



APPENDIX G

Air Quality Impact Assessment



G



30 August 2012

Rachael Russell
Ground Floor, Suite 01
20 Chandos Street
St Leonards NSW 2065

Sent via email: rrussell@emgamm.com

RE: INTEGRA MINE COMPLEX MODIFICATION 2 – AIR QUALITY ASSESSMENT

Dear Rachael,

1 INTRODUCTION

It is understood that Integra Coal Operations Pty Ltd (Integra) is seeking to modify its Project Approvals (08_0101 and 08_0102 issued on 26th November 2010) to allow truck haulage of run-of-mine (ROM) coal from the Underground surface facilities to the coal handling and preparation plant (CHPP) to continue after the end of September 2012.

Schedule 3, Condition 48 of the Project Approvals states:

**“TRANSPORT
Coal Transport**

48. By the end of September 2012, the Proponent shall cease truck haulage of ROM coal from the underground surface facilities to the CHPP, and transport such coal only via overland conveyor, except in an emergency situation and with the prior written approval of the Director-General.”

The subject modification of the Project Approvals is referred to in this report as Modification 2. A prior modification to the Project Approvals (Modification 1) was approved by the Department of Planning and Infrastructure on 18 March 2012.

This letter report assesses the potential air quality impacts of the continuation of truck haulage of ROM coal from the underground surface facilities to the CHPP.

1.1 Background information

Holmes Air Sciences (now PAEHolmes) completed an air quality impact assessment (AQIA) in June 2009 (**Holmes Air Sciences, 2009**), to support the Environmental Assessment (**URS, 2009**) for the Integra Western Extension which was approved by the then NSW Department of Planning (DoP) in November 2010. The AQIA included emissions from all operations at the Integra Mine Complex (the Complex) that is, Underground, North Open Cut, South Pit and Western Extension.

Subsequent to the EA exhibition period, substantial modifications were made to the proposed Year 1 and Year 3 operations at the Western Extension to minimise the potential air quality impacts at the Dulwich property (Residence 153) (**DoP, 2010**).

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GOLD COAST

TOOWOOMBA

An assessment of air quality impacts for Modification 1 (**EMGA Mitchell McLennan, 2011**) determined there would be minimal change to total emissions, and hence predicted impacts, compared with those determined through the AQIA process.

1.2 Existing environment

Air quality at the Complex and surrounding areas is mainly influenced by dust emissions from the mine itself and other nearby mines, with minor emissions attributable to traffic on unsealed roads and local building and construction activities.

The Complex maintains a network of air quality monitoring equipment including dust deposition gauges, high volume air samplers and TEOMs (tapered elemental oscillating microbalances) with the locations shown on **Figure 1-1**. The data collected from this monitoring network, in conjunction with air dispersion modelling and assessments for the existing operations, provide accurate information on existing air quality around the mine.

The nearest residential concentrations are Camberwell and Obanvale, generally to the west and east respectively. There are also a number of residences situated in the immediate vicinity of the Complex. A variety of dust controls and safeguards are currently in place to achieve compliance with approved limits. These include regular monitoring in accordance with the project approvals and environmental licensing conditions.

Recent air quality monitoring results, presented in the Integra Mine Complex 2010/2011 Annual Review, were reviewed by PAEHolmes for this report. The data shows that the annual average dust deposition levels at all monitoring locations were compliant with approved levels, except for one monitoring location (DG06 – located at the Dulwich property shown on **Figure 1-1**) situated within the Complex boundary.

PM₁₀ monitoring during this period also showed that there were no exceedences of the annual average criteria PM₁₀ of 30 µg/m³ and only one exceedence of the short term 24-hour average maximum PM₁₀ criteria of 50 µg/m³ at monitoring location HV3 (located in the Glennies Creek locality shown on **Figure 1-1**) in February 2011, which was attributed to external influences. There was no exceedence of the annual average Total Suspended Particulates (TSP) criteria for the reporting period and an improvement from the 2009/10 reporting period in the annual average TSP and PM₁₀ concentrations was seen at all sites.

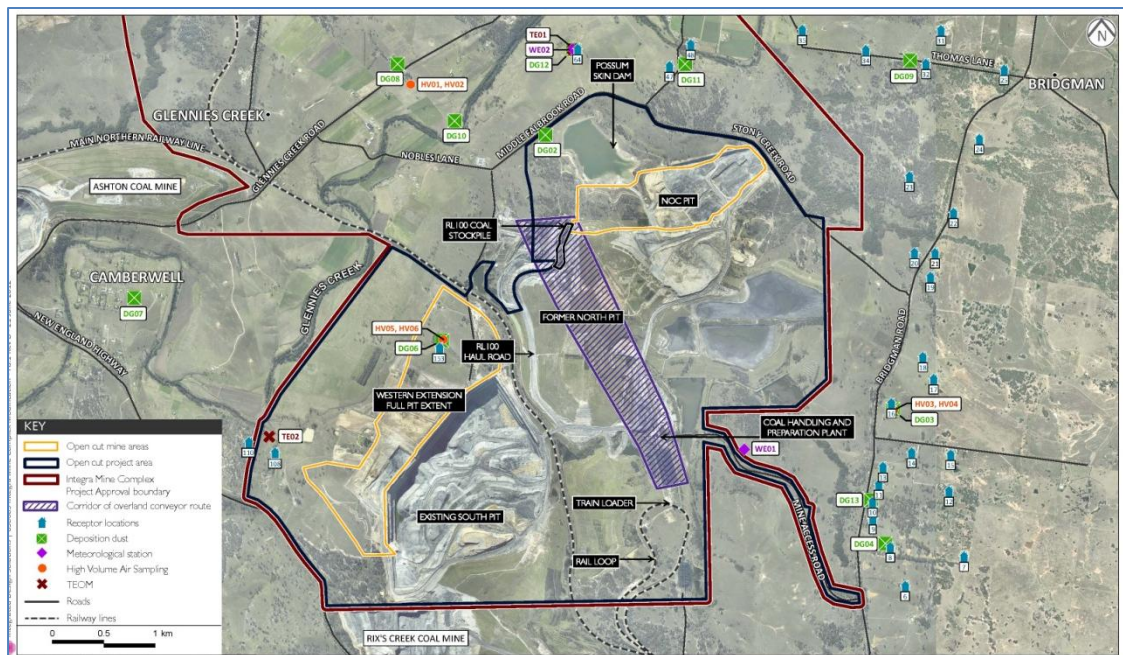


Figure 1-1: Location of air quality monitoring sites

1.3 Approach to assessment

The Complex comprises:

- Integra North Open Cut;
- Integra South Pit and Western Extension; and
- Integra Underground.

For the purposes of this assessment, the impacts at the sensitive receptors of continued haulage from the Underground surface facilities to the CHPP have been compared with the predicted impacts from approved operations at the Complex for:

- the Year 3 operations as modified under Modification 1; and
- the predicted impacts as per the AQIA for Year 4, Year 6 and Year 8 (Full Pit operations).

As no dispersion modelling was completed for Modification 1, and in order to provide a direct comparison with the dispersion modelling completed for the AQIA, no changes were made to the following:

- Meteorological data used (2003);
- Dispersion model (ISCMOD);
- Emissions from the South Pit and Western Extension;
- Emissions from the North Open Cut;
- Emissions from Underground operations (other than the addition of hauling);
- Emissions from other mines in the area;
- Background concentrations. These were assumed to be:
 - PM_{10} annual average = $8 \mu g/m^3$;
 - TSP annual average = $40 \mu g/m^3$; and

- Dust deposition = 0.5 g/m²/month.

1.4 Emission factor for haulage on unpaved roads

It should be noted that subsequent to the completion to the dispersion modelling for the EA process, NSW Environment Protection Authority (EPA) advised that the current AP-42 TSP emission factor for haulage should be used in place of the default emission factor of 4 kg/km (**SPCC, 1983**). The current AP-42 emission factor is as follows:

$$EF_{TSP} = \frac{0.4536}{1.6093} \times 4.9 \times \left(\frac{s}{12}\right)^{0.7} \times \left(\frac{W \times 1.1023}{3}\right)^{0.45} \quad \text{Equation 1}$$

Where:

EF_{TSP} = TSP emission factor (kg/km);
 s = surface material silt content (%);
 W = mean vehicle weight (tonnes)
 0.4536 = unit conversion factor (kg/lb)
 1.6093 = unit conversion factor (km/mile)
 1.1023 = unit conversion factor (tonne/ton)

As the AQIA used the default emission factor of 4 kg/km, the impacts due to continuation of haulage have been predicted using both the default and revised emission factors.

Figure 1-2 shows the location of sources used in the dispersion modelling to represent the hauling of ROM coal from the underground operations.

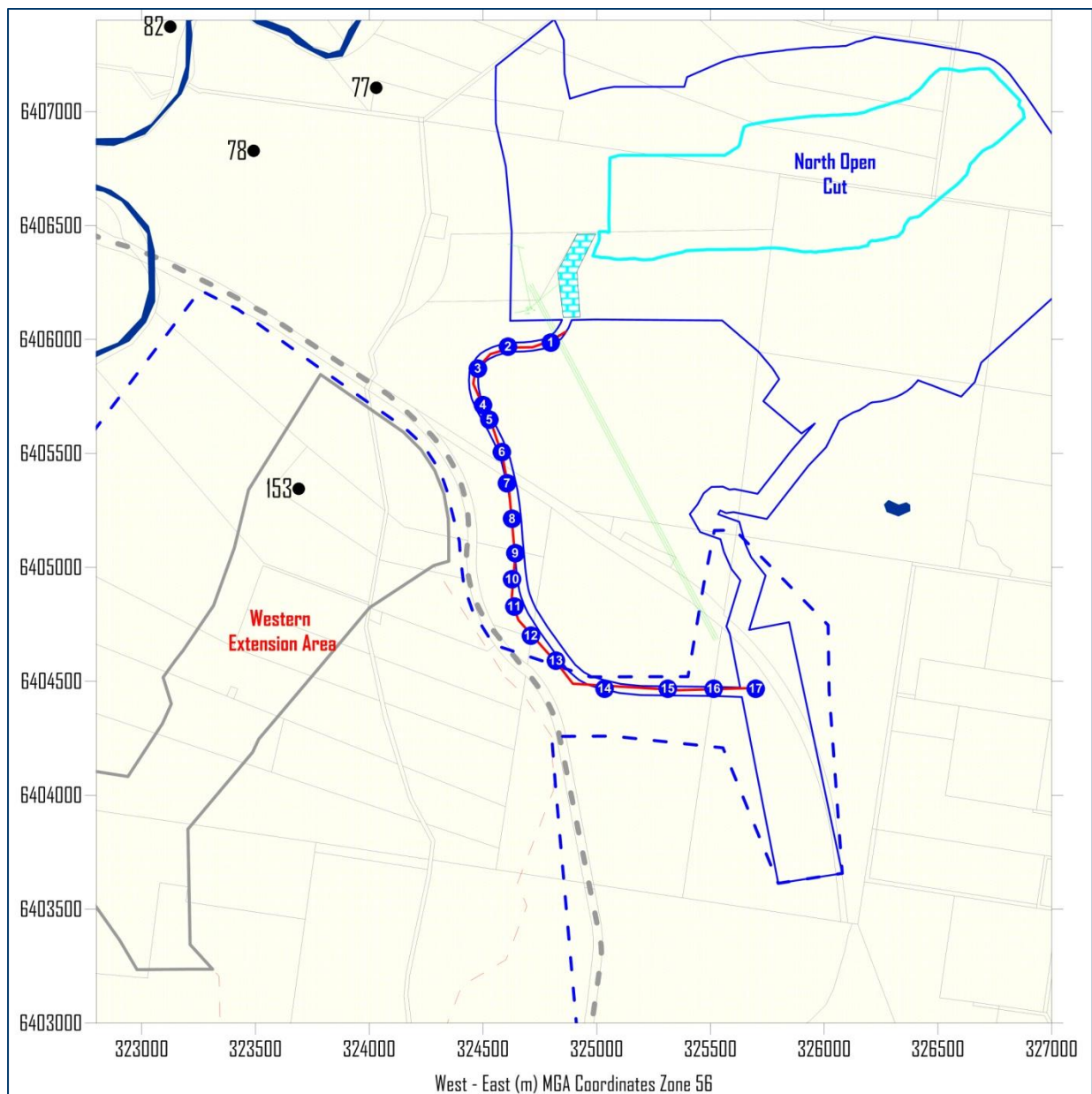


Figure 1-2: Source locations for underground haulage of ROM

2 RESULTS

The predicted impacts under Modification 2 at all receptors previously assessed in the AQIA are presented in **Appendix B (Table B.1 to Table B.8)**. For the majority of the residences there is little or no change in the predicted impacts due to the continuation of hauling, therefore the presentation of results focuses on those residences where an exceedance is predicted to occur due to the continuation of hauling.

The predicted incremental impact from haulage of the underground coal for PM₁₀, TSP and dust deposition using both the default emission factor and the current AP-42 emission factor are presented in **Appendix C (Figure C.1 to Figure C.4)**.

2.1 Default emission factor

Based on the following assumptions the TSP emissions from haulage using the default uncontrolled emission factor of 4 kg/km were calculated to be 110,734 kg/y:

- Return travel distance = 5.6 km/trip
- Quantity of material hauled = 3,500,000 t/y
- Truck capacity = 124.5 t/load
- Control efficiency = 75%

$$\begin{aligned} \text{TSP emissions} &= 4[\text{kg/km}] * 5.6[\text{km/trip}] * 1/124.5[\text{t/load}] * 1-0.75[\% \text{ control}] * 3,500,000[\text{t/y}] \\ &= 157,430 \text{ kg/y} \end{aligned}$$

As per the AQIA, as shown in **Table 2-1**, applying the default haulage emission factor, the predicted increase in emissions from the Complex due to the continuation of haulage of ROM coal is less than 6% compared with that currently approved.

Table 2-1: Comparison of total emissions from the Complex with and without haulage of underground coal (using default emission factor)

Pit	Year 3 modified	Year 4 per AQIA	Year 6 per AQIA	Year 8 per AQIA
Western Extension	1,972,350	2,935,367	2,429,178	2,791,261
Underground (exc. haul) ^(a)	80,512	198,084	198,084	198,084
North Open Cut	1,007,661	1,108,991	293,874	0
Total (exc. Haul)	3,060,523	4,242,442	2,921,136	2,989,345
Underground haulage	157,430	157,430	157,430	157,430
Total (inc. Haul)	3,217,953	4,399,872	3,078,566	3,146,775
% increase	5.1	3.7	5.4	5.3

Notes:

- a) As part of the approvals process, Year 3 emissions were re-calculated to reflect the underground reclaim of the product stockpile. As no changes were made during the approvals process to subsequent years, it has conservatively been assumed the emissions are as per the AQIA.

Table 2-2 presents a summary of residences where the continuation of hauling is predicted to result in an exceedance of an air quality assessment criterion using the default emission factor. Residence 108 has been purchased by Vale since the AQIA was completed. Residence 47, B&R Cherry, is privately owned and is currently entitled upon request, to acquisition due to subsidence, and additional air mitigation measures. Residence 110, G J Hall, is privately owned, and is currently entitled upon request, to acquisition due to noise, and additional air mitigation measures.

Table 2-2: Residences where continuation of hauling is predicted to result in an exceedence (using default emission factor)

Year	ID	Ownership (per EA)	PM ₁₀ 24-hour average Project Only		PM ₁₀ Annual average Project & other sources	
			Per AQIA	Per AQIA plus haul Default Emission Factor	Per AQIA	Per AQIA plus haul Default Emission Factor
Assessment criteria			50 µg/m ³ / 150 µg/m ³ ^(a)		30 µg/m ³	
Y3	108 ^(b)	VALE P/L and others.	50	55	-	-
Y4	47 ^(c)	B&R Cherry	50	53	-	-
	108 ^(b)	VALE P/L and others.	-	-	30	31
Y6	110 ^(d)	GJ Hall	47	51	-	-

Notes:

- The EPA assessment criteria are a cumulative criteria i.e. the impact of the Project and other sources. However, the DP&I acquisition criteria for 24-hour average PM₁₀ is assessed against both a Project only criteria of 50 µg/m³ and a cumulative criteria of 150 µg/m³. The DPI acquisition criteria for annual average PM₁₀ is assessed against a cumulative criteria of 30 µg/m³.
- Residence 108 has been purchased by Vale since the AQIA was completed. It was previously a private residence owned by IM Tisdell.
- In the current Project Approval for Integra Coal Operations, Residence 47 is entitled to acquisition upon request due to subsidence and also entitled to additional noise mitigation measures upon request.
- In the current Project Approval for Integra Coal Operations, Residence 110 is entitled to acquisition upon request due to noise and also entitled to additional dust mitigation measures upon request.

2.2 Current AP-42 emission factor

Due to the sensitivity of the current AP-42 emission factor, the surface silt content of the road, Integra collected surface samples from their haul roads and analysed them in accordance with ASTM-C-136 as prescribed in Section 13.2.2 of AP-42.

The results of the sampling are presented in **Appendix A**. The fraction of silt is defined as particles smaller than 75 µm in diameter. Three samples were collected and the silt content ranged from 1.6% to 2.5%, with an average of 2.1%. Assuming a mean vehicle weight of 202.5 t (average of loaded – 264.5 t, and unloaded – 140 t), and applying this to Equation 1, results in an uncontrolled emission factor of approximately 2.8 kg/VKT (when rounded; the emission factor used in the calculations is 2.8336 kg/t), which is lower than the default emission factor of 4 kg/VKT used in the AQIA. Therefore the calculated emissions presented in the AQIA can be considered conservative.

Based on the following assumptions the TSP emissions from haulage using the current emission factor were calculated to be 82,873 kg/y:

- Return travel distance = 5.6 km/trip
- Quantity of material hauled = 3,500,000 t/y
- Truck capacity = 124.5 t/load
- Control efficiency = 75%

$$\text{TSP emissions} = 2.8336 \text{ [kg/km]} * 5.6 \text{ [km/trip]} * 1/124.5 \text{ [t/load]} * 1-0.75 \text{ [% control]} * 3,500,000 \text{ [t/y]}$$

$$= 111,523 \text{ kg/y}$$

As per the AQIA, a control of 75% has been applied to represent watering of the haul roads for dust control.

As shown in **Table 2-1**, applying the AP-42 haulage uncontrolled emission factor of approximately 3.0 kg/VKT, the predicted increase in emissions from the Complex due to the continuation of haulage of ROM coal is less than 4% compared with that currently approved. It is important to note that the emissions from all other haul roads have been based on the default emission factor of 4 kg/VKT.

Table 2-3: Comparison of total emissions from Integra Coal operations with and without haulage of underground coal (using AP-42 emission factor)

Pit	Year 3 modified	Year 4 per AQIA	Year 6 per AQIA	Year 8 per AQIA
Western Extension	1,972,350	2,935,367	2,429,178	2,791,261
Underground (exc. haul) ^(a)	80,512	198,084	198,084	198,084
North Open Cut	1,007,661	1,108,991	293,874	0
Total (exc. Haul)	3,060,523	4,242,442	2,921,136	2,989,345
Underground haulage	111,523	111,523	111,523	111,523
Total (inc. Haul)	3,172,046	4,353,965	3,032,659	3,100,868
% increase	3.6	2.6	3.8	3.7

Note:

- a) As part of the approvals process, Year 3 emissions were re-calculated to reflect the underground reclaim of the product stockpile. As no changes were made during the approvals process to subsequent years, it has conservatively been assumed the emissions are as per the AQIA.

Table 2-4 presents a summary of residences where the continuation of hauling is predicted to result in an exceedence of an air quality assessment criterion using the current AP-42 emission factor. Consistent with the results adopting the default emission factor, residences are mined owned with the exception of ID 47, B&R Cherry. An increase of up to 2 µg/m³ is predicted at this residence. This residence is currently entitled upon request, to acquisition due to subsidence, and additional air mitigation measures.

Table 2-4: Residences where continuation of hauling is predicted to result in an exceedence (using AP-42 emission factor)

Year	ID	Ownership (per AQIA)	PM ₁₀ 24-hour average Project Only	
			Per AQIA	Per AQIA plus haul AP-42 Emission Factor
Y3	108 ^(a)	VALE P/L and others.	50	54
Y4	47 ^(b)	B&R Cherry	50	52

Notes:

- a) Residence 108 has been purchased by Vale since the AQIA was completed. It was previously a private residence owned by IM Tisdell.
- b) In the current Project Approval for Integra Coal Operations, Residence 47 is entitled to acquisition upon request due to subsidence and also entitled to additional noise mitigation measures upon request.

3 CUMULATIVE IMPACTS

At the request of the then Department of Planning (now DP&I), a similar assessment to the Camberwell Cumulative Impacts Review (**PAEHolmes, 2010**) was completed as part of the Environmental Assessment process to assess the potential for cumulative impacts of the Integra Complex with other projects. A copy of the assessment is provided in **Appendix D**. The assessment demonstrated that when predicted cumulative impacts are compared with measured concentrations, the predicted impacts are lower than measured i.e. the AQIA provides a conservative assessment of impacts.

As presented in **Section 2**, the continuation of underground haulage is predicted to have negligible impact on fugitive emissions, even at the very closest residences. It can be seen on **Figure C.1** to **Figure C.4** that the predicted incremental impact at Camberwell Village is significantly below the impact assessment criteria for all pollutants.

It is therefore concluded, that when considered in the context of the Camberwell Cumulative Impacts Review (**PAEHolmes, 2010**), the potential for the continuation of haulage to have a detrimental impact on the air quality in Camberwell Village is minimal.

4 MITIGATION

Although it is expected that the impact of fugitive emissions from the continuation of haulage would remain negligible, regular watering of unsealed access roads takes places to minimise airborne emissions (and hence impact) and will continue to form part on Integra's ongoing air quality management.

5 GREENHOUSE GAS ASSESSMENT

The greenhouse gas (GHG) emissions from the diesel usage associated with the continuation of haulage have been compared with the GHG emissions from the electricity usage for a conveyor. The GHG assessment has been conducted using the NGA Factors, published by the **DCCEE (2012)**.

The relevant GHG emissions included in the assessment are as follows:

- Fuel consumption (diesel) during haulage operations – Scope 1;
- Indirect emissions associated with conveyor electricity use – Scope 2;
- Indirect emissions associated with the production and transport of fuels – Scope 3;

5.1 Haulage

The relevant GHG sources from haulage are:

- Fuel consumption (diesel) during haulage operations – Scope 1;
- Indirect emissions associated with the production and transport of fuels – Scope 3;

Based on information provided by Integra, the trucks used for haulage consume approximately 115 litres of diesel per hour (1.92 l/minute) and the return travel distance takes approximately 9 minutes. Therefore, 17.25 litres of diesel is used per trip.

Based on an average load of 124.5 tonnes per trip, and the assumption that 3,500,000 tonnes per year will be moved, this equates to approximately 28,113 trips per year (3,500,000 [tonnes per year]/124.5 [tonnes per trip]).

Thus, the total fuel used is approximately 485 kL per year (17.25 [litres/trip] * 28,113 [trips per year] / 1000 [litres/kilolitre]).

Greenhouse gas emissions from diesel consumption were estimated using the following equation:

$$E_{CO_2-e} = \frac{Q \times EF}{1000}$$

where:

E_{CO_2-e}	=	Emissions of GHG from diesel combustion	(t CO ₂ -e/y)
Q	=	Estimated combustion of diesel	(GJ/y) ¹
EF	=	Emission factor (Scope 1 or Scope 3) for diesel combustion	(kg CO ₂ -e/GJ) ²

¹ GJ = giga joules

² kg CO₂-e/GJ = kilograms of carbon dioxide equivalents per gigajoule

The quantity of diesel consumed in GJ is calculated using an energy content factor for diesel of 38.6 gigajoules per kilolitre (GJ/kL). The Scope 1 and Scope 3 emission factors are 69.5 and 5 kg CO₂-e/GJ respectively. The estimated annual GHG emissions from diesel usage are 1,400 t CO₂-e, as presented in **Table 5-1**.

Table 5-1: Estimated CO₂-e (tonnes) for diesel consumption from continued haulage

Activity	Diesel (kL)	Emissions (t CO ₂ -e/y)		
		Scope 1	Scope 3	Total
RL100 haulage	485	1,301	99	1,400

5.2 Conveyor

The relevant GHG sources from the conveyor are:

- Indirect emissions associated with conveyor electricity use – Scope 2;
- Indirect emissions associated with the production and transport of fuels – Scope 3;

Based on information contained in the ROM Conveyor Options report completed by Worley Parsons (**Worley Parsons, 2011**), the overland conveyor (identified as SC06) would use 1,540,058 kWh per year electricity.

Greenhouse gas emissions from electricity usage were estimated using the following equation:

$$E_{CO_2-e} = \frac{Q \times EF}{1000}$$

where:

E _{CO₂-e}	=	Emissions of greenhouse gases from electricity usage	(tCO ₂ -e/y)
Q	=	Estimated electricity usage	(kWh/y) ¹
EF	=	Emission factor (Scope 2 or Scope 3) for electricity usage	(kgCO ₂ -e/kWh) ²

¹ kWh/annum = kilowatt hours per annum

² kgCO₂-e/kWh = kilograms of carbon dioxide equivalents per kilowatt hour

The Scope 2 and Scope 3 emission factors are 0.88 and 0.16 kg CO₂-e/kWh respectively. GHG emission factors for electricity were sourced from the NGA Factors (**DCCEE, 2012**).

The estimated annual GHG emissions from electricity usage of the conveyor are 1,602 t CO₂-e, as presented in **Table 5-2**.

Table 5-2: Estimated CO₂-e (tonnes) for electricity consumption from overland conveyor

Activity	Electricity (kWh)	Emissions (t CO ₂ -e/y)		
		Scope 2	Scope 3	Total
RL100 overland conveyor	1,540,058	1,355	246	1,602

5.3 Conclusions

The continued haulage of ROM coal from the underground is calculated to generate 202 t CO₂-e/y less emissions when compared with the overland conveyor.

6 CONCLUSIONS

A review of the dust emissions arising from Modification 2 to the Project Approvals to allow the continuation of hauling of ROM coal from the Underground operations at the Complex shows that the estimated dust emissions are negligible relative to the total emissions from the Complex.

Only two private residences (ID 47 and ID 110) are predicted to experience an exceedance of any of the air quality criteria as a result of the continuation of haulage. Each of these residences is predicted to exceed the 24-hour average PM₁₀ criteria of 50 µg/m³. The maximum 24-hour average PM₁₀ concentration is predicted to increase by a maximum of 4 µg/m³. Both these residences are

currently entitled to acquisition upon request due to subsidence (ID 47) or noise (ID 110). Residence ID 110 is also entitled to additional air mitigation measures upon request.

It is important to note that residence ID 110 is only predicted to exceed the 24-hour average PM₁₀ criteria of 50 µg/m³ when the default emission factor of 4 kg/km is applied. As presented in **Section 2.2**, the current AP-42 emission factor, when applying site-specific data is 2.8 kg/km, which is approximately 30% lower. As the rest of the emissions from road haulage have been calculated using the default emission factor of 4 kg/km, the predicted increase in 24-hour average PM₁₀ concentrations is considered to be conservative.

Air quality monitoring data in the vicinity of the site, which includes the impacts of dust emission generated from the current hauling of ROM coal from the Underground, has generally demonstrated compliance with all relevant criteria.

In addition, the GHG emissions from continuation from haulage are lower than the use of an overland conveyor.

It is concluded, therefore, that the continuation of hauling of ROM coal from the underground operations would not cause any discernible change to dust levels in the area, including Camberwell Village, relative to the approved operations at the Complex as a whole.

Please do not hesitate to contact me should you require any further information.

A handwritten signature in black ink, appearing to read 'JCox'.

Judith Cox
Senior Air Quality Engineer

References:

DCCEE (2011)

"National Greenhouse Account (NGA) Factors". Published by the Department of Climate Change and Energy Efficiency. July 2012. Website: <http://www.climatechange.gov.au/>

DoP (2010)

"Major Project Assessment: Integra Open Cut Project (08_102)" NSW Department of Planning November 2010. Available from: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2701 accessed 31 May 2011.

EMGA Mitchell McLennan (2011)

"Integra Mine Complex Modification 1 Environmental Assessment" prepared for Integra Coal Operations Pty Ltd, 2 December 2011.

Holmes Air Sciences (2009)

"Air Quality Impact Assessment: Integra open Cut Project" 16 June 2009. Prepared for URS Australia Pty Ltd on behalf of Integra Coal.

PAEHolmes (2010)

"Additional Cumulative Air Quality Assessment for Proposed Ashton Coal Operations Ltd, Integra Coal Operations Pty Ltd and Ravensworth Operations Pty Ltd", 1 July 2010. Prepared for Ashton Coal Operations Ltd, Integra Coal Operations Pty Ltd and Ravensworth Operations Pty Ltd

SPCC (1983)

"Air Pollution from Coal Mining and Related Developments", State Pollution Control Commission.

URS Australia Pty Limited (2009)

"Environmental Assessment Integra Open Cut Project", prepared on behalf of Integra Coal Operations Pty Limited.

Worley Parsons (2011)

"Integra Coal Operations Pty Ltd. ROM Conveyor Options – Summary" prepared by Worley Parsons, 3 November 2011.

Appendix A: Surface silt measurement results



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ANALYTICAL REPORT

TO: CARBON BASED ENVIRONMENTAL

ATT: Mr Colin Davies

MONTH: Nov-10

OUR REF: HM00096

DATE 27-Jan-11

Sample Description: RL100 North End

Mass Sample (a.r.): 3392.4 g

Total Moisture (a.r.): 1.5 %

SIZE ANALYSIS

Aperture (mm)		Fractional		Cumulative
(-)	(+)	Mass (g)	Mass (%)	Mass (%)
	8.0	138.37	35.4	35.4
8.0	4.0	67.27	17.2	52.6
4.0	1.00	94.91	24.3	76.9
1.00	0.600	22.12	5.7	82.5
0.600	0.106	52.95	13.5	96.1
0.106	0.075	6.65	1.7	97.8
0.075		8.79	2.2	100.0
Total Mass (g)		391.06		

Sample Description: RL100 Centre

Mass Sample (a.r.): 5401.9 g

Total Moisture (a.r.): 1.4 %

SIZE ANALYSIS

Aperture (mm)		Fractional		Cumulative
(-)	(+)	Mass (g)	Mass (%)	Mass (%)
	8.0	212.52	52.9	52.9
8.0	4.0	41.09	10.2	63.1
4.0	1.00	62.83	15.6	78.8
1.00	0.600	19.60	4.9	83.7
0.600	0.106	49.52	12.3	96.0
0.106	0.075	5.63	1.4	97.4
0.075		10.47	2.6	100.0
Total Mass (g)		401.66		



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ANALYTICAL REPORT

TO: CARBON BASED ENVIRONMENTAL

ATT: Mr Colin Davies

MONTH: Nov-10

OUR REF: HM00096

DATE 27-Jan-11

Sample Description: RL100 South End

Mass Sample (a.r.): 418.6 g

Total Moisture (a.r.): 1.3 %

SIZE ANALYSIS

Aperture (mm)		Fractional		Cumulative
(-)	(+)	Mass (g)	Mass (%)	Mass (%)
	8.0	122.31	30.4	30.4
8.0	4.0	84.32	21.0	51.3
4.0	1.00	111.48	27.7	79.1
1.00	0.600	24.40	6.1	85.1
0.600	0.106	48.29	12.0	97.1
0.106	0.075	5.09	1.3	98.4
0.075		6.52	1.6	100.0
Total Mass (g)		402.41		

Appendix B: Predicted impacts at residences

Table B.1: Predicted PM₁₀, TSP and dust deposition levels – Y3 modified post-EA compared with continued hauling of underground coal – project only

Residence ID	Y3 Project only Modified post-EA				Y3 Project only Modified post-EA plus underground haulage Default emission factor				Y3 Project only Modified post-EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2	-	30	90	4
Private Residences (per EA)												
3	14	3	3	0.4	16	3	3	0.4	15	3	3	0.4
4	14	3	3	0.4	16	3	3	0.4	16	3	3	0.4
5	14	2	3	0.3	16	3	3	0.3	15	3	3	0.3
6	14	3	3	0.3	16	3	3	0.3	15	3	3	0.3
7	13	2	2	0.3	14	2	3	0.3	14	2	3	0.3
8	16	3	3	0.3	18	3	3	0.4	18	3	3	0.4
9 ^(a)	16	3	3	0.4	18	3	4	0.4	17	3	4	0.4
10 ^(b)	17	3	3	0.4	19	3	4	0.4	19	3	4	0.4
11	19	3	3	0.4	21	3	4	0.4	21	3	3	0.4
12	15	2	2	0.3	16	2	3	0.3	16	2	3	0.3
13	19	3	3	0.4	21	3	4	0.4	21	3	3	0.4
14	16	2	3	0.4	17	3	3	0.4	17	3	3	0.4
15	14	2	2	0.3	15	2	3	0.3	15	2	3	0.3
16	17	3	3	0.4	18	3	4	0.5	18	3	4	0.5
17	15	2	3	0.3	16	2	3	0.3	16	2	3	0.3
18	16	2	3	0.3	18	2	3	0.3	17	2	3	0.3
19	12	2	2	0.1	14	2	2	0.1	14	2	2	0.1
20	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
21	15	1	2	0.1	16	2	2	0.1	16	2	2	0.1
22	15	1	1	0.1	16	1	2	0.1	16	1	2	0.1
23	16	1	2	0.1	17	1	2	0.1	16	1	2	0.1
24	11	1	1	0.0	12	1	1	0.0	12	1	1	0.0
25	10	1	1	0.0	11	1	1	0.0	10	1	1	0.0
26	9	1	1	0.0	10	1	1	0.0	10	1	1	0.0
27	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
28	6	1	1	0.0	7	1	1	0.0	7	1	1	0.0
29	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
30	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
31	10	1	1	0.0	11	1	1	0.0	11	1	1	0.0
32	12	1	1	0.0	13	1	1	0.0	12	1	1	0.0
34	13	1	1	0.1	14	1	2	0.1	14	1	2	0.1
35	20	2	2	0.1	22	2	2	0.1	21	2	2	0.1
36	13	1	1	0.0	14	1	1	0.0	14	1	1	0.0
37	15	1	1	0.0	17	1	2	0.1	16	1	1	0.0

Residence ID	Y3 Project only Modified post-EA				Y3 Project only Modified post-EA plus underground haulage Default emission factor				Y3 Project only Modified post-EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
38	13	1	1	0.0	15	1	1	0.0	14	1	1	0.0
39	13	1	1	0.0	14	1	1	0.0	14	1	1	0.0
40	12	1	1	0.0	14	1	1	0.0	14	1	1	0.0
41	12	1	1	0.0	14	1	1	0.0	13	1	1	0.0
42	13	1	1	0.0	15	1	1	0.0	14	1	1	0.0
43	19	1	2	0.1	21	2	2	0.1	20	2	2	0.1
44	28	2	3	0.1	30	3	3	0.1	29	2	3	0.1
47	42	4	4	0.3	45	4	5	0.3	44	4	5	0.3
48	30	3	3	0.2	33	3	4	0.2	32	3	3	0.2
49	30	3	3	0.2	33	3	3	0.2	32	3	3	0.2
50	19	2	2	0.1	21	2	2	0.1	21	2	2	0.1
51	18	2	2	0.1	20	2	2	0.1	19	2	2	0.1
52	18	2	2	0.1	20	2	2	0.1	19	2	2	0.1
53	19	2	2	0.1	20	2	2	0.1	20	2	2	0.1
54	21	2	2	0.1	23	2	2	0.1	22	2	2	0.1
55	17	1	2	0.1	19	2	2	0.1	18	2	2	0.1
57	19	1	2	0.1	20	2	2	0.1	19	2	2	0.1
62	26	2	3	0.2	28	2	3	0.2	27	2	3	0.2
63	22	3	4	0.4	24	4	4	0.4	24	3	4	0.4
64	26	5	6	0.7	28	5	6	0.7	28	5	6	0.7
65	17	2	3	0.2	19	3	3	0.2	18	3	3	0.2
66	18	3	3	0.3	20	3	3	0.3	20	3	3	0.3
67	17	3	4	0.3	19	3	4	0.4	18	3	4	0.4
68	19	3	4	0.4	21	4	4	0.4	20	4	4	0.4
71	19	4	5	0.6	22	5	6	0.6	21	5	6	0.6
72	19	4	5	0.6	22	5	6	0.7	21	5	6	0.6
73	19	5	6	0.7	22	5	6	0.7	21	5	6	0.7
76	23	5	6	0.6	27	5	6	0.7	26	5	6	0.7
80	19	4	5	0.4	23	5	5	0.5	22	4	5	0.5
87	34	6	8	0.9	36	7	8	0.9	35	7	8	0.9
88	18	3	3	0.3	19	3	3	0.3	19	3	3	0.3
91	18	3	3	0.3	19	3	3	0.3	19	3	3	0.3
94	15	2	3	0.2	17	2	3	0.2	16	2	3	0.2
95	16	2	3	0.2	18	3	3	0.2	17	3	3	0.2
96	16	3	3	0.2	18	3	3	0.2	17	3	3	0.2
99	15	2	3	0.2	16	2	3	0.2	16	2	3	0.2
100	14	2	2	0.2	15	2	3	0.2	15	2	3	0.2
103	15	2	2	0.2	16	2	3	0.2	16	2	3	0.2

Residence ID	Y3 Project only Modified post-EA				Y3 Project only Modified post-EA plus underground haulage Default emission factor				Y3 Project only Modified post-EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
105	20	3	4	0.3	22	3	4	0.3	21	3	4	0.3
106	24	4	5	0.4	28	5	5	0.5	27	5	5	0.4
108 ^(C)	50	8	9	0.7	55	8	10	0.7	54	8	10	0.7
109	69	8	9	0.4	74	8	9	0.4	72	8	9	0.4
110	45	6	7	0.4	50	6	7	0.4	48	6	7	0.4
111	40	4	4	0.1	43	4	4	0.1	42	4	4	0.1
112	23	3	3	0.2	26	3	4	0.2	25	3	4	0.2
118	17	2	3	0.2	19	2	3	0.2	18	2	3	0.2
120	18	2	3	0.2	19	2	3	0.2	19	2	3	0.2
121	16	2	2	0.1	17	2	3	0.1	17	2	2	0.1
123	14	2	2	0.1	15	2	2	0.1	15	2	2	0.1
125	15	2	2	0.1	17	2	3	0.1	17	2	2	0.1
126	14	2	2	0.1	16	2	2	0.1	15	2	2	0.1
129	22	2	2	0.1	25	2	3	0.1	25	2	3	0.1
132	22	1	1	0.0	25	2	2	0.0	24	1	2	0.0
133	21	1	1	0.0	23	1	1	0.0	22	1	1	0.0
137	14	1	1	0.0	15	1	1	0.0	15	1	1	0.0
139	9	1	2	0.1	10	2	2	0.1	10	2	2	0.1
142	7	1	1	0.1	8	1	1	0.1	8	1	1	0.1
143	10	2	2	0.3	11	2	2	0.3	11	2	2	0.3
144	11	2	2	0.3	12	2	3	0.3	11	2	3	0.3
145	11	2	3	0.3	12	2	3	0.3	12	2	3	0.3
146	11	2	3	0.3	13	2	3	0.3	12	2	3	0.3
147	12	2	3	0.3	13	3	3	0.3	13	2	3	0.3
148	12	2	3	0.3	14	3	3	0.4	13	3	3	0.4
149	12	2	3	0.3	13	3	3	0.3	13	2	3	0.3
150	12	2	3	0.4	14	3	3	0.4	13	3	3	0.4
151	12	2	3	0.3	14	3	3	0.4	13	3	3	0.4
152	13	3	3	0.3	15	3	3	0.4	14	3	3	0.4
153	85	22	26	2.1	97	23	28	2.2	93	23	27	2.2
154	18	3	3	0.2	21	3	3	0.2	20	3	3	0.2
156	19	3	3	0.2	20	3	3	0.2	20	3	3	0.2
157	18	2	3	0.2	20	3	3	0.2	19	3	3	0.2
159	17	2	3	0.2	19	2	3	0.2	18	2	3	0.2
161	17	3	3	0.2	18	3	3	0.3	18	3	3	0.3
Mine-owned Residences (per EA)												
1	13	3	3	0.4	15	3	3	0.4	15	3	3	0.4
2	14	3	3	0.4	16	3	4	0.4	16	3	4	0.4

Residence ID	Y3 Project only Modified post-EA				Y3 Project only Modified post-EA plus underground haulage Default emission factor				Y3 Project only Modified post-EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
33	11	1	1	0.0	13	1	1	0.0	12	1	1	0.0
45	54	4	5	0.3	57	5	6	0.3	56	5	6	0.3
46	48	4	5	0.3	51	4	5	0.3	50	4	5	0.3
56	20	2	2	0.1	21	2	2	0.1	21	2	2	0.1
58	19	2	2	0.1	20	2	2	0.1	20	2	2	0.1
59	15	2	2	0.1	16	2	2	0.1	15	2	2	0.1
60	11	2	2	0.1	12	2	2	0.1	12	2	2	0.1
61	18	2	2	0.1	20	2	2	0.1	19	2	2	0.1
69	19	4	4	0.5	22	4	5	0.5	21	4	5	0.5
70	20	4	5	0.6	23	4	5	0.6	22	4	5	0.6
74	10	2	2	0.2	11	2	3	0.2	11	2	3	0.2
75	11	2	3	0.2	12	3	3	0.2	12	2	3	0.2
77	26	6	7	0.6	33	7	8	0.7	31	6	8	0.7
78	28	6	7	0.5	34	7	8	0.7	32	6	8	0.6
79	19	4	5	0.5	24	5	6	0.5	22	5	6	0.5
81	19	4	5	0.4	22	5	6	0.5	21	5	5	0.5
82	20	5	5	0.5	23	5	6	0.5	22	5	6	0.5
83	17	4	5	0.4	20	5	5	0.5	19	4	5	0.5
84	18	5	6	0.6	21	5	6	0.6	20	5	6	0.6
85	22	4	5	0.5	25	4	5	0.5	24	4	5	0.5
86	23	4	5	0.5	25	4	5	0.5	24	4	5	0.5
89	15	2	2	0.2	16	2	2	0.2	15	2	2	0.2
90	17	2	3	0.3	18	3	3	0.3	18	3	3	0.3
92	15	2	2	0.2	16	2	3	0.2	16	2	3	0.2
93	16	2	3	0.2	17	2	3	0.2	17	2	3	0.2
97	16	3	3	0.2	18	3	3	0.2	17	3	3	0.2
98	15	2	3	0.2	16	2	3	0.2	16	2	3	0.2
101	14	2	2	0.2	15	2	2	0.2	15	2	2	0.2
102	14	2	2	0.2	15	2	3	0.2	15	2	2	0.2
104	13	2	2	0.1	14	2	2	0.1	14	2	2	0.1
107	31	6	6	0.5	35	6	7	0.5	34	6	7	0.5
113	19	3	3	0.2	21	3	3	0.2	21	3	3	0.2
114	18	2	3	0.2	20	3	3	0.2	20	3	3	0.2
115	18	2	3	0.2	20	3	3	0.2	20	3	3	0.2
116	18	2	3	0.2	20	3	3	0.2	19	3	3	0.2
117	18	2	3	0.2	20	3	3	0.2	19	3	3	0.2
119	16	2	2	0.2	18	2	3	0.2	17	2	3	0.2
122	15	2	2	0.1	17	2	2	0.1	16	2	2	0.1

Residence ID	Y3 Project only Modified post-EA				Y3 Project only Modified post-EA plus underground haulage Default emission factor				Y3 Project only Modified post-EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
124	14	2	2	0.1	16	2	2	0.1	15	2	2	0.1
127	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
128	20	2	3	0.1	23	2	3	0.1	22	2	3	0.1
130	16	2	2	0.0	18	2	2	0.0	18	2	2	0.0
131	16	1	2	0.0	18	2	2	0.0	17	2	2	0.0
134	7	1	1	0.1	8	1	1	0.1	8	1	1	0.1
135	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
136	16	1	1	0.0	17	1	1	0.0	17	1	1	0.0
138	13	1	1	0.0	15	1	2	0.0	14	1	2	0.0
140	9	1	1	0.1	10	1	2	0.1	10	1	1	0.1
141	8	1	1	0.1	9	1	1	0.1	9	1	1	0.1
155	19	3	3	0.2	21	3	3	0.2	20	3	3	0.2
158	18	2	3	0.2	20	3	3	0.2	19	2	3	0.2
160	16	2	3	0.2	17	2	3	0.2	17	2	3	0.2
162	15	2	3	0.2	17	2	3	0.2	16	2	3	0.2
163	14	2	2	0.2	16	2	3	0.2	15	2	3	0.2
164	18	3	3	0.3	20	3	3	0.3	19	3	3	0.3
165	16	2	3	0.2	18	3	3	0.2	17	3	3	0.2
166	16	2	3	0.2	17	3	3	0.2	17	2	3	0.2
167	16	2	3	0.2	17	2	3	0.2	17	2	3	0.2
168	15	2	2	0.2	16	2	3	0.2	16	2	3	0.2
169	15	2	2	0.2	16	2	3	0.2	16	2	3	0.2
170	19	5	6	0.6	22	5	6	0.6	21	5	6	0.6

Notes:

- Vale are in the process of purchasing Residence 9 (W&N Pendered).
- Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.2: Predicted PM₁₀, TSP and dust deposition levels – Y3 modified post-EA compared with continued hauling of underground coal – project and other sources

Residence ID	Y3 Project & other sources Modified post-EA			Y3 Project & other sources Modified post-EA plus underground haulage Default emission factor			Y3 Project & other sources Modified post-EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
	Private Residences (per EA)								
3	16	49	1.1	17	49	1.1	17	49	1.1
4	16	49	1.1	17	49	1.1	17	49	1.1
5	16	48	1.0	16	49	1.1	16	49	1.0
6	16	49	1.0	16	49	1.1	16	49	1.1
7	15	48	1.0	15	48	1.0	15	48	1.0
8	16	49	1.1	16	49	1.1	16	49	1.1
9 ^(a)	16	49	1.1	17	50	1.1	17	50	1.1
10 ^(b)	16	49	1.1	17	50	1.1	17	50	1.1
11	16	49	1.1	17	50	1.1	17	49	1.1
12	15	48	1.0	15	48	1.0	15	48	1.0
13	16	49	1.1	17	49	1.2	17	49	1.2
14	16	49	1.1	16	49	1.1	16	49	1.1
15	15	48	1.0	15	48	1.0	15	48	1.0
16	16	49	1.2	17	49	1.2	16	49	1.2
17	15	48	1.0	16	48	1.0	15	48	1.0
18	16	48	1.0	16	48	1.0	16	48	1.0
19	15	47	0.9	15	48	0.9	15	48	0.9
20	15	48	0.9	15	48	0.9	15	48	0.9
21	15	47	0.8	15	47	0.8	15	47	0.8
22	14	47	0.8	15	47	0.8	15	47	0.8
23	15	47	0.8	15	48	0.8	15	47	0.8
24	14	46	0.8	14	46	0.8	14	46	0.8
25	14	46	0.7	14	46	0.7	14	46	0.7
26	13	46	0.7	13	46	0.7	13	46	0.7
27	13	45	0.7	13	45	0.7	13	45	0.7
28	13	45	0.7	13	45	0.7	13	45	0.7
29	13	46	0.7	14	46	0.7	14	46	0.7
30	14	46	0.8	14	46	0.8	14	46	0.8
31	14	47	0.8	14	47	0.8	14	47	0.8
32	14	47	0.8	15	47	0.8	15	47	0.8
34	15	48	0.9	15	48	0.9	15	48	0.9
35	16	49	1.0	16	49	1.0	16	49	1.0
36	15	47	0.9	15	48	0.9	15	48	0.9
37	15	48	0.9	16	48	0.9	15	48	0.9

Residence ID	Y3 Project & other sources Modified post-EA			Y3 Project & other sources Modified post-EA plus underground haulage Default emission factor			Y3 Project & other sources Modified post-EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
38	15	48	0.9	15	48	0.9	15	48	0.9
39	15	48	0.9	15	48	0.9	15	48	0.9
40	15	48	0.9	15	48	0.9	15	48	0.9
41	15	47	0.9	15	48	0.9	15	48	0.9
42	16	49	1.0	16	49	1.0	16	49	1.0
43	16	49	1.0	16	49	1.0	16	49	1.0
44	17	50	1.1	18	51	1.1	17	50	1.1
47	19	52	1.3	19	53	1.3	19	53	1.3
48	18	51	1.2	18	51	1.2	18	51	1.2
49	18	51	1.2	18	52	1.2	18	51	1.2
50	17	50	1.1	18	51	1.1	18	51	1.1
51	17	50	1.1	18	50	1.1	17	50	1.1
52	17	50	1.1	18	51	1.1	18	51	1.1
53	18	51	1.2	18	51	1.2	18	51	1.2
54	19	52	1.2	19	52	1.2	19	52	1.2
55	18	51	1.2	19	52	1.2	18	52	1.2
57	19	52	1.3	19	52	1.3	19	52	1.3
62	19	52	1.3	19	52	1.3	19	52	1.3
63	19	53	1.4	20	53	1.4	20	53	1.4
64	21	55	1.8	21	55	1.8	21	55	1.8
65	20	54	1.4	20	54	1.4	20	54	1.4
66	20	54	1.4	20	54	1.4	20	54	1.4
67	21	54	1.5	21	54	1.5	21	54	1.5
68	21	54	1.5	21	55	1.6	21	55	1.6
71	22	56	1.7	22	56	1.8	22	56	1.8
72	22	56	1.8	22	56	1.8	22	56	1.8
73	22	57	1.8	23	57	1.9	23	57	1.9
76	23	57	1.8	24	58	1.9	23	58	1.9
80	23	57	1.8	24	58	1.9	24	58	1.9
87	26	61	2.5	26	61	2.5	26	61	2.5
88	22	56	1.8	22	56	1.8	22	56	1.8
91	21	55	1.7	21	55	1.7	21	55	1.7
94	21	54	1.5	21	54	1.5	21	54	1.5
95	21	54	1.5	21	55	1.6	21	55	1.6
96	21	54	1.5	21	54	1.5	21	54	1.5
99	20	54	1.5	20	54	1.5	20	54	1.5
100	20	54	1.4	20	54	1.5	20	54	1.4
103	20	53	1.3	20	53	1.3	20	53	1.3

Residence ID	Y3 Project & other sources Modified post-EA			Y3 Project & other sources Modified post-EA plus underground haulage Default emission factor			Y3 Project & other sources Modified post-EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
105	22	56	1.8	22	56	1.8	22	56	1.8
106	22	56	1.7	22	56	1.7	22	56	1.7
108 ^(c)	26	61	2.0	26	61	2.0	26	61	2.0
109	26	60	1.7	26	61	1.7	26	60	1.7
110	24	58	1.7	24	58	1.7	24	58	1.7
111	21	54	1.3	21	55	1.3	21	55	1.3
112	20	53	1.3	20	53	1.3	20	53	1.3
118	20	53	1.3	20	53	1.3	20	53	1.3
120	19	53	1.3	19	53	1.3	19	53	1.3
121	19	52	1.2	19	52	1.2	19	52	1.2
123	18	51	1.1	18	51	1.1	18	51	1.1
125	18	52	1.2	19	52	1.2	19	52	1.2
126	18	51	1.1	18	51	1.1	18	51	1.1
129	18	51	1.1	18	51	1.1	18	51	1.1
132	15	48	0.8	15	48	0.8	15	48	0.8
133	14	47	0.7	14	47	0.7	14	47	0.7
137	13	46	0.7	14	46	0.7	14	46	0.7
139	23	58	1.7	23	58	1.7	23	58	1.7
142	15	48	1.1	15	48	1.1	15	48	1.1
143	16	49	1.2	16	49	1.2	16	49	1.2
144	17	50	1.2	17	50	1.3	17	50	1.2
145	18	51	1.3	18	51	1.3	18	51	1.3
146	17	50	1.2	17	50	1.2	17	50	1.2
147	17	50	1.2	17	50	1.2	17	50	1.2
148	17	50	1.1	17	50	1.2	17	50	1.1
149	16	49	1.1	17	50	1.1	17	49	1.1
150	17	50	1.1	17	50	1.1	17	50	1.1
151	16	49	1.1	17	50	1.1	17	49	1.1
152	16	49	1.1	16	49	1.1	16	49	1.1
153	40	77	3.4	41	79	3.5	41	78	3.5
154	19	53	1.3	20	53	1.3	19	53	1.3
156	20	53	1.3	20	53	1.3	20	53	1.3
157	19	53	1.3	20	53	1.3	20	53	1.3
159	19	53	1.3	19	53	1.3	19	53	1.3
161	21	55	1.6	21	55	1.6	21	55	1.6
	Mine-owned Residences (per EA)								
1	16	49	1.1	17	49	1.1	16	49	1.1
2	17	50	1.1	17	50	1.2	17	50	1.2

Residence ID	Y3 Project & other sources Modified post-EA			Y3 Project & other sources Modified post-EA plus underground haulage Default emission factor			Y3 Project & other sources Modified post-EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
33	15	47	0.8	15	47	0.8	15	47	0.8
45	19	53	1.2	20	53	1.3	20	53	1.3
46	19	53	1.3	20	53	1.3	20	53	1.3
56	19	52	1.3	19	52	1.3	19	52	1.3
58	19	52	1.3	19	52	1.3	19	52	1.3
59	20	53	1.4	20	53	1.4	20	53	1.4
60	21	55	1.6	22	55	1.6	22	55	1.6
61	19	53	1.3	20	53	1.3	20	53	1.3
69	21	55	1.6	22	55	1.6	21	55	1.6
70	22	55	1.7	22	56	1.7	22	56	1.7
74	26	60	1.9	26	61	1.9	26	60	1.9
75	29	64	2.1	29	64	2.1	29	64	2.1
77	23	57	1.8	24	59	1.9	24	58	1.9
78	24	58	1.9	25	60	2.0	25	59	2.0
79	23	57	1.8	24	58	1.9	24	58	1.9
81	24	58	1.9	24	58	1.9	24	58	1.9
82	24	58	1.9	25	59	2.0	24	59	2.0
83	24	59	2.0	25	59	2.0	25	59	2.0
84	27	62	2.6	27	62	2.6	27	62	2.6
85	27	62	2.6	27	62	2.6	27	62	2.6
86	27	61	2.5	27	62	2.5	27	62	2.5
89	23	57	1.7	23	57	1.7	23	57	1.7
90	21	55	1.7	21	55	1.7	21	55	1.7
92	21	55	1.6	21	55	1.6	21	55	1.6
93	21	55	1.6	21	55	1.6	21	55	1.6
97	21	54	1.5	21	54	1.5	21	54	1.5
98	20	54	1.4	20	54	1.4	20	54	1.4
101	20	54	1.5	21	54	1.5	21	54	1.5
102	20	53	1.4	20	53	1.4	20	53	1.4
104	19	52	1.2	19	52	1.2	19	52	1.2
107	23	57	1.7	23	57	1.7	23	57	1.7
113	19	53	1.3	20	53	1.3	20	53	1.3
114	19	53	1.3	20	53	1.3	20	53	1.3
115	20	53	1.3	20	53	1.3	20	53	1.3
116	20	53	1.3	20	53	1.3	20	53	1.3
117	20	53	1.3	20	53	1.3	20	53	1.3
119	19	52	1.3	19	53	1.3	19	53	1.3
122	18	52	1.2	19	52	1.2	18	52	1.2

Residence ID	Y3 Project & other sources Modified post-EA			Y3 Project & other sources Modified post-EA plus underground haulage Default emission factor			Y3 Project & other sources Modified post-EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
124	18	51	1.1	18	51	1.1	18	51	1.1
127	17	50	1.0	18	50	1.0	18	50	1.0
128	18	51	1.1	19	52	1.1	19	52	1.1
130	16	49	0.9	17	49	0.9	17	49	0.9
131	16	49	0.9	16	49	0.9	16	49	0.9
134	16	49	0.8	17	49	0.8	17	49	0.8
135	14	47	0.7	15	47	0.7	15	47	0.7
136	12	45	0.6	13	45	0.6	13	45	0.6
138	56	114	4.8	56	115	4.8	56	115	4.8
140	23	58	1.7	23	58	1.7	23	58	1.7
141	22	57	2.0	23	57	2.0	23	57	2.0
155	20	53	1.3	20	53	1.3	20	53	1.3
158	19	53	1.3	20	53	1.3	19	53	1.3
160	20	53	1.3	20	53	1.3	20	53	1.3
162	20	54	1.5	21	54	1.5	20	54	1.5
163	20	54	1.4	20	54	1.4	20	54	1.4
164	21	55	1.7	22	55	1.7	22	55	1.7
165	21	55	1.6	21	55	1.6	21	55	1.6
166	21	55	1.6	21	55	1.6	21	55	1.6
167	21	55	1.6	21	55	1.6	21	55	1.6
168	21	54	1.6	21	55	1.6	21	55	1.6
169	21	54	1.5	21	54	1.5	21	54	1.5
170	27	61	2.5	27	62	2.6	27	62	2.6

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.3: Predicted PM₁₀, TSP and dust deposition levels – Y4 (Full Pit) per EA compared with continued hauling of underground coal – project only

Residence ID	Y4 (Full Pit) Project only Per EA				Y4 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y4 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2	-	30	90	4
Private Residences (per EA)												
3	26	5	5	0.6	28	5	6	0.7	27	5	6	0.6
4	28	5	6	0.6	30	5	6	0.7	29	5	6	0.7
5	30	4	5	0.6	32	5	5	0.6	31	5	5	0.6
6	29	5	5	0.6	31	5	6	0.6	30	5	6	0.6
7	24	3	4	0.4	26	4	4	0.4	25	4	4	0.4
8	31	5	6	0.5	33	5	6	0.6	32	5	6	0.6
9 ^(a)	33	5	6	0.6	35	5	6	0.6	34	5	6	0.6
10 ^(b)	30	5	6	0.5	32	5	6	0.6	32	5	6	0.6
11	31	5	5	0.5	33	5	6	0.5	32	5	6	0.5
12	23	3	4	0.4	25	4	4	0.4	24	3	4	0.4
13	32	4	5	0.5	34	5	5	0.5	34	5	5	0.5
14	29	4	4	0.4	31	4	5	0.4	31	4	5	0.4
15	25	3	4	0.3	27	3	4	0.4	27	3	4	0.3
16	22	4	5	0.5	24	4	5	0.5	24	4	5	0.5
17	19	3	4	0.3	21	3	4	0.3	20	3	4	0.3
18	21	3	4	0.3	22	3	4	0.3	22	3	4	0.3
19	18	3	3	0.1	19	3	3	0.1	19	3	3	0.1
20	18	3	3	0.1	20	3	3	0.1	19	3	3	0.1
21	17	2	3	0.1	18	2	3	0.1	18	2	3	0.1
22	16	2	2	0.1	17	2	2	0.1	17	2	2	0.1
23	18	2	2	0.1	20	2	3	0.1	19	2	3	0.1
24	14	2	2	0.0	15	2	2	0.1	14	2	2	0.0
25	14	1	2	0.0	15	2	2	0.0	15	1	2	0.0
26	13	1	1	0.0	14	1	2	0.0	13	1	1	0.0
27	12	1	1	0.0	13	1	1	0.0	12	1	1	0.0
28	10	1	1	0.0	11	1	1	0.0	10	1	1	0.0
29	12	1	1	0.0	13	1	2	0.0	13	1	1	0.0
30	13	1	1	0.0	13	1	2	0.0	13	1	2	0.0
31	15	2	2	0.0	16	2	2	0.0	16	2	2	0.0
32	16	2	2	0.1	17	2	2	0.1	17	2	2	0.1
34	17	2	2	0.1	18	2	2	0.1	17	2	2	0.1
35	25	3	3	0.1	27	3	3	0.1	26	3	3	0.1
36	17	2	2	0.1	18	2	2	0.1	18	2	2	0.1
37	20	2	2	0.1	21	2	2	0.1	21	2	2	0.1
38	18	2	2	0.1	20	2	2	0.1	20	2	2	0.1

Residence ID	Y4 (Full Pit) Project only Per EA				Y4 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y4 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
39	18	2	2	0.1	19	2	2	0.1	19	2	2	0.1
40	17	2	2	0.1	19	2	2	0.1	19	2	2	0.1
41	17	2	2	0.0	19	2	2	0.0	18	2	2	0.0
42	19	2	2	0.1	20	2	2	0.1	20	2	2	0.1
43	25	2	3	0.1	27	3	3	0.1	26	2	3	0.1
44	33	4	4	0.2	35	4	4	0.2	35	4	4	0.2
47	50	5	6	0.4	53	6	7	0.4	52	6	6	0.4
48	37	4	5	0.2	40	4	5	0.3	39	4	5	0.2
49	37	4	5	0.2	40	4	5	0.3	39	4	5	0.3
50	25	3	3	0.1	28	3	3	0.1	27	3	3	0.1
51	24	3	3	0.1	26	3	3	0.1	25	3	3	0.1
52	24	3	3	0.1	26	3	3	0.1	25	3	3	0.1
53	27	3	3	0.1	29	3	3	0.1	28	3	3	0.1
54	30	3	3	0.1	32	3	3	0.1	31	3	3	0.1
55	25	2	3	0.1	27	2	3	0.1	26	2	3	0.1
57	27	2	3	0.1	28	3	3	0.1	28	2	3	0.1
62	37	4	4	0.2	39	4	4	0.2	38	4	4	0.2
63	36	5	6	0.4	38	5	6	0.4	37	5	6	0.4
64	37	7	8	0.8	40	7	9	0.8	39	7	9	0.8
65	22	4	4	0.3	24	4	5	0.3	23	4	4	0.3
66	24	4	5	0.3	26	4	5	0.3	25	4	5	0.3
67	24	5	5	0.4	26	5	6	0.4	25	5	6	0.4
68	26	5	6	0.5	28	5	6	0.5	27	5	6	0.5
71	26	6	8	0.7	29	7	8	0.8	28	7	8	0.7
72	27	6	8	0.7	30	7	8	0.8	29	7	8	0.8
73	29	7	9	0.8	32	8	9	0.9	31	7	9	0.9
76	38	8	9	0.9	42	9	10	0.9	41	8	10	0.9
80	34	7	9	0.8	38	8	9	0.8	36	8	9	0.8
87	60	9	11	1.2	62	9	11	1.2	61	9	11	1.2
88	23	4	4	0.4	24	4	4	0.4	24	4	4	0.4
91	22	4	4	0.3	23	4	4	0.3	23	4	4	0.3
94	21	3	4	0.3	22	3	4	0.3	22	3	4	0.3
95	22	3	4	0.3	23	3	4	0.3	23	3	4	0.3
96	23	3	4	0.3	25	4	4	0.3	24	4	4	0.3
99	21	3	3	0.3	22	3	4	0.3	22	3	4	0.3
100	20	3	3	0.2	21	3	3	0.2	21	3	3	0.2
103	22	3	3	0.2	24	3	4	0.2	24	3	3	0.2
105	25	4	5	0.4	27	4	5	0.4	26	4	5	0.4

Residence ID	Y4 (Full Pit) Project only Per EA				Y4 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y4 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
106	43	6	7	0.5	46	6	7	0.5	45	6	7	0.5
108 ^(c)	88	12	16	1.8	92	13	16	1.8	91	13	16	1.8
109	111	13	18	1.6	115	14	18	1.6	114	13	18	1.6
110	82	9	10	0.8	87	9	11	0.8	85	9	11	0.8
111	68	5	6	0.2	72	5	6	0.2	71	5	6	0.2
112	54	4	5	0.2	57	5	5	0.2	56	5	5	0.2
118	28	3	4	0.2	30	3	4	0.2	30	3	4	0.2
120	31	3	4	0.2	33	3	4	0.2	33	3	4	0.2
121	31	3	3	0.2	33	3	4	0.2	32	3	3	0.2
123	28	3	3	0.1	29	3	3	0.1	29	3	3	0.1
125	31	3	3	0.2	33	3	3	0.2	32	3	3	0.2
126	28	3	3	0.1	30	3	3	0.1	29	3	3	0.1
129	51	3	4	0.1	54	3	4	0.1	53	3	4	0.1
132	37	2	2	0.0	39	2	2	0.0	39	2	2	0.0
133	33	2	2	0.0	35	2	2	0.0	34	2	2	0.0
137	17	2	2	0.0	18	2	2	0.0	18	2	2	0.0
139	16	2	2	0.1	17	2	2	0.2	17	2	2	0.2
142	10	2	2	0.2	11	2	2	0.2	11	2	2	0.2
143	17	3	3	0.4	18	3	3	0.4	18	3	3	0.4
144	18	3	4	0.4	19	3	4	0.4	19	3	4	0.4
145	19	3	4	0.4	20	3	4	0.4	20	3	4	0.4
146	19	3	4	0.5	21	4	4	0.5	20	4	4	0.5
147	20	4	4	0.5	21	4	4	0.5	21	4	4	0.5
148	20	4	4	0.5	22	4	4	0.5	21	4	4	0.5
149	20	4	4	0.5	21	4	4	0.5	21	4	4	0.5
150	20	4	4	0.5	22	4	5	0.5	22	4	4	0.5
151	20	4	4	0.5	22	4	5	0.5	21	4	5	0.5
152	22	4	5	0.6	24	4	5	0.6	23	4	5	0.6
153	Acquisition of property assumed for Full Pit Assessment											
154	34	4	4	0.2	36	4	4	0.2	35	4	4	0.2
156	33	3	4	0.2	35	4	4	0.2	34	4	4	0.2
157	32	3	4	0.2	34	3	4	0.2	33	3	4	0.2
159	30	3	4	0.2	32	3	4	0.2	31	3	4	0.2
161	23	4	4	0.3	25	4	4	0.3	24	4	4	0.3
Mine-owned Residences (per EA)												
1	23	4	5	0.6	25	5	5	0.6	25	5	5	0.6
2	24	5	6	0.7	26	5	6	0.7	26	5	6	0.7
33	17	2	2	0.1	18	2	2	0.1	18	2	2	0.1

Residence ID	Y4 (Full Pit) Project only Per EA				Y4 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y4 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
45	61	6	7	0.4	64	6	7	0.4	63	6	7	0.4
46	54	6	7	0.4	58	6	7	0.4	57	6	7	0.4
56	29	3	3	0.1	30	3	3	0.1	30	3	3	0.1
58	27	2	3	0.1	28	3	3	0.1	28	3	3	0.1
59	22	3	3	0.2	24	3	3	0.2	23	3	3	0.2
60	15	3	3	0.2	16	3	3	0.2	16	3	3	0.2
61	27	3	3	0.1	29	3	3	0.2	28	3	3	0.2
69	26	6	6	0.6	29	6	7	0.6	28	6	7	0.6
70	27	6	7	0.7	29	6	8	0.7	29	6	7	0.7
74	17	3	4	0.3	19	4	4	0.3	19	4	4	0.3
75	20	4	4	0.3	22	4	5	0.4	22	4	4	0.3
77	48	11	13	1.0	55	12	14	1.1	53	11	14	1.1
78	63	13	16	1.4	68	14	17	1.6	67	14	17	1.5
79	35	8	9	0.8	40	8	10	0.9	38	8	10	0.9
81	38	8	10	0.9	41	9	10	0.9	40	9	10	0.9
82	47	9	11	1.1	51	10	12	1.2	50	10	12	1.2
83	41	8	9	0.9	44	8	10	0.9	43	8	10	0.9
84	49	8	9	1.1	52	8	10	1.2	52	8	10	1.2
85	47	6	7	0.8	50	6	8	0.8	49	6	7	0.8
86	45	6	7	0.7	47	6	7	0.7	46	6	7	0.7
89	18	3	3	0.2	19	3	3	0.2	19	3	3	0.2
90	21	3	4	0.3	22	3	4	0.3	22	3	4	0.3
92	19	3	3	0.3	20	3	4	0.3	20	3	3	0.3
93	20	3	4	0.3	22	3	4	0.3	21	3	4	0.3
97	23	3	4	0.3	24	4	4	0.3	24	4	4	0.3
98	21	3	4	0.2	23	3	4	0.3	22	3	4	0.3
101	19	3	3	0.2	20	3	3	0.2	20	3	3	0.2
102	20	3	3	0.2	21	3	3	0.2	21	3	3	0.2
104	19	3	3	0.2	21	3	3	0.2	20	3	3	0.2
107	78	8	9	0.8	82	8	10	0.8	81	8	10	0.8
113	34	4	4	0.2	36	4	4	0.2	36	4	4	0.2
114	33	3	4	0.2	35	4	4	0.2	35	4	4	0.2
115	32	3	4	0.2	34	4	4	0.2	34	4	4	0.2
116	32	3	4	0.2	33	4	4	0.2	33	4	4	0.2
117	30	3	4	0.2	32	4	4	0.2	31	3	4	0.2
119	27	3	3	0.2	29	3	4	0.2	28	3	3	0.2
122	29	3	3	0.2	30	3	3	0.2	30	3	3	0.2
124	29	3	3	0.1	31	3	3	0.1	30	3	3	0.1

Residence ID	Y4 (Full Pit) Project only Per EA				Y4 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y4 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
127	28	3	3	0.1	30	3	3	0.1	29	3	3	0.1
128	47	3	4	0.1	50	4	4	0.1	49	3	4	0.1
130	36	2	3	0.1	38	3	3	0.1	38	2	3	0.1
131	35	2	2	0.0	38	2	2	0.0	37	2	2	0.0
134	13	1	2	0.1	14	2	2	0.1	14	2	2	0.1
135	16	1	1	0.0	17	1	1	0.0	17	1	1	0.0
136	22	1	1	0.0	23	1	1	0.0	23	1	1	0.0
138	20	2	2	0.1	21	2	2	0.1	21	2	2	0.1
140	15	2	2	0.1	16	2	2	0.1	16	2	2	0.1
141	13	1	1	0.1	13	1	1	0.1	13	1	1	0.1
155	33	4	4	0.3	35	4	4	0.3	34	4	4	0.3
158	32	3	4	0.2	33	3	4	0.2	33	3	4	0.2
160	25	3	3	0.2	27	3	4	0.2	26	3	4	0.2
162	22	3	4	0.3	23	3	4	0.3	23	3	4	0.3
163	21	3	3	0.2	22	3	4	0.2	22	3	4	0.2
164	22	4	4	0.4	24	4	4	0.4	23	4	4	0.4
165	21	3	4	0.3	23	3	4	0.3	22	3	4	0.3
166	21	3	4	0.3	22	3	4	0.3	22	3	4	0.3
167	20	3	4	0.3	21	3	4	0.3	21	3	4	0.3
168	19	3	3	0.3	21	3	4	0.3	20	3	3	0.3
169	20	3	3	0.3	21	3	4	0.3	21	3	4	0.3
170	52	8	10	1.1	55	8	10	1.2	54	8	10	1.2

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.4: Predicted PM₁₀, TSP and dust deposition levels – Y4 (Full Pit) per EA compared with continued hauling of underground coal – project and other sources

Residence ID	Y4 (Full Pit) Project & other sources Per EA			Y4 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y4 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
	Private Residences (per EA)								
3	18	51	1.3	19	52	1.4	18	52	1.4
4	18	52	1.4	19	52	1.4	19	52	1.4
5	18	51	1.3	18	51	1.3	18	51	1.3
6	18	51	1.3	18	51	1.3	18	51	1.3
7	16	49	1.1	16	49	1.1	16	49	1.1
8	18	51	1.3	18	52	1.3	18	52	1.3
9 ^(a)	19	52	1.3	19	52	1.3	19	52	1.3
10 ^(b)	18	52	1.3	19	52	1.3	19	52	1.3
11	18	51	1.3	18	52	1.3	18	51	1.3
12	16	49	1.1	17	49	1.1	16	49	1.1
13	18	51	1.2	18	51	1.3	18	51	1.3
14	17	50	1.2	17	50	1.2	17	50	1.2
15	16	49	1.1	16	49	1.1	16	49	1.1
16	18	51	1.3	18	51	1.3	18	51	1.3
17	16	49	1.1	17	49	1.1	16	49	1.1
18	16	49	1.1	17	50	1.1	17	49	1.1
19	16	48	0.9	16	49	0.9	16	49	0.9
20	16	49	0.9	16	49	0.9	16	49	0.9
21	16	48	0.9	16	48	0.9	16	48	0.9
22	15	48	0.8	15	48	0.8	15	48	0.8
23	16	48	0.8	16	48	0.8	16	48	0.8
24	14	47	0.8	15	47	0.8	15	47	0.8
25	14	47	0.8	14	47	0.8	14	47	0.8
26	14	46	0.7	14	46	0.7	14	46	0.7
27	13	46	0.7	13	46	0.7	13	46	0.7
28	13	45	0.7	13	46	0.7	13	46	0.7
29	14	46	0.7	14	46	0.7	14	46	0.7
30	14	47	0.8	14	47	0.8	14	47	0.8
31	15	47	0.8	15	47	0.8	15	47	0.8
32	15	48	0.8	15	48	0.8	15	48	0.8
34	16	49	0.9	16	49	0.9	16	49	0.9
35	17	50	1.0	17	50	1.0	17	50	1.0
36	15	48	0.9	16	48	0.9	16	48	0.9
37	16	49	0.9	16	49	0.9	16	49	0.9

Residence ID	Y4 (Full Pit) Project & other sources Per EA			Y4 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y4 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
38	16	49	0.9	16	49	0.9	16	49	0.9
39	16	48	0.9	16	48	0.9	16	48	0.9
40	16	48	0.9	16	48	0.9	16	48	0.9
41	15	48	0.9	15	48	0.9	15	48	0.9
42	17	49	1.0	17	50	1.0	17	50	1.0
43	17	50	1.0	17	50	1.0	17	50	1.0
44	18	52	1.1	19	52	1.1	19	52	1.1
47	21	54	1.3	21	55	1.3	21	54	1.3
48	19	53	1.2	20	53	1.2	20	53	1.2
49	19	53	1.2	20	53	1.2	20	53	1.2
50	18	51	1.1	19	52	1.1	19	52	1.1
51	18	51	1.1	18	51	1.1	18	51	1.1
52	18	51	1.1	19	52	1.1	18	51	1.1
53	19	52	1.2	19	52	1.2	19	52	1.2
54	19	53	1.3	20	53	1.3	20	53	1.3
55	19	52	1.2	19	52	1.3	19	52	1.3
57	20	53	1.3	20	53	1.3	20	53	1.3
62	20	53	1.3	20	53	1.3	20	53	1.3
63	21	54	1.5	21	55	1.5	21	55	1.5
64	23	57	1.8	23	58	1.9	23	58	1.9
65	21	55	1.5	22	55	1.5	22	55	1.5
66	21	55	1.5	22	55	1.5	22	55	1.5
67	22	56	1.6	22	56	1.6	22	56	1.6
68	22	56	1.6	23	57	1.6	23	56	1.6
71	24	58	1.9	24	59	1.9	24	58	1.9
72	24	58	1.9	24	59	1.9	24	58	1.9
73	25	59	2.0	25	60	2.0	25	60	2.0
76	26	61	2.1	27	61	2.1	27	61	2.1
80	27	61	2.1	27	62	2.2	27	62	2.2
87	28	64	2.7	29	64	2.8	29	64	2.8
88	23	57	1.9	23	57	1.9	23	57	1.9
91	22	56	1.7	22	56	1.7	22	56	1.7
94	21	55	1.6	22	55	1.6	22	55	1.6
95	22	55	1.6	22	56	1.6	22	56	1.6
96	22	55	1.6	22	55	1.6	22	55	1.6
99	21	55	1.5	21	55	1.5	21	55	1.5
100	21	54	1.5	21	55	1.5	21	55	1.5
103	20	54	1.4	20	54	1.4	20	54	1.4

Residence ID	Y4 (Full Pit) Project & other sources Per EA			Y4 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y4 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
105	23	57	1.8	23	57	1.8	23	57	1.8
106	24	58	1.8	24	58	1.8	24	58	1.8
108 ^(c)	30	67	3.0	31	67	3.1	31	67	3.1
109	31	69	2.9	32	69	2.9	32	69	2.9
110	27	61	2.1	27	62	2.1	27	62	2.1
111	22	56	1.4	23	56	1.4	23	56	1.4
112	21	55	1.4	21	55	1.4	21	55	1.4
118	20	54	1.4	21	54	1.4	20	54	1.4
120	20	54	1.3	20	54	1.3	20	54	1.3
121	19	53	1.2	20	53	1.2	20	53	1.2
123	19	52	1.2	19	52	1.2	19	52	1.2
125	19	53	1.2	19	53	1.2	19	53	1.2
126	19	52	1.1	19	52	1.1	19	52	1.1
129	19	52	1.1	19	52	1.1	19	52	1.1
132	16	48	0.8	16	49	0.8	16	48	0.8
133	15	47	0.7	15	48	0.7	15	47	0.7
137	14	46	0.7	14	46	0.7	14	46	0.7
139	24	59	1.7	24	59	1.7	24	59	1.7
142	15	48	1.1	15	48	1.2	15	48	1.2
143	17	50	1.3	17	50	1.3	17	50	1.3
144	18	51	1.3	18	51	1.4	18	51	1.4
145	19	52	1.4	19	52	1.4	19	52	1.4
146	18	51	1.3	18	51	1.3	18	51	1.3
147	18	51	1.3	18	51	1.3	18	51	1.3
148	18	51	1.3	18	51	1.3	18	51	1.3
149	18	51	1.3	18	51	1.3	18	51	1.3
150	18	51	1.3	18	51	1.3	18	51	1.3
151	18	51	1.3	18	51	1.3	18	51	1.3
152	18	51	1.3	18	51	1.3	18	51	1.3
153	Acquisition of property assumed in Full-Pit scenario								
154	20	54	1.3	21	54	1.3	20	54	1.3
156	21	54	1.4	21	54	1.4	21	54	1.4
157	20	54	1.3	20	54	1.3	20	54	1.3
159	20	54	1.3	20	54	1.3	20	54	1.3
161	22	56	1.6	22	56	1.6	22	56	1.6
	Mine-owned Residences (per EA)								
1	18	51	1.3	18	51	1.3	18	51	1.3
2	19	52	1.4	19	52	1.4	19	52	1.4

Residence ID	Y4 (Full Pit) Project & other sources Per EA			Y4 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y4 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
33	15	48	0.8	15	48	0.8	15	48	0.8
45	21	55	1.3	21	55	1.3	21	55	1.3
46	21	55	1.3	21	55	1.3	21	55	1.3
56	20	53	1.3	20	53	1.3	20	53	1.3
58	20	53	1.3	20	53	1.3	20	53	1.3
59	21	54	1.4	21	54	1.4	21	54	1.4
60	22	56	1.6	22	56	1.6	22	56	1.6
61	20	54	1.4	20	54	1.4	20	54	1.4
69	23	57	1.7	23	57	1.7	23	57	1.7
70	23	58	1.8	24	58	1.8	24	58	1.8
74	27	62	2.0	27	62	2.0	27	62	2.0
75	30	65	2.3	30	66	2.3	30	65	2.3
77	28	63	2.2	29	65	2.3	29	64	2.3
78	32	68	2.8	33	69	2.9	33	69	2.9
79	27	61	2.1	27	62	2.2	27	62	2.2
81	27	62	2.3	28	63	2.3	28	63	2.3
82	29	64	2.5	29	65	2.6	29	65	2.6
83	28	63	2.4	28	64	2.5	28	63	2.5
84	29	65	3.1	30	66	3.2	30	66	3.1
85	28	64	2.8	29	64	2.8	29	64	2.8
86	28	63	2.7	28	64	2.7	28	64	2.7
89	23	57	1.7	24	58	1.7	23	58	1.7
90	22	56	1.7	22	56	1.7	22	56	1.7
92	22	56	1.6	22	56	1.7	22	56	1.7
93	22	55	1.6	22	56	1.6	22	56	1.6
97	21	55	1.6	22	55	1.6	22	55	1.6
98	21	54	1.5	21	55	1.5	21	55	1.5
101	21	55	1.6	21	55	1.6	21	55	1.6
102	20	54	1.4	21	54	1.4	21	54	1.4
104	20	53	1.3	20	53	1.3	20	53	1.3
107	25	60	2.0	26	60	2.0	26	60	2.0
113	21	54	1.4	21	54	1.4	21	54	1.4
114	20	54	1.3	20	54	1.3	20	54	1.3
115	20	54	1.3	21	54	1.3	21	54	1.3
116	21	54	1.4	21	54	1.4	21	54	1.4
117	21	54	1.4	21	54	1.4	21	54	1.4
119	20	53	1.3	20	53	1.3	20	53	1.3
122	19	52	1.2	19	53	1.2	19	53	1.2

Residence ID	Y4 (Full Pit) Project & other sources Per EA			Y4 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y4 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
124	19	52	1.2	19	52	1.2	19	52	1.2
127	18	51	1.1	18	51	1.1	18	51	1.1
128	19	53	1.2	20	53	1.2	20	53	1.2
130	17	50	1.0	17	50	1.0	17	50	1.0
131	16	49	0.9	17	49	0.9	17	49	0.9
134	17	50	0.8	17	50	0.8	17	50	0.8
135	15	47	0.7	15	47	0.7	15	47	0.7
136	13	45	0.6	13	45	0.6	13	45	0.6
138	57	116	4.9	57	116	4.9	57	116	4.9
140	24	58	1.7	24	59	1.7	24	59	1.7
141	23	58	2.0	23	58	2.0	23	58	2.0
155	21	54	1.4	21	54	1.4	21	54	1.4
158	20	54	1.3	20	54	1.3	20	54	1.3
160	20	54	1.4	21	54	1.4	21	54	1.4
162	21	55	1.5	21	55	1.5	21	55	1.5
163	21	54	1.5	21	55	1.5	21	54	1.5
164	22	56	1.8	22	57	1.8	22	56	1.8
165	22	56	1.6	22	56	1.6	22	56	1.6
166	22	56	1.6	22	56	1.6	22	56	1.6
167	22	56	1.7	22	56	1.7	22	56	1.7
168	21	55	1.6	21	55	1.6	21	55	1.6
169	21	55	1.6	21	55	1.6	21	55	1.6
170	29	65	3.1	30	66	3.1	30	65	3.1

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.5: Predicted PM₁₀, TSP and dust deposition levels – Y6 (Full Pit) per EA compared with continued hauling of underground coal – project only

Residence ID	Y6 (Full Pit) Project only Per EA				Y6 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y6 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2	-	30	90	4
Private Residences (per EA)												
3	19	4	4	0.4	21	4	4	0.4	21	4	4	0.4
4	20	4	4	0.4	22	4	4	0.5	22	4	4	0.4
5	21	3	4	0.4	23	4	4	0.4	22	3	4	0.4
6	20	3	4	0.3	22	4	4	0.4	22	4	4	0.4
7	17	2	3	0.2	18	3	3	0.2	18	3	3	0.2
8	22	3	4	0.3	24	4	4	0.3	24	4	4	0.3
9 ^(a)	24	4	4	0.3	26	4	4	0.3	25	4	4	0.3
10 ^(b)	23	3	4	0.3	25	4	4	0.3	24	4	4	0.3
11	24	3	4	0.2	26	3	4	0.2	25	3	4	0.2
12	18	2	2	0.1	19	2	3	0.1	19	2	3	0.1
13	23	3	3	0.2	25	3	4	0.2	25	3	4	0.2
14	19	2	3	0.1	20	3	3	0.2	20	3	3	0.2
15	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
16	18	3	3	0.1	20	3	3	0.1	19	3	3	0.1
17	15	2	2	0.1	17	2	2	0.1	16	2	2	0.1
18	16	2	2	0.1	17	2	2	0.1	17	2	2	0.1
19	15	2	2	0.0	17	2	2	0.1	16	2	2	0.1
20	13	2	2	0.0	15	2	2	0.1	15	2	2	0.1
21	14	2	2	0.0	15	2	2	0.0	15	2	2	0.0
22	11	1	2	0.0	12	2	2	0.0	12	2	2	0.0
23	11	2	2	0.0	13	2	2	0.0	12	2	2	0.0
24	9	1	1	0.0	10	1	1	0.0	10	1	1	0.0
25	9	1	1	0.0	10	1	1	0.0	9	1	1	0.0
26	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
27	7	1	1	0.0	8	1	1	0.0	8	1	1	0.0
28	7	1	1	0.0	7	1	1	0.0	7	1	1	0.0
29	7	1	1	0.0	8	1	1	0.0	8	1	1	0.0
30	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
31	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
32	11	1	1	0.0	12	1	2	0.0	11	1	2	0.0
34	10	1	2	0.0	12	2	2	0.0	11	2	2	0.0
35	12	2	2	0.0	14	2	2	0.1	13	2	2	0.1
36	10	1	1	0.0	11	1	1	0.0	11	1	1	0.0
37	12	1	1	0.0	13	2	2	0.0	13	1	2	0.0
38	12	1	1	0.0	14	1	2	0.0	13	1	1	0.0

Residence ID	Y6 (Full Pit) Project only Per EA				Y6 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y6 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
39	12	1	1	0.0	13	1	1	0.0	13	1	1	0.0
40	12	1	1	0.0	13	1	1	0.0	13	1	1	0.0
41	12	1	1	0.0	14	1	1	0.0	13	1	1	0.0
42	15	1	1	0.0	16	1	2	0.0	16	1	2	0.0
43	15	2	2	0.0	17	2	2	0.0	17	2	2	0.0
44	20	2	2	0.1	23	2	3	0.1	22	2	3	0.1
47	29	3	3	0.1	32	3	4	0.1	31	3	4	0.1
48	25	3	3	0.1	28	3	3	0.1	27	3	3	0.1
49	25	3	3	0.1	28	3	3	0.1	27	3	3	0.1
50	19	2	2	0.1	21	2	2	0.1	21	2	2	0.1
51	18	2	2	0.1	20	2	2	0.1	20	2	2	0.1
52	17	2	2	0.1	19	2	2	0.1	19	2	2	0.1
53	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
54	18	2	2	0.1	19	2	2	0.1	19	2	2	0.1
55	15	2	2	0.1	17	2	2	0.1	16	2	2	0.1
57	16	2	2	0.1	17	2	2	0.1	17	2	2	0.1
62	21	2	2	0.1	23	3	3	0.1	23	2	3	0.1
63	26	3	3	0.1	29	3	4	0.1	28	3	3	0.1
64	33	4	4	0.2	36	4	5	0.2	35	4	5	0.2
65	18	2	3	0.1	20	3	3	0.1	20	3	3	0.1
66	20	3	3	0.1	22	3	3	0.1	22	3	3	0.1
67	18	3	3	0.2	20	3	4	0.2	20	3	4	0.2
68	20	3	4	0.2	22	4	4	0.2	22	3	4	0.2
71	20	4	5	0.3	23	5	5	0.3	22	4	5	0.3
72	21	4	5	0.3	24	5	5	0.3	23	4	5	0.3
73	24	5	6	0.4	27	5	6	0.4	26	5	6	0.4
76	29	6	7	0.6	33	6	8	0.6	32	6	7	0.6
80	25	6	6	0.6	29	6	7	0.6	27	6	7	0.6
87	31	7	9	0.9	34	8	9	0.9	33	8	9	0.9
88	18	3	4	0.3	20	3	4	0.4	19	3	4	0.3
91	18	3	4	0.3	20	3	4	0.3	20	3	4	0.3
94	18	3	3	0.3	19	3	4	0.3	19	3	3	0.3
95	18	3	4	0.3	20	3	4	0.3	19	3	4	0.3
96	19	3	4	0.3	21	3	4	0.3	20	3	4	0.3
99	18	3	3	0.3	19	3	3	0.3	19	3	3	0.3
100	17	3	3	0.2	19	3	3	0.2	19	3	3	0.2
103	18	3	3	0.2	20	3	3	0.2	20	3	3	0.2
105	21	4	5	0.4	22	4	5	0.4	22	4	5	0.4

Residence ID	Y6 (Full Pit) Project only Per EA				Y6 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y6 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
106	32	6	7	0.7	35	6	7	0.7	34	6	7	0.7
108 ^(c)	73	12	15	1.4	77	12	16	1.4	76	12	15	1.4
109	88	11	14	0.7	92	12	14	0.7	91	11	14	0.7
110	47	8	10	0.7	51	9	10	0.7	50	9	10	0.7
111	45	5	6	0.2	48	5	6	0.2	47	5	6	0.2
112	37	4	5	0.3	40	4	5	0.3	39	4	5	0.3
118	20	3	3	0.2	21	3	3	0.2	21	3	3	0.2
120	20	3	3	0.2	21	3	4	0.2	21	3	3	0.2
121	19	3	3	0.2	21	3	3	0.2	21	3	3	0.2
123	17	2	3	0.1	18	3	3	0.2	18	3	3	0.2
125	20	3	3	0.2	22	3	3	0.2	22	3	3	0.2
126	18	2	3	0.1	19	3	3	0.1	19	3	3	0.1
129	33	3	3	0.1	36	3	3	0.1	35	3	3	0.1
132	29	2	2	0.0	31	2	2	0.0	31	2	2	0.0
133	27	2	2	0.0	29	2	2	0.0	28	2	2	0.0
137	17	1	1	0.0	18	1	2	0.0	18	1	2	0.0
139	13	2	2	0.1	14	2	2	0.1	14	2	2	0.1
142	9	1	1	0.1	10	1	2	0.1	9	1	2	0.1
143	13	2	3	0.3	14	2	3	0.3	14	2	3	0.3
144	13	3	3	0.3	15	3	3	0.3	14	3	3	0.3
145	14	3	3	0.3	16	3	3	0.3	15	3	3	0.3
146	14	3	3	0.3	16	3	3	0.3	15	3	3	0.3
147	15	3	3	0.3	16	3	3	0.3	16	3	3	0.3
148	15	3	3	0.3	17	3	3	0.4	16	3	3	0.4
149	15	3	3	0.3	16	3	3	0.4	16	3	3	0.3
150	15	3	3	0.4	17	3	4	0.4	16	3	4	0.4
151	15	3	3	0.4	17	3	4	0.4	17	3	4	0.4
152	17	3	4	0.4	19	3	4	0.4	18	3	4	0.4
153	Acquisition of property assumed for Full Pit Assessment											
154	27	3	4	0.2	29	4	4	0.2	28	4	4	0.2
156	21	3	4	0.2	23	3	4	0.2	22	3	4	0.2
157	20	3	3	0.2	22	3	4	0.2	21	3	4	0.2
159	19	3	3	0.2	21	3	3	0.2	21	3	3	0.2
161	19	3	4	0.3	20	3	4	0.3	20	3	4	0.3
Mine-owned Residences (per EA)												
1	18	3	4	0.4	20	4	4	0.4	19	4	4	0.4
2	19	4	4	0.4	21	4	5	0.5	21	4	4	0.5
33	9	1	1	0.0	10	1	2	0.0	10	1	2	0.0

Residence ID	Y6 (Full Pit) Project only Per EA				Y6 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y6 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
45	21	3	3	0.1	24	3	4	0.1	23	3	3	0.1
46	27	3	3	0.1	31	3	4	0.1	30	3	4	0.1
56	17	2	2	0.1	18	2	2	0.1	18	2	2	0.1
58	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
59	17	2	2	0.1	18	2	2	0.1	18	2	2	0.1
60	11	2	2	0.1	12	2	2	0.1	12	2	2	0.1
61	18	2	2	0.1	19	2	2	0.1	19	2	2	0.1
69	19	3	4	0.2	21	4	4	0.2	21	4	4	0.2
70	21	4	4	0.3	24	4	5	0.3	23	4	5	0.3
74	13	2	3	0.2	15	3	3	0.2	15	3	3	0.2
75	16	3	3	0.2	17	3	3	0.2	17	3	3	0.2
77	39	8	10	0.8	46	10	12	0.9	44	9	11	0.9
78	50	11	13	1.1	55	12	14	1.2	53	11	14	1.2
79	26	6	7	0.6	30	7	8	0.7	29	6	7	0.6
81	28	6	7	0.7	31	7	8	0.7	30	7	8	0.7
82	36	7	9	0.8	39	8	10	0.9	39	8	9	0.9
83	30	6	7	0.7	33	7	8	0.7	32	6	8	0.7
84	34	6	7	0.8	37	6	8	0.8	36	6	8	0.8
85	30	5	6	0.6	32	5	6	0.6	32	5	6	0.6
86	27	5	6	0.6	29	5	6	0.6	29	5	6	0.6
89	15	2	3	0.2	16	3	3	0.2	16	2	3	0.2
90	18	3	4	0.3	19	3	4	0.3	19	3	4	0.3
92	16	3	3	0.3	18	3	3	0.3	17	3	3	0.3
93	17	3	3	0.3	19	3	3	0.3	18	3	3	0.3
97	19	3	4	0.3	21	3	4	0.3	20	3	4	0.3
98	18	3	3	0.3	20	3	3	0.3	19	3	3	0.3
101	16	3	3	0.2	18	3	3	0.2	17	3	3	0.2
102	18	3	3	0.2	19	3	3	0.2	19	3	3	0.2
104	17	2	3	0.2	18	2	3	0.2	18	2	3	0.2
107	45	8	9	0.8	50	8	10	0.8	48	8	10	0.8
113	23	3	4	0.3	26	4	4	0.3	25	4	4	0.3
114	20	3	4	0.2	22	3	4	0.2	22	3	4	0.2
115	21	3	4	0.2	23	3	4	0.2	22	3	4	0.2
116	21	3	4	0.2	23	3	4	0.3	22	3	4	0.3
117	21	3	4	0.3	22	3	4	0.3	22	3	4	0.3
119	19	3	3	0.2	20	3	3	0.2	20	3	3	0.2
122	17	3	3	0.2	19	3	3	0.2	18	3	3	0.2
124	18	3	3	0.2	20	3	3	0.2	19	3	3	0.2

Residence ID	Y6 (Full Pit) Project only Per EA				Y6 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y6 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
127	22	2	3	0.1	24	2	3	0.1	24	2	3	0.1
128	33	3	3	0.1	35	3	4	0.1	35	3	3	0.1
130	26	2	2	0.1	28	2	2	0.1	27	2	2	0.1
131	24	2	2	0.0	27	2	2	0.0	26	2	2	0.0
134	10	1	1	0.1	10	1	1	0.1	10	1	1	0.1
135	11	1	1	0.0	12	1	1	0.0	11	1	1	0.0
136	21	1	1	0.0	22	1	1	0.0	21	1	1	0.0
138	15	2	2	0.1	16	2	2	0.1	16	2	2	0.1
140	13	2	2	0.1	14	2	2	0.1	13	2	2	0.1
141	11	1	1	0.1	12	1	1	0.1	11	1	1	0.1
155	22	3	4	0.3	24	4	4	0.3	23	3	4	0.3
158	20	3	3	0.2	22	3	4	0.2	21	3	4	0.2
160	19	3	3	0.2	21	3	3	0.2	20	3	3	0.2
162	19	3	3	0.3	20	3	4	0.3	20	3	4	0.3
163	18	3	3	0.2	20	3	3	0.2	19	3	3	0.2
164	19	3	4	0.4	20	4	4	0.4	20	3	4	0.4
165	18	3	3	0.3	19	3	4	0.3	19	3	4	0.3
166	17	3	3	0.3	19	3	4	0.3	18	3	4	0.3
167	17	3	3	0.3	18	3	3	0.3	18	3	3	0.3
168	17	3	3	0.3	18	3	3	0.3	18	3	3	0.3
169	17	3	3	0.3	18	3	3	0.3	18	3	3	0.3
170	34	6	7	0.8	37	6	8	0.8	36	6	8	0.8

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.6: Predicted PM₁₀, TSP and dust deposition levels – Y6 (Full Pit) per EA compared with continued hauling of underground coal – project and other sources

Residence ID	Y6 (Full Pit) Project & other sources Per EA			Y6 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y6 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
	Private Residences (per EA)								
3	17	50	1.1	17	50	1.2	17	50	1.2
4	17	50	1.1	18	51	1.2	17	50	1.2
5	17	49	1.1	17	50	1.1	17	50	1.1
6	17	50	1.1	17	50	1.1	17	50	1.1
7	15	48	0.9	15	48	0.9	15	48	0.9
8	17	50	1.0	17	50	1.1	17	50	1.1
9 ^(a)	17	50	1.0	18	51	1.1	17	50	1.1
10 ^(b)	17	50	1.0	17	50	1.0	17	50	1.0
11	17	50	1.0	17	50	1.0	17	50	1.0
12	15	48	0.9	15	48	0.9	15	48	0.9
13	17	49	0.9	17	50	1.0	17	49	1.0
14	16	48	0.9	16	49	0.9	16	49	0.9
15	15	48	0.8	15	48	0.8	15	48	0.8
16	16	49	0.9	16	49	0.9	16	49	0.9
17	15	48	0.8	15	48	0.8	15	48	0.8
18	15	48	0.8	16	48	0.8	15	48	0.8
19	15	48	0.8	15	48	0.8	15	48	0.8
20	15	48	0.8	15	48	0.8	15	48	0.8
21	15	47	0.8	15	48	0.8	15	48	0.8
22	15	47	0.8	15	47	0.8	15	47	0.8
23	15	48	0.8	15	48	0.8	15	48	0.8
24	14	47	0.8	14	47	0.8	14	47	0.8
25	14	46	0.7	14	46	0.8	14	46	0.7
26	14	46	0.7	14	46	0.7	14	46	0.7
27	13	46	0.7	13	46	0.7	13	46	0.7
28	13	45	0.7	13	45	0.7	13	45	0.7
29	14	46	0.7	14	46	0.7	14	46	0.7
30	14	46	0.8	14	46	0.8	14	46	0.8
31	14	47	0.8	15	47	0.8	15	47	0.8
32	15	47	0.8	15	47	0.8	15	47	0.8
34	15	48	0.9	16	48	0.9	16	48	0.9
35	16	49	0.9	16	49	0.9	16	49	0.9
36	15	48	0.9	15	48	0.9	15	48	0.9
37	16	48	0.9	16	48	0.9	16	48	0.9

Residence ID	Y6 (Full Pit) Project & other sources Per EA			Y6 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y6 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
38	15	48	0.9	16	48	0.9	16	48	0.9
39	15	48	0.9	15	48	0.9	15	48	0.9
40	15	48	0.9	15	48	0.9	15	48	0.9
41	15	48	0.9	15	48	0.9	15	48	0.9
42	16	49	1.0	16	49	1.0	16	49	1.0
43	16	49	1.0	17	49	1.0	17	49	1.0
44	17	50	1.0	18	50	1.0	17	50	1.0
47	19	52	1.1	19	52	1.1	19	52	1.1
48	18	51	1.1	18	51	1.1	18	51	1.1
49	18	51	1.1	18	51	1.1	18	51	1.1
50	18	51	1.1	18	51	1.1	18	51	1.1
51	18	51	1.1	18	51	1.1	18	51	1.1
52	18	51	1.1	18	51	1.1	18	51	1.1
53	18	51	1.2	19	52	1.2	19	52	1.2
54	19	52	1.2	19	52	1.2	19	52	1.2
55	19	52	1.2	19	52	1.2	19	52	1.2
57	19	52	1.3	19	53	1.3	19	52	1.3
62	19	52	1.2	19	52	1.2	19	52	1.2
63	19	52	1.2	19	52	1.2	19	52	1.2
64	20	53	1.3	21	54	1.3	20	54	1.3
65	20	53	1.3	20	54	1.3	20	54	1.3
66	20	53	1.3	20	54	1.3	20	54	1.3
67	21	54	1.3	21	54	1.3	21	54	1.3
68	21	54	1.3	21	54	1.3	21	54	1.3
71	22	55	1.4	22	56	1.5	22	56	1.4
72	22	55	1.4	22	56	1.5	22	56	1.4
73	23	56	1.6	23	57	1.6	23	57	1.6
76	24	58	1.8	25	59	1.8	25	59	1.8
80	25	59	1.9	25	60	2.0	25	60	1.9
87	27	62	2.4	27	62	2.5	27	62	2.5
88	22	56	1.8	22	57	1.8	22	57	1.8
91	22	56	1.7	22	56	1.7	22	56	1.7
94	21	55	1.6	21	55	1.6	21	55	1.6
95	21	55	1.6	21	55	1.6	21	55	1.6
96	21	55	1.6	21	55	1.6	21	55	1.6
99	21	55	1.5	21	55	1.5	21	55	1.5
100	20	54	1.5	21	54	1.5	21	54	1.5
103	20	54	1.4	20	54	1.4	20	54	1.4

Residence ID	Y6 (Full Pit) Project & other sources Per EA			Y6 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y6 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
105	22	57	1.8	23	57	1.8	23	57	1.8
106	24	58	1.9	24	58	1.9	24	58	1.9
108 ^(c)	30	66	2.7	30	67	2.7	30	67	2.7
109	29	66	2.1	30	66	2.1	30	66	2.1
110	26	61	1.9	27	61	1.9	26	61	1.9
111	22	56	1.4	23	56	1.4	22	56	1.4
112	21	55	1.4	21	55	1.4	21	55	1.4
118	20	54	1.4	20	54	1.4	20	54	1.4
120	20	53	1.3	20	53	1.3	20	53	1.3
121	19	52	1.2	19	53	1.2	19	53	1.2
123	19	52	1.2	19	52	1.2	19	52	1.2
125	19	52	1.2	19	53	1.2	19	52	1.2
126	18	51	1.1	18	52	1.1	18	52	1.1
129	19	52	1.1	19	52	1.1	19	52	1.1
132	15	48	0.8	16	48	0.8	16	48	0.8
133	15	47	0.7	15	47	0.7	15	47	0.7
137	14	46	0.7	14	46	0.7	14	46	0.7
139	24	59	1.7	24	59	1.7	24	59	1.7
142	15	48	1.1	15	48	1.1	15	48	1.1
143	17	50	1.2	17	50	1.2	17	50	1.2
144	18	51	1.2	18	51	1.3	18	51	1.3
145	18	51	1.3	18	51	1.3	18	51	1.3
146	17	50	1.2	18	51	1.2	18	51	1.2
147	17	50	1.2	18	51	1.2	18	51	1.2
148	17	50	1.1	18	51	1.2	18	50	1.2
149	17	50	1.1	17	50	1.1	17	50	1.1
150	17	50	1.1	18	51	1.2	17	50	1.1
151	17	50	1.1	17	50	1.1	17	50	1.1
152	17	50	1.1	17	50	1.1	17	50	1.1
153	Acquisition of property assumed for Full Pit Assessment								
154	20	54	1.4	20	54	1.4	20	54	1.4
156	20	54	1.4	20	54	1.4	20	54	1.4
157	20	53	1.3	20	54	1.3	20	54	1.3
159	20	53	1.3	20	53	1.3	20	53	1.3
161	22	55	1.6	22	56	1.6	22	55	1.6
	Mine-owned Residences (per EA)								
1	17	50	1.1	17	50	1.1	17	50	1.1
2	18	51	1.2	18	51	1.2	18	51	1.2

Residence ID	Y6 (Full Pit) Project & other sources Per EA			Y6 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y6 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
33	15	47	0.8	15	48	0.8	15	47	0.8
45	18	51	1.0	18	51	1.0	18	51	1.0
46	18	51	1.1	19	52	1.1	19	52	1.1
56	19	52	1.3	19	52	1.3	19	52	1.3
58	19	53	1.3	20	53	1.3	19	53	1.3
59	20	53	1.4	20	54	1.4	20	54	1.4
60	22	55	1.6	22	55	1.6	22	55	1.6
61	20	53	1.3	20	53	1.3	20	53	1.3
69	21	54	1.3	21	55	1.4	21	55	1.4
70	21	55	1.4	22	55	1.4	22	55	1.4
74	26	61	1.9	27	61	1.9	27	61	1.9
75	29	64	2.1	30	64	2.2	29	64	2.1
77	26	61	2.0	27	62	2.1	27	62	2.1
78	29	65	2.4	30	66	2.5	30	66	2.5
79	25	59	1.9	25	60	2.0	25	60	2.0
81	25	60	2.1	26	61	2.1	26	60	2.1
82	27	61	2.3	27	62	2.4	27	62	2.3
83	26	61	2.2	27	61	2.3	26	61	2.2
84	28	63	2.8	28	63	2.8	28	63	2.8
85	27	63	2.6	28	63	2.6	28	63	2.6
86	27	62	2.5	27	62	2.5	27	62	2.5
89	23	57	1.7	23	57	1.7	23	57	1.7
90	22	56	1.7	22	56	1.7	22	56	1.7
92	21	55	1.6	21	55	1.6	21	55	1.6
93	21	55	1.6	21	55	1.6	21	55	1.6
97	21	55	1.6	21	55	1.6	21	55	1.6
98	21	54	1.5	21	54	1.5	21	54	1.5
101	21	55	1.5	21	55	1.6	21	55	1.6
102	20	54	1.4	20	54	1.4	20	54	1.4
104	19	53	1.3	19	53	1.3	19	53	1.3
107	26	60	2.0	26	61	2.0	26	60	2.0
113	20	54	1.4	20	54	1.4	20	54	1.4
114	20	54	1.3	20	54	1.3	20	54	1.3
115	20	54	1.4	20	54	1.4	20	54	1.4
116	20	54	1.4	21	54	1.4	20	54	1.4
117	20	54	1.4	21	54	1.4	21	54	1.4
119	20	53	1.3	20	53	1.3	20	53	1.3
122	19	52	1.2	19	52	1.2	19	52	1.2

Residence ID	Y6 (Full Pit) Project & other sources Per EA			Y6 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y6 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
124	19	52	1.2	19	52	1.2	19	52	1.2
127	18	51	1.1	18	51	1.1	18	51	1.1
128	19	52	1.2	19	53	1.2	19	52	1.2
130	17	50	1.0	17	50	1.0	17	50	1.0
131	16	49	0.9	16	49	0.9	16	49	0.9
134	17	49	0.8	17	49	0.8	17	49	0.8
135	15	47	0.7	15	47	0.7	15	47	0.7
136	13	45	0.6	13	45	0.6	13	45	0.6
138	58	117	5.0	58	117	5.0	58	117	5.0
140	24	59	1.7	24	59	1.7	24	59	1.7
141	23	58	2.1	23	58	2.1	23	58	2.1
155	21	54	1.4	21	54	1.4	21	54	1.4
158	20	53	1.3	20	54	1.3	20	54	1.3
160	20	54	1.4	20	54	1.4	20	54	1.4
162	21	55	1.5	21	55	1.5	21	55	1.5
163	20	54	1.5	21	54	1.5	21	54	1.5
164	22	56	1.7	22	56	1.8	22	56	1.8
165	21	55	1.6	22	55	1.6	22	55	1.6
166	21	55	1.6	22	55	1.6	21	55	1.6
167	21	55	1.7	22	56	1.7	22	56	1.7
168	21	55	1.6	21	55	1.6	21	55	1.6
169	21	55	1.6	21	55	1.6	21	55	1.6
170	28	63	2.7	29	65	2.8	29	64	2.8

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.7: Predicted PM₁₀, TSP and dust deposition levels – Y8 (Full Pit) per EA compared with continued hauling of underground coal – project only

Residence ID	Y8 (Full Pit) Project only Per EA				Y8 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y8 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)		TSP (µg/m³)	Dust deposition (g/m²/month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2	-	30	90	4
Private Residences (per EA)												
3	21	4	4	0.4	23	4	5	0.5	22	4	4	0.4
4	21	4	4	0.4	23	4	5	0.5	22	4	5	0.4
5	19	3	4	0.3	21	3	4	0.3	20	3	4	0.3
6	19	3	4	0.3	21	3	4	0.3	20	3	4	0.3
7	17	2	2	0.1	18	2	3	0.1	18	2	3	0.1
8	23	3	4	0.2	25	3	4	0.3	24	3	4	0.3
9 ^(a)	26	3	4	0.2	28	4	4	0.2	27	4	4	0.2
10 ^(b)	27	3	3	0.2	29	3	4	0.2	28	3	4	0.2
11	27	3	3	0.1	29	3	3	0.1	28	3	3	0.1
12	21	2	2	0.1	22	2	2	0.1	22	2	2	0.1
13	25	3	3	0.1	27	3	3	0.1	26	3	3	0.1
14	23	2	2	0.1	25	2	3	0.1	24	2	3	0.1
15	20	2	2	0.1	21	2	2	0.1	21	2	2	0.1
16	21	2	3	0.1	23	3	3	0.1	22	2	3	0.1
17	17	2	2	0.0	19	2	2	0.0	18	2	2	0.0
18	19	2	2	0.0	21	2	2	0.0	20	2	2	0.0
19	18	2	2	0.0	19	2	2	0.0	19	2	2	0.0
20	16	2	2	0.0	18	2	2	0.0	17	2	2	0.0
21	16	2	2	0.0	18	2	2	0.0	17	2	2	0.0
22	13	1	1	0.0	15	2	2	0.0	15	1	2	0.0
23	11	2	2	0.0	13	2	2	0.0	12	2	2	0.0
24	9	1	1	0.0	10	1	1	0.0	10	1	1	0.0
25	9	1	1	0.0	10	1	1	0.0	10	1	1	0.0
26	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
27	8	1	1	0.0	9	1	1	0.0	8	1	1	0.0
28	7	1	1	0.0	8	1	1	0.0	8	1	1	0.0
29	8	1	1	0.0	9	1	1	0.0	8	1	1	0.0
30	8	1	1	0.0	9	1	1	0.0	9	1	1	0.0
31	9	1	1	0.0	10	1	1	0.0	10	1	1	0.0
32	10	1	1	0.0	11	1	1	0.0	11	1	1	0.0
34	12	1	1	0.0	13	2	2	0.0	13	2	2	0.0
35	13	2	2	0.0	15	2	2	0.0	14	2	2	0.0
36	11	1	1	0.0	12	1	1	0.0	12	1	1	0.0
37	12	1	1	0.0	14	1	2	0.0	13	1	2	0.0
38	12	1	1	0.0	14	1	1	0.0	13	1	1	0.0

Residence ID	Y8 (Full Pit) Project only Per EA				Y8 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y8 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
39	11	1	1	0.0	13	1	1	0.0	12	1	1	0.0
40	12	1	1	0.0	13	1	1	0.0	13	1	1	0.0
41	11	1	1	0.0	13	1	1	0.0	12	1	1	0.0
42	12	1	1	0.0	14	1	1	0.0	13	1	1	0.0
43	14	1	2	0.0	16	2	2	0.0	15	2	2	0.0
44	17	2	2	0.1	20	2	2	0.1	19	2	2	0.1
47	21	2	3	0.1	24	3	3	0.1	23	3	3	0.1
48	19	2	2	0.1	22	2	3	0.1	21	2	3	0.1
49	19	2	2	0.1	22	2	3	0.1	21	2	3	0.1
50	15	2	2	0.0	17	2	2	0.1	17	2	2	0.1
51	14	2	2	0.0	16	2	2	0.0	16	2	2	0.0
52	13	2	2	0.0	15	2	2	0.0	15	2	2	0.0
53	13	2	2	0.0	15	2	2	0.0	14	2	2	0.0
54	14	2	2	0.0	15	2	2	0.1	15	2	2	0.1
55	12	1	2	0.0	14	2	2	0.0	13	2	2	0.0
57	13	1	2	0.0	14	2	2	0.0	14	2	2	0.0
62	16	2	2	0.1	18	2	2	0.1	17	2	2	0.1
63	18	2	2	0.1	20	3	3	0.1	20	3	3	0.1
64	19	3	3	0.1	22	3	3	0.1	21	3	3	0.1
65	13	2	2	0.1	15	2	2	0.1	14	2	2	0.1
66	14	2	2	0.1	16	2	3	0.1	16	2	3	0.1
67	14	2	3	0.1	16	3	3	0.1	15	3	3	0.1
68	15	2	3	0.1	17	3	3	0.1	17	3	3	0.1
71	15	3	3	0.1	18	3	4	0.2	18	3	3	0.2
72	16	3	3	0.1	19	3	4	0.2	18	3	3	0.2
73	17	3	4	0.2	20	4	4	0.2	19	4	4	0.2
76	20	4	4	0.2	23	4	5	0.3	22	4	5	0.3
80	19	4	4	0.3	22	4	5	0.3	21	4	5	0.3
87	40	9	11	1.3	43	9	12	1.3	42	9	11	1.3
88	30	4	5	0.5	32	4	5	0.5	31	4	5	0.5
91	32	4	5	0.5	33	4	5	0.5	33	4	5	0.5
94	29	4	4	0.4	30	4	4	0.4	30	4	4	0.4
95	30	4	4	0.4	32	4	5	0.4	31	4	5	0.4
96	31	4	5	0.5	33	4	5	0.5	32	4	5	0.5
99	28	3	4	0.4	29	4	4	0.4	29	4	4	0.4
100	26	3	4	0.4	28	3	4	0.4	28	3	4	0.4
103	29	3	4	0.3	31	3	4	0.4	30	3	4	0.3
105	36	5	6	0.7	38	5	6	0.7	37	5	6	0.7

Residence ID	Y8 (Full Pit) Project only Per EA				Y8 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y8 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
106	53	8	9	1.0	57	8	10	1.1	56	8	10	1.0
108 ^(c)	105	16	20	2.0	109	16	21	2.0	108	16	20	2.0
109	109	16	20	1.4	113	16	20	1.4	112	16	20	1.4
110	81	11	13	1.1	85	11	14	1.1	84	11	14	1.1
111	61	6	7	0.3	65	6	7	0.3	64	6	7	0.3
112	39	5	6	0.4	43	5	6	0.4	42	5	6	0.4
118	32	4	4	0.4	34	4	4	0.4	34	4	4	0.4
120	33	4	4	0.3	35	4	4	0.3	34	4	4	0.3
121	29	3	4	0.3	31	3	4	0.3	31	3	4	0.3
123	26	3	3	0.2	27	3	3	0.2	27	3	3	0.2
125	28	3	4	0.3	30	3	4	0.3	30	3	4	0.3
126	24	3	3	0.2	26	3	3	0.2	25	3	3	0.2
129	36	3	4	0.1	39	4	4	0.1	39	4	4	0.1
132	33	2	2	0.0	36	2	2	0.0	35	2	2	0.0
133	33	2	2	0.0	35	2	2	0.0	34	2	2	0.0
137	26	2	2	0.0	27	2	2	0.0	26	2	2	0.0
139	14	2	3	0.2	15	2	3	0.2	15	2	3	0.2
142	11	2	2	0.2	12	2	2	0.2	11	2	2	0.2
143	15	3	3	0.3	17	3	3	0.3	16	3	3	0.3
144	16	3	3	0.4	18	3	4	0.4	17	3	4	0.4
145	17	3	4	0.4	19	3	4	0.4	18	3	4	0.4
146	18	3	4	0.4	19	3	4	0.4	19	3	4	0.4
147	18	3	4	0.4	20	3	4	0.4	19	3	4	0.4
148	19	3	4	0.4	20	3	4	0.4	20	3	4	0.4
149	18	3	4	0.4	20	3	4	0.4	19	3	4	0.4
150	19	3	4	0.4	21	4	4	0.4	20	3	4	0.4
151	19	3	4	0.4	21	4	4	0.4	20	3	4	0.4
152	20	3	4	0.4	22	4	4	0.4	21	4	4	0.4
153	Acquisition of property assumed for Full Pit Assessment											
154	36	4	5	0.4	39	4	5	0.4	38	4	5	0.4
156	35	4	5	0.4	37	4	5	0.4	37	4	5	0.4
157	34	4	4	0.4	36	4	5	0.4	35	4	4	0.4
159	32	4	4	0.3	34	4	4	0.3	34	4	4	0.3
161	32	4	5	0.5	33	4	5	0.5	33	4	5	0.5
Mine-owned Residences (per EA)												
1	21	4	4	0.4	23	4	4	0.4	22	4	4	0.4
2	22	4	5	0.5	24	4	5	0.5	24	4	5	0.5
33	11	1	1	0.0	12	1	1	0.0	12	1	1	0.0

Residence ID	Y8 (Full Pit) Project only Per EA				Y8 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y8 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
45	18	3	3	0.1	20	3	3	0.1	20	3	3	0.1
46	21	3	3	0.1	24	3	3	0.1	23	3	3	0.1
56	14	2	2	0.0	15	2	2	0.1	15	2	2	0.0
58	13	2	2	0.0	15	2	2	0.0	14	2	2	0.0
59	13	2	2	0.1	14	2	2	0.1	14	2	2	0.1
60	10	2	2	0.1	11	2	2	0.1	11	2	2	0.1
61	14	2	2	0.1	15	2	2	0.1	15	2	2	0.1
69	15	3	3	0.1	17	3	3	0.1	16	3	3	0.1
70	15	3	3	0.1	18	3	3	0.1	17	3	3	0.1
74	12	2	2	0.1	13	2	2	0.1	13	2	2	0.1
75	13	2	3	0.1	15	3	3	0.2	14	2	3	0.2
77	24	5	6	0.4	32	6	7	0.5	30	6	7	0.4
78	28	6	7	0.5	34	7	8	0.7	32	6	8	0.6
79	19	4	4	0.3	24	4	5	0.3	22	4	5	0.3
81	20	4	5	0.3	24	5	5	0.4	23	4	5	0.4
82	23	5	5	0.4	26	5	6	0.5	25	5	6	0.5
83	21	4	5	0.4	23	5	5	0.4	23	4	5	0.4
84	30	6	7	0.7	33	6	7	0.8	32	6	7	0.8
85	25	6	7	0.7	27	6	7	0.8	27	6	7	0.8
86	26	6	7	0.7	28	6	7	0.7	27	6	7	0.7
89	24	3	3	0.3	25	3	3	0.3	25	3	3	0.3
90	30	4	4	0.5	31	4	5	0.5	30	4	5	0.5
92	27	3	4	0.4	28	3	4	0.4	28	3	4	0.4
93	29	4	4	0.4	30	4	4	0.4	30	4	4	0.4
97	31	4	5	0.5	33	4	5	0.5	32	4	5	0.5
98	28	3	4	0.4	30	4	4	0.4	30	4	4	0.4
101	26	3	4	0.3	27	3	4	0.3	27	3	4	0.3
102	27	3	4	0.3	29	3	4	0.4	28	3	4	0.3
104	26	3	3	0.3	27	3	3	0.3	27	3	3	0.3
107	76	10	13	1.2	80	10	13	1.2	79	10	13	1.2
113	37	4	5	0.4	40	4	5	0.4	39	4	5	0.4
114	35	4	4	0.4	37	4	5	0.4	37	4	5	0.4
115	35	4	4	0.4	37	4	5	0.4	36	4	5	0.4
116	35	4	4	0.4	37	4	5	0.4	36	4	5	0.4
117	34	4	4	0.4	36	4	5	0.4	35	4	5	0.4
119	31	3	4	0.3	32	3	4	0.3	32	3	4	0.3
122	28	3	4	0.3	29	3	4	0.3	29	3	4	0.3
124	26	3	3	0.2	28	3	4	0.2	27	3	4	0.2

Residence ID	Y8 (Full Pit) Project only Per EA				Y8 (Full Pit) Project only Per EA plus underground haulage Default emission factor				Y8 (Full Pit) Project only Per EA plus underground haulage AP-42 emission factor			
	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)		TSP (µg/m ³)	Dust deposition (g/m ² /month)
	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual	24-hour	Annual	Annual	Annual
	Assessment criteria											
	-	-	-	2	-	-	-	2		30	90	4
127	20	3	3	0.2	22	3	3	0.2	21	3	3	0.2
128	28	4	4	0.2	31	4	4	0.2	30	4	4	0.2
130	26	2	3	0.1	29	3	3	0.1	28	2	3	0.1
131	27	2	2	0.1	30	2	2	0.1	29	2	2	0.1
134	13	1	2	0.1	14	2	2	0.1	14	2	2	0.1
135	10	1	1	0.0	11	1	1	0.0	10	1	1	0.0
136	29	1	1	0.0	30	1	1	0.0	30	1	1	0.0
138	17	2	2	0.1	18	2	2	0.1	18	2	2	0.1
140	14	2	2	0.2	15	2	2	0.2	15	2	2	0.2
141	13	2	2	0.1	13	2	2	0.1	13	2	2	0.1
155	37	4	5	0.4	39	4	5	0.4	38	4	5	0.4
158	34	4	4	0.4	36	4	4	0.4	35	4	4	0.4
160	31	3	4	0.4	32	4	4	0.4	32	4	4	0.4
162	29	4	4	0.4	30	4	4	0.4	30	4	4	0.4
163	28	3	4	0.4	29	4	4	0.4	29	4	4	0.4
164	32	4	5	0.5	34	4	5	0.5	33	4	5	0.5
165	30	4	4	0.4	31	4	5	0.5	31	4	5	0.4
166	29	4	4	0.4	31	4	4	0.4	30	4	4	0.4
167	29	4	4	0.4	30	4	4	0.4	29	4	4	0.4
168	27	3	4	0.4	28	3	4	0.4	28	3	4	0.4
169	27	3	4	0.4	29	3	4	0.4	28	3	4	0.4
170	31	6	7	0.8	34	7	8	0.8	33	6	8	0.8

Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Table B.8: Predicted PM₁₀, TSP and dust deposition levels – Y8 (Full Pit) per EA compared with continued hauling of underground coal – project and other sources

Residence ID	Y8 (Full Pit) Project & other sources Per EA			Y8 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y8 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
	Private Residences (per EA)								
3	16	49	1.1	17	49	1.1	16	49	1.1
4	16	49	1.1	17	49	1.1	16	49	1.1
5	15	48	1.0	15	48	1.0	15	48	1.0
6	15	48	0.9	15	48	1.0	15	48	1.0
7	14	46	0.8	14	46	0.8	14	46	0.8
8	15	48	0.9	16	48	0.9	16	48	0.9
9 ^(a)	16	48	0.9	16	49	0.9	16	49	0.9
10 ^(b)	15	48	0.8	16	48	0.9	16	48	0.9
11	15	48	0.8	15	48	0.8	15	48	0.8
12	14	46	0.7	14	46	0.7	14	46	0.7
13	15	47	0.8	15	48	0.8	15	48	0.8
14	14	47	0.7	14	47	0.7	14	47	0.7
15	14	46	0.7	14	46	0.7	14	46	0.7
16	14	47	0.7	15	47	0.7	15	47	0.7
17	14	46	0.7	14	46	0.7	14	46	0.7
18	14	46	0.7	14	46	0.7	14	46	0.7
19	14	46	0.7	14	46	0.7	14	46	0.7
20	14	46	0.7	14	46	0.7	14	46	0.7
21	13	46	0.7	14	46	0.7	14	46	0.7
22	13	46	0.7	13	46	0.7	13	46	0.7
23	14	46	0.7	14	46	0.7	14	46	0.7
24	13	45	0.7	13	45	0.7	13	45	0.7
25	13	45	0.7	13	45	0.7	13	45	0.7
26	12	45	0.7	12	45	0.7	12	45	0.7
27	12	44	0.7	12	45	0.7	12	44	0.7
28	12	44	0.7	12	44	0.7	12	44	0.7
29	13	45	0.7	13	45	0.7	13	45	0.7
30	13	45	0.7	13	45	0.7	13	45	0.7
31	13	46	0.7	13	46	0.7	13	46	0.7
32	13	46	0.8	13	46	0.8	13	46	0.8
34	14	46	0.8	14	46	0.8	14	46	0.8
35	14	47	0.8	15	47	0.8	14	47	0.8
36	14	46	0.8	14	46	0.8	14	46	0.8
37	14	47	0.8	14	47	0.8	14	47	0.8

Residence ID	Y8 (Full Pit) Project & other sources Per EA			Y8 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y8 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
38	14	47	0.9	14	47	0.9	14	47	0.9
39	14	46	0.8	14	46	0.8	14	46	0.8
40	14	46	0.8	14	46	0.8	14	46	0.8
41	14	46	0.8	14	46	0.8	14	46	0.8
42	15	47	0.9	15	47	0.9	15	47	0.9
43	15	47	0.9	15	47	0.9	15	47	0.9
44	15	48	0.9	15	48	0.9	15	48	0.9
47	16	48	0.9	16	49	0.9	16	49	0.9
48	15	48	0.9	16	48	0.9	16	48	0.9
49	15	48	0.9	16	48	0.9	16	48	0.9
50	15	48	1.0	16	48	1.0	16	48	1.0
51	15	48	1.0	16	48	1.0	16	48	1.0
52	16	48	1.0	16	48	1.0	16	48	1.0
53	16	49	1.1	16	49	1.1	16	49	1.1
54	16	49	1.1	17	49	1.1	16	49	1.1
55	16	49	1.1	17	50	1.1	17	49	1.1
57	17	50	1.2	17	50	1.2	17	50	1.2
62	16	49	1.0	16	49	1.0	16	49	1.0
63	16	49	0.9	16	49	0.9	16	49	0.9
64	16	49	0.9	17	49	0.9	17	49	0.9
65	17	50	1.0	17	50	1.0	17	50	1.0
66	17	49	1.0	17	50	1.0	17	50	1.0
67	17	49	1.0	17	50	1.0	17	50	1.0
68	17	49	0.9	17	50	1.0	17	50	1.0
71	17	50	0.9	17	50	1.0	17	50	1.0
72	17	50	0.9	17	50	1.0	17	50	1.0
73	17	50	1.0	18	51	1.0	18	51	1.0
76	18	51	1.1	19	52	1.1	19	52	1.1
80	19	52	1.2	19	53	1.3	19	53	1.2
87	26	62	2.7	26	62	2.7	26	62	2.7
88	21	55	1.9	21	55	1.9	21	55	1.9
91	21	55	1.8	21	55	1.8	21	55	1.8
94	20	54	1.6	20	54	1.6	20	54	1.6
95	20	54	1.7	20	54	1.7	20	54	1.7
96	20	54	1.6	20	54	1.6	20	54	1.6
99	20	53	1.6	20	54	1.6	20	54	1.6
100	19	53	1.5	19	53	1.5	19	53	1.5
103	19	53	1.4	19	53	1.4	19	53	1.4

Residence ID	Y8 (Full Pit) Project & other sources Per EA			Y8 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y8 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
105	22	56	1.9	22	56	2.0	22	56	2.0
106	24	59	2.2	24	59	2.2	24	59	2.2
108 ^(c)	32	70	3.2	33	70	3.2	33	70	3.2
109	33	70	2.6	33	70	2.6	33	70	2.6
110	28	63	2.3	28	63	2.3	28	63	2.3
111	22	56	1.5	23	56	1.5	23	56	1.5
112	21	54	1.5	21	55	1.5	21	54	1.5
118	19	53	1.4	19	53	1.4	19	53	1.4
120	19	53	1.4	19	53	1.4	19	53	1.4
121	18	52	1.3	19	52	1.3	18	52	1.3
123	18	51	1.2	18	51	1.2	18	51	1.2
125	18	52	1.3	18	52	1.3	18	52	1.3
126	17	51	1.2	18	51	1.2	18	51	1.2
129	18	51	1.2	18	51	1.2	18	51	1.2
132	15	47	0.8	15	48	0.8	15	47	0.8
133	14	46	0.7	14	46	0.7	14	46	0.7
137	13	46	0.7	13	46	0.7	13	46	0.7
139	24	59	1.8	24	59	1.8	24	59	1.8
142	15	48	1.1	15	48	1.1	15	48	1.1
143	16	49	1.2	16	49	1.2	16	49	1.2
144	17	50	1.3	17	51	1.3	17	51	1.3
145	18	51	1.3	18	51	1.3	18	51	1.3
146	17	50	1.2	17	50	1.2	17	50	1.2
147	17	50	1.2	17	50	1.2	17	50	1.2
148	17	50	1.2	17	50	1.2	17	50	1.2
149	16	49	1.1	17	50	1.1	17	49	1.1
150	17	50	1.2	17	50	1.2	17	50	1.2
151	16	49	1.1	17	50	1.1	17	49	1.1
152	16	49	1.1	16	49	1.1	16	49	1.1
153	Acquisition of property assumed for Full Pit Assessment								
154	19	53	1.5	20	53	1.5	20	53	1.5
156	19	53	1.5	20	53	1.5	20	53	1.5
157	19	53	1.4	19	53	1.4	19	53	1.4
159	19	52	1.4	19	53	1.4	19	53	1.4
161	20	54	1.7	21	55	1.7	21	54	1.7
	Mine-owned Residences (per EA)								
1	16	49	1.1	16	49	1.1	16	49	1.1
2	17	50	1.2	17	50	1.2	17	50	1.2

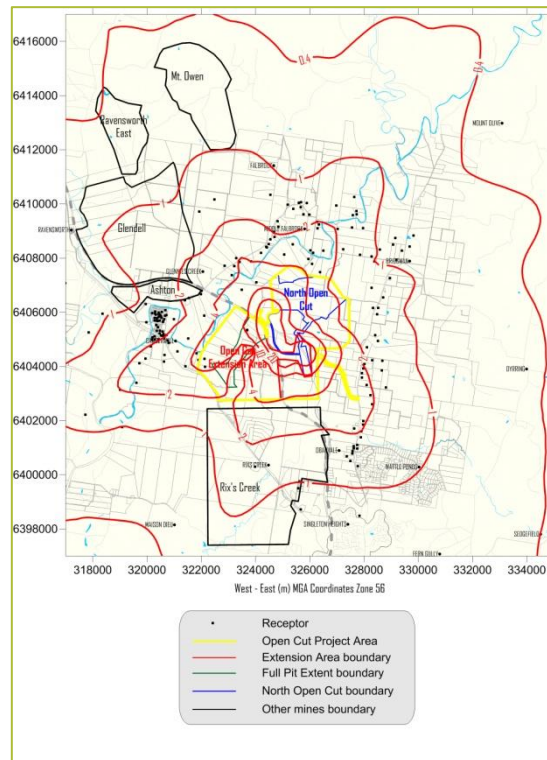
Residence ID	Y8 (Full Pit) Project & other sources Per EA			Y8 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y8 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)	PM ₁₀ (µg/m ³)	TSP (µg/m ³)	Dust deposition (g/m ² /month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
33	13	46	0.8	14	46	0.8	14	46	0.8
45	16	48	0.8	16	49	0.9	16	48	0.9
46	16	48	0.9	16	49	0.9	16	49	0.9
56	17	50	1.1	17	50	1.1	17	50	1.1
58	17	50	1.2	17	50	1.2	17	50	1.2
59	17	50	1.2	18	51	1.2	17	50	1.2
60	18	52	1.4	19	52	1.4	19	52	1.4
61	17	50	1.2	17	50	1.2	17	50	1.2
69	17	50	0.9	17	50	1.0	17	50	0.9
70	17	50	0.9	17	50	1.0	17	50	0.9
74	19	52	0.9	19	52	0.9	19	52	0.9
75	20	54	1.0	21	54	1.0	21	54	1.0
77	19	53	1.3	20	54	1.4	20	54	1.3
78	21	55	1.6	22	56	1.7	22	56	1.7
79	19	52	1.2	19	53	1.3	19	53	1.2
81	19	53	1.3	20	54	1.4	20	53	1.4
82	20	54	1.5	21	55	1.6	21	55	1.6
83	20	54	1.5	21	55	1.6	21	54	1.5
84	25	59	2.4	25	60	2.5	25	60	2.5
85	25	60	2.5	25	61	2.5	25	60	2.5
86	25	60	2.5	25	60	2.5	25	60	2.5
89	21	55	1.7	21	55	1.7	21	55	1.7
90	21	55	1.8	21	55	1.8	21	55	1.8
92	20	54	1.7	20	54	1.7	20	54	1.7
93	20	54	1.7	20	54	1.7	20	54	1.7
97	20	54	1.6	20	54	1.6	20	54	1.6
98	19	53	1.5	20	53	1.5	20	53	1.5
101	20	53	1.6	20	53	1.6	20	53	1.6
102	19	53	1.5	19	53	1.5	19	53	1.5
104	18	51	1.3	18	52	1.3	18	52	1.3
107	26	62	2.4	27	62	2.4	27	62	2.4
113	20	53	1.5	20	53	1.5	20	53	1.5
114	19	53	1.4	19	53	1.4	19	53	1.4
115	19	53	1.4	20	53	1.4	20	53	1.4
116	20	53	1.5	20	53	1.5	20	53	1.5
117	20	53	1.5	20	53	1.5	20	53	1.5
119	19	52	1.4	19	52	1.4	19	52	1.4
122	18	51	1.3	18	51	1.3	18	51	1.3

Residence ID	Y8 (Full Pit) Project & other sources Per EA			Y8 (Full Pit) Project & other sources Per EA plus underground haulage Default emission factor			Y8 (Full Pit) Project & other sources Per EA plus underground haulage AP-42 emission factor		
	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)	PM ₁₀ (µg/m³)	TSP (µg/m³)	Dust deposition (g/m²/month)
	Annual			Annual			Annual		
	Assessment criteria								
	30	90	4	30	90	4	30	90	4
124	18	51	1.2	18	51	1.2	18	51	1.2
127	17	50	1.1	17	50	1.1	17	50	1.1
128	18	52	1.2	19	52	1.2	19	52	1.2
130	16	49	1.0	16	49	1.0	16	49	1.0
131	15	48	0.9	15	48	0.9	15	48	0.9
134	15	48	0.8	15	48	0.8	15	48	0.8
135	14	46	0.7	14	46	0.7	14	46	0.7
136	12	44	0.6	12	44	0.6	12	44	0.6
138	58	119	5.1	58	119	5.1	58	119	5.1
140	24	59	1.8	24	59	1.8	24	59	1.8
141	23	58	2.1	23	58	2.1	23	58	2.1
155	20	53	1.5	20	54	1.5	20	54	1.5
158	19	53	1.4	19	53	1.4	19	53	1.4
160	19	53	1.4	19	53	1.4	19	53	1.4
162	20	54	1.6	20	54	1.6	20	54	1.6
163	19	53	1.5	20	53	1.5	19	53	1.5
164	21	55	1.8	21	55	1.8	21	55	1.8
165	20	54	1.7	20	54	1.7	20	54	1.7
166	20	54	1.7	20	54	1.7	20	54	1.7
167	20	54	1.7	20	54	1.7	20	54	1.7
168	20	54	1.6	20	54	1.6	20	54	1.6
169	20	54	1.6	20	54	1.6	20	54	1.6
170	25	60	2.4	25	60	2.5	25	60	2.5

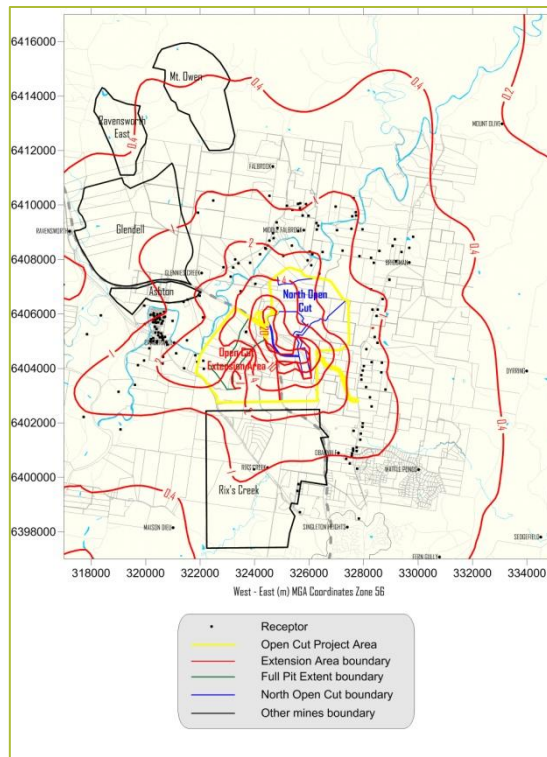
Notes:

- a) Vale are in the process of purchasing Residence 9 (W&N Pendered).
- b) Residence 10 has been purchased by Vale since the EA was completed. It was previously a private residence owned by E&B Kleinman..
- c) Residence 108 has been purchased by Vale since the EA was completed. It was previously a private residence owned by IM Tisdell.

Appendix C: Contour plots of predicted increment due to continued haulage

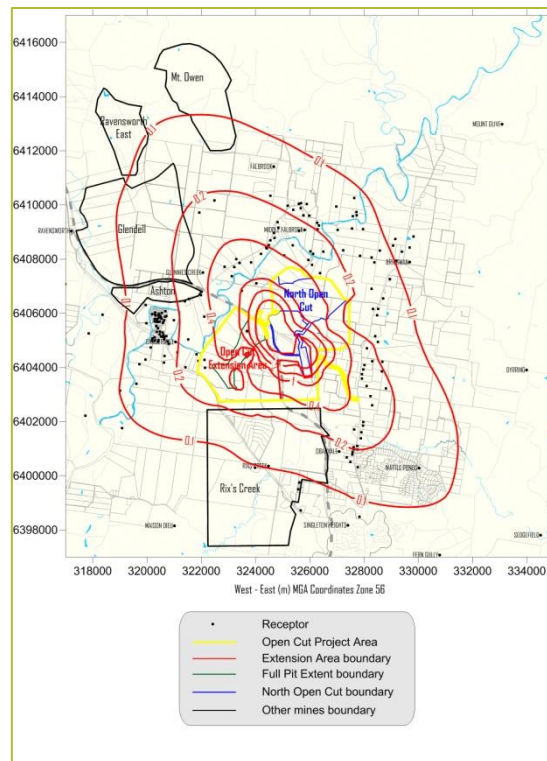


Default emission factor

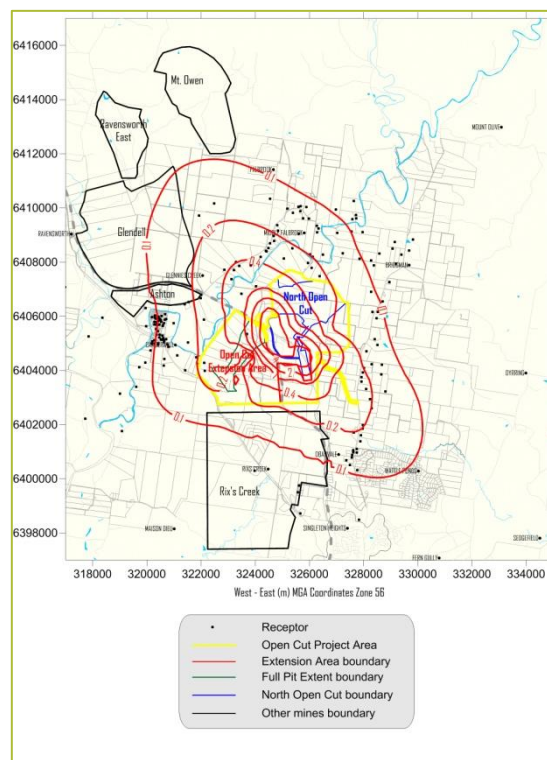


AP-42 emission factor

Figure C.1: Predicted increment in maximum 24-hour average PM_{10} concentration due to continued haulage of ROM coal from underground operations ($\mu g/m^3$)

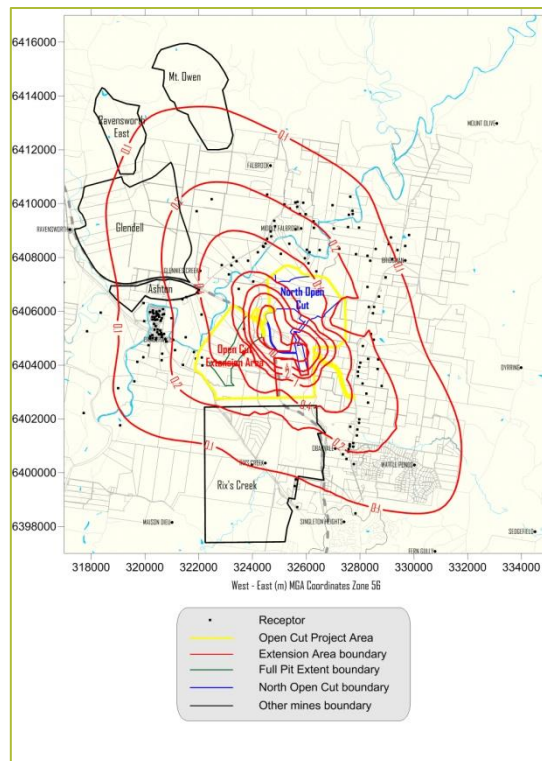


Default emission factor

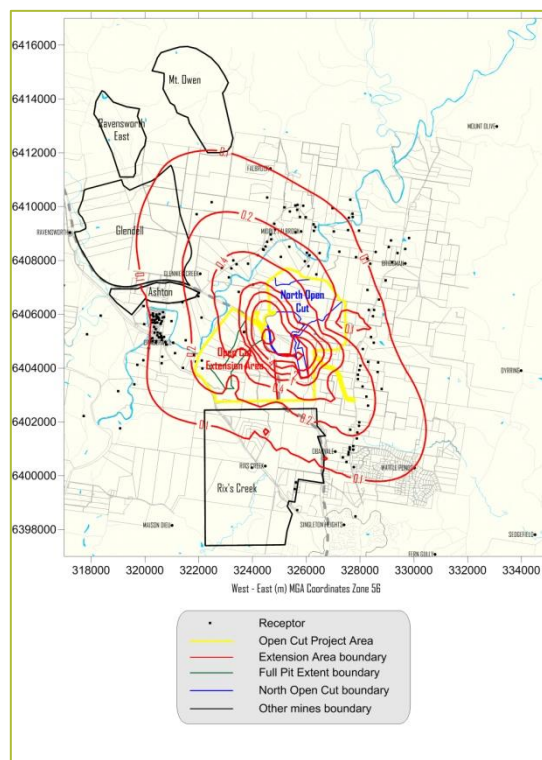


AP-42 emission factor

Figure C.2: Predicted increment in annual average PM_{10} concentration due to continued haulage of ROM coal from underground operations ($\mu g/m^3$)

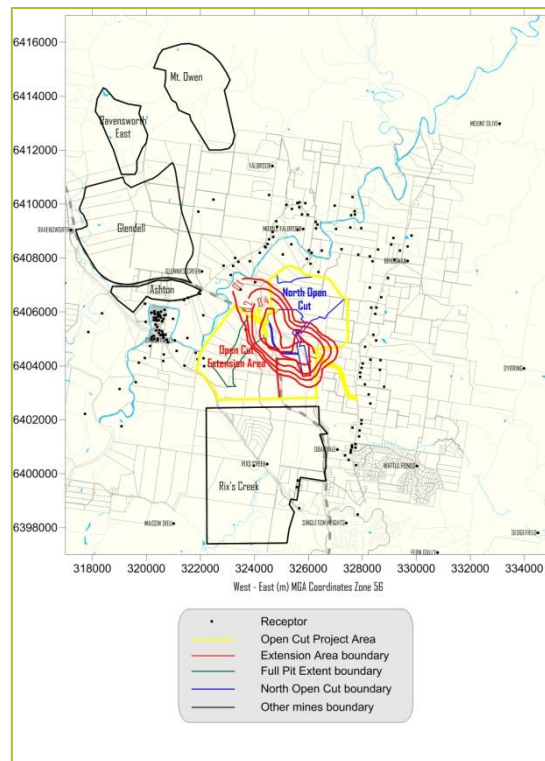


Default emission factor

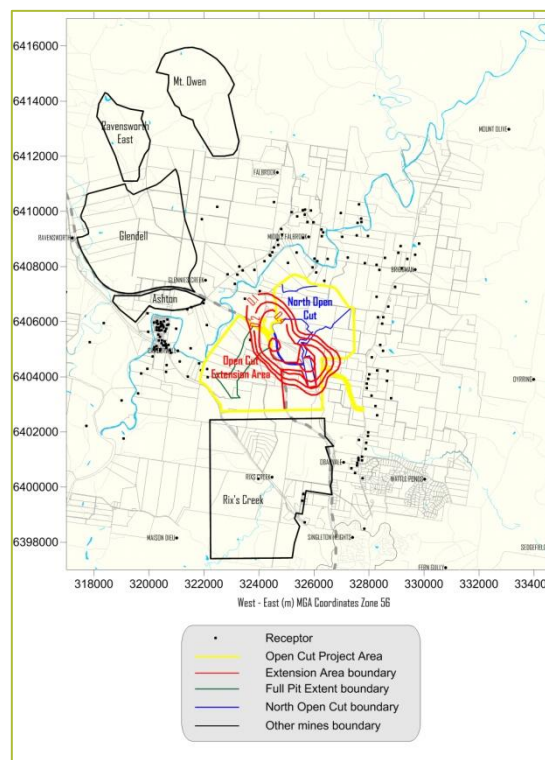


AP-42 emission factor

Figure C.3: Predicted increment in annual average TSP concentration due to continued haulage of ROM coal from underground operations ($\mu\text{g}/\text{m}^3$)



Default emission factor



AP-42 emission factor

Figure C.4: Predicted increment in annual average dust deposition due to continued haulage of ROM coal from underground operations (g/m²/month)

Appendix D: Additional cumulative impact assessment completed as part of 2009 EA

30 August 2010

Nicholas Hall

NSW Department of Planning

Via email: Nicholas.Hall@planning.nsw.gov.au

Re: Integra Operations Pty Ltd – additional cumulative analysis at residences

Further to the report prepared by **PAEHolmes (2010a)** in July 2010, which examined in detail the actual and potential cumulative air quality impacts at a number of residences in the Camberwell area, NSW Department of Planning (DoP) have requested that PAEHolmes examine the cumulative air quality impacts in the same manner for the residences identified in **Table 1**.

Table 1: Residences assessed in this study

Integra ID	Ashton SEOC ID	Ravensworth Operations ID	Ownership
87	111	7c	B & R Richards
88	35	50	M & T De Jong
95	24a	20b	J & T Clarke
99	30	1	A J Bennett
161	23	46	V Lopes

The location of these residences in relation to the Ashton mine air quality monitors is shown on **Figure 1**.

Section 1 presents a summary of the data sources used in this assessment.

Section 2 presents an analysis of the measured, and predicted, annual average concentrations at each of the residences, for the period 2007 to 2021.

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GOLD COAST

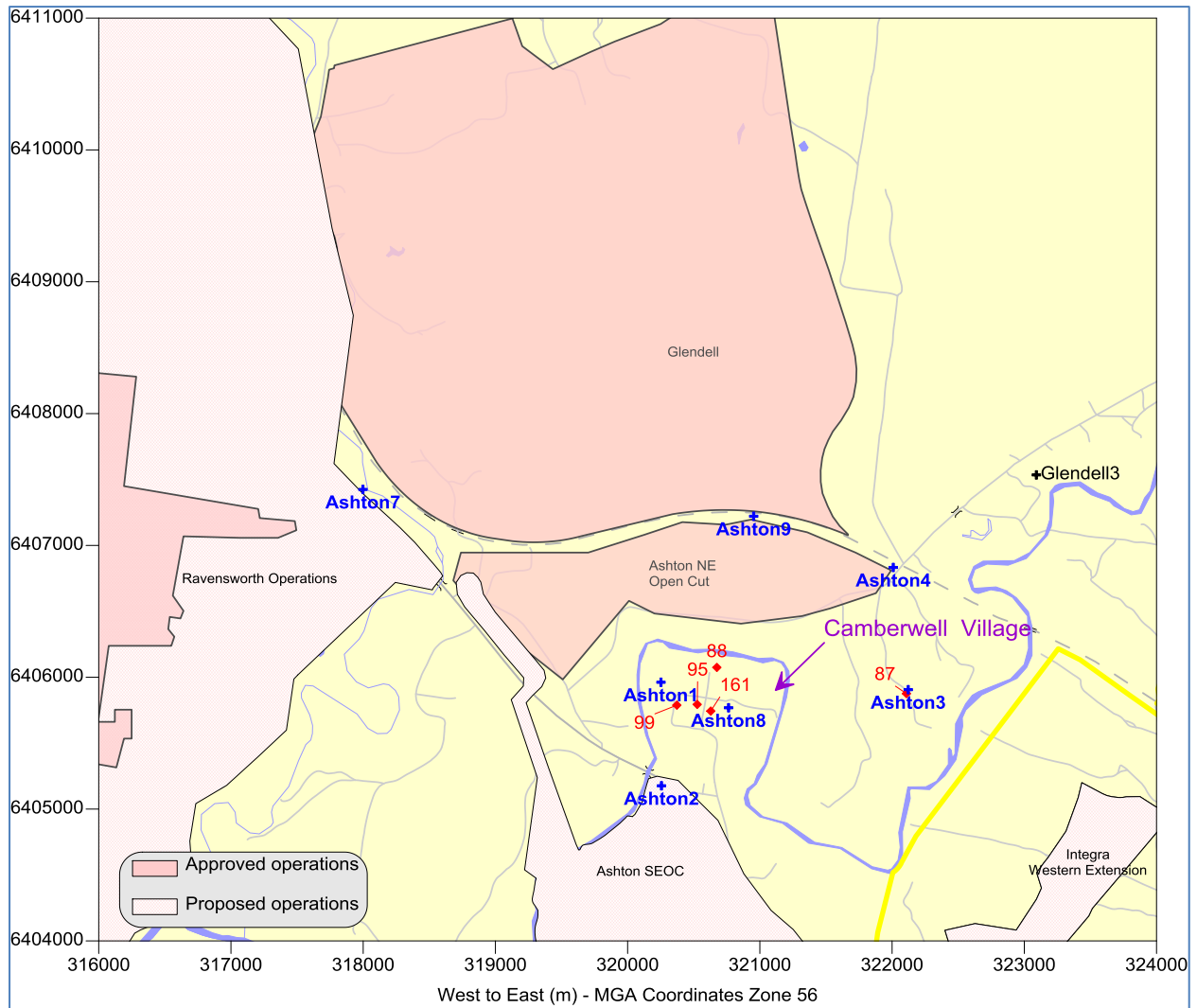


Figure 1: Location of residences and Ashton air quality monitors

1 DATA SOURCES

In order to simplify the presentation of the data and avoid repetition of references, a summary of the data references is given below:

1.1 Approved operations

■ Ashton North East Open Cut (NEOC)

- **Holmes Air Sciences (2001)** "Air Quality Assessment Proposed Ashton Mine near Camberwell, NSW" Prepared for White Mining Pty Ltd, October 2001.
- Please note that the predicted impacts for the Ashton NEOC did not consider the impact of reactive dust management that is employed at the mine, and as such are considered to be an over-estimate of the actual impacts experienced at residences.
- Open cut operations at Ashton NEOC will cease in the first quarter of 2011. Should the proposed Ashton SEOC (see below) be granted approval there would be a progressive transfer of plant and equipment from Ashton NEOC to Ashton SEOC.

■ Integra South Pit

- **Epps & Associates Pty Ltd (1989)** "Camberwell Coal Project, Glennies Creek, NSW, Camberwell Coal Joint Venture" Prepared by Epps & Associates Pty Ltd, 3 Julian Street, Mosman, NSW 2088.
- Please note that at the time this assessment was completed there was no requirement to predict concentrations of PM₁₀. When TSP and PM₁₀ concentration monitoring data are not available, it becomes difficult to quantify the existing air quality and to undertake a robust air quality assessment. There is, however, an approximate relationship between annual dust deposition and annual TSP concentrations. Monitoring data from areas in the Hunter Valley where co-located TSP and PM₁₀ monitors have been operated for reasonably long periods of time indicate that long term average PM₁₀ concentrations are approximately 40% of the corresponding long-term TSP concentration (**NSW Minerals Council, 2000**). It has therefore been assumed that annual average PM₁₀ concentrations are 40% of the TSP predictions presented.
- Open cut operations at Integra South Pit will cease in 2011.

■ Integra North Open Cut (previously known as Glennies Creek Open Cut)

- **Holmes Air Sciences (2007a)** "Air Quality Assessment: Glennies Creek Open Cut Coal Mine" prepared for R.W. Corkery & Co. Pty Limited on behalf of Integra Coal Operations Pty Ltd. March 2007.

■ Rix's Creek

- **Holmes Air Sciences (1994)** "Proposed Rixs Creek Open Cut Mine, Near Singleton, NSW", Prepared for Envirosiences Pty Ltd, November 1994.
- Please note that at the time this assessment was completed there was no requirement to predict concentrations of PM₁₀. It has therefore been assumed that annual average PM₁₀ concentrations are 40% of the TSP predictions presented (**NSW Minerals Council, 2000**).

■ Mt Owen

- **Holmes Air Sciences (2003)** "Air Quality Assessment: Mount Owen Operations" Prepared for Umwelt (Australia) Pty Ltd by Holmes Air Sciences, Suite 2B, 14 Glen Street, Eastwood, NSW 2122. December 2003.

■ Ravensworth East

- **ERM Mitchell McCotter (1999)** "Ravensworth East Mine Air Quality Impact Assessment" Prepared for Peabody Resources Ltd, February 1999.

■ Glendell

- **Holmes Air Sciences (2007b)** "Air Quality Assessment: Proposed Glendell Mine – Modification to Development Consent" Prepared for Umwelt (Australia) Pty Ltd by Holmes Air Sciences, Suite 2B, 14 Glen Street, Eastwood, NSW 2122. August 2007.

■ Ravensworth West

- **ERM Mitchell McCotter (1997)** "Extension of Mining Operations at Ravensworth Mine – Environmental Impact Statement", August 1997.

- Cumnock

- **Environ (2008)** "Cumnock Wash Plant Mining and Rehabilitation Project Air Quality Assessment" Prepared for Umwelt (Australia) Pty Ltd on behalf of Cumnock No. 1 Colliery, December 2008

- Narama

- **PAEHolmes (2009b)** "Air Quality Assessment for Narama Extended Project" prepared for Umwelt (Australia) Pty Ltd, June 2009.

1.2 Proposed operations

- Integra Operations (includes the proposed Western Extension and the approved operations at Integra NOC and Integra Underground):

- **Holmes Air Sciences (2009)** "Air Quality Impact Assessment. Integra Open Cut Operation" Prepared for URS Australia Pty Ltd on behalf of Integra Coal, June 2009. Integra Operations proposed two pit designs (Full Pit Extent and Part Pit Extent). For the purposes of this assessment only the Full Pit assessment is presented.
 - Please note that since the environmental assessment was submitted, in order to minimise the potential air quality impacts, significant modifications have been made to the Year 1 and Year 3 mine plans and the updated results have been used in this assessment.

- Ashton South East Open Cut (SEOC) (includes approved operations at Ashton Underground):

- **PAEHolmes (2009a)** "Air Quality Impact Assessment. Ashton South East Open Cut" prepared for Wells Environmental Services on behalf of Ashton Coal Operations Limited, October 2009.
 - Please note that since the environmental assessment was submitted, in order to minimise the potential air quality impacts, significant modifications have been made to the Year 1 mine plans and the updated results have been used in this assessment.
 - The assessment of air quality impacts for Year 1 SEOC operations includes a period of overlap with Ashton NEOC as there will be a progressive reduction of activities and transfer of plant and equipment from Ashton NEOC to Ashton SEOC.

- Ravensworth Operations (includes approved operations at Narama, Cumnock and Ravensworth West):

- **PAEHolmes (2010b)** "Air Quality Impact Assessment. Ravensworth Operations Project", prepared for Umwelt (Australia) Pty Ltd, January 2010.

2 RESULTS

2.1 Residence 87 (B & R Richards)

Table 1 and **Figure 1** present the predicted impacts at Residence 87 for 2007 to 2021, compared with the annual average PM₁₀ concentrations for 2007 to May 2010 collected at Ashton3 TEOM. Ashton3 TEOM is located at Residence 87.

The data show that for the period 2007 to 2010, neither the predicted cumulative impacts, nor the monitoring data from Ashton3 TEOM, were greater than the impact assessment criteria of 30 µg/m³.

For the period 2011 to 2021 (with the exception of 2014), the predicted cumulative impacts are all below the impact assessment criteria of 30 µg/m³.

Table 1: Predicted annual average PM₁₀ concentrations at Residence 87 (B & R Richards) (µg/m³)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
APPROVED OPERATIONS															
Ashton NEOC	3.0	3.0	3.0	3.0											
Integra South Pit	7.0	7.0	7.0	7.0											
Integra North Open Cut				1.0											
Integra Underground	0.1	0.1	0.1	0.1											
Rix's Creek	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0					
Mt Owen	4.0	5.0	4.8	4.5	4.3	4.0	4.0	4.0	4.0	4.0	4.0	4.5	5.0		
Ravensworth East	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0							
Glendell		1.0	1.0	1.0	1.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Ravensworth West	0.5	0.5	0.5	0.5											
Cumnock	1.0	1.0	1.0	1.0											
Narama	0.0	0.0	0.0	0.0											
PROPOSED OPERATIONS															
Integra operations (full-pit)					8.0	7.0	6.0	9.0	8.0	7.0	8.0	9.0	4.0		
Ashton SEOC					1.0	1.5	2.0	2.0	2.0	1.5	1.0				
Ravensworth Operations (includes Narama)					2.0	3.0	3.0	3.0	3.0	3.2	3.4	3.6	3.8	4.0	4.0
CUMULATIVE IMPACTS															
<i>Mines only cumulative</i>	21	23	22	23	22	23	23	26	22	21	19	20	15	6	6
Assumed "background"	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total predicted annual average PM₁₀	26	28	27	28	27	28	28	31	27	26	24	25	20	11	11
MONITORING DATA															
Annual average PM ₁₀ (Ashton3)	24	23	27	21											

* Shaded shows actual modelled years

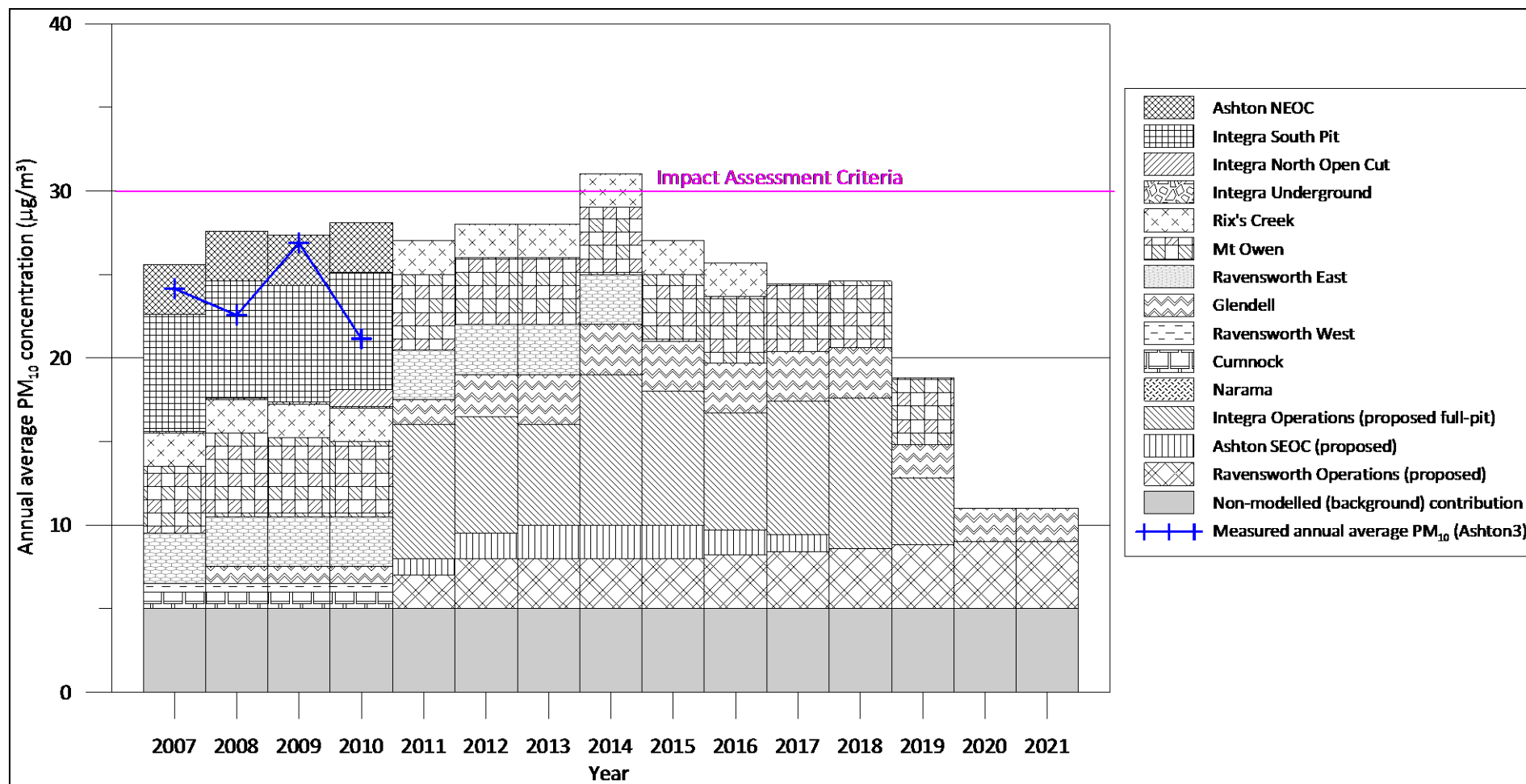


Figure 1: Predicted annual average PM₁₀ concentrations at Residence 87 (B & R Richards) (µg/m³)

2.1.1 Residence 88 (M & T De Jong)

Table 2 and **Figure 2** present the predicted impacts at Residence 88 for 2007 to 2021, compared with the annual average PM_{10} concentrations for 2007 to May 2010 collected at Ashton8 TEOM. Ashton8 TEOM is located approximately 300m south-southeast of Residence 88.

The data show that the predicted cumulative impacts for the period 2007 to 2010 were greater than the impact assessment criteria of $30 \mu\text{g}/\text{m}^3$. However, the monitoring data from Ashton8 TEOM are all below the criteria. The main contribution to the cumulative impacts for this period is from Ashton NEOC. However, the air quality assessment for Ashton NEOC did not take into account the reactive dust management that Ashton Coal Operations Limited (ACOL) apply to the site.

For the period 2011 to 2021, the predicted cumulative impacts are all below the impact assessment criteria of $30 \mu\text{g}/\text{m}^3$.

Table 2: Predicted annual average PM₁₀ concentrations at Residence 88 (M & T De Jong) (µg/m³)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
APPROVED OPERATIONS															
Ashton NEOC	30.0	30.0	30.0	30.0											
Integra South Pit	4.0	4.0	4.0	4.0											
Integra North Open Cut				0.3											
Integra Underground	0.1	0.1	0.1	0.1											
Rix's Creek	2.0	2.0	2.0	2.0	2.0	1.8	1.6	1.4	1.2	1.0					
Mt Owen	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Ravensworth East	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0							
Glendell		1.0	1.0	2.0	2.5	3.0	4.0	4.5	5.0	6.0	6.0	5.0	4.0	4.0	4.0
Ravensworth West	0.5	0.5	0.5	0.5											
Cumnock	1.0	1.0	1.0	1.0											
Narama	0.8	0.8	0.8	1.0											
PROPOSED OPERATIONS															
Integra operations (full-pit)					3.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0		
Ashton SEOC					3.0	3.0	4.0	4.0	4.0	4.0	2.0				
Ravensworth Operations (includes Narama)					3.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
CUMULATIVE IMPACTS															
<i>Mines only cumulative</i>	44	45	45	47	20	20	23	24	21	21	18	16	15	9	9
Assumed "background"	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total predicted annual average PM₁₀	49	50	50	52	25	25	28	29	26	26	23	21	20	14	49
MONITORING DATA															
Annual average PM ₁₀ (Ashton8)	25	25	28	23											

* Shaded shows actual modelled years

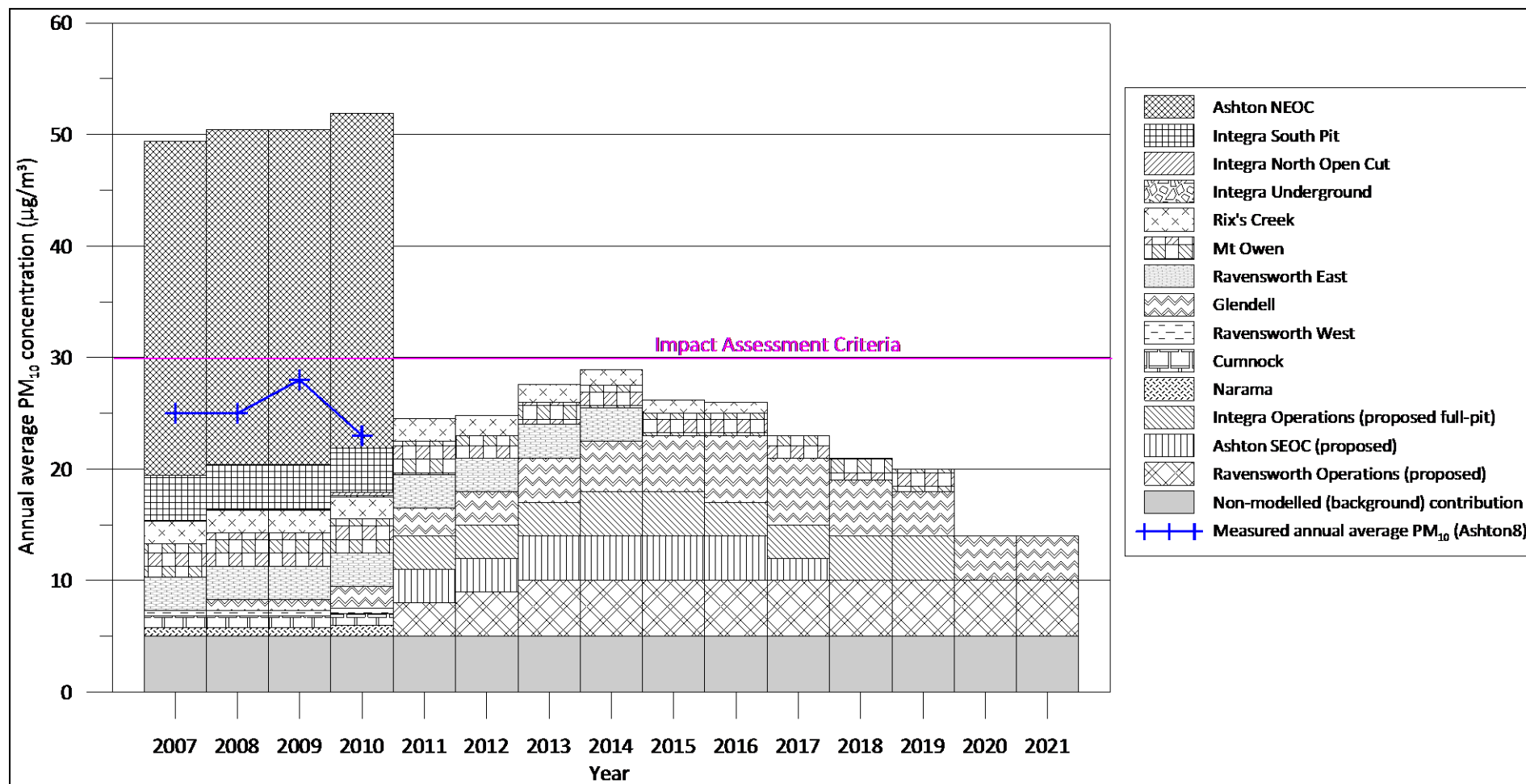


Figure 2: Predicted annual average PM₁₀ concentrations at Residence 88 (M & T De Jong) (µg/m³)

2.1.2 Residence 95 (J & T Clarke)

Table 3 and **Figure 3** present the predicted impacts at Residence 95 for 2007 to 2021, compared with the annual average PM_{10} concentrations for 2007 to May 2010 collected at Ashton8 TEOM. Ashton8 TEOM is located approximately 300m south-southwest of Residence 95.

The data show that the predicted cumulative impacts for the period 2007 to 2010 were greater than the impact assessment criteria of $30 \mu g/m^3$. However, the monitoring data from Ashton8 TEOM are all below the criteria. The main contribution to the cumulative impacts for this period is from Ashton NEOC. However, the air quality assessment for Ashton NEOC did not take into account the reactive dust management that Ashton Coal Operations Limited (ACOL) apply to the site.

For the period 2011 to 2021, the predicted cumulative impacts are all below the impact assessment criteria of $30 \mu g/m^3$.

Table 3: Predicted annual average PM₁₀ concentrations at Residence 95 (J & T Clarke) (µg/m³)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
APPROVED OPERATIONS															
Ashton NEOC	35.0	35.0	35.0	35.0											
Integra South Pit	4.0	4.0	4.0	4.0											
Integra North Open Cut				0.3											
Integra Underground	0.1	0.1	0.1	0.1											
Rix's Creek	2.0	2.0	2.0	2.0	2.0	1.8	1.6	1.4	1.2	1.0					
Mt Owen	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Ravensworth East	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0							
Glendell		1.0	1.0	1.0	1.5	2.0	3.0	4.0	5.0	6.0	5.0	4.5	4.0	4.0	4.0
Ravensworth West	0.5	0.5	0.5	0.5											
Cumnock	1.0	1.0	1.0	1.0											
Narama	1.0	1.0	1.0	1.0											
PROPOSED OPERATIONS															
Integra operations (full-pit)					3.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	4.0		
Ashton SEOC					3.0	3.0	5.0	5.0	5.0	4.0	2.0				
Ravensworth Operations (includes Narama)					3.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
CUMULATIVE IMPACTS															
<i>Mines only cumulative</i>	49	50	50	50	18	19	22	23	20	20	16	15	15	9	9
Assumed "background"	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total predicted annual average PM₁₀	54	55	55	55	23	24	27	28	25	25	21	20	20	14	14
MONITORING DATA															
Annual average PM ₁₀ (Ashton8)	25	25	28	23											

* Shaded shows actual modelled years

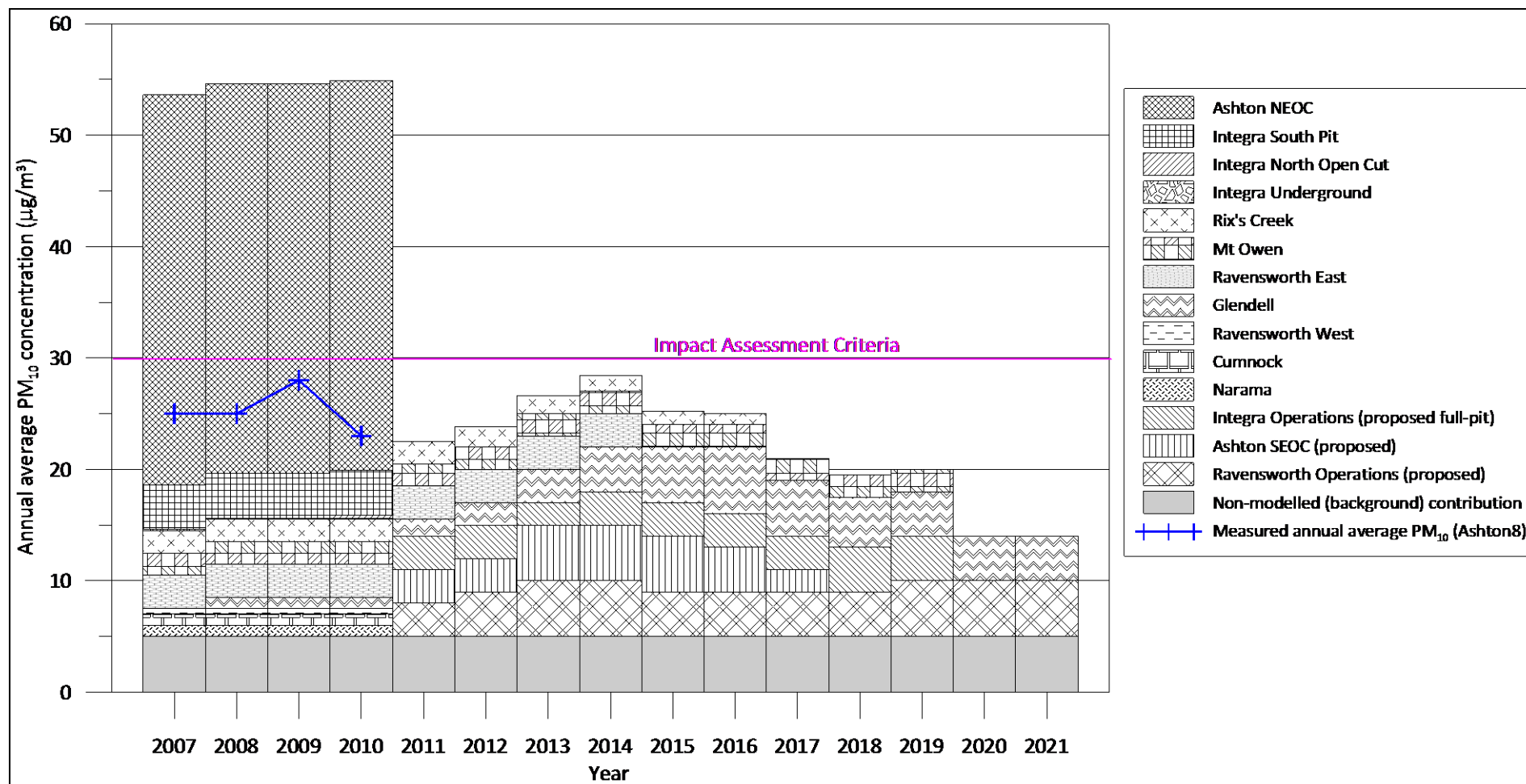


Figure 3: Predicted annual average PM₁₀ concentrations at Residence 95 (J & T Clarke) (µg/m³)

2.1.3 Residence 99 (A J Bennett)

Table 4 and **Figure 4** present the predicted impacts at Residence 99 for 2007 to 2021, compared with the annual average PM₁₀ concentrations for 2007 to May 2010 collected at Ashton1 TEOM. Ashton1 TEOM is located approximately 230m north-west of Residence 99.

The data show that the predicted cumulative impacts for the period 2007 to 2010 were greater than the impact assessment criteria of 30 µg/m³. However, the monitoring data from Ashton1 TEOM are all below the criteria. The main contribution to the cumulative impacts for this period is from Ashton NEOC. However, the air quality assessment for Ashton NEOC did not take into account the reactive dust management that Ashton Coal Operations Limited (ACOL) apply to the site.

For the period 2011 to 2021, the predicted cumulative impacts are all below the impact assessment criteria of 30 µg/m³.

Table 4: Predicted annual average PM₁₀ concentrations at Residence 99 (A J Bennett) (µg/m³)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
APPROVED OPERATIONS															
Ashton NEOC	35.0	35.0	35.0	35.0											
Integra South Pit	4.0	4.0	4.0	4.0											
Integra North Open Cut				0.3											
Integra Underground	0.1	0.1	0.1	0.1											
Rix's Creek	2.0	2.0	2.0	2.0	2.0	1.8	1.6	1.4	1.2	1.0					
Mt Owen	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Ravensworth East	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0							
Glendell		1.0	1.0	1.0	1.5	2.0	3.0	4.0	5.0	6.0	5.0	4.5	4.0	4.0	4.0
Ravensworth West	0.5	0.5	0.5	0.5											
Cumnock	1.0	1.0	1.0	1.0											
Narama	1.0	1.0	1.0	1.0											
PROPOSED OPERATIONS															
Integra operations (full-pit)					3.0	3.0	2.0	3.0	3.0	3.0	3.0	4.0	4.0		
Ashton SEOC					3.0	3.0	5.0	5.0	5.0	4.0	2.0				
Ravensworth Operations (includes Narama)					3.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
CUMULATIVE IMPACTS															
<i>Mines only cumulative</i>	49	50	50	50	18	19	22	23	20	20	16	15	15	9	9
Assumed "background"	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total predicted annual average PM₁₀	54	55	55	55	23	24	27	28	25	25	21	20	20	14	14
MONITORING DATA															
Annual average PM ₁₀ (Ashton8)	25	25	28	23											

* Shaded shows actual modelled years

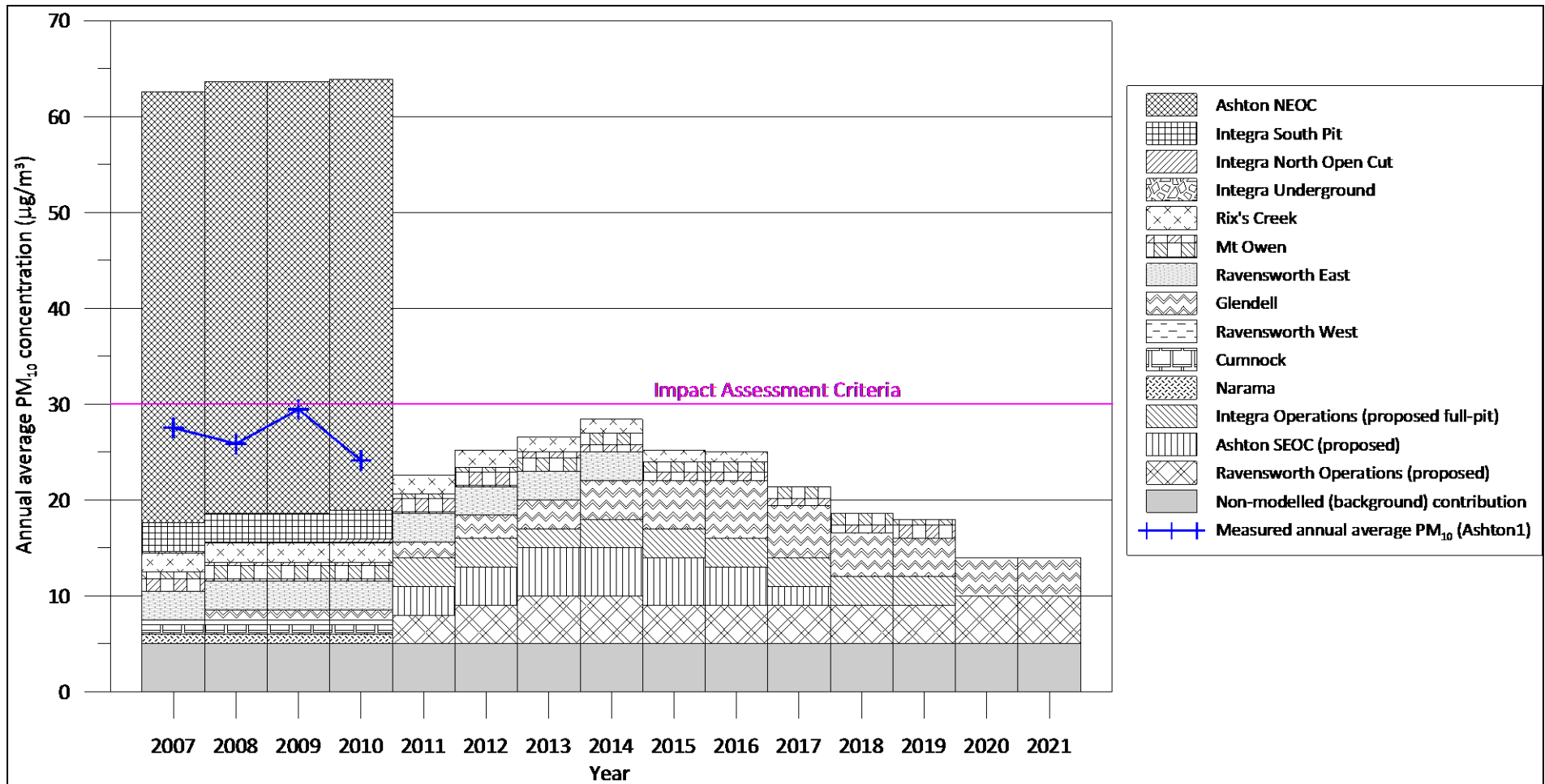


Figure 4: Predicted annual average PM₁₀ concentrations at Residence 99 (A J Bennett) (µg/m³)

2.1.4 Residence 161 (V Lopes)

Table 5 and **Figure 5** present the predicted impacts at Residence 161 for 2007 to 2021, compared with the annual average PM_{10} concentrations for 2007 to May 2010 collected at Ashton8 TEOM. Ashton8 TEOM is located approximately 130m west of Residence 161.

The data show that the predicted cumulative impacts for the period 2007 to 2010 were greater than the impact assessment criteria of $30 \mu g/m^3$. However, the monitoring data from Ashton8 TEOM are all below the criteria. The main contribution to the cumulative impacts for this period is from Ashton NEOC. However, the air quality assessment for Ashton NEOC did not take into account the reactive dust management that Ashton Coal Operations Limited (ACOL) apply to the site.

For the period 2011 to 2021, the predicted cumulative impacts are all below the impact assessment criteria of $30 \mu g/m^3$.

Table 5: Predicted annual average PM₁₀ concentrations at Residence 161 (V Lopes) (µg/m³)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
APPROVED OPERATIONS															
Ashton NEOC	28.0	28.0	28.0	28.0											
Integra South Pit	3.0	3.0	3.0	3.0											
Integra North Open Cut				0.3											
Integra Underground	0.1	0.1	0.1	0.1											
Rix's Creek	3.0	3.0	3.0	3.0	3.0	2.8	2.6	2.4	2.2	2.0					
Mt Owen	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Ravensworth East	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0							
Glendell		1.0	1.0	1.0	1.6	2.4	3.0	3.6	4.4	5.0	5.0	4.5	4.0	4.0	4.0
Ravensworth West	0.5	0.5	0.5	0.5											
Cumnock	1.0	1.0	1.0	1.0											
Narama	1.0	1.0	1.0	1.0											
PROPOSED OPERATIONS															
Integra operations (full-pit)					3.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0		
Ashton SEOC					3.0	4.0	5.0	5.0	4.0	4.0	2.0				
Ravensworth Operations (includes Narama)					3.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0
CUMULATIVE IMPACTS															
<i>Mines only cumulative</i>	42	43	43	43	19	21	24	25	21	20	16	15	14	9	9
Assumed "background"	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total predicted annual average PM₁₀	47	48	48	48	24	26	29	30	26	25	21	20	19	14	14
MONITORING DATA															
Annual average PM ₁₀ (Ashton8)	25	25	28	23											

* Shaded shows actual modelled years

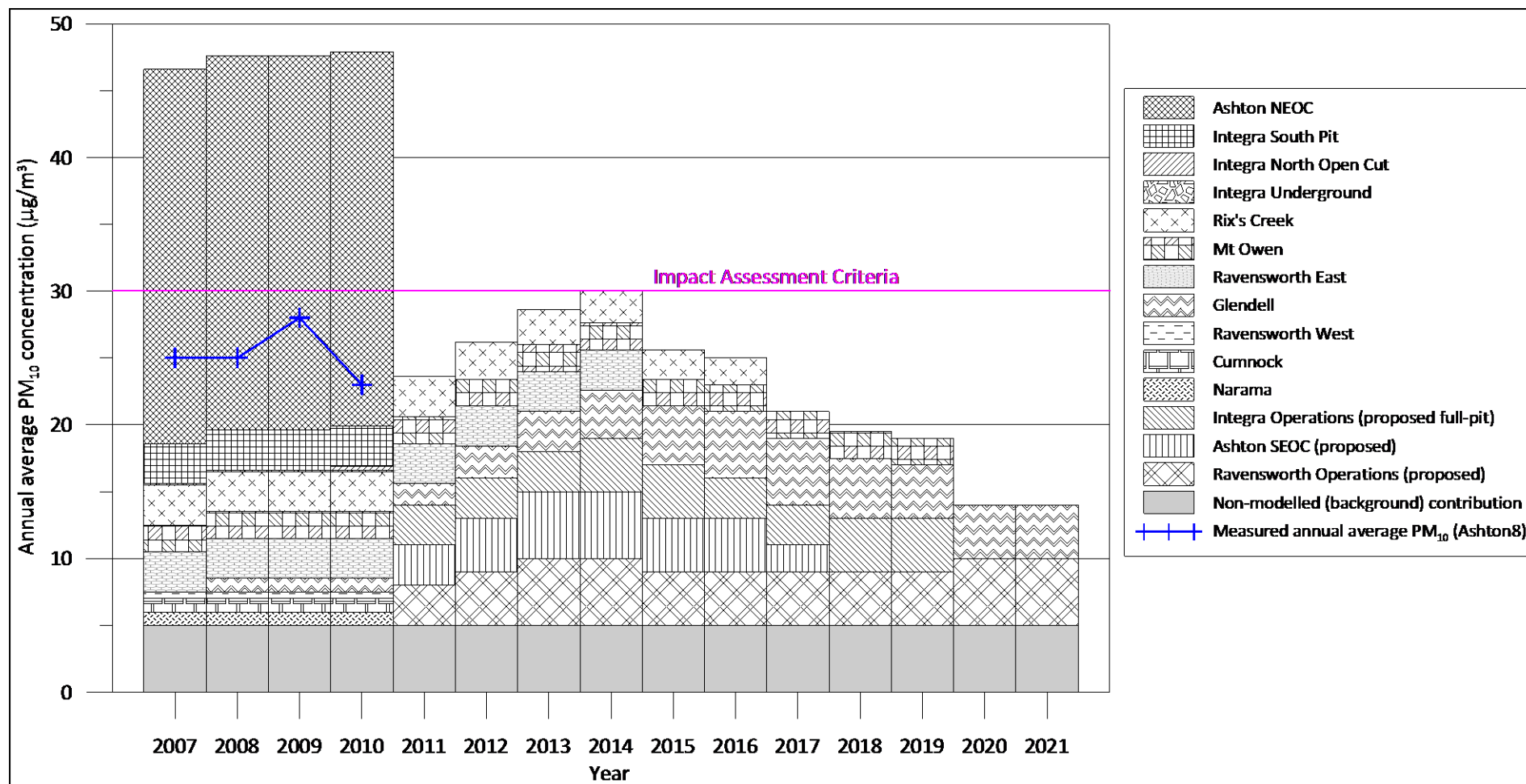


Figure 5: Predicted annual average PM₁₀ concentrations at Residence 161 (V Lopes) (µg/m³)

Please do not hesitate to contact me should you have any further queries.

Kind regards

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