

## APPENDIX 6.2: METHODOLOGY FOR CONSTRUCTION PHASE ASSESSMENT

### Institute of Air Quality Management Guidance

- 1.1 The methodology for the construction phase dust assessment is set out in guidance from the Institute of Air Quality Management (IAQM)<sup>1</sup>.

#### Step 1

- 1.2 Step 1 is to screen the requirement for a more detailed assessment. The guidance states that an assessment will normally be required where there are existing sensitive human receptors within 350m of the site boundary and/or within 100m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- 1.3 With regards to ecological receptors, the guidance states that an assessment will normally be required where there are existing receptors within 50m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- 1.4 Where any of these criteria are met, it is necessary to proceed to Step 2.

#### Step 2

- 1.5 Step 2 determines the potential risk of dust arising in sufficient quantities to cause annoyance and/or health or ecological impacts. The risk is related to:
- the activities being undertaken (demolition, number of vehicles and plant etc);
  - the duration of these activities;
  - the size of the site;
  - the meteorological conditions (wind speed, direction and rainfall);
  - the proximity of receptors to the activity;
  - the adequacy of the mitigation measures applied to reduce or eliminate dust; and
  - the sensitivity of receptors to dust.

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<sup>1</sup> Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, February 2014

- 1.6 The risk of dust impacts is determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based upon the following two factors (known as Step 2A and Step 2B).
- 1.7 **Step 2A** assesses the scale and nature of the works which determines the potential dust emission magnitude as small, medium or large. Examples of how the magnitude may be defined are included in Table A6.2/1.

Table A6.2/1: Determining the Dust Emission Magnitude of Construction Phase Activities			
Activity	Dust Emission Class		
	Large	Medium	Small
<b>Demolition</b>	Total building volume >50,000m <sup>3</sup> ; Potentially dusty construction material (e.g. concrete); On-site crushing and screening; Demolition activities >20m above ground level	Total building volume 20,000-50,000m <sup>3</sup> ; Potentially dusty construction material; Demolition activities 10-20m above ground level	Total building volume <20,000m <sup>3</sup> ; Construction material with low potential for dust release (e.g. metal cladding or timber)
<b>Earthworks</b>	Total site area >10,000m <sup>2</sup> ; Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); >10 heavy earth moving vehicles active at any one time; Formation of bunds >8m in height; Total material moved >100,000 tonnes	Total site area 2,500-10,000m <sup>2</sup> ; Moderately dusty soil type (e.g. silt); 5-10 heavy earth moving vehicles active at any one time; Formation of bunds 4-8m in height; Total material moved 20,000-100,000 tonnes	Total site area <2,500m <sup>2</sup> ; Soil type with large grain size (e.g. sand); <5 heavy earth moving vehicles active at any one time; Formation of bunds <4m in height; Total material moved <20,000 tonnes; Earthworks during wetter months
<b>Construction</b>	Total building volume >100,000m <sup>3</sup> ; On-site concrete batching; Sandblasting	Total building volume 25,000-100,000m <sup>3</sup> ; Potentially dusty construction material (e.g. concrete); On-site batching	Total building volume <25,000m <sup>3</sup> ; Construction material with a low potential for dust release (e.g. metal cladding or timber)
<b>Trackout</b>	>50 HDV (>3.5t) outward movements <sup>a</sup> in any one day <sup>b</sup> ; Potentially dusty surface material (e.g. high clay content);	10-50 HDV (>3.5t) outward movements <sup>a</sup> in any one day <sup>b</sup> ; Moderately dusty surface material (e.g. high clay content);	<10 HDV (>3.5t) outward movements <sup>a</sup> in any one day <sup>b</sup> ; Surface material with low potential for dust release;

Table A6.2/1: Determining the Dust Emission Magnitude of Construction Phase Activities			
Activity	Dust Emission Class		
	Large	Medium	Small
	Unpaved road length >100m	Unpaved road length 50-100m	Unpaved road length <50m
<p>a. A vehicle movement is a one way journey i.e. from A to B, and excludes the return journey</p> <p>b. HGV movements during a construction project may vary over its lifetime, and the number of movements is the maximum, not the average</p>			

1.8 **Step 2B** considers the sensitivity of the area to dust impacts which is defined as low, medium or high. The sensitivity categories for different types of receptors are described in Table A6.2/2.

Table A6.2/2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects			
Sensitivity Category	Dust Soiling Effects	Health effects of PM <sub>10</sub>	Ecological Effects
<b>High</b>	Users can reasonably expect to enjoy a high level of amenity; Appearance, aesthetics or value of a property would be diminished; Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car show rooms	Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM <sub>10</sub> ; Examples include residential properties, hospitals, schools, and residential care homes	Locations with an international or national designation and the designated features may be affected by dust soiling; Locations where there is a community of a particularly dust sensitive species; Examples include a Special Area of Conservation with dust sensitive features
<b>Medium</b>	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; The appearance, aesthetics or value of their property could be diminished; People or property wouldn't reasonably be expected to be continuously present or	Locations where people are exposed as workers and exposure is over a period of time relevant to the air quality objective for PM <sub>10</sub> ; Examples include office and shop workers but will generally not include workers occupationally exposed to PM <sub>10</sub>	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; Locations with a national designation where the features may be affected by dust deposition; Examples include a Site of Special Scientific Interest with dust sensitive features

Table A6.2/2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects			
Sensitivity Category	Dust Soiling Effects	Health effects of PM <sub>10</sub>	Ecological Effects
	regularly for extended periods of time; Examples include parks and places of work		
<b>Low</b>	Enjoyment of amenity would not reasonably be expected; Property would not be diminished in appearance, aesthetics or value; People or property would be expected to be present only for limited periods of time; Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads	Locations where human exposure is transient; Examples include public footpaths, playing fields, parks and shopping streets	Locations with a local designation where the features may be affected by dust deposition; Examples include a Local Nature Reserve with dust sensitive features

- 1.9 Based on the sensitivity of individual receptors, the overall sensitivity of the area to dust soiling, human health and ecological effects is then determined using the criteria detailed in Tables A6.2/3 to A6.2/5, respectively.

Table A6.2/3: Sensitivity of the Area to Dust Soiling Effects on People and Property <sup>ab</sup>					
Receptor Sensitivity	Number of Receptors	Distance from Source (m) <sup>c</sup>			
		<20m	<50m	<100m	<350m
<b>High</b>	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
<b>Medium</b>	>1	Medium	Low	Low	Low
<b>Low</b>	>1	Low	Low	Low	Low
<p>a. The sensitivity to the area should be derived for each of the four activities</p> <p>b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered</p> <p>c. For trackout, distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur for up to 500m from large sites, 200m from medium sites and 50m from small sites, measured from the site exit. The impact declines with</p>					

**Table A6.2/3: Sensitivity of the Area to Dust Soiling Effects on People and Property<sup>ab</sup>**

Receptor Sensitivity	Number of Receptors	Distance from Source (m) <sup>c</sup>			
		<20m	<50m	<100m	<350m
distance from the site and it is only necessary to consider trackout impacts up to 50m from the edge of the road					

**Table A6.2/4: Sensitivity of the Area to Human Health Impacts<sup>ab</sup>**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration <sup>c</sup>	Number of Receptors <sup>d</sup>	Distance from Source (m) <sup>e</sup>				
			<20m	<50m	<100m	<200m	<350m
<b>High</b>	>32µg/m <sup>3</sup>	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m <sup>3</sup>	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m <sup>3</sup>	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m <sup>3</sup>	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
<b>Medium</b>	>32µg/m <sup>3</sup>	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m <sup>3</sup>	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m <sup>3</sup>	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m <sup>3</sup>	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
<b>Low</b>	-	>1	Low	Low	Low	Low	Low

a. The sensitivity to the area should be derived for each of the four activities

Table A6.2/4: Sensitivity of the Area to Human Health Impacts <sup>ab</sup>							
Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration <sup>c</sup>	Number of Receptors <sup>d</sup>	Distance from Source (m) <sup>e</sup>				
			<20m	<50m	<100m	<200m	<350m
<i>b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered</i>							
<i>c. Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32µg/m<sup>3</sup> being the annual mean concentration at which an exceedance of the 24-hour mean objective is likely in England, Wales and Northern Ireland. In Scotland, there is an annual mean objective of 18µg/m<sup>3</sup></i>							
<i>d. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties</i>							
<i>e. For trackout, distances should be measured from the side of the roads used by construction traffic</i>							

Table A6.2/5: Sensitivity of the Area to Ecological Impacts <sup>abc</sup>		
Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low
<p><i>a. The sensitivity to the area should be derived for each of the four activities</i></p> <p><i>b. Only the highest level of sensitivity from the table needs to be considered</i></p> <p><i>c. For trackout, distances should be measured from the side of the roads used by construction traffic</i></p>		

- 1.10 These two factors are combined in **Step 2C** to determine the risk of dust impacts with no mitigation applied.
- 1.11 The risk of dust effects is determined for four types of construction phase activities, with each activity being considered separately. If a construction phase activity is not taking place on the site, then it does not need to be assessed. The four types of activities to be considered are:
- demolition;
  - earthworks;
  - construction; and
  - trackout.

- 1.12 The risk of dust being generated by demolition activities at the site is determined using the criteria in Table A6.2/6.

Table A6.2/6: Risk of Dust Impacts for Demolition			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

- 1.13 The risk of dust being generated by earthworks and construction at the site is determined using the criteria in Table A6.2/7.

Table A6.2/7: Risk of Dust Impacts for Earthworks and Construction			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

- 1.14 The risk of dust being generated by trackout at the site is determined using the criteria in Table A6.2/8.

Table A6.2/8: Risk of Dust Impacts for Trackout			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Medium Risk	Low Risk	Negligible

### Step 3

- 1.15 Step 3 of the assessment determines the site-specific mitigation required for each of the activities, based on the risk determined in Step 2. Mitigation measures are

detailed in guidance published by the Greater London Authority<sup>2</sup>, recommended for use outside the capital by LAQM guidance, and the IAQM guidance document itself. Professional judgement should be used to determine the type and scale of mitigation measures required.

- 1.16 If the risk is classed as negligible, no mitigation measures beyond those required by legislation will be necessary.

#### **Step 4**

- 1.17 Step 4 assesses the residual effect, with mitigation measures in place, to determine whether or not these are significant.

#### **Professional Judgement**

- 1.18 The IAQM guidance makes reference to the use of professional judgement when assessing the risks of dust and fine particulate matter from demolition and construction sites. Details of the experience of the personnel involved with the project are provided in **Appendix 6.3**.

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<sup>11</sup> Greater London Authority, The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, 2006