

Outer Dowsing Offshore Wind Preliminary Environmental Information Report

Volume 2, Appendix 19.1: Onshore Air Quality Construction Phase Dust Assessment

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OUTER DOWSING OFFSHORE WIND PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

VOLUME 2, APPENDIX 19.1: ONSHORE AIR QUALITY CONSTRUCTION PHASE DUST ASSESSMENT

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1.0 Construction Dust Assessment Methodology

The construction dust assessment methodology is set out within the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' (referred to as 'IAQM guidance' throughout this appendix). This appendix provides a summary of the methodology.

Where figures relating to area, volume, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance.

1.1 Step 1: Screening the Need for a Detailed Assessment

In accordance with the IAQM guidance, a detailed construction dust assessment is required where a:

- Human receptor (any location where a person or property may experience the adverse effects of airborne dust or dust soiling) is located within 350m of the site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s); and/or
- Ecological receptor (any sensitive habitat affected by dust soiling) is located within 50m of the site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, effects are not believed to be significant, and no further assessment is required.

1.2 Step 2: Assess the Risk of Dust Impacts

1.2.1 Step 2a: Define the Potential Dust Emission Magnitude

The dust emission magnitude is defined for four potential construction activities using criteria provided within the IAQM guidance (presented in Table 1-1), in combination with professional judgment by a technically competent assessor. The activities considered, if applicable to anticipated works, are as follows:

- Demolition (note, demolition activities are not anticipated to be required for the Project);
- Earthworks;
- Construction; and
- Trackout.

Table 1-1 – IAQM Criteria Used to Determine the Dust Emission Magnitude for Each Activity

Activity	Dust Emission Magnitude		
	Small	Medium	Large
Demolition	<ul style="list-style-type: none"> Total building volume <20,000m³ Construction material with low potential for dust release (e.g. metal cladding or timber) Demolition activities <10m above ground Demolition during wetter months 	<ul style="list-style-type: none"> Total building volume 20,000 – 50,000m³ Potentially dusty construction material Demolition activities 10-20m above ground level 	<ul style="list-style-type: none"> Total building volume >50,000m³ Potentially dusty construction material (e.g., concrete) On-site crushing and screening Demolition activities >20m above ground level
Earthworks	<ul style="list-style-type: none"> Total site area <2,500m² 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 	<ul style="list-style-type: none"> Total site area 2,500 to 10,000m² 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 	<ul style="list-style-type: none"> Total site area >10,000m² 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
Construction	<ul style="list-style-type: none"> Total building volume <25,000m³ Construction material with low potential for dust release (e.g., metal cladding or timber) 	<ul style="list-style-type: none"> Total building volume 25,000 to 100,000m³ Potentially dusty construction material (e.g., concrete) On site concrete batching 	<ul style="list-style-type: none"> Total building volume >100,000m³ On site concrete batching; sandblasting
Trackout	<ul style="list-style-type: none"> <10 outward heavy-duty vehicles (HDV) trips in any one day Surface material with low potential for dust release Unpaved road length <50m 	<ul style="list-style-type: none"> 10-50 outward HDV trips in any one day Moderately dusty surface material (e.g., high clay content) Unpaved road length 50-100m 	<ul style="list-style-type: none"> >50 outward HDV trips in any one day Potentially dusty surface material (e.g., high clay content) Unpaved road length >100m

1.2.2 Step 2b: Define the Sensitivity of the Area

In accordance with the IAQM guidance, the sensitivity of the area is defined in relation to three separate dust impacts:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM₁₀; and
- Harm to ecological receptors.

This is informed by several parameters which are set out in the IAQM guidance; such as the proximity and number of receptors in relation to construction activities, as well as their individual sensitivity.

Receptors can demonstrate different sensitivities to changes in their environment, dependant on location, use and perceived value. The sensitivities for individual receptors are determined using the approach outlined in Table 1-2 for each assessed impact.

Once the sensitivity of each individual receptor has been established, this is used to determine the sensitivity of the surrounding area in combination with the number of receptors, their distance to dust sources, and the annual mean PM₁₀ background concentration (for human health impacts).

Reproduced from the IAQM guidance, Table 1-3 to Table 1-5 illustrates how the sensitivity of the area may be determined for dust soiling, human health, and ecosystem impacts, respectively. The highest level of sensitivity from each table should be recorded.

The quoted distances relate to the nearest dust emission source(s). In the context of construction, demolition and earthworks these activities will occur on-site. Where the exact locations of these activities are not known, receptor distances are determined from the site boundary.

By comparison, trackout occurs off-site when Heavy Duty Vehicles (HDV) transport dust and dirt from construction areas onto the public road network; where it may be deposited and then re-suspended. The quoted distances therefore relate to the proximity of receptors to the public road links likely to be used by construction vehicles. The extent (length) of road links affected by trackout from HDVs leaving the site exit(s) is determined by the calculated trackout dust emission magnitude as per Section 1.2.1; and is directly linked to the number of construction vehicle movements and the condition (i.e. dust emission potential) of construction areas. Without site-specific mitigation, trackout may occur along the public highway up to 500m from the site exit(s) for large sites, 200m for medium sites and 50m for small sites.

Table 1-2 – IAQM Criteria for Defining Sensitivity of Receptors

Sensitivity of Area	Human Receptors		Ecological Receptors ^(A)
	Dust Soiling Effects	Health Effects of Particulate Matter (PM ₁₀)	
High	<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; 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. Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms. 	<ul style="list-style-type: none"> Locations where 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 may be exposed for eight hours or more in a day). 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. 	<ul style="list-style-type: none"> 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 such as vascular species included in the Red Data List for Great Britain. 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.
Medium	<ul style="list-style-type: none"> 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 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. Indicative examples include parks and places of work. 	<ul style="list-style-type: none"> Locations where the people exposed are workers, and exposure is 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 may be exposed for eight hours or more in a day). 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. 	<ul style="list-style-type: none"> 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. Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	<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. Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads. 	<ul style="list-style-type: none"> Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets. 	<ul style="list-style-type: none"> Locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with dust sensitive features.
<p>Notes: ^(A) Only applicable if ecological habitats are present which may be sensitive to dust effects.</p>			

Table 1-3 – Sensitivity of 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
	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 1-4 – Sensitivity of Area to Human Health Impacts

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

Table 1-5 – Sensitivity of Area to Ecological Impacts

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

1.2.3 Define the Risk of Impacts

The risk of dust impacts arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area.

As reproduced from the IAQM guidance, Table 1-6 to Table 1-9 illustrates how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts with no mitigation measures applied.

Table 1-6 – Risk of Dust Impacts: 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

Table 1-7 – Risk of Dust Impacts: Earthworks

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

Table 1-8 – Risk of Dust Impacts: 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

Table 1-9 – Risk of Dust Impacts: Trackout

Sensitivity of 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

1.3 Step 3: Mitigation

Mitigation, as provided within the IAQM guidance, is then recommended based upon the calculated dust risks i.e., low, medium or high-risk. The measures are classified as either ‘highly recommended’ or ‘desirable’.

The Project-specific measures determined from the assessment outcomes will be included within Section 1.1 of the Outline Air Quality Management Plan (document reference: 8.1.2).

1.4 Step 4: Determine Significant Effects

As per IAQM guidance, significance is only assigned to the effect after considering the construction activity with mitigation. This is because for almost all construction activities, the aim is to prevent significant effects on receptors through the use of effective mitigation. The IAQM guidance therefore recommends that the significance of the unmitigated effect is not defined, as is not considered appropriate nor relevant in this context.

Following the application of the recommended mitigation measures, residual effects are assessed. In accordance with the IAQM guidance and assuming the effective application of measures, residual effects associated with construction dust are considered to be not significant.

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