

APPENDIX 14.2 – GUIDANCE ON THE ASSESSMENT OF DUST FROM DEMOLITION AND CONSTRUCTION

The effects associated with the site preparation, earthworks and construction phase of the Development have been determined qualitatively using criteria provided in the IAQM (2023) guidance and professional judgement.

The significance of effects associated with the site preparation, earthworks and construction phase of the Development has been determined qualitatively and involved the following tasks:

- Evaluation of the proposed Site layout, to evaluate size of the Site and possible site construction activities that could generate dust and PM₁₀, their likely location and duration. No information on the precise construction plan was available at the time of undertaking the current assessment and hence assumptions were made;
- Collection and appraisal of meteorological data related to wind speed, direction and frequency, and precipitation for the local and wider area;
- Identification of any natural shelters, such as trees, likely to reduce the risk of wind-blown dust;
- In the case of PM₁₀, mapping of local background concentrations;
- Assessing the potential distance which the construction traffic will travel across unpaved roads on the construction Site, prior to accessing the local road network (referred to as 'trackout');
- Identification of the location and type of sensitive receptors within 250m of the boundary of the Site and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s) (at-risk receptors);
- Indication of the number of receptors and sensitivity types at different distances from the Site boundary (or dust generating activities wherever known);
- Assessment of the risk of dust and PM₁₀ effects arising using three risk categories: low risk, medium risk, and high risk. The Site was allocated to a risk category based on two factors:
 - The scale and nature of the works, which determined the magnitude of potential dust emissions classed as: small, medium or large; and

- The type and proximity of receptors, considered separately for human and ecological receptors, which determined the sensitivity of the area.

The criteria developed by IAQM is divides the activities on construction sites into four different types to assess their different level of impacts upon receptors. These are:

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

The assessment procedure includes four steps summarised below:

STEP 1 - SCREENING THE NEED FOR A FULL ASSESSMENT

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

- A 'human' receptor within:
 - 250m of the Site boundary; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- An 'ecological' receptor within:
 - 50m of the Site boundary; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

Should this criterion not be met it can be concluded that the level of risk upon receptors is negligible and there the effects are not significant, and therefore no mitigation measures will be required.

STEP 2 - ASSESS THE RISK OF DUST ARISING

The Site is given a risk classification based upon the following two factors:

- The scale and nature of the construction works, to provide the potential dust emission magnitude (Step 2A); and
- The sensitivity of the area / receptors to the dust impacts (Step 2B).

These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

STEP 2A - DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The dust magnitude is categorised by the following:

- Small;
- Medium; or
- Large.

The IAQM provide a brief description upon what could apply for each classification (as set out in Table 14.2.1) and should be based upon professional judgement. The definitions are provided as examples, and not all the criteria need to be met, and that other criteria may be used if justified in the assessment. Where relevant, multiple screening assessments may be completed for different development phases (or even sub-phases where demolition may be brief or there is a very short period of intense activity, for example). This may particularly be the case for linear schemes (i.e. new roads, railways).

Table 14.2.1: Dust Magnitude Classification

Magnitude Class	Classification Description
	Demolition
Large	Total building volume >75,000 m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level;
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material, demolition activities 6-12 m above ground level; and
Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.
	Earthworks
Large	Total site area >110,000 m ² , 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 >6 m in height;
Medium	Total site area 18,000 m ² – 110,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height; and
Small	Total site area <18,000 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.
	Construction
Large	Total building volume >75,000 m ³ , on site concrete batching, sandblasting;

Magnitude Class	Classification Description
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching
Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout
Large	>50 HDV (>3.5t) outward movements in any one day,10 potentially dusty surface material (e.g. high clay content), unpaved road length >100 m
Medium	20-50 HDV (>3.5t) outward movements in any one day,10 moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m
Small	<20 HDV (>3.5t) outward movements in any one day,10 surface material with low potential for dust release, unpaved road length <50 m.

STEP 2B - DEFINE THE SENSITIVITY OF THE AREA

The sensitivity of the area / receptor is defined by taking account of the following factors and the criteria set out in Table 14.2.2 to Table 14.2.6.

- The type of receptors in the area;
- The distance and number of receptors; and
- Background PM₁₀ concentrations.

Table 14.2.2: Defining Receptor Sensitivity – Human Receptors

Receptor Sensitivity	Sensitivities of People to Dust Soiling Effects	Sensitivities of People to the Health Effects of PM ₁₀
High	<p>surrounding land where:</p> <ul style="list-style-type: none"> • users can reasonably expect enjoyment of a high level of amenity; or • the appearance, aesthetics or value of their property would be diminished by soiling; • the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. <p>indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms</p>	<p>locations where</p> <ul style="list-style-type: none"> • members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals maybe exposed for eight hours or more in a day). <p>indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.</p>
Medium	<p>surrounding land where:</p> <ul style="list-style-type: none"> • users would expect to enjoy a reasonable level of amenity, but would 	<p>locations where</p> <ul style="list-style-type: none"> • the people exposed are workers, and exposure is over a time period relevant

	<p>not reasonably expect to enjoy the same level of amenity as in their home; or</p> <ul style="list-style-type: none"> the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. <p>indicative examples include parks and places of work.</p>	<p>to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).</p> <p>indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM₁₀, as protection is covered by Health and Safety at Work legislation.</p>
Low	<p>surrounding land where:</p> <ul style="list-style-type: none"> the enjoyment of amenity would not reasonably be expected ; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. <p>indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.</p>	<p>locations where</p> <ul style="list-style-type: none"> human exposure is transient. <p>indicative examples include public footpaths, playing fields, parks and shopping streets.</p>

Table 14.2.3: Defining Receptor Sensitivity – Ecological Receptors

Receptor Sensitivity	Sensitivities of Receptors to Ecological Effects
High	<p>locations with</p> <ul style="list-style-type: none"> an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. <p>indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.</p>
Medium	<p>locations where</p>

	<ul style="list-style-type: none"> there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition. <p>indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.</p>
Low	<p>locations with</p> <ul style="list-style-type: none"> a local designation where the features may be affected by dust deposition. <p>indicative example is a local Nature Reserve with dust sensitive features.</p>

Table 14.2.4: Sensitivity of the Area to Effects on People and Property from Dust Soiling

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 14.2.5: Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM ₁₀	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

14.2.6: Sensitivity of the Area to Ecological Effects

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

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts with no mitigation applied. The IAQM provides the matrix in Table 14.2.7 as a method of assigning the level of risk for each activity.

Table 14.2.7: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
	Demolition		
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
	Earthworks		
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
	Construction		
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
	Trackout		
High	High Risk	Medium Risk	Low Risk

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

STEP 3 – IDENTIFY THE NEED FOR SITE SPECIFIC MITIGATION

From the identification of the risk of impacts with no mitigation, 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. The mitigation measures for each specific activity are set out in the main ES Chapter, and the general dust mitigation measures are set out in Appendix 14.11.

STEP 4 – DETERMINE SIGNIFICANT IMPACTS

The IAQM does not provide a method for assessing the significance of effects before mitigation and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant.'