Appendix - IAQM Construction Dust Methodology

1.1 Overview

Potential impacts from dust generation during construction have been assessed using *Guidance on the assessment of dust from demolition and construction* (IAQM 2014). This document provides a risk-based assessment process for the potential unmitigated impact of dust generated from demolition, earthmoving, construction activities and track-out as described in Section 3 of the REF.

The IAQM guidance process is a four-step risk-based assessment of dust emissions associated with demolition, earthworks, construction, and track-out activities. The IAQM assessment process is provided in the sections below.

This assessment has been informed by construction and demolition volumes and equipment usage information provided in the REF Report.

2.1 Step 1 – Screening assessment

Step 1 requires the determination of whether there are any receptors close enough to the construction footprint to warrant further assessment. An assessment is required where there is a human receptor within:

- 350 metres from the boundary of the site, or
- 50 metres from the route used by construction vehicles on public roads up to 500 m from the site entrance.

An assessment is also required if an ecological receptor is within:

- 50 metres of the boundary of the site, or
- 50 metres from the route used by construction vehicles on public roads up to 500 metres from a site entrance.

A summary of the proximity of both human and ecological receptors examined as part of the Stage 1 Screening assessment are presented in Table 1.

Table 1: Stage 1 IAQM Screening Assessment for Construction Zones

Receptor Type	Stage 1 Assessment
Human	Three (3) human receptors within 350 m of the site. Land use is primarily pastural land with some residential and recreational properties.
Ecological	Ecological receptors within 50 m of the site are of high ecological value including natural wetlands zoned for ecological conservation.

3.1 Step 2 – Dust risk assessment

Step 2 in the IAQM is a risk assessment tool designed to identify the potential for dust impacts due to unmitigated dust emissions. The key components of the risk assessment involve:

1. defining the dust emission magnitudes (Step 2A),
2. defining the surrounding area's sensitivity to dust emissions (Step 2B)
3. combining these in a risk matrix (Step 2C) to determine a potential risk rating for dust impacts on surrounding receptors.

Additional details on steps 2A, 2B and 2C are provided in the following sections.

Step 2A – Dust emission magnitude

Dust emission magnitudes are estimated according to the scale of works being undertaken and are classified as small, medium, or large. The IAQM guidance provides examples of demolition, earthworks, construction and track-out to aid classification (refer Table 2).

It should be noted that the IAQM guidance document provides generic activity criteria for estimating dust emission magnitude from construction and demolition projects. Section 7.2 of the IAQM allows for other project specific criteria to be used in the assessment if justified. In this instance additional construction activity criteria have been added to Table 2.

Additional criteria are specific to construction of road projects and include the length of road and the number of construction ancillary facilities and laydown areas.

Table 2: Emission magnitudes for small, medium and large demolition and construction activities

Activity	Activity criteria	Small	Medium	Large
Demolition	Total building volume (m^3)	<20,000	20,000–50,000	>50,000
	Material type	Material with low dust generating potential	Potentially dusty material	Potentially dusty and includes crushing and screening
	Demolition height	<10 m AGL	10-20 m AGL	>20 m AGL
Earthworks	Total site area (m^2)	<2,500	2,500–10,000	>10,000
	Number of heavy earth moving vehicles active at one time	<5	5-10	>10
	Total material moved (tonnes (t))	<20,000	20,000–100,000	>100,000
	Bund Height	< 4m	4 to 8m	> 8m
	Fine content of soil type	Low fine content (e.g sand)	Moderately fine content (e.g Silt)	High fine content (e.g Clay)
Construction	Total building volume (m^3)	<25,000	25,000–100,000	>100,000
	Road Length	<1 km	1-2 km	>2 km
	Construction duration	< 6 months	– 12 months	>12 months
	Construction ancillary facilities & laydown areas	Temporary laydown area only	1 Construction ancillary facilities & laydown area	> 1 Construction ancillary facilities & laydown areas
	Operation of plant equipment including diesel generators.	No or minor reliance	Moderate reliance	Heavy reliance
Trackout	Number of heavy vehicle movements per day	<10	10-50	>50
	Surface material dust potential	Low fine content (e.g sand)	Moderately fine content (e.g silt)	High fine content (e.g clay)
	Length of unpaved access roads	<50m	50-100m	>100m

Step 2B – Sensitivity of the surrounding area

In the IAQM guidance a sensitive receptor is defined as a location that may be affected by dust emissions during demolition, earthworks, construction and trackwork. Human receptors include locations where people spend time and where property may be impacted by dust. Ecological receptors are habitats that might be sensitive to dust.

The "sensitivity" component of the risk assessment is determined by defining the surrounding areas sensitivity to dust soiling, human health effects and ecological impacts areas. This is described further below.

Sensitivity of the area to dust soiling and human health effects

The IAQM methodology classifies the sensitivity of an area to dust soiling and human health impacts due to particulate matter as high, medium, or low. The classification is determined by a matrix for both dust soiling and human health impacts (refer Table 4 and Table 3 respectively). Factors used in the matrix tables to determine the sensitivity of an area are as follows:

- Receptor sensitivity (for individual receptors in the area) as described in Table 4**.**
- Number of receptors of each sensitivity type in the area
- Distance from source
- Annual mean PM_{10} concentration (only applicable to human health impacts).

Table 3: Receptor sensitivity classification for dust soiling and health effects

Receptor sensitivity	Dust soiling effects	Health effects of PM_{10}
High	Land uses where: • users can reasonably expect enjoyment of a high level of amenity • the appearance, aesthetics or value of their property would be diminished by soiling • the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land Examples include dwellings, museums, culturally important collections, medium to long-term car parks and car showrooms.	Locations where members of the public are exposed over eight-hour period or more in a day. Examples include residential properties, hospitals, schools, and residential care homes.
Medium	Land uses where: • 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 their property could be diminished by soiling • the people or property wouldn't reasonably be expected to be present here 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 members of the public are exposed over eight-hour period or more in a day. Examples include office and shop workers.
Low	Land uses where: • 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 • there is 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, footpaths, short term car parks and roads.	Locations where human exposure is transient. Examples include public footpaths, playing fields, parks and shopping streets

Table 4: Surrounding area sensitivity to dust soiling effects on people and property

Receptor sensitivity	Number of receptors	Distance from source (m)			
		<20	20 - 50	50 - 100	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

The IAQM guidance provides human health sensitivities for a range of annual average PM_{10} concentrations (i.e. >32, 28-32, 24-28 and <24 $\mu g/m^3$). It is noted in the IAQM guidance that the human health sensitivities are tied to criteria from other different jurisdictions within the United Kingdom. The annual average PM_{10} criteria for Australia differ from United Kingdom jurisdictions and as such concentrations corresponding to the risk categories need to be modified to match Australian conditions.

The annual average criterion for PM_{10} in NSW is 25 µg/m^3 (refer Section 3.4.2 of the technical report) and therefore the scaled criteria for NSW are:

- > 25 µg/m^3
- 22-25 µg/m^3
- 19-22 µg/m^3
- <19 µg/m^3

This scaling is based on a ratio between the more stringent NSW EPA criteria and UK criteria, where the upper bounds represent an exceedance of the criteria.
The background PM_{10} concentrations in the region surrounding the project are outlined in Section 6.6.3 of the REF, which notes that regional data from the Port Macquarie monitoring station are less than 19 µg/m^3 and so the lowest PM_{10} category has been adopted for the IAQM assessment.

Table 5 provides the IAQM guidance sensitivity levels for human health impacts for the ranges outlined above for the annual average PM_{10} concentrations and highlights (in bold outline) the relevant range for NSW.

Table 5: Surrounding area sensitivity to human health impacts for annual average PM_{10} concentrations

Receptor sensitivity	Annual average PM_{10} concentration	Number of receptors	Distance from the source (m)				
			< 20	< 50	< 100	< 200	< 350
High	>25 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	22-25 µg/m^3	>100	High	High	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	19-22 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<19 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>25 µg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	22-25 µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	19-22 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	<19 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	-	≥1	Low	Low	Low	Low	Low

The sensitivity for each construction activity defined by the IAQM guidance is assessed for the project. This results in a sensitivity rating for the construction footprint along with ratings for portions of the construction footprint for each construction activity. The ratings depend on the sensitivity of the receptors and the distance from the boundary of the construction footprint. As shown in Table 4 and Table 5 the greater the distance from the construction footprint (the source), the lower the rating. Only the highest level of area sensitivity is considered for the assessment.

It should be noted that this is not a quantitative human health assessment and risks discussed in this context need to be understood in terms of the IAQM guidance. For receptors, a risk rating indicates the risk that a group of receptors may experience unmitigated dust concentrations above the NSW criteria, with the associated potential health effects linked to

that criterion. Once mitigated through the application of air emissions mitigation measures (as part of a well-designed air quality management plan), the dust impacts would be expected to be negligible.

Sensitivity of area to ecological impacts

Ecological impacts from construction activities occur due to deposition of dust on ecological areas. The sensitivity of ecological receptors can be defined by the following:

- High sensitivity ecological receptors
  - locations with international or national designation and the designation features may be affected by dust soiling
  - locations where there is a community of particularly dust sensitive species
- Medium sensitivity ecological receptors
  - locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown
  - locations within a national designation where the features may be affected by dust deposition
- Low sensitivity ecological receptors
  - locations with a local designation where the features may be affected by dust deposition.

The sensitivity of an ecological area to impacts is assessed using the criteria listed in Table 6. Ecological receptors are discussed further and Section 6.1 of the REF. Due to the proximity of the wetlands as well as other areas of relatively undisturbed native vegetation of environmental conservation value the study area ecological receptor sensitivity would high.

Table 6: Sensitivity of an area to ecological impacts

Receptor Sensitivity	Distance from source (m)	
	< 20	20 - 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C – Unmitigated risk of impacts

The dust emission magnitude as determined in Step 2A is combined with the sensitivity as determined in Step 2B to determine the risk of dust impacts with no mitigation applied. Table 7provides the risk ranking for dust impacts from construction activities for each scale of activity as listed in Table 2.

Table 7: Risk of dust impacts (for dust soiling and human health impacts)

Activity	Surrounding area sensitivity	Dust emission magnitude		
		Large	Medium	Small
Demolition	High	High	Medium	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Negligible
Earthworks	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Construction	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Track-out	High	High	Medium	Low
	Medium	Medium	Low	Negligible
	Low	Low	Low	Negligible

Step 3 – Management strategies

The outcome of Step 2C is used to determine the level of management that is required to ensure that dust impacts on surrounding sensitive receptors are maintained at an acceptable level. A high or medium-level risk rating suggests that implementation of management measures are highly recommended during the project. Mitigation measures should be specifically designed to minimise the emissions from the source to which they are applied and implemented at an appropriate level (e.g., low level road watering on a dry highly trafficked roadway may not reduce dust impacts by the desired amount).

Step 4 – Reassessment

The final step of the IAQM methodology is to determine whether there are significant residual impacts, post mitigation, arising from a proposed development. The IAQM guidance states:

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”.

Based on this expectation, as well as experience within Australia, construction activities with targeted mitigation measures can achieve high degrees of dust mitigation which significantly reduce dust impacts to a negligible level.

Air Quality Operational Impact Assessment – Traffic Forecast Inputs

Table 8. Traffic Forecast Data

Road Section	Direction	Opening year (2028)					10 Years after opening (2038)					Grade (%)
		AADT	Traffic Mix (%)			Peak hour speed (km/h)	AADT	Traffic Mix (%)			Peak hour speed (km/h)	
			Light	Moderate	Heavy			Light	Moderate	Heavy		
Coopernook Road	Eastbound	649	93	7	0	60	1,091	93	6	1	60	2
	Westbound	740	92	6	2	60	1,193	94	4	3	60	-2
Harrington Road	Eastbound	2,162	93	5	2	60	3,112	94	4	2	60	-2
	Westbound	2,096	94	6	0	60	3,172	95	5	0	60	2
Overpass	Eastbound	2,513	77	14	9	65	3,207	78	12	10	65	0
	Westbound	704	75	13	12	65	784	76	13	11	65	0
Pacific Highway North	Northbound	9,798	74	15	11	100	11,595	73	15	12	100	0
	Southbound	9,077	70	14	16	100	9,717	69	15	16	100	0
Pacific Highway South	Northbound	11,064	75	14	11	100	13,463	76	13	11	100	0
	Southbound	10,677	73	13	13	100	12,175	74	13	13	100	0

Air Quality Operational Impact Assessment – Pollutant Concentrations

Table 9: Predicted CO 1-Hour Maximum Concentration (mg/m^3)

Distance from Road (m)	2028 Predicted Concentration (mg/m^3)			2038 Predicted Concentration (mg/m^3)			Criteria (mg/m^3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
20 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
30 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
40 m from kerb	0	0.3	0.3	0	0.3	0.3	30
50 m from kerb	0	0.3	0.3	0	0.3	0.3	30
200 m from kerb	0	0.3	0.3	0	0.3	0.3	30
Harrington Road							
10 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
20 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
30 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
40 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
50 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
200 m from kerb	0	0.3	0.3	0	0.3	0.3	30
Overpass							
10 m from kerb	0.2	0.3	0.5	0.3	0.3	0.6	30
20 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
30 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
40 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
50 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
200 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
Pacific Highway North							
10 m from kerb	1.6	0.3	1.9	2.2	0.3	2.5	30
20 m from kerb	1.1	0.3	1.4	1.5	0.3	1.8	30
30 m from kerb	0.9	0.3	1.2	1.2	0.3	1.5	30
40 m from kerb	0.8	0.3	1.1	1.1	0.3	1.4	30

Distance from Road (m)	2028 Predicted Concentration (mg/m^3)			2038 Predicted Concentration (mg/m^3)			Criteria (mg/m^3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
50 m from kerb	0.7	0.3	1.0	0.9	0.3	1.2	30
200 m from kerb	0.3	0.3	0.6	0.4	0.3	0.7	30
Pacific Highway South							
10 m from kerb	1.7	0.3	2.0	6.2	0.3	6.5	30
20 m from kerb	1.2	0.3	1.5	2.3	0.3	2.6	30
30 m from kerb	1	0.3	1.3	1.6	0.3	1.9	30
40 m from kerb	0.8	0.3	1.1	1.3	0.3	1.6	30
50 m from kerb	0.8	0.3	1.1	1.1	0.3	1.4	30
200 m from kerb	0.3	0.3	0.6	0.5	0.3	0.8	30

Table 10: Predicted CO 8-Hour Maximum Concentration (mg/m^3)

Distance from Road (m)	2028 Predicted Concentration (mg/m^3)			2038 Predicted Concentration (mg/m^3)			Criteria (mg/m^3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0	0.3	0.3	0.1	0.3	0.4	10
20 m from kerb	0	0.3	0.3	0	0.3	0.3	10
30 m from kerb	0	0.3	0.3	0	0.3	0.3	10
40 m from kerb	0	0.3	0.3	0	0.3	0.3	10
50 m from kerb	0	0.3	0.3	0	0.3	0.3	10
200 m from kerb	0	0.3	0.3	0	0.3	0.3	10
Harrington Road							
10 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
20 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
30 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
40 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
50 m from kerb	0	0.3	0.3	0.1	0.3	0.4	30
200 m from kerb	0	0.3	0.3	0	0.3	0.3	10
Overpass							
10 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
20 m from kerb	0.1	0.3	0.4	0.2	0.3	0.5	30
30 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30

Distance from Road (m)	2028 Predicted Concentration (mg/m^3)			2038 Predicted Concentration (mg/m^3)			Criteria (mg/m^3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
40 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
50 m from kerb	0.1	0.3	0.4	0.1	0.3	0.4	30
200 m from kerb	0	0.3	0.3	0	0.3	0.3	10
Pacific Highway North							
10 m from kerb	1.1	0.3	1.4	1.5	0.3	1.8	10
20 m from kerb	0.8	0.3	1.1	1.1	0.3	1.4	10
30 m from kerb	0.6	0.3	0.9	0.9	0.3	1.2	10
40 m from kerb	0.5	0.3	0.8	0.7	0.3	1.0	10
50 m from kerb	0.5	0.3	0.8	0.7	0.3	1.0	10
200 m from kerb	0.2	0.3	0.5	0.3	0.3	0.6	10
Pacific Highway South							
10 m from kerb	1.2	0.3	1.5	1.6	0.3	1.9	10
20 m from kerb	0.8	0.3	1.1	1.1	0.3	1.4	10
30 m from kerb	0.7	0.3	1.0	0.9	0.3	1.2	10
40 m from kerb	0.6	0.3	0.9	0.8	0.3	1.1	10
50 m from kerb	0.5	0.3	0.8	0.7	0.3	1.0	10
200 m from kerb	0.2	0.3	0.5	0.3	0.3	0.6	10

Table 11: Predicted NO_2 1-Hour Maximum Concentration (µg/m^3)

Distance from Road (m)	2028 Predicted Concentration (µg/m^3)			2038 Predicted Concentration (µg/m^3)			Criteria (µg/m^3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.7	14.4	15.1	0.8	14.4	15.2	164
20 m from kerb	0.6	14.4	15.0	0.7	14.4	15.1	164
30 m from kerb	0.5	14.4	14.9	0.6	14.4	15.0	164
40 m from kerb	0.4	14.4	14.8	0.5	14.4	14.9	164
50 m from kerb	0.4	14.4	14.8	0.5	14.4	14.9	164
200 m from kerb	0.2	14.4	14.6	0.2	14.4	14.6	164
Harrington Road							
10 m from kerb	1.6	14.4	16.0	1.6	14.4	16.0	164
20 m from kerb	1.5	14.4	15.9	1.5	14.4	15.9	164

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
30 m from kerb	1.2	14.4	15.6	1.2	14.4	15.6	164
40 m from kerb	1	14.4	15.4	1	14.4	15.4	164
50 m from kerb	0.9	14.4	15.3	0.9	14.4	15.3	164
200 m from kerb	0.4	14.4	14.8	0.4	14.4	14.8	164
Overpass							
10 m from kerb	3.1	14.4	17.5	3	14.4	17.4	164
20 m from kerb	2.9	14.4	17.3	2.8	14.4	17.2	164
30 m from kerb	2.4	14.4	16.8	2.3	14.4	16.7	164
40 m from kerb	2.1	14.4	16.5	2	14.4	16.4	164
50 m from kerb	1.8	14.4	16.2	1.8	14.4	16.2	164
200 m from kerb	0.8	14.4	15.2	0.7	14.4	15.1	164
Pacific Highway North							
10 m from kerb	23	14.4	37.4	21.2	14.4	35.6	164
20 m from kerb	21.6	14.4	36.0	19.8	14.4	34.2	164
30 m from kerb	17.7	14.4	32.1	16.2	14.4	30.6	164
40 m from kerb	15.3	14.4	29.7	14	14.4	28.4	164
50 m from kerb	13.6	14.4	28.0	12.5	14.4	26.9	164
200 m from kerb	6.1	14.4	20.5	5.6	14.4	20.0	164
Pacific Highway South							
10 m from kerb	24.5	14.4	38.9	21.2	14.4	35.6	164
20 m from kerb	22.9	14.4	37.3	19.7	14.4	34.1	164
30 m from kerb	18.7	14.4	33.1	16.1	14.4	30.5	164
40 m from kerb	16.2	14.4	30.6	13.9	14.4	28.3	164
50 m from kerb	14.5	14.4	28.9	12.4	14.4	26.8	164
200 m from kerb	6.5	14.4	20.9	5.7	14.4	20.1	164

Table 12: Predicted NO^2 Annual Average Concentration ($\mu g/m^3$)

Distance from Road (m)	2028 Predicted Concentration ($\mu g/m^3$)			2038 Predicted Concentration ($\mu g/m^3$)			Criteria ($\mu g/m^3$)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.2	5.9	6.1	0.2	5.9	6.1	62
20 m from kerb	0.1	5.9	6.0	0.1	5.9	6.0	31
30 m from kerb	0.1	5.9	6.0	0.1	5.9	6.0	31
40 m from kerb	0.1	5.9	6.0	0.1	5.9	6.0	31
50 m from kerb	0.1	5.9	6.0	0.1	5.9	6.0	31
200 m from kerb	0	5.9	5.9	0	5.9	5.9	31
Harrington Road							
10 m from kerb	0.3	5.9	6.2	0.3	5.9	6.2	31
20 m from kerb	0.3	5.9	6.2	0.3	5.9	6.2	31
30 m from kerb	0.2	5.9	6.1	0.2	5.9	6.1	31
40 m from kerb	0.2	5.9	6.1	0.2	5.9	6.1	31
50 m from kerb	0.2	5.9	6.1	0.2	5.9	6.1	31
200 m from kerb	0.1	5.9	6.0	0.1	5.9	6.0	31
Overpass							
10 m from kerb	0.6	5.9	6.5	0.6	5.9	6.5	31
20 m from kerb	0.6	5.9	6.5	0.6	5.9	6.5	31
30 m from kerb	0.5	5.9	6.4	0.5	5.9	6.4	31
40 m from kerb	0.4	5.9	6.3	0.4	5.9	6.3	31
50 m from kerb	0.4	5.9	6.3	0.4	5.9	6.3	31
200 m from kerb	0.2	5.9	6.1	0.1	5.9	6.0	31
Pacific Highway North							
10 m from kerb	4.6	5.9	10.5	4.2	5.9	10.1	31
20 m from kerb	4.3	5.9	10.2	4	5.9	9.9	31
30 m from kerb	3.5	5.9	9.4	3.2	5.9	9.1	31
40 m from kerb	3.1	5.9	9.0	2.8	5.9	8.7	31
50 m from kerb	2.7	5.9	8.6	2.5	5.9	8.4	31
200 m from kerb	1.2	5.9	7.1	1.1	5.9	7.0	31
Pacific Highway South							
10 m from kerb	4.9	5.9	10.8	4.2	5.9	10.1	31

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
20 m from kerb	4.6	5.9	10.5	3.9	5.9	9.8	31
30 m from kerb	3.7	5.9	9.6	3.2	5.9	9.1	31
40 m from kerb	3.2	5.9	9.1	2.8	5.9	8.7	31
50 m from kerb	2.9	5.9	8.8	2.5	5.9	8.4	31
200 m from kerb	1.3	5.9	7.2	1.1	5.9	7.0	31

Table 13: Predicted PM^{10} 24-Hour Maximum Concentration (µg/m³)

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.5	16.3	16.8	0.7	16.3	17.0	50
20 m from kerb	0.3	16.3	16.6	0.5	16.3	16.8	50
30 m from kerb	0.3	16.3	16.6	0.4	16.3	16.7	50
40 m from kerb	0.2	16.3	16.5	0.4	16.3	16.7	50
50 m from kerb	0.2	16.3	16.5	0.3	16.3	16.6	50
200 m from kerb	0.1	16.3	16.4	0.1	16.3	16.4	50
Harrington Road							
10 m from kerb	1.2	16.3	17.5	1.7	16.3	18.0	50
20 m from kerb	0.9	16.3	17.2	1.2	16.3	17.5	50
30 m from kerb	0.7	16.3	17.0	1	16.3	17.3	50
40 m from kerb	0.6	16.3	16.9	0.8	16.3	17.1	50
50 m from kerb	0.5	16.3	16.8	0.7	16.3	17.0	50
200 m from kerb	0.2	16.3	16.5	0.3	16.3	16.6	50
Overpass							
10 m from kerb	1.3	16.3	17.6	1.6	16.3	17.9	50
20 m from kerb	0.9	16.3	17.2	1.1	16.3	17.4	50
30 m from kerb	0.8	16.3	17.1	0.9	16.3	17.2	50
40 m from kerb	0.7	16.3	17.0	0.8	16.3	17.1	50
50 m from kerb	0.6	16.3	16.9	0.7	16.3	17.0	50
200 m from kerb	0.2	16.3	16.5	0.3	16.3	16.6	50
Pacific Highway North							

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
10 m from kerb	4.4	16.3	20.7	4.8	16.3	21.1	50
20 m from kerb	3.1	16.3	19.4	3.3	16.3	19.6	50
30 m from kerb	2.5	16.3	18.8	2.7	16.3	19.0	50
40 m from kerb	2.2	16.3	18.5	2.3	16.3	18.6	50
50 m from kerb	2	16.3	18.3	2.1	16.3	18.4	50
200 m from kerb	0.9	16.3	17.2	0.9	16.3	17.2	50
Pacific Highway South							
10 m from kerb	4.8	16.3	21.1	5.2	16.3	21.5	50
20 m from kerb	3.3	16.3	19.6	3.6	16.3	19.9	50
30 m from kerb	2.7	16.3	19.0	3	16.3	19.3	50
40 m from kerb	2.4	16.3	18.7	2.6	16.3	18.9	50
50 m from kerb	2.1	16.3	18.4	2.3	16.3	18.6	50
200 m from kerb	1	16.3	17.3	1	16.3	17.3	50

Table 14: Predicted PM^{10} Annual Average Concentration (µg/m³)

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.2	10.8	11.0	0.3	10.8	11.1	25
20 m from kerb	0.1	10.8	10.9	0.2	10.8	11.0	25
30 m from kerb	0.1	10.8	10.9	0.2	10.8	11.0	25
40 m from kerb	0.1	10.8	10.9	0.1	10.8	10.9	25
50 m from kerb	0.1	10.8	10.9	0.1	10.8	10.9	25
200 m from kerb	0	10.8	10.8	0.1	10.8	10.9	25
Harrington Road							
10 m from kerb	0.5	10.8	11.3	0.7	10.8	11.5	25
20 m from kerb	0.4	10.8	11.2	0.5	10.8	11.3	25
30 m from kerb	0.3	10.8	11.1	0.4	10.8	11.2	25
40 m from kerb	0.2	10.8	11.0	0.3	10.8	11.1	25
50 m from kerb	0.2	10.8	11.0	0.3	10.8	11.1	25
200 m from kerb	0.1	10.8	10.9	0.1	10.8	10.9	25

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Overpass							
10 m from kerb	0.5	10.8	11.3	0.6	10.8	11.4	25
20 m from kerb	0.4	10.8	11.2	0.4	10.8	11.2	25
30 m from kerb	0.3	10.8	11.1	0.4	10.8	11.2	25
40 m from kerb	0.3	10.8	11.1	0.3	10.8	11.1	25
50 m from kerb	0.2	10.8	11.0	0.3	10.8	11.1	25
200 m from kerb	0.1	10.8	10.9	0.1	10.8	10.9	25
Pacific Highway North							
10 m from kerb	1.8	10.8	12.6	1.9	10.8	12.7	25
20 m from kerb	1.2	10.8	12.0	1.3	10.8	12.1	25
30 m from kerb	1	10.8	11.8	1.1	10.8	11.9	25
40 m from kerb	0.9	10.8	11.7	0.9	10.8	11.7	25
50 m from kerb	0.8	10.8	11.6	0.8	10.8	11.6	25
200 m from kerb	0.3	10.8	11.1	0.4	10.8	11.2	25
Pacific Highway South							
10 m from kerb	1.9	10.8	12.7	2.1	10.8	12.9	25
20 m from kerb	1.3	10.8	12.1	1.5	10.8	12.3	25
30 m from kerb	1.1	10.8	11.9	1.2	10.8	12.0	25
40 m from kerb	0.9	10.8	11.7	1	10.8	11.8	25
50 m from kerb	0.8	10.8	11.6	0.9	10.8	11.7	25
200 m from kerb	0.4	10.8	11.2	0.4	10.8	11.2	25

Table 15: Predicted $PM^{2.5}$ 24-Hour Maximum Concentration (µg/m³)

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.5	15.5	16.0	0.7	15.5	16.2	25
20 m from kerb	0.3	15.5	15.8	0.5	15.5	16.0	25
30 m from kerb	0.3	15.5	15.8	0.4	15.5	15.9	25
40 m from kerb	0.2	15.5	15.7	0.4	15.5	15.9	25
50 m from kerb	0.2	15.5	15.7	0.3	15.5	15.8	25

Distance from Road (m)	2028 Predicted Concentration (µg/m³)			2038 Predicted Concentration (µg/m³)			Criteria (µg/m³)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
200 m from kerb	0.1	15.5	15.6	0.1	15.5	15.6	25
Harrington Road							
10 m from kerb	1.1	15.5	16.6	1.6	15.5	17.1	25
20 m from kerb	0.9	15.5	16.3	1.1	15.5	16.6	25
30 m from kerb	0.7	15.5	16.2	1.0	15.5	16.4	25
40 m from kerb	0.6	15.5	16.1	0.8	15.5	16.2	25
50 m from kerb	0.5	15.5	16.0	0.7	15.5	16.2	25
200 m from kerb	0.2	15.5	15.7	0.3	15.5	15.8	25
Overpass							
10 m from kerb	1.2	15.5	16.7	1.5	15.5	17.0	25
20 m from kerb	0.9	15.5	16.3	1.0	15.5	16.5	25
30 m from kerb	0.8	15.5	16.2	0.9	15.5	16.3	25
40 m from kerb	0.7	15.5	16.2	0.8	15.5	16.2	25
50 m from kerb	0.6	15.5	16.1	0.7	15.5	16.2	25
200 m from kerb	0.2	15.5	15.7	0.3	15.5	15.8	25
Pacific Highway North							
10 m from kerb	4.2	15.5	19.7	4.6	15.5	20.0	25
20 m from kerb	2.9	15.5	18.4	3.1	15.5	18.6	25
30 m from kerb	2.4	15.5	17.9	2.6	15.5	18.1	25
40 m from kerb	2.1	15.5	17.6	2.2	15.5	17.7	25
50 m from kerb	1.9	15.5	17.4	2.0	15.5	17.5	25
200 m from kerb	0.9	15.5	16.3	0.9	15.5	16.3	25
Pacific Highway South							
10 m from kerb	4.6	15.5	20.0	4.9	15.5	20.4	25
20 m from kerb	3.1	15.5	18.6	3.4	15.5	18.9	25
30 m from kerb	2.6	15.5	18.1	2.9	15.5	18.3	25
40 m from kerb	2.3	15.5	17.8	2.5	15.5	18.0	25
50 m from kerb	2.0	15.5	17.5	2.2	15.5	17.7	25
200 m from kerb	1.0	15.5	16.4	1.0	15.5	16.4	25

Table 16: Predicted $PM^{2.5}$ Annual Average Concentration ($\mu g/m^3$)

Distance from Road (m)	2028 Predicted Concentration ($\mu g/m^3$)			2038 Predicted Concentration ($\mu g/m^3$)			Criteria ($\mu g/m3$)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
Coopernook Road							
10 m from kerb	0.2	10.3	10.5	0.3	10.3	10.5	8
20 m from kerb	0.1	10.3	10.4	0.2	10.3	10.5	8
30 m from kerb	0.1	10.3	10.4	0.2	10.3	10.5	8
40 m from kerb	0.1	10.3	10.4	0.1	10.3	10.4	8
50 m from kerb	0.1	10.3	10.4	0.1	10.3	10.4	8
200 m from kerb	0.0	10.3	10.3	0.1	10.3	10.4	8
Harrington Road							
10 m from kerb	0.5	10.3	10.7	0.7	10.3	10.9	8
20 m from kerb	0.4	10.3	10.6	0.5	10.3	10.7	8
30 m from kerb	0.3	10.3	10.5	0.4	10.3	10.6	8
40 m from kerb	0.2	10.3	10.5	0.3	10.3	10.5	8
50 m from kerb	0.2	10.3	10.5	0.3	10.3	10.5	8
200 m from kerb	0.1	10.3	10.4	0.1	10.3	10.4	8
Overpass							
10 m from kerb	0.5	10.3	10.7	0.6	10.3	10.8	8
20 m from kerb	0.4	10.3	10.6	0.4	10.3	10.6	8
30 m from kerb	0.3	10.3	10.5	0.4	10.3	10.6	8
40 m from kerb	0.3	10.3	10.5	0.3	10.3	10.5	8
50 m from kerb	0.2	10.3	10.5	0.3	10.3	10.5	8
200 m from kerb	0.1	10.3	10.4	0.1	10.3	10.4	8
Pacific Highway North							
10 m from kerb	1.7	10.3	12.0	1.8	10.3	12.1	8
20 m from kerb	1.1	10.3	11.4	1.2	10.3	11.5	8
30 m from kerb	1.0	10.3	11.2	1.0	10.3	11.3	8
40 m from kerb	0.9	10.3	11.1	0.9	10.3	11.1	8
50 m from kerb	0.8	10.3	11.0	0.8	10.3	11.0	8
200 m from kerb	0.3	10.3	10.5	0.4	10.3	10.6	8
Pacific Highway South							
10 m from kerb	1.8	10.3	12.1	2.0	10.3	12.3	8

Distance from Road (m)	2028 Predicted Concentration (µg/m^3)			2038 Predicted Concentration (µg/m^3)			Criteria (µg/m3)
	Incremental	Background	Cumulative	Incremental	Background	Cumulative	
20 m from kerb	1.2	10.3	11.5	1.4	10.3	11.7	8
30 m from kerb	1.0	10.3	11.3	1.1	10.3	11.4	8
40 m from kerb	0.9	10.3	11.1	1.0	10.3	11.2	8
50 m from kerb	0.8	10.3	11.0	0.9	10.3	11.1	8
200 m from kerb	0.4	10.3	10.6	0.4	10.3	10.6	8