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233 LONDON ROAD, READING AIR QUALITY ASSESSMENT

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EXECUTIVE SUMMARY

Ramboll UK Limited has been commissioned by Reading Foods Limited to undertake an air quality assessment of the Proposed Development at 233 London Road, Reading. The Proposed Development comprises 6 flats with the retention and reconfiguration of the ground floor retail unit with two one bed flats to the rear; the addition of a second storey on 233 London Road; the provision of a new two storey building to the rear; with cycle and refuse facilities. No car parking spaces or centralised heat and energy plant are proposed for the development

Construction of the development has the potential to lead to fugitive dust impacts. A qualitative assessment of the risk of dust impacts has been undertaken in accordance with Institute of Air Quality Management Guidance. Mitigation for a low-risk site is recommended; with the mitigation in place, construction phase effects will be not significant.

The Proposed Development is situated within an Air Quality Management Area (AQMA) where elevated pollutant concentrations would be expected, however results from monitoring undertaken nearby indicates that nitrogen dioxide (NO₂) concentrations are likely to be below National Air Quality Objectives (NAQOs) onsite. No mitigation against poor air quality is therefore required within the Development Site.

Development traffic is below the threshold for an assessment to be necessary and no significant combustion plant are proposed, therefore the development will have an insignificant impact on local air quality.

1. INTRODUCTION

1.1 Overview

Ramboll UK Limited has been commissioned by Reading Foods Limited to undertake an air quality assessment of the Proposed Development at 233 London Road, Reading. The Proposed Development comprises 6 flats with the retention and reconfiguration of the ground floor retail unit with two one bed flats to the rear; the addition of a second storey on 233 London Road; the provision of a new two storey building to the rear; with cycle and refuse facilities.

The Site is located within the Cemetery Junction district centre and is located on a key frontage within the district centre (Policy RL3 of the Local Plan)¹.

Construction of the properties has the potential to generate dust and fine particulate matter which could affect residential amenity in the vicinity of the Site.

The application Site is located within an Air Quality Management Area (AQMA) where elevated pollutant concentrations would be expected and therefore mitigation may be required against poor air quality.

The Proposed Development does not include provision for car parking spaces or centralised heat and energy plant.

1.2 Scope of the Assessment

The air quality assessment has considered the suitability of the Site for residential development. The assessment has focused on NO₂ and particulate matter PM₁₀ and PM_{2.5}.

Consideration has also been given to the potential for emissions of dust to arise during the construction phase. A qualitative assessment of the risk of dust impacts has been carried out using the Institute of Air Quality Management (IAQM) guidance² to identify the appropriate level of mitigation that should be applied to ensure impacts can be effectively mitigated.

There are no designated ecological sites close to the Proposed Development Site. Therefore an ecological assessment has been scoped out.

The Proposed Development does not include centralised heat and energy plant therefore an assessment of combustion emissions is not required.

In summary, the assessment includes:

- Establishment of baseline air quality;
- Assessment of dust impacts during the construction phase; and
- Qualitative assessment of road traffic impacts following development.

¹ Reading Borough Council, 2019. Reading Borough Local Plan. Adopted November 2019.

² Institute of Air Quality Management and Environmental Protection UK, 2017. Land-Use Planning & Development Control: Planning for Air Quality. Available: <https://iaqm.co.uk/guidance/>

2. SITE DESCRIPTION

2.1 Existing Site

The Site lies to the north of the A4 London Road to the east of Reading in an urban area with a mix of commercial and residential properties. The Site is currently an unoccupied retail unit with the first floor consisting of a two-bedroom flat. The rear of the site is currently vacant.

2.2 The Proposed Development

The Proposed Development comprises 6 flats with the retention and reconfiguration of the ground floor retail unit with two one bed flats the rear; the addition of a second storey; the provision of a new two storey building to the rear; with cycle and refuse facilities and landscaping. At ground floor to the front, the building would remain in retail use, with two one bed flats to the rear at ground floor level. At first floor level two flats are proposed and new two storey building to the rear. There are two, two bed and four one bed flats proposed. No car parking spaces, or centralised heat and energy plant are proposed for the development.

The Proposed Development will comprise up to:

- 49 m² for retail use;
- 293 m² for residential use;
- terraces; and
- amenity space.

The Site boundary is shown in Figure 2-1.

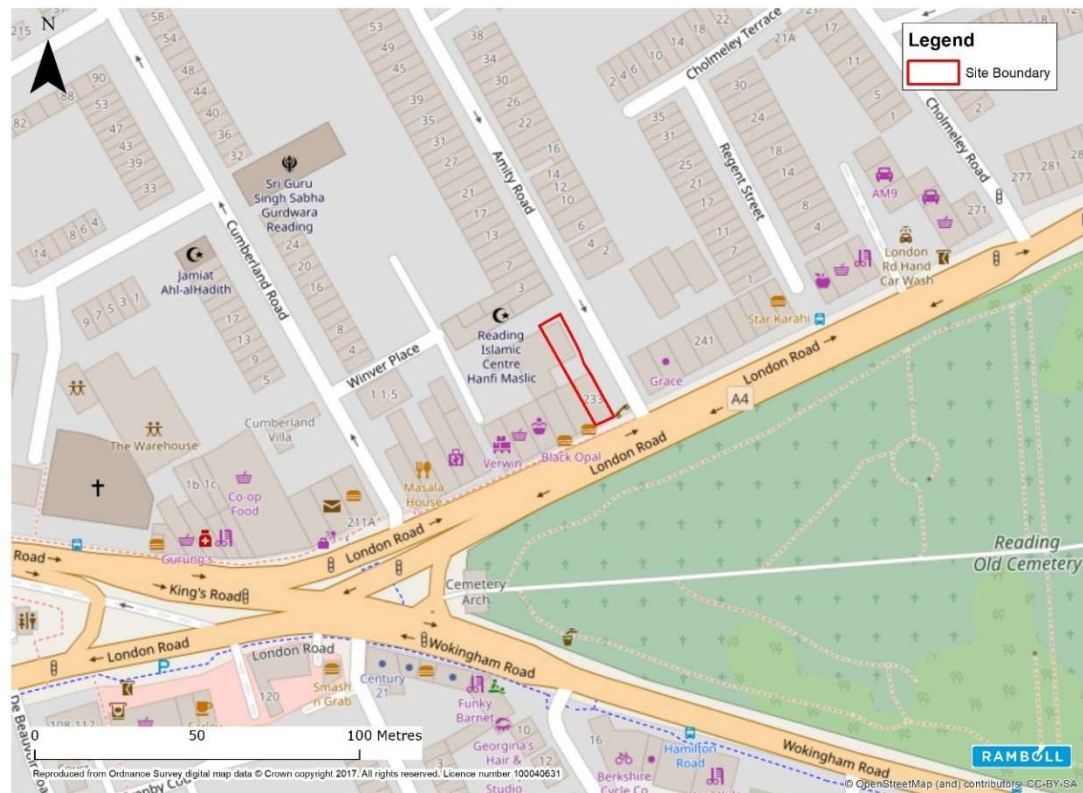


Figure 2-1: Proposed Development Site Boundary

2.3 Pre Planning Application Response

- 2.3.1 The pre application response (planning reference 211790/PRE)³ highlights that the Proposed Development is located within an AQMA and that the EU limit value for NO₂ may be breached increasing residential exposure to poor air quality. It states that *'The applicant will need to demonstrate sufficient mitigation measures are implemented to protect the residents from the effects of poor air quality.'* Potential mitigation measures are outlined by RBC within the response document.
- 2.3.2 Potential dust impacts during the construction phase are also highlighted. The impact to air quality and potential cause harm to residential amenity are stated, *'A scheme should be submitted which specifies the provisions to be made for the control of noise and dust emanating from the site during the demolition and construction phase.'*

³ Reading Borough Council, 2021. Pre-Planning Application Enquiry Response. 17th December 2021.

3. POLICY CONTEXT

3.1 National Legislation and Policy

3.1.1 European Union Ambient Air Quality and Clean Air for Europe, 2008

EU Directive 2008/50/EC⁴ on ambient air quality and cleaner air for Europe (the CAFE directive) sets out the ambient air quality standards for nitrogen dioxide (NO₂) and particulate matter with an aerodynamic diameter of less than 10 µm (PM₁₀) to be achieved by 1 January 2010 and 2005 respectively. The Air Quality Standards Regulations 2010⁵ implements the requirements of the Directive into United Kingdom (UK) legislation.

The Directive contains a series of limit values for the protection of human health and critical levels for the protection of vegetation. Compliance with the European Union (EU) Limit Values is mandatory. However, Member States can apply for a time extension for compliance, subject to approval of an action plan by the European Commission.

In December 2015, the Department for Environment Food and Rural Affairs (Defra) on behalf of the UK Government produced plans to improve air quality in the UK in order to meet the EU targets in the shortest possible time⁶. The adequacy of these plans to bring about the necessary improvements in air quality to meet the relevant national air quality objectives (NAQO) within the shortest time possible were successfully challenged within the High Court in 2016⁷.

Subsequently, in 2017 a plan for the reduction in roadside NO₂ concentrations was released⁸ which requires local authorities to identify local actions to accelerate the improvement in air quality in their jurisdictions. It also includes the national measures, including banning the sale of new conventionally powered cars and light goods vehicles by 2030^{9, 10} and further investment in cleaner transport.

3.1.2 Clean Air Strategy, 2019

Defra published a new Clean Air Strategy 2019¹¹ in January 2019, setting out how the UK will significantly reduce harmful air pollutant emissions by 2020 and 2030. The Clean Air Strategy contains an intention of working towards the previous World Health Organisation guideline value for PM_{2.5} of 10µg/m³. The Environment Bill¹² requires the government to bring forward at least two new air quality targets by 31 October 2022 which will include a new target for PM_{2.5} concentrations.

3.1.3 Environment Act, 2021

The Environment Act¹³ requires the government to set a long-term target for air quality (to be achieved no sooner than 15 years after the target has been set), as well as a target for PM_{2.5} concentrations. The targets must be brought forward by 31 October 2022.

⁴ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

⁵ Secretary of State, 2010. Statutory Instrument 2010 No. 1001, Air Quality Standards Regulations 2010. HMSO.

⁶ Defra, December 2015. Improving air quality in the UK, Tackling nitrogen dioxide in our towns and cities, UK overview document. Defra.

⁷ Royal Courts of Justice, 2016. Neutral Citation Number: [2016] EWHC 2740 (Admin). Case No: CO/1508/2016.

⁸ Department for Environment, Food and Rural Affairs, 2017. UK plan for tackling roadside nitrogen dioxide concentrations. Defra.

⁹ Department of Transport, 2021. Available at: <https://www.gov.uk/government/consultations/consulting-on-ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans/outcome/ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans-government-response>.

¹⁰ HM Government, 2021. Transitioning to zero emission cars and vans: 2035 delivery plan. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005301/transitioning-to-zero-emission-cars-vans-2035-delivery-plan.pdf

¹¹ Defra, 2019. Clean Air Strategy.

¹² Defra, 2021. Available at: <https://www.gov.uk/government/publications/environment-bill-2020/10-march-2020-air-quality-factsheet-part-4>.

¹³ Environment Act 2021, 2021 Chapter 30. HMSO.

3.1.4 Local Air Quality Management

Part IV of the Environment Act 1995¹⁴, requires the UK Government to publish an Air Quality Strategy and local authorities to review, assess and manage air quality within their areas. This is known as Local Air Quality Management (LAQM).

The 2007 Air Quality Strategy¹⁵ establishes the policy for ambient air quality in the UK. It includes the NNAQOs for the protection of human health and vegetation for 11 pollutants. Those NNAQOs included as part of LAQM are prescribed in the Air Quality (England) Regulations 2000 and the Air Quality (Amendment) (England) Regulations 2002. Table 3-1 presents the NNAQOs for NO₂ and PM₁₀, the two pollutants of most concern in urban areas.

Table 3-1: Objectives Included in Air Quality Regulations (England) 2000 for Purpose of Local Air Quality Management

Pollutant	Air Quality Objective		
	Concentration	Measured As	Date to be Achieved By
NO ₂	200 micrograms per metre cubed (µg/m ³) not to be exceeded more than 18 times per year	One-hour	31 December 2005
	40 µg/m ³	Annual mean	
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times per year	24-hour mean	31 December 2004
	40 µg/m ³	Annual mean	

Analysis of long-term monitoring data suggests that if the annual mean NO₂ concentration is less than 60 µg/m³ then the one-hour mean NO₂ objective is unlikely to be exceeded where road transport is the main source of pollution¹⁶. Therefore, in this assessment this concentration has been used to screen whether the one-hour mean objective is likely to be achieved. Similar to NO₂, a PM₁₀ annual mean below 32 µg/m³ is used to screen whether the 24-hour PM₁₀ mean objective is likely to be achieved.

The 2007 Air Quality Strategy also introduced a new policy framework for tackling PM_{2.5} which included an exposure reduction target and a 'backstop' annual mean NAQO. The exposure reduction target is focussed on reducing average concentrations across the most polluted urban areas and is therefore not applicable to individual schemes, whilst the annual mean NAQO can be considered a concentration cap to ensure environmental compliance. The UK NNAQOs for PM_{2.5} are provided in Table 3-2.

Table 3-2: UK Objectives for PM_{2.5}

Averaging Period	Objective	Target Date
Annual mean	25 µg/m ³	2020
Three-year running annual mean	15% reduction in concentrations measured at urban background sites	Between 2010 and 2020

The NNAQOs apply to external air where there is relevant exposure to the public over the associated averaging periods within each NAQO. Guidance is provided within LAQM.TG (16)¹⁶ issued by Defra for Local Authorities, on where the NNAQOs apply, as detailed in Table 3-3. The

¹⁴ Secretary of State, 1995. The Environment Act Part IV Air Quality, HMSO.

¹⁵ Department for Environment, Food and Rural Affairs, 2007. Air Quality Strategy for England, Scotland, Wales, and Northern Ireland. HMSO.

¹⁶ Department for Environment, Food and Rural Affairs, 2016. Local Air Quality Management Technical Guidance LAQM.TG (16). HMSO.

NNAQOs do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e., centre of roadways).

Table 3-3: Locations Where National Air Quality Objectives Apply

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

It should be noted that the EU Limit Values are numerically the same as the NAQO values but differ in terms of compliance dates, locations where they apply and legal responsibility. The compliance date for the NO₂ Limit Values was 1 January 2010, which was five years later than the date for the NAQO.

The Limit Values are mandatory whereas the NNAQOs are policy objectives. Local authorities are not required to achieve them but have to demonstrate effort of working towards their achievement. In addition, the Limit Values apply in all locations except:

- where members of the public do not have access and there is no fixed habitation;
- on factory premises or at industrial installations; and
- on the carriageway/central reservation of roads except where there is normally pedestrian access.

Where a local authority's review and assessment of its air quality identifies that air quality is likely to exceed the NNAQOs, it must designate these areas as AQMAs and draw up an Air Quality Action Plan (AQAP) setting out measures to reduce pollutant concentrations with the aim of meeting the NNAQOs.

3.1.5 National Planning Policy Framework

The National Planning Policy Framework 2021 (NPPF)¹⁷ sets out the Government's planning policies for England and how they are expected to be applied. In relation to achieving

¹⁷ Ministry of Housing, Communities & Local Government, 2021. National Planning Policy Framework. HMSO.

sustainable development, Paragraph 8 states that:

"Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):...

c) an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

Paragraph 105 states:

"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health."

Paragraph 174 on conserving and enhancing the natural environment states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: ...

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land stability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality ..."

Paragraph 180 within ground conditions and pollution 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."

Paragraph 186 states that:

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

Paragraph 187 states that:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".

3.1.6 Planning Practice Guidance

The Planning Practice Guidance (PPG)¹⁸ was launched as an online resource in March 2014 to support the NPPF and has separate guidance on air quality. Paragraph 001, Reference 32-001-20191101 06 (revision date 1 November 2019) of the PPG provides the following summary as to why air quality is a consideration for planning:

"... It is important that the potential impact of new development on air quality is taken into account in planning 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."

The PPG identifies when air quality could be relevant for a development management process, provides guidance on how detailed an assessment needs to be and provides guidance on how an impact on air quality can be mitigated.

3.2 Local Planning Policy

3.2.1 Reading Borough Local Plan

The RBC local plan¹⁹ was adopted in November 2019. The local plan identifies the amount of development that will take place, the areas, and sites where development is expected to be accommodated, and where it will be restricted, and sets out policies for how planning applications will be decided.

The policies in relation to air quality include:

'CC9: Securing Infrastructure

...

Proposals for development will not be permitted unless infrastructure, services, resources, amenities or other assets lost or impacted upon as a result of the development or made necessary by the development will be provided through direct provision or financial contributions at the appropriate time...

Other measures, as follows, should also be considered where a specific need is identified and justified:

- Measures to tackle poor air quality or for on-going air quality monitoring...*

EN15: Air Quality

Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

- Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:*
 - Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
 - Whether the development is within, or accessed via, an Air Quality Management Area; and*
 - Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health, or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*

¹⁸ Ministry of Housing, Communities & Local Government, 2014. Planning Practice Guidance. 'Air Quality'.

¹⁹ Reading Borough Council, 2019. Reading Council Local Plan. Adopted 2019.

- ii. *Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.*
- iii. *Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring...*

CR6: Living in Central Reading

Proposals for residential development within the central area will be assessed against the following criteria: ...

- ii. *Proposals for new residential development within the central area will be required to demonstrate how the issue of potential noise disturbance from neighbouring land uses and other sources, and air quality implications of residential development, have been considered and if necessary, mitigated...*

CC8 Safeguarding Amenity

Development will not cause a detrimental impact on the living environment of existing residential properties or unacceptable living conditions for new residential properties, in terms of: ...

- *Dust and fumes...'*

3.2.2 Reading Borough Council Air Quality Action Plan

The RBC Air Quality Action Plan²⁰ (AQAP), was produced to undertake a further review and assessment of air quality under Section 84(2) of the Environment Act 1995. The AQAP outlines the action that RBC propose to improve air quality within RBC. The actions of the AQAP are split into intervention and education/promotion. Such interventions include railway upgrade, cycle route infrastructure improvement, and reducing emissions from idling vehicles at hotspot locations within the AQMA.

3.3 Additional Guidance

3.3.1 Institute of Air Quality Management: Construction Dust Guidance, 2014 v1.1

The IAQM produced guidance²¹ to assist in the assessment of air quality impacts from demolition and construction activities. This guidance provides a consistent methodology for assessing the risks of dust impacts from demolition and construction activities and for identifying the correct level of mitigation which should be applied to avoid significant air quality effects.

3.3.2 Environmental Protection UK/Institute of Air Quality Management Guidance, Land-Use Planning Guidance

Environmental Protection UK (EPUK), together with the IAQM, produced updated guidance in 2017²² on how air quality impacts should be assessed within the land-use planning and development control process. This guidance provides clear criteria to determine when a detailed

²⁰ Reading Borough Council. Reading Borough Council Air Quality Action Plan Update.

²¹ Holman et al, 2014. IAQM Guidance on the assessment of dust from demolition and construction V1.1. Institute of Air Quality Management, London.

²² Institute of Air Quality Management and Environmental Protection UK, 2017. Land-Use Planning & Development Control: Planning for Air Quality. Available: <https://iaqm.co.uk/guidance/>

air quality assessment is required and a methodology for assessing the significance of air quality effects.

3.3.3 Defra, Local Air Quality Management Technical Guidance (LAQM TG16), 2016

Defra, in association with devolved regional environmental protection agencies, has produced technical guidance²³ designed to support local authorities in pursuit of their duties under the Environment Act 1995. It provides the methodology by which key air pollutants such as NO₂, PM₁₀ and PM_{2.5} should be monitored, assessed, and reported for the purposes of local air quality management and provides guidance on the actions to be taken by local authorities to improve local air quality.

²³ Department for Environment, Farming and Rural Affairs, 2016. Local Air Quality Management Technical Guidance (England) 2016 (TG16). HMSO.

4. METHODOLOGY

4.1 Baseline

To establish the existing baseline air quality in the vicinity of the Site, relevant data was reviewed and assessed. Data was obtained from the following sources:

- RBC diffusion tube and automated monitoring data²⁴; and
- Defra air quality background maps.

No site-specific air quality monitoring was carried out.

4.2 Construction Impacts

The assessment of potential construction impacts follows the guidance published by the IAQM on the assessment of the impacts of construction on air quality. The IAQM assessment methodology considers three separate dust effects and defines their significance according to the sensitivity of the surrounding area, as follows:

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

The assessment was therefore carried out in a number of steps:

- Step 1, the need for a construction assessment was screened, based on the proximity of receptors;
- Step 2, the risk of dust impacts was assessed considering the level of activity and the proximity of sensitive receptors;
- Step 3, site specific mitigation integral to the development proposals was reviewed and supplemented where necessary; and
- Step 4, the significance of the dust effects, after applying the site-specific mitigation, was assessed.

4.3 Operational Impacts

A screening assessment of operational phase vehicle exhaust emissions was undertaken by comparing the likely level of development traffic with thresholds within the IAQM guidance²², which identifies when an assessment is necessary.

²⁴ Reading Borough Council, 2020. 2020 Air Quality Annual Status Report (ASR). Reading Borough Council. June 2020.

5. EXISTING AIR QUALITY

5.1 Local Air Quality Management

The pollutants of concern in the RBC are NO₂, PM₁₀ and PM_{2.5}. As a result of identified air quality issues, RBC currently has one Air Quality Management Area (AQMA) covering all the major arterial roads in and out of the town as well as the central area. The AQMA was declared for the exceedance of the annual NO₂ objective.

The Site is located within the AQMA and therefore may be exposed to elevated NO₂ concentrations.

5.2 Local Authority Monitoring

RBC undertakes automatic and non-automatic monitoring of NO₂, PM₁₀ and PM_{2.5} at locations within the district. Six of these NO₂ monitoring sites are near the Proposed Development Site and are shown in Figure 5-1.

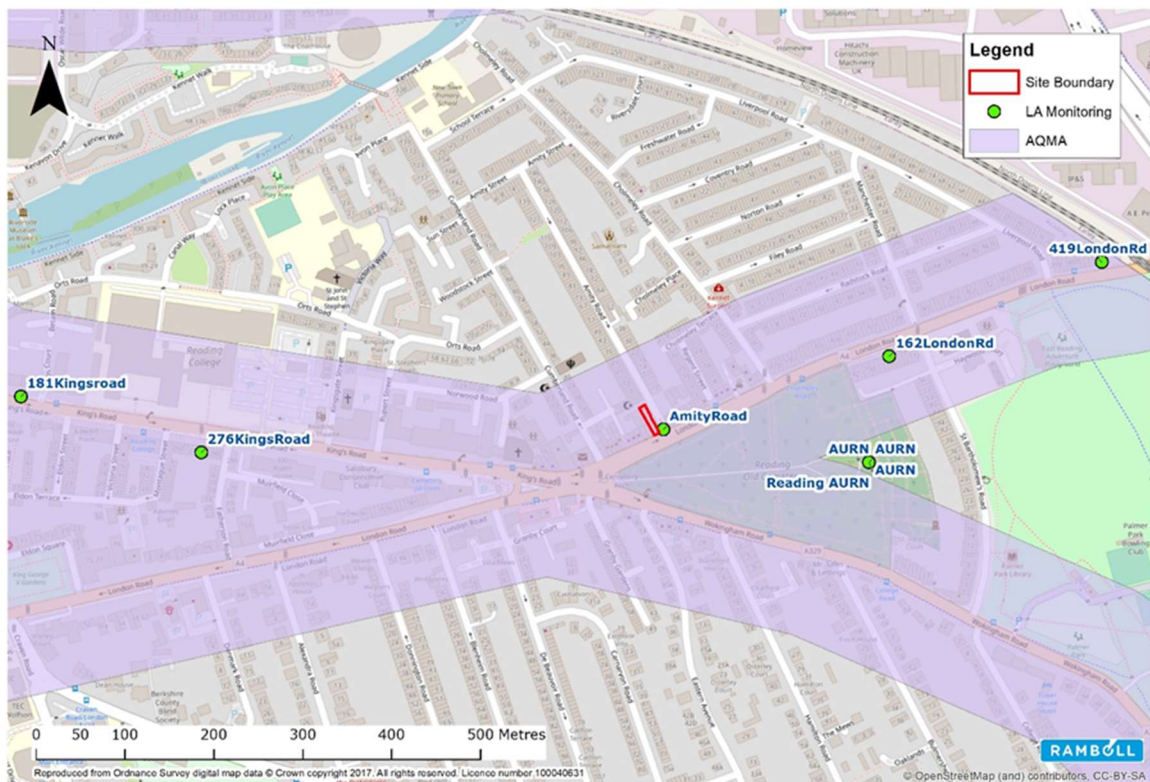


Figure 5-1: Monitoring Site Locations

5.2.1 Nitrogen Dioxide

The closest NO₂ monitoring sites and concentrations are presented in Table 5-1.

Table 5-1: Measured NO₂ Concentrations

Site ID	Site Type	Within AQMA	Annual Mean (µg/m³)				
			2016	2017	2018	2019	2020
Amity Road	Kerbside DT	Y	-	-	-	29	21
AURN	Urban Background Automatic	N	34	29	26	22	15
AURN	Urban Background DT	N	19	18	18	17	-
AURN	Urban Background DT	N	18	19	19	17	-
AURN	Urban Background DT	N	19	18	19	17	-
162 London Road	Roadside DT	Y	42	43	40	38	29
276 Kings Road	Roadside DT	Y	32	32	30	27	19
419 London Road	Roadside DT	Y	42	44	39	35	26
181 Kings Road	Roadside DT	Y	-	-	-	35	28
Objective			40				
DT – Diffusion Tube							
Exceedances of the objective highlighted in bold.							
*2020 monitoring data measured during Covid-19 pandemic scenario with restriction to travel imposed and therefore pollutant concentrations are likely to be lower than previous years and are unlikely to be representative of standard conditions							

The one-hour mean NO₂ concentrations at the AURN site are presented in Table 5-2 below.

Table 5-2: 1-Hour Mean NO₂ Concentrations

Site ID	Data Capture for the Monitoring Period (%)	Annual Mean (µg/m³)				
		2016	2017	2018	2019	2020
AURN	98	4	0	0	0	0
Objective		200µg/m³ not to be exceeded more than 18 times/year				
Exceedance of the NO ₂ 1-hour mean objective are highlighted in bold .						

The monitored one-hour mean NO₂ concentrations exceeded the NAOQ in 2016, however it has not been exceeded since then.

5.2.2 Particulate Matter

Particulate matter monitoring is undertaken within close proximity of the Proposed Development Site at AURN. The PM monitored concentrations are presented below in Table 5-3.

Table 5-3: Measured PM Concentrations

Annual PM Concentrations						
Annual PM ₁₀ Concentrations						
Site ID	Data Capture for Monitoring Period (%)	Annual Mean (µg/m³)				
		2016	2017	2018	2019	2020
AURN	95	13	12	13	13	15
Objective	40					
Annual PM _{2.5} Concentrations						
AURN	93	9	10	7	8	8
Objective	25					
*2020 monitoring data measured during Covid-19 pandemic scenario with restriction to travel imposed and therefore pollutant concentrations are likely to be lower than previous years and are unlikely to be representative of standard conditions						

The available monitored PM₁₀ and PM_{2.5} data within RBC shows that levels have met the NAQO for the last five years from 2016 to 2020.

5.3 Assessment of Monitoring Data

All NO₂ monitoring data shown in Table 5-1 shows ambient NO₂ concentrations below the annual mean NAQO between 2016 and 2019 with the exception of sites 162 London Road and 419 London Road which exceeded the NAQO from 2016 to 2018 and from 2016 to 2017, respectively. It is likely that these sites would have been influenced by emissions from the A4 London Road as they are located in a built-up area and are both roadside monitoring sites. The Proposed Development Site, is likely to experience similar concentrations to those at the Amity Road monitoring site which is approximately 1.5 m from the Site although concentrations at the Site would be lower as Amity Road is a kerbside monitoring site and the façade of the Proposed Development is further from the kerbside (approximately 6 m). Annual mean NO₂ concentrations were below the AQO in 2019 and 2020.

Diffusion tubes only monitor long term exposure and therefore results from this monitoring cannot be used for direct comparison with the short term 1-hour objective for NO₂. However, studies conducted into the relationship between long term monitored concentrations and short-term concentrations have indicated that where annual mean concentrations of more than 60 µg/m³ are recorded an exceedance of the hourly NO₂ objective is likely. On this basis, no exceedances of the short term one-hour objective have occurred at diffusion tube monitoring locations within the vicinity of the Site between 2016 and 2019. The monitored 1-hour NO₂ concentrations recorded at Reading AURN, approximately 500 m east of the Site, have been below the objectives since 2017. Therefore, it is unlikely that the 1-hour NO₂ objective will be exceeded at the Proposed Development.

The closest PM₁₀ and PM_{2.5} monitoring site to the application Site is Reading AURN. The concentrations at this site met the NAOQs between 2016 and 2020. In addition, Defra background map data indicates that the NAQOs for PM₁₀ and PM_{2.5} will be met at the Site.

5.4 Defra Background Maps

Estimated background concentrations for the Site have been obtained from the 2018 calibrated national maps provided by Defra²⁵ and are shown in Table 5-4. All of the predicted background concentrations are well below the NAQOs.

Table 5-4: Estimated Annual Mean Background Concentrations

Year	Location	Annual Mean ($\mu\text{g}/\text{m}^3$)		
		NO ₂	PM ₁₀	PM _{2.5}
2019	473500, 173500	21.3	17.1	11.9
2024		18.2	16.0	11.1

5.5 Air Quality at the Proposed Development Site

The monitoring data available suggests that concentrations of NO₂ will be below the NAQOs at the development Site. Although particulate monitoring is not undertaken near the Proposed Development, PM₁₀ and PM_{2.5} concentrations at the Site are likely to be below the NAQOs.

Air quality across the Proposed Development would therefore be expected to meet all relevant NAQOs.

²⁵ [Background Mapping data for local authorities - 2018 - Defra, UK](#)

6. CONSTRUCTION PHASE IMPACTS

6.1 Assessment of Impacts

The Site is located in an urban area with a small number of receptors within 20m of the site boundary, therefore, according to IAQM guidance a detailed assessment of the demolition and construction impacts is required.

6.2 Assessment of Impacts

Using the evaluation criteria within the IAQM's Guidance the potential dust emission magnitude has been identified for each stage of the Proposed Development as shown in Table 6-1 below.

Table 6-1: Dust Emissions Magnitude for Each Construction Activity

Activity	Dust Emission Magnitude	Justification
Demolition	Small	Total building volume less than 20,000 m ³ .
Earthworks	Small	Site area less than 2,500 m ²
Construction	Small	Total building volume < 25,000m ³ ; construction materials with low dust potential
Trackout	Small	Less than 10 HDV movements per day although potential for unpaved road length greater than 50m

The next stage of the process is to define the sensitivity of the assessment area to dust soiling and human health impacts. This process combines the sensitivity of the receptor with distance from the source to determine the overall sensitivity as summarised in Table 6-2.

Table 6-2: Sensitivity of Area to Dust Impacts

Sensitivity to Dust Soiling	Sensitivity to Human Health Impacts	Sensitivity to Ecological Receptors
Medium – approximately 10 highly sensitive receptors within 20m of site boundary	Low – PM ₁₀ concentrations less than 24µg/m ³ , approximately 10 highly sensitive receptors within 20m	N/A – there are no ecological sites with 50 m of the site or road links likely to be used by construction traffic.

The dust emission magnitude determined in Table 6-1 has been combined with the sensitivity assessment in Table 6-2 to define the risk of impacts for each construction activity of the Proposed Development in the absence of mitigation, as shown in Table 6-3.

Table 6-3: Risk of Dust Impacts in Absence of Mitigation

Sensitivity of Surrounding Area to Impacts	Dust Emission Magnitude			
	Demolition (Small)	Earthworks (Small)	Construction (Small)	Trackout (Small)
Dust Soiling (Medium)	Low	Low	Low	Negligible
Human Health (Low)	Negligible	Negligible	Negligible	Negligible

The highest risk is low for dust soiling due to earthworks and construction with a negligible risk for trackout. The risk to human health is negligible for construction, earthworks and trackout.

6.3 Mitigation of Construction Impacts

The control of dust emissions from construction sites relies upon good site management and mitigation techniques to reduce emissions of dust and limit dispersion. A summary of the relevant highly recommended mitigation measures from the IAQM guidance is provided in Table 6-4. It is recommended that these measures are included within a Construction Environmental Management Plan (CEMP) which could be secured through an appropriately worded planning condition. The proposed mitigation provided below are tried and tested and standard measures included in CEMPs on a regular basis.

Table 6-4: Recommended Dust Mitigation for a Low-Risk Site

Phase	Mitigation Measure
Communications	Display name and contact details of responsible person for dust issues on Site boundary in addition to head/regional office contact information.
Dust Management Plan	Develop and implement a Dust Management Plan (DMP), to be approved by the Local Authority.
	Record all complaints and incidents in a site log.
Site management	Take appropriate measures to reduce emissions in a timely manner, and record the measures taken within the log.
	Make the complaints log available to the Local Authority if requested.
	Record any exceptional dust incidents on or off site.
Monitoring	Carry out regular inspections to ensure compliance with the DMP and record results in the site logbook. Increase the frequency of inspections during activities with a high potential to create dust or in prolonged dry weather.
	Plan site layout to locate dust generating activities as far as possible from receptors.
	Use solid screens around dusty activities and around stockpiles.
	Avoid site runoff of water and mud.
Preparing and maintaining the site	Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Keep site fencing barriers and scaffolding clean using wet methods.
	Remove dusty materials from site as soon as possible. Minimise emissions from stockpiles by covering, seeding, fencing, or damping down.
Operating vehicles and machinery	Ensure vehicles switch off engines when stationary.
	Avoid use of generators where possible.
	Produce a Construction Logistics Plan to manage the sustainable delivery of materials.
	Cutting, grinding, or sawing equipment only to be used with suitable dust suppression equipment or techniques.
Operations	Ensure adequate water supply for effective dust and particulate matter suppression.
	Use enclosed chutes, conveyors, and covered skips.
	Minimise drop heights of materials.
	Ensure suitable cleaning material is available at all times to clean up spills.
Waste management	Avoid bonfires.
Demolition	Ensure effective water suppression is used, preferably through the use of handheld sprays.

Phase	Mitigation Measure
	Avoid explosive blasting. Bag and remove biological debris or damp down material prior to demolition.

7. OPERATIONAL AIR QUALITY IMPACTS

7.1 Impact of Development Traffic

The Proposed Development trip generation is expected to be below the IAQM/EPUK²² thresholds as there is no parking provision proposed at the Site. Development traffic is expected to be well below the threshold of 100 LDVs and 25 HDVs AADT for an assessment to be necessary in accordance with the IAQM guidance. Development traffic will therefore have an insignificant impact on local air quality.

7.2 Suitability for Intended Use

Emissions decrease with height and distance from the roadside. The ground floor at the front of the Development where retail space is proposed is likely to be exposed to higher pollutant concentrations than the rear of the Development where two one bed flats are proposed, and the upper floors of the Development where further residential accommodation is proposed.

The proposed Site layout does not move residential or workplace receptors any closer to the A4 than existing residential and workplace properties in the area.

Although the Proposed Development is within an AQMA, monitoring and background map data indicates that pollutant concentrations within the Site are well below NAQOs.

The Site is therefore considered suitable for residential development without the need for additional mitigation against poor air quality.

8. CONCLUSIONS

The air quality assessment has determined the following:

- Available monitoring data indicates that concentrations of NO₂, PM₁₀ and PM_{2.5} are currently likely to meet the long and short term NAQOs at the development site.
- The dust risk assessment has identified that construction activities pose a low dust risk. However, with the implementation of the mitigation measures detailed in Table 6-4, the activities are not expected to result in significant effects on local receptors.
- NO₂ annual mean, NO₂ one-hour mean, PM₁₀ and PM_{2.5} annual mean and PM₁₀ 24-hour mean concentrations are expected to meet the NAQOs at all floor levels when the Proposed Development is operational.
- The site is considered suitable for the development type proposed from an air quality perspective and no additional air quality mitigation is required to protect future site users from poor air quality.
- The Proposed Development would not result in significant effects on air quality.
- The Proposed Development meets local air quality policy requirements.

Overall, it is concluded that there are no air quality constraints to the proposed development.

APPENDIX 1

GLOSSARY

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
NAQO	National Air Quality Objective
CEMP	Construction Environmental Management Plan
Defra	Department for Environment, Food and Rural Affairs
Diffusion Tube	A passive sampler used for collecting NO ₂ in the air
EPUK	Environmental Protection UK
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle; a vehicle with a gross vehicle weight less than or equal to 3.5 tonnes.
NAQO	National Air Quality Objective as set out in the Air Quality Strategy and the Air Quality Regulations
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen oxides, generally considered to be nitric oxide and NO ₂
NPPF	National Planning Policy Framework
PM ₁₀ /PM _{2.5}	Small airborne particles less than 10/2.5 microns in aerodynamic diameter
PPG	Planning Practice Guidance
RBC	Reading Borough Council
Receptor	A location where the effects of pollution may occur
(µg/m ³)	Micrograms per metre cubed

APPENDIX 2

DUST RISK ASSESSMENT METHODOLOGY

Determining Dust Emission Magnitude

Large	Medium	Small
Demolition		
- total building volume >50,000 m³ - potentially dusty construction material (e.g., concrete) - on-site crushing and screening - demolition activities >20 m above ground level	- total building volume 20,000m³ – 50,000m³ - potentially dusty construction - demolition activities 10-20m above ground level	- total building volume <20,000m³ - construction material with low potential for dust release (e.g., metal cladding or timber) - demolition activities <10m above ground - during wetter months
Earthworks		
- total site area >10,000m² - potentially dusty soil type (e.g., clay, which will be prone to suspension when dry due to small particle size) >10 heavy earth moving vehicles active at any one time - formation of bunds >8m in height - total material moved >100,000 tonnes	- total site area 2,500m² - 10,000m² - moderately dusty soil type (e.g., silt) 5-10 heavy earth moving vehicles active at any one time - formation of bunds 4m - 8m in height - total material moved 20,000 - 100,000 tonnes	- total site area <2,500m² - soil type with large grain size (e.g., sand) <5 heavy earth moving vehicles active at any one time - formation of bunds <4m in height - total material moved <20,000 tonnes - earthworks during wetter months
Construction		
- total building volume >100,000m³ - piling - on-site concrete batching - sandblasting	- total building volume 25,000m³ - 100,000m³ - potentially dusty construction material (e.g., concrete) - piling - on-site concrete batching	- total building volume <25,000 m³ - construction material with low potential for dust release (e.g., metal cladding or timber)
Trackout		
>50 HDV (>3.5t) movements in any one day - potentially dusty surface material (e.g., high clay content) - unpaved road length >100m	10-50 HDV (>3.5t) movements in any one day - moderately dusty surface material (e.g., high clay content) - unpaved road length 50m – 100m	<10 HDV (>3.5t) movements in any one day - surface material with low potential for dust release - unpaved road length <50m

Determining Receptor Sensitivity

High	Medium	Low
Sensitivities of People to Dust Soiling Effects		
• users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • indicative examples include dwellings, museums, and other culturally important collections, medium and long term car parks and car showrooms.	• users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • the appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.	• the enjoyment of amenity would not reasonably be expected; or • property would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling; or • there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • indicative examples include playing fields, farmland (Unless commercially sensitive horticultural), footpaths, short term car parks and roads.
Sensitivities of People to the Health Effects of PM₁₀		
• locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include residential properties, Hospitals, schools, and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM₁₀, as protection is covered by Health and Safety at Work legislation.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks, and shopping streets.
Sensitivities of Receptors to Ecological Effects		
• locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling; or • locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.	• locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

Determining Sensitivity of the Area

Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Human Health Impacts

	Annual Mean PM ₁₀ concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	>28-32 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	>24-28 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium		>1	High	Medium	Low	Low	Low
Low		>1	Medium	Low	Low	Low	Low

Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Determining Risk of Dust Impacts

Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible