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# Morlais Project Environmental Statement

## Chapter 22: Air Quality

### Volume III

Applicant: Menter Môn Morlais Limited

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Chapter 22: Air Quality

Author: Royal HaskoningDHV



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## Appendix 22.1: Methodology for Assessment of Air Quality Impacts

### Volume III

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Author: Royal HaskoningDHV



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## TABLE OF CONTENTS

TABLE OF TABLES .....	II
GLOSSARY OF ABBREVIATIONS .....	III
GLOSSARY OF TERMINOLOGY .....	III
1. INTRODUCTION.....	1
2. STEP 1: SCREENING THE NEED FOR A DETAILED ASSESSMENT .....	1
3. STEP 2A: ASSESS THE RISK OF DUST IMPACTS.....	1
4. STEP 2B: DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE .....	1
5. STEP 2B: DEFINE THE SENSITIVITY OF THE AREA .....	2
6. STEP 2C: DEFINE THE RISK OF IMPACTS.....	4
7. STEP 3: SITE-SPECIFIC MITIGATION .....	4
8. STEP 4: DETERMINE SIGNIFICANT EFFECTS.....	4

## TABLE OF TABLES

Table 1-1 Criteria Used in the Determination of Dust Emission Class.....	1
Table 1-2 Criteria for Determining Sensitivity of Receptors .....	2
Table 1-3 Sensitivity of the Area to Dust Soiling Effects on People and Property .....	3
Table 1-4 Sensitivity of the Area to Human Health Impacts .....	3
Table 1-5 Sensitivity of the Area to Ecological Impacts .....	3
Table 1-6 Risk of Dust Impacts - Earthworks and Construction .....	4
Table 1-7 Risk of Dust Impacts - Trackout.....	4

## GLOSSARY OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
Defra	Department of Environment Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
EC	European Commission
EIA	Environmental Impact Assessment
EPUK	Environmental Protection United Kingdom
ES	Environmental Statement
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
km	Kilometres
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
LNR	Local Nature Reserve
$\mu\text{g.m}^{-3}$	Micrograms (of pollutant) per cubic meter (of air)
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
PM <sub>10</sub>	Particulate Matter with an aerodynamic diameter of less than 10 $\mu\text{m}$
PM <sub>2.5</sub>	Particulate Matter with an aerodynamic diameter of less than 2.5 $\mu\text{m}$
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
TG	Technical Guidance
UK	United Kingdom

## GLOSSARY OF TERMINOLOGY

Air pollutants	Amounts of foreign and/or natural substances occurring in the atmosphere that may result in adverse effects on humans, animals, vegetation and/or materials.
Air quality objectives	A series of objectives set by the UK Government's Expert Panel on Air Quality to be achieved either without exception or with a permitted number of

	exceedances within a specific timescale. For nitrogen dioxide the annual mean limit value and the annual mean objective value are set at the same concentration.
Ambient air quality	The concentrations of gases and particles in the atmosphere (tropospheric boundary layer) to which the general population would be exposed, as opposed to the concentration of pollutants emitted by a specific source.
Annual average daily traffic	A daily traffic flow (24hrs), expressed as a mean daily flow across all 365 days of the year (AADT) in units of vehicles per hour.
Annual mean concentration	The average (mean) of the hourly pollutant concentrations measured or predicted for a one year period.
Dust	A generic term that BS6069 (Part 2) used to describe particulate matter in the size range 1 – 75 µm (micrometres) in diameter.
Ecological receptors	Area where the ecology is considered valuable and has one or more designations such as SSSI, SPA, SAC, RAMSAR, LNR or Ancient Woodlands.
Heavy duty vehicle	A vehicle type classification, including rigid and articulated heavy goods vehicles, plus buses and coaches, that is used by air quality dispersion models.
Human receptors	Areas where the occupants are more susceptible to the adverse effects of pollutants.
Light duty vehicle	A vehicle type classification, including motorcycles, cars and light goods vehicles, that is used by air quality dispersion models.
Particulate matter	Solid particles or liquid droplets suspended or carried in the air.
Road links	Individual sections of the road network, usually divided by junctions, used in the modelling of scenarios.
Trackout	The transport of mud and other dusty materials from a works area onto the public highway. Usually on the wheels and body work of vehicles.

## 1. INTRODUCTION

1. The following section outlines criteria developed by the Institute of Air Quality Management (IAQM) for the assessment of air quality impacts arising from construction activities. The assessment procedure is divided into five steps and is summarised below.

## 2. STEP 1: SCREENING THE NEED FOR A DETAILED ASSESSMENT

2. An assessment will normally be required where there are human receptors within 350 m of the 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 50 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 affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.
3. Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible'.

## 3. STEP 2A: ASSESS THE RISK OF DUST IMPACTS

4. A site is allocated to a risk category on the basis of 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 construction activities outlined by the IAQM (construction, earthworks and trackout).

## 4. STEP 2B: DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

5. The IAQM guidance recommends that the dust emission magnitude is determined for demolition (not applicable to this project), earthworks, construction and trackout. The dust emission magnitude is based on the scale of the anticipated works. **Table 4-1** describes the potential dust emission class criteria for each outlined construction activity.

**Table 4-1 Criteria Used in the Determination of Dust Emission Class**

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Demolition	N/A		



Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Earthworks	<ul style="list-style-type: none"> <li>Total site area &lt;2,500 m<sup>2</sup>;</li> <li>&lt;5 heavy moving earth vehicles active at any one time.</li> </ul>	<ul style="list-style-type: none"> <li>Total site area 2,500 – 10,000 m<sup>2</sup>;</li> <li>5 – 10 heavy moving earth moving vehicles active at any one time.</li> </ul>	<ul style="list-style-type: none"> <li>Total site area &gt;10,000 m<sup>2</sup>;</li> <li>&gt;10 heavy earth moving vehicles active at any one time.</li> </ul>
Construction	<ul style="list-style-type: none"> <li>Total building volume &lt;25,000 m<sup>3</sup>;</li> <li>Construction material with low potential for dust release.</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume 25,000 – 100,000 m<sup>3</sup>;</li> <li>Potentially dusty construction material (e.g. concrete).</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume &gt;100,000 m<sup>3</sup>;</li> <li>On site concrete batching.</li> </ul>
Trackout	<ul style="list-style-type: none"> <li>&lt;10 outward HGV trips in any one day;</li> <li>Unpaved road length &lt;50 m.</li> </ul>	<ul style="list-style-type: none"> <li>10 – 50 outward HGV trips in any one day.</li> <li>Unpaved road length 50 – 100 m.</li> </ul>	<ul style="list-style-type: none"> <li>&gt;50 outward HGV trips in any one day;</li> <li>Unpaved road length &gt;100 m.</li> </ul>

## 5. STEP 2B: DEFINE THE SENSITIVITY OF THE AREA

6. The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of receptors;
- The local background PM<sub>10</sub> concentration; and
- Site-specific factors, such as the presence of natural shelters, such as trees, to reduce the risk of windblown dust.

**Table 5-1 Criteria for Determining Sensitivity of Receptors**

Sensitivity of Receptor	Criteria for Determining Sensitivity	
	Dust Soiling Effects	Health Effects of PM <sub>10</sub>
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
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM <sub>10</sub>
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets

7. The criteria detailed in **Table 4-1** and **Table 5-1** were used to determine the sensitivity of the area to dust soiling effects and human health and ecological impacts. **Figure 22.2 (Volume II)** details the distance bands, as detailed in **Table 5-2** to **Table 5-4**, from the site boundary for use in the construction phase assessment.

**Table 5-2 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 5-3 Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg.m <sup>3</sup>	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	>28-32 µg.m <sup>3</sup>	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	>24-28 µg.m <sup>3</sup>	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg.m <sup>3</sup>	>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 5-4 Sensitivity of the Area to Ecological Impacts**

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

## 6. STEP 2C: DEFINE THE RISK OF IMPACTS

8. The dust emission magnitude and sensitivity of the area are combined and the risk of impacts from each activity (earthworks, construction and trackout) before mitigation is applied should be determined using the criteria detailed in **Table 6-1** to **Table 6-2**.

**Table 6-1 Risk of Dust Impacts - Earthworks and 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 6-2 Risk of Dust Impacts - Trackout**

Potential Impact	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

## 7. STEP 3: SITE-SPECIFIC MITIGATION

9. 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 Project are detailed in **Chapter 22, Air Quality**.

## 8. STEP 4: DETERMINE SIGNIFICANT EFFECTS

10. With the implementation of the above mitigation measures, the residual impacts from the construction are considered to be **not significant**, in accordance with IAQM guidance.