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Chapter 6

Air Quality

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Genex Kidston Connection Project - Ministerial Infrastructure Designation Assessment Report

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6.0 Air Quality

6.1 Pollutants of Concern

A review of applicable National Pollution Inventory (NPI) emission estimation manuals and the Queensland Government Department of Transport and Main Roads (TMR) Road Traffic Air Quality Management Manual (RTAQMM) has been undertaken to determine the primary air pollutants of concern for the construction phase of the Project which have been considered in this air quality assessment. The pollutant species which have been considered are as follows:

- Particulate matter
- Nitrogen dioxide (NO_2)
- Sulfur dioxide (SO_2).

A brief discussion regarding these pollutants and their potential effects on health and the environment is provided in the following sections.

6.1.1 Particulate Matter

Particulate matter refers to the many types and sizes of particles which can be suspended in the air environment. Particle size fractions are commonly described as follows:

- Particles with an aerodynamic diameter of less than or equal to 50 micrometres (µm) are classified as total suspended particulates (TSP)
- Particles with an aerodynamic diameter less than or equal to 10 µm are classified as PM_{10}
- Particles with an aerodynamic diameter less than or equal to 2.5 µm are classified as $PM_{2.5}$.

Particulate matter can be emitted from natural sources (bushfires, dust storms and pollens) or as a result of human activities, such as from internal combustion sources (e.g., motor vehicle emissions, power generation, incineration, etc) or from mechanical processes (e.g., excavation works, bulk material handling, crushing operations, vehicles on unpaved roads, etc).

TSP, which includes the coarser sized particulates, is generated primarily from fugitive emissions sources such as vehicle travel on unsealed roads, wind erosion from exposed areas or earthen material stockpiles and handling of earthen material. TSP is primarily associated with nuisance impacts associated with coarse particles settling on surfaces, referred to as dust deposition, and is a common cause of complaints. Impacts resulting from dust deposition have been considered in the assessment of the construction phase for the Project.

PM_{10} particles tend to remain suspended in the air for longer periods than larger particles (e.g., TSP) and can penetrate into human lungs. PM_{10} can be created in high quantities through the crushing and grinding of rocks and soil. PM_{10} is also emitted from vehicle exhausts (combustion engine emissions). For the Project, PM_{10} is a pollutant of concern for the construction phase only.

$PM_{2.5}$ can travel further into human lungs than the larger particulates and are often made up of heavy metals and carcinogens due to its smaller aerodynamic size. Therefore, $PM_{2.5}$ is considered to pose a greater risk to human health than larger particle sizes (e.g., PM_{10} and TSP). However, $PM_{2.5}$ is most commonly emitted from combustion sources, which although present for construction (i.e., road vehicles and diesel generators) are not emitted in high quantities during construction activity. $PM_{2.5}$ is not considered a pollutant of concern for the Project and has not been considered further in the assessment.

6.1.2 Nitrogen Dioxide

NO_2 is a brownish gas with a pungent odour. NO_2 is a product of combustion processes, and in urban areas motor vehicles and industrial combustion processes are the major sources of ambient NO_2.

NO_2 can cause damage to the human respiratory tract, increasing a person's susceptibility to respiratory infections and asthma. Sensitive populations, such as the elderly, children, and people with pre-existing health conditions are most susceptible to the adverse effects of NO_2 exposure.

Damage to plants can occur in environments with high concentrations of NO_2, especially in the presence of other pollutants such as O_3 and SO_2.

For the Project, NO_2 is considered unlikely to be a pollutant of concern for the Project, however ambient air quality monitoring data has been reviewed to determine the risk of impact for this pollutant species.

6.1.3 Sulfur Dioxide

SO_2 is a colourless gas with a sharp, irritating odour. It is formed in combustion processes through burning fossil fuel containing sulfur, in petroleum refining and smelting mineral ores. SO_2 is an irritant gas that can cause respiratory tract infections. People with pre-existing respiratory conditions such as asthma are most sensitive to SO_2 exposure.

For the Project, SO_2 is considered unlikely to be a pollutant of concern for the Project, however ambient air quality monitoring data has been reviewed to determine the risk of impact for this pollutant species.

6.2 Relevant Air Quality Legislation and Criteria

Relevant Legislation and Policy instruments considered in the assessment of air quality are:

- *Environmental Protection Act 1994* (Queensland) (EP Act)
- *Environmental Protection (Air) Policy 2019* (Queensland) (EPP Air)
- National Environment Protection (Ambient Air Quality) Measure (Commonwealth) (Air Quality NEPM).

6.2.1 Environmental Protection Act 1994 and Environment Protection Regulation 2019

The *Environmental Protection Act 1994* (Qld) (EP Act) regulates environmentally relevant activities (ERA) under the EP Regulation which are permitted under an Environmental Authority (EA). There are several Environmental Protection Policies (EPPs) published under the EP Act that govern the requirement for management of environmental issues such as noise, air, and water. These policies determine objectives to be achieved in various environments with reference to sensitive receptors. The EPP Air was considered as part of this assessment.

6.2.2 Environmental Protection (Air) Policy 2019

The EPP Air seeks to enhance or protect the atmospheric environment in Queensland by providing air quality objectives. The air quality objectives set out in the EPP Air are intended to be progressively achieved over the long term.

The EPP Air recommends several strategies to control emissions for different types of activities to protect and enhance environmental values such as air quality. The EPP Air is conducive to protecting the health and biodiversity of ecosystems, human health and wellbeing, aesthetics of the environment, including the appearance of buildings, structures and other property, and agricultural use of the environment.

Air quality objectives discussed in Section 15.2.5 have been used to identify if an environmental value of the air environment is enhanced or protected in an area or place.

6.2.3 National Environment Protection (Ambient Air Quality) Measure

National Environment Protection Measures (NEPM) outline agreed national objectives for protecting or managing particular aspects of the environment. The air quality of an environment is protected by the Air Quality NEPM as amended (2021). The Air Quality NEPM provides guidance relating to air in the external environment and does not include air inside buildings or structures.

The Air Quality NEPM outlines monitoring, assessment, and reporting procedures for $PM_{10,}$ $PM_{2.5}$, NO_2, carbon monoxide (CO), ozone (O_3), and SO_2.

The Air Quality NEPM standards are intended to be applied to air quality experienced by the general population in a region and not to air quality in areas in the region affected by localised air emissions, such as individual industrial sources or projects.

The goal of the Air Quality NEPM is to achieve the recommended standards with the allowable exceedances, as assessed in accordance with the associated monitoring protocol. The standards were set at a level intended to adequately protect human health and wellbeing.

Until recently (May 2021), the Ambient Air Quality NEPM standards have been comparable to the impact assessment air quality standards prescribed by other States and Territories, and this remains true for most pollutants. However, the recently amended standards for NO_2 and SO_2 are no longer consistent with the standards prescribed by other States and Territories and therefore for the purposes of this assessment, the EPP Air 2019 air quality objectives have been adopted.

6.2.4 Adopted air quality objectives

Adopted air quality objectives for the Project are presented in Table 6-1.

Table 6-1 Adopted ambient air quality objectives as per EPP Air 2019

Pollutant	Air Quality Objective		Averaging Period	Environmental Value
	µg/m³	ppm		
NO_2	250	0.12	1-hour	Human health and well being
	62	0.03	Annual	
SO_2	570	0.20	1-hour	
	229	0.08	24-hour	
	57	0.02	Annual	
PM_{10}	50	-	24-hour	

6.3 Existing Environment

In order to characterise the existing air quality values in the Project area a review of available air quality monitoring data was conducted. The Department of Environment and Science (DES) has an ambient monitoring network across Queensland that monitors for controlled pollutants in areas with large population bases or heavy industry adjacent to residential areas. The nearest available DES air quality monitoring data is from Townsville, located approximately 100 km south-east of the Preferred Alignment.

Queensland's compliance with the standards and goals of the Ambient Air Quality NEPM is assessed and reported annually. For the Townsville region, all NEPM reporting is based on data collected at the Pimlico and Townsville North Ward stations. The Pimlico station was decommissioned in 2016, and subsequently replaced by the Townsville North Ward station, which is located in an area representative of the population average. Pollutants monitored at this station include NO_2, SO_2 and PM_{10}. Air quality monitoring data is presented below in Table 6-2. Pimlico data is presented from 2010 to 2016, and North Ward data is presented from 2017 to 2019.

2016 has insufficient data capture for each pollutant due to the decommissioning of Pimlico station in this year. Maximum annual average NO_2 concentration was 0.006 ppm and maximum 1 hour 90th percentile was 0.27 ppm, both recorded in 2011.

Maximum annual average for SO_2 was 0.001 ppm recorded in 2010, 2011, 2013 and 2014. Maximum 1 hour 90th percentile concentration was 0.005 ppm recorded in 2010, and maximum 24 hour 90th percentile was 0.001 ppm recorded in 2018 and 2019.

Maximum annual average PM_{10} concentration was recorded in 2019 (20.2 µg/m^3) and highest 24 hour 90th percentile concentration (26.5 µg/m^3) was also recorded in 2019. There are no exceedances of the adopted air quality objectives in the analysed data.

Historical data presented indicates that the general air quality in the Townsville area is consistent and of relatively good quality. Townsville is a developed city and is the largest population centre in the central North Queensland region. As discussed in Chapter 13 Land Use, land-use within the Project area is primarily characterised as rural pastoral, with only three small population centres in the vicinity. As the Project area lacks large populations and special industry, Townsville should be considered to be a very conservative estimation of the existing Project area air environment.

Table 6-2 Summary of background data from Pimlico (2010-2016) and North Ward (2017-2019) DES air quality monitoring station in Townsville

Year	NO_2		SO_2			PM_{10}		Data source
	Annual Average (ppm)	1 hour 90th percentile (ppm)	Annual Average (ppm)	1 hour 90th percentile (ppm)	24 hour 90th percentile (ppm)	Annual Average ($\mu g/m^3$)	24 hour 90th percentile ($\mu g/m^3$)	
2010	0.005	0.020	0.001	0.005	No data available	13.9	19.4	Queensland NEPM Report 2016
2011	0.006	0.027	0.001	0.003		15.4	22.3	
2012	0.005	0.022	<0.001	0.002		12.9	18.8	
2013	0.004	0.018	0.001	0.002		15.1	22.5	
2014	0.004	0.020	0.001	0.003		15.1	20.6	
2015	0.004	0.021	-	0.004		17.6	24.1	
2016	-	*0.015*	*<0.001*	*<0.001*	-	-	*24.5*	
2017	-	0.003	<0.001	<0.001	-	-	17.9	DES live data download 2021
2018	0.002	0.005	<0.001	<0.001	0.001	16.3	22.4	
2019	0.003	0.005	<0.001	<0.001	0.001	20.2	26.5	

Table note:
Data capture rates of less than 75% are highlighted in *italics.*

6.3.1 Local emission sources

The NPI regulated by the Australian Government tracks pollution sources across Australia and ensures that the community has access to information about the emission and transfer of toxic substances which may affect them locally. All major polluters are required by the Australian Government to submit annual reports of their emissions to air. The NPI has emission estimates for 93 toxic substances and the source and location of these emissions. These substances have been identified as important due to their possible effect on human health and the environment. The data comes from facilities like mines, power stations and factories, as well as other sources.

An NPI search conducted for the Project area and surrounding North Queensland region for the 2019/2020 reporting year shows the only facilities listed are located in the immediate Charters Towers, Ingham, and Townsville areas. The facility closest to the Preferred Alignment is the Victoria Wilmar Sugar Mill located approximately 45 km north-east. At this distance it is unlikely emissions from the facility will influence the Project area.

Information provided by Powerlink indicates that some third-party construction activities are currently occurring in the township of Kidston. Construction activities are likely to generate dust emissions, and these may impact the air quality local to the construction activity. It is likely that mitigation practices are in place and overall emissions from this source are considered negligible.

In summary, no significant existing emission sources are present in the Project area.

6.3.2 Sensitive receptors

A sensitive receptor is defined as a location that may be sensitive to impacts from the Project, such as residences, commercial or industrial facilities where people are present for an extended period of time. At *air quality* sensitive receptors, designated air quality objectives must be met. The location of the sensitive receptors in relation to the Project area has been mapped (Figure 3-2, Chapter 3 Project Description).

6.4 Potential Impacts

6.4.1 Construction phase

The construction phase of the Project will require activities that have the potential to impact local air quality. Emission sources associated with the construction phase including the following.

- Site preparation including vegetation clearing, topsoil stripping, chipping/mulching, and ground surface levelling.
- Transmission structure and switching station foundation excavation and installation.
- Stockpiling of excavated soil.
- Wind erosion from stockpiles.
- Vehicle and equipment movements over access tracks and work sites where ground is exposed.
- Exhaust emissions from vehicle and machinery operations.

Vegetation clearing will occur to establish switching station location, the transmission line easement and new access tracks. Construction will be conducted in a staged approach with the minimum area of disturbed ground exposed at any one time. Where the alignment approaches sensitive receptors, air quality impacts are possible from construction dust. This has been assessed further in this section.

Combustion generated pollutants (SO_2, NO_2, etc.) have not been considered further in this assessment due to their small quantities in the existing air shed (Section 6.3), the anticipated low magnitude of emissions, and the overall characteristics of the area (generally low traffic volumes and density, low population density, low density of similar or industry sources and rural location).

6.4.1.1 Dust impact assessment

A qualitative risk assessment of potential dust impacts on surrounding sensitive receptors was undertaken for the construction phase of the Project. The assessment was based on the methodology described in the UK Institute of Air Quality Management (IAQM) document, *Guidance on the assessment of dust from demolition and construction* (IAQM, 2014). The risk of dust deposition and human health impacts due to particulate matter (PM_{10}) on surrounding areas were determined based

on the scale of activities and proximity to sensitive receptors. The IAQM method uses a four-step process to assess dust impacts.

- Step 1: Screening based on distance to nearest sensitive receptors.
- Step 2: Assess risk of dust impacts from activities based on:
  - Scale and nature of the works, which determines the potential dust emission magnitude
  - Sensitivity of the area.
- Step 3: Determine site-specific mitigation for dust-emitting activities.
- Step 4: Reassess risk of dust impacts after mitigation has been considered.

Step 1 – screening assessment

The IAQM method recommends further assessment of dust impacts for construction activities where sensitive receptors are located closer than:

- 350 m from the boundary of the site
- 50 m from the route used by construction vehicles on public roads more than 500 m from the site entrance.

The number of sensitive receptors within the broader region (within 10 km of the corridor) is 237. Their respective distances from the Preferred Alignment are presented in Table 6-2 below.

Table 6-2 Number of receptors at specified distances from the Preferred Alignment.

Distance from Preferred Alignment (m)	Number of Sensitive receptors
<20	0
21 – 50	0
51 – 100	1
101 – 350	0
350+	236

Step 2A – dust emission magnitude

Dust emission magnitudes are estimated according to the scale of works being undertaken and other considerations such as meteorology, types of material being used, or general construction and demolition methodology. The IAQM guidance provides examples to aid classification, as presented in the following excerpt from IAQM:

> *The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large. The following are examples of how the potential dust emission magnitude for different activities can be defined. Note that, in each case, not all the criteria need to be met, and that other criteria may be used if justified in the assessment:*

Earthworks: Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Example definitions for earthworks are:

- *Large: Total site area >10,000 m^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 >8 m in height, total material moved >100,000 tonnes.*
- *Medium: Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g., silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.*
- *Small: Total site area <2,000 m^2 – soil type with large grain size, e.g., sand, <5 heavy earth moving vehicles at one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months.*

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. Example definitions for construction are:

- *Large: Total building volume >100, 000 m^3, on site concrete batching, sandblasting.*
- *Medium: Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g., concrete), on site concrete batching.*
- *Small: Total building volume <25,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber).*

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology, and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. Example definitions for trackout are:

- *Large: >50 truck (>3.5 t) outward movements in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length 50 m – 100 m.*
- *Medium: 10-50 truck (>3.5 t) outward movements in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 m – 100 m.*
- *Small: <10 truck (>3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.*

Potential dust emission magnitudes for the Project were estimated based on the IAQM examples listed above. Justification and the factors used in determining the magnitudes are presented in Table 6-3. All construction work associated with the Project will occur in a workday generally no longer than 12 hours in duration. As with vegetation clearing, construction is expected to be conducted in a staged approach. However, depending on project time constraints multiple work fronts may be present at any one time along the Preferred Alignment.

Table 6-3 Dust emission magnitudes in accordance with IAQM guidance

Activity	Potential Dust Emission Magnitude	Justification
Demolition	Nil	• No known buildings to be demolished.
Earthworks	Medium	• Vegetation clearing for transmission line easement and access tracks will occur where necessary to maintain safe electrical clearances – quantities yet to be established however will be limited to the 60 m wide easement and track locations. • Vegetation clearing for switching station buffer (50 m). • Excavation of up to 33,000 t[1] for transmission structure footings and foundation. Excavation is assumed to also be staged. • Earthworks and installation of earthing mat for switching station site. Surface area the switching station (excluding buffer of 50 m) is 52,000 m^2 equalling potential disturbance of up to 46,800 t[1] of soil. • Multiple work sites at any one time along the preferred Alignment. • Earthworks material likely to be dusty especially during dry season.
Construction	Medium	• Construction of approximately 351 transmission structures and one switching station. • Construction of four temporary construction camps and site office. • Multiple work sites at any one time along the preferred Alignment. • Onsite concrete batching for transmission structure foundations likely to occur due to isolated rural site locations (concrete is a high dust risk material). • Structural steel material presents a low dust risk. • Multiple materials for switching station construction (metal frames, electrical equipment) but overall low potential for dust. • Local concrete batching locations also likely due to rural site locations (concrete is a high dust risk material).
Trackout	High	• Traffic throughout construction estimated to be up to 216 light vehicle and 116 heavy vehicle movements' daily[2]. • Length of unpaved road unknown until design finalised but will be significant

Table notes:
[1]: Excavation volumes are conservative estimations calculated using preliminary construction details. Cut and fill volumes are site-dependent and likely to change during the detailed design phase of the Project.

[2]: See Chapter 18 –Transport and Traffic.

Step 2B – sensitivity of surrounding area

The IAQM methodology allows the sensitivity of an area to dust deposition, human health impacts due to PM_{10}, to be classified as high, medium, or low. The classifications are determined according to matrix tables provided in the IAQM guidance document. Individual matrix tables for dust soiling and human health impacts are provided. Factors used in the matrix tables to determine the sensitivity of the surrounding area are described as follows.

- Receptor sensitivity (for individual receptors in the area):
  - high sensitivity – locations where members of the public are likely to be exposed for eight hours or more in a day. For example, private residences, hospitals, schools, or aged care homes
  - medium sensitivity – places of work where exposure is likely to be eight hours or more in a day
  - low sensitivity – locations where exposure is transient – i.e., one or two hours maximum. For example, parks, footpaths, shopping streets, playing fields.
- Ambient annual mean PM_{10} concentrations (only applicable to the human health impact matrix).
- Number of receptors in the area.
- Proximity of receptors to dust sources.

According to the IAQM guidance listed above, the overall sensitivity of the Project area to both dust deposition and human health impacts is classified as low. The justification for this classification is provided on the basis that there is a single receptor identified within 350 m of the Preferred Alignment.

Step 2C – unmitigated risks of impacts

The dust emission magnitudes for each activity (demolition, earthworks, construction, trackout) were combined with the sensitivity of the area in Step 2B to determine the risk of construction dust air quality impacts, with no mitigation applied. The risk of impacts for each activity is assessed according to the IAQM risk matrix methodology. An example of the IAQM risk matrix (for earthworks, as example) is provided in Table 6-4. The 'without-mitigation' dust risk impacts for each activity for the construction phase of the Project are summarised in Table 6-5.

Table 6-4 Example dust emission risk matrix from IAQM (for 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 6-5 Risk assessment of dust impacts on sensitive receptors without mitigation

Potential Impact	Risk of Dust Impacts on Sensitive Receptors – Without Mitigation			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Negligible	Low	Low	Low
Human Health (PM_{10})	Negligible	Low	Low	Low

The result of the qualitative air quality risk assessment shows that the unmitigated air emissions from the construction phase of the Project pose a low risk of dust soiling and human health impacts. On a ”per work site” basis, emissions associated with construction activities are expected to be localised to the immediate area and only present for a short period of time. Historical average annual PM_{10} concentrations for the region vary from 12.9 to 20.2 µg/m^3 (refer Table 6-2), indicating that existing PM_{10} concentrations are currently well below the adopted air quality objective.

Nonetheless, active management of dust emissions during the construction phase is recommended to ensure the adopted air quality objectives are met. Mitigation measures for potential emissions are detailed in Section 6.5.

6.4.2 Operation and maintenance phase

Potential air quality impacts associated with the operation and maintenance of the Project are also anticipated to be negligible to low. The activities associated with the operational phase that have potential to create emissions are mostly related to the maintenance of transmission lines, and are as follows.

- Vegetation management and control of regrowth in easements to maintain safe electrical clearances.
- Access track maintenance by earth moving machinery.
- Movement of maintenance vehicles and machinery over access tracks.
- Exhaust emissions associated with the operation of maintenance vehicles and machinery.

Inspections and maintenance should require only a small workforce with a set number of vehicles and pieces of equipment. Events are likely to occur at a pre-determined frequency (1-2 events per year), and on a strict as-needed basis (for example, after extreme weather events) to inspect or rectify damage. Potential air quality impacts associated with these activities (as per construction) are likely to be localised to the work area and only present for a short period of time.

Dust mitigation methods (Section 6.5.1) should be utilised whenever possible to minimise local impacts, especially during dry periods. To minimise potential exhaust emissions, all equipment used should be well maintained and fit for purpose.

6.4.2.1 Decommissioning phase

Transmission line infrastructure generally has a design life of approximately 50 years. After this period it is possible that the infrastructure may be decommissioned. The following decommissioning activities have the potential to impact the local air quality.

- Vegetation clearing where required for access to structures.
- Vehicle and plant movement over the easement and access tracks.
- Exhaust emissions associated with vehicle and machinery operation during works.
- Ground disturbance for the facilitation of rehabilitation of easement and transmission structure locations.

As with the construction phase of the Project, decommissioning works are expected to occur in a staged approach to minimise amount of disturbed ground at any one time. If this occurs, potential impacts to air quality are expected to be localised to work-sites and short-term. The magnitude of potential impacts should not exceed those associated with the construction phase, assuming the size of the workforce and decommissioning fleet is not larger.

The recommended mitigation measures described below in Section 6.5 should be implemented during decommissioning to minimise any potential air quality impacts.

6.5 Mitigation and Management Measures

The following mitigation measures are recommended for the Project. These mitigation measures align with Powerlink's Standard Environmental Controls Specification (Appendix B Environmental Management Plan).

6.5.1 Dust and particulate matter mitigation

Recommended mitigation measures include the following.

- Orientating material stockpiles in a direction that reduces exposed surfaces to prevailing winds.
- Watering of stockpiles (located near sensitive uses) to maintain a moisture content that minimises dust generation or alternatively temporarily cover stockpiles.
- Adequately store all bulk materials, and cover vehicles transporting materials to and from site.
- Restrict vehicle movements to within designated access tracks, and enforce speed limits (<40 km/h) where track is unsealed.
- Limit dust-producing work on windy days when possible or water down of dusty work sites to minimise dust generation.
- Limit work on days with high levels of bushfire smoke in the air and if wind is blowing towards receptors.
- Watering unsealed haul roads when required for safety, or where located near sensitive uses.
- Ensure chipping/mulching equipment has dust collection devices attached.
- Avoid burning cleared vegetation whenever possible. If burning obtain relevant approvals prior.
- Disturbed areas and bare earth should be stabilised or revegetated as soon as practical to minimise wind-blown dust.

6.5.2 Vehicle and machinery emissions mitigation

Recommended mitigation measures include the following.

- Ensure stationary plant, construction vehicles and equipment (especially those powered by diesel motors) are working correctly and maintained as per manufacturers recommendations.
- Shut down plant and equipment idling for excessive periods (i.e. longer than 5 minutes) where possible.
- Avoid or minimise queuing in roadways approaching the worksites or adjacent to other sensitive activities.
- Minimise queuing of construction vehicles and idling for excessive periods (e.g. more than 5 minutes).