

REPORT

Boston Alternative Energy Facility – Environmental Statement

Appendix 14.1 Construction Phase Dust and Particulate Matter Assessment Methodology

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Appendix 14.1: Construction Phase Dust and Fine Particulate Matter Assessment Methodology

A14.1 Introduction

A14.1.1 This appendix outlines an assessment procedure developed by the Institute of Air Quality Management (IAQM, 2016) for the assessment of air quality impacts arising from construction activities. The assessment procedure is divided into four steps and is summarised below.

A14.1 Step 1: Screening the Need for a Detailed Assessment

A14.1.1 An assessment will normally be required where there are human receptors within 350 m of the development site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s). Designated ecological sites within 200 m of the site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), are also identified at this stage. A designated ecological site refers to any sensitive habitat that can potentially be affected by dust soiling. For locations with a statutory designation, such as a Sites of Specific Scientific Interest (SSSI), Special Areas of Conservation (SAC) and Special Protection Areas (SPA), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered, if appropriate.

A14.1.2 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible'.

A14.1.3 As there are several human receptors within 350 m of the Facility site boundary and the Havenside Local Nature Reserve (LNR) within 200 m, a Detailed Assessment was therefore required.

A14.2 Step 2: Assess the Risk of Dust Impacts

A14.2.1 A site is allocated to a risk category based on the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be

different for each of the four categories of construction activities outlined by the IAQM (demolition, construction, earthworks and trackout).

A14.3 Step 2A: Define the Potential Dust Emission Magnitude

A14.3.1 The IAQM guidance (IAQM, 2016) recommends that the dust emission magnitude is determined for demolition, earthworks, construction and trackout. There was not anticipated to be any demolition during the construction works of the Facility, therefore, demolition is not discussed further. The dust emission magnitude is based on the scale of the anticipated works. **Table A14.1-1** describes the potential dust emission class criteria for each outlined construction activity.

Table A14.1-1 Criteria Used in the Determination of Dust Emission Class

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Earthworks	Total site area <2,500 m ² ; <5 heavy moving earth vehicles active at any one time.	Total site area 2,500 – 10,000 m ² ; 5 – 10 heavy moving earth moving vehicles active at any one time.	Total site area >10,000 m ² ; >10 heavy earth moving vehicles active at any one time.
Construction	Total building volume <25,000 m ³ ; Construction material with low potential for dust release.	Total building volume 25,000 – 100,000 m ³ ; Potentially dusty construction material (e.g. concrete).	Total building volume >100,000 m ³ ; On site concrete batching.
Trackout	<10 outward HGV trips in any one day; Unpaved road length <50 m.	10 – 50 outward HGV trips in any one day. Unpaved road length 50 – 100 m.	>50 outward HGV trips in any one day; Unpaved road length >100 m.

A14.4 Step 2B: Define the Sensitivity of the Area

A14.4.1 The sensitivity of the area considers the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM₁₀ concentration; and
- site-specific factors, such as the presence of natural shelters, such as trees,

to reduce the risk of windblown dust.

A14.4.2 **Table A14.1-2** outlines the criteria used for determining the sensitivity of receptors.

Table A14.1-2 Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM ₁₀	Ecological Effects
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	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 dust sensitive species such as vascular species included in the Red Data List For Great Britain
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM ₁₀	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.
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Locations with a local designation where the features may be affected by dust deposition.

A14.4.3 The criteria detailed in **Table A14.1-3** to **Table A14.1-5** were used to determine the sensitivity of the area to dust soiling effects and human health impacts. **Figure 14.3** details the distance bands, as detailed in **Table A14.1-3** and **Table A14.1-4**, from the site boundary for use in the construction phase assessment.

Table A14.1-3 Sensitivity of the 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 A14.1-4 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentrations	Number of Receptors	Distance from the 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	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A14.1-5 Sensitivity of the Area to Ecological Impacts

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

A14.5 Step 2C: Define the Risk of Impacts

A14.5.1 The dust emission magnitude and sensitivity of the area are combined and the risk of impacts from each activity (demolition, earthworks, construction and

trackout) before mitigation is applied should be determined using the criteria detailed in **Table A14.1-6 - Table A14.1-8**.

Table A14.1-6 Risk of Dust Impacts- Earthworks

Potential Impact	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 A14.1-7 Risk of Dust Impacts- Construction

Potential Impact	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 A14.1-8 Risk of Dust Impacts- Trackout

Potential Impact	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

A14.6 Step 3: Site-Specific Mitigation

A14.6.1 Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high-risk site. The highly recommended mitigation measures for the Facility are detailed in **Section 14.8 of Chapter 14 Air Quality**.

A14.7 Step 4: Determine Significant Effects

A14.7.1 With the implementation of the relevant mitigation measures in **Section 14.8 of Chapter 14 Air Quality**, the residual effects from the construction are considered to be **not significant**, in accordance with IAQM guidance.

A14.8 References

Institute of Air Quality Management (IAQM) (2016). Guidance on the Assessment of Dust from Demolition and Construction.