

CALDECOTE FARM

NEWPORT PAGNELL · MILTON KEYNES

APPENDIX 10

ENVIRONMENTAL STATEMENT

AIR QUALITY

APPENDIX 10.2

IAQM (2016) DUST RISK ASSESSMENT

APPENDIX 10.2 - CONSTRUCTION DUST ASSESSMENT METHODOLOGY

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

The significance of effects associated with the site preparation, earthworks and construction phase of the Proposed 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 350m of the boundary of the Site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500m 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:
 - 350m of the Site boundary; 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 Site boundary; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m 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 therefore 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 10.2.1) and should be based upon professional judgement.

Table 10.2.1 Dust Magnitude Classification

Magnitude Class	
	Demolition
Large	Total building volume >50,000m ³ , potentially dusty material, on-site crushing and screening, activities >20m above ground level.
Medium	Total building volume 20,000-50,000m ³ , potentially dusty construction material, demolition activities 10-20m above ground level.
Small	Total building volume <20,000m ³ , construction material with low potential for dust release, demolition activities <10m above ground, works during wetter months.
	Earthworks
Large	Total site area over 10,000 m ² , potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved > 100,000 tonnes.
Medium	Total site area between 2,500 to 10,000 m ² , moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 - 8 m in height, total material moved 20,000 to 100,000 tonnes.
Small	Total site area less than 2,500 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, total material moved < 10,000 tonnes earthworks during winter months.
	Construction
Large	Total building volume over 100,000 m ³ , activities include piling, on-site concrete batching, and sand blasting. Period of activities more than two years.
Medium	Total building volume between 25,000 and 100,000 m ³ , use of construction

	materials with high potential for dust release (e.g. concrete), activities include piling, on-site concrete batching. Period of construction activities between one and two years.
Small	Total building volume below 25,000m ³ , use of construction materials with low potential for dust release (e.g. metal cladding or timber). Period of construction activities less than one year.
	Trackout
Large	> 50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m. (Trackout may occur up to 500m from the site entrance).
Medium	10-50 HDV (>3.5t) outwards movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m. (Trackout may occur up to 200m from the site entrance).
Small	<10HDV (>3,5t) outward movements in any one day. (Trackout may occur up to 50m from the site entrance).

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 Tables(s) 10.2.2 to 10.2.5:

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

Table 10.2.2 Defining Receptor Sensitivity

Receptor Sensitivity	Human	Ecological
High	Very densely populated area, 10-100 dwellings within 20m of site. Annual mean concentrations of PM ₁₀ close to/in exceedence of the national objective (40 µg 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	Nationally designated site where the features may be affected by dust

	<p>concentrations of PM₁₀ below the national objective ($> 28 \mu\text{g m}^{-3}$).</p> <p>Medium sensitivity receptors (e.g. office and shop workers).</p>	<p>deposition. A location with a particularly important plant species where its dust sensitivity is unknown.</p>
Low	<p>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).</p>	<p>Locally designated site where the features may be affected by dust deposition.</p>

Table 10.2.3 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	Low	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 10.2.4 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	$>32 \mu\text{g/m}^3$	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	$28 \mu\text{g/m}^3 - 32 \mu\text{g/m}^3$	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	$24 - 28 \mu\text{g/m}^3$	>100	High	Medium	Low	Low	Low

	$\mu\text{g}/\text{m}^3$	10 – 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	<24 $\mu\text{g}/\text{m}^3$	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	Medium	-	>10	High	Medium	Low	Low
-		1 – 10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 10.2.5 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 10.2.6 as a method of assigning the level of risk for each activity.

Table 10.2.6 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
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 described below are suggested as measures that could be utilised. Specific measures of which are included in Section 10.6 of the ES Chapter and general mitigation measures are set out in Appendix 10.3.

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'