

MILLER GOODALL
ACOUSTICS AND AIR QUALITY

AIR QUALITY ASSESSMENT

on behalf of

VISION DEVELOPMENTS ONE LTD

for

44-48 BRIDGE STREET, MANCHESTER

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Summary

This air quality report is submitted in support of a planning application for a commercial development at 44-48 Bridge Street, Manchester.

The assessment considered whether dust associated with construction of the proposed development could significantly change air quality during the construction phase. With the implementation of mitigation measures the dust impacts from the construction are considered to be not significant, in accordance with IAQM guidance.

A simple air quality assessment has also been undertaken to determine the impact of road traffic associated with the proposed development on local air quality. The assessment concludes that the effect of road traffic associated with the development will be insignificant.

Baseline information including local authority monitoring and background concentrations in the vicinity of the site has been collected. The development does lie within an Air Quality Management Area (AQMA) and future occupants of the development may, therefore, be exposed to poor air quality. However, the final use of the building indicates that the exposure of relevant receptors to breaches of air quality objectives is unlikely.

There is no reason, therefore, for this application to be refused on the ground of air quality.

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Contents

Summary **1**
Contents **2**
1 Introduction **3**
2 Site Description **3**
3 Proposed Development **3**
4 The Need for an Air Quality Assessment **3**
5 Policy Context **4**
5.1 The Air Quality Strategy 4
5.2 National Planning Policy Framework 6
5.3 Local Planning Policy 7
6 Data Collection **7**
7 Baseline Air Quality **8**
7.1 Local Air Quality Management 8
7.2 Air Quality Monitoring 9
7.3 Background Concentrations 9
8 Discussion of the Impact of Existing Local Air Quality on the Development **10**
9 Impact of the Development on Air Quality **10**
10 Dust Risk Assessment Methodology **11**
11 Dust Impact Assessment **15**
11.1 Step 1 – The Need for a Detailed Assessment 15
11.2 Step 2 – Assess the Risk of Dust Impacts 15
11.3 Step 3 – Site-Specific Mitigation 18
11.4 Step 4 – Determine Significant Effects 20
12 Summary of Impacts and Conclusion **20**
APPENDICES **21**
Appendix A: The Need for an Air Quality Assessment **23**
Appendix B: Planning Practice Guidance **25**
Glossary of Terms **27**

1 Introduction

1.1 This air quality report is submitted in support of an outline planning application for a proposed residential development of an eight storey building with ground floor commercial uses and offices above along with associated car parking at 44-48 Bridge Street, Manchester. The site lies within the administrative boundary of Manchester City Council (MCC).

1.2 The report provides a review of the existing air quality in proximity to the proposed development site and assesses the potential impact of the proposed development on local air quality, in accordance with Local Air Quality Management Technical Guidance[1].

1.3 Air pollution in urban areas is generally dominated by emissions from road vehicles. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed.

1.4 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO_2) and fine particulates – normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM_{10}), since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and in congested areas. This assessment has therefore focused on the impact of the proposed development on concentrations of NO_2 and PM_{10}.

2 Site Description

2.1 The site is located within the centre of Manchester within the main commercial district. The site is currently used for surface car parking and provide 30 spaces. The site location is shown in plan ref PL(00)001.

3 Proposed Development

3.1 The proposed development comprises the erection of an eight storey building. There will be 619 sqm of commercial space at ground floor and 4055 sqm of offices above. 18 car park spaces will be provided within the basement of the building giving a decrease of 12 car parking spaces on the existing use.

4 The Need for an Air Quality Assessment

4.1 IAQM guidance[2] outlines the need for an air quality assessment based on a two-stage approach, full details of which can be found in **Appendix A**.

- The first stage is intended to screen out smaller development and/or developments where impacts can be considered to have insignificant effects. Stage 1 requires any criteria under (A) coupled with any criteria under (B) to apply before it is considered appropriate to proceed to Stage 2. If none of the criteria are met

[1] Department for the Environment Food and Rural Affairs (2016) '*Local Air Quality Management Technical Guidance Document LAQM.TG (16)*', London: Defra.

[2] IAQM "Land-Use Planning & Development Control: Planning for Air Quality" May 2015

then there should be no requirement to carry out an air quality assessment and the impacts can be considered to have insignificant effects.

- The second stage relates to specific details regarding the proposed development and the likelihood of air quality impacts.

4.2 The development introduces more than 1000 m^2 of floor space and has more than 10 car parking spaces therefore it is appropriate to proceed to Stage 2. The development site is located within an AQMA and traffic associated with the development will pass through an AQMA. However, the development only includes 18 car parking spaces, and actually results in a decrease of car parking across the site of 12 spaces.

4.3 An air quality review has been carried out to confirm that the development will not impact on local air quality and that poor air quality will not impact on future residents. As the development is in close proximity to other buildings an assessment of the impacts of dust associated with demolition and construction activities is required and has been completed.

5 Policy Context

5.1 The Air Quality Strategy

5.1.1 European Union (EU) legislation forms the basis for current UK air quality policy. The EU Air Quality Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management came into force in September 1996[3]. This is a framework for tackling air quality through European-wide air quality limit values in a series of daughter directives, prescribing how air quality should be assessed and managed by the Member States. Directive 96/62/EC and the first three daughter objectives were combined to form the new EU Directive 2008/50/EC[4] on Ambient Air Quality and Cleaner Air for Europe, which came into force June 2008.

5.1.2 The Environment Act 1995 required the preparation of a national Air Quality Strategy (AQS) which set air quality standards and objectives for specified pollutants. The Act also outlined measures to be taken by local planning authorities (LPAs) in relation to meeting these standards and objectives (the Local Air Quality Management (LAQM) system).

5.1.3 The UK AQS was originally adopted in 1997 and has been reviewed and updated since then to take account of changing EU Legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued in 2000 as the AQS for England, Scotland, Wales and Northern Ireland. This was subsequently amended in 2003 and was last updated in July 2007[5].

[3] European Parliament (1996) Council Directive 96/62/EC on Ambient Air Quality Assessment and Management.

[4] European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe.

[5] Department for Environment, Food and Rural Affairs (DEFRA) (2007) 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland'

5.1.4 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.

5.1.5 The current air quality standards and objectives (for the purpose of LAQM) are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health. Pollutant objectives, however, incorporate target dates and averaging periods which take into account economic considerations, practicability and technical feasibility.

Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management

Pollutant	Air Quality Objective		To be Achieved by
	Concentration	Measured As*	
Benzene	5 µg/m^3	Annual mean	31/12/2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31/12/2003
Carbon monoxide	10 mg/m^3	Maximum daily running 8-hour mean	31/12/2003
Lead	0.25 µg/m^3	Annual mean	31/12/2008
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 per year	31/12/2004
	40 µg/m^3	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25 µg/m^3	Annual mean (target)	2020
	15% cut in annual mean (urban background exposure)		2010-2020
Sulphur Dioxide (SO_2)	350 µg/m^3	1-hour mean not to be exceeded more than 24 times a year	31/12/2004
	125 µg/m^3	24-hour mean not to be exceeded more than 3 times a year	31/12/2004
	266 µg/m^3	15-minute mean not to be exceeded more than 35 times a year	31/12/2005

Note:*how the objectives are to be measured is set out in the UK Air Quality (England) Regulations (2000).

5.1.6 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as Air Quality Management Areas (AQMAs) and take action to work towards meeting the objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

5.1.7 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

5.2 National Planning Policy Framework

5.2.1 National planning policy is now set by the National Planning Policy Framework (NPPF). The NPPF places a general presumption in favour of sustainable development, stressing the importance of local development plans. One of its 12 Core Planning Principles states that planning should:

"contribute to conserving and enhancing the natural environment and reducing pollution", by (paragraph 109) "preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".

5.2.2 It goes on to state (paragraphs 120 and 124) that:

"To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account.

Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with local air quality action plans".

5.2.3 Planning Practice Guidance (PPG) for the NPPF has been issued in respect of Air Quality[6]. It explains that 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 an 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). The steps a local planning authority might take in considering air quality are shown in **Appendix B**.

5.2.4 When deciding whether air quality is relevant to a planning application, considerations could include whether the development would:

- Significantly affect traffic in the immediate vicinity of the proposed development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;

[6] http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/

- Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area;
- Expose people to existing sources of air pollutants, for example by building new homes, workplaces or other development in places with poor air quality;
- Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations; and
- Affect biodiversity.

5.2.5 The PPG goes on to state that where there are concerns about air quality, the local planning authority may want to know about:

- The 'baseline' local air quality;
- Whether the proposed development could significantly change air quality during the construction and operational phases; and/or
- Whether there is likely to be a significant increase in the number of people exposed to a problem with air quality, such as when new residential properties are proposed in an area known to experience poor air quality.

5.2.6 The PPG advises that air quality assessments should be proportionate to the nature and scale of development proposed and the level of concern about air quality, and because of this are likely to be location specific and should be agreed between the local planning authority and applicant before it is commissioned.

5.3 Local Planning Policy

5.3.1 Policy EN 16 of Manchester's Local Development Framework Core Strategy states:

"The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant. When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

6 Data Collection

6.1 The air quality assessment of the proposed development was undertaken with reference to information from a number of sources, as detailed in **Table 2**.

Table 2: Key Information Sources

Data Source	Reference
Greater Manchester Combined Authority (GMCA)	Greater Manchester Combined Authority, (GMCA) (2016) 2016 Air Quality Annual Status Report (ASR) for Greater Manchester
Greater Manchester Combined Authority (GMCA)	GMCA 2015 Air Quality Screening and Updating Assessment
Department for Environment Food and Rural Affairs (Defra)	Defra (2016) *Local Air Quality Management Technical Guidance TG(16)*
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (May 2015) *Land Use Planning and Development Control: Planning for Air Quality*
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps
Institute of Air Quality Management (IAQM)	IAQM (2014) *Assessment of Dust from Demolition and Construction*

7 Baseline Air Quality

7.1 Local Air Quality Management

7.1.1 There are several locations along major roads within the administrative area of MCC where air quality does not meet the national objectives that aim to protect people's health and the environment. MCC has published a series of air quality Review and Assessment documents in accordance with the local air quality management (LAQM) process. Since 2012 the Greater Manchester Combined Authority (GMCA) has published joint reports for its ten constituent authorities. The 2015 Greater Manchester Annual Status Report concluded that long term trends show an improvement across Greater Manchester, however, there are areas that still remain above the annual air quality objective for NO_2.

7.1.2 The first Air Quality Management Area (AQMA) was declared in 1999, following further work it was re-defined in 2005 for exceedences of the annual mean nitrogen dioxide. Further refinements occurred in 2016. The current AQMA covers the areas surrounding the M60 motorway, as well main arterial routes into and out of the city centre and most of the city centre. The development lies within the city centre part of the AQMA.

7.2 Air Quality Monitoring

Nitrogen Dioxide (NO_2)

7.2.1 MCC undertake diffusion tube monitoring of NO_2 across its authority. There are no diffusion tubes located close to the development site. The nearest tubes (70, 77. 12 and 24) are located more than 400 m away from the site and are, therefore, not representative of exposure at the site.

7.2.2 MCC also undertake continuous monitoring of NO_2. However, the nearest automatic monitoring site lies approximately 700 m away from the development site at Piccadilly Gardens. This is an urban background site and is, therefore, unrepresentative of the study area.

Particulate Matter (PM_{10})

7.2.3 MCC undertakes continuous monitoring of PM_{10}, however, the nearest monitor is located on Picadilly Gardens, approximately 700 m from the development site and is, therefore, unrepresentative of site conditions. However, results from the station for the period 2011 to 2015 lie below 21µg/m^3.

7.3 Background Concentrations

7.3.1 There are no background monitoring locations in the vicinity of the proposed development site. Background concentrations of NO_2 and PM_{10} were, therefore, obtained from the background concentration maps provided by Defra for the grid squares covering the proposed development and receptor locations[7]. These are shown in **Table 3** below.

Table 3: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site and Receptor Locations*

Grid Square	Pollutant	2017 (µg/m^3)	2018 (µg/m^3)
383500,398500	NO_2	31.2	29.9
	PM_{10}	16.6	16.4

** Background concentrations obtained from the latest 2013 based background maps*

7.3.2 **Table 3** indicates that all background concentrations within the grid squares in which the site is located are below the respective annual mean air quality objectives for both NO_2 and PM_{10} .This is based on an average taken over a 1 km by 1 km square and so there will be areas within the grid square where pollution levels are higher, for example at kerbside locations.

[7] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013

8 Discussion of the Impact of Existing Local Air Quality on the Development

8.1 Air pollution in areas such as Manchester is generally dominated by emissions from road vehicles. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed.

8.2 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO_2) and fine particulates – normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM_{10}), since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and in congested areas. This assessment has therefore focused on the impact of existing levels of NO_2 and PM_{10} on the development.

8.3 The site does lie within the current AQMA which was declared in the basis of annual average levels of nitrogen dioxide.

8.4 Guidance issued by Defra[1] provide examples of where the air quality objectives should apply (Box 1.1). It advises that annual mean objectives should not apply at the building facades of offices or other places of work where members of the public do not have regular access or any other locations where exposure is expected to be short term. It does not, therefore, apply to the facades of the offices within this development, nor the retail units at ground floor.

8.5 There is a short term objective for NO_2 of 200 µg/m^3 1-hour mean not to be exceeded more than 18 times per year. One automatic monitoring site within MCC (Manchester Oxford Road) had more than 18 occurrences of the hourly NO_2 objective (total of 60 occurrences) in 2015. However, this site is not representative of Bridge Street in terms of the amount of vehicle movements along it and it is highly unlikely that Bridge Street would be exceeding the short term objective for NO_2.

8.6 There is are also annual and short term objectives for PM_{10}. However, there are currently no AQMA's declared within MCC on the basis of breaches of these objectives and so PM_{10} exposure is assumed to be acceptable.

9 Impact of the Development on Air Quality

9.1 As previously discussed, the development will have only 18 car parking spaces and so is very unlikely to introduce a change of light duty vehicle flows of more than 100 AADT or a change of heavy duty vehicle flows of more than 25 AADT on local roads with relevant receptors, particularly since the development provides a net decrease in car parking associated with the site.

10 Dust Risk Assessment Methodology

10.1 The following section outlines criteria developed by the IAQM for the assessment of air quality impacts arising from construction and demolition activities[8]. The assessment procedure is divided into four steps and is summarised below:

Step 1: Screen the Need for a Detailed Assessment

10.2 An assessment will normally be required where there are human receptors within 350 m of the site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s). Ecological receptors within 50 m of the site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), are also identified at this stage. An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

10.3 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects will not be significant.

Step 2: Assess the Risk of Dust Impacts

10.4 In step two, a site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the IAQM (construction, demolition, earthworks and trackout). A site can be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

Step 2A: Define the Potential Dust Emission Magnitude

10.5 Dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium or Large. The IAQM guidance recommends that the dust emission magnitude is determined separately for demolition, earthworks, construction and trackout. **Table 4** describes the potential dust emission class criteria for each outlined activity.

Table 4: Criteria Used in the Determination of Dust Emission Magnitude

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <20,000 m^3, construction materials with low potential for dust release.	Total building volume 20,000 m^3 – 50,000 m^3, potential dusty construction material.	Total building volume >50,000 m^3, potentially dusty construction material.
Earthworks	Total site area <2,500 m^2, soil type with large grain	Total site area 2,500 – 10,000 m^2, moderately dusty soil type	Total site area >10,000 m^2, potentially dusty soil type

[8] IAQM "Assessment of dust from demolition and construction" 2014

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Construction	Total building volume <25,000 m^3.	Total building volume 25,000 – 100,000 m^3.	Total building volume >100,000 m^3.
Trackout	<10 outward HDV trips in any one day. Unpaved road length <50 m.	10-50 outward HDV trips in any one day. Unpaved road length 50-100 m.	>50 outward HDV trips in any one day. Unpaved road length >100 m.

Step 2B: Define the Sensitivity of the Area

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

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM_{10} concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

10.7 The criteria detailed in **Table 5** is used to determine the sensitivity of the receptor in relation to dust soiling, health effects and ecological effects.

Table 5: Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM_{10}	Ecological Sites
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes	International or national designation *and* the features may be affected by dust soiling
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM_{10}	Presence of an important plant species where dust sensitivity is uncertain or locations with a national designation with features that may be affected by dust deposition
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Local designation where features may be affected by dust deposition

10.8 **Table 6** and **Table 7** are then used to define the sensitivity of the area to dust soiling and human health effects. This should be derived for each of construction, demolition, earthworks and trackout.

Table 6: Sensitivity of the Area to Dust Soiling Effects on People and Property.

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

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

*distances considered are to the dust source

Table 7: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	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
	28-32 µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	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

10.9 The sensitivity of the area is then summarised.

Step 2C Define the Risks of Impacts

10.10 The dust emission magnitude from **Table 4** and sensitivity of the area and receptors from **Table 5, Table 6 and Table 7** are combined, and the risk of impacts from each activity (demolition, earthworks, construction and trackout) before mitigation is applied, is determined using the criteria detailed in **Table 8** to **Table 11.**

Table 8: Risk of Dust Impacts - Demolition

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

Table 9: Risk of Dust Impacts- Earthworks

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

Table 10: Risk of Dust Impacts- Construction

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

Table 11: Risk of Dust Impacts- Trackout

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

Step 3 Determine Site Specific Mitigation

10.11 Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

Step 4 Determine Significance of Residual Effects

10.12 At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

10.13 There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

11 Dust Impact Assessment

11.1 Step 1 – The Need for a Detailed Assessment

11.1.1 The site boundary is within 350 m of human receptors. In addition there are human receptors within 50 m of the route(s) to be used by construction vehicles on the public highway, up to 500 m from the site entrance. Therefore, a detailed assessment of the construction phase of the development was undertaken. The detailed assessment has not addressed ecological receptors.

11.2 Step 2 – Assess the Risk of Dust Impacts

Step 2A Dust Emission Magnitude

11.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table 4**:

- Demolition: No buildings are to be demolished therefore **not applicable**.
- Earthworks: The development site area is < 2500 m^2. The dust emission magnitude for earthworks is, therefore, considered to be **Small**.

- Construction: The total building volume to be constructed is <25 000 m^3. The dust emission magnitude for construction is, therefore, considered to be **Small**.
- Trackout: It is conservatively assumed that there are likely to be <10 HDV outward movements in any one day. The unpaved road length is likely to be <50 metres. The dust emission magnitude for trackout is, therefore, considered to be **Small**.

11.2.2 The scale and nature of works onsite were considered to determine the potential dust emission magnitude for demolition, earthworks and trackout activities as outlined in **Table 12**.

Table 12: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitude	Justification
Demolition	N/A	• No buildings are to be demolished.
Earthworks	Small	• the site area upon which earthworks will occur is < 2500 m^2
Construction	Small	• total building volume to be constructed is <25 000 m^3
Trackout	Small	• there are likely to be <10 HDV outward movements in any one day.

Step 2B Sensitivity of the Receptors to Dust Soiling and Health Effects

11.2.3 Human receptors are located in places of work adjacent to the site within a distance of 20m from construction, and earthworks and 20m of road edges used by traffic associated with the site construction. There are likely to be dwellings within 20m of road edges used by construction traffic associated with the site within 350 m of the site. In accordance with the criteria in **Table 5** and the IAQM guidance, the sensitivity of human receptors to the effects of dust soiling and health effects from construction and earthwork activities is therefore likely to be **Medium**, and from trackout is therefore likely to be **High**.

Step 2B Sensitivity of the Area to Dust Soiling

11.2.4 The sensitivity of the area to dust soiling effects has been determined using the criteria detailed in **Table 6**:

- Demolition –N/A.
- Construction - sensitivity is considered to be **Medium** as construction activities take place less than 20 m from medium sensitivity receptors;
- Earthworks - sensitivity is considered to be **Medium** as earthworks activities take place less than 20 m from medium sensitivity receptors; and
- Trackout activities – sensitivity is considered to be **High** as there are more than 100 high sensitivity receptors within 20 metres of roads which relevant vehicles are likely to use that are up to 350 metres from the site.

Step 2B Sensitivity of People to the Health Effects of PM_{10}

11.2.5 The background concentrations of PM_{10} in 2017 and 2018 are shown above in **Table 3** and discussed in section 7.2.3. Local levels of PM_{10} are therefore likely to be less than 24 µg/m^3, during the construction phase.

11.2.6 Using this information and **Table 7**, the sensitivity of human receptors to health impacts from dust and PM_{10} for each activity were defined as:

- Demolition - N/A;
- Construction - sensitivity is considered to be **Low** as construction activities take place less than 20 m from 10-100 medium sensitivity receptors and the background PM_{10} concentration is predicted to be less than 24 µg/m^3;
- Earthworks - sensitivity is considered to be **Low** as earthworks activities take place less than 20 m from 10-100 medium sensitivity receptors and the background PM_{10} concentration is predicted to be less than 24 µg/m^3;
- Trackout activities – sensitivity is considered to be **Medium** as there are more than 100 high sensitivity receptors within 20 metres of roads which relevant vehicles are likely to use that are up to 500 metres from the site, and the background PM_{10} concentration is predicted to be less than 24 µg/m^3.

11.2.7 The sensitivity of the area to dust soiling and human health in each activity is summarised in **Table 13**.

Table 13: Outcome of Defining the Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium	Medium	High
Human Health	N/A	Low	Low	Medium

Step 2C Risk of Impacts

11.2.8 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts determined using the criteria detailed in **Table 8** to **Table 11**.

- Demolition – N/A;
- Earthworks – is considered to be **Low** risk for dust soiling and **Negligible** risk for human health;
- Construction – is considered to be **Low** risk for dust soiling and **Negligible** risk for human health; and
- Trackout activities – is considered to be **Low** risk for dust soiling and **Negligible** risk for human health.

11.2.9 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 14**.

Table 14: Risk of Dust Impacts

Potential Impact	Dust Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Low risk	Low risk	Low risk
Human Health	N/A	Negligible	Negligible risk	Negligible risk

11.3 Step 3 – Site-Specific Mitigation

11.3.1 Step 3 of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Good practice mitigation measures highly recommended for the proposed development taken from the IAQM guidance are detailed below.

11.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'low risk' classification[9]. Mitigation measures specific to earthworks, construction and trackout are proposed based on the risk classifications in **Table 14**.

Site Management

- Develop and implement a Dust Management Plan (DMP) which may be part of the CEMP, which may include measures to control other emissions;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager;
- Display the head or regional office contact information;
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the regulator when asked;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked;
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Consider enclosure of site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Take measures to control site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible; and
- Cover, seed or fence stockpiles to prevent wind whipping.

[9] For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for demolition and track-out, the general measures applicable to a high risk site should be applied.

Operating vehicle/machinery and sustainable travel

- Ensure all non-road mobile machinery (NRMM) comply with the standards set within the IAQM Guidance;
- Ensure all vehicles switch off engines when stationary - no idling vehicles;

Operations

- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Reuse and recycle waste to reduce dust from waste materials; and
- Bonfires and burning of waste materials should not be permitted.

Measures Specific to Earthworks

There is a 'low' risk of dust effects associated with earthworks activities onsite, therefore, there are no desirable measures that need to be implemented.

Measures Specific to Construction

There is a 'low' risk of dust effects associated with construction, it is therefore 'highly desirable' that the following measures are implemented:

- Avoid scabbling (roughening of concrete surfaces) if possible; and
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that the appropriate additional control measures are in place.

Measures Specific to Trackout

There is a 'low' risk of dust effects associated with trackout, it is therefore 'desirable' that the following measures are implemented:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Record all inspections of haul routes and any subsequent action in a site log book;

- Install a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); and
- Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.

11.4 Step 4 – Determine Significant Effects

11.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the above mitigation measures, therefore, the residual impacts from the construction are considered to be not significant, in accordance with IAQM guidance.

12 Summary of Impacts and Conclusion

12.1 This assessment has considered whether the proposed development could significantly change air quality during the construction phase. With the implementation of appropriate mitigation measures the dust impacts from the construction are considered to be not significant, in accordance with IAQM guidance.

12.2 A simple air quality assessment has also been undertaken to determine the impact of the proposed development on local air quality and to determine the suitability of the site for future residents.

12.3 Baseline information including local authority monitoring and background concentrations in the vicinity of the site has been collected. The development does lie within an Air Quality Management Area (AQMA) and future occupants of the development may, therefore, be exposed to poor air quality. However, the final use of the building indicates that the exposure of relevant receptors to breaches of air quality objectives is unlikely.

12.4 The impact of road traffic associated with the development has also been considered and, given the small number of car parking spaces associated with the development and the net decrease in parking spaces proposed, it is concluded that this development will not have a significant impact on local air quality by virtue of road traffic emissions.

12.5 There is, therefore no reason for this application to be refused on the ground of air quality.

APPENDICES

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Appendix A: The Need for an Air Quality Assessment

STAGE 1
Criteria to Proceed to Stage 2
A. If any of the following apply: • 10 or more residential units or a site area of more than 0.5ha • More than 1,000m^2 of floor space for all others uses or a site area greater than 1ha
B. Coupled with any of the following: • the development has more than 10 parking spaces • the development will have a centralised energy facility or other centralised combustion process
Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

STAGE 2	
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 local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - More than 100 AADT within or adjacent to an AQMA - More than 500 AADT elsewhere
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles and buses >3.5t gross vehicle weight).	A change in HDV flows of: - More than 25 AADT within or adjacent to an AQMA - More than 100 AADT elsewhere
3. Realign roads i.e. changing proximity of receptors to traffic lanes	Where the change is 5m or more and the road is within an AQMA
4. Introduce a new junction or remove an existing junction near to relevant receptors	Applies to junctions that cause traffic to significantly change vehicle accelerate/ decelerate, e.g. traffic lights, or roundabouts
5. Introduce or change a bus station	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m 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 bio fuel - any combustion plant with single or combined thermal input >300kW - a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year
8. Have a combustion process of any size	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.

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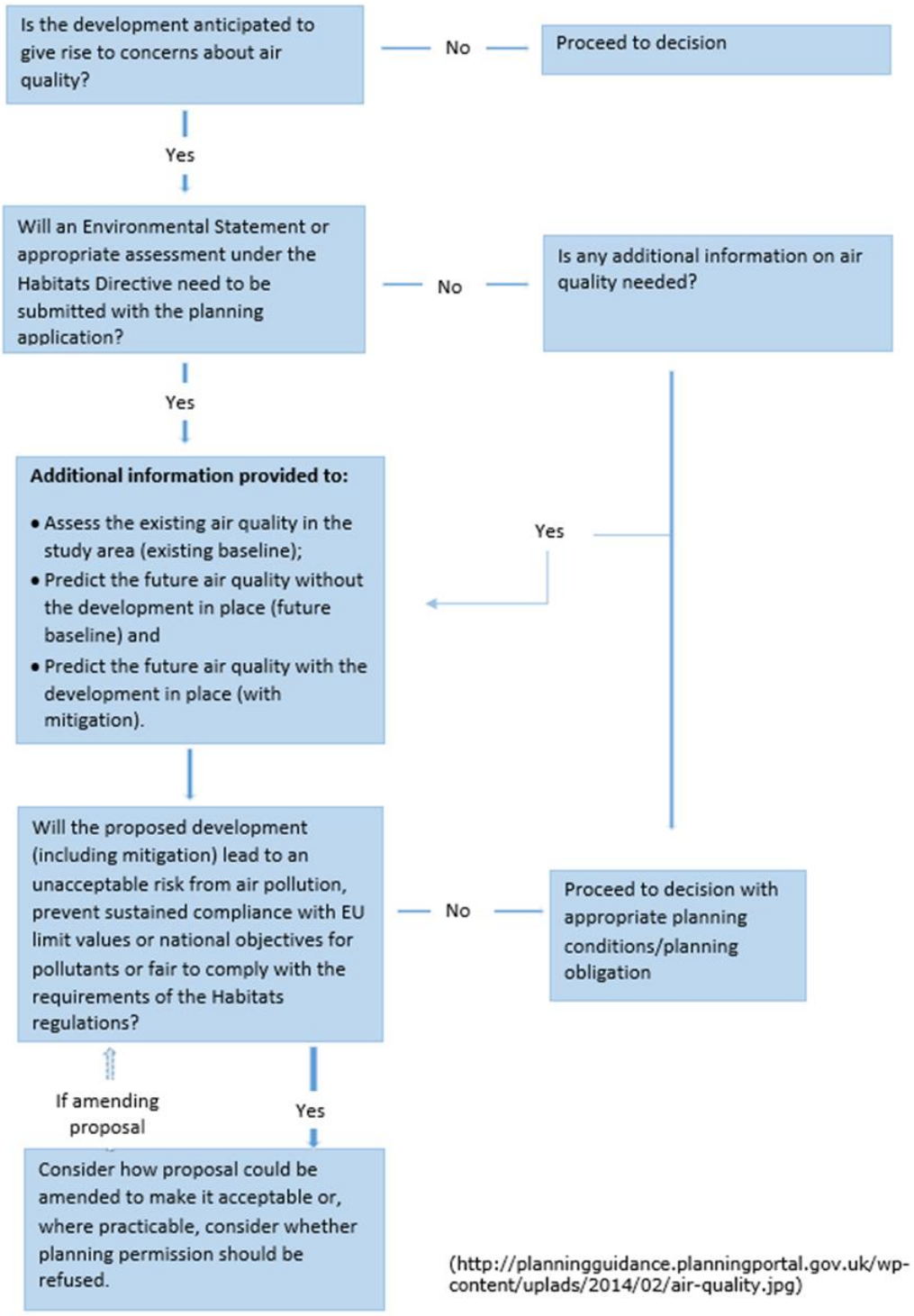
Appendix B: Planning Practice Guidance

How considerations about air quality fit into the development management process.



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Glossary of Terms

AADT Annual Average Daily Traffic flow

Air Quality Standard Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

Air Quality Objective Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

Annual Mean A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

(a) in the case of lead, the mean of the daily levels for that year;

(b) in the case of nitrogen dioxide, the mean of the hourly means for that year;

(c) in the case of PM_{10}, the mean of the 24-hour means for that year.

Annoyance (Dust) Loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance.

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

AQS Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Background Concentrations The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

CO Carbon monoxide

Construction Any activity involved with the provision of a new structure (or structures), its modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc.

Construction Impact Assessment An assessment of the impacts of demolition, earthworks, construction and trackout. In this Guidance, specifically the air quality impacts.

Defra Department for Environment, Food and Rural Affairs

Demolition Any activity involved with the removal of an existing structure (or structures). This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time.

Deposited Dust that is no longer in the air and which has settled onto a surface. Deposited dust is also sometimes called amenity dust or nuisance dust, with the term nuisance applied in the general sense rather than the specific legal definition.

DMRB Design Manual for Roads and Bridges

DMP Dust Management Plan; a document that describes the site-specific methods to be used to control dust emissions.

Dust Solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. The terms dust and particulate matter (PM) are often used interchangeably, although in some contexts one term tends to be used in preference to the other. In this guidance the term 'dust' has been used to include the particles that give rise to soiling, and to other human health and ecological effects. Note: this is different to the definition given in BS 6069, where dust refers to particles up to 75 µm in diameter.

Earthworks Covers the processes of soil-stripping, ground-levelling, excavation and landscaping.

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or morality due to exposure to PM_{10} or $PM_{2.5}$ or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

EPAQS Expert Panel on Air Quality Standards

EPUK Environmental Protection UK

HGV Heavy Goods Vehicle

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

LAQM Local Air Quality Management

LDF Local Development Framework

LGV Light Goods Vehicle

Mg/m^3 Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m^3 means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

NO_2 Nitrogen Dioxide

NOx A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO_2)

NPPF National Planning Policy Framework

Nuisance The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and us of his land.

Public nuisance, arising from and act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

$PM_{2.5}$ The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of $PM_{2.5}$, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

PM_{10} The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM_{10}, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

RSS Regional Spatial Strategy

Running Annual Mean A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

Trackout The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.


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