

Report

Land off Echo Hill, Royston

Air Quality Assessment

For Gladman Developments Ltd

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1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed residential development of land off Echo Hill, Royston. The proposed development will consist of 84 dwellings. The proposed development lies within the administrative boundary of North Herts Council (NHC). The site is not located close to any Air Quality Management Area (AQMA).
- 1.2 The location of the proposed development is shown in Figure 1.

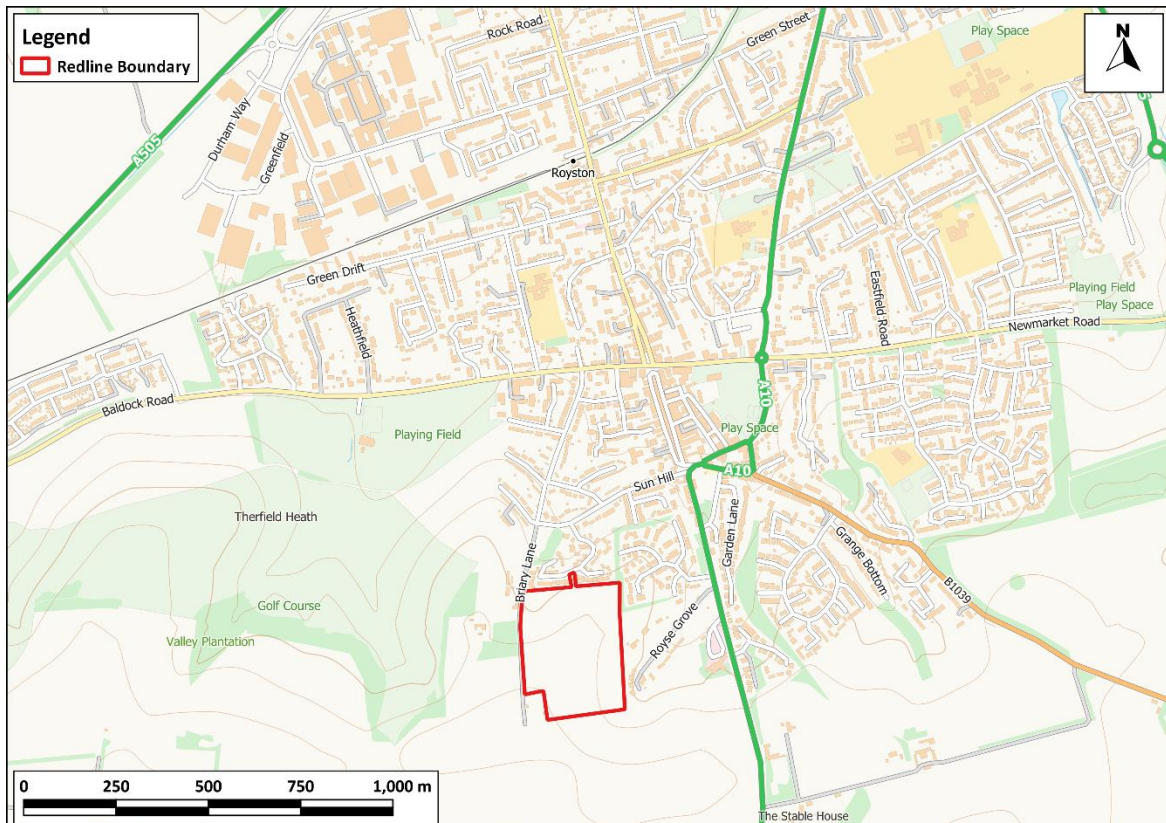


Figure 1: Proposed Development Location

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

- 1.3 Air quality needs to be considered to ensure that the development does not generate any unacceptable adverse impacts off site and to ensure that new residents are not exposed to exceedances of the air quality objectives.
- 1.4 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)¹ recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality effects. The approach, as described in Appendix A1 first considers the size of a development; if the development is for fewer than ten homes or covers less than 1,000 m² of other land uses and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment. The proposed development is above the development size, and therefore the potential impacts on air quality from traffic generated by the development needs to be considered. The IAQM have set out

¹ The IAQM is the professional body for air quality practitioners in the UK.

screening criteria, below which it can be assumed that there will not be significant impacts on air quality. The criteria for outside an AQMA are a change in traffic flows of more than 500 AADT Light Duty Vehicles (LDVs) or more than 100 AADT Heavy Duty Vehicles (HDVs).

- 1.5 There will be no centralised combustion plant and thus there will be no significant point sources of emissions within the proposed development.
- 1.6 This report has been prepared taking into account all relevant local and national guidance and regulations.

Consultation

- 1.7 The assessment follows a methodology agreed with NHC via email correspondence between Alan Stone (Senior Environmental Protection & Housing Officer at NHC) and Rosie Watts (Air Quality Consultants) in February 2025. Specifically, the following key points were agreed:
 - a qualitative assessment is sufficient to determine the impact of traffic generated by the scheme on existing residential properties, and the air quality conditions that future resident will experience; and
 - the proposed development meets the criteria for a 'medium' development in the context of the Council's Air Quality Planning Guidance Document (North Hertfordshire District Council, 2018a).

2 Policy Context

2.1 All European legislation referred to in this report is written into UK law and remains in place. The following Policy, Legislation and Guidance has been followed when preparing this document. For details of each, please see Appendix A2

- Air Quality Strategy 2007
- Air Quality Strategy 2023
- Clean Air Strategy 2019
- Environment Act 2021
- Environmental Improvement Plan 2023
- National Planning Policy
- Local Transport Plan
- Local Policies
- Air Quality Action Plans
 - i) National Air Quality Plan
 - ii) Local Air Quality Action Plan

3 Pollutants of Concern

- 3.1 The main air pollutants of concern in relation to road traffic are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}). UK-wide objectives for NO₂ and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter.
- 3.2 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2022). The annual mean objectives for NO₂ and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for NO₂ applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.3 For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value², originally set at 25 µg/m³ and currently set at 20 µg/m³.
- 3.4 Defra has also set two new targets, and two new interim targets, for PM_{2.5} concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by the end of 2040 (referred to as the annual mean concentration target or AMCT), with the interim target being a value of 12 µg/m³ by the start of 2028³. The second set of targets relate to reducing overall population exposure to PM_{2.5}. By the end of 2040, overall population exposure to PM_{2.5} should be reduced by 35% compared with 2018 levels (referred to as the population exposure reduction target or PERT), with the interim target being a reduction of 22% by the start of 2028 (Table 1).

Table 1: Environment Act PM_{2.5} Targets

Metric	Target	Target year
AMCT	Interim target: 12 µg/m ³	2028
	Legally binding target: 10 µg/m ³	2040
PERT	Interim target: 22% reduction in exposure compared to 2018	2028
	Legally binding target: 35% reduction in exposure compared to 2018	2040

- 3.5 In 2024 Defra published Interim Planning Guidance on the PM_{2.5} targets (Defra, 2024). This states that:

² EU Directive 2008/50/EC sets limit values for NO₂, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010). The limit values for NO₂ and PM₁₀ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values.

³ Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m³ would not exceed the 10 µg/m³ target.

“The purpose of the targets is to improve air quality by reducing levels of PM_{2.5} across the country, therefore improving public health. While achievement of the targets will be assessed at relevant monitoring sites, the targets apply to ambient (outdoor) air throughout England. Applicants and Local Planning Authorities should therefore consider the impact of developments on air quality in all ambient air, whether a monitor is present or not.”

3.6 In order to address the new targets, it is not sufficient to assess solely whether a scheme is likely to lead to an exceedance of a legal limit. Instead, developments need to implement appropriate mitigation measures from the design stage, ensuring the minimum amount of pollution is emitted and that exposure is minimised.

3.7 Pending publication of the new guidance, Defra advises applicants to provide evidence that they have identified key sources of air pollution within the scheme and taken appropriate action to minimise emissions of PM_{2.5} and its precursors as far as possible. More detailed assessment is expected for development closer to populations and/or having higher emissions. Defra has posed two questions to be used as prompts to support the interim assessment process:

“How has exposure to PM_{2.5} been considered when selecting the development site?; and

What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?”.

3.8 The relevant air quality criteria for this assessment are provided in Table 2.

Table 2: Air Quality Criteria for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Value
NO ₂	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5}	Annual Mean	20 µg/m ³ ^a

^a There is no numerical PM_{2.5} objective for local authorities (see Paragraph 3.3). Convention is to assess against the UK limit value which is currently 20 µg/m³.

4 Baseline Conditions

Relevant Features

- 4.1 The proposed development is located southwest of Royston, approximately 20 km to the south west of Cambridge. The application site is bounded by Briary Lane to the west, agricultural land to the south, and residential properties to the north and east. It currently consists of agricultural land. The proposed development is not located near to any AQMAs.

Industrial Sources

- 4.2 Industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2025b) and through examination of the Council's Air Quality Review and Assessment reports.
- 4.3 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local Air Quality Monitoring

- 4.4 NHC operates two automatic monitoring stations within its area, however, neither of these are located close to the proposed development. The Council also operates a number of NO₂ monitoring sites using diffusion tubes prepared and analysed by SOCOTEC Didcot (using the 50% TEA in acetone method). These include two deployed in Royston, adjacent to Melbourn Road and Old North Road. Annual mean results for the years 2018 to 2022 are summarised in Table 3. The monitoring locations are shown in Figure 2. The monitoring data have been taken from NHDC's 2023 Air Quality Annual Status Report (North Herts Council, 2023).

Table 3: Summary of Annual Mean NO₂ Monitoring (2018-2022) (µg/m³)

Site No.	Site Type	Location	2018	2019	2020	2021	2022
NH06	Roadside	Melbourn Road, Royston	24.6	24.8	21.7	20.5	27.4
NH115	Roadside	Old North Road, Royston	24.2	24.3	21.5	17.5	19.2
Objective			40				

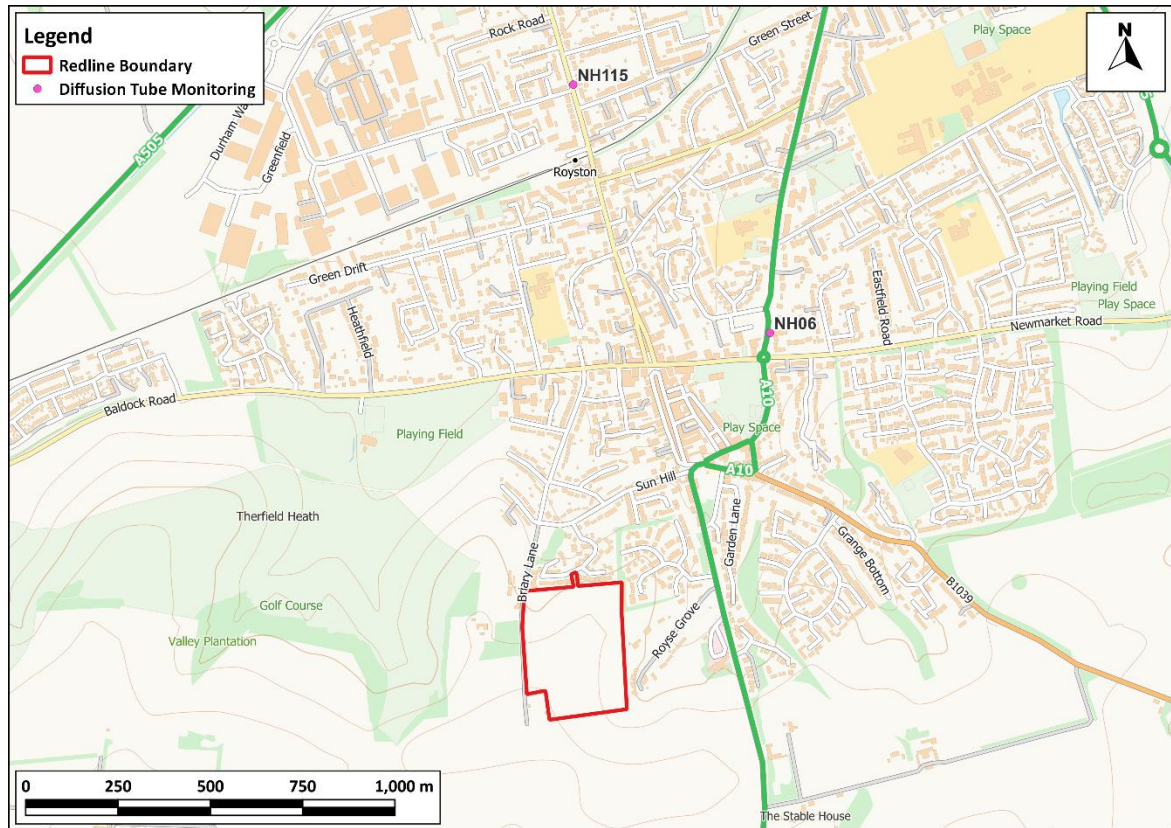


Figure 2: Monitoring Locations

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- 4.5 The measured annual mean concentrations of NO₂ at locations at both sites have been well below the objectives between 2018 and 2022. There is no discernible trend in concentrations at site NH06, however a decrease in concentrations is evident at site NH115 between 2018 and 2022.
- 4.6 While 2020 and 2021 results have been presented in this Section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.
- 4.7 The closest monitor which records PM₁₀ and PM_{2.5} concentrations is located over 20 km to the southwest of the proposed development. Concentrations measured in recent years have been well below the objectives for both PM₁₀ and PM_{2.5}, with the annual mean PM_{2.5} concentration also being below the AMCT value of 10 µg/m³.

Background Concentrations

- 4.8 Background concentrations have been defined using Defra's 2021-based background maps (Defra, 2025a). These cover the whole of the UK on a 1x1 km grid.
- 4.9 The maximum estimated background concentrations within the proposed development in 2029, the anticipated first year of occupation of the proposed development, are set out in Table 4. The values are all well below the objectives; PM_{2.5} concentrations are also well below the AMCT value.

Table 4: Estimated Annual Mean Background Pollutant Concentrations in 2029 ($\mu\text{g}/\text{m}^3$)

Year	NO ₂	PM ₁₀	PM _{2.5}
2029	6.1	12.1	6.5
Objective	40	40	20 ^a
AMCT	-	-	10 ^b

^a The 20 $\mu\text{g}/\text{m}^3$ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

^b To be met by 2040.

5 Assessment

Operational Impacts

- 5.1 Road traffic impacts from the development on the surrounding area have been screened out as the traffic generated by the site is below the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in the Introduction.
- 5.2 The project Transport Consultants (GTA Civils and Transport) have determined that the development will generate 434 AADT LDVs⁴ and is not expected to generate any HDVs. These daily trip rates are below the screening threshold of 500 LDVs recommended for use outside of an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Appendix A1). As such, the relevant screening thresholds will not be exceeded and there is no requirement for a detailed assessment of road traffic impacts at existing receptors; it can be concluded that the proposed development will not have a significant impact on local roadside air quality.

Impacts of Existing Sources on Future Residents of the Development

- 5.3 The impacts of NO₂, PM₁₀ and PM_{2.5} concentrations from the existing road network on new residents of the development have been assessed qualitatively, taking account of local air quality monitoring data and proximity to local roads. The assessment considers measured and background data for 2022 and assumes this is representative of conditions in the opening year of the proposed development.
- 5.4 The proposed development is located away from any busy roads, being over 240 m from the A10, in an area where pollutant concentrations would be expected to be close to background levels. Background concentrations at the site are well below the objectives (see Table 4). Further, in the centre of Royston, where roadside concentrations would be expected to be elevated compared to the proposed development, concentrations were well below the objectives in all recent years (see Table 3).
- 5.5 It can be concluded that there is no risk of exceedances of the objectives and that future users of the proposed development will experience acceptable air quality; there is no need for more detailed assessment.

⁴ The trip generation provided by GTA is based on a higher quantum of development of 99 residential units. The trip generation is higher than is to be expected for 84 residential units and the assessment is, therefore, robust.

6 Mitigation

Good Design and Best Practice

- 6.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required. Furthermore, NHC's Air Quality Planning Guidance Document requires that medium scale developments include the following, where appropriate:
- a Travel Plan including agreed mechanisms for discouraging high emission vehicle use and encouraging modal shift (i.e. public transport, cycling and walking) as well as the uptake of low emission fuels and technologies;
 - improved pedestrian links to public transport stops;
 - provision of new bus stops infrastructure including shelters, raised kerbing, information displays;
 - provision of subsidised or free access to public transport;
 - site layout to include improved pedestrian pathways to encourage walking; and
 - improved convenient and segregated cycle paths to link to any existing local cycle network.
- 6.2 The proposed development incorporates the following good design and best practice measures:
- setting back of the development buildings from roads by at least 25m;
 - provision of electric vehicle charging points in line with the Parking Standards Supplementary Planning Document (North Hertfordshire District Council, 2011);
 - provision of a Travel Plan setting out measures to encourage sustainable means of transport (public transport, cycling and walking); and
 - provision of pedestrian and cycle access to the new development, including cycle parking.
- 6.3 These measures are consistent with the measures set out NHC's Air Quality Planning Guidance.

Recommended Mitigation

- 6.4 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'; it will not introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant impact on local air quality. It is, therefore, not considered appropriate to propose further mitigation measures for this development.

7 Achieving Compliance with the PM_{2.5} Targets

- 7.1 The monitoring data described in Paragraph 4.7 demonstrate that annual mean PM_{2.5} concentrations are currently below the AMCT, which is to be met by 2040. Background concentrations at the proposed development are also well below the AMCT (Table 4).
- 7.2 Defra have set out in their Interim Planning Guidance (Defra, 2024) two questions designed to consider whether a development supports the AMCT and PERT PM_{2.5} targets.
- 7.3 The first question is *“How has exposure to PM_{2.5} been considered when selecting the development site?”*. Exposure to PM_{2.5} will be minimal as the site is in a rural area away from large populations of people and other potential sources of pollution; concentrations of PM_{2.5} at the site are expected to be well below the AMCT value. Emissions during the operational phase are considered to be negligible.
- 7.4 The second question is *“What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?”*. The proposed development will include best practise measures such as cycle parking and provision of a travel plan, the aim of which is to reduce private vehicle use and, thus, PM_{2.5} emissions.
- 7.5 It is considered that the development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as appropriate action has been taken to minimise emissions of PM_{2.5} and its precursors as far as is reasonably practicable.

8 Conclusions

- 8.1 The assessment has considered the impacts of the proposed development on local air quality in terms of emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future residents will experience.
- 8.2 Air quality conditions for future residents of the proposed development have been shown to be acceptable, with concentrations well below the air quality objectives throughout the site.
- 8.3 The traffic generated by the proposed development will be below industry screening thresholds and it will also not introduce any combustion sources. Thus, the proposed development will have a negligible impact on local air quality conditions.
- 8.4 The overall operational air quality effects of the proposed development are judged to be 'not significant'.
- 8.5 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 198 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents. It is also consistent with Paragraph 199, as it will not affect compliance with relevant limit values or national objectives. The proposed development is also consistent with Policy D4 of NHC's Local Plan, as it will not have a significant detrimental effect on air quality.
- 8.6 It is considered that the development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as appropriate action has been taken to minimise emissions of PM_{2.5} and its precursors as far as is reasonably practicable.

9 References

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10 Glossary

AADT	Annual Average Daily Traffic
AMCT	Annual Mean Concentration Target (for PM _{2.5})
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
Defra	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (<3.5 tonnes)
µg/m ³	Microgrammes per cubic metre
NHDC	North Hertfordshire District Council
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides (taken to be NO ₂ + NO)
NPPF	National Planning Policy Framework
OEP	Office for Environmental Protection
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PERT	Population Exposure Reduction Target (for PM _{2.5})
PM ₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM _{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance

Standards	A nationally defined set of concentrations for nine pollutants based on assessment of the effects of each pollutant on human health, including the effects on sensitive sub-groups.
TEA	Triethanolamine – used to absorb nitrogen dioxide

11 Appendices

A1 EPUK & IAQM Planning for Air Quality Guidance

A1.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- the severity of the impacts on air quality;
- the air quality in the area surrounding the proposed development;
- the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and
- the positive benefits provided through other material considerations”.

Recommended Best Practice

A1.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

A1.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

A1.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;
- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;

- The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - iii) Spark ignition engine: 250 mgNO_x/Nm³;
 - iv) Compression ignition engine: 400 mgNO_x/Nm³;
 - v) Gas turbine: 50 mgNO_x/Nm³.

A1.5 A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A1.6 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

"It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the "damage cost approach" used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential".

A1.7 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

"There may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

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

Impacts of the Development on the Local Area

A1.8 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A1.9 Coupled with any of the following:

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

A1.10 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;

- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A1.11 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A1.12 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

"Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable".

A1.13 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality".

A1.14 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

"The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer".

A1.15 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A1.16 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:
- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
 - a judgement on the overall significance of the effects of any impacts.
- A1.17 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either 'significant' or 'not significant'. In drawing this conclusion, the following factors should be taken into account:
- the existing and future air quality in the absence of the development;
 - the extent of current and future population exposure to the impacts;
 - the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
 - the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
 - the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.
- A1.18 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.
- A1.19 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A3.

A2 Policy Context

Air Quality Strategy 2007

- A2.1 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives.

Air Quality Strategy 2023

- A2.2 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023a) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

- A2.3 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Environment Act 2021

- A2.4 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- A2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in Paragraph 3.4.

Environmental Improvement Plan 2023

- A2.6 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018a). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.
- A2.7 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of PM_{2.5}. These targets, which are described in more detail in Paragraph 3.4, include the long-term targets in the Statutory Instrument described in Paragraph A2.5, and interim targets to be achieved by 2028.
- A2.8 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

National Policies

- A2.9 The National Planning Policy Framework (NPPF) (2024) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".

- A2.10 To prevent unacceptable risks from air pollution, Paragraph 187 of the NPPF states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".

- A2.11 Paragraph 198 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development".

- A2.12 More specifically on air quality, Paragraph 199 makes clear that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas."

- A2.13 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality.

- A2.14 The PPG sets out the information that may be required in an air quality assessment, making clear 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".

Local Policies

- A2.15 The North Hertfordshire Local Plan 2011 - 2031 (North Herts Council, 2022) was adopted in November 2022. Within this, Policy D4: Air Quality sets out expectations for air quality considerations in planning applications and states:

"Planning permission will be granted provided that development proposals:

a) Give consideration to the potential or actual impact on local air quality, both during the demolition/ construction phase and as a result of its final occupation and use;

b) Propose appropriate levels of mitigation to minimise emissions to the atmosphere and their potential effects upon health and the local environment; and

c) Carry out air pollution impact assessments, where required, to determine the impact on local air quality of the development.

Where an air quality impact assessment demonstrates that a development is unacceptable from a local air quality perspective the development will be refused.

Where air pollution impact assessments are not required there will still be a requirement on developers to provide appropriate levels of mitigation to address emissions of pollutants to the atmosphere."

A2.16 In support of the Local Plan, NHC has published an Air Quality Planning Guidance Document (North Hertfordshire District Council, 2018a), which sets out the expectations of air quality assessment for planning applications with the aim to "facilitate sustainable development by helping to achieve the best possible public health protection outcomes, in relation to air quality".

A2.17 The guidance outlines criteria to determine whether a development is minor, medium or major. The proposed development falls within the criteria for a 'medium' development as, although it will provide more than 50 residential units, it does not meet any of the additional trigger criteria for major developments; thus, a pollutant emission costs calculation is not required.

Air Quality Action Plans

National Air Quality Plan

A2.18 Defra has produced an Air Quality Plan to tackle roadside NO₂ concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018b) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

A2.19 NHC's Air Quality Action Plan (North Hertfordshire District Council, 2018b) sets out a series of measures by which they will seek to achieve the air quality objectives in their AQMAs. None of the policies are especially relevant to this assessment, being either general in nature, or focussed on the AQMAs, which are located in Hitchin, approximately 20 km southwest of the proposed development.

A3 Professional Experience

Dr Denise Evans, BSc (Hons) PhD MEnvSc MIAQM

Dr Evans is a Technical Director with AQC, with more than 25 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Isabel Stanley, MSci (Hons) AMEnvSc AMIAQM

Miss Stanley is a Senior Consultant with AQC, having joined the company in October 2019. Prior to joining AQC she completed an MSci degree in Geology at the University of Bristol, where her studies included modules focusing on GIS, dispersion modelling and environmental geochemistry. She has undertaken numerous air quality assessments, including road traffic and plant emissions modelling, as well as indoor air quality plans and construction dust risk assessments.

Dr Rosie Watts, BSc (Hons) MSc PhD MEnvSc

Dr Watts joined AQC in 2024 as an Assistant Consultant. Following a degree in Physical Geography, Rosie completed a PhD studying wild and prescribed fires. This was an ESRC-funded, collaborative project with industry stakeholders, focusing on perceptions towards fires as a risk and the use of prescribed fires as a mitigation tool. Rosie brings with her a background in climate change and its related risks, where throughout her academic career, she developed an interest in air quality, including in relation to wildfire events. She is currently gaining experience undertaking a variety of air quality assessments, including a range of scopes, assessment subjects, and techniques, including the use of ADMS-Roads and ADMS-6, and completing CDRA's and BREEAM Indoor Air Quality Plans.



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