Appendix A7.3: Air Quality Construction Assessment

1 Construction Phase Dust Assessment Methodology

1.1 The criteria developed by the Institute of Air Quality Management (IAQM 2016) for the assessment of air quality impacts arising from construction activities was used as the basis for the assessment methodology discussed in the following sections. The assessment is comprised of five steps as discussed below.

Step 1: Identify the Need for a Detailed Assessment

1.2 An assessment would normally be required where there is:

- a human receptor within 350m of the proposed scheme; and / or within 50m of the roadside used by the construction vehicles on the public highway, up to a distance of 500m from the construction site entrance(s); and/or
- an ecological receptor within 50m of the proposed scheme and / or within 50m of the roadside used by construction vehicles on the public highway, up to a distance of 500m from the construction site entrance(s).

1.3 A human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust-soiling, or exposure to particulate matter (PM_{10}) over a period relevant to the air quality objectives. Although $PM_{2.5}$ is not specifically included as a parameter within the assessment, the risk levels associated with PM_{10} and any subsequent mitigation measures would also apply to $PM_{2.5}$, as $PM_{2.5}$ is included within the PM_{10} fraction.

1.4 An ecological receptor 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, such as a Site of Importance for Nature Conservation (SINC) or Local Wildlife Site (LWS).

1.5 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects would be 'not significant'.

Step 2: Assess the Risk

1.6 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 allocation of mitigation measures. Risks are described in terms of there being a low, medium or high risk of dust impacts for each of the four separate potential activities (demolition, construction, earthworks and trackout). Site-specific mitigation would be required, proportionate to the level of risk.

<u>Step 2A: Define the Potential Dust Emission Magnitude</u>

1.7 The potential dust emission magnitude is based on the scale of the anticipated works and should be classified as small, medium or large. Table 1 presents the dust emission criteria outlined for each construction activity.

Table 1: Potential Dust Emission Magnitude

Construction Activity	Large	Medium	Small
Demolition	Total building volume >50,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level.	Total building volume 20,000m^3 to 50,000m^3, potentially dusty construction material, demolition activities 10 to 20m above ground level.	Total building volume <20,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.
Earthworks	Total site area >10,000m^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 >8m in height, total material moved >100,000 tonnes.	Total site area 2,500m^2 to 10,000m^2, moderately dusty soil type (e.g. silt), 5 to 10 heavy earth moving vehicles active at any one time, formation of bunds 4m to 8m in height, total material moved 20,000 tonnes to 100,000 tonnes.	Total site area <2,500 m^2, 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 month.
Construction	Total building volume >100,000m^3, on site concrete batching, sandblasting.	Total building volume 25,000m^3 to 100,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	>50 Heavy Duty Vehicles (HDV) (>3.5t) outward movements[1] in any one day[2], potentially dusty surface material (e.g. high clay content), unpaved road length >100m.	10 to 50 HDV (>3.5t) outward movements[1] in any one day[2], moderately dusty surface material (e.g. high clay content), unpaved road length 50m to 100m.	<10 HDV (3.5t) outward movements[1] in any one day[2], surface material with low potential for dust release, unpaved road length <50m.

1. A vehicle movement is a one-way journey. i.e. from A to B and excludes the return journey.
2. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Step 2B Define the Sensitivity of the Area

1.8 The sensitivity of the area is described as low, medium and high and takes into account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- the local background PM10 concentrations; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

1.9 Table 2 presents indicative examples of classification groups for the varying sensitivities of people to dust soiling effects to the health effects of PM_{10}; and the sensitivities of receptors to ecological effects. A judgement is made at the site-specific level where sensitivities may be lower, for example a soft fruit business may be more sensitive to soiling than an alternative industry in the same location. Box 6, Box 7 and Box 8 within IAQM (IAQM, 2016) outline more detailed guidance for defining sensitivity.

Table 2: Indicative Examples of the Sensitivity of Different Types of Receptors

Sensitivity of Receptor	Sensitivities of People and Ecological Receptors		
	Dust Soiling Effects [1]	Health Effects of PM_{10} [2]	Ecological Effects [3]
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 (e.g. SAC/SPA/Ramsar). 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.
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 dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition (e.g. SSSIs).
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 (e.g. local nature reserves).

1. People's expectations would vary depending on the existing dust deposition in the area.
2. This follows the Department for Environment, Food and Rural Affairs (Defra 2018) guidance as set out in Local Air Quality Management Technical Guidance (LAQM.TG (16)). Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. As such workers have been included in the medium sensitivity category.
3. Only if there are habitats that might be sensitive to dust. A Habitat Regulation Assessment (HRA) of the site may be required as part of the planning process if the site lies close to an internationally designated site i.e. Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites

1.10 The IAQM guidance advises consideration of the risk associated with the nearest receptors to construction activities.

1.11 Where there are multiple receptors in a single location, a worst-case representative receptor location is considered and the highest risk applicable is allocated.

1.12 The receptor sensitivity and distance are then used to determine the potential dust risk for each dust effect for each construction activity as shown in Table 3, Table 4 and Table 5. It is noted that distances are to the dust source and so a different area may be affected by trackout than by on-site works.

1.13 For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur from roads up to 500m from large sites, 200m from medium sites and 50m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50m from the edge of the road.

Table 3: Sensitivity of the Area to Dust Soiling Effects on People and Property[1,2]

Receptor sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 to 100	High	Medium	Low	Low
	1 to 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

1. Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are seven high sensitivity receptors <20 metres of the source and 95 high sensitivity receptors between 20 and 50m, then the total of number of receptors <50 metres is 102. The sensitivity of the area in this case would be high.
2. For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur from roads up to 500m from large sites, 200m from medium sites and 50m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50m from the edge of the road.

Table 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	>32 µg/m^3 (>18 µg/m^3 in Scotland)	>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 (16-18 µg/m^3 in Scotland)	>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 (14-16 µg/m^3 in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m^3 (>18 µg/m^3 in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m^3 (16-18 µg/m^3 in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m^3 (14-16 µg/m^3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m^3 (>14 µg/m^3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

1. Estimate the total within the stated distance (e.g. the total within 350m and not the number between 200 and 350m), noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are seven high sensitivity receptors <20 metres of the source and 95 high sensitivity receptors between 20 and 50m, then the total of number of receptors <50 metres is 102. If the annual mean PM_{10} concentration is 17µg/m^3, the sensitivity of the area would be high.

2. Most straightforwardly taken from the national background maps but should also take account of local sources. The values are based on 18µg/m^3 being the annual mean concentration at which an exceedance of the 24-hour objective is likely in Scotland.
3. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.

Table 5: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)[1]	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

1. Only the highest level of area sensitivity from the table needs to be considered.

Step 2C Define the Risks of Impacts

1.14 The dust emission magnitude is then combined with the sensitivity of the area to determine the overall risk of impacts with no mitigation measures applied. The matrices in Table 6 provide a method of assigning the level of risk for each activity. These can then be used to determine the level of mitigation that is required.

Table 6: Risks of Dust Impacts

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible risk
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible risk
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Low risk	Negligible risk
Low	Low risk	Low risk	Negligible risk

Step 3 Site Specific mitigation

1.15 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 highest risk category of a site (of all activities being undertaken) is recommended when considering appropriate mitigation measures for the site. Where risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required. However, additional mitigation measures may be applied as good practice.

1.16 A selection of these measures have been specified for Low risk to High risk sites in the IAQM guidance (IAQM, 2016) as measures suitable to mitigate dust emissions from activities.

Step 4 Determine Significant Effects

1.17 Following Step 2 (definition of the proposed scheme and the surroundings and identification of the risk of dust effects occurring for each activity), and Step 3 (identification of appropriate site-specific mitigation), the significance of the potential dust effects can be determined. The recommended mitigation measures should normally be sufficient to reduce construction dust impacts to a not significant effect.

1.18 The approach in Step 4 of IAQM dust assessment guidance has been adopted to determine the significance of effects with regard to dust emissions. The guidance states the following: '*For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant.'*

1.19 IAQM guidance also states that: '*Even with a rigorous DMP [Dust Management Plan] in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects will be 'not significant'.'*

1.20 Step 4 of IAQM guidance recognises that the key to the above approach is that it assumes that the regulators ensure that the proposed mitigation measures are implemented. The management plan would include the necessary systems and procedures to facilitate on-going checking by the regulators to ensure that mitigation is being delivered, and that it is effective in reducing any residual effect to 'not significant' in line with the guidance.

2 Construction Dust Assessment

Step 1: Identify the Need for a Detailed Assessment

2.1 An assessment of potential demolition, earthworks, and construction and trackout impacts was undertaken in accordance with the IAQM methodology described earlier and as set out in Chapter 7 (Air Quality). The first step is Step 1, where the need for a detailed assessment is determined based on the location of receptors within the vicinity of the study area.

Human receptors

2.2 There are human receptors within 350m of the study area; therefore, further assessment is required. A count of the 'High' sensitive relevant human receptors within the specified assessment bands for each phase of the proposed scheme was carried out as recommended in IAQM guidance (IAQM 2016), the results of which are set out in Table 7.

Table 7: Dust Soiling and Human Health Receptor Count (assumed that all are High sensitivity receptors)

Construction activity and distance to receptor		Number of Receptors*
Demolition, Earthworks and Construction Activities		
Distance to application site red line boundary	< 20m	4
	< 50m	14
	< 100m	36
	< 350m	652
Trackout (Haul route SA1 and SA5)		
Distance from roads up to 500 m from the site entrance	< 20m	4
	< 50m	10

*Exact counting of the number of 'human receptors' is not required. It is recommended that judgement is used to determine the approximate number of receptors within each distance band (IAQM 2016).

Ecological Receptors

2.3 There are no ecological receptors within proximity of the construction site boundary or within 50m of the local road network up to 500m from the site entrance likely to be used during construction of the proposed scheme. No further consideration is made to construction dust effects at ecological designations.

Step 2A: Define the Potential Dust Emission Magnitude

2.4 Phase 1 of the respective Sections of the construction works is considered to give rise to the highest emission magnitudes due to the volume of material to be moved, size of the area and variety of activities (this Phase of the works includes the construction of the Cradlehall Rail Bridge (PS03) and the Inshes Overbridge (PS02), see Chapter 4 (The Proposed Scheme) and Appendix A4.1 (Construction Information). In the absence of a plan indicating site-specific construction activities within each Section, it is assumed all activities will take place close to the site boundary.

2.5 At the time of writing information relating to the maximum number of earth moving vehicles on site, maximum Heavy Duty Vehicles (HDVs) outward movements per day, the proposed haul routes (on-site and off-site) and the likely stockpiling heights have been assumed to allow determination of activity specific dust emission magnitudes, as presented in Table 8. Any assumptions are based on realistic scenarios where applicable.

Table 8: Dust Emission Magnitude

Construction activity	Dust Emission Magnitude
Demolition	Not applicable
Earthworks	Large
Construction	Medium
Trackout	Large

Step 2B: Define the Sensitivity of the Area

2.6 Table 9 displays the sensitivities of the surrounding area to demolition, earthworks, construction and trackout based on the criteria set out in Table 3 and Table 4. The national estimated annual mean mapped background PM_{10} concentrations (Scottish Air Quality 2018) within the study area are less than 18 µg/m^3.

Table 9: Sensitivity of Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Not applicable	Medium	Medium	Medium
Human Health	Not applicable	Low	Low	Low

Step 2C: Define the risk of impacts

Human Receptors

2.7 Using the dust emission magnitudes for the various activities in Table 8 and the sensitivity of the area provided in Table 9, the definition of the risks for each activity are provided in Table 10 for dust soiling and human health impacts.

Table 10: Dust Risk at Human Receptors

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Not applicable	Medium risk	Medium risk	Medium risk
Human Health	Not applicable	Low risk	Low risk	Low risk

Step 3: Site-specific Mitigation

Recommended mitigation measures

2.8 The results in Table 10 indicate that dust risk from construction activities associated with the proposed scheme have the potential to be medium for dust soiling and low for human health impacts. Mitigation measures would be needed to reduce the potential for significant effects of dust emissions in the vicinity of the proposed scheme. The suggested mitigation measures, based on the risk level identified which should be adopted for the proposed scheme, are set out below.

2.9 The mitigation measures are those specified in the IAQM guidance (IAQM 2016) and are suitable to mitigate dust emissions generated by the proposed scheme. Measures such as those specified in the guidance would normally be sufficient to reduce construction dust nuisance, risk to human health or effects on ecological sites to a 'not significant' effect. These measures are listed in Table 11 with a recommendation as to whether or not they should be applied based on the risk level identified in the dust assessment for the proposed scheme.

2.10 For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for demolition and track out, the general measures applicable to high risk site should be applied.

2.11 The measures to control dust emissions and monitor the effectiveness of the mitigation should be agreed formally with the respective local authority and potentially key stakeholders as part of a Dust and Air Quality Management Plan (DMP) which would form part of the Construction Environmental Management Plan (CEMP). It is anticipated that this would be achieved through the setting of an appropriate condition or requirement through the Environmental Impact Assessment (EIA) process.

Key: H – Highly recommended D – Desirable N – Not required

Table 11: Mitigation for the Proposed Scheme

Mitigation Controls	High Risk	Medium Risk	Low Risk
Communication			
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	H	H	N
2. Display the name and contact details of person(s) accountable for air quality (including dust and odour) 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	D	H
Dust Management			
4. Develop and implement a Dust Management Plan (DMP) which should be discussed with and approved by the relevant Local Authorities. The level of detail should reflect the worse-case locations, 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 question.	H	H	D
Site management			
5. Record all dust and air quality complaints, identify cause(s), and 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/air emissions, either onsite or offsite, and the action taken to resolve the situation in the log book. Review measures accordingly.	H	H	H
Monitoring			
9. Undertake daily on/off site inspections, at nearby receptors (including roads) to monitor dust, record inspection results, and make the log available to the local authority when asked. Regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary should be undertaken, with cleaning to be provided if necessary. It is understood road cleaning would be in operation.	H	D	D
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

Mitigation Controls	High Risk	Medium Risk	Low Risk
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	D	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.	H	D	N
Site Preparation and Maintenance			
13. Plan site layout so that machinery and dust/odour 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 specific operations where there is a high potential for dust production and the site is active for an extensive period.	H	H	D
16. Avoid site runoff of water (minimising risk of dissolution from leachate) or mud.	H	H	H
17. Keep site fencing and barriers clean using wet methods.	H	D	D
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used. If they are being re-used on-site, provide cover as described below, especially when sites are not active (i.e. weekends).	H	H	D
19. Any contaminated excavated material being disposed off-site in accordance with the Site Waste Management Plan (SWMP) as agreed with the Environment Agency.	H	H	H
20. Cover, seed or fence stockpiles to prevent wind whipping.	H	H	D
Operating vehicle/machinery and sustainable travel			
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	D	H
23. Impose and signpost a maximum-speed-limit of 15 mph (surfaced) and 10 mph (unsurfaced) haul roads and work areas (if long haul routes are required, 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).	H	D	D

Mitigation Controls	High Risk	Medium Risk	Low Risk
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	H	H	N
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	H	D	N
Operations			
27. 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
28. 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
29. Use enclosed chutes and conveyors and covered skips.	H	H	H
30. 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	D	H
31. 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.	H	H	D
Waste management			
32. Avoid bonfires and burning of waste materials.	H	H	H
Demolition			
33. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);	H	N	D
34. 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	N	H
35. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	N	H
36. Bag and remove any biological debris or damp down such material before demolition.	H	N	H
Earthworks			
37. Re-vegetate earthworks and exposed areas / soil stockpiles to stabilize surfaces as soon as practicable.	H	D	N
38. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	H	D	N

Mitigation Controls	High Risk	Medium Risk	Low Risk
39. Only remove the cover in small areas during work and not all at once.	H	D	N
Construction			
40. Avoid scabbling (roughening of concrete surfaces) if possible.	H	D	D
41. 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.	H	H	D
Trackout			
42. 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.	H	H	D
43. Avoid dry sweeping of large areas.	H	H	D
44. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	H	H	D
45. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	H	H	N
46. Record all inspections of haul routes and any subsequent action in a site log book.	H	D	D
47. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	H	H	N
48. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	H	H	D
49. 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.	H	H	N
50. Access gates to be located at least 10m from receptors where possible.	H	H	N