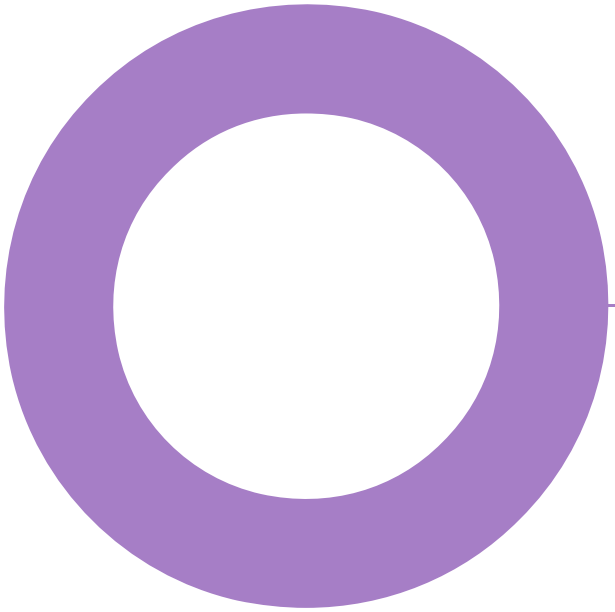
HOARE LEA

Godwin and Crowndale Estate. Camden.
London Borough of Camden.

AIR QUALITY
AIR QUALITY ASSESSMENT

REVISION 01 – 13 NOVEMBER 2020



Audit sheet.

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Contents.

Executive Summary.

Hoare Lea have been commissioned by London Borough of Camden to undertake an air quality assessment to support the planning application for a proposed residential development at the existing Godwin and Crowndale Estate in Camden, London, NW1 1PA (the 'Application Site').

The proposals comprise the construction of 10 four-bed residential dwellings to provide additional social rented units to the Godwin and Crowndale Estate, together with improved public realm works.

The baseline assessment shows that the Application Site is within an Air Quality Management Area declared for exceedances of the annual mean nitrogen dioxide (NO_2) and 24-hour mean particulate matter (PM_{10}) objectives. Multiple exceedances of the annual mean NO_2 objective have been recorded at monitoring locations in the vicinity of the Application Site in the last five years. However, pollutant concentrations recorded at nearby automatic monitoring stations indicate that the 1-hour mean NO_2, the annual and 24-hour mean PM_{10} and the annual mean $PM_{2.5}$ objectives have all been achieved in the vicinity of the Application Site in the last two years.

The energy strategy for the Proposed Development is fully electric, utilising Air Source Heat Pumps (ASHPs), a zero-emission technology. As no combustion sources are proposed, a detailed assessment of the impacts of emissions from the energy plant has been screened out of this assessment.

The traffic generated by the Proposed Development, as supplied by Iceni Projects Ltd, the project transport consultants, has been screened against the criteria set-out in the Environmental Protection United Kingdom and Institute of Air Quality Management planning guidance to determine the need for a detailed assessment. This showed that the potential impact of additional road traffic on local air quality is considered insignificant and a detailed assessment is not required.

The impacts of demolition and construction work on dust soiling and ambient fine particulate matter concentrations have been assessed. This identified that there is a high risk of dust soiling impacts and a medium risk of increases in particulate matter concentrations due to construction activities.

The risk of dust causing a loss of local amenity and increased exposure to fine particulate matter concentrations has been used to identify appropriate mitigation measures. Provided these are implemented and included within a dust management plan, for example through a planning condition, the residual impacts are considered to be not significant.

The Site Suitability assessment indicates no likely exceedance of either the short or long term NO_2, PM_{10} or $PM_{2.5}$ air quality objectives at the Proposed Development. Therefore, the Application Site is considered suitable for residential use without the need for additional mitigation.

The Proposed Development is considered air quality neutral according to Greater London Authority's benchmarking assessment methodology with regard to both building and transport emissions.

Based on the assessment results, the Application Site is considered suitable for the Proposed Development without the inclusion of mitigation and air quality should not be considered as a constraint to the planning consent.

1. Introduction.

Hoare Lea have been commissioned by London Borough of Camden (LBoC) to undertake an Air Quality Assessment to support the planning application for a proposed residential development at the existing Godwin and Crowndale Estate, Camden, NW1 1PA (hereafter referred to as the 'Application Site').

1.1 Proposed Development.

The Proposed Development comprises the construction of 10 four-bed three-storey residential dwellings to provide additional social rented units to the existing Godwin and Crowndale Estate, together with improved public realm works.

The Proposed Development will be car-free with the exception of one disabled parking space provided on Chalton Street. The Application Site's existing car park, which contains 18 spaces, will be removed as part of the works. It is proposed that two visitor spaces and four commercial spaces within the Godwin and Crowndale Estate will be repurposed for resident parking along with the three to four allocated on Chalton Street to the eastern edge of the Application Site. There will be no vehicular access into the Application Site, however either side of the Proposed Development can still be accessed from the Charlton Street spur. Pedestrian access is proposed to remain via Charlton Street.

The energy strategy for the Proposed Development is fully electric, utilising Air Source Heat Pumps (ASHPs), a zero-emission technology. As no combustion sources are proposed, a detailed assessment of the impacts of emissions from the energy plant has been screened out of this assessment.

1.2 Application Site Description and Location.

The Application Site is located within the LBoC's administrative area at the approximate National Grid Reference (NGR): X 529476, Y 183393. It is bound by Oakley Square Park to the west, Regent High School to the south east and residential properties belonging to the existing Godwin and Crowndale estate to the north, east and west. The Application Site currently exists as a car park, a multi-use games area and communal outdoor amenity space.

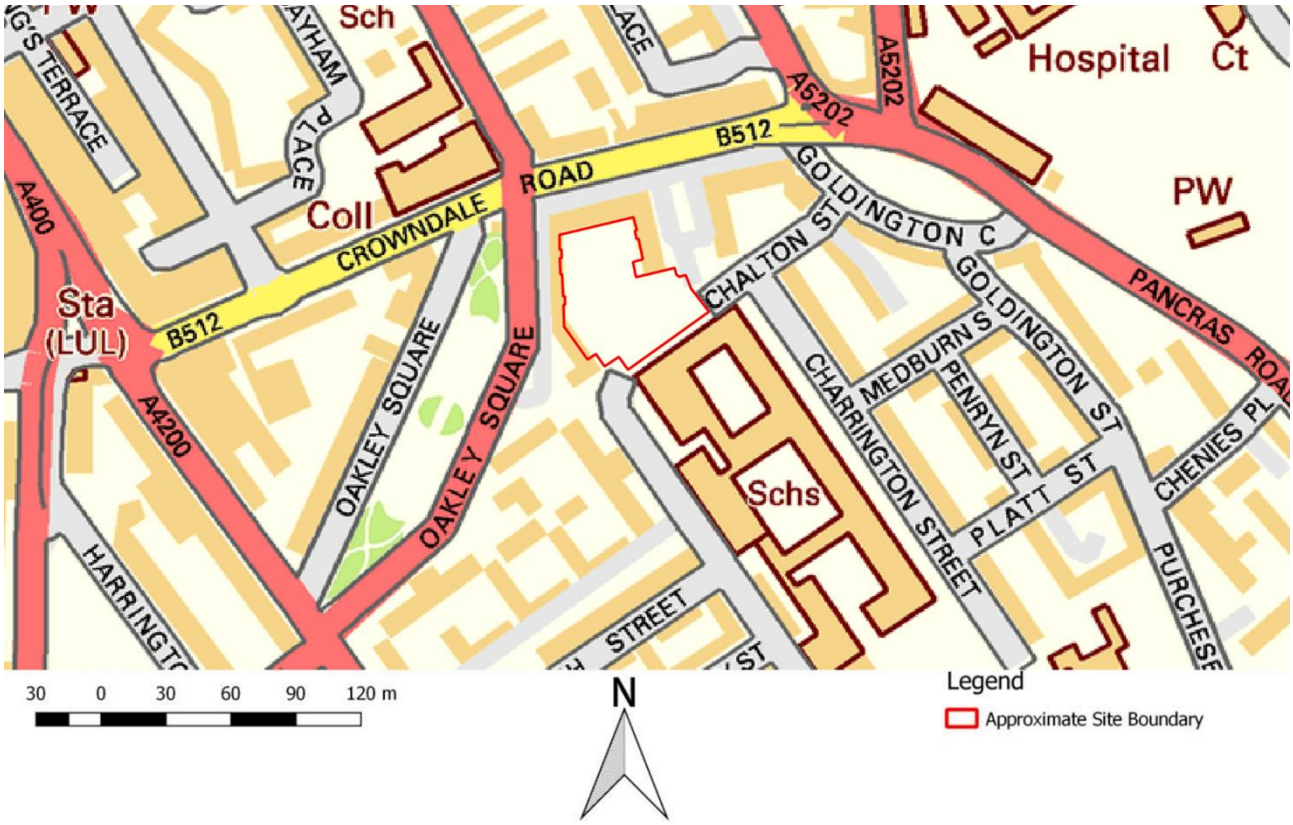

Figure 1: Location of the Application Site. Contains OS Data © Crown Copyright and Database rights 2020

A glossary of terms is provided in Section 9.

1.3 Scope of Assessment.

An email detailing the proposed methodology for the Air Quality Assessment was provided to LBoC on the 4 November 2020. At the time of writing, no response has been received. A copy of the correspondence with LBoC has been included in Appendix 1.

A summary of the scope of the assessment includes:

- Determination of baseline scenario, using LBoC's recent monitoring data;
- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase;
- An air quality neutral assessment; and
- Identification of required mitigation measures.

2. Legislation, Policy and Guidance Documents.

2.1 Air Quality Strategy and Local Air Quality Management.

The Environment Act 1995 (Part IV)[1] requires the Secretary of State to publish an air quality strategy and local authorities to review and assess the quality of air within their boundaries. The latter has become known as Local Air Quality Management (LAQM).

The Air Quality Strategy[2] provides the policy framework for local air quality management and assessment in the UK. It sets out air quality standards and objectives for key air pollutants. These standards and objectives are designed to protect human health and the environment. The Strategy also sets out how the different sectors of industry, transport and local government, can contribute to achieving these air quality objectives.

Local authorities are required to identify whether the objectives have been, or will be, achieved at relevant locations. If the objectives are not achieved, the authority must declare an Air Quality Management Area (AQMA) and should prepare an Air Quality Action Plan (AQAP) within 12 months. The action plan must identify appropriate measures and policies that can be introduced to help achieve the objective(s).

The air quality objectives set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations 2000[3], and the Air Quality (England) (Amendment) Regulations 2002[4].

The objectives for nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$) are given in Table 1. The target dates for meeting the NO_2 and PM_{10} objectives were 2005 and 2004, respectively. The $PM_{2.5}$ objective is to be achieved by the end of 2020. It should be noted that local authorities in England have a flexible role in working towards reducing emissions and concentrations of $PM_{2.5}$.

Table 1: Air Quality Objectives for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
Nitrogen Dioxide (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
Fine Particulate Matter (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
Fine Particulate Matter ($PM_{2.5}$) †*	Annual Mean	25 µg/m^3

Notes:
†Measured gravimetrically.
*The $PM_{2.5}$ objective, which is to be met by the end of 2020, is not in Air Quality (England) Regulations[4] and there is no requirement for local authorities to assess it, although they are encouraged to do so.

The objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objective. Examples of where the annual mean objectives should apply are provided in LLAQM.TG19[5] and include building facades of residential properties, schools, hospitals. The annual mean objectives are not relevant for the building facades of offices or other places of work where members of the public do not have regular access, nor kerbsides nor gardens.

The 24-hour objective for PM_{10} 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 objective for NO_2 also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, carparks and bus stations which are not fully enclosed. The 1-hour objective does not apply at kerbside sites where the public do not have regular access.

2.2 EU Limit Values.

The European Union has also set limit values for NO_2, PM_{10} and $PM_{2.5}$; these are legally binding and have been implemented into English legislation by The Air Quality Standards Regulations 2010[6] and The Air Quality Standards (Amendment) Regulations 2016[7].

The limit values for NO_2, PM_{10} and $PM_{2.5}$ are the same as the English objectives (given in Table 1), but applied from 2010 for NO_2, 2005 for PM_{10} and 2015 for $PM_{2.5}$. The limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway).

2.3 Statutory Nuisance Legislation.

Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance.

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

2.4 UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations.

The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations was published in 2017[8]. This sets out roles, responsibilities and measures for bringing NO_2 levels within the mandatory limit values in the shortest possible time. Under the UK plan, local authorities with roadside concentrations of NO_2 forecast by Defra as exceeding legal limits are identified and the areas of exceedance must be declared as AQMAs.

2.5 Clean Air Strategy.

The Clean Air Strategy (CAS)[9], published in 2019, sets out the Government's proposals aimed at delivering cleaner air in England, and also indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air to help meet EU limit values for the five most damaging air pollutants: NO_x (including NO_2), $PM_{2.5}$, ammonia (NH_3), sulphur dioxide (SO_2) and non-methane volatile organic compounds (NMVOC).

The immediate challenge is to reduce NO_x emissions due to non-compliance with the limit value for annual mean NO_2 (as given in Table 1). Targets for action include road traffic to reduce ambient NO_2 concentrations, and domestic coal and wood burning to improve ambient $PM_{2.5}$ concentrations.

2.6 Planning Policy.

2.6.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2019[10] sets out planning policy for England. It includes advice on when air quality should be a material consideration in development control decisions. Relevant sections are set out below:

> Paragraph 54: "Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition."
>
> Paragraph 170: "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."
>
> Paragraph 180: "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 181: "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 183: "The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

The NPPF is supported by Planning Practice Guidance (PPG)[11].

The PPG states that:

Paragraph 001 (Reference ID: 32-001-20191101): "Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance relevant Limit Values. 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."

Paragraph 002 (Reference ID: 32-002-20191101): Plans may need to consider ways in which the development could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable".

Paragraph 005 (Reference ID: 32-005-20191101): "Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and / or breach legal obligations (including those relating to the conversation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

The PPG also sets out the information that may be required in an air quality assessment, stating that:

Paragraph 007 (Reference ID: 32-007-20191101): "Assessments need to be proportional 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. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is commissioned".

It also provides guidance on options for mitigating air quality impacts, and makes clear that:

Paragraph 008 (Reference ID: 32-008-20191101): "Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact."

2.7 Local Policy.

2.7.1 London Plan 2016

The London Plan Consolidated with Alterations since 2011[12] sets out the spatial development strategy for London. The London Plan sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years (to the period 2036) and contains policies which are harmonious to those of Development Plan Documents to the 32 London Boroughs.

The following policy relating to air quality is contained within the London Plan:

> *"Policy 7.14 Improving air quality*
>
> *Strategic*
>
> *The Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimise public exposure to pollution.*
>
> *Planning Decision Development proposals should:*
>
> *a) minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3)*
>
> *b) promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the Greater London Authority (GLA) and London Councils' 'The control of dust and emissions from construction and demolition'*
>
> *c) be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs).*
>
> *d) ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches.*
>
> *e) where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified. Local Development Framework (LDF) preparation Boroughs should have policies that: a) seek reductions in levels of pollutants referred to in the Government's National Air Quality Strategy having regard to the Mayor's Air Quality Strategy. b) take account of the findings of their Air Quality Review and Assessments and Action Plans, in particular where Air Quality Management Areas have been designated."*

2.7.2 Intend to Publish London Plan 2019

The Examination in Public on the London Plan was held between 15 January and 22 May 2019. The Panel of Inspectors appointed by the Secretary of State issued their report and recommendations to the Mayor of London on 8 October 2019. The Mayor of London considered these recommendations and on 9 December 2019, issued

to the Secretary of State his intention to publish the London Plan along with a clean and tracked version of the Intend to Publish London Plan[13] , a statement of reasons for any of the Inspectors' recommendations that the Mayor does not wish to accept and a note that sets out a range of interventions that will help achieve the housing delivery set out in the Plan.

The following policy relating to air quality is contained within the Intend to Publish London Plan:

> *"Policy SI1 Improving air quality*
>
> *A London's air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:*
>
> *1) Development proposals should not:*
>
> *a) lead to further deterioration of existing poor air quality*
>
> *b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
>
> *c) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality*
>
> *d) create unacceptable risk of high levels of exposure to poor air quality.*
>
> *2) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas (AQFAs) or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.*
>
> *3) Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development.*
>
> *3A) Major development proposals must be at least air quality neutral and be submitted with an Air Quality Assessment.*
>
> *4) Development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.*
>
> *5) Development proposals should ensure that where emissions need to be reduced, this is done onsite. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated."*

2.7.3 The London Environment Strategy

The London Environment strategy (LES), published in May 2018[14], supersedes the previous Mayor's Air Quality Strategy (MAQS) for London, published in December 2010. The LES strategy aims to reduce pollution concentrations in London to achieve compliance within the EU limit values as soon as possible. The LES commits to the continuation of measures identified in the 2002 and 2010 MAQS and sets out a series of additional measures.

Proposal 4.3.3.a states that the London Strategy provides policies in which all new large-scale developments can not only become 'Air Quality Positive', but also maintain Air Quality Neutral requirements for all other developments. Within the planning guidance for building operations and transport emissions, information about emission benchmarks for 'Air Quality Neutral' developments are set out. Any development that either meets or exceeds the benchmarks is considered Air Quality Neutral as they avoid any increase in PM and NO_x emissions. In order for the benchmarks to remain relevant, the Mayor will continue to review them. To ensure that the

requirements are met, execution of the Air Quality Neutral policy will be monitored by utilising both the London Local Air Quality Management (LLAQM) and the London Plan monitoring report.

The following proposed policies relate to the planning process with regards to improving air quality:

Policy 4.2.2: "Reduce emissions from non-road transport sources, including by phasing out fossil fuels;"

Policy 4.2.3: "Reduce emissions from non-transport sources, including by phasing out fossil fuels;"

Policy 4.2.4: "The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality."

Policy 4.2.5: "The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence-based steps to improve air quality;"

Policy 4.3.1: "The Mayor will establish new targets for $PM_{2.5}$ and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners;"

Policy 4.3.2: "The Mayor will encourage the take up of ultra-low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines;"

Policy 4.3.3: "Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality;"

Policy 4.3.4: "Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces."

Furthermore, the strategy outlines that negative consequences that can occur from developing air quality and climate policies in isolation, particularly with regards to energy and planning policy. Instead, integrated policy design can lead to benefits such as reducing carbon emissions by switching to zero emission vehicles simultaneously.

The Strategy also includes the focus on the 187 Air Quality Focus Areas (AQFAs) declared by the GLA. Focus Areas are defined to address concerns raised by boroughs within the LAQM review process and forecasted air pollution trends. These are locations that not only exceed the EU annual mean limit value for NO_2 but are also locations with high human exposure. This is not an exhaustive list of London's hotspot locations, but where the GLA believe the problem to be most acute.

2.7.4 Camden Local Plan

The Camden Local Plan is the key strategic document in the London Borough of Camden's (LBoC) development plan. It sets out the vision for shaping the future LBoC and contains policies for guiding planning decisions. It was adopted by the Council on 3 July 2017, replacing the Core Strategy and Development Policies planning documents (adopted in 2010). The Local Plan will cover the period from 2016-2031.

The following policy relating to air quality is contained within the Local Plan:

Policy CC4 Air quality-

"The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce

sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan."

2.7.5 Local Air Quality Management in Camden

The whole of Camden has been designated as an Air Quality Management Area (AQMA) for exceedances of the annual mean NO_2 and 24-hour mean PM_{10} objectives. Camden's Clean Air Action Plan[15] has been produced as part of LBoC's duty to London Local Air Quality Management. It outlines the actions that will be taken to improve air quality in Camden between 2019 and 2022.

The key priorities of the Clean Air Action Plan are:

- Reducing building emissions
- Reducing construction emissions
- Reducing transport emissions
- Supporting communities and schools
- Reducing emissions from delivery, servicing and freight
- Continuing public health and awareness raising
- Lobbying

A number of Council plans and strategies support the Clean Air Action Plan:

- Camden 2025
- Our Camden Plan
- Green Action for Change 2010-2020
- Camden's Parking and Enforcement Plan
- Camden's Transport Strategy 2019-2041
- Joint Strategic Needs Assessment

2.8 Assessment Guidance.

The primary guidance documents consulted in undertaking this assessment are detailed below.

2.8.1 Mayor of London, London Local Air Quality Management Technical Guidance

The Mayor of London's London Local Air Quality Management Policy Guidance (LLAQM.TG(19))[5] was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.8.2 EPUK-IAQM 'Air Quality Guidance for Planning'

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance[16] to help ensure that air quality is properly accounted for in the development control process. It clarifies when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

2.8.3 GLA 'Construction and Demolition Dust Guidance'

Guidance on the assessment of dust from demolition and construction has been published by the GLA[17]. The guidance provides a methodology to determine the dust emission magnitude and provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities. This allows for the identification of appropriate mitigation measures that are defined within further IAQM guidance.

2.8.4 Camden Planning Guidance: Air Quality

LBoC has prepared the Camden Planning Guidance (CPG)[18] on air quality to provide information on key air quality issues within the borough and to support the policies in the Camden Local Plan 2017. This guidance is consistent with the Local Plan and forms a Supplementary Planning Document (SPD) which is an additional "*material consideration*" in planning decisions. LBoC adopted this CPG on Air Quality in March 2019.

3. Methodology of Assessment.

3.1 Consultation.

The approach to the assessment, as described in Section 1.3, was provided to the LBoC for review. A copy of the correspondence with LBoC has been provided in Appendix 1.

3.2 Existing Air Quality in the Study Area.

A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Application Site. This desk-top study was undertaken using the following sources:

- Air quality data for Camden, including a review of the LBoC's air quality reports[19] and local monitoring data;
- Background pollution maps from Defra's Local Air Quality Management (LAQM) website[20];
- The UK Pollutant Release and Transfer Register[21];
- Pollution Inventory from the Environment Agency[22]
- Greater London Authority LAEI Air Quality Focus Areas[23];
- Greater London Authority LAEI Modelling[24];
- The UK Ambient Air Quality Interactive Map[25]; and
- Ordnance Survey data and aerial photography from Google Maps.

3.3 Construction Phase Impacts.

3.3.1 Construction Dust Assessment

The assessment of construction dust impacts has been undertaken in line with the GLA methodology. Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- Earthworks;
- Construction; and
- Trackout

The potential impacts from demolition activities has been screened out of this assessment as there are not existing solid structures to be demolished at the Application Site.

The risk of dust emissions was assessed for each activity with respect to:

- Potential loss of amenity due to dust soiling; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

The first stage of the assessment involves screening to determine whether there are any sensitive receptors within the threshold distances defined by the GLA guidance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 50 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance;
- An 'ecological receptor' is located within 50 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance.

The magnitude of dust emission for each activity is determined on the basis of the guidance, indicative thresholds, information available relating to the project and expert judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the mitigation requirements.

Descriptors for magnitude of impact and impact significance used in this assessment of construction phase dust are given in the guidance[17] available online.

3.3.2 Construction Traffic

3.3.2.1 Construction Traffic Emissions Screening

A screening assessment has been undertaken with reference to the following EPUK and IAQM guidance indicative criteria:

- a change of Light Duty Vehicle (LDV) flows of more than 100 AADT (within an AQMA); and/or
- a change of Heavy Duty Vehicle (HDV) flows of more than 25 AADT (within an AQMA).

3.3.2.2 NRMM Emissions Screening

Non-Road Mobile Machinery (NRMM) refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads. NRMM emissions have been screened following IAQM guidance[26].

3.4 Operational Phase Impacts.

3.4.1 Road Traffic Impacts

The screening assessment has been undertaken with reference to the following documents:

- EPUK and IAQM guidance indicative criteria, i.e.:
  - a change of LDV flows of more than 100 AADT (within an AQMA); and/or
  - a change of HDV flows of more than 25 AADT (within an AQMA).

Where these criteria are exceeded, a detailed assessment is required, although the guidance advises that "the criteria provided are precautionary and should be treated as indicative", and "it may be appropriate to amend them on the basis of professional judgement".

Where impacts can be screened out there is no need to progress to a more detailed assessment.

3.4.2 Site Suitability

A qualitative assessment has been undertaken to consider the Site Suitability which refers to the exposure of future occupants of the Proposed Development to existing air quality.

The assessment of Site Suitability will be assessed qualitatively using background monitoring data from Defra, LAEI data from GLA and local monitoring data from LBoC.

3.4.3 Air Quality Neutral Assessment

To enable the implementation of the air quality neutral policy of the London Plan, emission benchmarks have been developed for buildings and transport, the latter of which are dependent on the zone in London where the development is located. Developers are required to calculate emissions due to building operations and transport, and to compare these emissions with the benchmarks.

Where the development's emissions exceed the benchmarks, on-site mitigation is required. Where emissions continue to exceed the benchmarks after appropriate on-site mitigation, the excess emissions need to be off-set off-site through agreement with the local planning authority.

3.4.4 Camden Planning Guidance for Air Quality

Following the criteria of assessment triggers in Table 1 of the Camden Air Quality CPG, it has been determined that a detailed air quality assessment is not required and that a screening assessment should be undertaken based on the scale of the Proposed Development and the sensitivity of the area. This screening assessment will determine the significance of air quality impacts arising from the operation of the Proposed Development.

3.5 Assessment of Significance.

3.5.1 Construction Phase Impacts

The GLA guidance[17] on the assessment of dust from demolition and construction states that the primary aim of the risk assessment is to identify site specific mitigation that, once implemented, should ensure that there will be

no significant effect. Therefore, the assessment has been used to determine an appropriate level of mitigation for the construction phase.

The determination of which mitigation measures are recommended include elements of professional judgement and the professional experience of the consultants preparing this report is set out in Appendix 2.

3.5.2 Operational Phase Impacts

The EPUK and IAQM guidance[16] has been used to assess the potential for significant impacts as a result of vehicle emissions from traffic associated with the Proposed Development. The focus of the guidance is to assess traffic emission impacts and advises on how to describe the air quality impacts and their significance.

3.5.3 Significance of Effect

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

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

4. Baseline Environment.

This section sets out the available information on air quality in the vicinity of the Application Site.

4.1 Site Setting.

The Application Site is located within LBoC's area of administration at approximate NGR: X 529476, Y 183393 (approximate postcode NW1 1PA). The Application Site is currently bound by:

- Oakley Square Gardens to the west;
- Regent High School to the south east; and
- Existing Godwin and Crowndale Estate residential properties located along Oakley Square (A400) to the west, Crowndale Road to the north and Crowndale Court to the east.

The Application Site currently exists as a car park, a multi-use games area and communal outdoor amenity space.

4.2 Local Air Quality Management Review and Assessment.

The Application Site is located within Camden's AQMA declared by LBoC for exceedances of the annual mean NO_2 and annual mean and 24-hour mean PM_{10} objectives. Based on a review of the most recent Annual Status Report (ASR) published in July 2020[19], NO_2 concentrations continue to gradually decrease across Camden, however exceedances of the annual mean objective are still recorded at multiple sites. PM_{10} and $PM_{2.5}$ concentrations continue to remain fairly constant across Camden and with no exceedances of the annual mean PM_{10} and $PM_{2.5}$ objectives or the 24-hour mean PM_{10} objective recorded between 2015 and 2019.

4.3 Local Air Quality Monitoring.

LBoC operate four automatic monitoring stations, with the closest sites being Coopers Lane, Euston Road and London Bloomsbury located approximately 350 m south east, 820 m south and 1.5 km south of the Application Site respectively. The fourth automatic monitoring station, Swiss Cottage, is located approximately 3 km away and therefore is not considered to be representative of the air quality conditions experienced at the Application Site.

Recent monitoring data for the automatic monitoring sites is detailed in Table 2 and a visual representation of the locations of the automatic monitoring sites is shown in Figure 2.

Table 2: Automatic Monitoring Stations within 2 km of the Application Site. Data presented in bold represents exceedances of the relevant air quality objectives.

Monitoring station and distance (m) from site boundary (approx.)	Objective	2015	2016	2017	2018	2019
NO_2						
Euston Road, 820 m, Roadside	Annual mean concentration (µg/m^3)	**90**	**88**	**83**	**82**	**70**
	Number of hours with concentrations >200 µg/m^3	**54**	**39**	**25**	18	7
London Bloomsbury, 1,500 m, Urban Background	Annual mean concentration (µg/m^3)	**48**	**42**	38	36	32
	Number of hours with concentrations >200 µg/m^3	0	0	0	0	0
PM_{10}						
Coopers Lane*, 350 m, Urban Background	Annual mean concentration (µg/m^3)	-	-	-	15	15

Monitoring station and distance (m) from site boundary (approx.)	Objective	2015	2016	2017	2018	2019
	Number of days with concentrations > 50 µg/m^3	-	-	-	1	5
Euston Road 820 m, Roadside	Annual mean concentration (µg/m^3)	18	24	20	21	22
	Number of days with concentrations > 50 µg/m^3	5	10	3	2	8
London Bloomsbury, 1,500 m, Urban Background	Annual mean concentration (µg/m^3)	22	20	19	17	18
	Number of days with concentrations > 50 µg/m^3	6	9	6	1	9
$PM_{2.5}$						
Euston Road 820 m, Roadside	Annual mean concentration (µg/m^3)	17	17	14	15	14
London Bloomsbury, 1,500 m, Urban Background	Annual mean concentration (µg/m^3)	11	12	13	10	11

* PM_{10} was monitored at Coopers Lane from 2018 onwards.

The Euston Road automatic monitoring station is at a roadside location and has exceeded the annual mean NO_2 objective every year between 2015 and 2019. However, the London Bloomsbury automatic monitoring station is in an urban background location and has not exceeded the annual mean objective since 2016. There have not been any exceedances of the NO_2 hourly objective at any of the automatic monitoring stations since 2017.

Further to this, there have not been any exceedances of the annual mean and 24-hour mean PM_{10} objectives or the annual mean $PM_{2.5}$ objective at any of the automatic monitoring sites in the last five years.

In addition to the automatic monitoring stations, LBoC currently monitor annual mean NO_2 concentrations across the borough at 33 passive diffusion tube locations. The annual mean concentrations for those located within approximately 1 km of the Proposed Development are shown in Figure 2 and detailed in Table 3.

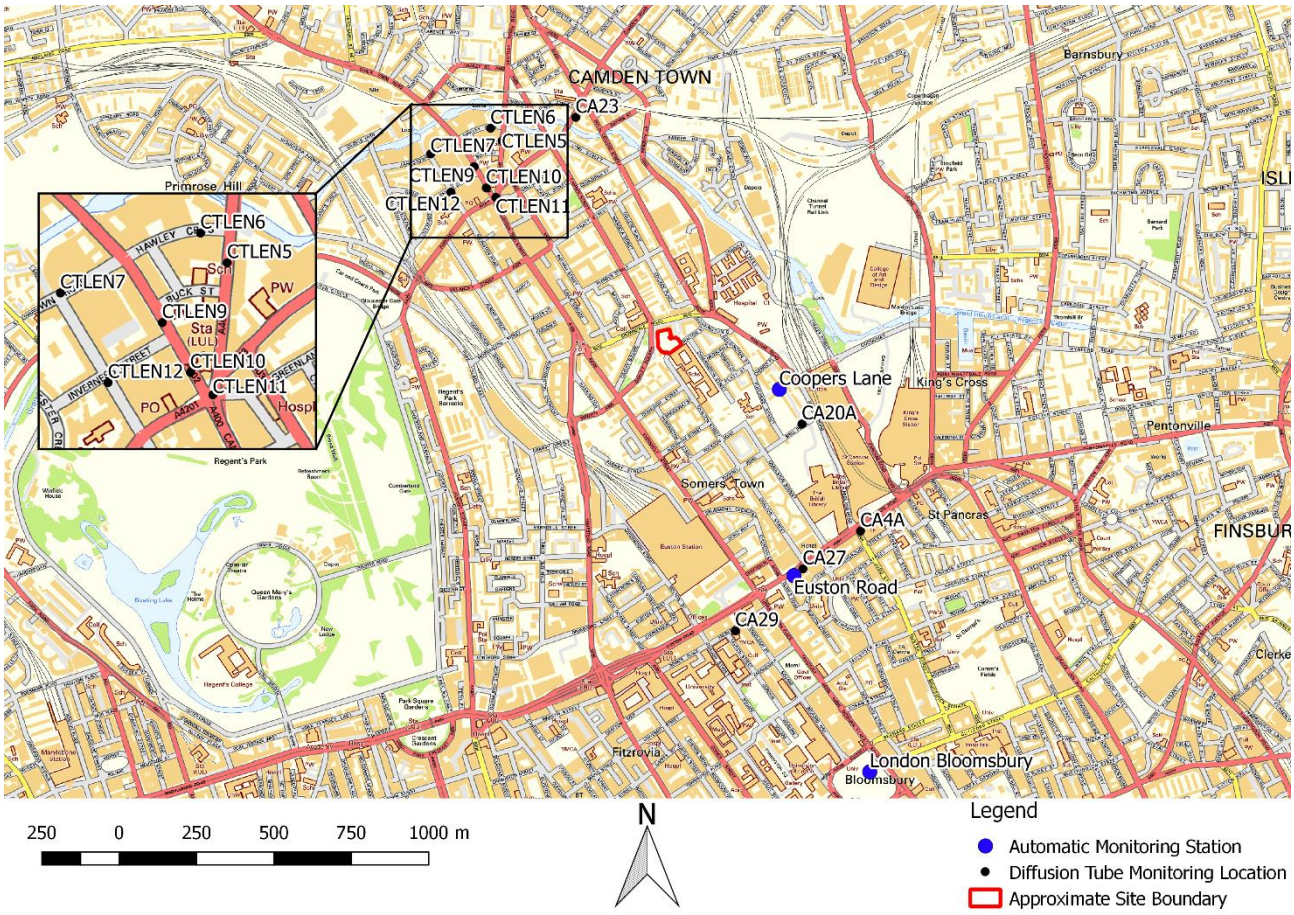

Figure 2: Automatic and non-automatic monitoring locations in the vicinity of the Application Site. Contains OS Data © Crown Copyright and Database rights 2020.

Table 3: Passive diffusion tube monitoring results within 1 km of the Application Site. Data presented in bold represents exceedances of the annual mean NO_2 objective.

Site ID	Site Type	Site Name	Distance (m) from Application Site (approx.)	Annual Mean NO_2 Concentration (µg/m^3)				
				2015	2016	2017	2018	2019
CA20A*	Roadside	Brill Place	470	48.94	47.53	52.65	41.15	43.13
CTLEN11	Kerbside	Britannia Junction	680	-	-	-	-	52.69
CTLEN10	Roadside	Camden High Street (American Candy)	720	-	-	-	-	46.58
CA23	Kerbside	Camden Road	740	63.33	61.74	69.30	55.57	52.49
CA16	Roadside	Kentish Town Road	800	63.55	58.72	68.81	54.66	45.03
CTLEN9	Roadside	Camden High Street (Camden News)	800	-	-	-	-	37.93
CTLEN12	Roadside	Cavendish School (Arlington Road)	810	-	-	-	-	33.21

Site ID	Site Type	Site Name	Distance (m) from Application Site (approx.)	Annual Mean NO_2 Concentration (µg/m^3)				
				2015	2016	2017	2018	2019
CA27	Roadside	Euston Road LAQN colocation	820	-	-	-	-	63.81
CA4A*	Kerbside	Euston Road	840	86.76	82.71	84.95	69.19	69.06
CTLEN6	Roadside	Hawley Crescent	850	-	-	-	-	38.02
CA29	Roadside	Endsleigh Gardens	920	-	-	-	-	48.34
CTLEN7	Roadside	Jamestown Road	930	-	-	-	-	37.84

*The passive diffusion tubes at Brill Place and Euston Road were relocated in 2018. Annual mean NO_2 concentrations between 2015 and 2018 have been taken from the old monitoring locations, approximately 10-20 m away, in order to obtain a full set of data.

As shown in Table 3 above, the annual mean NO_2 objective has often been exceeded at monitoring locations in the vicinity of the Application Site over the last five years. The closest passive diffusion tube to the Application Site, Brill Place (ID: CA20A), consistently exceeded the annual mean objective between 2015 and 2019. However, linear regression indicates that NO_2 concentrations (averaged across all sites in Table 3 with five years of data) are decreasing in the vicinity of the Application Site at an average rate of 3.4 µg/m^3 per year, although this trend is not significant.

An annual mean NO_2 concentration of 60 µg/m^3 or above is often used to indicate a possible exceedance of the 1-hour mean NO_2 objective. Four of the monitoring locations have recorded NO_2 concentrations in excess of 60 µg/m^3 over the last five years.

4.4 Industrial Pollution.

A desk-based review of potential industrial sources using the UK Pollutant Release and Transfer Register and the Environment Agency's Pollution Inventory[22] did not identify any significant industrial or waste management sources of air pollution that are likely to affect the Application Site with regard to air quality.

4.5 Defra Predicted Concentrations.

The background concentrations have been obtained from the national maps published by Defra[20]. These estimated concentrations are produced on a 1 km by 1 km grid basis for the whole of the UK. The Application Site falls into grid square X 529500 Y 183500 and the predicted concentrations for this grid square for NO_2, PM_{10} and $PM_{2.5}$ are provided in Table 4 for 2019, the most recent year with available monitoring data, 2020, the earliest year construction could commence and for 2021, the earliest possible opening year for the Proposed Development.

Table 4: Predicted Background Concentrations at the Application Site in 2019, 2020 and 2021

Year	Predicted Background Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2019	32.5	19.9	12.7
2020	30.6	19.4	12.4
2021	29.7	19.1	12.3

As shown in Table 4, background concentrations are below the relevant air quality objectives for all pollutants in the earliest possible opening year of the Proposed Development, 2021.

4.6 Greater London Authority.

4.6.1 Air Quality Focus Areas

Air Quality Focus Areas (AQFAs) are locations that not only exceed the annual mean NO_2 objective but are also locations with high human exposure. There are three AQFAs in the vicinity of the Application Site, with the closest described as 'Camden High Street from Mornington Crescent to Chalk Farm and Camden Road', which is located approximately 90 m to the west.

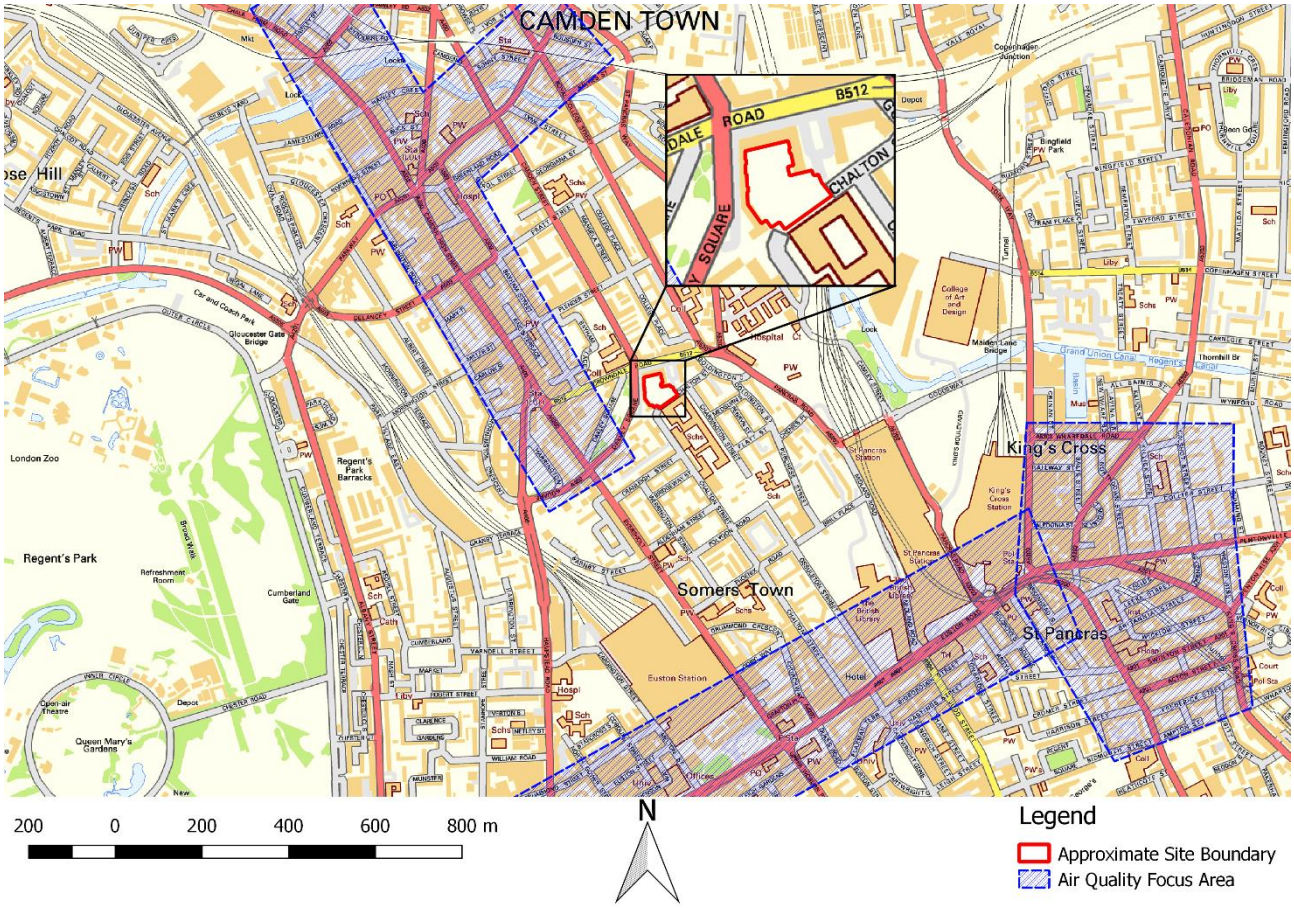

Figure 3: Air Quality Focus Areas in the Vicinity of the Application Site. Contains OS Data © Crown Copyright and Database rights 2020

4.6.2 LAEI Pollution Maps

The GLA produce annual mean concentration maps for the whole of London on a 20 m by 20 m grid for a historic year (2013) and future years (2020, 2025 and 2030) based on the baseline year of 2013. Figure 4 and Figure 5 illustrate the annual mean NO_2 and PM_{10} concentrations in the immediate area of the Proposed Development for 2020.

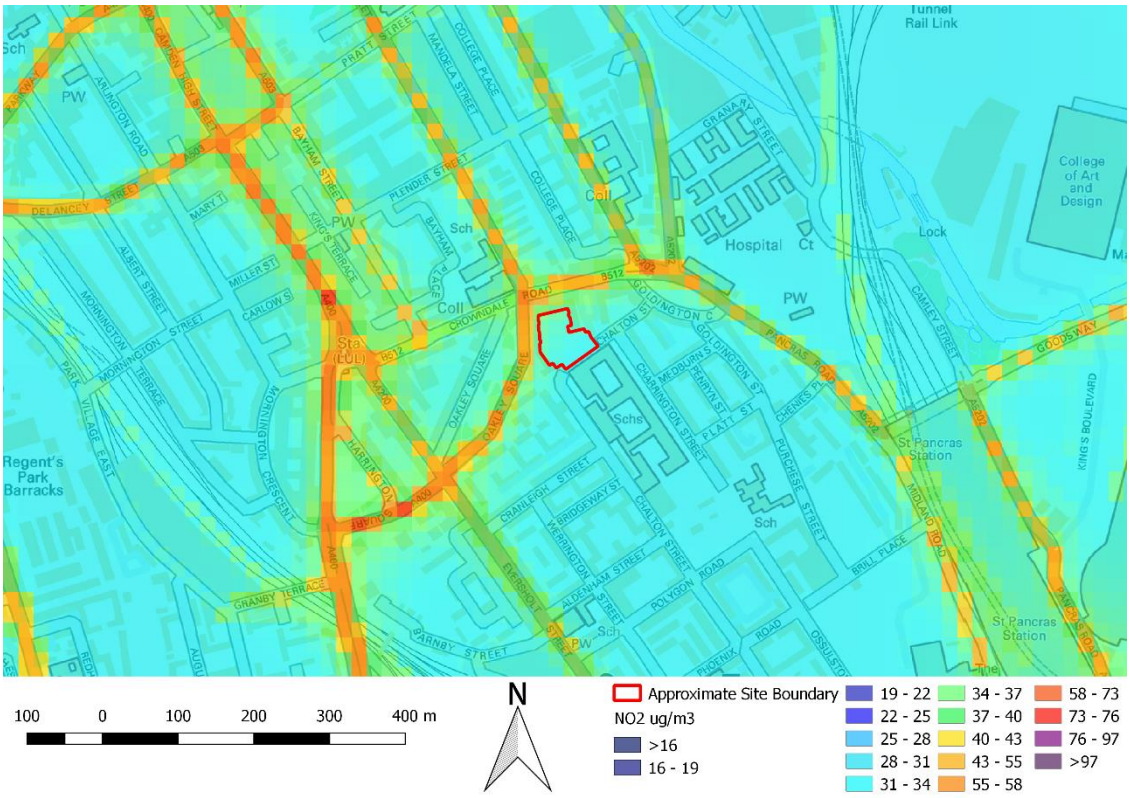

Figure 4: Modelled 2020 Annual Mean NO_2 Concentrations (GLA, 2013). Contains OS Data © Crown Copyright and Database rights 2020

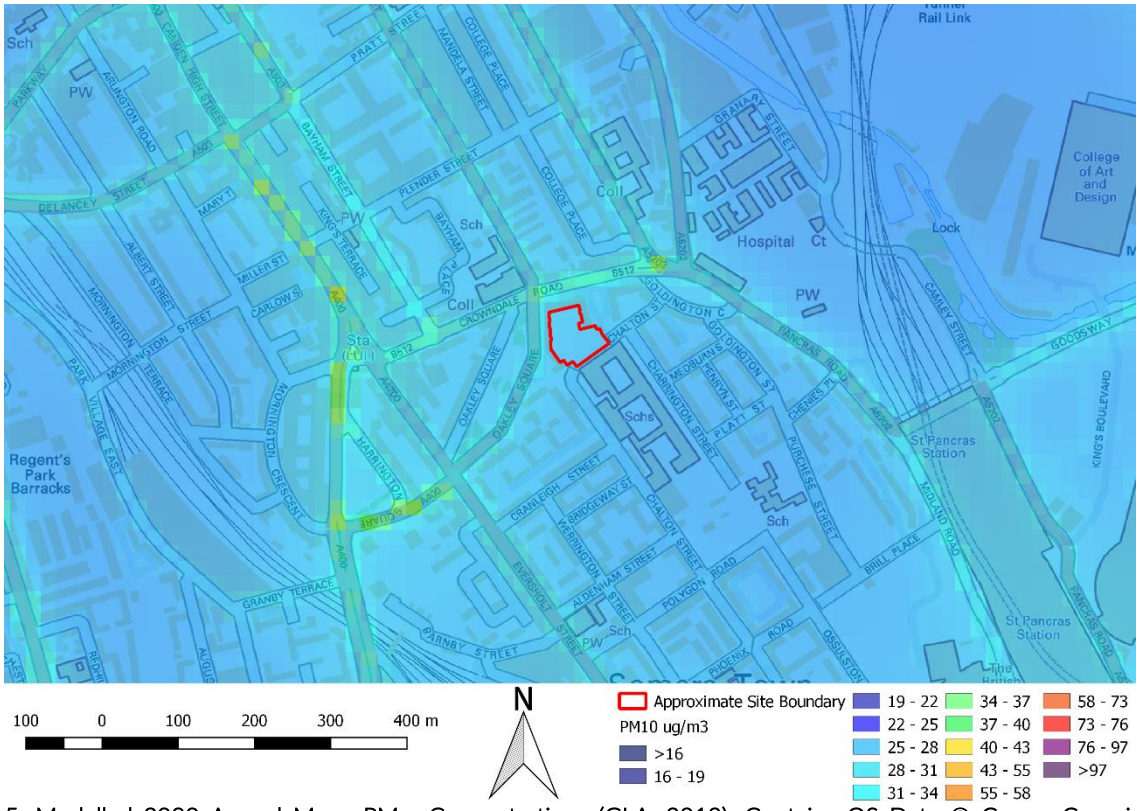

Figure 5: Modelled 2020 Annual Mean PM_{10} Concentrations (GLA, 2013). Contains OS Data © Crown Copyright and Database rights 2020

The concentrations of key pollutants in 2013 and 2020 are shown in Table 5 for the Application Site. These concentrations have been taken from the north west extent of the Application Site, fronting both Oakley Square and Crowndale Road, to represent a worst-case scenario. Although NO_2 concentrations were predicted to be in exceedance of the annual mean objective in 2013, the annual mean NO_2, PM_{10} and $PM_{2.5}$ objectives are all predicted to be achieved in 2020.

Table 5: Annual Mean Concentrations of NO_2, PM_{10} and $PM_{2.5}$

Year	Pollutant Concentrations (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2013	50.2	28.0	17.6
2020	34.1	25.9	15.7

4.7 Summary of Background Data.

The baseline assessment has shown that NO_2 concentrations recorded in the vicinity of the Application Site are often in excess of the annual mean objective. However, LAEI and Defra background concentrations at the Application Site predict compliance with the annual mean NO_2 objective in 2020, the earliest year construction could commence.

The 1-hour mean NO_2, 24-hour mean and annual mean PM_{10} and annual mean $PM_{2.5}$ objectives have not been exceeded at any of the automatic monitoring stations since 2017.

Furthermore, the Defra predicted background concentrations at the Application Site are below the relevant objectives in the earliest possible opening year of the Proposed Development, 2021.

5. Construction Phase Assessment.

The potential for air quality impacts during the construction of the Proposed Development are assessed in this section.

5.1 Construction Phase Dust Assessment.

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with no mitigation applied. In the absence of any site-specific information, a higher risk category has been applied to represent a worst-case scenario.

5.1.1 Assessment Screening

There are 'human receptors' within 50 m of the Application Site but no designated habitat sites within 50 m of the Application Site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Application Site entrance. The closest ecological receptor to the Application Site is Camley Street Nature Park, a Local Nature Reserve located approximately 600 m along the route to be used by construction vehicles, as measured from the Application Site entrance.

Therefore, an assessment of construction dust on ecological receptors can be screened out from this assessment but an assessment of construction dust at human receptors is required.

5.1.2 Potential Dust Emission Magnitude

The potential magnitude of dust emissions from earthworks, construction and trackout have been assessed, as identified in Table 6. The assessment of potential dust impacts from demolition activities has been screened out of this assessment as there are no existing solid structures at the Application Site.

Table 6: Predicted Magnitude of Dust Emissions

Activity	Magnitude	Justification
Earthworks	Medium	The Application Site comprises predominantly loamy and clay soils[27], which have a high potential to generate dust, with a total area of approximately 3,900 m^2. The potential dust magnitude is considered to be medium.
Construction	Small	The total building volume for the Proposed Development is approximately 4,200 m^3 *. Building material will be a mix of masonry material such as concrete which has a high potential to generate dust as well as materials with a lower dust potential including metals and timber. The potential dust emission magnitude is considered to be small.
Trackout	Medium	Initial information on the number of outward HDV trips to be generated during the construction phase per day was not available at the time of writing this report. Due to the nature and size of the Application Site, there is likely to be between 50 and 100 m of unpaved road, comprising a moderately dust surface material. The potential dust emission magnitude is considered to be medium.

*Construction volume has been estimated using the Proposed Site Plan and Upper Levels drawings provided by Surface to Air Ltd, assuming a floor-to-ceiling height of 3 m.

5.1.3 Sensitivity of the Study Area

The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.

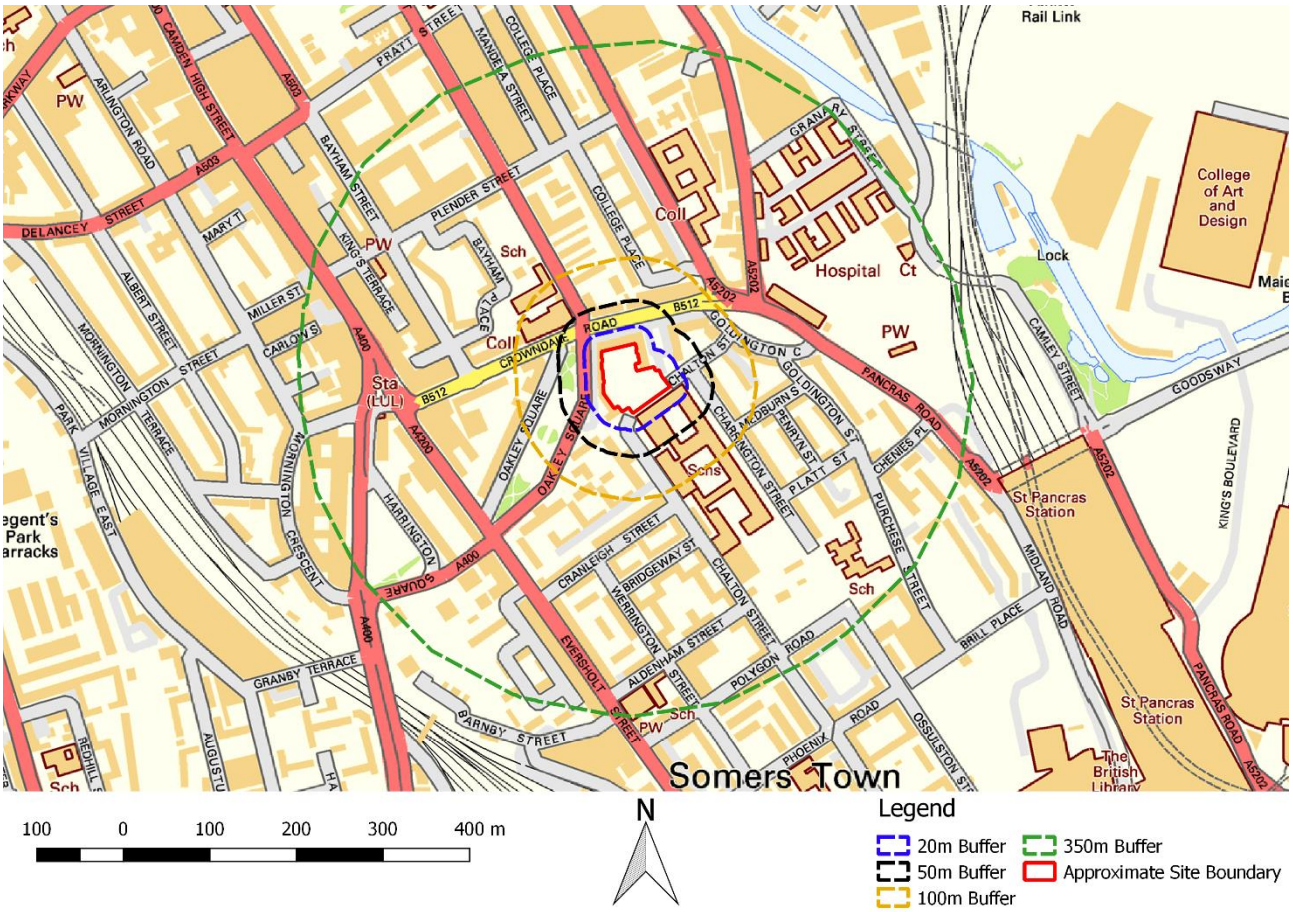

Figure 6: GLA Demolition and Construction Dust Band Criteria from Application Site Boundary. Contains OS Data © Crown Copyright and Database rights 2020

The sensitivity of the area and the factors considered are detailed in Table 7.

Table 7: Sensitivity of the Area

Sensitivity Type	Factors	Sensitivity of Area	
		On – Site Activity	Trackout
Dust Soiling	There are more than 10 receptors, including residential dwellings at the existing Godwin and Crowndale Estate, within 20 m of the Application Site, that would reasonably expect to enjoy a high level of amenity. There are over 100 further residential dwellings within 350 m of the Application Site, as well as St Pancras Hospital, that have also been considered as high sensitivity receptors. Without site-specific mitigation, trackout may occur on roads used by construction traffic up to 200 m from medium development sites, as measured from the site exit, and up to 50 m from the edge of the road. There are more than 100 high sensitivity receptors with 50 m of the route to be used by construction traffic.	High	High
Human Health	The background PM_{10} concentration at the Application Site during construction is predicted to be 19.4 µg/m^3, based on 2020 mapped background estimates as presented in Table 4. There are more than 100 human receptors within 20 m of the Application Site, including students	Medium	Medium

Sensitivity Type	Factors	Sensitivity of Area	
		On – Site Activity	Trackout
	at Regent High School and residents of the Godwin and Crowndale Estate, where people could be exposed to PM_{10} for an extended period of time.		

5.1.4 Risk of Dust Impacts

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. This risk is then used to inform the selection of appropriate mitigation. Table 8 details the risk of dust impacts for earthworks, construction and trackout activities.

Table 8: Summary of Potential Unmitigated Dust Risks

Potential Impact	Sensitivity	Earthworks	Construction	Trackout
		Magnitude		
		Medium	Small	Medium
Dust Soiling Impacts	High	Medium Risk	Low Risk	Medium Risk
Human Health Impacts	Medium	Medium Risk	Low Risk	Low Risk

5.2 Construction Phase – Vehicular Pollutants.

The Application Site is located within Camden's AQMA and therefore the lower screening criterion (i.e. 100 LDV and 25 HDV) would apply.

Information on traffic movements anticipated during construction works was unavailable for the completion of the Air Quality Assessment. However, the development quantum is not anticipated to result in a significant increase in movements above the EPUK and IAQM criterion. The duration of movements will be short-term in nature and are not considered further within the context of this assessment. Therefore, in accordance with the criterion presented within EPUK and IAQM guidance, additional road vehicle trips during the construction phase of the Proposed Development "can be considered to have insignificant effects" on air quality.

5.3 Construction Phase – Non-Road Mobile Machinery.

Pollutants emitted by NRMM that may have the most significant potential effects on local air quality are particulate matter (PM_{10} and $PM_{2.5}$), and NO_x/NO_2. Typically, NRMM is associated with construction sites and, therefore there is a potential for NRMM emissions to adversely affect local air quality as a result of the Proposed Development. Within London the London Environment Strategy guidance[14] states that "Emissions from NRMM construction and maintenance activities will, where appropriate, meet or exceed the standards set out by the NRMM Low Emission Zone" as such emission from NRMM will be controlled at this Application Site.

However, IAQM guidance states that "Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed."

6. Operational Phase Assessment.

6.1 Road Traffic Emissions Screening Assessment.

Initial road traffic data associated with the Proposed Development has been provided by Iceni Projects Ltd, the appointed Transport Consultants for the project.

The Proposed Development will be car-free with the exception of one disabled parking space provided on Chalton Street. The Application Site's existing car park, which contains 18 spaces, will be removed as part of the works. It is proposed that two visitor spaces and four commercial spaces within the Godwin and Crowndale Estate will be repurposed for resident parking along with the three to four allocated on Chalton Street to the eastern edge of the Application Site.

The provision of one disabled parking space on Charlton Street is expected to generate an AADT increase of 4 LDV trips. However, due to the car-free nature of the Proposed Development, and the redevelopment of the existing car park, the proposals are expected to provide a net benefit to the local highway network compared to the extant use.

Based on the above, it is not anticipated that the indicative criteria set out in the EPUK and IAQM guidance will be exceeded (a change in AADT of 100 or more LDVs and/or 100 or more HDVs) and therefore no further assessment is required.

In accordance with the EPUK and IAQM guidance, the impacts on air quality from operational phase traffic generation are considered to be not significant.

6.2 Site Suitability.

This section presents a review of LBoC's recent monitoring data in the vicinity of the Application Site, for the purpose of identifying the suitability of the Application Site for residential use and identify any requirements for potential mitigation to be embedded into the Proposed Development's design.

As presented in section 2 in line with LLAQM.TG(19), the annual mean, 24-hour mean, and 1-hour mean objectives apply to the Proposed Development due to its proposed use as a residential development. As such, this section considers the predicted annual mean, 24-hour mean, and the 1-hour mean pollutant concentrations at the Application Site.

6.2.1 NO_2 Concentrations

A review of the annual mean NO_2 concentrations monitored within the vicinity of the Application Site has been completed as part of the baseline review with recent monitoring results presented in Table 2 and Table 3.

The residential elements of the Proposed Development are set back approximately 40 m from the nearest major road, Oakley Square. As such, the roadside and kerbside monitoring results presented in Table 3 are not considered to be representative of the air quality at the Proposed Development. The automatic monitoring station located at London Bloomsbury is an urban background site and is considered to be the most representative of the Application Site. NO_2 concentrations recorded at London Bloomsbury have not exceeded the annual mean objective for the last three years.

In addition, the highest onsite annual mean NO_2 concentration using LAEI mapping in 2020 is 34.1 $\mu g/m^3$. Furthermore, as the residential elements of the Proposed Development are set back from major roads, the LAEI predicted annual mean NO_2 concentrations at the residential dwellings are even lower - approximately 31 $\mu g/m^3$. Therefore, it is considered unlikely that the annual mean NO_2 objective will be exceeded at the residential elements of the Proposed Development.

An annual mean concentration of 60 $\mu g/m^3$ or above is often used to indicate a possible exceedance of the hourly mean NO_2 objective. Four of the passive diffusion tube monitoring locations have recorded NO_2 concentrations in excess of 60 $\mu g/m^3$ over the last five years, however these monitoring sites are all situated in roadside or kerbside locations. The 1-hour mean objective has not been exceeded at any of the automatic monitoring stations in the vicinity of the Application Site in the last two years, with London Bloomsbury recording

no exceedances in the last five years. As such, it is considered unlikely that the 1-hour mean objective will be exceeded at the Proposed Development.

Furthermore, the Defra predicted NO_2 background concentration at the Application Site, as shown in Table 4, is well below the annual mean objective in the earliest possible opening year of the Proposed Development, 2021.

Therefore, NO_2 concentrations in the locale of the Proposed Development are considered to be in compliance with the annual mean and 1-hour mean air quality objectives and the Application Site is considered suitable for residential use without the inclusion of mitigation measures against NO_2 concentrations.

6.2.2 PM_{10} Concentrations

The automatic monitoring stations in the vicinity of the Application Site have been in compliance with the annual mean and 24-hour mean PM_{10} objectives in the last five years. Furthermore, the LAEI mapped and Defra predicted PM_{10} background concentrations are well below the relevant objectives in 2020, the earliest year construction could commence.

Therefore, PM_{10} concentrations in the locale of the Proposed Development are considered to be in compliance with the annual mean and 24-hour mean air quality objectives and the Application Site is considered suitable for residential use without the inclusion of mitigation measures against PM_{10} concentrations.

6.2.3 $PM_{2.5}$ Concentrations

The automatic monitoring stations in the vicinity of the Application Site have been in compliance with the annual mean $PM_{2.5}$ objective in the last five years. Furthermore, the LAEI mapped and Defra predicted $PM_{2.5}$ background concentrations are well below the relevant objectives in 2020, the earliest year construction could commence.

Therefore, $PM_{2.5}$ concentrations in the locale of the Proposed Development are considered to be in compliance with the annual mean air quality objective and the Application Site is considered suitable for residential use without the inclusion of mitigation measures against $PM_{2.5}$ concentrations.

6.2.4 Significance of Air Quality Impacts

To determine the significance of predicted air quality impacts based upon a site-suitability assessment, such as that undertaken as part of this assessment, the EPUK & IAQM guidance states:

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

With regards to the Proposed Development, the unmitigated impact significance associated with the Proposed Development has been predicted in accordance with the stated assessment methodology. The following factors have been considered when providing justification:

- The Proposed Development will not introduce any new receptor into an area of exceedance of the annual or 1-hour mean NO_2 air quality objective based upon a review of NO_2 monitoring data within the development locale; and
- The Proposed Development will not introduce any new receptor exposure into an area of exceedance of the annual mean or 24-hour mean PM_{10} air quality objectives based upon a review of PM_{10} monitoring data within the development locale.
- The Proposed Development will not introduce any new receptor exposure into an area of exceedance of the annual mean $PM_{2.5}$ air quality objective based upon a review of $PM_{2.5}$ monitoring data within the development locale.

As no exceedances of the considered air quality objectives are predicted, mitigation measures are not required for the operational phase of the Proposed Development. As such, the overall effect is considered to be 'not significant'.

6.3 Air Quality Neutral Assessment.

6.3.1 Building Emissions

The energy strategy for the Proposed Development is fully electric, utilising Air Source Heat Pumps (ASHPs), a zero-emission technology. As such, the total building emissions (TBE) will be zero and below the building

emissions benchmark (BEB). As there are no combustion processes and therefore emissions associated with the operational phase, the Proposed Development can be considered air quality neutral in relation to building emissions.

6.3.2 Transport Emissions

Initial traffic flows, as provided by Iceni Projects Ltd, indicate that the provision of one disabled parking space on Charlton Street will generate an AADT increase of 4 LDV trips. These trips are expected to generate minimal transport related emissions (TRE) and, therefore, the TRE associated with the Proposed Development is anticipated to be below the transport emissions benchmark (TEB).

Furthermore, due to the car-free nature of the Proposed Development, and the redevelopment of the existing car park, the proposals are expected to provide a net benefit to the local highway network compared to the extant use. As such, the Proposed Development can be considered air quality neutral in relation to transport emissions.

7. Mitigation.

7.1 Construction Phase.

To mitigate the potential impacts during the construction phase it is recommended that mitigation measures consistent with the GLA's SPG and IAQM guidance are implemented. These mitigation measures have been carefully selected for the Proposed Development and are based upon the dust risk categories outlined in the guidance[17].

It is recommended that the local authority approve an Air Quality and Dust Management Plan (AQDMP) as part of a Construction Management Plan prior to works commencing on site, and that this is implemented using an appropriately worded planning condition. Table 9 below details the measures that should be incorporated into the AQDMP. For general mitigation measures, which excludes those specifically targeted towards earthworks, construction and trackout (which are given towards the end of the table), medium risk measures have been applied as these represent the highest risk category determined in Table 8. This approach is consistent with the GLA and IAQM guidance.

Table 9: Mitigation Measures

Issue	Mitigation Measure
Communications	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager
	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site
	Display the head or regional office contact information
Air Quality and Dust Management Plan	Develop and implement an Air Quality and Dust Management Plan (AQDMP), which may include measures to control emissions, approved by the Local Authority. The AQDMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken
	Make the complaints log available to the Local Authority when asked
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling check of surfaces such as street furniture, cars, window sills within 100 m of the site boundary, with cleaning to be provided if necessary
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences

Issue	Mitigation Measure
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period
	Avoid site runoff of water or mud
	Keep site fencing, barriers and scaffolding clean using wet methods
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used cover as described below
	Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicles/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles
	Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable
	Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the Local Authority, where applicable)
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing)
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate
	Use enclosed chutes and conveyors and covered skips
	Minimize drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
Waste management	Avoid bonfires and burning of waste materials
	Reuse and recycle waste to reduce dust from waste materials
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable

Issue	Mitigation Measure
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
	Only remove the cover in small areas during work and not all at once
Construction	Avoid scrabbling (roughening of concrete surfaces) if possible
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use
	Avoid dry sweeping of large areas
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable
	Record all inspections of haul routes and any subsequent action in a site log book
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable)
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits
	Access gates to be located at least 10 m from receptors where possible

Potential dust effects during the construction phase are considered to be both temporary and short-term in nature. The impacts are determined to be 'temporary' as they will only potentially occur throughout the construction phase and 'short term' because these will only arise at particular times when certain activities and meteorological conditions combine to create the predicted level. Notwithstanding this, with the application of the above dust control and mitigation measures, it is considered that residual effect at all receptors will be 'not significant' in accordance with the GLA guidance.

7.1.1 Construction Phase Road Traffic Emissions

The need for further assessment of the potential air quality impacts associated with construction phase road traffic emissions, principally HDV movements, have been screened out as they are considered to have an insignificant effect on air quality and mitigation measures are not required.

7.1.2 Construction Phase NRMM Emissions

In accordance with Part 4 of the IAQM Control of Dust and Emissions guidance, all NRMM would need to adhere to the emissions standards for NO_2 and PM_{10} set out for NRMM. It is therefore considered the likely effects of construction plant on local air quality would be insignificant.

7.2 Operational Phase.

7.2.1 Road Traffic Emissions

Potential air quality impacts associated with operational phase development trips have been screened out from further assessment as 'the impacts [on air quality from operational phase movements] can be considered to have

insignificant effects' in accordance with the EPUK and IAQM Guidance. Therefore, mitigation measures are not considered to be required.

7.2.2 Baseline Site Suitability Review

A review of LBoC's recent monitoring data, together with Defra background and LAEI concentrations in the locale of the Application Site, indicates no likely exceedance of the annual and 1-hour mean NO_2, the annual and 24-hour mean PM_{10} or the annual mean $PM_{2.5}$ air quality objectives.

As no exceedances of any considered air quality objective are predicted, this follows the 1st hierarchy principle of the IAQM guidance to 'prevent and avoid' exposure[28]. Therefore, no embedded mitigation into the Proposed Development design is required.

7.2.3 Air Quality Neutral

As the Proposed Development is air quality neutral with regards to both building and transport emissions, no mitigation measures are required.

8. Summary and Conclusions.

This report details the potential air quality impacts associated with the construction and operation of a proposed residential development at the existing Godwin and Crowndale Estate in Camden, London.

The findings of the assessment are as follows:

- A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken. Through good practice and implementation of appropriate mitigation measures, it is expected that the release of dust would be effectively controlled and mitigated, with resulting impacts considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature;
- The results of the operational phase traffic screening assessment indicate that the Proposed Development is expected to cause a net benefit on the local highway network, and any traffic generated is not anticipated to exceed the criteria set out in the EPUK and IAQM guidance. The impact of operational road traffic is therefore considered to be negligible;
- A baseline site suitability review has been undertaken to assess the suitability of the Application Site for the proposed residential use. NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Proposed Development are not expected to exceed the relevant air quality objectives. Therefore, the Application Site is considered suitable for residential use without the inclusion of mitigation measures; and
- The Proposed Development is considered air quality neutral according to GLA's benchmarking assessment methodology with regards to both building and transport emissions.

Based on the information above, it is considered that air quality should not be viewed as a constraint to planning and the Proposed Development conforms to the principles of National Planning Policy Framework and the Camden Local Plan.

9. Glossary of Terms.

AADT	Annual Average Daily Traffic
AQDMP	Air Quality and Dust Management Plan
AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
ASHP	Air Source Heat Pump
BEB	Building Emissions Benchmark
CPG	Camden Planning Guidance
Defra	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
GLA	Greater London Authority
HDV	Heavy Duty Vehicles (> 3.5 tonnes gross vehicle weight)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LBoC	London Borough of Camden
LDV	Light Duty Vehicles (≤3.5 tonnes gross vehicle weight)
LLAQM	London Local Air Quality Management
µg/m^3	Micrograms per cubic metre
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
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
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
PPG	Planning Practice Guidance
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
Trackout	The process involving the transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site
TBE	Total Building Emissions
TEB	Transport Emissions Benchmark
TRE	Transport Related Emissions

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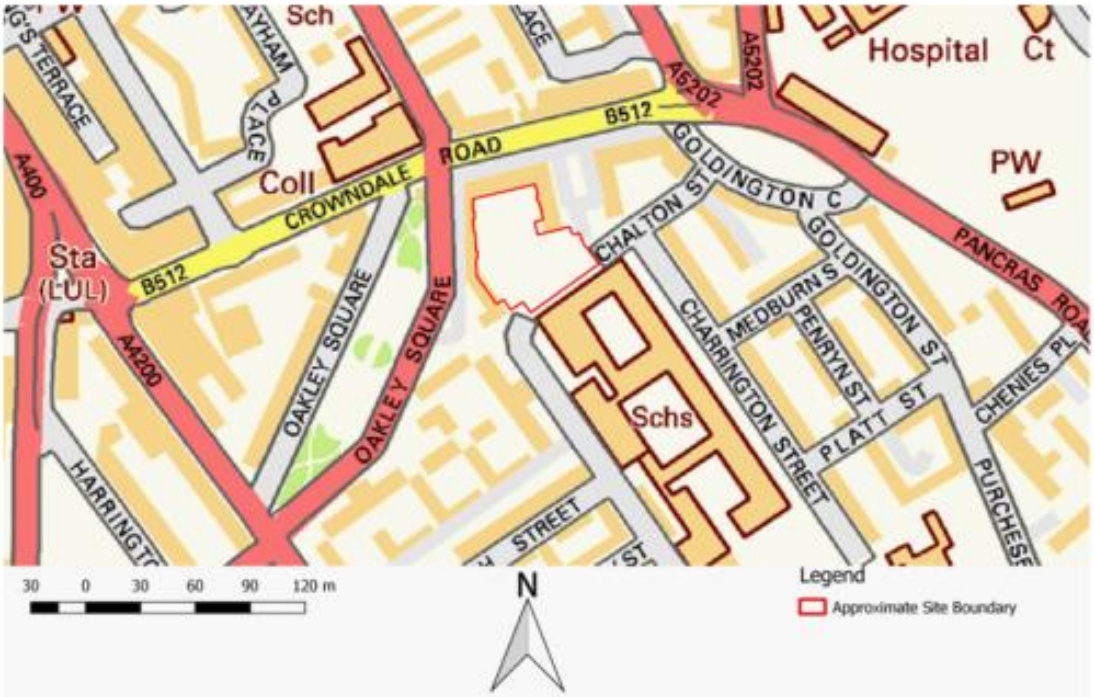
Appendix 1 - EHO Consultation.

From: Emma Rigler
Sent: 04 November 2020 14:27
To: Tom.Parkes@camden.gov.uk
Cc: Kathryn Woolley
Subject: Godwin and Crowndale Estate - Air Quality Scope

Dear Tom,

Hoare Lea have been instructed to undertake an air quality assessment for a proposed residential development at the existing Godwin and Crowndale Estate, Camden, NW1 1PA. Please site below site boundary for reference.



The Proposed Development involves the construction of 10 four-bed residential dwellings on an existing car park and multi-use games area to provide additional social rented units to the Godwin and Crowndale Estate.

Hoare Lea propose to undertake the assessment using the following methodology:

- A baseline assessment will be undertaken using data from London Borough of Camden's most recent Annual Status Report.
- Defra's background and LAEI pollution maps will be used to establish background concentrations in the area.
- Existing monitoring data, LAEI pollutant concentrations and the Defra background maps will all be used to qualitatively inform the suitability of the site for the Proposed Development.
- The project transport consultant has confirmed that, due to the car-free nature of the development, the Proposed Development is expected to cause a net benefit on the local highway network. Therefore, a detailed assessment of road traffic generated by the development will not be undertaken and a screening assessment will be undertaken in line with the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance document 'Land-Use Planning for Air Quality' January 2017.
- There are no central combustion systems proposed as part of the Proposed Development. Instead, the energy strategy involves the use of Air Source Heat Pumps (ASHPs) and individual gas-fired boilers serving each dwelling. Therefore, a detailed assessment of the energy systems has been scoped out, and a screening assessment will be undertaken against the criteria set out in the EPUK/IAQM guidance.
- The air quality assessment will include an assessment of construction impacts on air quality and dust using the IAQM methodology, in compliance with London's Supplementary Planning Guidance on 'The Control of Dust and Emissions During Construction and Demolition (2014)'.

- An air quality neutral assessment will also be carried out for the Proposed Development.
- A basic air quality assessment will be prepared in line with the Camden Planning Guidance for Air Quality.

I would be grateful if you could please confirm your acceptance of the proposed methodology and provide me with any comments you may have.

If you would like to discuss further, please do not hesitate to contact me on the number below.

Many thanks,

Emma Rigler
Graduate Air Quality Consultant

Appendix 2 - Professional Experience.

Chris Rush (Hoare Lea), BSc (Hons), MSc, PG Dip Acoustics, CEnv, MIOA, MIEMA, MIEnvSc, MIAQM

Chris is a Senior Associate Air Quality Consultant with Hoare Lea. He is a Chartered Environmentalist, a Member of the Institute of Acoustics, a Full Member of the Institute of Environmental Management and Assessment, a Member of the Institution of Environmental Sciences and a Member of the Institute of Air Quality Management.

He has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Chris's expertise covers planning, noise and air quality, specifically in relation to residential developments, industrial fixed installations such as waste management centres and transportation environmental impact on developments including air traffic.

Kathryn Woolley (Hoare Lea), BSc (Hons), AMIEnvSc, MIAQM

Kathryn is a Principal Air Quality Consultant with Hoare Lea. She's is an associate Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management.

She has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Kathryn's expertise covers planning, and air quality, specifically in relation to residential developments, industrial fixed installations such as district heating networks. Kathryn has completed over 30 EIA in the past 6 years throughout the UK and abroad including; St Johns Masterplan in Manchester (residential led), Leicester City Football club training facility north of Leister (sports use), 1-5 Grosvenor Place, Westminster (mixed use residential, retail and hotel site), and Chestnut Avenue in Eastleigh (residential and community use).

Emma Rigler (Hoare Lea), MChem (Hons), AMIEnvSc, AMIAQM

Emma is a Graduate Air Quality Consultant with Hoare Lea. She graduated from the University of York with a Chemistry degree focusing on Resources and the Environment. Emma's MChem project involved monitoring and mitigating pollutants released during the manufacture of antiperspirant sticks, to prevent adverse effects on human health and the environment.

Emma has worked on projects across a range of sectors including residential, commercial, hospitals, schools and television studios. She has experience preparing air quality, odour and environmental impact assessments, indoor air quality plans and Medium Combustion Plant Directive permitting reports. Emma's interests lie in the chemical and photochemical interactions of pollutants throughout the atmosphere.

Alex Gorringe (Hoare Lea), MESci (Hons)

Alex is a Graduate Environmental Engineer with Hoare Lea. She graduated from Cardiff University with an Integrated Masters in Environmental Geoscience and has two years' previous experience as an Environmental Scientist. Alex has worked on a range of projects amongst different specialist groups, most notably, Acoustics, and has experience writing Environmental Statements, EIAs and noise assessments. Alex has also undertaken a number of noise and air quality monitoring surveys, as well as engaged in environmental monitoring of dust, noise and vibration on construction and demolition sites for a variety of large scale residential and commercial projects. Alex's interests lie in the interconnectivity of different environmental specialisms and the roles they play in large-scale development projects.

HOARE LEA

CHRIS RUSH
SENIOR ASSOCIATE

+44 161 672 7132
chrisrush@hoarelea.com

HOARELEA.COM

Western Transit Shed
12-13 Stable Street
London
N1C 4AB
England