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Appendix 15-1: Construction Phase Dust Assessment

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Appendix 15-1 Construction Phase Dust Assessment

The construction phase of the Proposed Development will involve a number of activities which have the potential to impact on local air quality.

The location of sensitive receptors in relation to construction activities will affect the potential for such construction activities to cause dust soiling, nuisance and local air quality impacts. Meteorological conditions and the use of control measures will also contribute to the effects experienced.

Steps 1 to 4 of the IAQM guidance were followed in undertaking the construction phase dust assessment.

Step 2: Assess the Risk of Dust Impacts

Step 2A: Define the Potential Dust Emission Extent

The dust emission extents for the construction activities were defined using the criteria detailed in the IAQM guidance as summarised in Table 15-1.1.

Table 15-1.1: Dust Emission Extent Criteria and Definition

Activity	IAQM Dust Emission Magnitude	IAQM Dust Emission Magnitude Criteria
Demolition	Large	Total building volume >75,000m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level.
	Medium	Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material, demolition activities 6 - 12m above ground level.
	Small	Total building volume <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.
Earthworks	Large	Total site area >110,000m 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 >6 m in height.
	Medium	Total site area 18,000m ² – 110,000m ² , moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height.

Activity	IAQM Dust Emission Magnitude	IAQM Dust Emission Magnitude Criteria
	Small	Total site area <18,000m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3m in height.
Construction	Large	Total building volume >75,000m ³ , on site concrete batching, sandblasting.
	Medium	Total building volume 12,000m ³ – 75,000m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching.
	Small	Total building volume <12,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber).
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.
	Medium	20 - 50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m.
	Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

The dust emission extents defined for the Project are detailed in Table 15-1.2. Demolition is not proposed as part of the Proposed Development and therefore was not considered further in the assessment.

Table 15-1.2 Summary of Project Defined Dust Emission Extents

Activity	Project Defined Dust Emission Extent	IAQM Dust Emission Extent Criteria
Earthworks	Large	Earthworks are required to provide foundations to the proposed infrastructure and to allow for cable routes to be lay. The area where earthworks are required is greater than 110,000m ² .
Construction	Small	Due to the nature of the Proposed Development, limited construction is required on site and therefore the total building volume is anticipated to be less than 12,000m ³ across the DCO extents. Furthermore, construction material will mostly comprise metal which has low potential for dust release.
Trackout (trackout is defined as dirt, mud or other debris tracked out onto a paved public roadway by a vehicle leaving a construction site.)	Large	Based on the scale of the Proposed Development, it is anticipated there more than 50 outward HDV movements may be operational during peak construction.

Step 2B: Define the Sensitivity of the Area

The assessment requires the determination of the sensitivity of the area for the purposes of dust soiling, human health and ecological impacts. The sensitivity of the study area takes into account the specific receptors in the vicinity of the Site, the proximity and number of those receptors, the local background concentration of PM₁₀ and site-specific factors. Figure 15.1 was utilised to determine the number of receptors located within the distance bands provided in the IAQM guidance for determining receptor sensitivity.

According to Institute of Air Quality Management (IAQM) guidance, the main potential impacts on ecological receptors resulting from dust emissions are direct physical effects in the form of “reduced photosynthesis, respiration and transpiration through smothering”. Other impacts, such as chemical changes to soil “are likely to occur only as a result of long-term demolition and construction works”. Unless species particularly sensitive to these effects are present, ecological receptors are likely to be less sensitive than human receptors. There are a number of ecological designations within the DCO extents of varying national and local importance. To provide a robust assessment, the highest sensitivity of ecological designations was applied when considering ecological receptors within the defined construction dust buffers.

A summary of the sensitivity of the area to construction phase dust, human health and ecological effects is provided in Table 15-1.3.

Table 15-1.3: Determination of Sensitivity in the Area

Potential Impact	Justification	Sensitivity		
		Earthworks	Construction	Trackout
Dust Soiling	There are between 10 and 100 highly sensitive residential dwellings within 20m of the Draft Order Limits. No receptors are located within 50m of the route to be used by construction traffic up to 250m from the site access point. Based on the information available to date, it is assumed that the site access is at the Former Shell Oil Storage Consolidation Centre. However this may be amended once detailed information of phasing and specific access to parcels is confirmed.	High	High	Low

<p>Human Health</p>	<p>There are between 10 and 100 highly sensitive residential dwellings within 20m of the Site boundary. No receptors are located within 50m of the route to be used by construction traffic up to 250m from the Site access point. Based on the information available to date, it is assumed that the site access is at the Former Shell Oil Storage Consolidation Centre. However this may be amended once detailed information of phasing and specific access to parcels is confirmed.</p> <p>Furthermore, annual mean background PM₁₀ concentrations are below 24µg/m⁻³ across the study area as shown in Table 15-8.</p>	<p>Low</p>	<p>Low</p>	<p>Low</p>
<p>Ecological</p>	<p>The Llyn Alaw SSSI is located within 20m of the Site boundary which has robustly been considered to be of high sensitivity. No ecological designations are located within 50m of the of the route to be used by construction traffic up to 250m from the Site access point. Based on the information available to date, it is assumed that the site access is at the Former Shell Oil Storage Consolidation Centre. However this may be amended once detailed information of phasing and specific access to parcels is confirmed.</p>	<p>High</p>	<p>High</p>	<p>Low</p>

Step 2C: Define the Risk of Impacts

The dust emission extent determined in Step 2A is then combined with the sensitivity of the area determined in Step 2B to define the risk of dust impacts with no mitigation applied. The results of this assessment are detailed in Table 15-1.4.

Table 15-1.4: Summary Dust Risk Table to Define Site Specific Risk

Activity	Step 2A: Dust Emission Extent	Step 2B: Sensitivity of the Area	Step 2C: Risk of Dust Impacts
<i>Dust Soiling Effects on People and Property</i>			
Earthworks	Large	High	High Risk
Construction	Small	High	Low Risk
Trackout	Large	Low	Low Risk
<i>Human Health Impacts</i>			
Earthworks	Large	Low	Low Risk
Construction	Small	Low	Negligible Risk
Trackout	Large	Low	Low Risk
<i>Ecological Effects</i>			
Earthworks	Large	High	High Risk
Construction	Small	High	Low Risk
Trackout	Large	Low	Low Risk

Step 3: Site Specific Mitigation

The risk of dust impacts, defined in Step 2C of the assessment, is used to determine the mitigation measures required to minimise the emission of dust during construction phase activities. The IAQM guidance provides details of highly recommended and desirable mitigation measures which are commensurate with the risk of dust impacts defined in Step 2C for construction, earthworks and trackout activities. Where the mitigation measures are general in nature, the highest risk category was applied in accordance with the guidance. The highest risk category identified was 'High Risk' and the recommended mitigation taken from the IAQM guidance for inclusion within the oCEMP is provided in Tables 15-1.5 and 15-1.6 below.

Table 15-1.5: Mitigation Measures for a High Risk Site

Category	Mitigation Measures for a High Risk Site	
	Highly Recommended	Desirable
Communication	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	None
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager.	
	Display the head or regional office contact information.	
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document.	
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.	None
	Make the complaints log available to the local authority when asked.	
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	
	Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site	

	transport/deliveries which might be using the same strategic road network routes.	
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided as necessary.	None
	Carry out regular site inspections to monitor compliance with the DMP, record inspections results, and make an inspection log available to the local authority when asked.	
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	
Preparing and maintaining the site	Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	None
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.	
	Avoid site runoff of water or mud.	
	Keep site fencing, barriers and scaffolding clean using wet methods.	
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If	

	<p>they are being re-used on-site cover as described below.</p> <p>Cover, seed or fence stockpiles to prevent wind whipping.</p>	
<p>Operating vehicle/ machinery and sustainable travel</p>	<p>Ensure all vehicles switch off engines when stationary – no idling vehicles.</p>	<p>None</p>
	<p>Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.</p>	
	<p>Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable control measures provided, subject to the approval of the nominated undertaker with the agreement of the local authority, where appropriate).</p>	
	<p>Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.</p>	
	<p>Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).</p>	
<p>Operations</p>	<p>Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.</p>	<p>None</p>
	<p>Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.</p>	
	<p>Used enclose chutes and conveyors and covered skips.</p>	
	<p>Minimise drop heights from conveyors, loading shovels, hoppers and other</p>	

	loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	
	Ensure equipment is readily available on site to clean and dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	
Waste Management	Avoid bonfires and burning of waste materials.	None

Table 15-1.6: Mitigation Measures Specific to Earthworks, Construction and Trackout

Category	Mitigation Measures	
	Highly Recommended	Desirable
Earthworks (High Risk Site)	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	
	Only remove the cover in small areas during work and not all at once.	
Construction (Medium Risk Site)	None	Avoid scabbling (roughening of concrete surfaces) if possible.
		Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Trackout (Low Risk Site)	None	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any materials tracked out of the site. This may require the sweeper being continuously in use.
		Avoid dry sweeping of large areas.
		Ensure vehicles entering and leaving the sites are covered to prevent escape of materials during transport.
		Record all inspections of haul routes and any subsequent action in a site log book.
		Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Step 4: Determine Significant Effects

In accordance with IAQM guidance, with the implementation of the mitigation measures detailed in Step 3, the residual impacts from the construction phase are considered to be 'not significant'.

Figure 15.1: Construction Phase Dust Distance Buffers

