APPENDIX 14.5: IAQM CONSTRUCTION PHASE ASSESSMEMT METHODLOGY

Step 1 – Screening the need for a Detailed Assessment

An assessment will normally be required where there are:

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

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

Step 2A – Define the Potential Dust Emission Magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

1. Demolition

- Large: Total building volume >50,000m^3 potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- Medium: Total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and
- Small: Total building volume <20,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

2. Earthworks

- Large: Total site area >10,000m^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 >8m in height, total material moved >100,000 tonnes;
- Medium: Total site area 2,500m^2 – 10,000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m - 8m in height, total material moved 20,000 tonnes – 100,000 tonnes; and,
- Small: Total site area <2,500m^2, 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 <10,000 tonnes, earthworks during wetter months.

3. Construction Activities

The key issues when determining the potential dust emission magnitude include the size of the building(s)/infrastructure, method if construction, construction materials and duration of build.

- Large: Total building volume >100,000m^3, on site concrete batching, sandblasting
- Medium: Total building volume 25,000m^3 – 100,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

4. Trackout

Factors which determine the magnitude class are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the magnitude categories.

- Large: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- Medium: 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and
- Small / Medium: <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

These numbers are for vehicles that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

Step 2B – Define the Sensitivity of the Area

The tables below summarise the IAQM guidance on the sensitivity of different types of receptor to dust soiling, health and ecological effects.

Table 2Ba: Examples of Human Receptor Sensitivity to Construction Phase Impacts

Sensitivity	Dust Soiling Effects	Health Effects of PM_{10}
High	■ Users can reasonably expect an enjoyment of a high level amenity; or ■ The appearance, aesthetics or value of their property would be diminished by soiling; and 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. Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	■ Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM_{10}. Examples include residential properties, hospitals, schools and residential care homes.
Medium	■ 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; or ■ The appearance, aesthetics or value of their property could be diminished by soiling; or	■ Locations where the people exposed are workers and exposure is over a period of time relevant to the air quality objective for PM_{10}. Examples include office and shop workers.

	▪ The people or property wouldn't reasonably be expected to be present continuously, or regularly for extended periods, as part of the normal pattern of use of the land. Examples include places of work.	
Low	▪ 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. Examples include playing fields, farmland, footpaths, short-term car parks and roads.	▪ Locations where human exposure is transient. Examples include footpaths, playing fields, parks and shopping streets.

Table 2Bb: Examples of Ecological Receptor Sensitivity to Construction Phase Impacts

Sensitivity	Description
High	▪ Locations with 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. 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 sire containing concrete (alkali) buildings.
Medium	▪ Locations where 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. Examples include a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	▪ Locations with a local designation where the features may be affected by dust deposition. Examples include a Nature Reserve with dust sensitive features.

The tables below presents the IAQM assessment methodology determines the sensitivity of the area can be determined for dust soiling, human health and ecological impacts respectively.

Table 2Bc: Sensitivity of the Area to Dust Soiling Effects

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 2Bd: Sensitivity of the Area to Human Health Impacts

Receptor	Annual Mean	Number	Distance from the Source (m)

Sensitivity	PM_{10} Concentration ($\mu g/m^3$)	of Receptors	<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>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	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 2Be: Sensitivity of the Area to Ecological Impacts

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

Step 2C – Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts with no mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2Ca: Risk of Dust Impacts – Demolition

Sensitivity of surrounding 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 2Cb: Risk of Dust Impacts – Earthworks and Construction

Sensitivity of surrounding 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 2Cc: Risk of Dust Impacts – Trackout

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 –Site Specific Mitigation

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Step 4 – Determine Significant Effects

The significance of effects associated with dust and PM_{10} generated from on-site construction activities has been determined through professional judgement and consideration of the assessment criteria developed by the IAQM outlined above. For the purposes of this ES, the overall magnitude of change has been determined by taking account of the 'dust emission magnitude' as defined by the IAQM guidance and using professional judgement. The significance of effects was then determined based on the overall magnitude of change and sensitivity of receptors using the matrix presented in **Table 2.7 (ES Chapter 2: Approach)**.