	-	33.5	-

The outcomes are as follows:

- The impacts of the full elements of the Proposed Development on annual mean PM₁₀ concentrations are 'negligible' at all existing receptors;
- There are no predicted exceedences of the annual mean PM₁₀ AQAL at any existing or proposed receptor; and
- The maximum predicted annual mean PM₁₀ concentration (F-ER8 and F-ER10) equates to approximately 1 day where 24-hour mean PM₁₀ concentrations are predicted to be >50µg/m³. This is below the 35 permitted number of exceedences.

Based on the above, effects associated with PM₁₀ concentrations at the assessed receptor locations are therefore considered 'not significant'.



6.1.1.3 PM_{2.5} Modelling Results

Table N presents the annual mean PM_{2.5} concentrations predicted at all assessed receptor locations for the 2023 BC, 2028 DM and 2028 DS scenarios.

Table N: Predicted Annual Mean PM_{2.5} Concentrations & Impacts

Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)			% Change of AQAL	% of 2028 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2028 DM	2028 DS			
Existing Receptors						
F-ER1	9.2	8.7	8.7	0.2	43.5	Negligible
F-ER2	8.7	8.2	8.2	0.1	41.0	Negligible
F-ER3	9.0	8.5	8.5	0.2	42.5	Negligible
F-ER4	9.1	8.6	8.6	0.2	43.0	Negligible
F-ER5	9.6	9.0	9.1	0.3	45.5	Negligible
F-ER6	9.1	8.6	8.6	0.2	43.0	Negligible
F-ER7	10.5	9.8	9.9	0.3	49.5	Negligible
F-ER8	11.0	10.3	10.3	<0.1	51.5	Negligible
F-ER9	10.5	9.8	9.8	<0.1	49.0	Negligible
F-ER10	11.0	10.3	10.3	<0.1	51.5	Negligible
F-ER11	10.5	9.8	9.8	<0.1	49.0	Negligible
F-ER12	10.8	10.1	10.1	0.1	50.5	Negligible
F-ER13	10.6	9.9	9.9	0.1	49.5	Negligible
Proposed Receptors						
F-PR1	-	-	8.0	-	40.0	-
F-PR2	-	-	8.0	-	40.0	-
F-PR3	-	-	8.0	-	40.0	-

The outcomes are as follows:

- The impacts of the full elements of the Proposed Development on annual mean PM_{2.5} concentrations are 'negligible' at all existing receptors; and
- There are no exceedences of the annual mean PM_{2.5} AQAL at any existing or proposed receptor.

Based on the above, effects associated with PM_{2.5} concentrations at the assessed receptor locations are therefore considered 'not significant'.

6.1.2 Full + Outline Elements

6.1.2.1 NO₂ Modelling Results

Table O presents the annual mean NO₂ concentrations predicted at all assessed receptor locations for the 2023 BC, 2030 DM and 2030 DS scenarios.



Table O: Predicted Annual Mean NO₂ Concentrations & Impacts

Receptor	Predicted Annual Mean NO ₂ Concentration (µg/m ³)			% Change of AQAL	% of 2030 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2030 DM	2030 DS			
Existing Receptors						
O-ER1	17.7	11.3	11.7	0.9	29.3	Negligible
O-ER2	14.7	9.8	10.0	0.5	25.0	Negligible
O-ER3	16.1	10.4	10.7	0.6	26.8	Negligible
O-ER4	16.9	10.8	11.1	0.7	27.8	Negligible
O-ER5	19.4	12.0	12.4	1.0	31.0	Negligible
O-ER6	16.9	10.8	11.1	0.7	27.8	Negligible
O-ER7	28.0	16.3	16.9	1.3	42.3	Negligible
O-ER8	34.2	19.7	19.7	<0.1	49.3	Negligible
O-ER9	30.7	17.8	17.8	<0.1	44.5	Negligible
O-ER10	34.1	19.6	19.7	<0.1	49.3	Negligible
O-ER11	30.3	17.5	17.6	<0.1	44.0	Negligible
O-ER12	32.8	19.4	19.7	0.9	49.3	Negligible
O-ER13	31.2	18.5	18.8	0.8	47.0	Negligible
O-ER14	18.7	11.8	12.0	0.5	30.0	Negligible
O-ER15	16.9	11.3	11.4	0.3	28.5	Negligible
O-ER16	19.7	12.7	12.9	0.5	32.3	Negligible
O-ER17	23.0	14.5	14.7	0.6	36.8	Negligible
O-ER18	20.9	13.3	13.5	0.5	33.8	Negligible
O-ER19	17.0	11.0	11.2	0.6	28.0	Negligible
O-ER20	21.6	13.6	13.9	0.8	34.8	Negligible
Proposed Receptors						
F-PR1	-	-	9.3	-	23.3	-
F-PR2	-	-	9.3	-	23.3	-
F-PR3	-	-	9.3	-	23.3	-
O-PR1	-	-	8.8	-	22.0	-

The outcomes are as follows:

- The impacts of the full + outline elements of the Proposed Development on annual mean NO₂ concentrations are ‘negligible’ at all existing receptors;
- There are no predicted exceedences of the annual mean NO₂ AQAL at any existing or proposed receptor; and
- Exceedences of the 1-hour mean NO₂ AQAL are unlikely to occur, in accordance with the empirical relationship given in LAQM.TG(22).

Based on the above, effects associated with NO₂ concentrations at the assessed receptor locations are therefore considered ‘not significant’.



6.1.2.2 PM₁₀ Modelling Results

Table P presents the annual mean PM₁₀ concentrations predicted at all assessed receptor locations for the 2023 BC, 2030 DM and 2030 DS scenarios.

Table P: Predicted Annual Mean PM₁₀ Concentrations & Impacts

Receptor	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)			% Change of AQAL	% of 2030 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2030 DM	2030 DS			
Existing Receptors						
O-ER1	15.3	14.5	14.7	0.6	36.8	Negligible
O-ER2	14.4	13.7	13.8	0.3	34.5	Negligible
O-ER3	14.9	14.1	14.3	0.5	35.8	Negligible
O-ER4	15.2	14.4	14.6	0.5	36.5	Negligible
O-ER5	16.0	15.2	15.5	0.7	38.8	Negligible
O-ER6	15.2	14.4	14.6	0.5	36.5	Negligible
O-ER7	17.4	16.3	16.7	0.8	41.8	Negligible
O-ER8	20.7	19.4	19.5	<0.1	48.8	Negligible
O-ER9	19.4	18.2	18.3	<0.1	45.8	Negligible
O-ER10	20.7	19.4	19.5	<0.1	48.8	Negligible
O-ER11	19.3	18.1	18.1	<0.1	45.3	Negligible
O-ER12	20.1	18.9	19.1	0.6	47.8	Negligible
O-ER13	19.5	18.3	18.5	0.5	46.3	Negligible
O-ER14	15.4	14.5	14.7	0.3	36.8	Negligible
O-ER15	14.8	14.0	14.1	0.2	35.3	Negligible
O-ER16	15.7	14.9	15.0	0.3	37.5	Negligible
O-ER17	17.0	16.1	16.2	0.5	40.5	Negligible
O-ER18	15.9	15.0	15.2	0.3	38.0	Negligible
O-ER19	15.1	14.3	14.4	0.4	36.0	Negligible
O-ER20	16.7	15.8	16.0	0.5	40.0	Negligible
Proposed Receptors						
F-PR1	-	-	13.3	-	33.3	-
F-PR2	-	-	13.3	-	33.3	-
F-PR3	-	-	13.3	-	33.3	-
O-PR1	-	-	13.0	-	32.5	-



The outcomes are as follows:

- The impacts of the full + outline elements of the Proposed Development on annual mean PM₁₀ concentrations are ‘negligible’ at all existing receptors;
- There are no predicted exceedences of the annual mean PM₁₀ AQAL at any existing or proposed receptor; and
- The maximum predicted annual mean PM₁₀ concentration (O-ER8 and O-ER10) equates to approximately 3 days where 24-hour mean PM₁₀ concentrations are predicted to be >50µg/m³. This is below the 35 permitted number of exceedences.

Based on the above, effects associated with PM₁₀ concentrations at the assessed receptor locations are therefore considered ‘not significant’.

6.1.2.3 PM_{2.5} Modelling Results

Table Q presents the annual mean PM_{2.5} concentrations predicted at all assessed receptor locations for the 2023 BC, 2030 DM and 2030 DS scenarios.

Table Q: Predicted Annual Mean PM_{2.5} Concentrations & Impacts

Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)			% Change of AQAL	% of 2030 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2030 DM	2030 DS			
Existing Receptors						
O-ER1	9.2	8.5	8.6	0.6	43.0	Negligible
O-ER2	8.7	8.0	8.1	0.3	40.5	Negligible
O-ER3	9.0	8.3	8.4	0.5	42.0	Negligible
O-ER4	9.1	8.4	8.5	0.5	42.5	Negligible
O-ER5	9.6	8.8	9.0	0.8	45.0	Negligible
O-ER6	9.1	8.4	8.5	0.5	42.5	Negligible
O-ER7	10.5	9.6	9.8	0.9	49.0	Negligible
O-ER8	12.1	11.1	11.1	<0.1	55.5	Negligible
O-ER9	11.4	10.4	10.5	<0.1	52.5	Negligible
O-ER10	12.1	11.1	11.1	<0.1	55.5	Negligible
O-ER11	11.4	10.4	10.4	<0.1	52.0	Negligible
O-ER12	11.8	10.8	10.9	0.6	54.5	Negligible
O-ER13	11.5	10.5	10.6	0.5	53.0	Negligible
O-ER14	9.4	8.7	8.7	0.3	43.5	Negligible
O-ER15	9.1	8.4	8.4	0.2	42.0	Negligible
O-ER16	9.6	8.9	8.9	0.4	44.5	Negligible
O-ER17	10.2	9.4	9.5	0.5	47.5	Negligible
O-ER18	9.6	8.9	8.9	0.4	44.5	Negligible
O-ER19	9.1	8.4	8.5	0.4	42.5	Negligible
O-ER20	9.5	8.8	8.9	0.5	44.5	Negligible
Proposed Receptors						



Receptor	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)			% Change of AQAL	% of 2030 DS Relative to AQAL	EPIC & IAQM Impact Descriptor
	2023 BC	2030 DM	2030 DS			
F-PR1	-	-	7.9	-	39.5	-
F-PR2	-	-	7.9	-	39.5	-
F-PR3	-	-	7.9	-	39.5	-
O-PR1	-	-	7.7	-	38.5	-

The outcomes are as follows:

- The impacts of the full + outline elements of the Proposed Development on annual mean PM_{2.5} concentrations are ‘negligible’ at all existing receptors; and
- There are no exceedences of the annual mean PM_{2.5} AQAL at any existing or proposed receptor.

Based on the above, effects associated with PM_{2.5} concentrations at the assessed receptor locations are therefore considered ‘not significant’.

6.2 Road Traffic Emissions Assessment – Ecological Receptors

Based on the extent of the available traffic data provided by the project’s transport consultant, a review of the setting of designated ecological sites has been undertaken to determine whether a net change in vehicle trips associated with the Proposed Development are predicted to occur within 200m of each to determine the appropriate level of assessment required. The extent of the affected road network and therefore the identified designations are the same for both the full and full + outline scenarios. This data is presented in Table R and illustrated in Figure K.

Table R: Review of Ecological Designations

Site / Designation	Road within 200m
Hooks Wood AW	Cooper’s Green Lane / Link 1
Oak Wood AW	Cooper’s Green Lane / Link 1
Home Wood AW	A1057 Hatfield Road (east of Site access) / Link 2 A1057 Hatfield Road (west of Site access) / Link 3
The Wick Wood LNR	Sandpit Lane (east of Beechwood Avenue) / Link 4 Beechwood Avenue / Link 5 Sandpit Lane (west of Beechwood Avenue) / Link 6 Marshalswick Lane / Link 7

Table S presents the net change in vehicle trips associated with the full and full + outline elements of the Proposed Development occurring on the road links identified in Table R.

For designations of national and local status (i.e. AWs and LNRs), an assessment of project-alone trip generation, only, is required.



Table S: Review of Proposed Development Trips

Site / Designation	Link	Full		Full + Outline	
		Total AADT	HDV AADT	Total AADT	HDV AADT
Oak Wood AW	1	106	1	423	4
Hooks Wood AW	1	106	1	423	4
Home Wood AW	2	320	5	338	5
	3	139	0	157	0
The Wick Wood LNR	4	719	0	2,245	6
	5	126	0	386	1
	6	226	0	750	4
	7	111	0	355	1
	4 + 5 (A)	845	0	2,631	7

Note:
(A) Multiple road links have been presented where more than one link intersects within 200m of a designation. Proposed Development trips on these links (4 and 5) have been summed to represent the total trips expected at the intersection. To avoid double counting, only trips on links 4 and 5 have been included since these links are the primary routes to and from the Site access points, and represent the greatest trip generation.

Table S shows that project-alone trips associated with the full elements of the Proposed Development are below the 1,000 total AADT and 200 HDV AADT IAQM Nature guidance screening criteria at all identified ecological designations. Therefore, development trips associated with the full elements of the Proposed Development will result in ‘no likely significant effect’ at habitats within the identified ecological designations.

Table S further indicates project-alone trips associated with the full + outline elements of the Proposed Development are below the 1,000 total AADT and 200 HDV AADT IAQM Nature guidance screening criteria at the Oak Wood AW, Hooks Wood AW and Home Wood AW. However, project-alone trips are in excess of the 1,000 total AADT IAQM Nature guidance on Sandpit Lane (east of Beechwood Avenue) i.e. link 4, and at the junction between Sandpit Lane (east) and Beechwood Avenue, i.e. links 4 and 5, which intersects at a location within 200m of The Wick Wood LNR designation.

Based on the above, further assessment by the project’s ecologist, ECOSA, was undertaken to determine whether the predicted trip generation associated with the full + outline elements of the Proposed Development would result in a likely significant effect on habitats present within The Wick Wood LNR. ECOSA have determined:

“There are no anticipated direct or indirect impacts to The Wick Wood LNR given the distance of the designated site from the site. In addition, the reasons for the designation of the LNR do not suggest that it supports ecological features that would be negatively impacted from impacts associated with the site during operation, including an increase in traffic along Sandpit Lane and footfall from an increase in nearby residents”.

Reference to the submitted ecological reports should be made for further detail. Therefore, development trips associated with the full +outline element of the Proposed Development will additionally result in ‘no likely significant effect’ at habitats within the identified ecological designations.



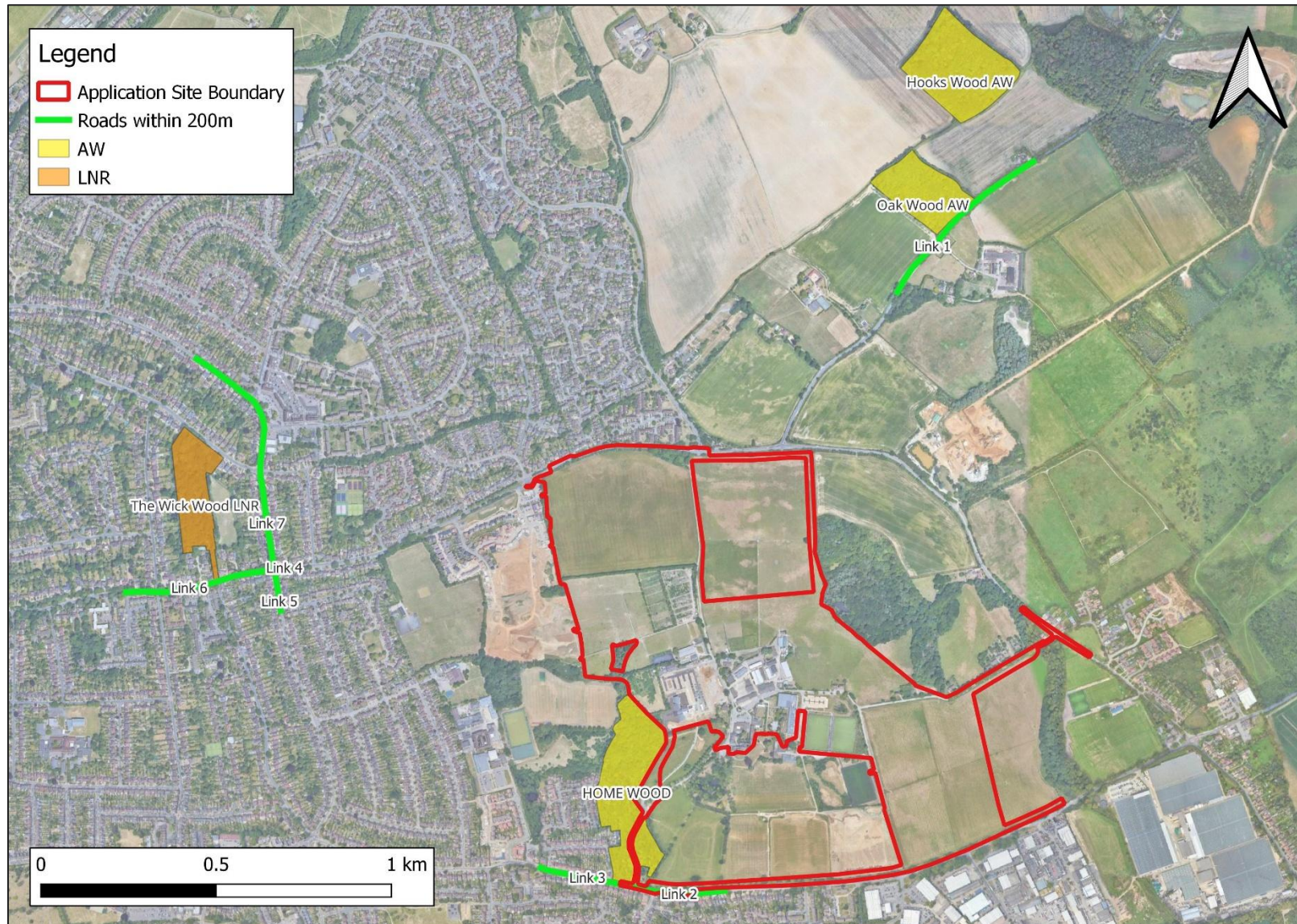


Figure K: Roads within 200m from Ecological Designations



7.0 Mitigation Measures

This section presents any proportionate mitigation measures required during the construction and operational phases of the full and outline elements of the Proposed Development.

7.1 Construction Dust

7.1.1 Full and Outline Elements

As discussed in Section 5.0, construction activities associated with the full and outline elements of the Proposed Development would result in the generation of dust and PM₁₀.

In order to control potential impacts, Table T presents a range of mitigation measures, which could be applied and align with the IAQM Construction Dust guidance. With the effective application of the dust mitigation measures, residual effects will be 'not significant'.

These measures can be integrated into a Construction Environmental Management Plan (CEMP) / Dust Management Plan (DMP), or similar, for adherence during construction as part of the contractor's environmental responsibilities and commitments, to be secured by planning condition.

While the IAQM Construction Dust guidance is primarily aimed at PM₁₀ and dust soiling, the recommended measures will also have a direct effect on controlling associated PM_{2.5} emissions and associated impacts.

Table T: Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Highly Recommended	
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. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Demolition	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.

Site Application	Mitigation Measures
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Operating Vehicle / Machinery and Sustainable Travel	Ensure all vehicles switch off engines when stationary - no idling vehicles.
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Site Application	Mitigation Measures
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	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 (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.
Waste Management	Avoid bonfires and burning of waste materials.
Desirable	
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
	Only remove the cover in small areas during work and not all at once.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
Operating Vehicle/Machinery and Sustainable Travel	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).
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

7.2 Operational Phase

In relation to human health receptors, road traffic impacts associated with the operation of the full and full + outline elements of the Proposed Development can be considered as having a 'not significant' effect on local air quality. Furthermore, the Site is considered suitable for the proposed uses and site suitability air quality effects are concluded to be 'not significant'.

With regard to ecological designations, road traffic impacts associated with the operation of the full and full + outline elements of the Proposed Development can be considered as having 'no likely significant effects' at habitats within the considered ecological designations.

Notwithstanding the above, consideration of good basic design and standard mitigation measures applicable to all development is required. In recognition of this, the following design measures have been integrated into the scheme:

- Zero-emission and low-emission technologies for the provision of heating and hot water will be installed;
- Locations of relevant exposure (e.g. on-site accommodation) have been positioned away from the roadside to reduce the pollutant exposure of future occupants. The results of the detailed dispersion modelling demonstrate no predicted exceedences of the AQALs at proposed receptors of relevant exposure; and
- A series of Framework Travel Plan by proposed land-use have been produced to which reference should be made. There are a number of measures within aimed to encourage occupants to use more sustainable modes of transport to and from the Site. These measures would subsequently have a knock-on effect in terms of reducing road traffic emissions from personal car use.

8.0 Conclusions

SLR has undertaken an AQA to support a hybrid planning application for a proposed mixed-use development at Oaklands College on land south of Sandpit Lane, St Albans.

8.1 Construction Phase

A qualitative assessment of the potential dust impacts during the construction of the full and outline elements of the Proposed Development has been undertaken following the IAQM Construction Dust guidance.

Following the construction dust assessment, the Site is found to be at worst 'medium risk' in relation to dust soiling effects on people and property and human health, and 'low risk' in relation to ecological impacts. Providing effective mitigation measures are implemented, such as those outlined in Section 7.1 of this report, residual effects from dust and PM₁₀ emissions during the construction phase would be 'not significant'.

Given the short-term nature of the construction phase and the comparatively low volume of vehicle movements that will likely arise, there is predicted to be an 'insignificant' effect on air quality from construction-generated road traffic emissions.

8.2 Operational Phase

The assessment of operational phase effects considered impacts on all relevant receptors from road traffic emissions associated with the full and full + outline elements of the Proposed Development.

The ADMS-Roads dispersion model was used to determine the likely NO₂, PM₁₀, and PM_{2.5} concentrations at all assessed existing receptor locations for a series of scenarios, in accordance with LAQM.TG(22). Predicted pollutant concentration changes at relevant receptor locations as a result of the full and full + outline elements of the Proposed Development were assessed using the EPIC & IAQM significance criteria. Impacts on NO₂, PM₁₀ and PM_{2.5} concentrations at all existing assessed receptor locations are considered to be 'negligible'. Unmitigated effects associated with NO₂, PM₁₀ and PM_{2.5} concentrations at all existing receptor locations are therefore considered to be 'not significant'.

Furthermore, the predicted absolute concentrations of NO₂, PM₁₀ and PM_{2.5} at locations of relevant exposure within the Site are well-below the annual mean AQALs. The Site is therefore considered to be suitable for its proposed uses. Unmitigated site suitability effects associated with likely exposure of future occupants are considered to be 'not significant'.

In addition, consideration has been given to potential road traffic impacts at habitats within ecological designations within the vicinity of the Site. Project-alone trips associated with the full elements of the Proposed Development in respect of national and local designations are below the relevant screening criteria and will therefore result in 'no likely significant effect' on habitats within the identified ecological designations. Project-alone trips associated with the full + outline elements of the Proposed Development in respect of national and local designations are below the relevant screening criteria at all but one designation, The Wick Wood LNR. However, further assessment by the project's ecologist determined that road traffic emissions impacts on habitats within the LNR will result in 'no likely significant effects'.





Appendix A Traffic Data

Oaklands Blossom and Oaklands College, St Albans

Air Quality Assessment

Taylor Wimpey North Thames

SLR Project No.: 425.067013.00001

15 September 2025

A.1 Traffic Data – Full Application

Table U details the traffic data used within assessment of the full application elements of the Proposed Development.

Table U: Traffic Data Used within the Assessment – Full Application

Road Link	Full Operational Phase Trip Generation		2023 BC		2028 DM		2028 DS		Speed (kph)
Description	Total AADT	HDV AADT	Total AADT	%HDV	Total AADT	%HDV	Total AADT	%HDV	
Sandpit Lane (west of Site access)	719	0	15,726	6.9	16,342	6.9	12,502	8.9	48/64
Sandpit Lane (east of Site access)	373	0	15,726	6.9	16,342	6.9	9,104	10.1	64/97
Beechwood Avenue	126	0	12,462	7.5	12,950	7.5	9,019	2.3	48
Marshalswick Lane (north of The Ridgeway)	111	0	11,669	8.6	12,126	8.6	11,748	2.0	48
House Lane	61	0	8,620	2.3	8,958	2.3	11,892	3.8	64
Coopers Green Lane	106	1	11,203	2.0	11,642	2.0	16,541	6.4	97
Sandpit Lane (west of Beechwood Avenue)	226	0	10,290	8.4	10,693	8.4	18,107	3.1	48/64
Marshalswick Lane (south of The Ridgeway)	6	0	12,722	3.9	13,220	3.9	14,740	3.8	48
A1081 St. Peter's Street (north of A1057 Hatfield Road)	184	0	17,248	3.1	17,923	3.1	15,574	3.9	32/48
A1057 Hatfield Road (west of Beechwood Avenue)	168	0	13,484	4.2	14,012	4.2	15,447	1.2	32/48
A1057 Hatfield Road (east of Beechwood Avenue, west of Site access)	139	0	11,321	5.6	11,764	5.6	11,903	5.5	48
A1057 Hatfield Road (east of Site access)	320	5	12,342	5.3	12,825	5.3	13,145	5.2	48
A1081 St. Peter's Street (south of A1057 Hatfield Road)	184	0	13,758	1.5	14,297	1.5	11,844	3.8	32/48
A1081 London Road (east of A5183 Holywell Hill)	0	0	14,865	1.2	15,447	1.2	11,726	3.9	32/48
Oaklands Lane (north of Site access)	274	1	11,134	3.8	11,570	3.8	13,145	5.2	97
Sandridge Road (north of Sandpit Lane)	0	0	6,670	2.8	6,931	2.8	12,502	8.9	48



Road Link	Full Operational Phase Trip Generation		2023 BC		2028 DM		2028 DS		Speed (kph)
Description	Total AADT	HDV AADT	Total AADT	%HDV	Total AADT	%HDV	Total AADT	%HDV	
Sandridge Road (south of Sandpit Lane)	226	0	6,670	2.8	6,931	2.8	9,104	10.1	48
A1081 Harpenden Road (south of Beech Road)	0	0	8,882	2.2	9,230	2.2	9,230	2.2	48
A4147 Catherine Street (west of A1081 St. Peter's Street)	0	0	9,984	1.4	10375	1.4	10,375	1.4	32/48
A5183 Verulam Road (west of A5183 Holywell Hill)	0	0	6,253	1.3	6,498	1.3	6,498	1.3	32/48
A5183 Redbourne Road (west of A4147 Catherine Street)	0	0	15,844	1.1	16,465	1.1	16,465	1.1	48



A.2 Traffic Data – Full + Outline Application

Table U details the traffic data used within the assessment of the full + outline application elements of the Proposed Development.

Table V: Traffic Data Used within the Assessment – Full + Outline Application

Road Link	Full + Outline Operational Phase Trip Generation		2023 BC		2030 DM		2030 DS		Speed (kph)
Description	Total AADT	HDV AADT	Total AADT	%HDV	Total AADT	%HDV	Total AADT	%HDV	
Sandpit Lane (west of Site access)	2,245	6	15,726	6.9	16,651	6.9	18,896	6.1	48/64
Sandpit Lane (east of Site access)	1,230	6	15,726	6.9	16,651	6.9	17,881	6.5	64/97
Beechwood Avenue	386	1	12,462	7.5	13,196	7.5	13,582	7.3	48
Marshalswick Lane (north of The Ridgeway)	355	1	11,669	8.6	12,356	8.6	12,711	8.3	48
House Lane	188	0	8,620	2.3	9,128	2.3	9,316	2.3	64
Coopers Green Lane	423	4	11,203	2.0	11,862	2.0	12,285	2.0	97
Sandpit Lane (west of Beechwood Avenue)	750	4	10,290	8.4	10,895	8.4	11,645	7.9	48/64
Marshalswick Lane (south of The Ridgeway)	39	0	12,722	3.9	13,471	3.9	13,510	3.9	48
A1081 St. Peter's Street (north of A1057 Hatfield Road)	609	3	17,248	3.1	18,263	3.1	18,872	3.0	32/48
A1057 Hatfield Road (west of Beechwood Avenue)	236	0	13,484	4.2	14,278	4.2	14,514	4.1	32/48
A1057 Hatfield Road (east of Beechwood Avenue, west of Site access)	157	0	11,321	5.6	11,987	5.6	12,144	5.5	48
A1057 Hatfield Road (east of Site access)	338	5	12,342	5.3	13,069	5.3	13,407	5.2	48
A1081 St. Peter's Street (south of A1057 Hatfield Road)	609	0	13,758	1.5	14,568	1.5	15,177	1.4	32/48
A1081 London Road (east of A5183 Holywell Hill)	0	0	14,865	1.2	15,740	1.2	15,740	1.2	32/48
Oaklands Lane (north of Site access)	686	4	11,134	3.8	11,789	3.8	12,475	3.7	97
Sandridge Road (north of Sandpit Lane)	0	0	6,670	2.8	7,063	2.8	7,063	2.8	48



Road Link	Full + Outline Operational Phase Trip Generation		2023 BC		2030 DM		2030 DS		Speed (kph)
Description	Total AADT	HDV AADT	Total AADT	%HDV	Total AADT	%HDV	Total AADT	%HDV	
Sandridge Road (south of Sandpit Lane)	750	4	6,670	2.8	7,063	2.8	7,813	2.6	48
A1081 Harpenden Road (south of Beech Road)	0	0	8,882	2.2	9,405	2.2	9,405	2.2	48
A4147 Catherine Street (west of A1081 St. Peter's Street)	0	0	9,984	1.4	10,572	1.4	10,572	1.4	32/48
A5183 Verulam Road (west of A5183 Holywell Hill)	0	0	6,253	1.3	6,621	1.3	6,621	1.3	32/48
A5183 Redbourne Road (west of A4147 Catherine Street)	0	0	15,844	1.1	16,777	1.1	16,777	1.1	48





Appendix B Model Verification

Oaklands Blossom and Oaklands College, St Albans

Air Quality Assessment

Taylor Wimpey North Thames

SLR Project No.: 425.067013.00001

15 September 2025

B.1 Model Verification

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is specifically listed in LAQM.TG(22) as an accepted dispersion model.

Model validation undertaken by the software developer (CERC) will not have included validation in the vicinity of the Site. It is therefore necessary to perform a comparison of modelled results with local monitoring data at relevant locations. This process of verification attempts to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results.

Prior to undertaking model verification, model setup parameters and input data were reviewed to maximise the performance of the dispersion model in relation to the real-world conditions.

B.1.1 NO_x / NO₂ Verification

NO_x / NO₂ verification relates to the comparison and adjustment of modelled road-NO_x (as output from the ADMS-Roads dispersion model), relative to monitored road-NO_x.

For NO_x / NO₂ model verification, the 2023 annual mean NO₂ monitoring dataset obtained from SACDC's diffusion tube monitoring network has been used (see Section 4.2). Table W presents the local monitoring data available for model verification.

Table W: Local Monitoring Data Available for Model Verification

Site ID	NGR (m)		2023 Annual Mean NO ₂ Concentration (µg/m ³)	2023 Data Capture (%)
	X	Y		
SA101	515099	207474	19.9	100.0
SA133	514606	206801	22.4	100.0
SA134	514649	206920	21.3	100.0
SA136	514881	207419	32.4	90.4
SA137	514686	207103	27.1	65.4
SA138	514704	207089	28.1	100.0
SA143	514751	207094	24.4	92.3
SA144	514840	207355	28.5	84.6
SA148	514703	207120	34.4	100.0
SA149	515065	206947	19.9	100.0
SA150	516591	207275	20.1	100.0
SA155	514346	206325	20.4	100.0
SA156	514602	207674	23.4	100.0
SA157	514844	207612	27.9	100.0
SA160	514680	207059	36.3	100.0
SA161	514785	207071	23.2	100.0
SA162	514605	207295	18.8	100.0
SA163	514643	206941	32.8	100.0

Note:

^(A) The presented monitored concentration has been annualised by SACDC in accordance with LAQM.TG(22).



The locations and heights of each verification monitor have been validated, where possible, using publicly available satellite and street view imagery.

NOx was back calculated using the latest version of Defra’s NOx to NO₂ Calculator (v9.1) for all monitors – given the absence of data. The NOx to NO₂ Calculator was also used to facilitate the conversion of modelled road-NOx (as output from the ADMS-Roads dispersion model) into road-NO₂.

Verification was completed using the 2023 Defra background mapped concentrations (2021 reference year) for the relevant 1km² grid squares (i.e. those within which the model verification locations are located), as discussed in Section 4.4. To avoid double counting of potential background sources already contained within the ADMS-Roads dispersion model, relevant sources were removed from the appropriate background grid squares. This was limited to the removal of ‘Primary A Road in’.

Initial comparison of the modelled vs. monitored road-NOx contribution at the verification locations detailed in Table W is provided in Table X. An initial adjustment factor of 2.975 has been derived, based on a linear regression forced through zero as shown in Figure L.

Table X: NOx / NO₂ Model Verification – Initial Comparison (2.975)

Site ID	Monitored Road-NOx (µg/m ³)	Modelled Road-NOx (µg/m ³)	Ratio (Monitored vs. Modelled Road-NOx)	Adjustment Factor	Adjusted Modelled Total NO ₂ (µg/m ³)	Monitored Total NO ₂ (µg/m ³)	% Difference (Adjusted Modelled NO ₂ vs Monitored NO ₂)
SA101	17.4	6.1	2.9	2.975	20.2	19.9	+1.6
SA133	25.6	5.8	4.4		19.0	22.4	-15.4
SA134	22.9	7.2	3.2		20.7	21.3	-2.9
SA136	52.0	7.0	7.4		20.9	32.4	-35.6
SA137	36.8	9.3	4.0		23.6	27.1	-12.9
SA138	39.5	15.2	2.6		30.1	28.1	+7.2
SA143	29.7	14.7	2.0		29.6	24.4	+21.4
SA144	40.6	6.3	6.4		20.0	28.5	-29.8
SA147	27.9	3.1	9.0		15.8	23.7	-33.3
SA148	58.2	25.0	2.3		39.3	34.4	+14.2
SA149	18.4	5.8	3.2		19.4	19.9	-2.5
SA150	20.2	5.8	3.5		18.9	20.1	-6.1
SA155	20.8	4.4	4.7		17.1	20.4	-16.0
SA156	27.1	4.9	5.5		18.2	23.4	-22.3
SA157	39.0	12.7	3.1		27.5	27.9	-1.5
SA160	64.3	16.6	3.9		31.6	36.3	-13.0
SA161	26.6	17.7	1.5	32.6	23.2	+40.6	



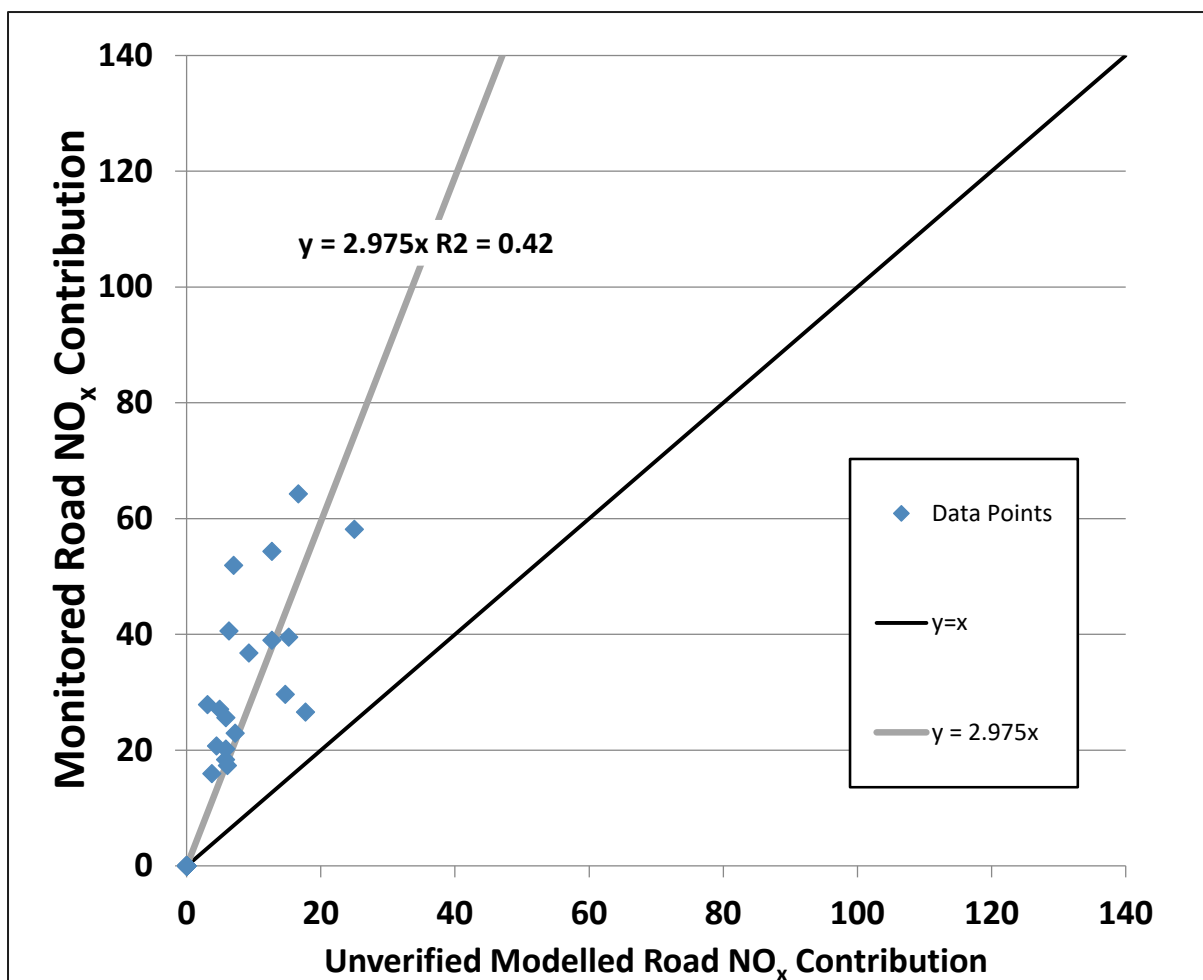


Figure L: Modelled vs. Monitored Road-NO_x Contribution – Initial Comparison (2.975)

LAQM.TG(22) states that:

“In order to provide more confidence in the model predictions and the decisions based on these, the majority of results should be within 25% of the monitored concentrations as a minimum, preferably within 10%”.

As shown in Table X, the difference between the adjusted modelled NO₂ and monitored NO₂ is outside the prescribed limit of $\pm 25\%$ at four monitors, including SA136, SA144, SA147 and SA161.

Upon review, SA136, SA144 and SA161 are each located directly adjacent / opposite to a bus stop along the A1081 St. Peter’s Street (SA136 and SA144) and the A1081 London Road (SA161), a link where traffic data was unavailable to explicitly model associated emission contributions, hence resulting in a large under prediction of modelled road-NO_x. In addition, SA137 was found to be located directly adjacent to a loading bay, another emissions source the model is unable to account for. For these reasons, SA136, SA137, SA144 and SA161 were removed from the verification process given the large disagreement in model performance at these locations.

Following the above, a final comparison of the of the modelled vs. monitored road-NO_x contributions for the remaining verification locations is provided in Table Y. A further adjustment factor of 2.955 has been derived, based on a linear regression forced through zero as shown in Figure M.



Table Y: NO_x / NO₂ Model Verification – Further Comparison (2.955)

Site ID	Monitored Road-NO _x (µg/m ³)	Modelled Road-NO _x (µg/m ³)	Ratio (Monitored vs. Modelled Road-NO _x)	Adjustment Factor	Adjusted Modelled Total NO ₂ (µg/m ³)	Monitored Total NO ₂ (µg/m ³)	% Difference (Adjusted Modelled NO ₂ vs Monitored NO ₂)
SA101	17.4	6.1	2.9	2.955	20.2	19.9	+1.3
SA133	25.6	5.8	4.4		18.9	22.4	-15.6
SA134	22.9	7.2	3.2		20.6	21.3	-3.2
SA138	39.5	15.2	2.6		30.0	28.1	+6.8
SA143	29.7	14.7	2.0		29.5	24.4	+20.9
SA148	58.2	25.0	2.3		39.1	34.4	+13.8
SA149	18.4	5.8	3.2		19.4	19.9	-2.8
SA150	20.2	5.8	3.5		18.8	20.1	-6.3
SA155	20.8	4.4	4.7		17.1	20.4	-16.1
SA156	27.1	4.9	5.5		18.1	23.4	-22.5
SA157	39.0	12.7	3.1		27.4	27.9	-1.9
SA160	64.3	16.6	3.9		31.5	36.3	-13.3
SA162	16.0	3.7	4.3		16.7	18.8	-11.4
SA163	54.3	12.7	4.3		27.0	32.8	-17.7



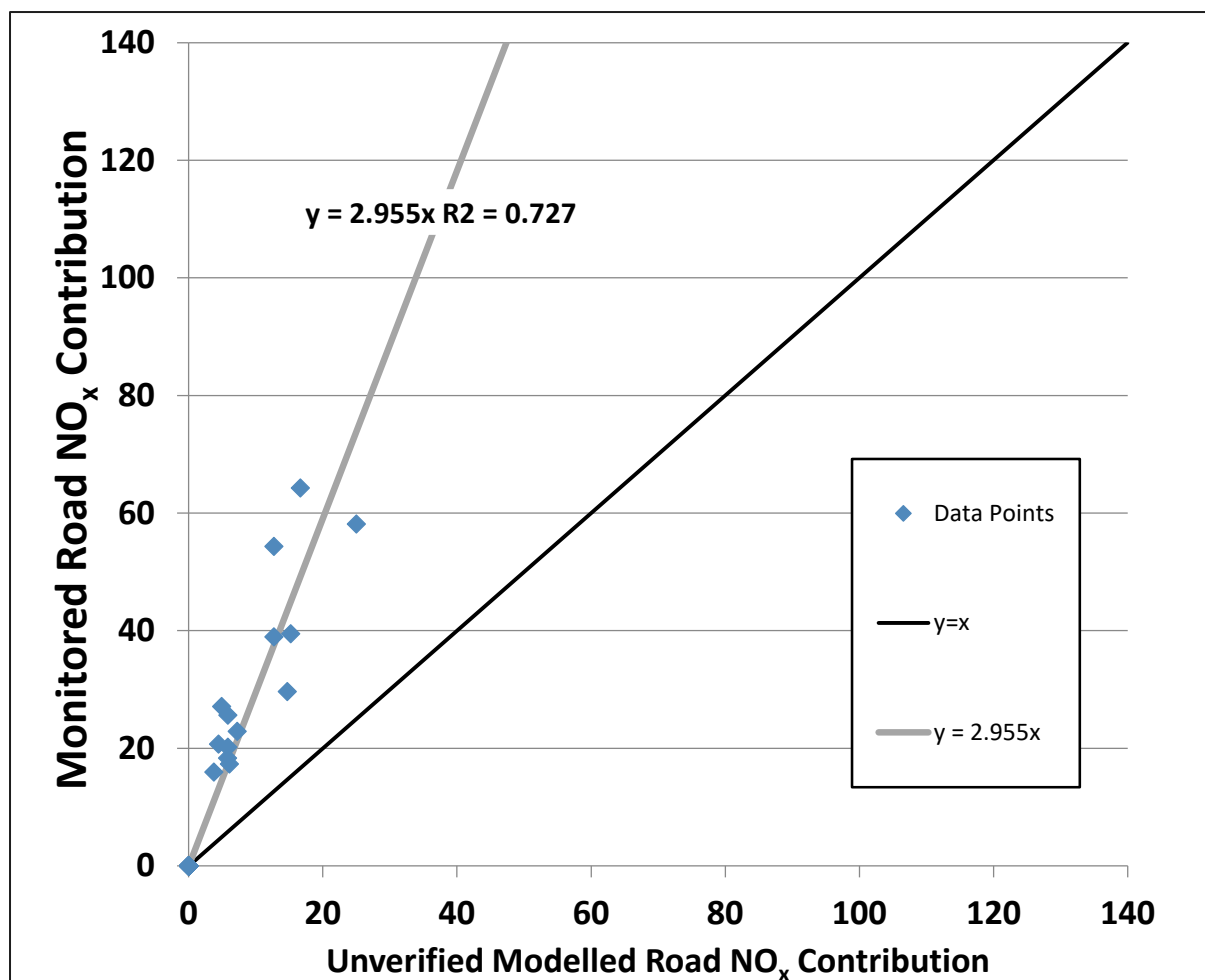


Figure M: Modelled vs. Monitored Road-NO_x Contribution – Further Comparison (2.955)

As shown in Table Y, the removal of SA136, SA137, SA144 and SA161 results in the difference between adjusted modelled NO₂ and monitored NO₂ being within the LAQM.TG(22) preferred limit of $\pm 10\%$ at six monitors and within the LAQM.TG(22) prescribed limit of $\pm 25\%$ at the remaining eight monitors.

In reference to Table Y, the difference between adjusted modelled NO₂ and monitored NO₂ at locations within the St Albans AQMA No. 1 shows three overpredictions (SA138, SA143, SA148) and one underprediction (SA160), i.e. 75% of the monitors were over predicting, compared to locations outside the AQMA where only one of ten monitors (10%) were overpredicting. This indicates the modelling is performing differently at locations within / adjacent the setting of the AQMA, in comparison to those locations removed from the setting of the AQMA.

On this basis the model domain was split into two verification domains in order to provide more confidence in the model predictions:

- **Domain A** – The area within and adjacent to the St Albans AQMA No. 1, including receptors F-ER8 to F-ER13 and O-ER8 to O-ER13; and
- **Domain B** – The remaining area located outside / away from the St Albans AQMA No. 1, including receptors F-ER1 to F-ER7, F-PR1 to F-PR3, O-ER1 to O-ER7, OER14 to O-ER20 and O-PR1.

A discussion on the verification factor applied to each of the above domains is provided below.



Domain A

The comparison of the modelled vs. monitored road-NOx contribution at the verification locations within Domain A is provided in Table Z. An adjustment factor of 2.638 has been derived, based on a linear regression forced through zero as shown in Figure N.

Table Z: NOx / NO₂ Model Verification – Domain A (2.638)

Site ID	Monitored Road-NOx (µg/m ³)	Modelled Road-NOx (µg/m ³)	Ratio (Monitored vs. Modelled Road-NOx)	Adjustment Factor	Adjusted Modelled Total NO ₂ (µg/m ³)	Monitored Total NO ₂ (µg/m ³)	% Difference (Adjusted Modelled NO ₂ vs Monitored NO ₂)
SA138	39.5	15.2	2.6	2.638	28.3	28.1	+0.7
SA143	29.7	14.7	2.0		27.8	24.4	+14.1
SA148	58.2	25.0	2.3		36.8	34.4	+7.0
SA160	64.3	16.6	3.9		29.7	36.3	-18.3

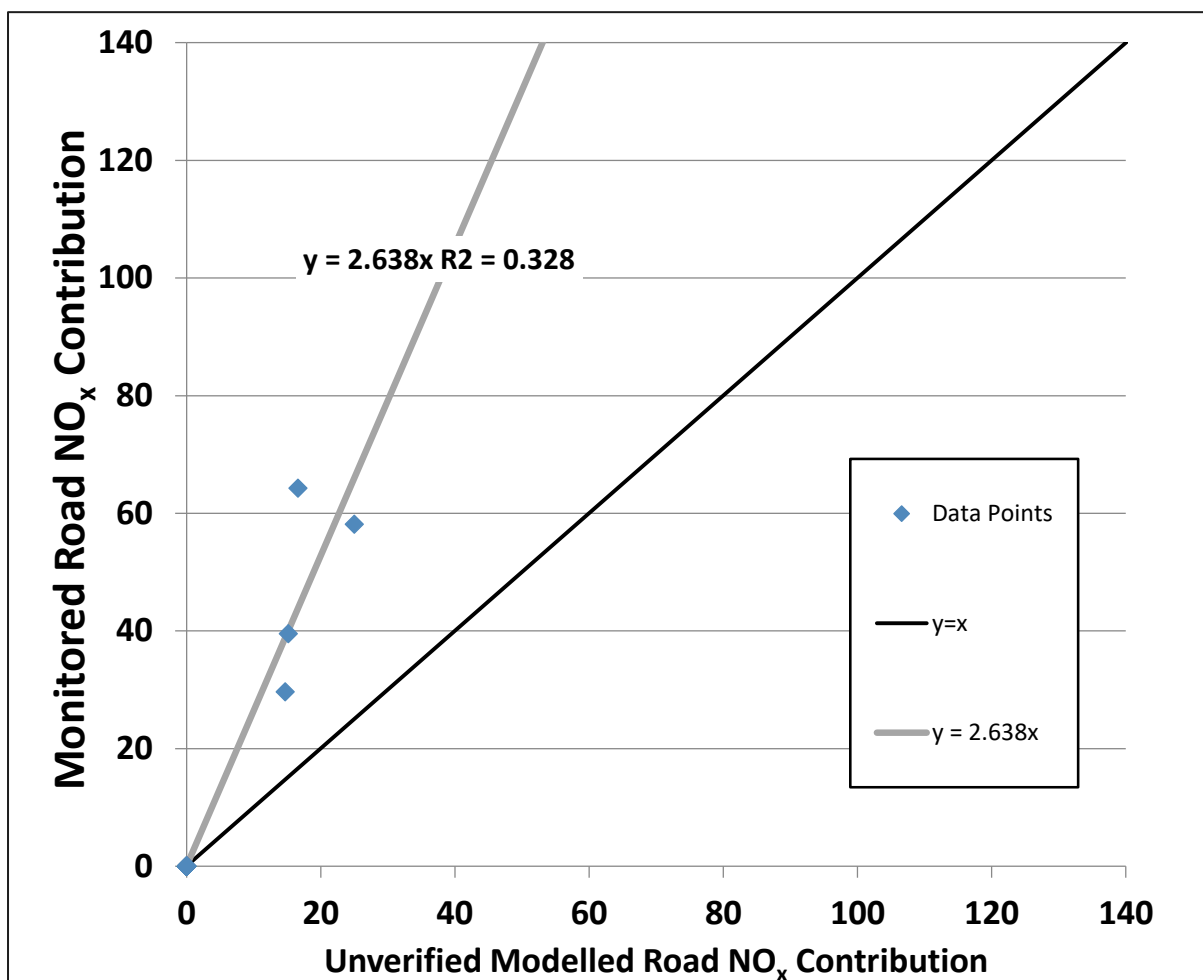


Figure N: Modelled vs. Monitored Road-NOx Contribution – Domain A (2.638)

As shown in Table X, the difference between the adjusted modelled NO₂ and monitored NO₂ is within the LAQM.TG(22) preferred limit of ±10% at two monitors and within the LAQM.TG(22) prescribed limit of ±25% at the remaining two monitors.



In addition, a verification factor of 2.638 reduces the Root Mean Square Error (RMSE) from a value of $11.905\mu\text{g}/\text{m}^3$ to $3.930\mu\text{g}/\text{m}^3$ (i.e. 9.8% of the annual mean NO_2 AQAL) – well within the LAQM.TG(22) prescribed limit of $\pm 25\%$.

On this basis, the derived verification factor (2.638) was considered acceptable and was subsequently applied to all road- NO_x concentrations predicted (as output of the ADMS Roads dispersion model) within Domain A at receptors F-ER8 to F-ER13 and O-ER8 to O-ER13.

Domain B

The comparison of the modelled vs. monitored road- NO_x contribution at the verification locations within Domain B is provided in Table Z. An adjustment factor of 3.705 has been derived, based on a linear regression forced through zero as shown in Figure N.

Table AA: NO_x / NO_2 Model Verification – Domain B (3.705)

Site ID	Monitored Road- NO_x ($\mu\text{g}/\text{m}^3$)	Modelled Road- NO_x ($\mu\text{g}/\text{m}^3$)	Ratio (Monitored vs. Modelled Road- NO_x)	Adjustment Factor	Adjusted Modelled Total NO_2 ($\mu\text{g}/\text{m}^3$)	Monitored Total NO_2 ($\mu\text{g}/\text{m}^3$)	% Difference (Adjusted Modelled NO_2 vs Monitored NO_2)
SA101	17.4	6.1	2.9	3.705	22.1	19.9	+10.8
SA133	25.6	5.8	4.4		20.8	22.4	-7.4
SA134	22.9	7.2	3.2		22.8	21.3	+7.1
SA149	18.4	5.8	3.2		21.2	19.9	+6.3
SA150	20.2	5.8	3.5		20.7	20.1	+2.8
SA155	20.8	4.4	4.7		18.6	20.4	-9.1
SA156	27.1	4.9	5.5		19.7	23.4	-15.8
SA157	39.0	12.7	3.1		30.8	27.9	+10.2
SA162	16.0	3.7	4.3		17.9	18.8	-4.8
SA163	54.3	12.7	4.3		30.4	32.8	-7.4



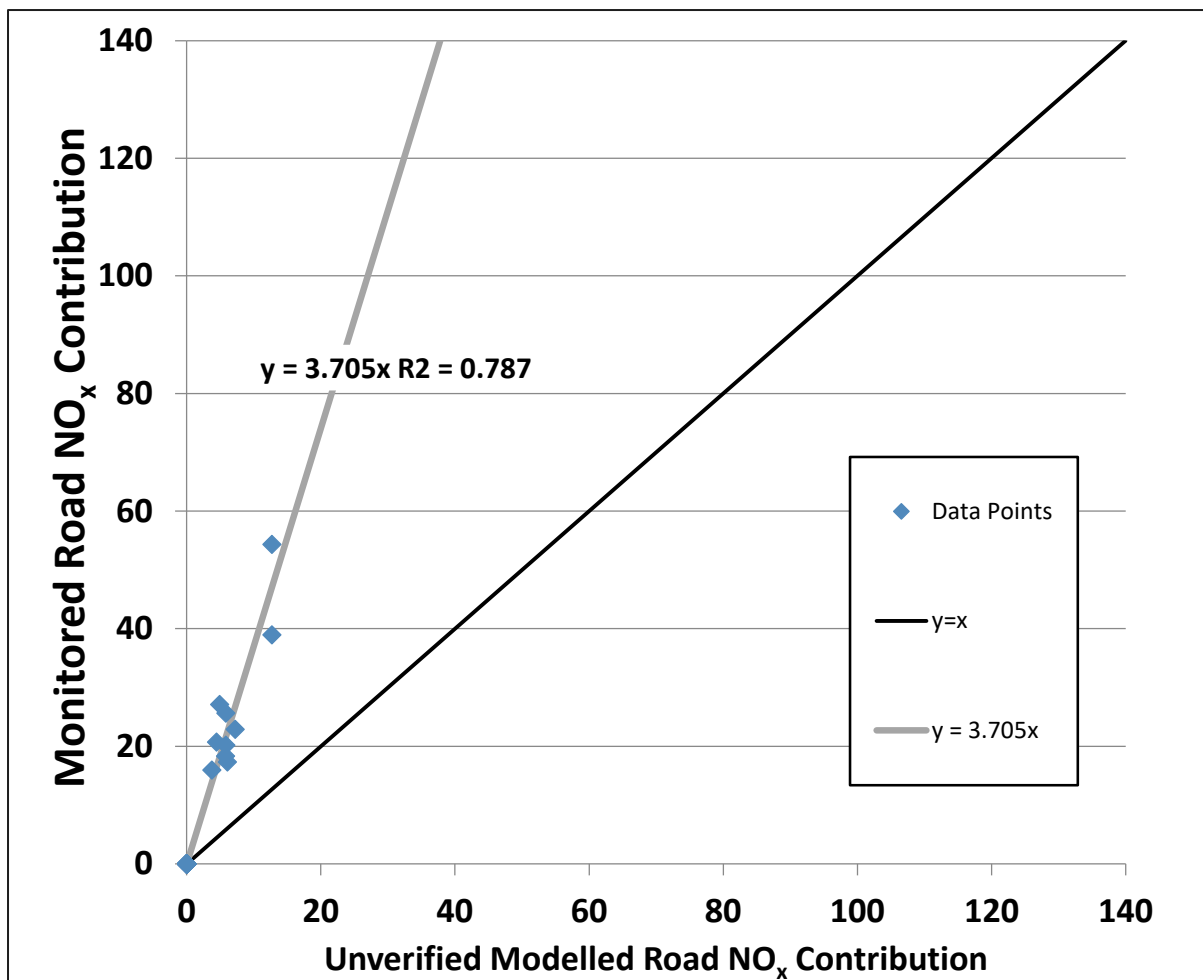


Figure O: Modelled vs. Monitored Road-NO_x Contribution – Domain B (3.705)

As shown in Table X, the difference between the adjusted modelled NO₂ and monitored NO₂ is within the LAQM.TG(22) preferred limit of ±10% at seven monitors and within the LAQM.TG(22) prescribed limit of ±25% at the remaining three monitors.

In addition, a verification factor of 3.705 reduces the RMSE from a value of 8.672µg/m³ to 2.084µg/m³ (i.e. 5.2% of the annual mean NO₂ AQAL) – well within the LAQM.TG(22) preferred limit of ±10%.

On this basis, the derived verification factor (3.705) was considered acceptable and was subsequently applied to all road-NO_x concentrations predicted (as output of the ADMS Roads dispersion model) within Domain B at receptors F-ER1 to F-ER7, F-PR1 to F-PR3, O-ER1 to O-ER7, O-ER14 to O-ER20 and O-PR1.

B.1.2 PM₁₀ / PM_{2.5} Verification

The adjustment factors for Domain A and B were also applied to road-PM₁₀ and PM_{2.5} concentrations (as output of the ADMS-Roads dispersion model), following the recommendations of LAQM.TG(22) in the absence of local particulate monitoring.



