Premier Inn

Premier Inn, Dukes Road, Euston, WC1H 9PJ

Air Quality & Odour Assessment

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Executive Summary

WYG have undertaken an Air Quality Screening Assessment for the proposed development to provide an expansion to the current premises on Dukes Road, Euston.

The potential effects during the construction phase include fugitive dust emissions from site activities, such as construction and trackout. Implementation of mitigation during the construction phase of the development, and adherence to good practice measures will be implemented.

Following a review of the baseline conditions and the DMRB modelling results, there is not predicted to be an exceedance of the AQO for NO_2 and PM_{10} at any proposed modelled receptors.

An assessment of odour from the extended restaurant has shown that, with mitigation controls in place, there is no significant odour impact predicted.

Based on the assessment undertaken and methodology within this assessment, it is concluded that the site is suitable for the proposed development and no further air quality assessment is required.

1. Introduction

Premier Inn commissioned WYG Environment to prepare an Air Quality Screening Assessment to support the proposed development to provide an expansion to the current premises on Dukes Road, Euston.

1.1 Site Location and Context

The site is bounded to the north by a rail line, and to the south, east and west by residential properties.

The approximate site United Kingdom National Grid Reference (NGR) is approximately 529884, 182639.

The following assessment stages have been undertaken as part of this assessment:

- Baseline air quality evaluation;
- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase;
- Assessment of potential odour from the kitchen extract on the site; and,
- Identification of mitigation measures (as required).

The results of the assessment are detailed in the following sections of this report.

2. Policy and Planning Context

2.1 Legislation and Policy Background

European Legislation

European air quality legislation is consolidated under Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates, and includes:

- **Directive 1999/30/EC** – the First Air Quality "Daughter" Directive – sets ambient air limit values for nitrogen dioxide and oxides of nitrogen, sulphur dioxide, lead and particulate matter;
- **Directive 2000/69/EC** – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene and carbon monoxide; and,
- **Directive 2002/3/EC** – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- **Directive 2004/107/EC** – sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

UK Legislation

The Air Quality Standards Regulations (Amendments 2016) seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2007 No. 64 Regulation 14 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.

For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set

of Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments.

The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are presented in Table 2.1 along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines.

Table 2.1 Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	UK	50µg/m³ by end of 2004 (max 35 exceedances a year)	24-hour mean	1st January 2005	50µg/m³ by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m³ by end of 2004	Annual mean	1st January 2005	40µg/m³	1st January 2005	
$PM_{2.5}$	UK	25µg/m³	Annual Mean	31st December 2010	25µg/m³	1st January 2010	Retain Existing
NO_2	UK	200µg/m³ not to be exceeded more than 18 times a year	1-Hour Mean	31st December 2005	200µg/m³ not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m³	Annual Mean	31st December 2005	40µg/m³	1st January 2010	

Within the context of this assessment, the annual mean objectives are those against which facades of residential receptors will be assessed and the short-term objectives apply to all other receptor locations, where people may be exposed over a short duration, both residential and non-residential such as using gardens, balconies, walking along streets, using playgrounds, footpaths or external areas of employment uses.

Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future air quality against the AQOs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA, the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

National Policy

The National Planning Policy Framework (NPPF), revised February 2019, principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF states that:

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

The Planning Practice Guidance (PPG) web-based resource was updated by the Ministry for Housing, Communities and Local Government (MHCLG) on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. A review of PPG: Air Quality identified the following guidance (Paragraph: 001 Reference ID: 32-001-20191101):

"The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that affect public health such as particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2).

The UK also has national emission reduction commitments for overall UK emissions of 5 damaging air pollutants:

- *fine particulate matter ($PM_{2.5}$)*
- *ammonia (NH_3)*
- *nitrogen oxides (NO_x)*
- *sulphur dioxide (SO_2)*
- *non-methane volatile organic compounds (NMVOCs)*

As well as having direct effects on public health, habitats and biodiversity, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems. Odour and dust can also be a planning concern, for example, because of the effect on local amenity."

Regional Policy

The London Borough of Camden lies within the Greater London Authority (GLA) Area. The London Plan addresses the improvement of air quality. Policy 7.14 within the London Plan specifically relates to air quality improvement:

'Policy 7.14 Improving Air Quality

A. 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 Decisions

A. *Development proposals should: 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 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.*

The London Plan (Intend to Publish) has also been reviewed for any policies relevant to Air Quality. Policy SI1, Improving Air Quality, was identified as relevant and has been outlined below;

"SI1: Improving Air Quality;

Local Policy

A. *Development plans, through relevant strategic, site specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.*
B. *To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:*
    1. *Development proposals should not:*
        i. *lead to further deterioration of existing poor air quality*

ii. 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

iii. create unacceptable risk of high levels of exposure to poor air quality.

2. In order to meet the requirements in Part 1, as a minimum:

a. Development proposals must be at least Air Quality Neutral

b. 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 in preference to post-design or retro-fitted mitigation measures

c. Major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1

d. Development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.

C. Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

a) How proposals have considered ways to maximise benefits to local air quality, and

b) What measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.

D. In order to reduce the impact on air quality during the construction and demolition phase 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.

E. Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.

Local Policy

The London Borough of Camden Local Plan 2017 has been reviewed for policies related to Air Quality. The following policy was deemed relevant to this assessment:

> *"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."*

3. Baseline Conditions

3.1 Air Quality Review and Assessment

This section provides a review of the existing air quality in the vicinity of the proposed development site in order to provide a benchmark against which to assess potential air quality impacts of the proposed development. Baseline air quality in the vicinity of the proposed development site has been defined from a number of sources, as described in the following sections.

Air Quality Review

As required under section 82 of the Environment Act 1995, The London Borough of Camden (LBC) has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO_2 are above the relevant AQOs at a number of locations of relevant public exposure within the Borough. LBC therefore has one designated Air Quality Management Area (AQMAs) as outlined below;

- Camden AQMA: An area encompassing the whole borough.

The proposed development site is located within the Camden AQMA, so receptors within the AQMA have been included within this assessment.

Air Quality Monitoring

Monitoring of air quality within LBC is undertaken through continuous and non-continuous monitoring methods. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the proposed development site.

Continuous Monitoring

LBC operates one automatic monitoring station. This automatic monitoring station is located 650 m south west of the proposed development site. EHDC have not yet published their full Air Quality Annual Status report for 2017. The most recently available automatic monitoring results are for 2016 which are included in Table 3.1.

Table 3.1 Automatic Monitoring Locations

Site ID	Location	Site Type	Distance to Kerb of Nearest Road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)
LB	London Bloomsbury	Urban Background	27	3	36.0
CD9	Euston Road	Roadside	0.5	2.5	82.3

Table 3.1 above illustrates, all automatic monitoring stations during 2017 did not monitor exceedances of the relevant AQO (40 µg/m^3).

Non-Continuous Monitoring

LBC operated a network of 14 diffusion tubes where NO_2 concentrations were monitored in 2018. The closest diffusion tube is located approximately 0.22 km east-north-east from the site boundary.

The closest NO_2 diffusion tube monitoring results from within LBC are presented in Table 3.2 below.

Table 3.2 Diffusion Tube Monitoring Locations

Site ID	Location	Site Type	Distance to Nearest Road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)
CA4	Euston Road	Roadside	5	1.5	69.2
CA6	Wakefield Gardens	Urban Background	30	1.5	26.7
CA10	Tavistock Garden	Urban Background	25	1.5	35.4
CA11	Tottenham Court Road	Kerbside	<1	1.5	65.7
CA20	Brill Place	Roadside	<5	1.5	41.1
CA21	Bloomsbury Street	Roadside	<1	1.5	59.4

Table 3.2 above illustrates, all diffusion tubes during 2017 monitored below the relevant AQO for NO_2 (40 µg/m^3).

3.2 Background Concentrations

The use of background concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study site.

Background concentrations were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the development site. In May 2019, Defra issued revised 2017 based background maps for NO_X, NO_2, PM_{10} and $PM_{2.5}$ which incorporate updates to the input data used for modelling.

The updated mapped background concentrations for the predicted development opening year (2022) are summarised in Table 3.3 below.

Table 3.3 Published Background Air Quality Levels (µg/m^3)

UK NGR(m)		2022			
X	Y	NO_2	NO_x	PM_{10}	$PM_{2.5}$
529500	182500	33.37	57.64	57.64	12.19
529500	183500	27.21	43.87	43.87	12.12
530500	182500	33.60	58.50	58.50	12.23
530500	183500	28.51	46.74	18.43	12.15

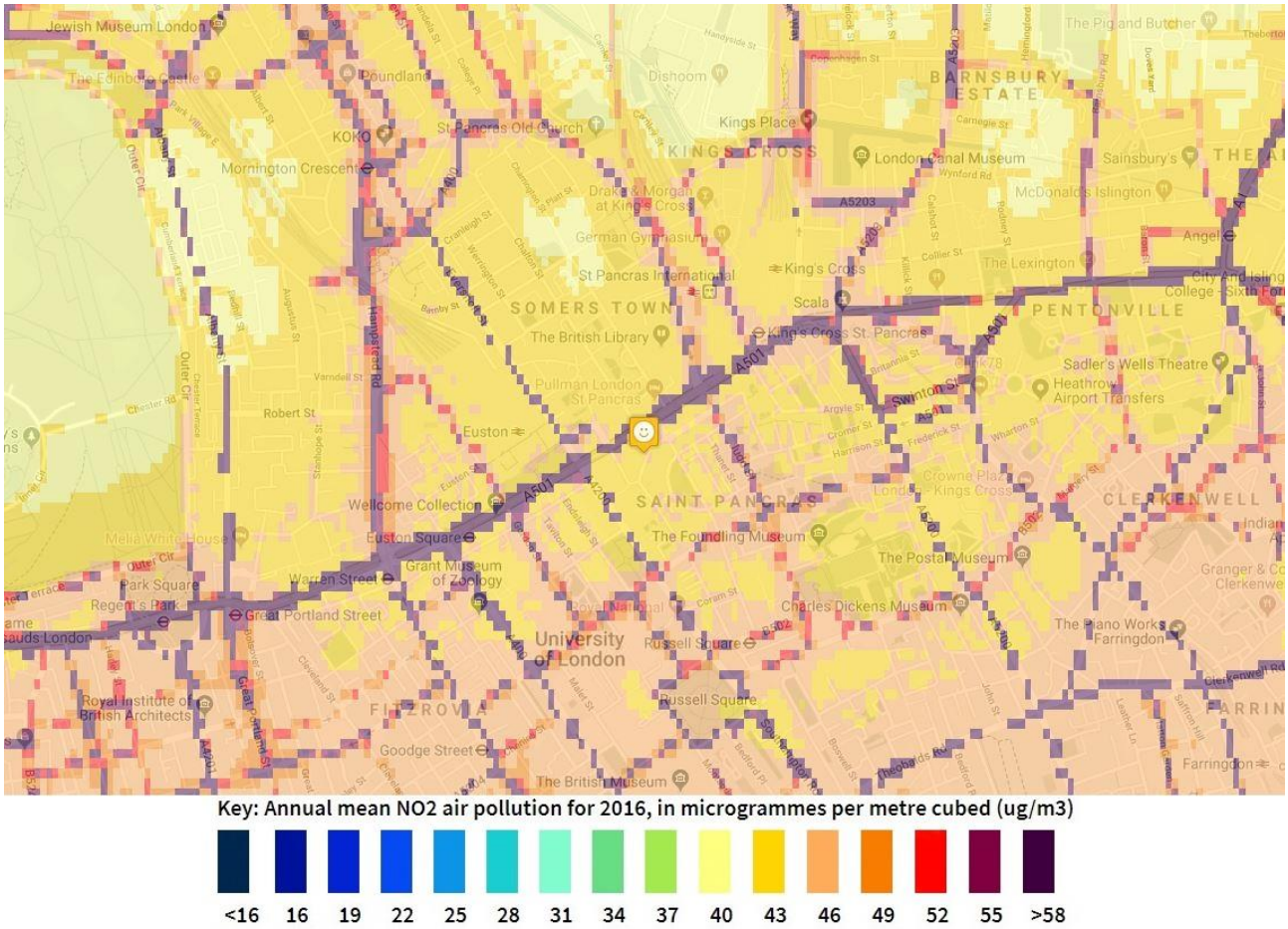
The predicted background concentrations of NO_2 in the vicinity of the proposed development site range between 68.01% to 83.99% of the relevant the AQO of 40 µg/m^3.

The predicted background concentrations of PM_{10} in the vicinity of the proposed development site range between 46.08% to 146.24% of the relevant the AQO of 40 µg/m^3.

London Air Monitoring Background Maps

Figure 3.1 below illustrates the London Air's 2016 Background Concentrations. Following a review of London Air's 2016 Background Concentration Maps for NO_2.

Figure 3.1 London Air Background Map at Proposed Development



Based on Figure 3.1 the London Air's 2016 Background Concentration map shows a concentration of between 40 – 43 µg/m^3 at the proposed site location with a level of around 52 – 58 µg/m^3 at the northern edge of the site, on Euston Road.

Local Authority Monitoring Background

Based on there being no nearby representative Local Authority Monitoring undertaken by the London Borough

of Camden at the proposed site, Local authority monitoring will be considered when assuming background concentrations at the site. Monitoring location LB is an Urban Background monitoring station and could be used as the background for the proposed development site.

4. Construction Phase

The main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months) or from construction materials. The main potential effects of dust and particulate matter are:

- Visual - dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination; and,
- Health effects due to inhalation e.g. asthma or irritation of the eyes.

A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway or windblown stockpiles.

4.1 Air Quality Standards

The UK Air Quality Standards seek to control the health implications of respirable PM_{10}. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

4.2 Dust

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there is no formal standards or criteria for nuisance caused by deposited particles, the IAQM 'Guidance on Monitoring in the Vicinity of Demolition and Construction Sites' (October 2018) and the Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

Recommended mitigation measures proportionate to the risk associated with the development and based on best practice guidance are discussed in the following sections.

4.3 Methodology

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Two construction processes are considered; these are construction and trackout. For each of these phases, the significance of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts. A full explanation of the methodology is contained in Appendix A.

4.4 Assessment Results

Based on the methodology detailed in Appendix A, the scale of the anticipated works has determined the potential dust emission magnitude for each process, as presented in the Table 4.1 below.

Table 4.1 Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No Demolition as part of the Scheme	N/A
Earthworks	Total Site Area <2,500m^2	Small
Construction	Total Building <25,000m^2	Small
Trackout	<10 HDV outward movements in any one day	Small

The sensitivity of the surrounding area to each construction process has been determined following stage 2B of the IAQM guidance. The assessment has determined the area sensitivities as shown in the Table 4.2.

Table 4.2 Sensitivity of the Area

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM_{10}	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A	No demolition as part of the proposals	N/A	No demolition as part of the proposals	N/A	No demolition as part of the proposals
Earthworks	High	10-100 receptors within 20m of proposed development	Low	10-100 Receptors within 20m of Annual Mean PM_{10} Concentration <24 µg/m^3	N/A	Distance from Ecological Receptor >50m
Construction	High	10-100 receptors within 20m of proposed development	Low	10-100 Receptors within 20m of Annual Mean PM_{10} Concentration <24 µg/m^3	N/A	Distance from Ecological Receptor >50m
Trackout	High	10-100	Low	10-100	N/A	Distance from

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM_{10}	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
		receptors within 20m of proposed development		Receptors within 20m of Annual Mean PM_{10} Concentration <24 µg/m^3		Ecological Receptor >50m

The dust emission magnitude determined in Table 4.1 has been combined with the sensitivity of the area determined in Table 4.2, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the construction phase, without mitigation, is presented below in Table 4.3.

Table 4.3 Impact Significance of Construction Activities without Mitigation

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM_{10}	Ecological
Demolition	N/A	N/A	N/A
Earthworks	Low	Negligible	N/A
Construction	Low	Negligible	N/A
Trackout	Low	Negligible	N/A

5. Operational Phase DMRB Assessment

5.1 DMRB Assessment

An assessment of operational phase traffic flows has been undertaken to assess the potential impact of the proposed development with regards to increases in traffic flows along the local road network. Principal pollutants of concern considered within this assessment are nitrogen dioxide (NO_2) and particulate matter (PM_{10}).

The DMRB Calculation Sheet V1.03c has been used to calculate pollutant concentrations. Assessment receptor locations have been selected at existing property facades at locations where higher than average pollution concentrations are likely to be experienced. Selecting receptors at such locations ensures a 'worst case scenario' prediction of pollutant concentrations. An assessment of the impact of existing air quality on proposed receptors has also been included.

5.2 Traffic Data

Baseline traffic data has been provided by RGP transport consultants for all modelled road links.

The traffic data used in the assessment is shown in Table 5.1.

Table 5.1 Traffic Data

Link		2021 Do Minimum			2021 Do Something		
		AADT	%HGV	Speed (km/hr)	AADT	%HGV	Speed (km/hr)
1	Euston Road, East of Upper Woburn Place	59114	3.62	48	59122	3.62	48
2	Cartwright Gardens	1951	3.84	32	1968	3.81	32
3	Upper Woburn Place	15036	6.38	48	15036	6.38	48
4	Euston Road, West of Upper Woburn Place	65925	2.26	48	65933	2.26	48
5	Euston Road, East of Cartwright Gardens	59114	3.62	48	59122	3.62	48
6	Flaxman Terrace	5169	2.84	32	5186	2.83	32
7	Duke's Road	5169	2.84	32	5186	2.83	32

5.3 Limitations of DMRB Assessment

The following limitations have been identified with the DRMB Assessment:

- The assessment has only considered the impact on the identified affected roads, namely those included in Table 4.1.
- Background concentrations have been used from London Air 2016 Concentration Maps.
- The DRMB result outputs are unadjusted results.

5.4 Assessment Receptor Locations

Receptor locations have been identified to indicate the effects of the surrounding road network. The receptor locations are presented in Table 5.2 and reference should be made to Figure 1 for a visual representation.

Table 5.2 Assessment Receptor Locations

Receptor		Distance from Link (m)						
ID	Location	From Link 1	From Link 2	From Link 3	From Link 4	From Link 5	From Link 6	
R1	18 Woburn Walk	-	-	-	-	-	13	10
R2	8 Duke's Road	-	-	-	-	-	-	10
R3	Flaxman Court, Flaxman Terrace	-	36	-	-	-	11	-
R4	120 Euston Road	23	-	-	-	-	-	-
R5	161 Euston Road	-	-	13	20	-	-	-

5.5 Ecological Receptors

Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The IAQM guidance on 'Air Quality Impacts on Designated Nature Conservation Sites' (2019) document outlines the types of designated nature sites within 2 km of the proposed development which require air quality assessment. These are inclusive of;

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and,
- Areas of Ancient Woodland (AW).

The Conservation of Habitats and Species Regulations (2017) additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations.

Following a search within a 2 km radius of the site boundary, three ecological receptors were identified, as shown in Table 5.3 below and on Figure 1.

Table 5.3 Ecological Receptors

Site ID	Site	Designation	UK NGR (m)		Distance from Site (m)	Distance from Nearest Road (m)
			X	Y		
E1	Camley Street Nature Park	LNR	530013	183365	694	17

In accordance with the IAQM Guidance, several receptor assessments points have been positioned on the conservation site. This is to determine the effects at different locations of the site.

It should be noted that the IAQM Guidance only requires the assessment of ecological receptors which are located within 200 m of the road network. It should be noted that Natural England Guidance requires an assessment of the impact of emissions from road traffic where a predicted traffic flow change is greater than 100 AADT or more. Due to associated traffic flow changes, E1 can be scoped out of this assessment in line with the Natural England HRA guidance. As a result, all ecological receptors outlined in Table 5.5 are not predicted to be significantly affected by the proposed development.

5.6 Background Concentrations

Table 5.4 below illustrates the background concentrations of NO_2 and NO_x respectively used within the DMRB assessment.

Table 5.4 Background Concentration of NO_2 at all Receptors

ID	Receptor	Background NO_2	Source
R1	18 Woburn Walk	36.00	Urban Background LB
R2	8 Duke's Road	36.00	
R3	Flaxman Court, Flaxman Terrace	36.00	
R4	120 Euston Road	36.00	
R5	161 Euston Road	36.00	

5.7 DMRB Assessment Results

Predicted annual mean ground level NO_2 and PM_{10} concentrations for the 'do minimum' and 'do something' scenarios are illustrated in Table 5.5.

Table 5.5 DMRB Nitrogen Dioxide and Particulate Matter Assessment Results (µg/m³)

Receptor ID	2021 Predicted Annual Mean NO_2 Concentration (µg/m³)		Development Contribution (DS-DM)	2021 Predicted Annual Mean PM_{10} Concentration (µg/m³)		Development Contribution (DS-DM)
	Do Minimum	Do Something		Do Minimum	Do Something	
R1	39.49	39.49	<0.01	17.41	17.41	<0.01
R2	40.03	40.03	<0.01	17.48	17.48	<0.01
R3	41.18	41.18	<0.01	17.61	17.61	<0.01
R4	44.61	44.61	<0.01	18.08	18.08	<0.01
R5	45.98	45.98	<0.01	18.23	18.23	<0.01
Annual Mean AQO: 40 µg/m³						

As illustrated in Table 5.5, at nearby existing receptors, the maximum modelled NO_2 annual average exposure is 45.98 µg/m³ at 161 Euston Road (R5). This is above the long term NO_2 AQO of 40 µg/m³.

All modelled proposed receptors are predicted to be below the long term AQO for NO_2, therefore no additional mitigation will be required.

As illustrated in Table 5.5, at nearby existing receptors, the maximum modelled PM_{10} annual average exposure is 18.23 µg/m³ at 161 Euston Road (R5). This is below the long term PM_{10} AQO of 40 µg/m³.

The impact description of changes in traffic flow associated with the development with respect to annual mean of NO_2 and PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in Tables 5.6 and 5.7 below.

Table 5.6 Impact Description of Effects at Key Existing Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change Due to Development (% of AQO)	% Change in Concentration Relative to AQAL	% Annual Mean Concentration in Assessment Year	Impact Description
R1	<0.01	<0.01	0%	95-102% of AQO	Negligible
R2	<0.01	<0.01	0%	95-102% of AQO	Negligible
R3	<0.01	<0.01	0%	103-109 of AQO	Negligible
R4	<0.01	<0.01	0%	≥110 of AQO	Negligible
R5	<0.01	<0.01	0%	≥110 of AQO	Negligible
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

Table 5.7 Impact Description of Effects at Key Existing Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change Due to Development (% of AQO)	% Change in Concentration Relative to AQAL	% Annual Mean Concentration in Assessment Year	Impact Description
R1	<0.01	<0.01	0%	≤75% of AQO	Negligible
R2	<0.01	<0.01	0%	≤75% of AQO	Negligible
R3	<0.01	<0.01	0%	≤75% of AQO	Negligible
R4	<0.01	<0.01	0%	≤75% of AQO	Negligible
R5	<0.01	<0.01	0%	≤75% of AQO	Negligible

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change Due to Development (% of AQO)**	**% Change in Concentration Relative to AQAL**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The magnitude of the effects of changes in traffic flow as a result of the proposed development, with respect to NO_2 exposure is determined to be 'negligible'.

The magnitude of the effects of changes in traffic flow as a result of the proposed development, with respect to PM_{10} exposure, is determined to be 'negligible'.

The DMRB assessment calculations have predicted that there will be no exceedances of the AQO for PM_{10} at any existing receptor. All modelled proposed receptors are predicted to be above the long term AQO for NO_2, therefore additional mitigation will be required as outlined below in Section 6.

5.8 Effect of Development Reducing Service Yard Area

The number of servicing vehicle movements associated, arriving and departing the service yard are not expected to change as a result of the new scheme. It should be noted that the existing service yard is expected to reduce in area as part of the development. As there is not expected to be any change in the number of service vehicles, the predicted change in pollutants is expected to be 'negligible' as a result of the reduction in area. Additionally, all vehicles which use the service yard will follow an implemented service yard management plan to reduce any effects of pollutants.

A result of changing the massing of buildings in the courtyard will not have a significant effect on pollutant levels or dispersion of pollutants. There is the potential that the result of the new massing will decrease pollutant concentrations within the courtyard area as greater shielding will be provided from the main source of pollutants (I.e. the surrounding roads).

6. Air Quality Neutral Assessment

This Air Quality Neutral assessment considers the emissions of atmospheric pollutants from the development at source (i.e. from vehicles and building services plant) and compares the emissions with the benchmark levels that define neutrality.

The requirement for this Air Quality Neutral report is driven by:

- Policy 7.14 in the London Plan. The London Plan states: "development proposals should be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality"; and
- The Mayor's Air Quality Strategy (MAQS). The MAQS includes a policy which states that "New developments in London shall as a minimum be 'air quality' neutral through the adoption of best practice in the management and mitigation of emissions."

The 'air quality neutral' policy is designed to address the problem of multiple new developments that individually add only a small increment to pollution at the point of human exposure (i.e. ambient concentrations), but cumulatively lead to baseline pollution levels creeping up. The policy requires Developers to design their schemes so that they are at least Air Quality Neutral in terms of emissions at source.

The Greater London Authority (GLA) Sustainable Design and Construction Supplementary Planning Guidance (SPG), published in April 2014, provides a formal definition for the term 'air quality neutral' and allows a transparent and consistent approach to demonstrating whether a development is 'air quality neutral'. This Air Quality Neutral assessment determines whether the proposed development is air quality neutral using the GLA SPG calculation method that separately quantifies building emissions (from heating and power plant) and transport emissions.

The GLA published a report of "Air quality Neutral Planning support update (GLA 80371) in April 2014. This updated report provided a guidance note on the application of the "air quality neutral" policy.

6.1 Benchmark Emissions

6.1.1 Building Emissions Benchmarks (BEB)

The GLA 80371 report has defined two Building Emission Benchmarks (BEBs), one for NO_x and one for PM_{10}, for a series of land-use classes. The benchmarks are expressed in terms of g/m^2/annum. The gross floor area (GFA) is used to define the area.

The derived BEBs for NO_x and PM_{10} Emissions are shown in Table 6.1.

Table 6.1 Building Emissions Benchmarks

Land Use Class	NO_x (g/m^2)	PM_{10} (g/m^2)
Class A1	22.6	1.29
Class A3- A5	75.2	4.32

Land Use Class	NO_x (g/m²)	PM_{10} (g/m²)
Class A2 and Class B1	30.8	1.77
Class B2- B7	36.6	2.95
Class B8	23.6	1.90
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
D1 (a)	43.0	2.47
D1 (b)	75.0	4.30
Class D1(c -h)	31.0	1.78
Class D2(a-d)	90.3	5.18
Class D2(e)	284	16.3

Note 1: These benchmarks have been calibrated for London.

6.1.2 Transport Emissions Benchmarks

The derived Transport Emission Benchmarks (TEB) for NO_x and PM_{10} Emissions are shown in Table 6.2.

Table 6.2 Transport Emissions Benchmarks

Land use	CAZ	Inner	Outer
NO_x (g/m²/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
NO_x (g/m²/annum)			
Residential (C3)	234	558	1553
PM_{10} (g/m²/annum)			
Retail (A1)	29.3	39.3	42.9
Office (B1)	0.22	2.05	11.8
PM_{10} (g/dwelling/annum)			
Residential (C3, C4)	40.7	100	267

Table 6.3 Proposed Floor Space Areas

Land Use Class	Proposed Floor Space Areas (GIA) (m²)
Residential (Class C1)	1332

6.2 Air Quality Neutral Calculation

6.2.1 Building Emissions

The guidance on Air Quality Neutral Planning support states the following for Building Emissions Benchmarks (BEB):

"Two Building Emission Benchmarks (BEBs) have been defined, one for NOx and one for PM10, for a series of land-use classes. The benchmarks are expressed in terms of g/m²/annum. The gross floor area (GFA) is used to define the area. For developments classified as "one-off" (Sui Generis), it will be for the developer to provide convincing evidence that one of the derived BEBs should be used in those situations, or to provide an

alternative approach."

Based on the number of residential units and there being no CHP or energy centre associated with the proposed development, there is expected to be no significant building emissions associated with the development. As a result, the proposed development is air quality neutral in terms of building emissions.

6.2.2 Transport Emissions

The residential land use class has been utilised for the prosed development to determine the emissions factors as a worst-case assessment.

The transport assessment provides a summary of daily 2-way trips generation by the proposed development:

Vehicle Trips

- Residential Daily vehicle trips = 17
- Total residential vehicle trips/annum = 17 x 365 = 6,205 trips

The average journey lengths for residential, office and retail developments are presented in Table 6.4. The average emissions rates for cars, in g/veh-km, for CAZ, Inner and Outer London per vehicle-km are presented in Table 6.5.

Table 6.4 Average Distance Travelled by Car per Trip

Land Use Class	Distance (km)		
	CAZ	Inner	Outer
Residential (Class C1)	4.3	3.7	11.4
(1) Based on the LTDS destination. Note these distances are based on the straight line between the origin and destination of a trip not the actual trip lengths.			

Table 6.5 Emission Factors

Pollutant	g/vehicle-km		
	CAZ	Inner	Outer
NO_x	0.4224	0.370	0.353
PM_{10}	0.0733	0.0665	0.0606

NO_x Emissions

The average distance travelled for Residential is 11.4 km per trip. The NO_x emission factor is 0.353 g/veh-km (for outer London) and thus the development transport NO_x Emissions is:

Vehicle Trips

- Residential (C3) Vehicle Trips: 6,205 x 4.3 x 0.4224 = 11.27 kg/annum.
- Total NO_x Emissions = 11.27 kg/annum

The total benchmarked building NO_x emissions are calculated from the land use categories and the TEBs and

are shown in Table 6.6.

Table 6.6 Calculation of Benchmarked NO_x emissions Using Transport Emissions Benchmarks for Each Land-use Category

Land Use Class	GIA m²/ Number of Properties	NOx Transport Emissions Benchmark	PM10 Transport Emissions Benchmark	Kg per annum	
				NO_x	PM_{10}
Residential (Class C1)	932	1553	267	1447	249
Total Benchmarked Transport Emissions				**1447**	**249**

The total transport NO_x emission of 11.27 kg/annum may be compared with the total benchmarked transport NO_x emission of 1447 kg/annum. The results indicate that the transport emission of NO_x is more than the benchmark and additional mitigation measures need to be considered.

PM_{10} Emissions

The PM_{10} emission factor is 0.0606 g/veh-km (for outer London) and thus the development transport PM_{10} emission is:

- Residential (C3) Vehicle Trips: 6,205 x 4.3 x 0.0733 = 1.96 kg/annum.
- Total PM_{10} Emissions = 1.96 kg/annum

The total benchmarked building PM_{10} emissions are calculated from the land use categories and the TEBs and are shown in Table 6.7.

Table 6.7 Calculation of Benchmarked PM_{10} emissions Using Transport Emissions Benchmarks for Each Land-use Category

Land Use Class	GLA m²/ Number of Properties	Transport Emissions Benchmarks (gPM_{10}/m^2/annum)	Benchmarked Emissions ($kgPM_{10}$/annum)
Residential	932	267	249

The total transport PM_{10} emission of 1.96 kg/annum may be compared with the total benchmarked transport PM_{10} emission of 249 kg/annum. The results indicate that the transport emissions of PM_{10} are above the benchmark and additional mitigation measures need to be considered.

In conclusion, the proposed development does not meet the London policy requirements to be at least air quality neutral for the transport emissions and therefore, additional mitigation is proposed, this mitigation is detailed in Section 8.

6.3 Summary

Both transport NO_x emissions and transport PM_{10} emissions are below the transport emission benchmark and can be considered air quality neutral.

7. Kitchen Odour Assessment

7.1 Planning Policy Context

This odour assessment evaluates the potential odour annoyance from the proposed kitchen on the surrounding receptors.

Following major regulations/guidance/guidelines have been used in the assessment:

- Guidance on the assessment of odour for planning, IAQM, July 2018;
- H4 Odour Management, "How to comply with your environmental permit", March 2011; and
- Guidance of "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", by EMAQ+, 5 September 2018.

This odour assessment includes:

(1) An odour screening assessment;
(2) Selections of the required carbon filter solution based on the screening results; and
(3) A detailed odour modelling assessment.

7.2 Definition of Impact and Effect

IEMA Guidelines for Environmental Impact Assessment (2004) recommend a clear progression from the characterisation of "impact" to the assessment of the significance of the "effect" considering the evaluation of the sensitivity and value of the receptors. The guidelines emphasise the need to clearly define at the outset how the two terms will be used and then to apply them in a consistent fashion. In this IAQM guidance, the following definitions are used:

- **Impacts** – these are changes to the environment attributable to the development proposal.
- **Effects** – these are the results of the changes on specific receptors.
- **Receptors** - are the users of the adjacent land, which may vary in their sensitivity to odour.

An increase in odour levels (the impact) would therefore cause an effect (e.g. loss of amenity) if the adjacent land use was residential, and perhaps a lesser effect if the adjacent land use was an industrial facility.

7.3 Odour Benchmarks and Odour Effect Descriptors for Impact Assessment

Environment Agency Guidance H4 Odour Management (March 2011) and the latest Institute of Air Quality Management (IAQM) Guidance on the Assessment of Odour for Planning (July 2018) provides a methodology for assessing the impacts of odour based on the combinations of field odour survey observations and odour dispersion modelling.

The modelling method calculates the 98th percentile of hourly average odour concentrations ($C_{98,\ 1\text{-hour}}$) over a year, (i.e. the levels exceeded for 2% of the time) with the results being expressed as European Odour Unit contours on a map. The exposure contours can then be used to check unacceptable levels of odour pollution against exposure benchmarks at sensitive receptor locations.

The H4 benchmarks are based on the 98th percentile of hourly averages and they are presented in Table 7.1.

Table 7.1 H4 Benchmark Odour Criteria

Criterion C_{98} ou_E/m^3	Offensiveness	Odour Emission Sources
1.5	Most offensive odours	Processes involving decaying animal or fish remains Processes involving septic effluent or sludge Biological landfill odours
3.0	Moderately offensive odours	Intensive livestock rearing Fat frying (food processing) Sugar beet processing Well aerated green waste composting
6.0	Less offensive odours	Brewery Confectionery Coffee

The latest IAQM guidance states that the predictive, quantitative approach involves obtaining estimates of the odour source emission rate, use of the emissions in a dispersion model to predict 98th percentile concentration at sensitive receptors and comparison of these with criteria that have evolved from research and survey work. At the present time, this remains an accepted technique and the IAQM supports this.

IAQM confirm that in the absence of comprehensive dose-response information the assessor should allow the derivation of exact C98 concentration metrics for different types of odour, IAQM is *'of the opinion that the practitioner should observe, from the various scientific studies, case law and practical examples of the investigation of odour annoyance cases, that in any specific case, an appropriate criterion could lie somewhere in the range of 1 to 10 ouE/m^3 as a 98th percentile of hourly mean odour concentrations.*

Taking into account the available scientific evidence and the collective experience of IAQM members involved in drafting this guidance, the odour concentration change descriptors together with impact descriptors in Table 7.2 are proposed by IAQM for an odour at the offensive end of the spectrum. These adopt the C98 as the

appropriate frequency metric, encompasses the 1 to 10 ouE/m³ concentration range referred to above and also considers also the potential sensitivity of different receptors. It is also consistent in format and concept with other guidance in the air quality field.

For odours that are less unpleasant, the level of odour exposure required to elicit the same effect may be somewhat higher, requiring professional judgement to be applied. For example, odours from sewage treatment works plant operating normally, i.e. non-septic conditions, would not be expected to be at the 'most offensive' end of the spectrum (Table 7.2) and can be considered on par with 'moderately offensive' odours such as intensive livestock rearing. Table 7.3 below shows the impact descriptors proposed for a 'moderately offensive' odour.'

Table 7.2 Proposed odour effect descriptors for impacts predicted by modelling – "Most Offensive" odours

Odour Exposure Level C_{98}, ou_E/m^3	Receptor Sensitivity		
	Low	Medium	High
≥10	Moderate	Substantial	Substantial
5-<10	Moderate	Moderate	Substantial
3-<5	Slight	Moderate	Moderate
1.5-<3	Negligible	Slight	Moderate
0.5-<1.5	Negligible	Negligible	Slight
<0.5	Negligible	Negligible	Negligible

It should be noted that the Table applies equally to cases where there are increases and decreases in odour exposure as a result of this development, in which case the appropriate terms "adverse" or "beneficial "should be added to the descriptors.

Table 7.3 Proposed odour effect descriptors for impacts predicted by modelling – "Moderately Offensive" odours

Odour Exposure Level C_{98}, ou_E/m^3	Receptor Sensitivity		
	Low	Medium	High
≥10	Moderate	Substantial	Substantial
5-<10	Slight	Moderate	Moderate
3-<5	Negligible	Slight	Moderate
1.5-<3	Negligible	Negligible	Slight
0.5-<1.5	Negligible	Negligible	Negligible
<0.5	Negligible	Negligible	Negligible

It should be noted that the Table applies equally to cases where there are increases and decreases in odour exposure as a result of this development, in which case the appropriate terms "adverse" or "beneficial "should be added to the descriptors.

A benchmark odour criterion of 3.0 OU_e/m^3 has been used in this assessment.

7.4 Key Odour Sources

The key potential odour sources associated with the proposed development have been identified to be associated with the kitchen facility. A worst-case scenario has been assessed as the relevant location of the kitchen and kitchen extract is yet finalized.

7.5 Odour Risk Assessment

The "*Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, September 2018*" contains a methodology for the assessment of odour from kitchen extract as outlined below.

Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach. The odour control requirements considered here are consistent with the performance requirements listed in this report. The assessment method is outlined in Tables 7.4 and 7.5 below.

Table 7.4 Odour Impact Risk

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high-level odour control	more than 35

* based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type:

Table 7.5 Odour Assessment Criteria

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s.
	Good	5	Discharging 1m above ridge at 15 m/s.
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge.
Size of kitchen	Large	5	More than 100 covers or large sized take away.
	Medium	3	Between 30 and 100 covers or medium sized take away.
	Small	1	Less than 30 covers or small take away.
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips.
	High	7	Kebab, Vietnamese, Thai or Indian.
	Medium	4	Cantonese, Japanese or Chinese

Criteria	Score	Score	Details
	Low	1	Most pubs, Italian, French, Pizza or steakhouse.

Based on the above criteria and assumptions on the kitchen's discharging location at the proposed development, the following screening assessments have been undertaken as shown in Table 7.6 below. The screening assessment below represents a worst case scenario.

Table 7.6 Screening Assessment of Potential Odour Risks

Unit Type	Dispersion Score (related to flue height and velocity)	Proximity of Receptors	Size of Kitchen	Cooking Type	Total Score
Bar/Restaurant	20	10	5	1	36
	Low level discharge, discharge into courtyard or restriction on stack.	Closest sensitive receptor less than 20m from kitchen discharge.	More than 100 covers or large sized take away.	Most pubs, Italian, French, Pizza or steakhouse.	

As shown in Table 7.6, odour from the kitchen falls into the 'Very High' risk category. "A very high level of control measure", presented within the Guidance of "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", EMAQ+, 5 September 2018", will be required as below:

1. Fine Filtration or ESP followed by carbon filtration (carbon filters rates with a 0.4 – 0.8 second residence time);
2. Fine Filtration or ESP followed by carbon filtration and by counteractant/neutralising system to achieve the same level of control as 1;
3. Fine Filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

8. Odour Mitigation and Maintenance

8.1 Odour Mitigation Measures

Odour screening assessment has identified in Section 7 that the control odour system will include:

1. Fine Filtration or ESP followed by carbon filtration (carbon filters rates with a 0.4 – 0.8 second residence time);
2. Fine Filtration or ESP followed by carbon filtration and by counteractant/neutralising system to achieve the same level of control as 1;
3. Fine Filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

8.2 Initial Proposed Odour Control System

In the selection of "a very high level of control measure" to meet the requirement, a solution for "very high odour control" system can be selected as:

> Fine Filtration or ESP (ESP module 630 h x 1020w x 640mml) followed by carbon filtration (carbon filters rates with a 0.4 – 0.8 second residence time) 2100h x 1850w x 1200mml).

This example is based on WYG's previous project experiences after contacting Univent Systems Ltd for the design of the odour filtration system to meet the "Very High" risk requirement.

Odour Filtration Unit Maintenance for Initial Control System

A regular maintenance schedule of servicing and cleaning will be followed according to the manufactures' specifications. A manufactures' maintenance manual consists of following 6 servicing and cleaning steps:

- Step 1 – shut down ventilation system;
- Step 2 – unscrew the access panel door on the side of the carbon filtration unit;
- Step 3 – slide out the pre filter to check condition. if this looks dirty and full of grease change as frequent as necessary;
- Step 4 – carbon filters can be checked for grease but if the pre-filters are maintained the carbon filters should have the lifespan outlined in manufacturers literature;
- Step 5 – in line with the manufacturer's literature change the carbon filters. again, these items slide out of the casing when the door is off. care should be taken due to the weight of these items and may require 2 men; and
- Step 6 – after any of the filters have been removed please re-attach the door.

The cleaning period for the carbon filters and extract system ductwork is presented in Table 8.1.

Table 8.1 Cleaning Schedule

Description	Light Cooking	Medium Cooking	Heavy Cooking
Pre-filters extract	n/a	1-monthly	1-monthly
Carbon-filters extract replace	n/a	6-12 monthly	4-monthly
Ductwork clean extract	12-monthly	6-12-monthly	3-6-monthly

9. Modelling of Odour Releases from Kitchen Ventilation Systems

An assessment of odour releases from the kitchen ventilation systems was undertaken using AERMOD modelling software. AERMOD is an US EPA (Environmental Protection Agency) regulatory model and it is an Environment Agency approved model for the prediction of pollutant concentrations from a wide range of sources that are present at typical industrial facilities.

9.1 AERMOD Dispersion Model

The AERMOD model accepts hourly meteorological data to define the conditions for plume rise, transport, diffusion and deposition. It estimates the concentration or deposition value for each source and receptor combination for each hour of input meteorology and calculates annual and user-selected short-term averages. The model also considers the local terrain surrounding the facility. Since most air quality standards are stipulated as averages or percentiles, AERMOD allows further analysis of the results for comparison purposes.

9.2 Meteorological Data

One year of meteorological data used in the assessment is from London City Airport Meteorological Station (2018). The meteorological data are considered representative of conditions at the development site. Reference should be made to Figure 2 for an illustration of the prevalent wind conditions at this site.

9.3 Surface Roughness Length

BREEZE AERMET 7 has been used to produce AERMOD-ready meteorological data files (. SFC and .PFL files) using the meteorological data from London City Airport Meteorological Station.

The land uses surrounding the emission sources are described as a 'large urban area'. A surface roughness value of 1.5 for the large urban land use has been used to produce a worst-case assessment.

9.4 Treatment of Terrain

The presence of steep terrain can influence the dispersion of emissions and the resulting pollutant concentrations. US EPA guidance indicates that terrain effects should be considered if the gradient exceeds 1:10. A digital terrain file in the UK Ordnance Survey (OS) Landranger format (.NTF) has been used in the assessment.

9.5 Sensitive Residential Receptors

The existing sensitive residential receptors adjacent to the kitchen are contained in Table 9.1 and shown in Figure 1.

It should be noted that these do not represent an exhaustive list of all receptors within the vicinity of the Site, rather worst-case representative locations adjacent to the site.

Table 9.1 Modelled Sensitive Residential Receptors

Discrete Receptor		UK NGR (m)		
		X	Y	Z
R1	18 Woburn Walk	529913.3	182533.1	1.5
R2	8 Duke's Road	529867.3	182563.5	1.5
R3	Flaxman Court, Flaxman Terrace	529964.9	182634.2	1.5
R4	120 Euston Road	529891.4	182699.3	1.5
R5	161 Euston Road	529763.4	182567.1	1.5
PR1	Receptors at Hotel	529885	182647.7	6
PR2	Receptors at Hotel	529905.5	182664.6	6
R6	20 Flaxman Terrace, Holborn	529914.8	182606.3	1.5
R7	Flat 10 Grafton Mansions, Duke's Road	529881.1	182580.1	1.5
R8	Somerton House 1	529878.7	182633.1	22
R9	Somerton House 2	529888.9	182618.3	22

9.6 Buildings in the Modelling Assessment

Buildings nearby or immediately adjacent to the emission source could potentially cause building downwash effects on emission sources and have therefore been modelled. The locations and dimensions of the buildings used in the model are given in Table 9.2.

Table 9.2 Locations and Heights of Buildings Used in the Model

Name		UK NGR (m)		Height (m)
		X	Y	
1	Existing Premier Inn Euston	529859.4	182632.2	19
2	Service Area Extension	529896.9	182637.7	19
3	Roof Extension	529881.8	182647.4	25
4	Buildings Along Duke's Road	529877.1	182586.7	9.9
5	Martial Arts Centre	529888.1	182593.4	6.6
6	Flaxman Terrace	529898.6	182589.1	9.9
7	London Karate-do Shotokai	529909.3	182621	9.9
8	137 Flaxman Terrace Lower Block	529937.1	182659.7	9.9
9	137 Flaxman Terrace Tall Block	529937	182659.4	19
10	Halo Building 1 Mabledon Place	529942.1	182687.6	36.3

9.7 Odour Concentrations from Odour Extract Systems

The odour concentrations in the kitchen extract system for this assessment is based on odour measurements information in a similar kitchen exhaust duct. An analysis of odour samples in a kitchen exhaust duct that ventilates. The samples for determining odour concentration are taken in bags and the analysis is conducted within 30 hours of the sample being taken.

The samples were taken at 6 different points on the exhaust duct of the restaurant, for example, points at the kitchen extract hood, and point at the duct discharge point.

The measured odour concentration at the duct discharge point is 2,828 OU_E/m^3 without the application of the AirMaid odour control.

The measured odour concentration at the duct discharge point is 790 to 1024 OU_E/m^3 after the application of the AirMaid odour control. The AirMaid odour control system has an approximately 75% of an odour reduction efficiency.

9.8 Odour Modelling Scenario

As there is no odour concentration information to be available for either the proposed or existing kitchen operations, the measured odour concentrations at a similar kitchen system have been used in the modelling assessment.

Odour emission concentration with proposed extension after using the proposed odour control measure of a carbon filtration unit which consists of 2 number pre filters and 2 number carbon cells has been used in the assessment.

9.9 Odour Emission Rates for the Proposed Odour Extract Systems

Odour concentrations at the extract fan outlet/discharge point is 2,828 OU_E/m^3 without the odour control system.

Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems states that a carbon adsorption filter may achieve a high odour reduction efficiency up to 95% under optimum conditions. For Scenario 2 with the proposed carbon filtration unit, an odour reduction efficiency of 75%, which is similar to the AirMaid odour control system used in the kitchen exhaust duct at the similar kitchen, has been used.

The detailed of the modelling odour emission rates and emission parameters are presented in Table 9.3.

Table 9.3 Kitchen Extract Emissions for the Assessment and Discharge Parameters

Parameter [1]	Proposed Kitchen	Unit
Air Flow Rate	1.577	m^3/s
Odour Concentration at Extract Fan Outlet	2,828 x (100% – 75%) = 707	OU_E/m^3
Odour emission rate	1115	OU_E/s
Exhaust Gas Temperature	25	°C
Diameter of Outlet Duct	1.0	m
Exhaust Velocity at Outlet	2.01	m/s
Stack Height	4.2	m (above ground level)

Note:

1. *Assumption based on similar size commercial kitchen.*

10. Odour Modelling and Assessment Results

10.1 Odour Modelling Results

The results of the model predictions at each discrete receptor using 2018 met data are summarised in Table 10.1. The results are presented at the 98th percentile of hourly averages (Environment Agency, March 2011).

Table 10.1 The 98th%ile Maximum Short-Term (Hourly) Concentrations of Odour

Receptors		Predicted Hourly PEC (Contribution from the Kitchen) OU_E/m^3
		2018 Met Data
R1	18 Woburn Walk	0.33
R2	8 Duke's Road	0.25
R3	Flaxman Court, Flaxman Terrace	0.45
R4	120 Euston Road	0.47
R5	161 Euston Road	0.15
PR1	Receptors at Hotel	0.85
PR2	Receptors at Hotel	0.56
R6	20 Flaxman Terrace, Holborn	0.60
R7	Flat 10 Grafton Mansions, Duke's Road	0.34
R8	Somerton House 1	0.29
R9	Somerton House 2	0.42

Notes:

1. *There is no background for odour and hence the PC = PEC.*

The predicted odour concentrations at existing receptors range from 0.05 to 0.85 OU_e/m^3. The maximum predicted odour concentration is 0.85 OU_e/m^3, which is below the benchmark odour criterion of 3.0 OU_e/m^3.

The predicted odour

The contour plots of the predicted odour concentrations for all receptors and grid receptors are presented in Figure 3. The contour plots show that the predicted maximum concentrations occur adjacent to the emission source, with a predicted decrease in concentration with the increased distance from the emission source.

10.2 Odour Effects on the Existing Receptors

The magnitudes of odour effects for the modelled receptors for 2018 are presented in Table 10.2.

The existing sensitive residential receptors have been assessed as high sensitivity receptors.

Table 10.2 Odour Effect for the Predicted Odour Impact

Receptors		Predicted Hourly PEC OU_E/m^3	Odour Effect
		2018 Met Data	2018 Met Data
R1	18 Woburn Walk	0.33	Negligible
R2	8 Duke's Road	0.25	Negligible
R3	Flaxman Court, Flaxman Terrace	0.45	Negligible
R4	120 Euston Road	0.47	Negligible
R5	161 Euston Road	0.15	Negligible
PR1	Receptors at Hotel	0.85	Slight
PR2	Receptors at Hotel	0.56	Slight
R6	20 Flaxman Terrace, Holborn	0.29	Negligible
R7	Flat 10 Grafton Mansions, Duke's Road	0.42	Negligible
R8	Somerton House 1	0.33	Negligible
R9	Somerton House 2	0.25	Negligible

Notes:

1. *There is no background for odour and hence the PC = PEC.*

The odour effects at the existing receptors are predicted to be 'Slight' at two receptor locations and to be 'Negligible" at remaining receptors.

11. Mitigation

11.1 Construction Phase

The dust risk categories have been determined in Section 3 for each of the four construction activities. The assessment has determined that the potential impact significance of dust emissions associated with the construction phase of the proposed development is 'low risk' at the worst affected receptors.

Using the methodology described in Appendix A, site specific mitigation measures associated with the determined level of risk can be found in Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction. The mitigation measures have been divided into general communications and dust management measures applicable to all sites, and measures applicable specifically to demolition, earthworks, construction and trackout.

The recommended mitigation measures for the proposed development are detailed in Table 11.1 below:

Table 11.1 Highly Recommended Construction Phase Mitigation Measures

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.
Display the head or regional office contact information.
Dust Management
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
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.
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.
Avoid site runoff of water or mud.
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
Ensure all vehicles switch off engines when stationary - no idling vehicles.
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips.
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Avoid bonfires and burning of waste materials.
Demolition
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
Avoid explosive blasting, using appropriate manual or mechanical alternatives.

Bag and remove any biological debris or damp down such material before demolition.
Earthworks
No Action Required.
Construction
Avoid scabbling (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 continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Record all inspections of haul routes and any subsequent action in a site log book.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Following the implementation of the mitigation measures detailed in the table above, the impact significance of the construction phase is not considered to be described as significant.

11.2 Operational Phase

Mechanical Ventilation

Based on the onsite monitoring exceeding the AQO and being above 60µg/m³ which is indicative of exceedances of short term AQO for NO_2 at the proposed development. All proposed additional hotel units will have mechanical ventilation installed.

These units will be provided with filtration via an "AAC Eurovent Nitrosorb" (or similar) unit which is combined with the MVHR mechanical ventilation.

The AAC unit is an independently tested NO_2 and NO_x removal solution which has been formulated to remove low concentrations (typically external concentrations of around 70µg/m³ NO_2). This high-quality solution delivers sustainable NO_2 and NO_x mitigation and is designed to improve indoor air quality in residential properties. The unit has been proven to mitigate levels of Nitrogen Oxides to 70-80% of their outside value.

11.3 Odour Control Measures

As discussed in Section 7, odour from the restaurant within the hotel falls into the 'Very High' risk category, this is not expected to change due to the proposed restaurant expansion. "A very high level of control measure", which is presented within the "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", EMAQ+, 5 September 2018", to control odour at the site will include fine filtration or ESP followed by carbon filtration (carbon filters rates with a 0.4 – 0.8 second residence time).

11.4 Proposed Odour Control Equipment

The proposed odour filtration system comprises a primary (or pre) filter and the main (or secondary) filter with a dwell time of 0.4 – 0.8 seconds system. This system is considered sufficient to control odour from the site.

Maintenance Program

The good practice measures, as identified within the "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", by EMAQ+, 5 September 2018" guidance, should be implemented at the site to control odour.

A visual inspection of the ventilation system should be undertaken once a week. All metal surfaces should be checked to ensure no accumulation of grease or dirt and no surface damage. Cooker hoods and grease filters should be cleaned on a daily basis.

Carbon filters with ESP pre-treatment should be changed every six to twelve months, while systems employing fine filtration and carbon filtration should change the fine filters every two weeks, and carbon filters every four to six months.

Extract ductwork is required to be maintained and operated effectively. The recommended cleaning period for extract ductwork is based upon the level of use and grease production.

Table 11.2 Maintenance Program

Grease Production		Daily Usages	Cleaning interval
Heavy Use	Heavy / continuous grease production	6 – 12 Hours	3 – 6 Months
		12 – 16 Hours	2 – 3 Months
Moderate Use	Moderate grease production	6 – 12 Hours	6 – 12 Months
		12 – 16 Hours	3 – 4 Months
Light Use	No significant grease production	6 – 12 Hours	12 Months
		12 – 16 Hours	6 Months

11.5 Good Practice Guidance

The good practice measures, as identified within the "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", by EMAQ+, 5 September 2018" guidance, should be implemented at the site to control odour.

12. Conclusions

WYG have undertaken an Air Quality Screening Assessment for the proposed development to provide an expansion to the current premises on Dukes Road, Euston.

Prior to the implementation of appropriate mitigation measures, the potential impact significance of dust emissions associated within the construction phase of the proposed development has potential as 'low' at some worst affected receptors without mitigation. However, appropriate site-specific mitigation measures have been recommended based on Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition, Earthworks, Construction and Trackout. It is anticipated that with these appropriate mitigation measures in place, the risk of adverse effects due to emissions from the construction phase will not be described as significant.

The effect of additional development traffic on local air quality is considered to be 'negligible'.

Based on the onsite monitoring results being exceeding the long-term AQO and being above 60µg/m³, which is indicative of exceedances of short term AQO for NO_2 at the proposed development, all proposed additional hotel units will have mechanical ventilation installed.

These units will be provided with filtration via an "AAC Eurovent Nitrosorb" (or similar) unit which is combined with the MVHR mechanical ventilation.

The Air Quality Neutral assessment has concluded that the proposed development will be air quality neutral in terms of transport emission.

The kitchen odour screening assessment has concluded that odour from proposed development falls into the 'Very High' risk category. Good practice measures, as identified within the "Control of Odour and Noise from Commercial Kitchen Exhaust Systems", by EMAQ+, 5 September 2018" guidance, will be implemented at the site to control odour.

Odour modelling assessment has shown that levels at the assessed receptors will be below the relevant assessment criteria of 3 OUe/m^3. As such, after the application of a required very high odour control system the 'very high' mitigation, the impact from the expanded restaurant will not cause significant odour issues.

Figure 1 Site Location Plan

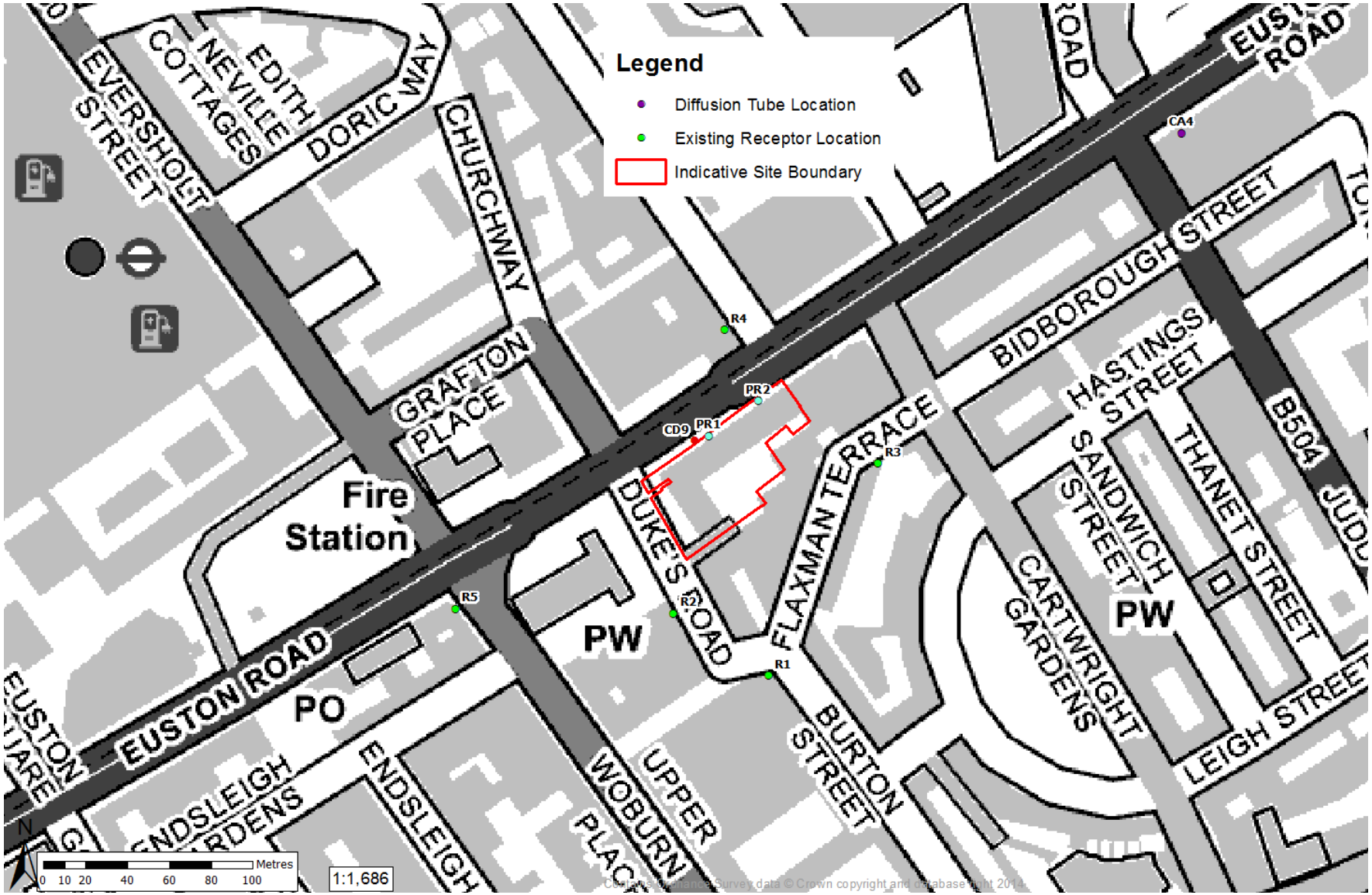


Figure 2 Meteorological Data/Windrose

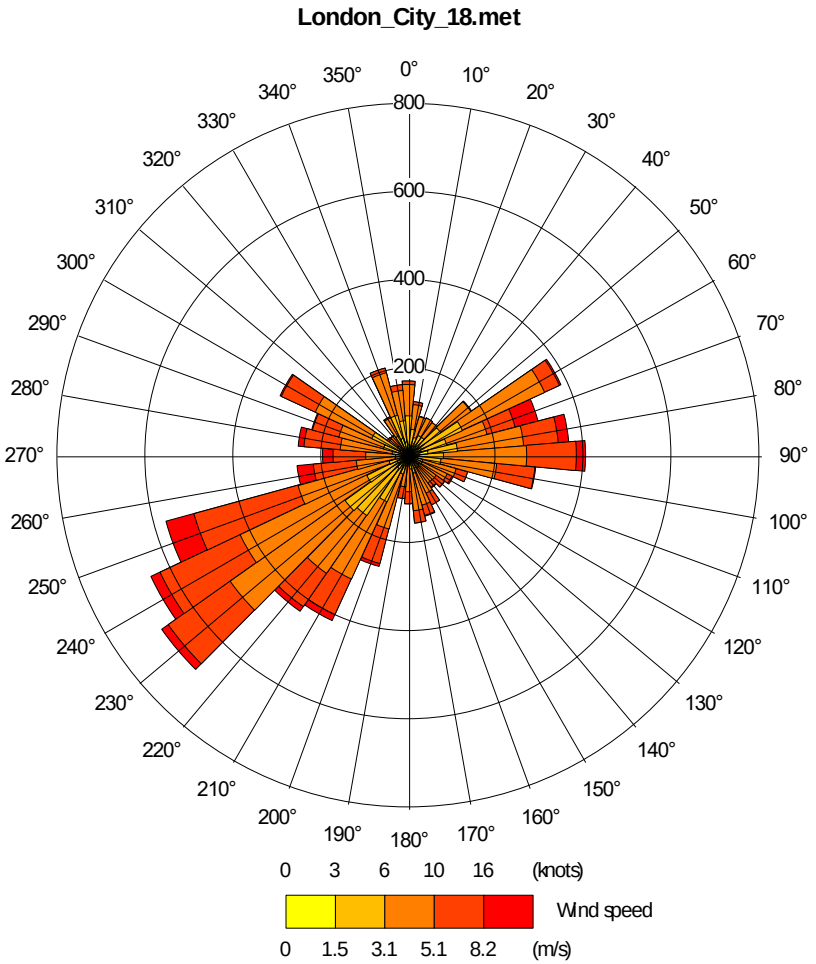


Figure 3 Predicted the 98th%ile Short-Term (Hourly) Odour Concentrations

Appendix A Construction Phase Assessment Methodology

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect a enjoyment of a high level of amenity;
  - The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
  - Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.
- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;

[1] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

- The appearance, aesthetics or value of their property could be diminished by soiling;
- The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
- Indicative examples include parks and places of work.

- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A1– Sensitivity of the Area to Dust Soiling Effects on People and Property

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

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.

- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.

- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A2 - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 · g/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 · g/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 · g/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 · g/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A3 - Sensitivity of the Area to Ecological Impacts

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

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included

in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table A4 - Risk of Dust Impacts, Demolition

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

Earthworks

Table A5 - Risk of Dust Impacts, Earthworks

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

Construction

Table A6 - Risk of Dust Impacts, Construction

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

Trackout

Table A7 - Risk of Dust Impacts, Trackout

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

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

Appendix B Report Terms & Conditions

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