51 CALTHORPE STREET, LONDON

Air Quality Assessment

51 CALTHORPE STREET, LONDON
Air Quality Assessment

Client: Mr Simon Firth

Engineer: Create Consulting Engineers Limited
109-112 Temple Chambers
3-7 Temple Avenue
London
EC4Y 0HA

Tel: 0207 822 2300
Email: enquiries@createconsultingengineers.co.uk
Web: www.createconsultingengineers.co.uk

Report By: David Harvey, BSc, MBA, FIAQM

Checked By: Mark Powers, BEng (Hons), CEng, MICHT

Reference: DH/GL/P12-385/13

Date: August 2013

51 CALTHORPE STREET, LONDON
Air Quality Assessment

51 CALTHORPE STREET, LONDON

Air Quality Assessment

Contents

Registration of Amendments

Revision	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by Mr Simon Firth to assess the potential effect on air quality of the proposed redevelopment of 51 Calthorpe Street, London. Also to be considered is the potential exposure of future residents to the prevailing air quality.

1.2 The Site is located at 51 Calthorpe Street, London, WC1X 0HH, and comprises an existing three storey Victorian-era building that is currently used as offices, storage and light industrial space. The building's eastern side is located adjacent to the Holiday Inn Hotel and the western side abuts other residential buildings on Calthorpe Street while also facing the rear elevations and gardens of dwellings on Packenham Street. The front of the existing development faces south-east over Calthorpe Street and is opposite the Mount Pleasant Royal Mail sorting centre. The rear north-west facing of the development faces the Cubitt Street play centre. The Site is accessed via Calthorpe Street.

1.3 The proposal includes the partial demolition of the existing building, with the retention of the front façade and some floors. The new development will comprise 16 flats on six floors (including a basement floor).

1.4 The development will have no parking and therefore will be car free.

1.5 The result of a telephone discussion with London Borough of Camden (LBC) was an agreement that an assessment of the impacts on air quality by the development due to emissions from vehicles was not required because the development will be car free [(1)].

1.6 Following a feasibility study, it was determined that it was not viable to link into an existing district heating network and, therefore, a combination of CHPs and boilers will be used to provide the space and water heating for the proposed development. Currently no details on the size or emissions from the CHP and boiler are available and therefore no assessment of emissions to atmosphere is possible at this stage. A full assessment of the impacts on air quality of emissions from the CHPs and boilers will be undertaken when detailed design is available and will be submitted to LBC for approval prior to construction.

1.7 The two aspects considered in this assessment are:

- the potential impact of the development on air quality during construction; and
- the suitability of the proposed location for its proposed use.

1.8 Figure 1.1 shows the location of the proposed development.

(1) Telephone conversation and email, (15 October 2012) Poppy Lyle, Sustainability Officer, LB Camden and David Harvey (ADM Ltd) .

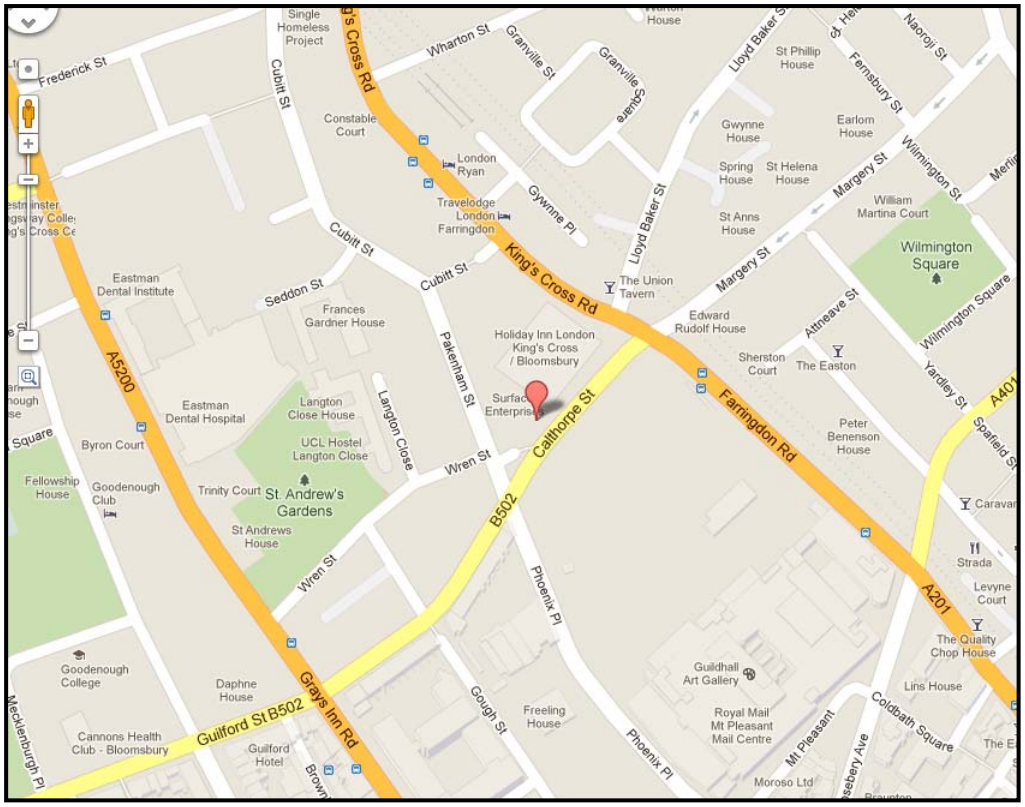

Figure 1.1: Location of Proposed Development

Source: Google maps

1.9 The site is located on the south east border of the London Borough of Camden and Islington.

1.10 The remainder of this report is structured as follows.

- Section 2 – relevant air quality legislation, policy and guidance.
- Section 3 – describes the baseline conditions.
- Section 4 – methodology
- Section 5 – potential impacts on air quality.
- Section 6 – potential exposure of residents to the prevailing air quality and mitigation measures.
- Section 7 – Summary and conclusions.

2.0 LEGISLATION, POLICY AND GUIDANCE

Introduction

2.1 This section presents the planning context of the proposed development with regard to air quality.

European Legislation

2.2 The air quality criteria used in this assessment have been taken from European and national legislation. The EU Framework Directive 96/62/EC on ambient air quality assessment and management came into force in November 1996 and had to be implemented by Member States by May 1998. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants. As a Framework Directive, it requires the Commission to propose 'Daughter' Directives setting air quality objectives, limit values, alert thresholds, guidance on monitoring, siting and measurement for individual pollutants.

2.3 The Air Quality Standards Regulations 2007 (SI No. 2007/64) implement Council Directive 96/62/EC on ambient air quality assessment and management and related Daughter Directives. These regulations supersede the Air Quality Limit Values Regulations 2003 (SI 2003 No. 2121) and the 2004 Amendment (SI 2004 No. 2888). The obligation for complying with these limit values rests with central Government.

2.4 The European Commission worked together with Clean Air For Europe (CAFE) to produce and publish a new European Directive in 2008 (Directive 2008/50/EC). Key changes include a new air quality objective for particulate matter smaller than 2.5 microns (μm) in aerodynamic diameter ($PM_{2.5}$). The objective includes a limit value and exposure reduction target.

2.5 Local authorities currently have no statutory obligation to assess air quality against European limit values but are encouraged to do so. In order to assist with longer-term planning and the assessment of development proposals in their local areas, Defra's Technical Guidance LAQM TG(09) for Local Authorities provides guidance on how to assess against the time-frame of the European limit values.

2.6 The Air Quality (England) Regulations 2000 (SI 2000 No. 928) and Air Quality (England) (Amendment) Regulations 2002 (SI 2002 No. 3043) include national air quality objectives which, in most cases, are numerically synonymous with the European limit values although they may have different compliance target dates and can apply to different locations.

2.7 The air quality objectives are for specific use by local authorities when undertaking their Local Air Quality Management (LAQM) duties in pursuit of Part IV of the Environment Act

1995. Of principal concern to this assessment are nitrogen dioxide (NO_2) and particulate matter smaller than 10 µm in aerodynamic diameter (PM_{10}).

National Legislation and Guidance

Air Quality Strategy

2.8 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales & Northern Ireland, published in July 2007 in accordance with the requirements of Part IV of the Environment Act 1995. The AQS sets out a framework to reduce adverse health effects from air pollution and ensures that international commitments are met. The AQS sets standards and objectives for pollutants to protect human health, vegetation and ecosystems.

2.9 Where road traffic is the dominant source of air pollution, which is usually the case in urban environments, Local Authorities have found that the objectives for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) are the most difficult to achieve. It is also generally the case that, where annual average concentrations of nitrogen dioxide (NO_2) and fine particulate matter (PM_{10}) meet their respective objectives and where there are no other local significant sources of air pollution, concentrations of all other pollutants in the air quality strategy will also be achieved. It is for this reason that this assessment considers only nitrogen dioxide (NO_2) and fine particulate matter (PM_{10}).

2.10 Nitrogen dioxide (NO_2) is a reddish brown gas (at sufficiently high concentrations) and occurs as a result of the oxidation of nitric oxide (NO), which in turn originates from the combination of atmospheric nitrogen (N_2) and oxygen (O_2) during combustion processes. In terms of ground level concentrations in many parts of the United Kingdom, concentrations of nitrogen dioxide (NO_2) are dominated by emissions from road transport. This applies particularly in urban areas, where traffic densities are at their highest.

2.11 Particulate matter (PM) is a term used to describe all suspended matter, sometimes referred to as total suspended particulate matter. Sources of particles in the air include road transport, power stations and other industry, quarrying, mining and agriculture. Chemical processes in the air can also lead to the formation of particles. PM_{10} is the subject of health concerns because of its ability to penetrate and remain deep within the lungs.

2.12 In recent years, epidemiological studies have shown increases in mortality correlated with concentrations of PM_{10} (COMEAP, 2009). There is increasing focus on $PM_{2.5}$ (particulate matter with an aerodynamic diameter of less than 2.5 µm) which gives a stronger association with ill-heath than PM_{10}. This assessment however uses PM_{10} because of the availability of measured and emissions data for this size fraction, which includes $PM_{2.5}$.

2.13 Air quality objectives and limit values which currently apply in the United Kingdom can be divided into four groups:

- United Kingdom air quality objectives set down in regulations for the purpose of Local Air Quality Management (LAQM);
- United Kingdom air quality objectives not included in regulations;
- European Union (EU) Limit Values transcribed into United Kingdom legislation; and
- Guidelines: e.g. World Health Organization (WHO) guidelines.

2.14 Many of the objectives in the air quality strategy were made statutory in England with the Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM). The objectives for nitrogen dioxide (NO_2) and PM_{10} detailed in the air quality strategy are included in the Air Quality (England) (Amendment) Regulations and are shown in Table 2.1.

	Air Quality Standard		AQS Objective
Pollutant	Concentration ($\mu g\ m^{-3}$)	Averaging Period	Exceedences per year
Nitrogen dioxide (NO_2)	200	1 hour	18
	40	Annual	-
Particulate matter (PM_{10})	50	24 hour	35
	40	Annual	-
Particulate matter ($PM_{2.5}$)	25	Annual	-

Table 2.1: United Kingdom Air Quality Strategy (AQS) Objectives

2.15 The AQS 15% exposure reduction target for $PM_{2.5}$ cannot be assessed when considering the incremental impacts of a single development.

2.16 It should be noted that the Air Quality Standards Regulations 2010 do not supersede the 2002 regulations and are designed to ensure full compliance with the UK obligations under the various EU air quality directives. For the purpose of this assessment the 2002 regulations are the most relevant assessment criteria.

2.17 Construction dust is not covered by any national Air Quality Regulations or European Legislation. Generally dust is only a cause of annoyance or a 'nuisance'; it is unlikely to be prejudicial to health. Relevant legislation dealing with Statutory Nuisance is given in Part III of the Environmental Protection Act 1990.

2.18 Under the provisions of the Act where a local authority is satisfied that a Statutory Nuisance exists, it is under a mandatory duty to serve an Abatement Notice requiring abatement or cessation of one or more activities deemed to be causing the nuisance.

2.19 In the absence of any kind of standard, identification of a nuisance is dependent on the professional judgement of the local authority which would also need to determine if Best Practical Means (BPM) are being employed to control emissions. Where BPM is evident or can be clearly demonstrated then a particular activity cannot be deemed to be causing a Statutory Nuisance.

National Planning Policy Framework

2.20 In March 2012 the Department of Communities and Local Government published the National Planning Policy Framework (NPPF)[(2)]. The purpose of the framework is to help achieve sustainable development. Section 11 of the policy makes the following references to air quality.

- The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.
- Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan

Planning Policy Statement 23: Planning and Pollution Control

2.21 Policy guidance for Local Authorities regarding local air quality and new development is provided in a Planning Policy Statement 23 (PPS 23). Although PPS23 has been replaced by the National Planning Policy Framework (NPPF), it contains useful principles relating to how air quality is considered in the planning system.

2.22 PPS 23 advises on the policies and practices that should be taken into account by those involved in the planning of any development that has the potential to cause pollution. With regard to emissions to air, PPS 23 states that, 'any air quality consideration that relates to land use and development is capable of being a material planning consideration'.

2.23 This is most likely to be the case in situations where the proposed development could contravene an AQS objective and result in the designation of an Air Quality Management Area (AQMA), where development is proposed in an AQMA, or where a proposed development renders a local planning authority's Air Quality Action Plan unworkable.

(2) Department of Communities and Local Government (March 2012) National Planning Policy Framework.

2.24 PPS 23 also re-iterates that the presence of an AQMA should not result in the 'sterilisation' of a site from development.

The Mayor's London Plan, Consolidated with Alterations since 2004

2.25 The London Plan includes a policy to improve air quality by means of the London's Air Quality Strategy, where the Mayor is legally required to reduce the level of main air pollutants within the city. This is to be achieved by targeting road traffic and subsequent emissions, sustainable building strategies and controlling emissions from industry.

The Mayor's Air Quality Strategy

2.26 The London Air Quality Strategy was released in December 2010 [(3)]. The new strategy sets out actions to reduce emissions from transport, homes, offices and new developments in order to reduce risk of exposure to air pollution. Some of the transport policy measures included are: expansion of smart travel options, encouragement of electric vehicles, promotion of new vehicle technologies (hybrid) for the public bus fleet and the introduction of emission control within Low Emission Zones.

London Low Emission Zone

2.27 The Low Emission Zone (LEZ) applies to all roads and some motorways within the Greater London Area. The LEZ operates for 24 hours a day and affects older, diesel-engine lorries, buses, coaches, large vans (exceeding 1.2 tonnes unladen weight) and minibuses (over eight seats and below 5 tonnes).

2.28 From 3 January 2012, the current vehicle emission standards were changed and more vehicle types are covered in the LEZ. Vehicles included are lorries, coaches and heavy specialist vehicles.

Local Policy Guidance

2.29 In 2011 Camden released planning guidance which includes guidance on air quality, CPG6 [(4)]. Other guidance on air quality is contained in DP32, Air Quality and Camden's Clear Zones and the Air Quality Action Plan report (2009 to 2012) [(5)].

2.30 Areas of relevance to this assessment detailed in CPG6 are reproduced below:

- The Council's overarching aim is for new development to be 'air quality neutral' and not lead to further deterioration of existing poor air quality. You will be required to include

(3) Greater London Authority (January 2010) Clearing the Air, The Mayor's Air Quality Strategy.
(4) Camden Planning Guidance (2011) CPG 6 Amenity.
(5) Camden Planning Guidance (2009) Air Quality Action Plan Report 2009-2012.

mitigation and offsetting measures to deal with any negative air quality impacts associated with your development proposals. At the same time your development should be designed to minimise exposure of occupants to existing poor air quality. To manage and prevent further deterioration of air quality in Camden, we will require an air quality assessment with planning applications for development that could have a significant negative impact in air quality. This impact can arise during both the construction and operational stages of a development as a result of increased NO_x and PM_{10} emissions.

- The Council will not grant planning permission for developments that could significantly harm air quality or introduce people into areas of elevated pollution concentrations, unless mitigation measures are adopted to reduce the impact to acceptable levels and protect public exposure
- The Council requires the impact of outdoor air pollution on indoor air quality in new developments to be taken into account at the earliest stages of building design.
- Gas boilers are a large source of NO_x emissions in Camden. In order to minimise NO_x emissions arising from heating and hot water systems the Council requires boilers fitted in new development to achieve a NO_x emissions of <40 mg/m^3 and an energy efficiency rating >90%.
- The impact of the construction and demolition phases of a development on air quality must be taken into account as part of your planning application. Exhaust emissions from construction vehicles and machinery such as generators, piling and grinding equipment can result in: dust emissions; gases (NO_x); and fine particles.

GLA and IAQM Guidance on Construction Dust

2.31 In January 2012 the Institute of Air Quality Management (IAQM) published guidance on how to assess impacts of emissions of dust from demolition and construction sites[(6)]. This guidance is used in this assessment together with the mitigation measures proposed in the GLA's best practice guidance for control of dust emissions[(7)].

Significance Criteria

2.32 The impact refers to the change that is predicted to take place to the prevailing environment as a result of the proposed development.

2.33 The significance of an impact is generally determined as the combination of the 'sensitivity' and/or ''value' of the affected environmental receptor and the predicted "extent" and/or "magnitude" of the impact or change.

(6) IAQM (January 2012) Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance.
(7) Greater London Authority and London Councils (November 2006) Best Practice Guidance, The Control of dust and emissions from construction and demolition.

2.34 The descriptors for the magnitude of change are the same as those suggested in EPUK Development Control: Planning for Air Quality. The assessment of significance ultimately relies on professional judgement, although comparing the extent of the impact with criteria and standards specific to each environmental topic can guide this judgement.

2.35 Details of the criteria specific to this assessment are defined in Table 2.2 and Table 2.3. It should be noted that the EPUK descriptors of significance refer to permanent changes in air quality brought about by a development and not short term or temporary changes. They refer to locations where there is relevant exposure and not therefore necessarily the location of the maximum impact.

2.36 The criteria are only appropriate for changes to annual average concentrations of nitrogen dioxide (NO_2) and PM_{10} at locations where there is relevant exposure, i.e. not generally the point of maximum impact.

Magnitude of Change	Increase In Annual Mean (%) [(a)]	Increase in NO_2/PM_{10} ($\mu g\ m^{-3}$)
Large	> 10	> 4
Medium	5 - 10	2 - 4
Small	1 - 5	0.4 - 2
Imperceptible	< 1	< 0.4
(a) Percentage of assessment level.		

Table 2.2: EPUK Definition of Impact Magnitude for Changes in Pollutant Concentrations

Absolute Concentrations in Relation to Objective Values	Change in Concentration		
	Small	Medium	Large
Above Objective with Development (>40 $\mu g\ m^{-3}$)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective with Development (36-40 $\mu g\ m^{-3}$)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective with Development (30-36 $\mu g\ m^{-3}$)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective with Development (<36 $\mu g\ m^{-3}$)	Negligible	Negligible	Slight Adverse

Table 2.3: EPUK Air Quality Impact Descriptors for Increase Due to Development

3.0 PREVAILING AIR QUALITY

Introduction

3.1 This section presents a description of the ambient air quality in the region of the proposed development.

3.2 Given the large degree of variation in pollutant concentrations, both with time and location, it is desirable to have measurements over a period of time that is long enough to ensure that a complete range of meteorological conditions and emissions have been experienced.

Air Quality Management Area (AQMA)

3.3 As part of the ongoing review and assessment process required by the Environment Act 1995, the London Borough of Camden (LBC) has identified that a large portion of the borough exceeds the Air Quality Strategy (AQS) objectives for both nitrogen dioxide (NO_2) and particulate matter (PM_{10}) and, in 2000, declared an Air Quality Management Area (AQMA) covering the whole borough for annual average concentrations of nitrogen dioxide (NO_2).

3.4 The declaration of an AQMA does not necessarily mean that all locations within it exceed the AQS objectives. LBC has determined that the AQS objectives for the remaining pollutants are met at all locations where there is relevant exposure.

3.5 The AQAP states that 64% of emissions of the oxides of nitrogen (NO_x), which is the precursor to nitrogen dioxide (NO_2) come from non-road traffic sources such as space and water heating boilers, whereas the majority (58%) of emissions of PM_{10} are from road transport.

3.6 It is therefore important that both traffic related and non-traffic related sources of NO_x and PM_{10} are considered and assessed where appropriate.

Estimated Pollutant Concentrations

3.7 Figure 3.1 shows the modelled annual average concentration of nitrogen dioxide (NO_2) and the location of the proposed development. The modelling was undertaken in 2009 and therefore does not include the recently updated background concentrations (see the next section).

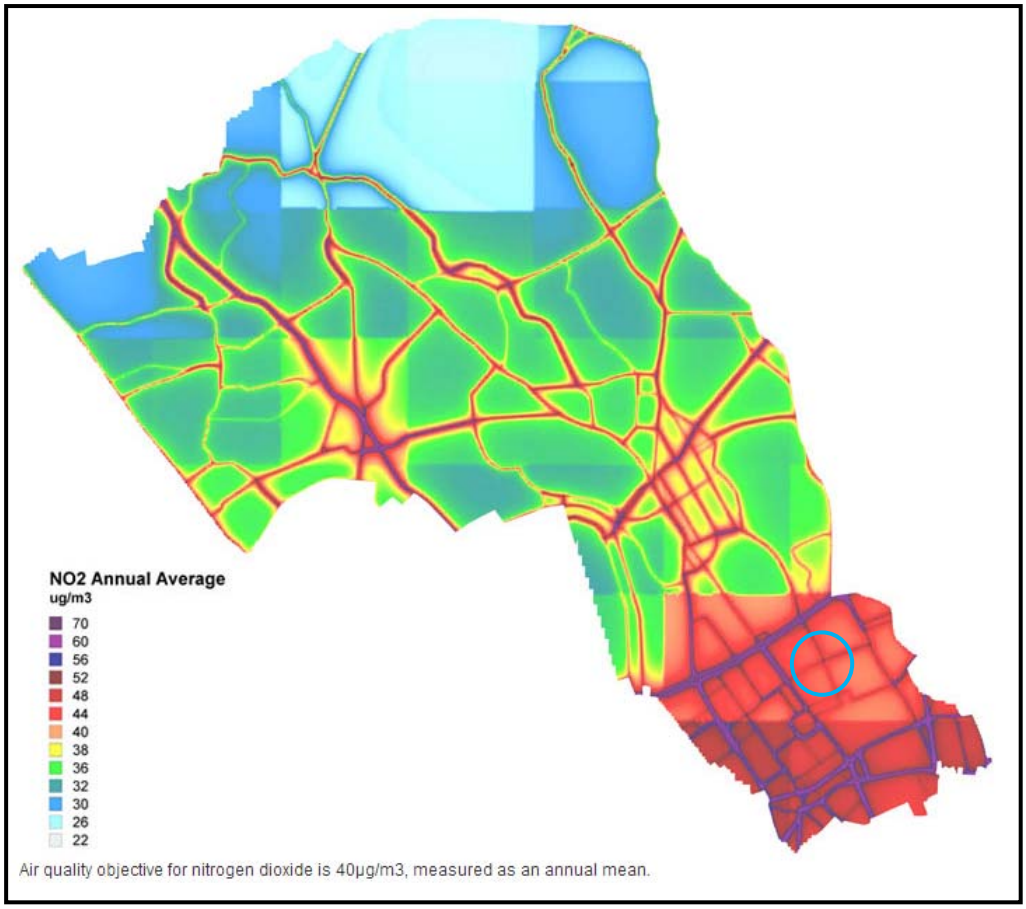

Figure 3.1: Modelled Predicted Annual Average Concentration of Nitrogen Dioxide (NO_2, µg m^{-3})

Source: Camden Council: 2010 Air Quality Progress Report

3.8 Figure 3.1 shows that modelled annual average background concentration in the region of the proposed development is in the range of about 40 µg m^{-3} to 44 µg m^{-3}. This can be compared to the Air Quality Strategy (AQS) objective of 40 µg m^{-3}.

3.9 It should be noted that the predictions are for ground level or perhaps 1.8 m above ground level which is often still referred to as ground level.

3.10 The figure shows how the maximum concentrations are limited to locations close to the principal roads and reduces rapidly with distance away from the roads. Although the figure does not show this, the same effect occurs with height, pollutant concentration reducing rapidly with height above the principal roads.

3.11 Figure 3.2 shows the modelled annual average concentration of particulate matter (PM_{10}) and the location of the proposed development.

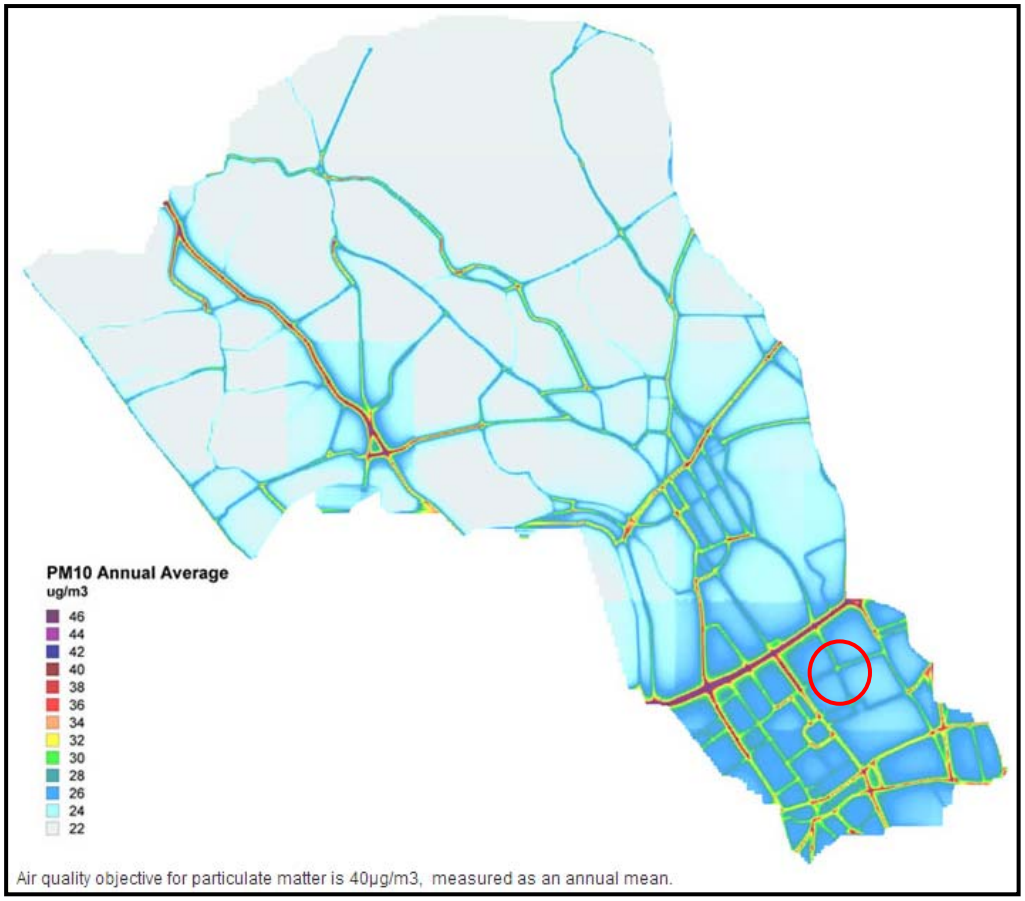

Figure 3.2: Modelled Predicted Annual Average Concentration of Particulate Matter (PM_{10}, µg m^{-3})

Source: Camden Council: 2010 Air Quality Progress Report

3.12 Figure 3.2 shows that modelled annual average background concentration in the region of the proposed development is in the range of about 28 µg m-3 to 32 µg m^{-3}. This can be compared to the Air Quality Strategy (AQS) objective of 40 µg m^{-3}.

3.13 In April 2012 Defra updated its estimates of background concentrations which are made for a number of pollutants on a 1 km grid resolution for the whole of the UK. Currently updated estimates are only available for 2010.

3.14 The estimates of background concentration have increased significantly compared to previous estimates of 2010 background concentrations. The explanation for the increase, given by Defra is shown below [(8)].

(8) www.laqm.defra.gov.uk/maps/maps2010.html.

The main changes are as follows:

- The revised maps are based on ambient monitoring and meteorological data for 2010 whereas the previous maps were based on 2008 measurements and meteorology and projected forwards to 2010.
- The revised maps incorporate new information on the age distribution of vehicles and emissions factors for NO_x for road vehicles, and include improved spatial resolution of underlying information on regional oxidant concentrations used with the 2010 maps.
- The revised maps for particulate matter incorporate updated information on secondary inorganic aerosols and proportions of $PM_{2.5}$ and PM_{10} based on improved understanding of ambient concentrations available from the wider network of $PM_{2.5}$ monitors within the AURN.

The changes have impacted significantly on the maps for NOx and NO_2, where a decline in background concentrations between 2008 and 2010 was previously projected based on the expected reductions in emissions. Measured concentrations in 2010 at AURN background stations were higher in 2010 than in 2008 and this is reflected in the revised maps. The higher concentrations measured in 2010 are thought to be due in part to the unusually cold weather during 2010 in combination with a less steep decline in NO_x emissions from road traffic sources in recent years. This less steep decline is thought to be in part due to the poor "real world" emissions performance of some vehicles including some modern diesel vehicles.

Text Box 4.1: Defra Explanation for Increase in Background Concentration

3.15 Table 3.1 shows the Defra estimated background concentration at the two closest grid point to the site.

OS Grid Reference (m)		Distance from Site (m)	Nitrogen Dioxide (NO_2)		Particulate Matter (PM_{10})	
			2011	2015	2011	2015
530500	182500	450	50.0	44.3	23.7	22.2
533150	182500	500	50.6	44.8	23.9	22.4
Average			50.3	44.6	23.8	22.3
Assessment Criteria			40		40	

Table 3.1: Estimated Annual Average Background Concentration of Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) in 2011 and 2015 (µg m^{-3})

3.16 Table 3.1 shows that current Defra estimated background concentration of nitrogen dioxide (NO_2) of 50.3 µg m^{-3} exceeds the Air Quality Strategy (AQS) objective of 40 µg m^{-3}. For PM_{10} the current estimated background concentration of 23.8 µg m^{-3} is less than the AQS objective.

3.17 It is considered that the background levels shown in Table 3.1 provide a reasonable estimate of current concentrations in the region of the proposed development, away from the immediate locality of the principal roads.

Measured Background Concentrations

3.18 The most reliable method for determining the prevailing pollutant concentration at the location of the proposed development would be a number of years of measured concentrations.

3.19 There are a number of air qualities monitoring stations in Camden and other nearby boroughs but none at the location of the proposed development and therefore they will not be representative and have not been presented.

4.0 POTENTIAL IMPACTS ON AIR QUALITY

Introduction

4.1 Impacts on air quality from the proposed development can occur both during construction and operation.

Construction

4.2 During construction there is the potential for emissions of dust to cause annoyance.

4.3 The development is in a residential area with a number of residential properties that border the site together with the Holiday Inn.

4.4 The Institute of Air Quality Management (IAQM) published guidance on how to assess impacts of emissions of dust from demolition and construction sites [9]. This guidance has been followed in Table 4.1 which shows the steps undertaken to determine the risk of dust from construction giving rise to annoyance.

Step	Outcome
	Construction
Step 1: Need for Detailed Assessment	Detailed assessment required due to proximity of sensitive receptors within 350 m
Step 2: Assess the Risk of Dust Effect	High risk site due to receptors within 20 m
Step 3: Identify the Need for Site-Specific Mitigation	Mitigation measures detailed in the GLA best practice guidance for High Risk will be followed
Step 4: Define Effects and their Significance	Slight Adverse impact (following mitigation)

Table 4.1: IAQM Dust Risk Assessment Methodology

4.5 Given the close proximity of sensitive receptors, the risk of dust annoyance occurring during construction is considered to be high, although with the implementation of appropriate mitigation measures the significance of the impacts is only slight.

Operation

4.6 During operation, emissions to atmosphere can occur from both vehicles using the development and the proposed CHPs and gas fuelled boilers.

(9) IAQM (January 2012) Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance.

4.7 As the development will be car free there will be no emissions from vehicles using the development.

4.8 Figure 4.1 shows the location of the proposed development in relation to existing district heating networks.

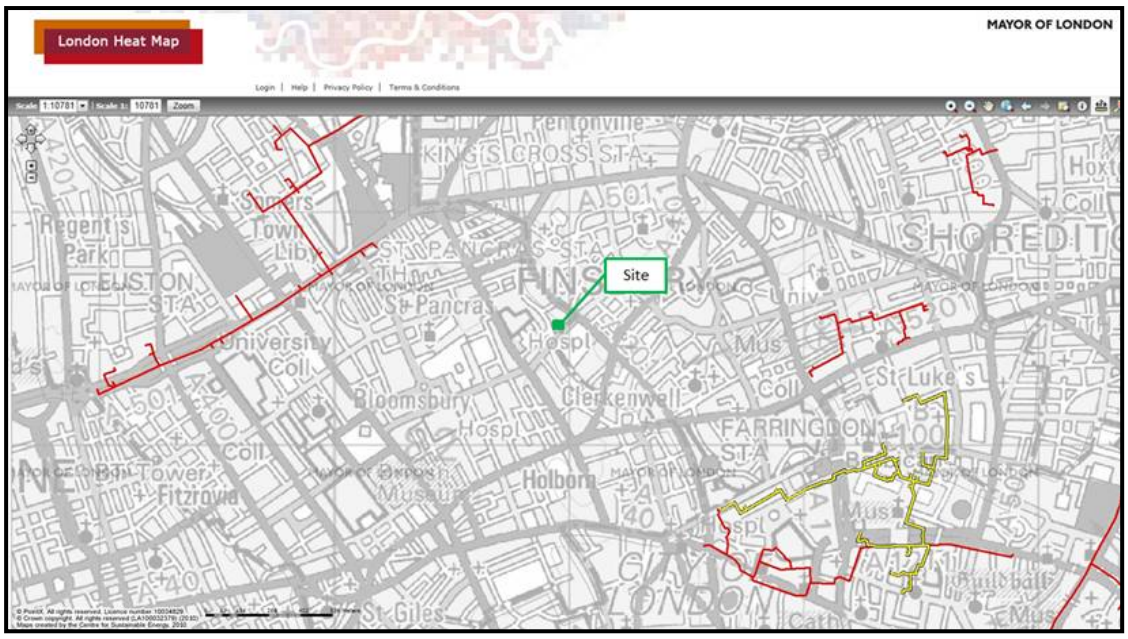

Figure 4.1: Location of Site and District Heating Networks

Source: www.londonheatmap.org.uk

4.9 There are no existing or proposed heat networks or suitable heat sources or heat loads within 1.2 km of the proposed development location. As this distance is further than the 1 km recommended in guidance document CPG 3 for assessing viability, connection to a decentralised heat network has not been explored further for this development [(10)].

4.10 Because of this a combination of CHPs and boilers will be used to provide the space and water heating for the proposed. Currently no details on the size or emissions from the CHP and boiler are available and therefore no assessment of emissions to atmosphere is possible at this stage.

4.11 A full assessment of the impacts on air quality of emissions from the CHPs and boilers will be undertaken when detailed design is available and will be submitted to LBC for approval prior to construction.

(10) Camden Planning Guidance CPG 3 Sustainability.

5.0 SUITABILITY OF PROPOSED LOCATION FOR ITS PROPOSED USE AND MITIGATION MEASURES

Introduction

5.1 This section assesses the suitability of the proposed location for its proposed use and the measures required to mitigate against the effects of poor air quality during both construction and operation.

Construction

5.2 During construction, without appropriate mitigation measures, there is a high risk of annoyance due to emissions of dust. However, with appropriate mitigation measures to control dust, emissions will be minimised leaving only a slight adverse impact.

5.3 The mitigation measures used will be drawn from the GLA best practice guidance and will be agreed with London Borough of Camden prior to commencement of construction [(11)].

Suitability of Proposed Location for Proposed Use

5.4 The location of the proposed development is where the prevailing air quality at ground level exceeds the Air Quality Strategy (AQS) objectives for annual average concentrations of nitrogen dioxide (NO_2) at ground level.

5.5 It is considered that the Defra estimates which were significantly revised upwards in August 2012 provide a reliable estimate of the prevailing air quality in the location of the proposed development. The Defra estimated annual average concentration of nitrogen dioxide (NO_2) in 2011 is 50.3 µg m^{-3} reducing to 44.6 µg m^{-3} by 2015.

5.6 When considering the suitability of the location for its proposed use, account should be taken that pollutant concentrations reduce with height as the estimates of background concentrations are at ground level.

5.7 The actual reduction in pollutant concentration with height is difficult to predict accurately and little measured data are available. However, one study undertaken in Glasgow during 2006 reported the following [(12)] *"The rate of decline of NO_2 [with height] was found to be greatest when the NO_2 concentration at street level was high. In Hope Street, concentrations decreased by an average of 39% between 5m and 10m"*.

(11) Greater London Authority and London Councils (November 2006) Best Practice Guidance, The Control of dust and emissions from construction and demolition.
(12) BMT Cordah (March 2006) NO_2 Concentrations in Glasgow Street Canyons.

5.8 Given that the location of the proposed development is located where air quality is at background levels there is no advantage to indoor air quality in mechanical ventilation as even if air were to be drawn in from the rear of the property it would have very much the same pollutant concentrations as air at the front of the building.

5.9 If practical, the proposed development will include tree planting and a green wall, both of which have been shown to improve air quality.

5.10 The residents of the proposed development will be made aware of the adverse effects of the prevailing pollutant. They will also be made aware of AirText which is a free service providing text messages when air quality is forecasted to be poor [(13)].

(13) www.airtext.info.

6.0 SUMMARY AND CONCLUSIONS

6.1 Create Consulting Engineers Ltd has commissioned by Mr Simon Firth to assess the potential effect on air quality of the proposed development at 51 Calthorpe Street. Also to be considered is the potential exposure of future residents to the prevailing air quality.

6.2 The Site is located at 51 Calthorpe Street, London, WC1X 0HH, and comprises an existing three storey Victorian-era building that is currently used as offices, storage and light industrial space. The proposal includes the partial demolition of the existing building with the retention of the front façade and some floors. The new development will comprise 16 flats on six floors (including a basement floor).

6.3 The development will have no parking and therefore will be car free.

6.4 The following are the principal conclusions that can be drawn from this assessment:

- Given the close proximity of sensitive receptors, the risk of dust annoyance occurring during construction is considered to be high, although with the implementation of appropriate mitigation measures the significance of the impacts is only slight.
- The impacts on air quality of the proposed development will be negligible.
- The location of the development is suitable for its proposed use given its location where air quality will be at background levels.

6.5 Prior to construction, an air quality assessment of the impacts of emissions from the CHP and boilers will be undertaken and submitted to Camden for approval.

7.0 DISCLAIMER

7.1 Create Consulting Engineers Ltd disclaims any responsibility to Mr Simon Firth and others in respect of any matters outside the scope of this report.

7.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Mr Simon Firth. Mr Simon Firth, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Mr Simon Firth.

7.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.