



**HEALEY DEVELOPMENT SOLUTIONS
(HAYED) LIMITED
STANFORD HOUSE, 9 NESTLES AVENUE,
HAYES, LONDON**

AIR QUALITY ASSESSMENT

NOVEMBER 2018



the journey is the reward

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**Healey Development Solutions (Hayed) Limited
Stanford House, 9 Nestles Avenue, Hayes, London
Air Quality Assessment**

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1 Introduction

- 1.1 Mayer Brown Limited has been instructed by Healey Development Solutions (Hayed) Limited to undertake an Air Quality Assessment (AQA) in support of the forthcoming planning application for the redevelopment of Stanford House, 9 Nestles Avenue, Hayes in the London Borough of Hillingdon.
- 1.2 The site location in relation to the local highway network can be seen in **Figure 1.1** below.

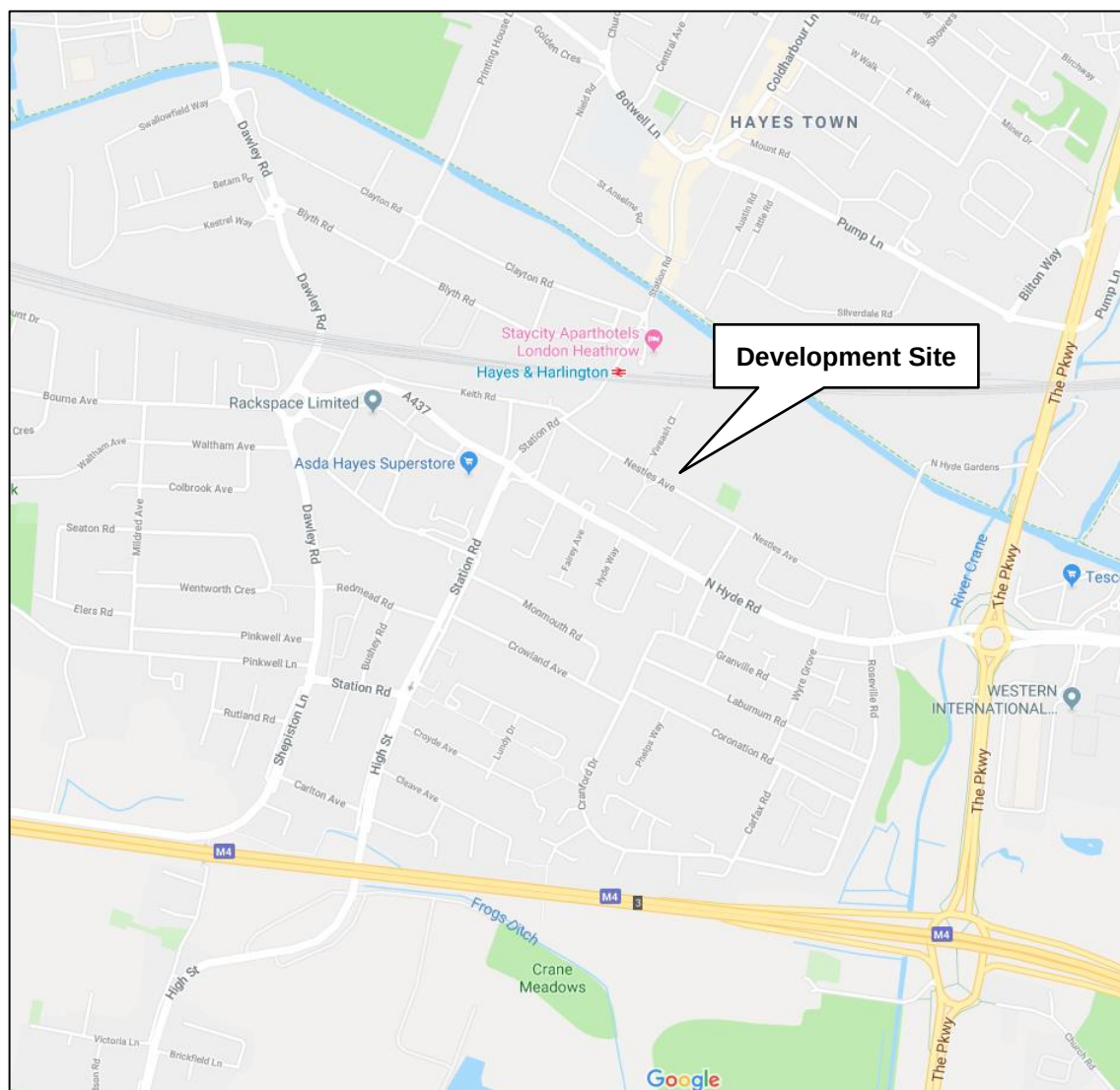


Figure 1.1: Site in Relation to the Local Highway Network

- 1.3 The site is located on Nestles Avenue in the London Borough of Hillingdon (LBH). The site is bound by Squirrels Trading Estate to the north, the former Nestle Factory to the east and Nestles Avenue to the south. To the west of the site is 7 Nestles Avenue, which was formerly occupied by the College of Accountancy and Management Studies, as well

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as industrial units 7-11 located off Viveash Close. Hayes and Harlington Railway Station is located north west of the site.

- 1.4 The site currently comprises a vacant two storey commercial building, which was formally occupied by Victoria Litho Limited. The existing site layout and surroundings is illustrated in **Figure 1.2** below.



Figure 1.2: Existing Site Layout and Surroundings

- 1.5 The planning application to which this report relates to seeks the demolition of the existing building and redevelopment to provide a building up to 10 storeys, with 868 sqm of Class B floorspace at ground and first floor level and 81 residential units to the upper floors, with associated landscaping, access, car parking and cycle parking.
- 1.6 The site forms part of the wider masterplan for mixed use residential led redevelopment. The latest iteration of the document, with Major Modifications made following Examination, seeks up to 300 residential units over Site B along with appropriate community infrastructure, employment floorspace, pedestrian links and set-back landscaping on Nestles Avenue to be incorporated.
- 1.7 The following Air Quality Assessment (AQA) has been undertaken in order to establish whether the site's location is considered suitable for the proposed use and quantify any

likely air quality impacts upon the surrounding area associated with the construction and/or operation of the proposed development.

1.8 In the event that potential impacts are identified, specific mitigation measures will be recommended in order to minimise significant pollution impacts and help safeguard the health and wellbeing of any existing and proposed sensitive receptors within the local area.

1.9 The AQA is divided into the following sections:

- **Section 2** - Legislation and Policy Content;
- **Section 3** - Assessment Methodology and Significance Criteria;
- **Section 4** - Baseline Conditions;
- **Section 5** - Evaluation of Potential Effects;
- **Section 6** - Mitigation Measures; and
- **Section 7** - Residual Effects and Conclusions.

2 Legislation and Policy Content

The Air Quality Strategy

- 2.1 Part IV of the Environment Act 1995¹ requires local authorities to review and assess the air quality within their boundaries. As a result, the Air Quality Strategy (AQS) was adopted in 1997, with national health-based standards and objectives set out for the then, key eight air pollutants of benzene, 1-3 butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulphur dioxide.
- 2.2 The purpose of the AQS was to identify areas where air quality was unlikely to meet the objectives prescribed in the regulations. The strategy was reviewed in 2000 and the amended AQS for England, Scotland, Wales and Northern Ireland (2000) was published. This was followed by an Addendum in February 2003 and in July 2007 an updated AQS was published².
- 2.3 The AQS sets standards and objectives for pollutants to protect human health, vegetation and ecosystems. The pollutant objectives are the future dates by which each standard is to be achieved, taking into account economic considerations, practical and technical feasibility.
- 2.4 The AQS also sets out a framework for Local Authorities to reduce adverse health effects from air pollution and ensures that international commitments are met (the Local Air Quality Management system).
- 2.5 Air quality objectives and limit values that 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 national 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.

¹ Department for Environment, Food and Rural Affairs (1995) The Environment Act. HMSO, London.

² Department of the Environment, Transport and the Regions (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Island (Volume 2). HMSO, London.

2.6 The main air quality pollutants of concern with regards to new developments such as the one proposed at this Application Site are the traffic related pollutants of Nitrogen Dioxide (NO₂) and Particulate Matter of size 10 and 2.5 microns (PM₁₀ and PM_{2.5}).

2.7 The relevant air quality standards and objectives are presented in **Table 2.1** below.

Pollutant	Air Quality Objectives		Date to be Achieved by
	Concentration	Measured As	
Nitrogen Dioxide (NO ₂)	200 µg m ⁻³	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40 µg m ⁻³	Annual mean	31/12/2005
Particles (PM ₁₀)	50 µg m ⁻³	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40 µg m ⁻³	Annual mean	31/12/2004
Particles (PM _{2.5}) (UK – Except Scotland)	25 µg/m ³	Annual mean	2020
Particles (PM _{2.5}) (UK – Urban Areas)	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020

Table 2.1: Air Quality Objectives in the UK- Defra

[London Local Air Quality Management \(LLAQM\)](#)³

2.8 The LLAQM Technical Guidance (2016) has been prepared by the Greater London Authority (GLA) to support London boroughs in carrying out their duties under the Environment Act 1995 and connected regulations. It supersedes the previous LAQM.TG(09), which supported all Local Authorities to fulfil their duties as part of the LAQM system and has now been updated by Defra (national technical guidance LAQM.TG(16)).

2.9 This guidance applies only to London's 32 boroughs (and the City of London), whilst LAQM.TG(16) applies to all other UK local authorities. It is the statutory process by which local authorities monitor, assess and take action to improve local air quality. If when following a detailed assessment, a Local Authority considers that one or more of the air quality objectives is not being met, an Air Quality Management Area (AQMA) must be declared.

³ Greater London Authority (GLA). Mayor of London. London Local Air Quality Management (LLAQM), Technical Guidance 2016 (LLAQM.TG(16))

- 2.10 In response to the issuing of an AQMA, an Air Quality Action Plan (AQAP) should be prepared within 12 months setting out the measures intended to reach the exceeded air quality objectives. London boroughs should update their existing AQAP every 5 years as a minimum, to reflect current policy and to improve their effectiveness.
- 2.11 The GLA has followed a similar approach to England and Scotland, adopting a new streamlined approach which places greater emphasis on action planning to bring forward improvements in air quality and to include local measures as part of EU reporting requirements. It also sees the introduction of an air quality Annual Status Report (ASR) to reduce the burden of the cycle of Updating and Screening Assessments, Progress Reports, Detailed Assessments, and Further Assessments.

[Air Quality Standards Regulations, 2010](#)

- 2.12 The air quality limit values set out in EU Directive (2008/50/EC, 2008) are transposed in English law by the Air Quality Standards Regulations (2010).⁴ This imposes duties on the Secretary of State relating to achieving the limit values.

[The National Planning Policy Framework \(2018\)](#) ⁵

- 2.13 The National Planning Policy Framework (NPPF) was adopted in July 2018, replacing the previously adopted 2012 NPPF. This consolidates a series of proposals that have been made in various consultation documents published over the few years.

- 2.14 In respect of air quality, Section 9 – Promoting Sustainable Transport it states that:

“Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

...d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains...;

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

⁴ UK Parliament (2010). The Air Quality Standards Regulations 2010, SI 2010/1001. HMSO, London.

⁵ Department of Communities and Local Government (2018). National Planning Policy Framework. HMSO, London.

vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”

- 2.15 Section 15 – Conserving and Enhancing the Natural Environment, under ground conditions and pollution, paragraph 181 adds:

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

- 2.16 Paragraph 183 concludes:

“The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

[Planning Policy Guidance \(2014\)](#)

- 2.17 The National Planning Policy Guidance (NPPG)⁶ details the circumstances when air quality would be relevant to a planning application. Considerations could include whether a development would:

- *‘Generate or increase traffic volumes or congestion, changing vehicle speeds;*
- *Introduce new sources of air pollution;*
- *Expose people to existing sources of air pollution;*
- *Give rise to unacceptable impacts during construction for sensitive receptors; and*
- *Affect biodiversity by deposition or concentration of pollutants.’*

⁶ Department for Communities and Local Government (2014). National Planning Policy Guidance. HMSO, <http://planningguidance.planningportal.ov.uk/>

- 2.18 The NPPG provides guidance for the completion of air quality assessments, stating the importance of an assessment to be location specific, and being:

‘proportionate to the nature and scale of development proposed and the level of concern about air quality.’

- 2.19 The mitigation measures necessary for a development are stated to be:

‘location specific, depend on the proposed development and should be proportionate to the likely impact.’

- 2.20 The NPPG states:

“Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife)”.

Regional Planning Policy

[Draft Replacement London Plan⁷](#)

- 2.21 On 13th August 2018 the Mayor published a version of the draft replacement London plan that included his suggested changes. When adopted, this plan will replace all previous versions.

- 2.22 The Plan sets out policies and supporting text (also known as reasoned justification). These take account of:

- the legal requirements related to the development of the Plan (including those discussed above) and the various issues that European and national legislation requires to be considered
- other requirements of planning law and Government planning policy and guidance (without seeking to repeat these)
- the integrated impact and habitats regulations assessment
- the evidence that underpins the Plan (without seeking to repeat it).

⁷ Greater London Authority (GLA) (2018) The Draft Replacement London Plan. The Spatial Development Strategy for Greater London
– Suggested changes August 2018. GLA, London.

2.23 In Chapter 9 – Sustainable Infrastructure, Policy SI1: Improving Air Quality states the following:

A. *“London’s air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:*

1. Development proposals should not:

- a. lead to further deterioration of existing poor air quality*
- b. create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
- c. reduce air quality benefits that result from the Mayor’s or boroughs’ activities to improve air quality*
- d. create unacceptable risk of high levels of exposure to poor air quality.*

2. Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.

3. Masterplans and development briefs for a large-scale development proposals subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development.

3a. Major development proposals must be at least air quality neutral and be submitted with an Air Quality Assessment.

4. Development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

5. Development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated.

Guidance is currently in ‘The control of dust and emissions for construction and demolition SPG’

2.24 Policy SI1 explains that:

“The aim of this policy is to ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. Where limit values are already met, or are predicted to be met at the time of completion, new developments must endeavour to maintain the best ambient air quality compatible with sustainable development principles.

For larger-scale development areas such as Opportunity Areas, or those large enough to already require an Environmental Impact Assessment, there should be an aim to be Air Quality Positive by implementing measures across the area that will actively reduce air pollution. This could be achieved, for example, by the provision of low or zero-emission heating and energy, or improvements to public transport, walking and cycling infrastructure, and designing out features such as street canyons that prevent effective dispersion of pollutants. Data from the use of smart infrastructure such as sensors could contribute to beneficial design solutions.

For major developments, a preliminary AQA should be carried out before designing the development to inform the design process. The aim of a preliminary assessment is to assess:

- *The most significant sources of pollution in the area*
- *Constraints imposed on the site by poor air quality*
- *Appropriate land uses for the site*
- *Appropriate design measures that could be implemented to ensure that development reduces exposure and improves air quality.*

Further assessments should then be carried out as the design evolves to ensure that impacts from emissions are prevented or minimised as far as possible, and to fully quantify the expected effect of any proposed mitigation measures, including the cumulative effect where other nearby developments are also underway or likely to come forward.

Assessment of the impacts of a scheme on local air pollution should include fixed plant, such as boiler and emergency generators, as well as expected transport-related sources. Impact assessments should always include all relevant pollutants. Industrial,

waste and other working sites may need to include on-site vehicles and mobile machinery as well as fixed machinery and transport sources.

It may not always be possible in practice for developments to achieve Air Quality Neutral standards or to acceptably minimise impacts using on-site measures alone. If a development can demonstrate that it has exploited all relevant on-site measures it may be possible to make the development acceptable through additional mitigation or offsetting payments.

Where there have been significant improvements to air quality resulting in an area no longer exceeding air quality limits, development should not take advantage of this investment and worsen the local air quality back to a poor level.

Further guidance will be published on Air Quality Neutral and Air Quality Positive standards as well as guidance on how to reduce construction and demolition impacts.”

[The London Plan \(Adopted\)](#)⁸

2.25 The London Plan, which is currently undergoing a review process, is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years.

2.26 In Chapter 5 – London’s Response to Climate Change, policy 5.1, Climate change mitigation, states:

“The Mayor seeks to achieve an overall reduction in London’s carbon dioxide emissions of 60 per cent (below 1990 levels) by 2025. It is expected that the GLA Group, London boroughs and other organisations will contribute to meeting the strategic reduction target...”

2.27 Policy 5.2, Minimising carbon dioxide emissions states:

“A. Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- 1. Be lean: use less energy*
- 2. Be clean: supply energy efficiently*
- 3. Be green: use renewable energy...”*

2.28 Policy 5.3, Sustainable design and construction states:

⁸ Greater London Authority (GLA) (2015) The London Plan. Spatial Development Strategy for London Consolidated with Alterations Since 2011. GLA, London.

“The highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments...”

2.29 Chapter 6 - London's Transport, policy 6.3 specifically seeks the submission of travel plans, construction logistic plans and delivery and servicing management plans from developers. Noting that these plans and assessments seek to help minimise emissions into the air.

2.30 In addition to these, Chapter 7 – London's Living Places and Spaces, policy 7.14, Improving Air Quality and under planning decisions, it states the following:

“...Development proposals should:

- a. minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAS) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans.*
- 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....”*

[London Environment Strategy, May 2018](#)⁹

- 2.1 Changes made by the Localism Act 2011 brought in a requirement for the original six separate environmental strategies to be brought together into a single London Environment Strategy (“the strategy”) under section 351A of the Greater London Authority Act 1999. This included The Mayor’s Air Quality Strategy – Cleaning the Air, 2010.
- 2.2 The London Environment Strategy sets out an ambitious vision for improving London’s environment for the benefit of all Londoners. This strategy sets out a vision for London in 2050, that will realise the potential of London’s environment to support good health and quality of life and to make the city a better place to live, work and do business. The Mayor wants London to be the world’s greenest global city. This will mean making it: Greener, cleaner and ready for the future.
- 2.3 The London Environment Strategy sets out bold policies and proposals in seven policy areas, to make this vision a reality. The key aims for London are:
- *“for London to have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities;*
 - *for London to be the world’s first National Park City, where more than half of its area is green, where the natural environment is protected, and where the network of green infrastructure is managed to benefit all Londoners;*
 - *for London to be a zero carbon city by 2050, with energy efficient buildings, clean transport and clean energy;*
 - *to make London a zero waste city. By 2026 no biodegradable or recyclable waste will be sent to landfill, and by 2030 65 per cent of London’s municipal waste will be recycled;*
 - *for London and Londoners to be resilient to severe weather and longer-term climate change impacts. This will include flooding, heat risk and drought;*
 - *for Londoners’ quality of life to be improved by reducing the number of people adversely affected by noise and promoting more quiet and tranquil spaces; and*
 - *for London to transition to a low carbon circular economy”*
- 2.4 Chapter 4: Air Quality has the aim: *“London will have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities.”*

⁹ Greater London Authority (GLA). (2018). Mayor of London, London Environment Strategy. GLA, London.

- 2.5 Policy 4.1.1 states *“Make sure that London and its communities, particularly the most disadvantaged and those in priority locations, are empowered to reduce their exposure to poor air quality”*. The Mayor will continue to provide real time alerts during high or very high air pollution episodes by broadcasting information on bus shelters, Tube stations and on roadside signs. There will be a particular focus on reducing unnecessary private car use and other activities that contribute to pollution.
- 2.6 Policy 4.1.2 *“Improve the understanding of air quality health impacts to better target policies and action”*. The Mayor will produce and maintain the London Atmospheric Emissions Inventory (LAEI) to better understand key emissions sources and how they contribute to poor air quality, both now and projected into the future.
- 2.7 Policy 4.2.1 refers to reducing emissions and switching to more sustainable travel. It states: *“Reduce emissions from London’s road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport”*. The Mayor will promote and prioritise more sustainable travel in London, including walking, cycling and public transport.
- 2.8 Policy 4.2.3 states: *“Reduce emissions from non-transport sources, including by phasing out fossil fuels”*. The Mayor will work with government, TfL, the London boroughs, the construction industry and other users of Non-Road Mobile Machinery (NRMM), such as event organisers, to prevent or reduce NRMM emissions. The Mayor has issued guidance to create an NRMM Low Emission Zone through planning conditions with minimum emission standards, based on the European engine “stages”. The Mayor will continue to review the NRMM Low Emission Zone standards to ensure that they deliver the largest possible improvements.
- 2.9 Policy 4.2.4 states *“The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality”*. The Mayor will use the London Local Air Quality Management (LLAQM) framework to assist boroughs and require them to exercise their statutory duties to improve air quality in accordance with that framework.
- 2.10 Where pollution exceeds legal standards, the London boroughs must declare an Air Quality Management Area and put in place an action plan detailing how they will tackle the problem. The levers under the control of the London boroughs include:
- *emissions based parking charges;*
 - *reducing pollution from new developments through the planning system (especially those that are not referred to the Mayor);*

- *improving public realm for walking and cycling;*
 - *rolling-out targeted measures at pollution hotspots;*
 - *integrating air quality into their public health duties;*
 - *supporting new infrastructure for fuelling zero emission vehicles; and*
 - *taking enforcement action against idling vehicles.*
- 2.11 Policy 4.3.1 and 4.3.2 refer to meeting World Health Organization (WHO) air quality guidelines, establishing new targets for pollutants and zero emission transport. They state:
- “The Mayor will establish new targets for PM_{2.5} and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners”*
- “The Mayor will encourage the take up of ultra low and zero emission technologies to make sure London’s entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines”*
- 2.12 The Mayor aims to meet the World Health Organization’s guidelines for PM_{2.5} by 2030. The Mayor, through TfL and the boroughs, and working with Government, will seek to implement zero emission zones in town centres from 2020 and aim to deliver a zero emission zone in central London from 2025, as well as broader congestion reduction measures to facilitate the implementation of larger zero emission zones in inner London by 2040 and London-wide by 2050 at the latest.
- 2.13 Policy 4.3.3 states: *“Phase out the use of fossil fuels to heat, cool and maintain London’s buildings, homes and urban spaces, and reduce the impact of building emissions on air quality”*. The London Plan includes policies so that all new large scale developments in London are ‘Air Quality Positive’, and maintain Air Quality Neutral requirements for all other developments. London’s growth and redevelopment should contribute to delivering improvements in air quality now and into the future.
- 2.14 The final policy in the chapter for air quality relates to indoor air pollutants. It states: *“Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces”*. The Mayor will work with partners to develop protocols and tools for planners and the building design industry to improve indoor air quality in existing buildings, as well as guides for Londoners, schools and businesses to help them reduce levels of indoor pollution.

- 2.15 Chapter 6: Climate change mitigation and energy has the aim: *“London will be a zero carbon city by 2050, with energy efficient buildings, clean transport and clean energy”*.
- 2.16 Policy 6.1.4 states: *“Ensure that new developments are zero carbon”*. All new developments in London are currently expected to achieve at least a 35 per cent onsite reduction in greenhouse gas emissions above and beyond national government’s standards. Where the target cannot be met onsite, developers are able to offset emissions through other carbon reduction measures offsite in agreement with the borough, or make payments to offset the shortfall into a borough’s offsetting fund.
- 2.17 Policy 6.2.1 is about delivering more decentralised energy in London. Implementation of large scale decentralised and low carbon energy projects will be undertaken in a coordinated way so they also contribute towards improving air quality as well as reducing carbon emissions. This will include meeting any relevant air quality standards and emission requirements set out in the London Plan. To facilitate implementation, the Mayor will provide support to boroughs and the private sector through the Decentralised Energy Enabling Project (DEEP).

[Sustainable Design and Construction – Supplementary Planning Guidance¹⁰](#)

- 2.18 This document provides guidance on how boroughs can take forward the new approaches set out in the London Plan, including carbon-off-setting, and the application of ‘air quality neutral’ assessments.
- 2.19 Policy 5.3: Sustainable Design and Construction requires under section c that ‘Major Development’ should apply a number of Sustainable Design Principles including:
‘minimising pollution (including noise, air and urban runoff)’
- 2.20 It also refers to the Mayor’s strategic target to:
“contribute to the achievement of EU limit values for air pollution”
- 2.21 Additional air quality specific priorities which cross reference with the requirements of the London Plan Policies (LPP) include:
- *Developers are to design their schemes so that they are at least ‘air quality neutral’ (LPP 7.4);*
 - *Developments should be designed to minimise the generation of air pollution. (LPP 5.3 and 7.14);*

¹⁰ Greater London Authority (GLA) (2014) Sustainable Design and Construction - Supplementary Planning Guidance. GLA, London.

- *Developments should be designed to minimise and mitigate against increased exposure to poor air quality (LPP 3.2, 5.3, and 7.14);*
- *Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants set out in Appendix 7 (LPP 7.14); and*
- *Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during Construction and Demolition SPG when constructing their development (LPP 5.3 and 7.14).*

2.22 The principals of the 2013 draft Control of Dust and Emissions during Demolition and Construction (and subsequent 2014 final issue) SPG are embedded within the 2014 IAQM document 'Guidance on the assessment of dust from demolition and construction and this has been applied within this assessment.

Local Planning Policy

Hillingdon Local Plan: Part 1 Strategic Policies (Adopted November 2012)¹¹

- 2.23 The Hillingdon Local Plan: Part 1 – Strategic Policies was adopted in November 2012 and is the key strategic planning document for Hillingdon. It sets out the long-term vision and objectives for the Borough, what is going to happen, where and how this will be achieved.
- 2.24 The Hillingdon Local Plan: Part 1- Strategic Policies is consistent with the Sustainable Community Strategy, which focuses on three key components that together make up Hillingdon now and in the future: People, Place and Prosperity. Emerging from these three components are the six priority themes of the Sustainable Community Strategy, i.e. improving health and wellbeing; strong and active communities; protecting and enhancing the environment; making Hillingdon safer; a thriving economy; and improving aspiration through education and learning.
- 2.25 Hillingdon continues to prosper, through the implementation of the seven-point vision. One of which is:
- Improved environment and infrastructure is supporting healthier living and helping the borough to mitigate and adapt to climate change: “.... *Improved building design and less reliance on cars has helped the borough to reduce its carbon footprint and action to improve air quality.*”

¹¹ London Borough of Hillingdon (2012), A Vision for 2026. Local Plan: Part 1. Strategic Policies, Hillingdon, London

2.26 The Plan sets out a number of strategic objectives to deliver the Vision. Its objectives in relation to air quality are:

- SO10: *“Improve and protect air and water quality, reduce adverse impacts from noise including the safeguarding of quiet areas and reduce the impacts of contaminated land.”*
- SO11: *“Address the impacts of climate change, and minimise emissions of carbon and local air quality pollutants from new development and transport.”*

2.27 Chapter 8 Core Policies – Environmental Improvement sets out the way that Hillingdon will protect and enhance the environment over the period of the Hillingdon Local Plan: Part 1 – Strategic Policies.

2.28 Policy EM1: Climate Change Adaptation and Mitigation states the following:

“The Council will ensure that climate change mitigation is addressed at every stage of the development process by:

...

5. Promoting the use of decentralised energy within large scale development whilst improving local air quality levels.

6. Targeting areas with high carbon emissions for additional reductions through low carbon strategies. These strategies will also have an objective to minimise other pollutants that impact on local air quality. Targeting areas of poor air quality for additional emissions reductions.”

2.29 Policy EM8: Land, Water, Air and Noise relates to air quality and development. It states that: *“All development should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors.*

All major development within the Air Quality Management Area (AQMA) should demonstrate air quality neutrality (no worsening of impacts) where appropriate; actively contribute to the promotion of sustainable transport measures.... And provide a management plan for ensuring air quality impacts can be kept to a minimum.”

“The Council seeks to reduce the levels of pollutants referred to in the Government’s National Air Quality Strategy and will have regard to the Mayor’s Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Actions plans, in particular where Air Quality Management Areas have been designated.

The Council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major development in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements.”

[Local Plan: Part 2](#)

- 2.30 The Local Plan Part 2 comprises Development Management Policies, Site Allocations and Designations document and an Atlas of Changes to the existing Policies Map. Once adopted it will deliver the detail of the strategic policies set out in the Local Plan Part 1: Strategic Policies (2012). Together they will form a comprehensive development strategy for the borough up to 2026 and will replace all saved policies of the Unitary Development Plan (September 2007).

[London Borough of Hillingdon Local Plan Part 2 – Development Management Policies: \(Revised Proposed Submission Version October 2015\)¹²](#)

- 2.31 This Development Management Policies document forms part of Hillingdon’s Local Plan Part 2. Its purpose is to provide detailed policies that will form the basis of the Council’s decisions on individual planning applications.
- 2.32 Policy DMEI 1: Living Walls and Roofs and on-site Vegetation states that: *“Major development in Air Quality Management Areas must provide onsite provision of living roofs and/or walls. A suitable offsite contribution may be required where onsite provision is not appropriate.”*
- 2.33 Policy DMEI 2: Reducing Carbon Emissions adds:
- A) *“All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.*
- B) *All Major development proposals must be accompanied by an energy assessment showing how these reductions will be achieved.*
- C) *Proposals that fail to take reasonable steps to achieve the required savings will be resisted. However, if the Council is minded to approve the application despite not meeting the carbon reduction targets, then it will seek an off-site contribution to make up for the shortfall. The contribution will be sought at a flat rate of £/tonne over the lifetime of the development, in accordance with the current ‘allowable solutions cost’.”*

¹² London Borough of Hillingdon (2015). Local Plan Part 2: Revised Proposed Submission Version, Development Management Policies, Hillingdon Council, London.

Policy DMEI 3 refers to Decentralised Energy. It states that:

A) *“All major developments are required to be designed to be able to connect to a Decentralised Energy Network (DEN).*

B) *Major developments located within 500 metres of an existing DEN, and minor new-build developments located within 100 metres, will be required to connect to that network, including provision of the means to connect to that network and a reasonable financial contribution to the connection charge, unless a feasibility assessment demonstrates that connection is not reasonably possible.*

C) *Major developments located within 500 metres of a planned future DEN, which is considered by the Council likely to be operational within 3 years of a grant of planning permission, will be required to provide a means to connect to that network and developers shall provide a reasonable financial contribution for the future cost of connection and a commitment to connect via a legal agreement or contract, unless a feasibility assessment demonstrates that connection is not reasonably possible.*

D) *The Council will support the development of DEN’s and energy centres in principle, subject to meeting the wider policy requirements of this plan and in particular on design and air quality.”*

Policy DMEI 14: Air Quality states that:

A) *“Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.*

B) *Development proposals should as a minimum:*

- *be at least “air quality neutral”;*
- *include sufficient mitigation to ensure that there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and*
- *actively contribute towards the continued improvement of air quality, especially within the Air Quality Management Area.”*

2.34 Chapter 8 Transport & Aviation refers to managing transport impacts. Paragraph 8.6 states that: *“The Council will ensure that new development in Hillingdon is adequately managed and integrated with its transport networks, including public transport, pedestrian and cycle networks, to enable it to accommodate growth in a sustainable manner, so that it does not contribute further to air quality deterioration, increased noise and congestion.”*

2.35 Policy DMT 1: Managing Transport Impacts states that:

“A) Development proposals will be required to meet the transport needs of the development and address its transport impacts in a sustainable manner. In order to be acceptable, they are required to:

...

v) Have no significant adverse transport or associated air quality and noise impacts on the local and wider environment, particularly on the strategic road network.”

2.36 Policy DMT 2: Highways Impacts, adds: “Development proposals must ensure that:

...

ii) they do not contribute to the deterioration of air quality, noise or local amenity or safety of all road users and residents.”

[Local Plan Part 2: Site Allocations and Designations \(Revised Proposed Submission Version, October 2015\)¹³](#)

2.37 The Site Allocations and Designations document sets out sites for development to meet the Borough’s needs to 2026, based on the level of growth and general locations set out in the Local Plan Part 1.

2.38 Chapter 3 refers to identifying sites for new homes. It identifies suitable developable sites for new housing.

2.39 The site is part of the site allocation SA 3: Eastern End of Blyth Road, Hayes which policy states the following:

“Policy SA 3: Eastern End of Blyth Road, Hayes – Site B:

The Council will support the provision of residential development in accordance with the approved scheme (Ref: 3151/APP/2014/3777). On the remainder of Site B, the Council will seek to bring forward mixed use development to capitalise on the proximity of the site to the future Crossrail link at Hayes and Harlington Station.

Sites A and B should form a comprehensive development scheme across the whole site”

2.40 The following air quality assessment has taken into consideration all the above policies and guidelines.

¹³ London Borough of Hillingdon (2015) Local Plan Part 2 Draft Proposed Submission Version. Site Allocations and Designations, Hillingdon Council, London.

3 Assessment Methodology and Significance Criteria

3.1 This section outlines the assessment methodology and the criteria that have been used to assess the significance of risk associated with the proposed development.

Data Sources	Details
Department for Environment, Food and Rural Affairs (Defra)	The Local Air Quality Management Tools contain information pertaining to monitoring networks across the UK and provides tools, which aid in the estimation of pollutant concentrations with reference to the year of study.
	Defra (2015). LAQM Background Maps - 1 x 1 km grid background maps for NO _x , NO ₂ , PM ₁₀ and PM _{2.5} (2015-2030)
Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM)	EPUK (2010). Development Control: Planning for Air Quality, (2010 Update) This guidance has been produced to help ensure that air quality is properly accounted for in local development control processes.
	IAQM (2014). Guidance on the assessment of dust from demolition and construction
	The EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality (2017) ¹⁴ provides advice and guidance on how an air quality assessment should be undertaken.
The National Atmospheric Emissions Inventory (NAEI) ¹⁵	This is a website run by Ricardo AEA Technology where emission data can be obtained which relates the vehicle fleet composition for the year of study.
London Councils	Air Quality and Planning Guidance ¹⁶ . This guidance is aimed at local authorities, developers and their consultants, and provides technical advice on how to deal with planning applications that could have an impact on air quality.
Greater London Authority (GLA), Air Quality Consultants and Environ	Sustainable Design and Construction – Supplementary planning Guidance (2014) ¹⁷ .
	Air Quality Neutral Planning Support Update: GLA 80371(2014) ¹⁸ . This report has been commissioned by the GLA to provide support to the development of the Mayor's policy related to "air quality neutral" developments.
	Non-Road Mobile Machinery (NRMM) Low Emissions Zone. From 1st of September 2015 the NRMM regulations apply to all major developments, within London, using NRMM between 37 and 560kW.
	LLAQM Technical Guidance, TG (16) ¹⁹ . Published by GLA in 2016 in order to support London Boroughs in carrying out their duties under the Environmental Act 1995 and connected regulations.

Table 3.1: Key Information Sources

¹⁴ Environmental Protection UK & Institute of Air Quality Management (EPUK & IAQM) (2017) Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, London

¹⁵ <http://naei.defra.gov.uk>

¹⁶ London Councils. (2007) Air Quality and Planning Guidance, The London Air Pollution Planning and the Local Environment (APPLE) working group, London

¹⁷ Mayor of London (2014). Sustainable Design and Construction – Supplementary Planning Guidance (SPG). Greater London Authority (GLA). London.

¹⁸ Air Quality Consultants (AQC) (2014). Air Quality Neutral Planning Support Update: GLA80371. AQC. Bristol

¹⁹ Greater London Authority (GLA) (2016) London Local Air Quality Management (LLAQM) Technical Guidance (LLAQM.TG (16)). DEFRA. London

Scope of Air Quality Assessment

- 3.2 The following document assesses the suitability of the site for the proposed use and whether any significant air quality impacts are expected as a result of the construction and operation of the proposed development.
- 3.3 A staged assessment approach has been adopted. This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. Where a simple review of the likely impacts associated with the proposed development shows that the risk of a health/annoyance impact is negligible, this will be sufficient to conclude that no further assessment is necessary.
- 3.4 In cases where the risk involved cannot be regarded as insignificant, a more detailed and quantitative assessment will be undertaken.
- 3.5 The specific methodology used in this assessment is presented below.

Dust Assessment

- 3.6 In February 2014, The Institute of Air Quality Management (IAQM) published a guidance on how to access and mitigate the impacts the dust emissions from demolition and construction sites. The guidance was updated in June 2016 (Version 1.1) and supersedes the 2012 IAQM guidance on the assessment of the impacts of construction on air quality and the determination of their significance. This approach is broadly replicated within the Greater London Authority (GLA) construction dust document (2014) and provides detail for a clear and concise construction dust assessment.
- 3.7 Potential dust impacts associated with construction activities have been assessed in accordance with guidance from the IAQM and the GLA best practice documents. The IAQM provides guidance on a five-step process to assess the potential impacts of construction dust pre-mitigation, provide mitigation measures specific to the risk and assess the post-mitigation impacts.
- 3.8 The assessment procedure follows the following framework:
- Screen the requirement for a more detailed assessment;
 - Assess the risk of dust impacts of the four phases of construction (demolition, earthworks, construction and trackout), taking into account:
 - the scale and nature of the works, which determines the potential Dust Emission Magnitude; and
 - the sensitivity of the area.
 - Determine the site-specific mitigation for the potential activities;

- Examine the residual effects and determine whether or not these are significant; and
- Prepare the Construction Dust Assessment.

3.9 In the process of screening the need for a detailed assessment, the following criteria has been used:

“An assessment will normally be required where there is:

- a ‘human receptor’ within:
 - 350m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an ‘ecological receptor’ within:
 - 50m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).”

3.10 When defining the sensitivity of an area/receptor, the following factors have been used.

Area Sensitivity	Human Receptors	Ecological Receptors
High	Very densely populated area, 10-100 dwellings within 20m of site. Annual mean concentrations of PM10 close to/in exceedence of the national objective (40 $\mu\text{g m}^{-3}$). Very sensitive receptors (e.g. residential properties, hospitals, schools, care homes).	Internationally or nationally designated site, the designated features may be affected by dust soiling. A location where there is dust sensitive species present.
Medium	Densely populated area, 1-10 dwellings within 20m of site. Annual mean concentrations of PM10 below the national objective (> 28 $\mu\text{g m}^{-3}$). Medium sensitivity receptors (e.g. office and shop workers).	Nationally designated site where the features may be affected by dust deposition. A location with a particularly important plant species where its dust sensitivity is unknown.
Low	Sparsely populated area, 1 dwelling within 20m of site. Annual mean concentrations well below the national objectives (< 28 $\mu\text{g m}^{-3}$). Low sensitivity receptors (e.g. public footpaths, playing fields, shopping streets).	Locally designated site where the features may be affected by dust deposition.

Table 3.2: IAQM Factors for Defining the Sensitivity of an Area.

Building Emissions

3.11 Any emissions associated with the proposed energy strategy will be assessed in line with the recommendations provided within the Energy Statement prepared for same application by Mecserve Energy and Sustainability Consultants.

Air Quality Neutral Assessment

- 3.12 London's air quality problems are primarily a result of a very large number of sources each contributing a small amount. In light of these issues, both the London Plan and the 2018 London Environment Strategy make reference to new developments being "air quality neutral".
- 3.13 The Air Quality Neutral Planning Support Update: GLA 80371 (Air Quality Consultants and Environ, 2014) and Mayor of London's Sustainable Design and Construction – Supplementary Planning Guidance (SPG) (April 2014) set out the guidance on preparing air quality neutral assessments.
- 3.14 An air quality neutral assessment is considered required for the following developments:
- 10 or more residential dwellings (or where the area is not given, an area of more than 0.5 ha); or
 - For all other uses, where the floor space is 1,000 sqm or more (or the site area is 1ha or more)

Traffic Exhaust Emissions

- 3.15 The assessment of traffic impacts will be carried out in accordance with guidance prepared by EPUK and IAQM in order to help establish indicative criteria, which may trigger the requirement for an air quality assessment.

The Development Will:	Indicative Criteria to proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on roads with relevant receptors.	A change of LDV flows of: • more than 100 vehicles per day (vpd) within or adjacent to an AQMA or within 100m of an internationally or nationally designated habitat; and • more than 500 vpd elsewhere. Coupled with relevant receptors within: • 10m of roads with AADT flows 5,000 to 10,000 vpd; • 20m of roads with AADT flows 10,000 to 30,000 vpd; and • 30m of roads with AADT flows > 30,000 vpd.
2. Cause a significant change in Heavy Duty Vehicles (HDV) flows on local roads with relevant receptors.	A change of HDV flows of: • more than 25 vpd within or adjacent to an AQMA or within 100m of an internationally or nationally designated habitat; and • more than 100 vpd elsewhere. Coupled with relevant receptors within: • 10m of roads with AADT flows 5,000 to 10,000 vpd; • 20m of roads with AADT flows 10,000 to 30,000 vpd; and • 30m of roads with AADT flows > 30,000 vpd.
3. Cause a significant change in road alignment bringing roads closer to relevant receptors.	Where relevant receptors will be within: • 10m of roads with AADT flows 5,000 to 10,000 vpd; • 20m of roads with AADT flows 10,000 to 30,000 vpd; and • 30m of roads with AADT flows > 30,000 vpd.
4. Introduce a new junction near to relevant receptors.	The junction will cause vehicles to slow down and accelerate, e.g. traffic lights. Coupled with relevant receptors within 50m of the junction.
5. Introduce or change a bus station.	Where bus flows will be: • more than 25 vpd within or adjacent to an AQMA; and • more than 100 vpd elsewhere. Coupled with relevant receptors within: • 50m of the buses within the bus station.

6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes.	Where the combustion unit is: • any centralised plant using biomass fuel; • a CHP unit > 15kWe; • any other combustion plant with thermal input > 400kWth; and • a standby emergency generator associated with a centralised energy centre.
Note – Where distances from the road are presented, they are from the edge of the nearest carriageway to the nearest relevant receptor, taking account of vertical and horizontal dimensions. Where traffic flows are presented they are Annual Average Daily Traffic (AADT) in vehicles per day (vpd). Where HDV flows are specified, they include lorries and buses. Where LDV's are specified they include cars and vans (with a gross vehicle weight ≤ 3.5 tonnes).	

Table 3.3: EPUK & IAQM Indicative Criteria for Proceeding to an Air Quality Assessment

- 3.16 If any of the above criteria are met, then the significance of air pollution impacts must be assessed. This may be either a Simple or a Detailed Assessment. In accordance with the EPUK and IAQM guidance, a Simple Assessment is one relying on already published information and without quantification of impacts, in contrast to a Detailed Assessment that must be completed with the aid of a dispersion model.

Impact Criteria

- 3.17 In the event that the initial screening of proposed traffic flows indicates that there is a potential risk of impact, guidance is provided by the IAQM and EPUK on how to determine the magnitude and significance of any likely changes in air pollutant concentrations and/or exposure as a result of a proposed development.
- 3.18 This process takes the following into account:
- the magnitude of the change (% change of annual mean concentration);
 - the concentration relative to the AQS objective (above or below the objective); and
 - the direction of change (adverse or beneficial).
- 3.19 The magnitude of an impact should be described by using the EPUK criteria set out in **Table 3.4** below. The criteria are based upon the change in concentration resulting from the proposed development as a percentage of the Air Quality Action Level (AQAL) which in this case is NO₂ and PM₁₀ annual mean objective levels of 40 µg m³.

Change Magnitude	NO ₂ /PM ₁₀ Annual Mean	No Days PM ₁₀ > $\mu\text{g m}^{-3}$
Large	Increase/decrease >10% (>4 $\mu\text{g m}^{-3}$)	Increase/decrease >4 days
Medium	Increase/decrease 6-10% (2.4-4 $\mu\text{g m}^{-3}$)	Increase/decrease 2-4 days
Small	Increase/decrease 2-5% (0.8-2 $\mu\text{g m}^{-3}$)	Increase/decrease 1-2 days
Imperceptible	Increase/decrease <1% (<0.4 $\mu\text{g m}^{-3}$)	Increase/decrease <1 day

Table 3.4: Impact Magnitude for Changes in NO₂ and PM₁₀ Concentrations

- 3.20 The significance of the impact will be dependent upon the magnitude of change in relation to the relevant Air Quality Action Level (AQAL). The AQAL are the air quality objectives discussed within **Section 2**. This is set out in **Table 3.5** below, which is based on the EPUK and IAQM guidance.

Long term average Concentration at receptor in assessment year.	% Change in concentration relative to Air Quality Action Level (AQAL)			
	1	2-5	6-10	>10
Increase With Scheme				
75% or less of AQAL (<30 $\mu\text{g m}^{-3}$)	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL (30-38 $\mu\text{g m}^{-3}$)	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL (38-41 $\mu\text{g m}^{-3}$)	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL (41 - 44 $\mu\text{g m}^{-3}$)	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL (>44 $\mu\text{g m}^{-3}$)	Moderate	Substantial	Substantial	Substantial

Table 3.5: Impact Descriptors for Individual Receptors

- 3.21 Therefore, once the magnitude and the significance of the change has been established, the impact at each relevant receptor can be described. The impact magnitude at each receptor location can be described using the changes stated above as of Large, Medium, Small or Imperceptible magnitude and of Negligible, Slight, Moderate or Substantial significance and also as being either Temporary or Permanent.
- 3.22 The overall significance should be described separately for both the impact of emissions related to the proposed development on existing receptors, and for the impacts of emissions from existing source(s) on new receptors being introduced from the proposed development. This is discussed below.

Exposure Criteria

- 3.23 When determining both the significance of exposure to air pollution and the levels of mitigation required, consideration should be given to the following Air Pollution Exposure Criteria (APEC) specified within the London Councils Air Quality and Planning Guidance²⁰.
- 3.24 This guidance takes into account the now superseded Planning Policy Statement 23: Planning and Pollution Control, with a view of reducing exposure to air pollution across the whole of London. The APEC criteria is set out in **Table 3.6** below.

	Applicable Range Nitrogen Dioxide Annual Mean	Applicable Range PM ₁₀	Recommendation
APEC – A	> 5% below national objective	Annual Mean: > 5% below national objective 24 hr: > 1-day less than national objective	No air quality grounds for refusal; however mitigation of any emissions should be considered.
APEC – B	Between 5% below or above national objective	Annual Mean: Between 5% above or below national objective 24 hr: Between 1-day above or below national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.
APEC – C	> 5% above national objective	Annual Mean: > 5% above national objective 24 hr: > 1-day more than national objective.	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

Table 3.6: Air Pollution Exposure Criteria

- 3.25 It should be noted that air quality is not well suited to the rigid application of a generic significance matrix to determine the overall significance of a development and individual receptor sensitivity should also be taken into account. Therefore, professional judgement

²⁰ London Councils. (2007) Air Quality and Planning Guidance, The London Air Pollution Planning and the Local Environment (APPLE) working group, London

should be employed throughout, and the assessment should take into account site specific considerations.

- 3.26 Both the impact and exposure criteria will be applied to the findings of this assessment, where required.

4 Baseline Conditions

Local Air Quality Management

- 4.1 The proposed development site falls within the jurisdiction of The London Borough of Hillingdon (LBH).
- 4.2 Under the Air Quality Strategy, there is a duty on all Local Authorities to consider the air quality within their boundaries and prepare reports as required.
- 4.3 In 2003 the current Air Quality Management Area (AQMA) was declared in Hillingdon following exceedance of objectives for NO₂ in 2003. The AQMA covers all parts of the borough south of the Chiltern-Marylebone Railway line.
- 4.4 Although the AQMA is based primarily upon consideration of concentrations of the pollutant NO₂, it was agreed that Hillingdon would continue to also monitor PM₁₀ and include it in any future modelling studies and in the development of the action plan.
- 4.5 The proposed development site falls within the declared AQMA. This is illustrated in **Figure 4.1** below.

Healey Development Solutions (Hayed) Limited , Stanford House, 9 Nestles Avenue, Hayes, London
Air Quality Assessment

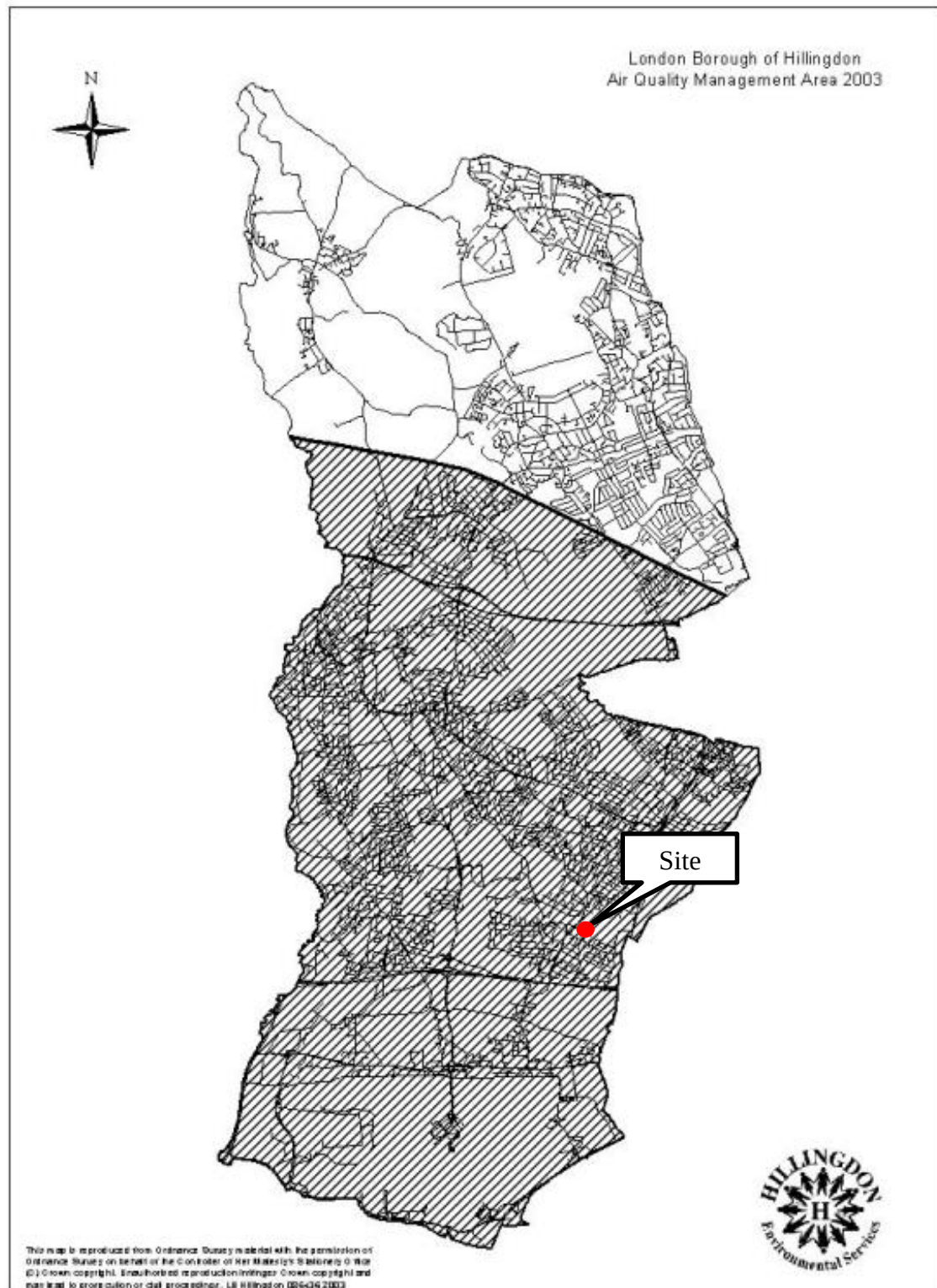


Figure 4.1: Site Location in Relation to the AQMA

- 4.6 An Action Plan, showing how Hillingdon Borough Council intend to tackle these problems was issued in 2004. The AQAP contains a series of 8 packages, each containing a number of measures, that address emissions from traffic, Heathrow Airport, industry, existing housing and new developments.
- 4.7 Progress reports have been issued annually since 2004. The latest report is the Air Quality Action Plan (AQAP) Progress Report 2017, mentions that the borough has made good progress on implementing its AQAP and that the majority of measures are either completed or defined as 'ongoing'.

Background

- 4.8 The Defra background mapping tool helps to establish the pollutant background concentration. Due to the site landing towards the middle of 2 x 1km grid squares we have calculated the average of the background concentration for the corresponding 2 x 1km grid square located in:
- X: 509500, Y: 179500
 - X: 510500, Y: 179500
- 4.9 The average NO_x, NO₂, PM₁₀, and PM_{2.5} background concentrations at these locations for 2017 are provided in **Table 4.1** below.

Pollutant	2017 (µg m ⁻³)
NO _x	50.93
NO ₂	31.24
PM ₁₀	16.59
PM _{2.5}	10.43

Table 4.1: Defra Annual Mean Background Concentrations

Automatic Monitoring

- 4.10 LBH released an Air Quality Annual Status Report in May 2018 which published 2017 data for the monitoring undertaken by the borough.
- 4.11 London Borough of Hillingdon undertook operational automatic monitoring at 11 sites in 2017. The monitoring locations closest to the proposed development is illustrated in **Figure 4.2** below.

Healey Development Solutions (Hayed) Limited , Stanford House, 9 Nestles Avenue, Hayes, London
Air Quality Assessment

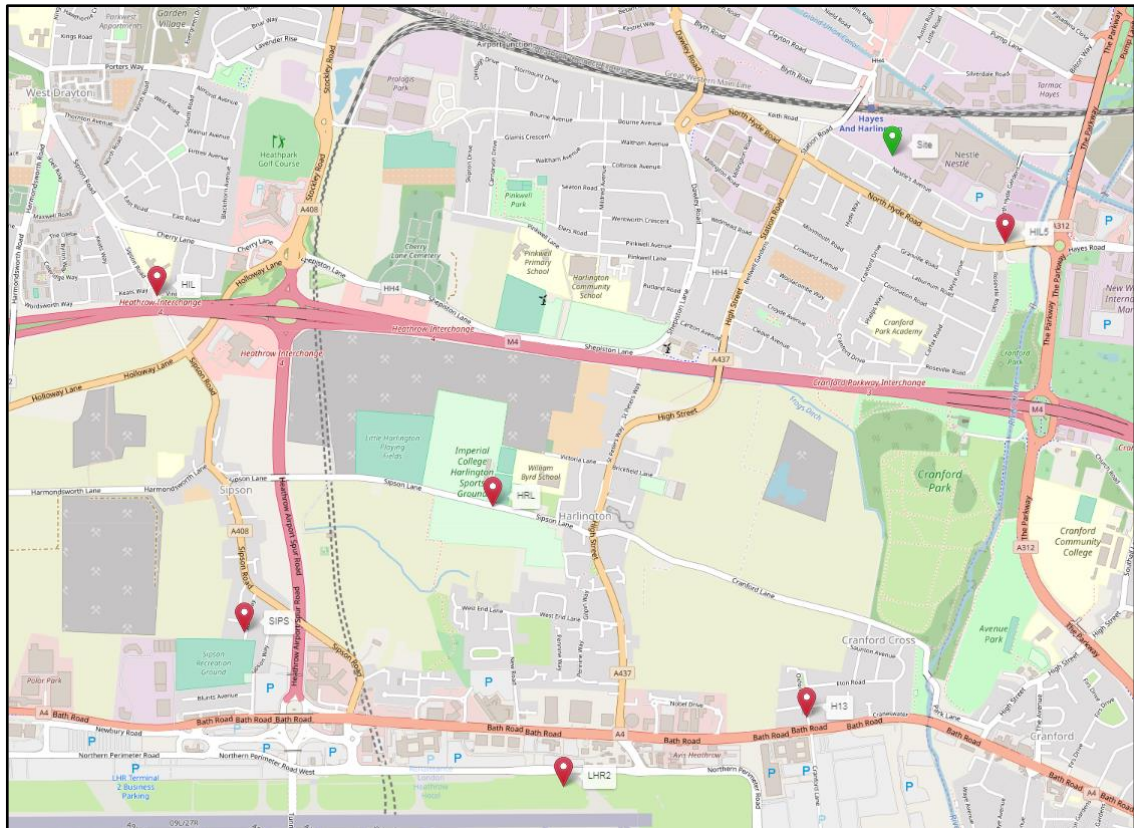


Figure 4.2: Closest automatic monitoring locations in relation to the site.

4.12 The most recent published results for all 11 automatic locations are set out in **Table 4.2** below.

Site	Location	Distance to kerb of nearest road (m)	Site Coordinates (X,Y)	Annual Mean Concentration PM ₁₀		Annual Mean Concentration NO ₂ (µg m ⁻³)	
				2016	2017	2016	2017*
LHR2	London Heathrow	N/A	508600; 176700	15	15	47.0	48
HIL	London Hillingdon	2.5m (30m to M4)	506951 178605	N/A	N/A	51.2	53 (47.2)
HI1	Hillingdon 1 - South Ruislip	2.5m	510857; 184917	22	17	42.9	46 (44.2)
HI3	Hillingdon 3 - Oxford Avenue	33m to A4 Bath Road (2m to Oxford Avenue)	509557; 176994	20	19	41.9	35 (41.8)
HRL	London Harlington	3m	508295 177800	15	15	34.0	32
SIPS	Hillingdon Sipson	2.5m	507325 177282	N/A	N/A	35.2	34
HIL1	London Harmondsworth	1m	505561 177661	23	23	27.0	27
HIL4	London Harmondsworth Osiris	13m	505671 177605	16	14		
T55	Heathrow Green Gates	N/A	505207 177072	14	13	34.4	32
T54	Heathrow Oaks	5m	505729 174496	15	14	31.0	26
HIL5	Hillingdon Hayes	1m	510303 178882	28	27	45.9	47 (41.5)

*Means (in brackets) were "corrected for relevant exposure" in accordance with LLAQM Technical Guidance.

Table 4.2: Automatic Annual Mean Monitored Concentrations

Non-Automatic Monitoring

- 4.13 London Borough of Hillingdon also undertakes non-automatic monitoring which have been carried out at several locations across the borough using diffusion tube monitoring of NO₂.
- 4.14 The closest, non-automatic monitoring locations to the proposed redevelopment site are illustrated in **Figure 4.3** below.

Healey Development Solutions (Hayed) Limited , Stanford House, 9 Nestles Avenue, Hayes, London
Air Quality Assessment

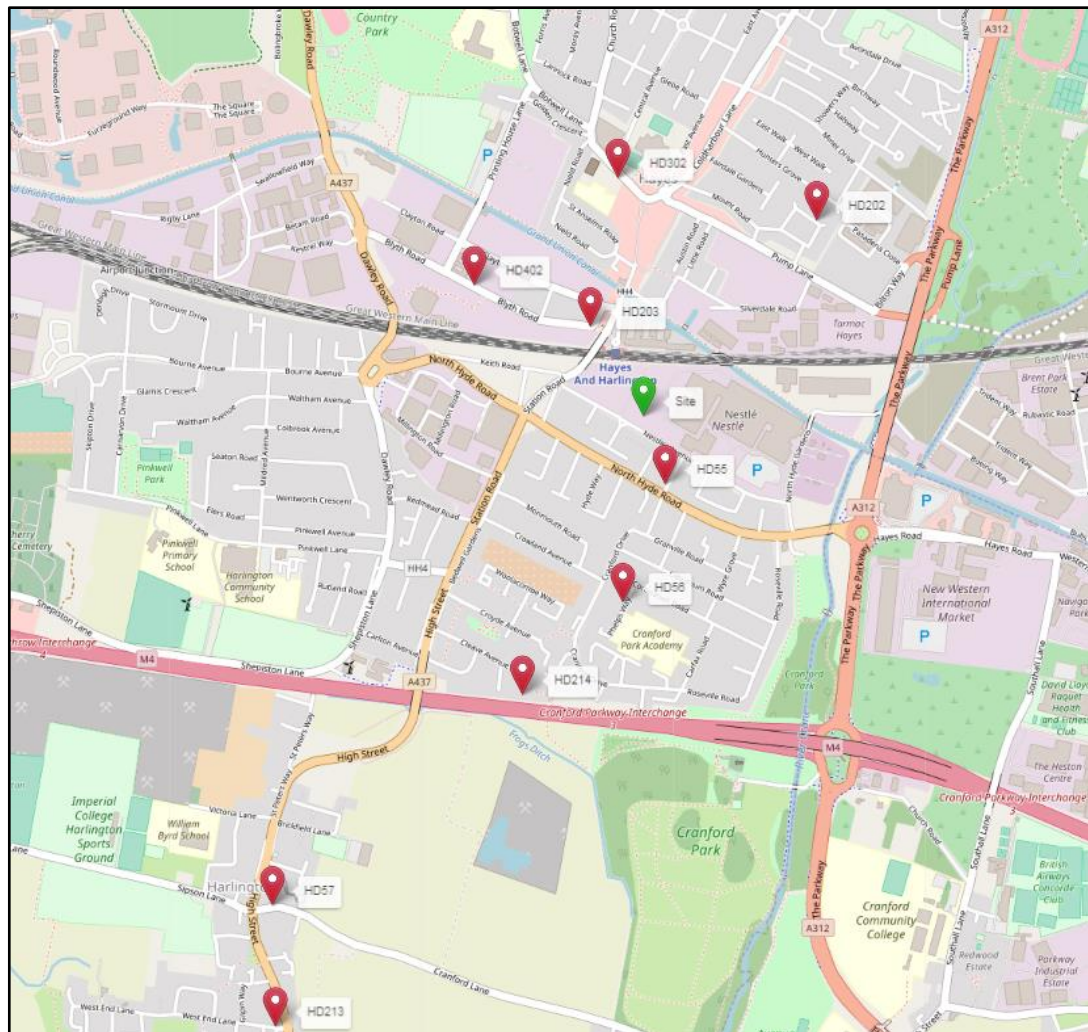


Figure 4.3: LBH Closest Non-Automatic Monitoring Locations 2017

4.15 The most recent published results for the closest monitoring locations are set out in **Table 4.3** below.

Site	Location	Distance to kerb of nearest road (m)	Site Coordinates (X,Y)	Annual Mean Concentration NO ₂ (µg m ⁻³)		
				2015	2016	2017
HD55	Harold Avenue (first lamp post on left)	30	509918 179015	35.7	34.7	43.3 (39.8)
HD56	15 Phelps Way Hayes (lamp post outside of)	1.5	509798 178654	31.4	32.1	33.4
HD57	25 Cranford Lane Harlington (lamp post on the left after car park)	1	508758 177718	35.6	35.5	33.4
HD202	49 Silverdale Gardens, Hayes Lamp Post (8)	14	510361 179820	26.7	26.1	32.7
HD203	Blyth Road, Hayes Lamp Post (4)	2	509683 179486	41.9	40.9	49.0 (44.3)
HD213	10 West End Lane, Harlington Lamp Post (2)	33	508773 177352	37.0	37.4	45.6 (57.6)
HD214	R/O 130 Cleave Avenue, Hayes Lamp Post (33)	27	509499 178370	43.7	42.1	51.5 (49.5)
HD302	Botwell House RC Primary School (Side-fence)	12	509755 179934	30.7	30.8	33.8
HD402	Blyth Road 2nd Tube, Hayes Lamp Post (17) (western most lamp post in front of 133 Enterprise House)	2	509328 179603	32.1	32.3	35.7

*Corrected to relevant exposure in accordance with LLAQM Technical Guidance

Table 4.3: Closest Non-Automatic Annual Mean Monitored Concentrations

4.16 The above **Tables 4.2 and 4.3** identify the latest published (2017) monitored data for the closest automatic and non-automatic monitoring locations. Most of the monitored locations are located at the kerb of main/major roads, and therefore not considered representative of the conditions likely to be experienced at the proposed development site, which is most closely comparable to a background location (over 100m from a major Road).

4.17 The closest monitoring locations, considered most representative of the conditions experienced at the proposed development site are HRL, SIPS (automatic), HD56, HD202 and HD302 (non-automatic) these monitoring locations all identify monitored NO₂ annual

mean concentrations for 2017 which are approximately > 5% below national objective (40 µg/m³).

- 4.18 In accordance with the exposure criteria in **Table 3.6**, the site would usually fall within APEC – A which states the following:

“No air quality grounds for refusal; however mitigation of any emissions should be considered.”

- 4.19 The requirement for any mitigation measures has been considered within section 6 of this AQA.

5 Evaluation of Potential Effects

- 5.1 The following section sets out the potential sources of air quality impact that could be applied to the proposed development site. It also assesses site suitability with regards to residential exposure.

Construction

Construction Dust

- 5.2 During the demolition and construction phases, there is the potential for emissions of dust to cause annoyance, nuisance and health effects to sensitive receptors, both human and ecological located close to the site.
- 5.3 The construction activities associated with the proposed development can be separated into four stages:
- Demolition
 - Earthworks;
 - Construction; and
 - Trackout.
- 5.4 There are a number of human receptors within 350m of the site boundary therefore a dust assessment has been undertaken in order to evaluate and minimise potential dust effects during the aforementioned four stages.
- 5.5 The construction dust assessment is included in **Appendix A**.

Construction Traffic and Plant

- 5.6 It is anticipated that, throughout the construction period, there will be a number of delivery vehicles, stationary plant and vehicles used by the construction workforce. These may potentially present an additional source of air pollutants in the vicinity of the proposed development site. Any likely pollutant impacts will be addressed by implementing Best Available Techniques (BAT) mitigation measures. Likely BAT are provided in Section 6.

Completed Development

Development Traffic

- 5.7 The Transport Assessment undertaken for the same application by i-Transport LLP compares the traffic attraction of the existing land use with the proposed in order to establish the net traffic attraction expected as a result of the proposed development. The net change in trip generation is demonstrated in **Table 5.1** below.

Land Use	AM Peak (8:00-9:00)	PM Peak (17:00-18:00)
Extant B1c/B2	13	11
Proposed Development	11	11
Net Impact	-2	-

Table 5.1: Net Change in Trip Generation.

- 5.8 Comparison of trips associated with the Extant B1c/B2 use and the proposed development indicates that the development proposals are estimated to result in a slight decrease in vehicular movement throughout the day, which is likely to result in an improvement to the local air quality.
- 5.9 Therefore, in line with the EPUK & IAQM (2017) criteria and the London's Sustainable Design and Construction – Supplementary Planning Guidance, it is not considered necessary to quantify traffic related impacts as a result of the operation of the proposed development.

Building Emissions

- 5.10 The Associated Energy Statement prepared for the proposed development by 'Mecserve', recommends the use of a CHP system (Sav 20kWe) with a spark ignition engine that achieves <100mgNO_x /Nm³ which translates to 0(Zero)mgNO_x/kWh, backed up by communal low NO_x boilers.
- 5.11 Therefore, the proposed building emissions are in accordance with the minimum standards/requirements outlined within the London's Sustainable Design and Construction – Supplementary Planning Guidance (<250mgNO_x/Nm³) and no further assessment of building emissions is considered to be required.
- 5.12 The technical specifications of the suggested CHP system are included in **Appendix B**.

6 Mitigation Measures

Construction

Construction Dust

- 6.1 A construction dust assessment has been completed for the proposed development in accordance with IAQM guidance and is presented in **Appendix A**. Within the assessment, site specific mitigation measures have been identified which ensure compliance with relevant standards.
- 6.2 The role of air quality monitoring within the package of mitigation measures that is proposed has also been considered since monitoring proposals are frequently incorporated into planning conditions
- 6.3 The mitigation measures outlined below, should make up part of a Construction Method Statement (CMS) that should be implemented to minimise the potential for adverse construction dust impacts throughout all the relevant construction stages.

Demolition:

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
- Bag and remove any biological debris or damp down such material before demolition; and
- 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 required.

Earthworks:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Avoid carrying out any earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water to control dust; and

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;

- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles arriving and leaving site are securely covered to prevent escape of materials during transport;
- Routinely clean public roads and any access routes using wet sweeping methods; and
- Avoid dry sweeping.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify the cause(s), take appropriate measures to reduce emissions in a timely manner and record all measures taken. Make the complaints log available to the Local Authority when requested;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (the last of which should be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless they are being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, so that there are no idling vehicles;

- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible;
- Avoid bonfires and the burning of waste materials; and
- Special provisions will apply for any materials containing asbestos. The safety method statement should outline the control measures necessary to minimise the risks to an acceptable level and all statutory notices will be placed with the Health and Safety Executive (HSE).

6.4 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

Dust Monitoring

6.5 The dust monitoring requirements are usually split in three categories as follows:

- **Negligible/Low risk** category sites- should not normally be necessary to undertake any quantitative air quality monitoring, although in some circumstances it may be applicable to undertake occasional surveys in the vicinity of the site boundary at least once on each working day.
- **Medium risk** category sites- should normally be adequate to undertake surveys of dust flux over the site boundary, and/or dust deposition/soiling rates around the site at nearby receptors, although this may have resource implications, and an approach based on continuous particulate matter monitoring may be preferred.
- **High risk** category sites- normally be necessary to supplement the monitoring for medium risk sites with monitoring of ambient PM concentrations. It is recommended that priority be assigned to the measurement of PM₁₀, as emissions of dust from construction sites are predominantly in the coarser fractions.

6.6 The proposed development site has been classified as having a low to medium risk of dust soiling.

6.7 Therefore, adequate dust monitoring should be undertaken during all the relevant stages of construction to ensure that:

- The construction activities do not give rise to any exceedances of the air quality objectives for PM₁₀ or PM_{2.5}.
- The agreed mitigation measures to control dust emissions are being applied and are effective.
- Any high levels of dust is attributed to specific activities on site to ensure that appropriate corrective measures take place.

- 6.8 The implementation of the specific mitigation measures given above within a CMS will ensure that any potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that, through the use of effective mitigation, the effects of dust from construction activity will normally not be considered significant.

Construction Traffic and Plant

- 6.9 As previously stated, there is potential for air pollutant impacts to arise from construction plant and vehicles associated with the scheme. However, the type and number of construction vehicles and plant have not yet been confirmed at this stage. Despite this, the following BAT should still be implemented during the construction phase.

- All vehicles should switch off engines when stationary, no idling vehicles;
- On-road vehicles to comply with the requirements of the Low Emission Zone and the London Non-Road Mobile Machinery (NRMM) standards, where applicable;
- All NRMM to use ultra low sulphur diesel (ULSD) where available;
- Minimise the movement of construction traffic around the site;
- Maximising efficiency (this may include alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing);
- Vehicles should be well maintained and kept in a high standard of working order;
- Avoid the use of diesel or petrol powered generators by using mains electricity or battery powered equipment where possible; and
- Locate plant away from boundaries close to residential areas.

Completed Development

Operational Traffic

- 6.10 The AQA has demonstrated that the predicted net traffic is likely to decrease as a result of the proposed development and therefore likely to result in an improvement to the air quality in the local area. Therefore, it is not anticipated that mitigation measures will be required.

Building Emissions

- 6.11 The Associated Energy/Sustainability Statement prepared for the proposed development recommends the use of a CHP system with NO_x emissions well within the London Plan SPG requirements (<250mgNO_x/Nm³). Therefore, it is not anticipated that mitigation measures will be required.
- 6.12 Compliance with relevant regulations and standards should be secured through planning conditions, where necessary.

7 Residual Effects and Conclusions

- 7.1 In 2003, an Air Quality Management Area (AQMA) was declared following exceedances of Nitrogen Dioxide (NO₂). The AQMA covers all parts of the borough south of the Chiltern-Marylebone Railway line.
- 7.2 A review of the monitoring sites within the borough has been undertaken. It was concluded that the nearest air quality monitoring site, considered most representative of the conditions experienced at the proposed development site identify monitored NO₂ annual mean concentrations for 2017 which are approximately > 5% below national objective (40 µg/m³).
- 7.3 In accordance with the exposure criteria in Table 3.6, the site would usually fall within APEC – A which states the following:
- “No air quality grounds for refusal; however mitigation of any emissions should be considered.”*
- 7.4 A construction dust assessment has been undertaken for the four stages of construction activities associated with the proposed development in accordance with IAQM and GLA guidance on the assessment of dust from demolition and construction (**Appendix A**).
- 7.5 Mitigation measures have been proposed for construction traffic and stationary plant associated with the proposed development.
- 7.6 Following the successful implementation of the suggested mitigation measures, the residual effects of construction dust and emissions from construction plant/vehicles upon the local area and sensitive receptors although adverse, will be temporary and considered to be ‘not significant’.
- 7.7 The predicted net traffic attraction indicates that the proposed development traffic is likely to decrease as a result of the proposed development and therefore likely to result in an improvement to the air quality in the local area.
- 7.8 The proposed CHP unit complies with the London’s Sustainable Design and Construction – Supplementary Planning Guidance. Compliance with relevant regulations and standards should be secured through planning conditions, where necessary.

Conclusion

- 7.9 The proposed development does not raise any significant or other residual adverse impacts on the health and/or quality of life for existing residential and commercial neighbours of the site as a result of any anticipated changes to air quality.
- 7.10 It is therefore concluded that the proposed development complies fully with air quality related national, regional and local planning policy and any mitigation can, if considered necessary, be enforced by means of appropriate planning conditions, consistent with paragraph 54 and 55 of the National Planning Policy Framework and the recommendations within the GLA's Sustainable Design and Construction SPD.

Appendix A
Construction Dust Assessment

CONSTRUCTION DUST ASSESSMENT

- A.1 The construction dust assessment has been completed in accordance with 2014 IAQM guidance and follows the procedures as outlined in Section 3 of this report.

Screen the Need for a Detailed Assessment

- A.2 The following screening criterion has been applied to the assessment: An assessment will normally be required where there is:

- a 'human receptor' within:
 - 350m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an 'ecological receptor' within:
 - 50m of the boundary of the site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

- A.3 There are a number of human receptors within 350m of the site boundary. Therefore, a dust assessment is required due to the proposed development location meeting some of the above criteria.

Assess the Risk of Dust Impacts

- A.4 The construction activities associated with the proposed development have been separated into four stages:

- Demolition
- Earthworks;
- Construction; and
- Trackout.

- A.5 The assessment of the risk of dust impacts has been completed in two stages:

- Determine the potential dust emission magnitude; and
- Determine the sensitivity of the area to dust impacts.

- A.6 The potential dust emission magnitude for all four of the construction stages have been determined to be either Small, Medium or Large according to the criteria presented in Table A1 below.

Construction Activity	Dust Emission Magnitude Scale		
	Small	Medium	Large
Demolition	Total building volume <20,000m ³ , construction material with low potential for dust release, demolition activities <10m above ground, works during wetter months.	Total building volume 20,000-50,000m ³ , potentially dusty construction material, demolition activities 10-20m above ground level.	Total building volume >50,000m ³ , potentially dusty material, on-site crushing and screening, activities >20m above ground level.
Earthworks	Total site area <2,500m ² , soil type with large grain size, <5 heavy earth moving vehicles active at one time, bunds <4m high, total material moved <20,000t, works during wetter months.	Total site area 2,500-10,000m ² , moderately dusty soil type, 5-10 heavy earth moving vehicles active at one time, bunds 4-8m high, total material moved 20,000-100,000t.	Total site area >10,000m ² , potentially dusty soil type, >10 heavy earth moving vehicles active at one time, bunds >8m high, total material moved >100,000t.
Construction	Total building volume <25,000m ³ , construction material with low potential for dust release.	Total building volume 25,000-100,000m ³ , potentially dusty construction material, on site concrete batching.	Total building volume >100,000m ³ , on site concrete batching, sandblasting.
Trackout	<10 HDV* outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50m.	10-50 HDV outward movements in any one day, moderately dusty surface material, unpaved road length 50-100m.	>50 HDV outward movements in any one day, potentially dusty surface material, unpaved road length >100m.
* HDV – Heavy Duty Vehicle (>3.5t), Note – In each case, not all the criteria need to be met, and that other criteria may be used if justified.			

Table A1: Dust Emission Magnitude Criteria

A.7 The completed assessment of Dust Emission Magnitude is shown in Table A2 below.

Construction Activity	Dust Emission Magnitude	Justification
Demolition	small	Estimated to have a total volume of <20,000m ³ .
Earthworks	Small	Estimated total site area <2,500m ²
Construction	Small	Estimated total building volume <25,000m ³ ,
Trackout	Medium	Estimated 10-50 HDV outward movements in any one day,

Table A2: Dust Emission Magnitude Assessment

A.8 Due to the scale of the proposed development the magnitude of dust emissions has been assessed as small.

A.9 The sensitivity of the area has been assessed in relation to a number of factors such as; the specific sensitivities of receptors in the area, the proximity and number of those receptors and in the case of PM₁₀, the local background concentration and by following the significance criteria in Tables A3, A4 and A5 below.

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

Table A3: Sensitivity of the Area to Dust Soiling Effects of People and Property

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32 µg m ⁻³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg m ⁻³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg m ⁻³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg m ⁻³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg m ⁻³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
		>10	Medium	Low	Low	Low	Low
	28-32 µg m ⁻³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
		>10	Low	Low	Low	Low	Low
	24-28 µg m ⁻³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
		>10	Low	Low	Low	Low	Low
	<24 µg m ⁻³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the Area to Human Health Impacts

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

Table A5: Sensitivity of the Area to Ecological Impacts

A.10 In addition to Tables A3, A4 and A5 any site-specific factors have been taken into account when defining the sensitivity of the area:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors; and
- the duration of the potential impact, as a receptor may become more sensitive over time.

A.11 The completed assessment of Sensitivity of the Area in **Table A6** below.

Receptor Sensitivity	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecological	Low	Low	Low	Low

Table A6: Sensitivity of the Surrounding Area Assessment.

A.12 The sensitivity of the area to dust and soiling effects on people and property has been considered High due to the risk of some receptors located in close proximity to the proposed site. The human health sensitivity of the area was considered Low due to the low PM₁₀ background concentrations in the local area (16.59µgm³), there are no ecological sites within 50m of the proposed site, therefore ecological sensitivity has been assessed as Low.

A.13 The completed pre-mitigation impact risk assessment incorporating the sensitivity of the area and the dust emissions magnitude for the construction activities are shown in **Table A7** below.

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Low	Low	Medium
Human Health	Negligible	Negligible	Negligible	Low
Ecological	Negligible	Negligible	Negligible	Low

Table A7: Summary of Dust Risk (pre-mitigation)

- A.14 Table A7 has been determined using a combination of the dust emission magnitude (Table A2) and the sensitivity of the area (Table A6) and following IAQM guidance procedures.
- A.15 As a result, the pre-mitigation risk of dust soiling has been assessed as Medium Risk for Demolition and Trackout but assessed as Low for Earthworks and Construction. The human health risk was considered Low or Negligible, and the ecological sensitivity has been assessed as Negligible.

Site-specific Mitigation

- A.16 From the identification of the risk of impacts with no mitigation applied in Table A7, it is possible to determine the specific mitigation measures that can be applied in relation to the level of risk associated with the construction activity.
- A.17 Additionally, the role of air quality monitoring within the package of mitigation measures that is proposed needs to be considered since monitoring proposals are frequently incorporated into planning conditions.
- A.18 The mitigation measures described below are suggested as measures that should be included in a site-specific Construction Method Statement (CMS).

Demolition:

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
- Bag and remove any biological debris or damp down such material before demolition; and
- 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 required.

Earthworks:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Avoid carrying out any earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water to control dust.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;

- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles arriving and leaving site are securely covered to prevent escape of materials during transport;
- Routinely clean public roads and any access routes using wet sweeping methods; and
- Avoid dry sweeping.

General Mitigation Measures- Applicable to all stages:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify the cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when requested;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (the last of which should be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;

- Remove materials that have a potential to produce dust as soon as possible, unless they are being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, so that there are no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible;
- Avoid bonfires and the burning of waste materials; and
- Special provisions will apply for any materials containing asbestos. The safety method statement should outline the control measures necessary to minimise the risks to an acceptable level and all statutory notices will be placed with the Health and Safety Executive (HSE).

A.19 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

Dust Monitoring

A.20 The dust monitoring requirements are usually split in three categories as follows:

- **Negligible/Low risk** category sites- should not normally be necessary to undertake any quantitative air quality monitoring, although in some circumstances it may be applicable to undertake occasional surveys in the vicinity of the site boundary at least once on each working day.
- **Medium risk** category sites- should normally be adequate to undertake surveys of dust flux over the site boundary, and/or dust deposition/soiling rates around the site at nearby receptors, although this may have resource implications, and an approach based on continuous particulate matter monitoring may be preferred.
- **High risk** category sites- normally be necessary to supplement the monitoring for medium risk sites with monitoring of ambient PM concentrations. It is recommended that priority be assigned to the measurement of PM₁₀, as emissions of dust from construction sites are predominantly in the coarser fractions.

A.21 The proposed development site has been classified as having a low to medium risk of dust soiling.

- A.22 Therefore, adequate dust monitoring should be undertaken during all the relevant stages of construction to ensure that:
- The construction activities do not give rise to any exceedances of the air quality objectives for PM₁₀ or PM_{2.5}.
 - The agreed mitigation measures to control dust emissions are being applied and are effective.
 - Any high levels of dust is attributed to specific activities on site to ensure that appropriate corrective measures take place.
- A.23 The implementation of the specific mitigation measures given above within the CMS will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will normally be considered 'not significant'.

Determine Significant Effects

- A.24 Prior to the implementation of any mitigation measures the highest significance of adverse effects was medium risk for dust soiling and low risk for human health, with dust emissions magnitude considered to be small to medium.
- A.25 The mitigation measures listed above have been chosen due to their suitability to the site and to reduce the risk of adverse effects from the four stages of construction.
- A.26 Through the implementation of site-specific mitigation measures (listed above), which are designed to mitigate potential dust impacts, will ensure that potential significant adverse dust effects will not occur, and the residual effect will normally be 'not significant'. Appropriate mitigation measures should be secured by planning condition where necessary.

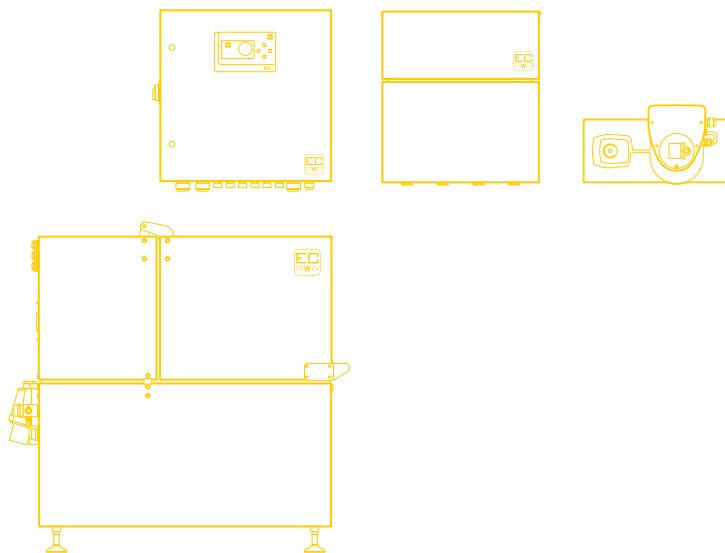
Conclusions of Construction Dust Assessment

- A.27 The completion of the construction dust assessment has shown that the residual effect of the proposed development in the context of construction dust emissions will be 'not significant'. This conclusion has been made based on the assumption that the suggested mitigation measures will be implemented (secured by planning condition) and is relevant for all sensitive receptors within 350m of the site.
- A.28 It should be noted that even with a rigorous CMS in place, it is not possible to guarantee that all mitigation measures will be effective at all times. If there is an interruption in the water supply used for dust suppression or adverse weather conditions are experienced that exacerbate dust emissions, the receptors may experience occasional, short term dust annoyance.

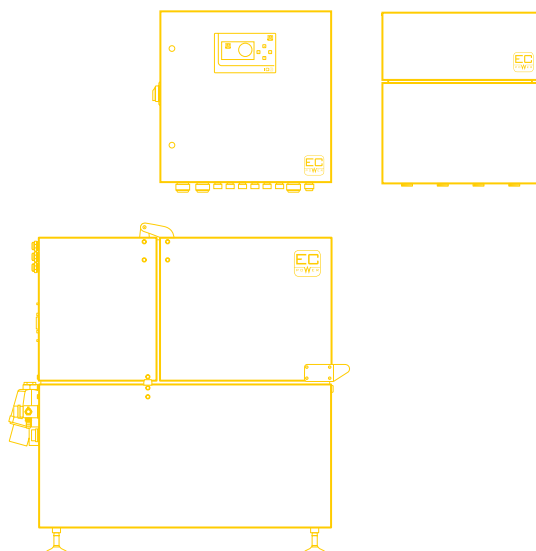
A.29 However, the likely scale of this would not normally be considered sufficient to change the conclusion of this assessment. It is therefore important to consider all mitigation measures and provide a frequent review and assessment procedure at each stage, to ensure that mitigation measures continue to provide the maximum attenuation level possible.

Appendix B
Indicative CHB Specifications

A+++



A++



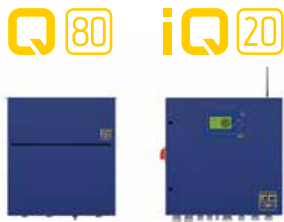
XRGI[®] 20

TECHNICAL DATA



TECHNICAL DATA FOR THE XRGi® 20

Product data sheet in accordance with Regulation (EU) No. 811/2013, Dated 26.09.2015



A++



The XRGi® is a combined heat and power plant (CHP) that works on the principle of cogeneration.

An XRGi® system consists of three main components – the Power Unit, Q-Heat Distributor and the iQ-Control Panel. In a package with a Flow Master (temperature controll, class II = 2 %) the XRGi® is rated as seasonal space heating energy efficiency class A+++.

In addition, you can also extend your XRGi® system with a storage tank with a capacity of 500, 800 or 1,000 litres for optimum operation.

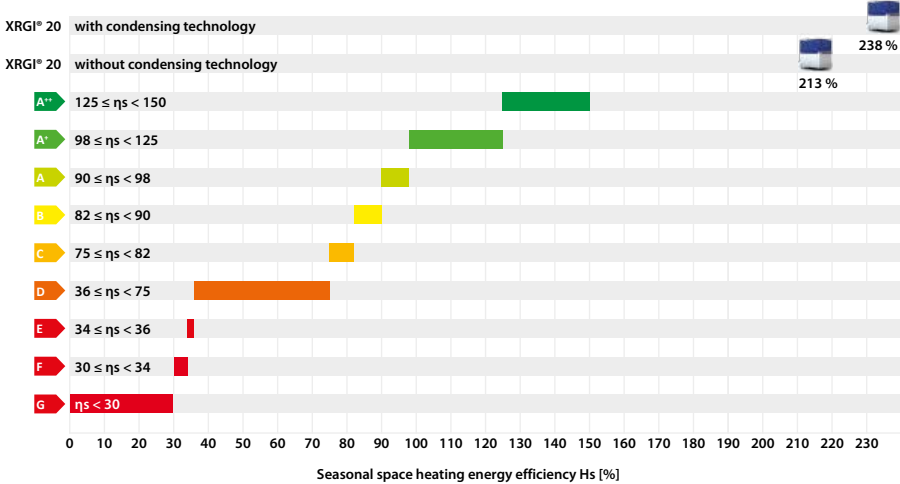
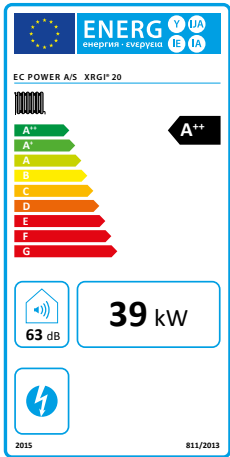
ORDERING DATA

Supplier's name or trademark	EC POWER	
Supplier's model identifier	XRGi® 20 without condensing technology¹	XRGi® 20 with condensing technology¹
Article number	X200001	X200001+01KIT2616
Modules	Power Unit, iQ20-Control Panel, Q80-Heat Distributor	Power Unit, iQ20-Control Panel, Q80-Heat Distributor + Condensing and exhaust gas heat exchanger kit

ErP-LABEL DATA²

Seasonal space heating energy efficiency class	A++	A++
Rated heat output P_{rated}	39 kW	42 kW
Seasonal space heating energy efficiency; H _s η_s	213 %	238 %
Sound power level, indoors L_{WA}	63 dB	63 dB
Electrical efficiency; in accordance with heating value Hi η_{el} CHP100+SUP 0	33 %	33 %
All special precautions to be taken during assembly, installation or service	Refer to Commissioning and Service Manual	Refer to Commissioning and Service Manual

¹ Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
² The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013.



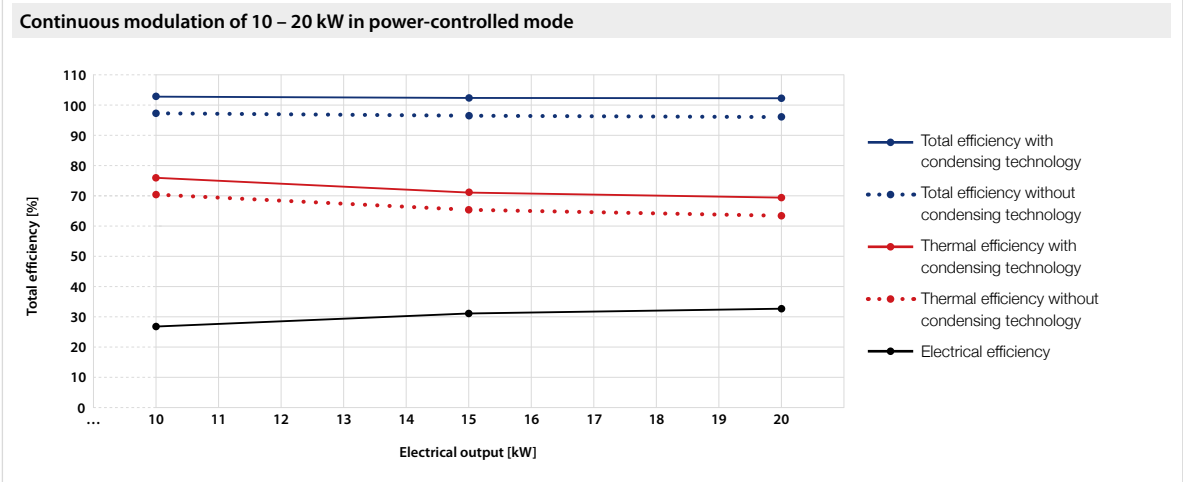
OUTPUT

XRGI® system		XRGI® 20 without condensing technology ¹			XRGI® 20 with condensing technology ¹		
Power modulation*		50 %	75 %	100 %	50 %	75 %	100 %
Electrical output, modulating*	kW	10.0	15.0	20.0	10.0	15.0	20.0
Thermal output, modulating*	kW	26.1	31.4	38.7	28.1	34.2	42.2
Power consumption, gas in accordance with Hi	kW	37.1	48.1	61.1	37.0	48.0	60.8
Electrical own demand, production	kW	0.078	0.078	0.078	0.083	0.082	0.081
Electrical own demand, stand-by	kW	0.025			0.025		

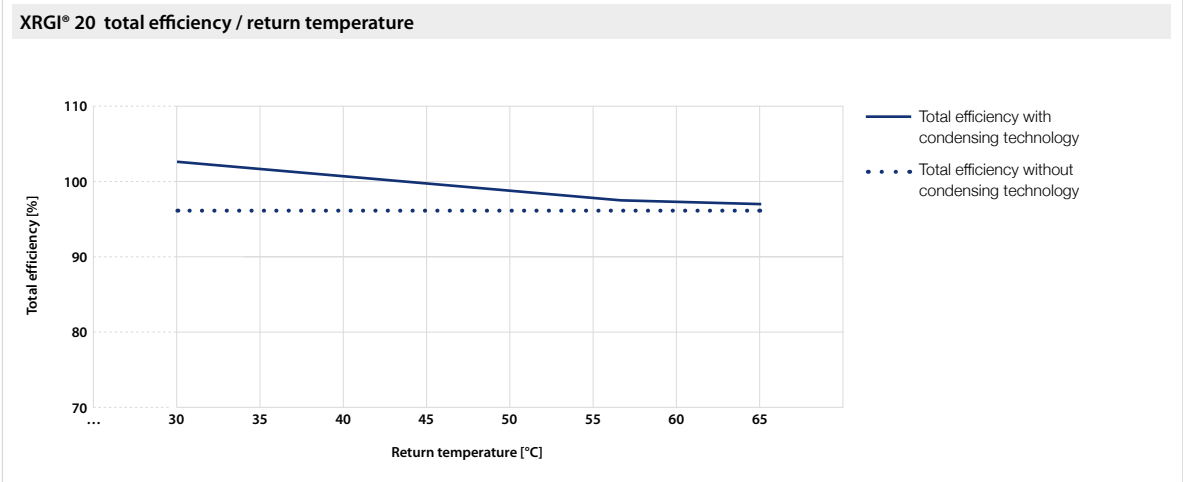
EFFICIENCIES
& OPERATING
PARAMETERS

Power modulation*		50 %	75 %	100 %	50 %	75 %	100 %
Electrical efficiency in accordance with Hi	%	26.9	31.1	32.7	26.9	31.2	32.9
Thermal efficiency in accordance with Hi	%	70.4	65.4	63.4	76.0	71.2	69.4
Total efficiency in accordance with Hi	%	97.3	96.5	96.1	102.9	102.4	102.3
Seasonal space heating energy efficiency in operating mode ^{2,3}	η_{son} %	217			242		

POWER
MODULATION



TOTAL
EFFICIENCY AT
FULL LOAD



* Continuous modulation in power-controlled mode
¹ Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
² Based on the values measured by the Danish Gas technology Center and accredited independent third-party organisations.
³ Efficiency at rated heat output as per the delegated Commission Regulation (EU) No. 811/2013

HYDRAULIC
INTEGRATION

Principle circuit diagram: Series circuit with injection – boiler with header

A+++

iq-CONTROL PANEL

Q-HEAT DISTRIBUTOR

XRGI® POWER UNIT

STORAGE CONTROL

Q-HEAT DISTRIBUTOR

STORAGE TANK

FLOW MASTER CONTROL

FLOW MASTER

CONDENSING AND EXHAUST GAS HEAT EXCHANGER

HEADER

BOILER

WH

DW

Ts

Tf

Tb

Tr

T

T-At

Please refer to the boiler manufacturer's specification!

More principle circuit diagrams and information can be found in the EC POWER „Hydraulic Solutions“.

NOTE:
If products from other companies are used in the system in addition to EC Power products, EC POWER assumes no liability for the accuracy of the energy efficiency class calculation for the entire system.

XRGI® system		XRGI® 20 without condensing technology¹	XRGI® 20 with condensing technology¹
Flow temperature, constant	°C	~ 85	~ 85
Return temperature, variable	°C	5-75	5-75

FUELS

Natural gas (all qualities), propane, butane	yes	yes
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EXHAUST GAS

Power modulation		50 %	75 %	100 %	50 %	75 %	100 %	
Max. exhaust gas temperature		°C	-	-	120	-	-	90
Condensate		kg/h	-	-	-	3.1	3.5	3.7
Emissions (test data)	CO < 50	mg/Nm³	-	-	15	-	-	26
	NOx < 100	mg/Nm³	-	-	18	-	-	10

SOUND

Sound pressure level at a distance of up to 1 m (based on surroundings)	dB(A)	49
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POWER
CONNECTION

Voltage, 3 phases + N + Earth	V	400
Frequency	Hz	50

SERVICE

Service interval (operating hours)	Hours	6,000
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DIMENSIONS
AND WEIGHT

		XRGI® 20 Power Unit	Q80-Heat Distributor	iQ20-Control Panel
Dimensions, W x H x D	mm	750 x 1,170 x 1,250	550 x 600 x 295	600 x 600 x 210
Footprint	m²	0.93	wall mounted	wall mounted
Weight	kg	750	44	40

All values are net and have been certified by an independent inspection body. Tolerance ±5 %.

Specifications subject to change without notice.

TECHNICAL DATA FOR THE XRGI® 20 WITH FLOW MASTER

(Temperature control, Class II = 2 %)

Product data sheet in accordance with Regulation (EU) No. 811/2013, Dated 26.09.2015



Q80 iQ20 FM

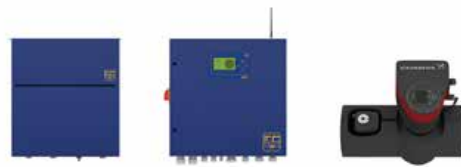


Figure shows FM type 350

A+++



The Flow Master including Flow Master Control regulates the supply of heat from the XRGI® and from the storage tank to the consumer network. This technology enables a significantly higher heat output to be temporarily made available to the consumer side. This allows peaks of heat demand to be handled by the XRGI®, thereby extending its service life and increasing electricity production.

The 4 models can deliver a heat output of 50, 150, 250 or 350 at a ΔT of 20 K.

ORDERING DATA

Supplier's name or trademark	EC POWER			
Supplier's model identifier	XRGI® 20 without condensing technology¹		XRGI® 20 with condensing technology¹	
Article number	X200001		X200001+01KIT2616	
Modules	Power Unit, iQ20-Control Panel, Q80-Heat Distributor		Power Unit, iQ20-Control Panel, Q80-Heat Distributor + Condensing and exhaust gas heat exchanger kit	
Supplier's model identifier	Flow Master including Flow Master Control			
FM-type (Temperature control, Class II = 2 %)	FM 50	FM 150	FM 250	FM 350
Article number	17D1130	17D1131	17D1132	17D1133

ErP-LABEL DATA²

Seasonal space heating energy efficiency class of package	A+++	A+++
Seasonal space heating energy efficiency of package	215 %	240 %

¹ Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
² The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013.

Seasonal space heating energy efficiency of the space heater with cogeneration	1	213 %
Temperature control	Class I = 1 %, Class II = 2 %, Class III = 1,5 %, Class IV = 2 %, Class V = 3 %, Class VI = 4 %, Class VII = 3,5 %, Class VIII = 5 % ,	2
From fiche of temperature control		2 %
Supplementary boiler	Seasonal space heating energy efficiency in %	
From fiche of boiler	('I') x 'II' =	3 %
Solar contribution (From fiche of solar device)	Collector size (in m²) Tank volume (in m³) Collector efficiency (in %) Tank rating A* = 0,95, A = 0,91, B = 0,86, C = 0,83, D-G = 0,81	4
('III' x + 'IV' x) x 0,7 x (/ 100) x =		5 %
Seasonal space heating energy efficiency of package		215 %
Seasonal space heating energy efficiency class of package	G F E D C B A A+ A++ A+++	X
< 30 % ≥ 30 % ≥ 34 % ≥ 36 % ≥ 75 % ≥ 82 % ≥ 90 % ≥ 98 % ≥ 125 % ≥ 150 %		

The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as this efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.



XRGI[®] 20

TECHNICAL DATA

