

The Wrexham (Gas Fired Power Station) Order

6.4.3 Volume 4: Environmental Statement Appendix 8.1: Construction Dust Assessment Methodology

Planning Act 2008 The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009

PINS Reference Number:	EN010055
Document Reference Number:	6.4.3
Regulation Number:	5(2) (a)
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Revision:	Date:	Description:
0	March 2016	Submission version

Appendix 8 ♦ Air Quality

A8.1 CONSTRUCTION DUST ASSESSMENT METHODOLOGY

Supplementary information

- 8.1.1 Assessment of construction dust effects has been undertaken in accordance with the four step process described in the IAQM Guidance (2014). The four steps to assessment are identification of receptors, risk assessment, consideration of site specific mitigation measures, followed by an assessment of the significance of effects.
- 8.1.2 Summary methodology was described in the Air Quality Chapter of the main Environmental Statement (Volume 1). Supplementary information is provided in this Appendix.
- 8.1.3 Step 2B of the construction dust assessment determines the sensitivity of the area. Table A8.1 below gives guidance on classifying the sensitivity of different types of receptor to dust soiling, health effects and ecological effects (Boxes 6, 7, and 8 of the IAQM Guidance).

Table A8.1: Definition of the sensitivity of receptors to dust

Receptor sensitivity	Guidance on the sensitivity of different types of receptor		
	Sensitivity of people to dust soiling effects	Sensitivity of people to the health effects of PM ₁₀	Sensitivity of receptors to ecological effects
High	Users can reasonably expect a enjoyment of high level of amenity; The appearance, aesthetics or value of 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 use of the land. Examples include dwellings, culturally important sites, medium	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM ₁₀ (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). Examples include residential properties, hospitals, schools and residential care homes.	Locations with an international or national designation with designated features that may be affected by dust soiling; Locations where there is a community of a particularly dust sensitive species such as vascular species; Examples include SACs for acid heathlands or a local site designated for lichens, adjacent to the demolition of a large site containing concrete (alkali) buildings

Receptor sensitivity	Guidance on the sensitivity of different types of receptor		
	Sensitivity of people to dust soiling effects	Sensitivity of people to the health effects of PM ₁₀	Sensitivity of receptors to ecological effects
	and long term car parks and car show rooms.		
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; The appearance, aesthetics or value of property could be diminished by soiling; The people or property wouldn't be present continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where people exposed are workers, and exposure over a period relevant to the air quality objective for PM ₁₀ (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). Examples include office and shop workers, but not workers occupationally exposed to PM ₁₀ (covered by Health and Safety at Work Legislation).	Locations where there is a particularly important plant species, where 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	The enjoyment of amenity would not reasonably be expected; Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; 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 (unless commercially-sensitive horticultural), footpaths, short term car parks and	Locations where human exposure is transient. Examples include footpaths, playing fields, parks and shopping streets.	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.

Receptor sensitivity	Guidance on the sensitivity of different types of receptor		
	Sensitivity of people to dust soiling effects	Sensitivity of people to the health effects of PM ₁₀	Sensitivity of receptors to ecological effects
	roads.		

8.1.4 The receptor sensitivity defined in the construction assessment above is combined with site specific conditions (e.g. the distance from source, and in the case of human health impacts, the existing background concentrations of PM₁₀); to determine overall sensitivity of the area using the matrices presented in Tables A8.2, A8.3 and A8.4 (Tables 2, 3 and 4 of the IAQM Guidance).

Table A8.2: Sensitivity of the area to dust soiling effects on people and property matrix

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 A8.3: Sensitivity of the area to human health impacts

Receptor sensitivity	Annual mean PM ₁₀ concentration	Number of receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/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 A8.4: Sensitivity of the area to ecological impacts

Receptor sensitivity	Distance from source
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	<20 m	< 50 m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

8.1.5 Step 2C seeks to determine the risk of impacts in the absence of mitigation by combining the dust emission magnitude for each activity with the sensitivity of the area. The matrices for defining the risk of dust impacts for each activity are presented in Tables A8.5, A8.6 A8.7 and A8.8, below.

Table A8.5: 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 A8.6: 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 A8.7: 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 A8.8: 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

- 8.1.6 In Step 3 the dust risk impacts determined in Step 2 are used to define appropriate, site specific mitigation measures for each of the potential activities if relevant to the scheme. Detailed recommendations are provided in the IAQM Dust Guidance and are discussed in Volume 1, Chapter 8 of the ES under the heading “Mitigation Measures”.
- 8.1.7 Step 4 determines the significance of residual effects after site specific mitigation. It is standard best practice that construction activities would include appropriate mitigation methods at major sites and IAQM Dust Guidance considers that the residual effects will normally be ‘not significant’. However, specific characteristics of the Scheme should be considered and mitigation measures should be defined in a form suitable for implementation by way of a planning agreement or CEMP.
- 8.1.8 The mitigation measures from the IAQM guidance for high, medium and low risk sites, are reproduced below. Those proposed as “highly recommended” for a medium risk site for demolition –type activities, and for a low risk site for all subsequent activities, have been highlighted in the main air quality assessment for inclusion in the CEMP.

Key:

- H highly recommended
- D desirable
- N not required.

Mitigation for all sites: Communications

Mitigation measure	Low Risk	Medium Risk	High Risk
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
3. Display the head or regional office contact information	H	H	H

Mitigation for all sites: Dust Management

Mitigation measure	Low Risk	Medium Risk	High Risk
4. 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. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.	D	H	H
Site Management			
5. 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.	H	H	H
6. Make the complaints log available to the local authority when asked.	H	H	H
7. 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.	H	H	H
8. 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.	N	N	H
Monitoring			
9. 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 site boundary, with cleaning to be provided if necessary.	D	D	H
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked	H	H	H
11. 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.	H	H	H
12. Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	N	H	H
Preparing and maintaining the site			
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period	D	H	H
16. Avoid site runoff of water or mud.	H	H	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H

Mitigation measure	Low Risk	Medium Risk	High Risk
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	D	H	H
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable	H	H	H
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
23. 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 additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	D	D	H
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	N	D	H
Operations			
26. 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.	H	H	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
28. Use enclosed chutes and conveyors and covered skips.	H	H	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H
Waste management			
31. Avoid bonfires and burning of waste materials.	H	H	H

Measures specific to demolition

Mitigation measure	Low Risk	Medium Risk	High Risk
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
33. Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	H	H	H
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
35. Bag and remove any biological debris or damp down such material before demolition.	H	H	H

Measures specific to earthworks

Mitigation measure	Low Risk	Medium Risk	High Risk
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable..	N	D	H
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable	N	D	H
38. Only remove the cover in small areas during work and not all at once	N	D	H

Measures specific to construction

Mitigation measure	Low Risk	Medium Risk	High Risk
39. Avoid scabbling (roughening of concrete surfaces) if possible	D	D	H
40. 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.	D	H	H
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery.	N	D	H
42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D

Measures specific to trackout

Mitigation measure	Low Risk	Medium Risk	High Risk
43. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	D	H	H
44. Avoid dry sweeping of large areas.	D	H	H
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
47. Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
50. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	N	H	H
51. Access gates to be located at least 10m from receptors where possible.	N	H	H