F

Updated Air Quality and Greenhouse Gas

BYLONG COAL PROJECT
Supplementary Information

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

10 July 2018

Nathan Cooper
Principal
Hansen Bailey
NCooper@hansenbailey.com.au

Dear Nathan

Bylong Coal Project – Revision to Project Mine Plan – Air Quality

In light of the advice received from the Planning Assessment Committee (PAC) (now referred to as the Independent Planning Commission (IPC)) and the Heritage Council of NSW, Department of Planning and Environment (DPE) has requested KEPCO provide information in relation to the potential environmental impacts of contracting the mining footprint of the Bylong Coal Project to remain off the Tarwyn Park property and other considerations. In relation to this, DPE has requested a high-level review of the Revised Mine Plan to confirm whether the impacts would be equal to or less than that predicted within the EIS documentation provided to date.

This letter addresses this request and presents a high-level comparison of the Total Suspended Particulate (TSP), Particulate Matter less than 10 microns (PM_{10}) and Particulate Matter less than 2.5 microns ($PM_{2.5}$) emissions for Project Year 5 of the Revised Mine Plan with Project Year 5 as assessed in the Air Quality and Greenhouse Gas Impact Assessment (AQGHGIA) prepared by ERM (formerly Pacific Environment) in 2015 (Pacific Environment, 2015) for the Environmental Impact Statement (EIS). Project Year 5 was selected for the purposes of demonstrating the worst case impacts of the Revised Mine Plan. The relevant components of the Response to Submissions (RTS) (Hansen Bailey, 2016a) and Supplementary Response to Submissions (SRTS) (Hansen Bailey, 2016b) have also been considered.

A high-level review of changes to the greenhouse gas emissions of the Revised Mine Plan is also provided.

Yours sincerely

Judith Cox CAQP
Principal Consultant
ERM

1 Worst Case Mine Plan Scenario

Figure 1 shows the updated mine plan schedule by pit (open cut activities only), and **Figure 2** shows the updated mine plan schedule totals (open cut activities only), for the revised Project Layout which operates between Project Year 3 to Project Year 9.

Whilst the total materials moved is greater in Project Year 6 to Project Year 8, the mining activity in each of these years is almost exclusively in one mining area (Eastern Open Cut) and will be considerably further away from the nearest sensitive private receivers located to the north of the Project. When considering the two mining areas (Eastern Open Cut (Pit 1) and Western Open Cut (Pit 5)) operating simultaneously, Project Year 5 has the highest amount of activity and is directly comparable with the worst case mine plan scenarios (Project Year 5) assessed in the AQGHGIA. Project Year 5 also has the greatest volume of topsoil removal of all years. For these reasons, Project Year 5 has been selected for the purposes of assessing the worst case impacts for the Revised Mine Plan for comparison to the emissions presented within the EIS.

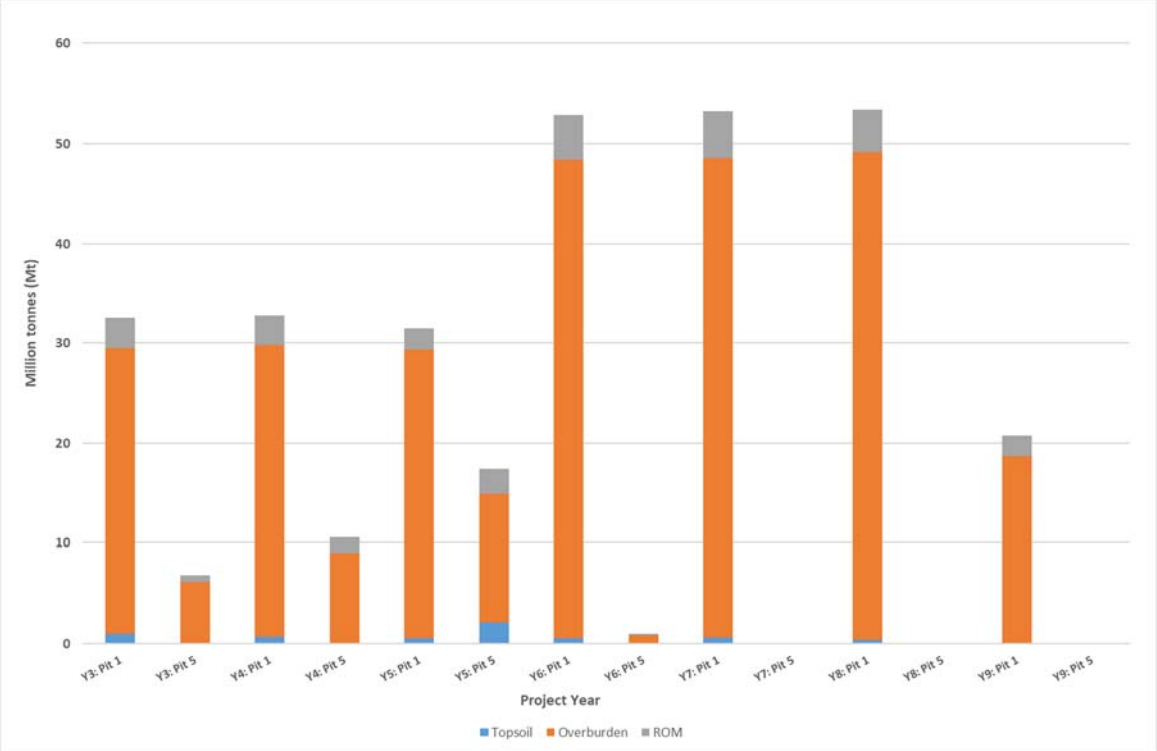

Figure 1: *Revised Mine Plan schedule – by pit*

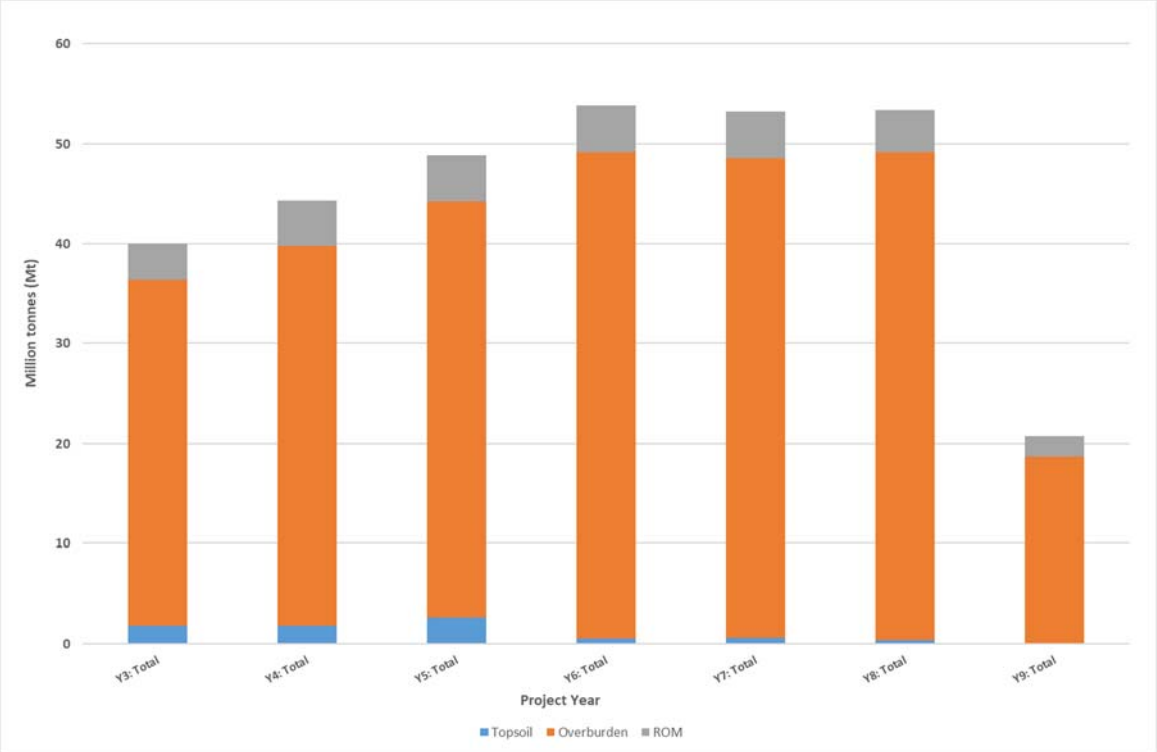

Figure 2: *Revised Mine Plan schedule – totals by year*

2 Revised Emission Inventory

2.1 Introduction

Figure 3 compares the location of activities for Project Year 5 (as assessed in the dispersion modelling completed for the EIS) with the forecast activities for Project Year 5 of the Revised Mine Plan.

It is apparent from **Figure 3** that there is significantly less activity overall for the Revised Mine Plan compared to the EIS mine plan. In summary:

- The Overburden Emplacement Area (OEA) within the northern portion of the Eastern Open Cut is no longer present;
- The haul road from the Eastern Open Cut mining area to the Open Cut Mine Infrastructure Area (MIA) is materially shorter;
- There is no separate mining operations in advance of the main mining progression within the southern portion of the Eastern Open Cut or Western Open Cut; and
- The large topsoil stockpile areas to the north-west is no longer part of Project Year 5, however for the Revised Mine Plan, this topsoil stockpile area has been established to the north western portion of the Eastern Open Cut mining area.

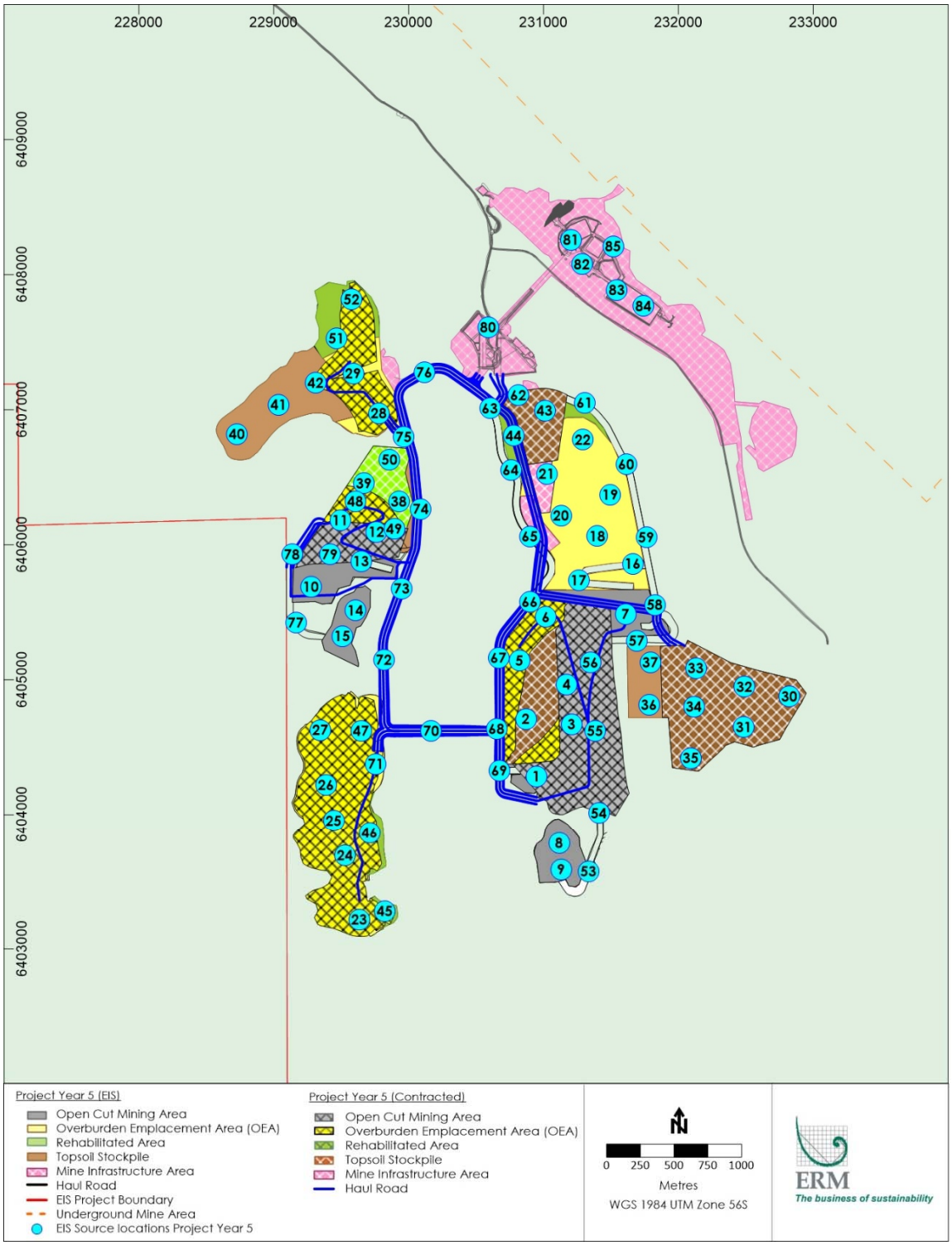

Figure 3: *Project Year 5 layout – Revised Mine Plan compared with EIS*

2.2 Emissions

Table 1 compares the calculated emissions by activity type. The detailed emission inventories are provided in **Appendix A**.

The same assumptions with respect to silt content, moisture content, and controls were applied as presented in the EIS.

The PM_{10} emissions from hauling activities have been adjusted from those used within the AQGHGIA, consistent with the calculations presented in Section 4.8.5 of the RTS (Hansen Bailey, 2016a).

It is noted that all diesel emissions were calculated based on the conservative assumption that all equipment would be compliant with Tier 2. The NSW Environment Protection Authority has been establishing the relevant policy to require new equipment procured for mining operations in NSW to comply with Tier 4 emission standards. KEPCO understands that the market is responding to this new policy approach. Whilst the Project is proposed to be contractor operated and therefore some existing equipment may be utilised for the open cut operations, any new equipment that is utilised for the Project will be commissioned to comply with Tier 4 standards. This would result in a further reduction of diesel emissions from those currently assessed.

Table 1: *Project Year 5 - TSP, PM_{10} and $PM_{2.5}$ emissions – EIS/RTS/SRTS Mine Plan compared with Revised Mine Plan (kg/y)*

Activity	TSP		PM_{10}		$PM_{2.5}$	
	EIS/RTS/SRTS	Revised	EIS/RTS/SRTS	Revised	EIS/RTS/SRTS	Revised
Topsoil (exc. Haul)	2,608	8,184	733	2,292	254	799
Blast/drill	22,612	17,849	11,758	9,281	678	535
Overburden (exc. haul)	167,919	94,939	47,215	28,521	16,370[(a)]	9,009
Coal (exc. haul)	465,967	389,445	99,287	82,811	9,788[(b)]	8,179
Haul	2,246,021	1,116,923	576,435	286,655	83,022	27,583
Wind erosion	366,347	274,666	183,174	137,333	27,476	20,600
Grading roads	31,906	31,906	11,148	11,148	989	989
Diesel emissions	-	-	-	-	19,384	13,698
TOTAL[(c)]	**3,303,381**	**1,933,911**	**929,749**	**558,042**	**157,961**	**81,391**
Revised Mine plan % reduction in Emissions		*-41*		*-40*		*-48*

Notes:

(a) It was identified the EIS contained an error in the $PM_{2.5}$ emission factor used for dozers on overburden which has been corrected.

(b) It was identified that there was an error in in the $PM_{2.5}$ emission factor used in the EIS for dozers on coal which has now been corrected

(c) Totals may not be exact due to rounding.

Table 1 shows that the Revised Mine Plan results in approximately 41% reduction in TSP emissions, a 40% reduction of PM_{10} and 48% reduction in $PM_{2.5}$ emissions, from those presented within the EIS in Project Year 5.

As shown in **Table 2**, whilst the Revised Mine Plan has more topsoil removed specific to the progression of mining in Project Year 5 within the Revised Mine Plan, the reduction in emissions for Project Year 5 mine plan is due to the following:

- Reduced overburden handling from approximately 22.8 Mbcm to approximately 17.3 Mbcm (a 24% reduction);
- Reduced coal production from approximately 5.5 Mtpa to approximately 4.6 Mtpa (a 16% reduction);
- Reduced wind erosion areas (mainly the former Eastern OEA) – previously located on Tarwyn Park property) (a 29% reduction);
- In addition, there are shorter haulage routes as they are no longer routing around previous years OEAs, more material is emplaced in-pit and there is overall less travel due to reduced amount of material being extracted.

The increase in topsoil stripping for Project Year 5 of the Revised Mine Plan, when compared to the EIS mine plan, relates to the mine progressing through areas with thicker soil resources when compared to the EIS mine plan within this particular year. Total soil resources recovered from the open cut mining area over the life of the Project will reduce for the Revised Mine Plan compared to the EIS in line with the reduced mining footprints

Table 2: *Project Year 5 Comparison of material moved/exposed areas in EIS/RTS/SRTS with Revised Mine Plan*

Activity (units)		EIS/RTS/SRTS	Revised	% change
Topsoil removed	(t/y)	850,000	2,616,730	208
Overburden removed	(bcm/y)	22,800,000	17,343,622	-24
Coal extracted	(t/y)	5,469,730	4,599,996	-16
Exposed areas	(ha/y)	535	381	-29

3 Greenhouse Gas Emissions

The Greenhouse Gas (GHG) emissions have been calculated for the Revised Mine Plan for the Project in comparison to the EIS and is shown in **Appendix B**. The methodology described within the AQGHGIA has been utilised for the purposes of comparison.

The Scope 1 GHG emissions calculated for the Revised Mine Plan represents an approximate 3.9% reduction compared to those calculated within the EIS. The average annual Scope 1 GHG emissions for the Revised Mine Plan for the Project (0.09 Mt CO_2-e) represents only 0.02% of Australia's commitment under the Paris Agreement (431 Mt CO_2-e by 2030).

There will also be a 1.4% and a 2.7% reduction in calculated Scope 2 and Scope 3 emissions, respectively, when compared to those assessed for the EIS. These reductions in Scope 2 and Scope 3 GHG emissions are the direct result of reduced energy consumption, electricity usage and

fuel consumption as well as the reduced tonnages of product coal which are transported and utilised overseas.

The reduced GHG emissions for the Revised Mine Plan for the Project are due to the following:

- Less haulage, reduced open cut mining activities and a slight reduction in major equipment resulting in approximately 5.1% less diesel consumption when compared to the EIS;
- Reduced intensity and duration of open cut mining activities resulting in an approximate 1.3% decrease in electricity consumption compared to that assessed within the EIS;
- A 3.3% reduction in fugitive emissions due to the contracted footprint of open cut mining activities compared with those assessed within the EIS; and
- A 2.7% reduction of Scope 3 emissions from the burning of product coal and coal transportation compared with the EIS.

A summary of the GHG emission for the Revised Mine Plan for the Project is provided in **Appendix B**.

4 Conclusions

The dispersion modelling completed for the EIS (Pacific Environment, 2015) and SRTS (Hansen Bailey, 2016b) showed that that no private residences were predicted to experience ground level concentrations of PM_{10}, $PM_{2.5,}$ TSP and dust deposition above the relevant impact assessment criteria, due to the Project alone or cumulatively.

The Revised Mine Plan is anticipated to reduce particulate emissions by approximately 40%, based on a review of the emissions calculated for the Project Year 5 which was selected as the worst case operational year due to it having the highest activity in both Eastern and Western Open Cut mining areas. The Revised Mine Plan has reduced the intensity of dust generating activities that are closest to private residences to the north of the Project.

On this basis, it is concluded that the Revised Mine Plan would reduce the predicted contribution of the Project to air quality at the private residences relative to the previously assessed EIS mine plan.

The Revised Mine Plan would also generate lower greenhouse gas emissions due to reduced mining activity.

5 References

Hansen Bailey (2016a). Bylong Coal Project. Environmental Impact Statement. Response to Submissions. March 2016. Available from: https://majorprojects.accelo.com/public/99fe9d2399e60a40c5b8800cc6e545f5/01.%20Bylong%20Coal%20RTS%20-%20Main%20Report.pdf

Hansen Bailey (2016b). Bylong Coal Project. Environmental Impact Statement. Supplementary Response to Submissions. Appendix E. August 2016. Available from: https://majorprojects.accelo.com/public/065e8ad76b31976964222de0738727a3/03.%20Bylong%20Coal%20Project%20-%20Preliminary%20Assessment%20Report%20-%20Appendix%20E%20Part%201.pdf

Pacific Environment (2015). Bylong Coal Project – Air Quality and Greenhouse Gas Impact Assessment. Prepared for Hansen Bailey. Job ID 05832. 1 July 2015. Available from: https://majorprojects.accelo.com/public/c5349f168095bc3091889b1fd620cabd/27.%20Bylong%20Coal%20Project%20EIS%20-%20Appendix%20O%20Air%20Quality%20and%20Greenhouse%20Gas.pdf

Appendix A: Emission Inventories

Project Year 5 – TSP emissions – EIS

ACTIVITY	TSP emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - northern area	1,275	375	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - southern area	181	53	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - northern area	420	124	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - southern area	146	43	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - northern area	152	536,015	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - southern area	22	75,955	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - northern area	50	176,541	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - southern area	17	61,489	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	24,680	536,015	t/y	0.3070	kg/t	150	t/load	249	Vehicle gross mass (t)	9.3	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	3,056	75,955	t/y	0.2682	kg/t	150	t/load	249	Vehicle gross mass (t)	8.1	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	5,742	176,541	t/y	0.2168	kg/t	150	t/load	249	Vehicle gross mass (t)	6.5	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	2,419	61,489	t/y	0.2622	kg/t	150	t/load	249	Vehicle gross mass (t)	7.9	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	218	536,015	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	31	75,955	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	72	176,541	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	25	61,489	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Drilling at Eastern Open Cut - northern area	936	5,285	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Drilling at Eastern Open Cut - southern area	133	749	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - northern area	399	2,253	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - southern area	139	785	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern Open Cut - northern area	7,547	17	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Eastern Open Cut - southern area	1,069	2	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - northern area	3,217	7	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - southern area	1,121	3	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - northern area	9,054	31,836,934	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - southern area	1,283	4,511,369	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - northern area	3,875	13,625,823	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - southern area	1,350	4,745,874	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern Open Cut (northern area) to Eastern OEA	798,426	18,498,691	t/y	0.288	kg/t	150	t/load	249	Vehicle gross mass (t)	8.7	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (southern area) to Eastern OEA	123,979	2,621,309	t/y	0.315	kg/t	150	t/load	249	Vehicle gross mass (t)	9.5	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	289,616	3,900,303	t/y	0.495	kg/t	150	t/load	249	Vehicle gross mass (t)	14.9	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	220,973	18,371,697	t/y	0.080	kg/t	150	t/load	249	Vehicle gross mass (t)	2.4	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut to Ex-Pit South (SOEA)	485,665	11,328,000	t/y	0.286	kg/t	150	t/load	249	Vehicle gross mass (t)	8.6	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Eastern OEA	7,515	18,498,691	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (southern area) to Eastern OEA	1,065	2,621,309	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	1,585	3,900,303	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	7,464	18,371,697	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing from Eastern Open Cut to Ex-Pit South (SOEA)	4,602	11,328,000	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Dozers on Eastern OEA	56,658	16,672	h/y	6.8	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Western Open Cut (northern area) Dump Area	29,536	8,691	h/y	6.8	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Ex-Pit South (SOEA)	43,933	12,928	h/y	6.8	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – TSP emissions – EIS cont'd

ACTIVITY	TSP emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (northern area)	36,481	2,414	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (southern area)	5,169	342	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (northern area)	12,015	795	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (southern area)	4,185	277	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern Open Cut (northern area)	78	2,587	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Drilling at Eastern Open Cut (southern area)	11	367	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (northern area)	57	1,889	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (southern area)	20	658	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern Open Cut (northern area)	3,706	9	blasts/y	436	kg/blast	15,778	Area of blast in square metres	304	holes/blast							0	% Control	-
CL - Blasting at Eastern Open Cut (southern area)	526	1	blasts/y	439	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (northern area)	2,711	6	blasts/y	439	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (southern area)	944	2	blasts/y	439	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern Open Cut (northern area) to trucks	70,033	2,570,656	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Eastern Open Cut (southern area) to trucks	9,924	364,268	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (northern area) to trucks	51,217	1,880,002	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (southern area) to trucks	17,839	654,805	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern Open Cut (northern area) to the hopper at the ROM coal pad	131,881	2,570,656	t/y	0.3420	kg/t	150	t/load	249	Vehicle gross mass (t)	10.3	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Eastern Open Cut (southern area) to the hopper at the ROM coal pad	22,722	364,268	t/y	0.4158	kg/t	150	t/load	249	Vehicle gross mass (t)	12.6	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (northern area) to the hopper at the ROM coal pad	63,763	1,880,002	t/y	0.2261	kg/t	150	t/load	249	Vehicle gross mass (t)	6.8	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (southern area) to the hopper at the ROM coal pad	29,219	654,805	t/y	0.2975	kg/t	150	t/load	249	Vehicle gross mass (t)	9.0	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern & Western Open Cuts to the hopper ROM coal pad	106,438	5,469,730	t/y	0.039	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	331	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	331	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	331	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	331	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	3,282	5,469,730	t/y	0.0006	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	6,017	5,469,730	t/y	0.0011	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	215	4,368,540	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	205	4,166,756	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	77,421	5,122	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	63,987	5,122	h/y	25.0	kg/h	10	silt content in %	11	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to Ex-Pit South (SOEA)	43,881	1,148,684	t/y	0.2547	kg/t	150	t/load	249	Vehicle gross mass (t)	7.7	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	215	4,368,540	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %							50	% Control	Water sprays
WE - Eastern Open Cut Pit (northern area)	85,656	97.8	ha	0.1	kg/ha/h	8,760	h/y									0	% Control	-
WE - Eastern Open Cut Pit (southern area)	12,138	13.9	ha	0.1	kg/ha/h	8,760	h/y									0	% Control	-
WE - Western Open Cut Pit (northern area)	28,212	32.2	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Western Open Cut Pit (southern area)	9,826	11.2	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Eastern OEA	72,967	83.3	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Ex-Pit South (Southern OEA)	56,578	64.6	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Ex-Pit North (Northern OEA)	20,737	23.7	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Rehab Eastern OEA	5,253	20.0	ha	0.1	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Southern OEA	4,086	15.5	ha	0.1	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Western Open Cut	1,938	7.4	ha	0.1	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Northern OEA	5,150	19.6	ha	0.1	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	17,777	40.6	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	7,814	17.8	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	34,602	79.0	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	1,018	2.3	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	2,595	5.9	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
Grading roads	31,906	103,680	km	0.62	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
Total TSP emissions for Year 5 (EIS Mine Plan) (kg/yr)	3,303,381																	

Project Year 5 – TSP emissions – Revised Mine Plan

ACTIVITY	TSP emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern (Pit 1) Open Cut	1,417	417	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western (Pit 5) Open Cut	4,959	1,459	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern (Pit 1) Open Cut	151	532,596	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western (Pit 5) Open Cut	593	2,084,133	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern (Pit 1) Open Cut - western area to Eastern (Pit 1) topsoil stockpile	11,647	532,596	t/y	0.1458	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to MIA topsoil stockpile area	49,721	1,563,100	t/y	0.2121	kg/t	150	t/load	249	Vehicle gross mass (t)	6.4	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to NWOE	14,502	521,033	t/y	0.1856	kg/t	150	t/load	249	Vehicle gross mass (t)	5.6	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern (Pit 1) Open Cut - westerm area to Eastern (Pit 1) topsoil stockpile	216	532,596	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut - MIA topsoil stockpile area	635	1,563,100	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut to NWOE	212	521,033	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Drilling at Eastern (Pit 1) Open Cut - northern area	846	4,780	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western (Pit 5) Open Cut - northern area	376	2,122	holes/y	0.59	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern (Pit 1) Open Cut - northern area	6,825	16	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western (Pit 5) Open Cut - northern area	3,030	7	blasts/y	432	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern (Pit 1) Open Cut - northern area	8,188	28,791,974	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western (Pit 5) Open Cut - northern area	3,649	12,832,719	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern (Pit 1) Open Cut to SW OEA	163,136	4,318,796	t/y	0.252	kg/t	150	t/load	249	Vehicle gross mass (t)	7.6	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to NW OEA	143,102	2,879,197	t/y	0.331	kg/t	150	t/load	249	Vehicle gross mass (t)	10.0	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to in-pit	321,979	21,593,981	t/y	0.099	kg/t	150	t/load	249	Vehicle gross mass (t)	3.0	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to NW OEA	14,032	641,636	t/y	0.15	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	4.97020151	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to in-pit	121,184	12,191,083	t/y	0.07	kg/t	150	t/load	249	Vehicle gross mass (t)	2.0	km/return trip	4.97020151	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at SW OEA	1,755	4,318,796	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at NW OEA	1,170	2,879,197	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut in-pit	8,773	21,593,981	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut at NW OEA	261	641,636	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut in-pit	4,953	12,191,083	t/y	0.0004	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Dozers in-pit - Pit 1	28,644	8,429	h/y	6.7967	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers in-pit - Pit 5	16,125	4,745	h/y	6.7967	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on NW OEA	4,668	1,374	h/y	6.8	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on SW OEA	16,754	4,930	h/y	6.8	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – TSP emissions – Revised Mine Plan cont'd

ACTIVITY	TSP emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern (Pit 1) Open Cut	29,804	1,972	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western (Pit 5) Open Cut	16,037	1,061	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern (Pit 1) Open Cut (northern area)	63	2,113	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western (Pit 5) Open Cut (northern area)	75	2,511	holes/y	0.1	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern (Pit 1) Open Cut (northern area)	3,028	7	blasts/y	436	kg/blast	15,786	Area of blast in square metres	305	holes/blast							0	% Control	-
CL - Blasting at Western (Pit 5) Open Cut (northern area)	3,605	8	blasts/y	439	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern (Pit 1) Open Cut (northern area) to trucks	57,211	2,099,998	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western (Pit 5) Open Cut (northern area) to trucks	68,108	2,499,998	t/y	0.039	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern (Pit 1) Open Cut to the hopper at the ROM coal pad	130,990	2,099,998	t/y	0.4158	kg/t	150	t/load	249	Vehicle gross mass (t)	12.6	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western (Pit 5) Open Cut to the hopper at the ROM coal pad	111,556	2,499,998	t/y	0.2975	kg/t	150	t/load	249	Vehicle gross mass (t)	9.0	km/return trip	5.0	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern (Pit 1) & Western (Pit 5) Open Cuts to the hopper ROM coal pad	89,513	4,599,996	t/y	0.039	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	278	4,599,996	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	278	4,599,996	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	278	4,599,996	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	278	4,599,996	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	2,760	4,599,996	t/y	0.0006	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	5,060	4,599,996	t/y	0.0011	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	182	3,683,524	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	182	3,683,524	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	65,104	4,308	h/y	30.2	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	54,189	4,338	h/y	25.0	kg/h	10	silt content in %	11.0	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to SWOEA	35,074	916,472	t/y	0.3	kg/t	150	t/load	249.0	Vehicle gross mass (t)	8	km/return trip	5	kg/VKT	4	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	182	3,683,524	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11.0	moisture content in %							50	% Control	Water sprays
WE - Eastern (Pit 1) Open Cut Pit	65,004	74.2	ha	0.1	kg/ha/h	8,760	h/y									0	% Control	-
WE - Western (Pit 5) Open Cut Pit (northern area)	17,484	20.0	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Eastern (Pit 1) OEA	22,139	25.3	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Western (Pit 5) N OEA	9,036	10.3	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - SW OEA	78,523	89.6	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - NW OEA	28,827	32.9	ha	0.1	kg/ha/h	8,760	h/y									-	% Control	-
WE - Rehab Western (Pit 5) Open Cut	4,125	15.7	ha	0.1	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	7,912	18.1	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	28,875	65.9	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	9,130	20.8	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	1,018	2.3	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	2,595	5.9	ha	0.1	kg/ha/h	8,760	h/y									50	% Control	Water sprays
Grading roads	31,906	103,680	km	0.62	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
Total TSP emissions for Year 5 (Contracted Mine Plan) (kg/yr)	**1,933,911**																	

Project Year 5 – PM_{10} emissions – EIS Mine Plan

ACTIVITY	PM_{10} emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - northern area	287	375	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - southern area	41	53	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - northern area	95	124	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - southern area	33	43	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - northern area	72	536,015	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - southern area	10	75,955	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - northern area	24	176,541	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - southern area	8	61,489	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	6,095	536,015	t/y	0.0758	kg/t	150	t/load	249	Vehicle gross mass (t)	9.3	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	755	75,955	t/y	0.0662	kg/t	150	t/load	249	Vehicle gross mass (t)	8.1	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	1,418	176,541	t/y	0.0535	kg/t	150	t/load	249	Vehicle gross mass (t)	6.5	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	597	61,489	t/y	0.0648	kg/t	150	t/load	249	Vehicle gross mass (t)	7.9	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	103	536,015	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	15	75,955	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	34	176,541	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	12	61,489	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Drilling at Eastern Open Cut - northern area	486	5,285	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Drilling at Eastern Open Cut - southern area	69	749	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - northern area	207	2,253	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - southern area	72	785	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern Open Cut - northern area	3,925	17	blasts/y	225	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Eastern Open Cut - southern area	556	2	blasts/y	225	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - northern area	1,673	7	blasts/y	225	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - southern area	583	3	blasts/y	225	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - northern area	4,282	31,836,934	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - southern area	607	4,511,369	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - northern area	1,833	13,625,823	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - southern area	638	4,745,874	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern Open Cut (northern area) to Eastern OEA	197,174	18,498,691	t/y	0.071	kg/t	150	t/load	249	Vehicle gross mass (t)	8.7	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (southern area) to Eastern OEA	30,617	2,621,309	t/y	0.078	kg/t	150	t/load	249	Vehicle gross mass (t)	9.5	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	71,522	3,900,303	t/y	0.122	kg/t	150	t/load	249	Vehicle gross mass (t)	14.9	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	54,570	18,371,697	t/y	0.020	kg/t	150	t/load	249	Vehicle gross mass (t)	2.4	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut to Ex-Pit South (SOEA)	119,937	11,328,000	t/y	0.071	kg/t	150	t/load	249	Vehicle gross mass (t)	8.6	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Eastern OEA	3,554	18,498,691	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (southern area) to Eastern OEA	504	2,621,309	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	749	3,900,303	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	3,530	18,371,697	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing from Eastern Open Cut to Ex-Pit South (SOEA)	2,177	11,328,000	t/y	0.0002	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Dozers on Eastern OEA	12,775	16,672	h/y	1.5	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Western Open Cut (northern area) Dump Area	6,660	8,691	h/y	1.5	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Ex-Pit South (SOEA)	9,906	12,928	h/y	1.5	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – PM_{10} emissions – EIS Mine Plan cont'd

ACTIVITY	PM_{10} emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (northern area)	10,333	2,414	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (southern area)	1,464	342	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (northern area)	3,403	795	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (southern area)	1,185	277	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern Open Cut (northern area)	40	2,587	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Drilling at Eastern Open Cut (southern area)	6	367	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (northern area)	29	1,889	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (southern area)	10	658	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern Open Cut (northern area)	1,927	9	blasts/y	227	kg/blast	15,778	Area of blast in square metres	304	holes/blast							0	% Control	-
CL - Blasting at Eastern Open Cut (southern area)	274	1	blasts/y	228	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (northern area)	1,410	6	blasts/y	228	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (southern area)	491	2	blasts/y	228	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern Open Cut (northern area) to trucks	10,605	2,570,656	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Eastern Open Cut (southern area) to trucks	1,503	364,268	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (northern area) to trucks	7,756	1,880,002	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (southern area) to trucks	2,701	654,805	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern Open Cut (northern area) to the hopper at the ROM coal pad	32,568	2,570,656	t/y	0.0845	kg/t	150	t/load	249	Vehicle gross mass (t)	10.3	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Eastern Open Cut (southern area) to the hopper at the ROM coal pad	5,611	364,268	t/y	0.1027	kg/t	150	t/load	249	Vehicle gross mass (t)	12.6	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (northern area) to the hopper at the ROM coal pad	15,747	1,880,002	t/y	0.0558	kg/t	150	t/load	249	Vehicle gross mass (t)	6.8	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (southern area) to the hopper at the ROM coal pad	7,216	654,805	t/y	0.0735	kg/t	150	t/load	249	Vehicle gross mass (t)	9.0	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern & Western Open Cuts to the hopper ROM coal pad	16,117	5,469,730	t/y	0.006	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	157	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	157	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	157	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	157	5,469,730	t/y	0.0001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	1,477	5,469,730	t/y	0.00027	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	2,024	5,469,730	t/y	0.00037	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	102	4,368,540	t/y	0.0000	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	97	4,166,756	t/y	0.0000	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	21,930	5,122	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	17,861	5,122	h/y	7.0	kg/h	10	silt content in %	11	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to Ex-Pit South (SOEA)	10,837	1,148,684	t/y	0.0629	kg/t	150	t/load	249	Vehicle gross mass (t)	7.7	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	102	4,368,540	t/y	0.0000	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content in %							50	% Control	Water sprays
WE - Eastern Open Cut Pit (northern area)	42,828	98	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Eastern Open Cut Pit (southern area)	6,069	14	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Western Open Cut Pit (northern area)	14,106	32	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Western Open Cut Pit (southern area)	4,913	11	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Eastern OEA	36,483	83	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Ex-Pit South (Southern OEA)	28,289	65	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Ex-Pit North (Northern OEA)	10,369	24	ha	0.05	kg/ha/h	8760	h/y									0	% Control	-
WE - Rehab Eastern OEA	2,626	20	ha	0.05	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Southern OEA	2,043	16	ha	0.05	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Western Open Cut	969	7	ha	0.05	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Northern OEA	2,575	20	ha	0.05	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	8,889	41	ha	0.05	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	3,907	18	ha	0.05	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	17,301	79	ha	0.05	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	509	2	ha	0.05	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	1,297	6	ha	0.05	kg/ha/h	8760	h/y									50	% Control	Water sprays
Grading roads	11,148	103,680	km	0.22	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
Total PM_{10} emissions for Year 5 (EIS Mine Plan) (kg/yr)	**907,978**	781,672																

Project Year 5 – PM_{10} emissions – Revised Mine Plan

ACTIVITY	PM10 emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern (Pit 1) Open Cut	320	417	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western (Pit 5) Open Cut	1,118	1,459	h/y	1.53	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern (Pit 1) Open Cut	72	532,596	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western (Pit 5) Open Cut	280	2,084,133	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern (Pit 1) Open Cut - western area to Eastern (Pit 1) topsoil stockpile	2,876	532,596	t/y	0.0360	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to MIA topsoil stockpile area	12,279	1,563,100	t/y	0.0524	kg/t	150	t/load	249	Vehicle gross mass (t)	6.4	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to NWOE	3,581	521,033	t/y	0.0458	kg/t	150	t/load	249	Vehicle gross mass (t)	5.6	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern (Pit 1) Open Cut - westerm area to Eastern (Pit 1) topsoil stockpile	102	532,596	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut - MIA topsoil stockpile area	300	1,563,100	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut to NWOE	100	521,033	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Drilling at Eastern (Pit 1) Open Cut - northern area	440	4,780	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western (Pit 5) Open Cut - northern area	195	2,122	holes/y	0.31	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern (Pit 1) Open Cut - northern area	3,549	16	blasts/y	224.5	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western (Pit 5) Open Cut - northern area	1,576	7	blasts/y	224.5	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern (Pit 1) Open Cut - northern area	3,873	28,791,974	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western (Pit 5) Open Cut - northern area	1,726	12,832,719	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern (Pit 1) Open Cut to SW OEA	40,287	4,318,796	t/y	0.062	kg/t	150	t/load	249	Vehicle gross mass (t)	7.6	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to NW OEA	35,340	2,879,197	t/y	0.082	kg/t	150	t/load	249	Vehicle gross mass (t)	10.0	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to in-pit	79,514	21,593,981	t/y	0.025	kg/t	150	t/load	249	Vehicle gross mass (t)	3.0	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to NW OEA	3,465	641,636	t/y	0.036	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to in-pit	29,927	12,191,083	t/y	0.016	kg/t	150	t/load	249	Vehicle gross mass (t)	2.0	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at SW OEA	830	4,318,796	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at NW OEA	553	2,879,197	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut in-pit	4,149	21,593,981	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut at NW OEA	123	641,636	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut in-pit	2,342	12,191,083	t/y	0.00019	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Dozers in-pit - Pit 1	6,458	8,429	h/y	1.53246	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers in-pit - Pit 5	3,636	4,745	h/y	1.53246	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on NW OEA	1,052	1,374	h/y	1.53246	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on SW OEA	3,778	4,930	h/y	1.53246	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – PM_{10} emissions – Revised Mine Plan cont'd

ACTIVITY	PM10 emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern (Pit 1) Open Cut	8,442	1,972	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western (Pit 5) Open Cut	4,543	1,061	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern (Pit 1) Open Cut (northern area)	33	2,113	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western (Pit 5) Open Cut (northern area)	39	2,511	holes/y	0.052	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern (Pit 1) Open Cut (northern area)	1,575	7	blasts/y	227	kg/blast	15,786	Area of blast in square metres	305	holes/blast							0	% Control	-
CL - Blasting at Western (Pit 5) Open Cut (northern area)	1,874	8	blasts/y	228	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern (Pit 1) Open Cut (northern area) to trucks	8,663	2,099,998	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western (Pit 5) Open Cut (northern area) to trucks	10,313	2,499,998	t/y	0.006	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern (Pit 1) Open Cut to the hopper at the ROM coal pad	32,348	2,099,998	t/y	0.1027	kg/t	150	t/load	249	Vehicle gross mass (t)	12.6	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western (Pit 5) Open Cut to the hopper at the ROM coal pad	27,549	2,499,998	t/y	0.0735	kg/t	150	t/load	249	Vehicle gross mass (t)	9.0	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern (Pit 1) & Western (Pit 5) Open Cuts to the hopper ROM coal pad	13,555	4,599,996	t/y	0.0059	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	132	4,599,996	t/y	0.00006	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	132	4,599,996	t/y	0.00006	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	132	4,599,996	t/y	0.00006	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	132	4,599,996	t/y	0.00006	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	1,242	4,599,996	t/y	0.0003	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	1,702	4,599,996	t/y	0.000370	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	86	3,683,524	t/y	0.00005	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	86	3,683,524	t/y	0.00005	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	18,441	4,308	h/y	8.6	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	15,126	4,338	h/y	7.0	kg/h	10	silt content in %	11.0	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to SWOEA	8,662	916,472	t/y	0.1	kg/t	150	t/load	249.0	Vehicle gross mass (t)	8	km/return trip	1	kg/VKT	4	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	86	3,683,524	t/y	0.00005	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11.0	moisture content in %							50	% Control	Water sprays
WE - Eastern (Pit 1) Open Cut Pit	32,502	74.2	ha	0.05	kg/ha/h	8,760	h/y									0	% Control	-
WE - Western (Pit 5) Open Cut Pit (northern area)	8,742	20.0	ha	0.05	kg/ha/h	8,760	h/y									-	% Control	-
WE - Eastern (Pit 1) OEA	11,069	25.3	ha	0.05	kg/ha/h	8,760	h/y									-	% Control	-
WE - Western (Pit 5) N OEA	4,518	10.3	ha	0.05	kg/ha/h	8,760	h/y									-	% Control	-
WE - SW OEA	39,262	89.6	ha	0.05	kg/ha/h	8,760	h/y									-	% Control	-
WE - NW OEA	14,413	32.9	ha	0.05	kg/ha/h	8,760	h/y									-	% Control	-
WE - Rehab Western (Pit 5) Open Cut	2,062	15.7	ha	0.05	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	3,956	18.1	ha	0.05	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	14,438	65.9	ha	0.05	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	4,565	20.8	ha	0.05	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	509	2.3	ha	0.05	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	1,297	5.9	ha	0.05	kg/ha/h	8,760	h/y									50	% Control	Water sprays
Grading roads	11,148	103,680	km	0.22	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
		% reduction from EIS																
Total PM10 emissions for Year 5 (Contracted Mine Plan) (kg/yr)	**547,215**	83																

Project Year 5 – $PM_{2.5}$ emissions – EIS Mine Plan

ACTIVITY	$PM_{2.5}$ emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - northern area	134	375	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Eastern Open Cut - southern area	19	53	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - northern area	44	124	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western Open Cut - southern area	15	43	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - northern area	11	536,015	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern Open Cut - southern area	2	75,955	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - northern area	4	176,541	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western Open Cut - southern area	1	61,489	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	609	536,015	t/y	0.0076	kg/t	150	t/load	249	Vehicle gross mass (t)	9.3	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	75	75,955	t/y	0.0066	kg/t	150	t/load	249	Vehicle gross mass (t)	8.1	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	142	176,541	t/y	0.0054	kg/t	150	t/load	249	Vehicle gross mass (t)	6.5	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	60	61,489	t/y	0.0065	kg/t	150	t/load	249	Vehicle gross mass (t)	7.9	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern Open Cut - northern area to Eastern topsoil stockpile	16	536,015	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Eastern Open Cut - southern area to Eastern topsoil stockpile	2	75,955	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - northern area to Western topsoil stockpile (north)	5	176,541	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western Open Cut - southern area to Western topsoil stockpile (south)	2	61,489	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Drilling at Eastern Open Cut - northern area	28	5,285	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Drilling at Eastern Open Cut - southern area	4	749	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - northern area	12	2,253	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western Open Cut - southern area	4	785	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern Open Cut - northern area	226	17	blasts/y	12.95	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Eastern Open Cut - southern area	32	2	blasts/y	12.95	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - northern area	97	7	blasts/y	12.95	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western Open Cut - southern area	34	3	blasts/y	12.95	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - northern area	648	31,836,934	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Eastern Open Cut - southern area	92	4,511,369	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - northern area	278	13,625,823	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western Open Cut - southern area	97	4,745,874	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern Open Cut (northern area) to Eastern OEA	19,717	18,498,691	t/y	0.007	kg/t	150	t/load	249	Vehicle gross mass (t)	8.7	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (southern area) to Eastern OEA	30,617	2,621,309	t/y	0.078	kg/t	150	t/load	249	Vehicle gross mass (t)	9.5	km/return trip	1.2	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	7,152	3,900,303	t/y	0.012	kg/t	150	t/load	249	Vehicle gross mass (t)	14.9	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	5,457	18,371,697	t/y	0.002	kg/t	150	t/load	249	Vehicle gross mass (t)	2.4	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern Open Cut to Ex-Pit South (SOEA)	11,994	11,328,000	t/y	0.007	kg/t	150	t/load	249	Vehicle gross mass (t)	8.6	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Eastern OEA	538	18,498,691	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (southern area) to Eastern OEA	76	2,621,309	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern Open Cut (northern area) to Western Open Cut (northern area) Dump Area	113	3,900,303	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western Open Cut (northern area) to Western Open Cut (northern area) Dump Area	535	18,371,697	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Trucks emplacing from Eastern Open Cut to Ex-Pit South (SOEA)	330	11,328,000	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	4	moisture content in %							0	% control	-
OB - Dozers on Eastern OEA	5,949	16,672	h/y	0.714	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Western Open Cut (northern area) Dump Area	3,101	8,691	h/y	0.714	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on Ex-Pit South (SOEA)	4,613	12,928	h/y	0.714	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – $PM_{2.5}$ emissions – EIS Mine Plan cont'd

ACTIVITY	$PM_{2.5}$ emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (northern area)	803	2,414	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Eastern Open Cut (southern area)	114	342	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (northern area)	264	795	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western Open Cut (southern area)	92	277	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern Open Cut (northern area)	2	2,587	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Drilling at Eastern Open Cut (southern area)	0	367	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (northern area)	2	1,889	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western Open Cut (southern area)	1	658	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern Open Cut (northern area)	111	9	blasts/y	13.08	kg/blast	15,778	Area of blast in square metres	304	holes/blast							0	% Control	-
CL - Blasting at Eastern Open Cut (southern area)	16	1	blasts/y	13.16	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (northern area)	81	6	blasts/y	13.16	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Blasting at Western Open Cut (southern area)	28	2	blasts/y	13.16	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern Open Cut (northern area) to trucks	1,331	2,570,656	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Eastern Open Cut (southern area) to trucks	189	364,268	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (northern area) to trucks	973	1,880,002	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western Open Cut (southern area) to trucks	339	654,805	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern Open Cut (northern area) to the hopper at the ROM coal pad	3,257	2,570,656	t/y	0.0084	kg/t	150	t/load	249	Vehicle gross mass (t)	10.322	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Eastern Open Cut (southern area) to the hopper at the ROM coal pad	561	364,268	t/y	0.0103	kg/t	150	t/load	249	Vehicle gross mass (t)	12.55	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (northern area) to the hopper at the ROM coal pad	1,575	1,880,002	t/y	0.0056	kg/t	150	t/load	249	Vehicle gross mass (t)	6.824	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western Open Cut (southern area) to the hopper at the ROM coal pad	722	654,805	t/y	0.0073	kg/t	150	t/load	249	Vehicle gross mass (t)	8.978	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern & Western Open Cuts to the hopper ROM coal pad	2,022	5,469,730	t/y	0.001	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	24	5,469,730	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	24	5,469,730	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	24	5,469,730	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	24	5,469,730	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	273	5,469,730	t/y	0.00005	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	137	5,469,730	t/y	0.000025	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	15	4,368,540	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	15	4,166,756	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	1,703	5,122	h/y	0.67	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	1,408	5,122	h/y	0.55	kg/h	10	silt content in %	11	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to Ex-Pit South (SOEA)	1,084	1,148,684	t/y	0.0063	kg/t	150	t/load	249	Vehicle gross mass (t)	7.686	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	15	4,368,540	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in r	11	moisture content in %							50	% Control	Water sprays
WE - Eastern Open Cut Pit (northern area)	6,424	98	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Eastern Open Cut Pit (southern area)	910	14	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Western Open Cut Pit (northern area)	2,116	32	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Western Open Cut Pit (southern area)	737	11	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Eastern OEA	5,472	83	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Ex-Pit South (Southern OEA)	4,243	65	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Ex-Pit North (Northern OEA)	1,555	24	ha	0.0075	kg/ha/h	8760	h/y									0	% Control	-
WE - Rehab Eastern OEA	394	20	ha	0.0075	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Southern OEA	306	16	ha	0.0075	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Western Open Cut	145	7	ha	0.0075	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Rehab Northern OEA	386	20	ha	0.0075	kg/ha/h	8760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	1,333	41	ha	0.0075	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	586	18	ha	0.0075	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	2,595	79	ha	0.0075	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	76	2	ha	0.0075	kg/ha/h	8760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	195	6	ha	0.0075	kg/ha/h	8760	h/y									50	% Control	Water sprays
Grading roads	989	103,680	km	0.02	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
Diesel emissions	19,384																	

Total $PM_{2.5}$ emissions for Year 5 (EIS Mine Plan) (kg/yr)	157,961

Project Year 5 – $PM_{2.5}$ emissions – Revised Mine Plan

ACTIVITY	PM2.5 emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
Topsoil Removal - Dozers stripping topsoil at Eastern (Pit 1) Open Cut	149	417	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil Removal - Dozers stripping topsoil at Western (Pit 5) Open Cut	521	1,459	h/y	0.71	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
Topsoil removal - Sh/Ex/FELs loading topsoil at Eastern (Pit 1) Open Cut	11	532,596	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Sh/Ex/FELs loading topsoil at Western (Pit 5) Open Cut	42	2,084,133	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% control	Minimise drop height from 3m to 1.5m
Topsoil removal - Hauling topsoil from Eastern (Pit 1) Open Cut - western area to Eastern (Pit 1) topsoil stockpile	288	532,596	t/y	0.0036	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to MIA topsoil stockpile area	1,228	1,563,100	t/y	0.0052	kg/t	150	t/load	249	Vehicle gross mass (t)	6.4	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Hauling topsoil from Western (Pit 5) Open Cut to NWOE	358	521,033	t/y	0.0046	kg/t	150	t/load	249	Vehicle gross mass (t)	5.6	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
Topsoil removal - Emplacing topsoil from Eastern (Pit 1) Open Cut - westerm area to Eastern (Pit 1) topsoil stockpile	15	532,596	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut - MIA topsoil stockpile area	45	1,563,100	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
Topsoil removal - Emplacing topsoil from Western (Pit 5) Open Cut to NWOE	15	521,033	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Drilling at Eastern (Pit 1) Open Cut - northern area	25	4,780	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Drilling at Western (Pit 5) Open Cut - northern area	11	2,122	holes/y	0.02	kg/hole											70	% Control	Water spray injection
OB - Blasting at Eastern (Pit 1) Open Cut - northern area	205	16	blasts/y	13.0	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Blasting at Western (Pit 5) Open Cut - northern area	91	7	blasts/y	13.0	kg/blast	15,676	Area of blast in square metres	302	holes/blast							0	% Control	-
OB - Sh/Ex/FELs loading OB to trucks at Eastern (Pit 1) Open Cut - northern area	586	28,791,974	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Sh/Ex/FELs loading OB to trucks at Western (Pit 5) Open Cut - northern area	261	12,832,719	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							30	% Control	Minimise drop height from 3m to 1.5m
OB - Hauling OB from Eastern (Pit 1) Open Cut to SW OEA	4,029	4,318,796	t/y	0.006	kg/t	150	t/load	249	Vehicle gross mass (t)	7.6	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to NW OEA	3,534	2,879,197	t/y	0.008	kg/t	150	t/load	249	Vehicle gross mass (t)	10.0	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Eastern (Pit 1) Open Cut to in-pit	7,951	21,593,981	t/y	0.002	kg/t	150	t/load	249	Vehicle gross mass (t)	3.0	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to NW OEA	347	641,636	t/y	0.004	kg/t	150	t/load	249	Vehicle gross mass (t)	4.4	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Hauling OB from Western (Pit 5) Open Cut to in-pit	2,993	12,191,083	t/y	0.002	kg/t	150	t/load	249	Vehicle gross mass (t)	2.0	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at SW OEA	126	4,318,796	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut at NW OEA	84	2,879,197	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Eastern (Pit 1) Open Cut in-pit	628	21,593,981	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut at NW OEA	19	641,636	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Trucks emplacing OB from Western (Pit 5) Open Cut in-pit	355	12,191,083	t/y	0.00003	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %							0	% control	-
OB - Dozers in-pit - Pit 1	3,008	8,429	h/y	0.71365	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers in-pit - Pit 5	1,693	4,745	h/y	0.71365	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on NW OEA	490	1,374	h/y	0.71365	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist
OB - Dozers on SW OEA	1,759	4,930	h/y	0.71365	kg/h	10	silt content in %	4	moisture content in %							50	% control	Keep travel routes and materials moist

Project Year 5 – $PM_{2.5}$ emissions – Revised Mine Plan cont'd

ACTIVITY	PM2.5 emission for Year 5 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units	CONTROLS ASSUMED
CL - Dozers ripping/pushing/clean-up on Eastern (Pit 1) Open Cut	656	1,972	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozers ripping/pushing/clean-up on Western (Pit 5) Open Cut	353	1,061	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Drilling at Eastern (Pit 1) Open Cut (northern area)	2	2,113	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Drilling at Western (Pit 5) Open Cut (northern area)	2	2,511	holes/y	0.003	kg/hole											70	% Control	Water spray injection
CL - Blasting at Eastern (Pit 1) Open Cut (northern area)	91	7	blasts/y	13	kg/blast	15,786	Area of blast in square metres	305	holes/blast							0	% Control	-
CL - Blasting at Western (Pit 5) Open Cut (northern area)	108	8	blasts/y	13	kg/blast	15,840	Area of blast in square metres	306	holes/blast							0	% Control	-
CL - Loading ROM coal from Eastern (Pit 1) Open Cut (northern area) to trucks	1,087	2,099,998	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Loading ROM coal from Western (Pit 5) Open Cut (northern area) to trucks	1,294	2,499,998	t/y	0.001	kg/t	9.5	moisture content in %									30	% control	Reduce drop height from 10 m to 5 m
CL - Hauling ROM coal from Eastern (Pit 1) Open Cut to the hopper at the ROM coal pad	3,235	2,099,998	t/y	0.0103	kg/t	150	t/load	249	Vehicle gross mass (t)	12.6	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Hauling ROM coal from Western (Pit 5) Open Cut to the hopper at the ROM coal pad	2,755	2,499,998	t/y	0.0073	kg/t	150	t/load	249	Vehicle gross mass (t)	9.0	km/return trip	0.1	kg/VKT	4.1	% silt content	85	% control	Watering and chemical suppressants
CL - Unloading ROM coal from Eastern (Pit 1) & Western (Pit 5) Open Cuts to the hopper ROM coal pad	1,701	4,599,996	t/y	0.0007	kg/t	9.5	moisture content in %									50	% control	Water sprays at hopper
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile	20	4,599,996	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - ROM coal pad to Raw Coal Stockpile - Unloading Conveyor	20	4,599,996	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP	20	4,599,996	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - Raw Coal Stockpile to CHPP - Unloading Conveyor	20	4,599,996	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	9.5	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Crushing OC ROM coal at the CHPP	230	4,599,996	t/y	0.0001	kg/t											0	% control	-
CL - Screening OC ROM coal at the CHPP	115	4,599,996	t/y	0.000025	kg/t											0	% control	-
CL - Conveyer transfer - CHPP to Product Coal Stockpile	13	3,683,524	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Conveyer transfer - CHPP to Product Coal Stockpile - Unloading Conveyor	13	3,683,524	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11	moisture content of coal in %							50	% control	Minimum of water at transfers.
CL - Dozer/FEL on Raw Coal Stockpile	1,432	4,308	h/y	0.7	kg/h	10	silt content in %	9.5	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Dozer/FEL on Product Coal Stockpile	1,192	4,338	h/y	0.5	kg/h	10	silt content in %	11.0	moisture content of coal in %							50	% Control	Keep travel routes and materials moist
CL - Hauling rejects from wash plant to SWOEA	866	916,472	t/y	0.006	kg/t	150	t/load	249.0	Vehicle gross mass (t)	8	km/return trip	0.1	kg/VKT	4	% silt content	85	% control	Watering and chemical suppressants
CL - Loading product coal to trains	13	3,683,524	t/y	0.00001	kg/t	0.91	average of (wind speed/2.2)^1.3 in m/s	11.0	moisture content in %							50	% Control	Water sprays
WE - Eastern (Pit 1) Open Cut Pit	4,875	74.2	ha	0.01	kg/ha/h	8,760	h/y									0	% Control	-
WE - Western (Pit 5) Open Cut Pit (northern area)	1,311	20.0	ha	0.01	kg/ha/h	8,760	h/y									-	% Control	-
WE - Eastern (Pit 1) OEA	1,660	25.3	ha	0.01	kg/ha/h	8,760	h/y									-	% Control	-
WE - Western (Pit 5) N OEA	678	10.3	ha	0.01	kg/ha/h	8,760	h/y									-	% Control	-
WE - SW OEA	5,889	89.6	ha	0.01	kg/ha/h	8,760	h/y									-	% Control	-
WE - NW OEA	2,162	32.9	ha	0.01	kg/ha/h	8,760	h/y									-	% Control	-
WE - Rehab Western (Pit 5) Open Cut	309	15.7	ha	0.01	kg/ha/h	8,760	h/y									70	% Control	Vegetative ground cover
WE - Topsoil Stockpile (1)	593	18.1	ha	0.01	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (2)	2,166	65.9	ha	0.01	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Topsoil Stockpile (3)	685	20.8	ha	0.01	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Raw Coal Stockpile	76	2.3	ha	0.01	kg/ha/h	8,760	h/y									50	% Control	Water sprays
WE - Product Coal Stockpile	195	5.9	ha	0.01	kg/ha/h	8,760	h/y									50	% Control	Water sprays
Grading roads	989	103,680	km	0.02	kg/km	8	speed of graders in km/h	12,960	grader hours							50	% Control	50% for keep travel routes moist.
Diesel emissions	13,698																	
Total PM2.5 emissions for Year 5 (Contracted Mine Plan) (kg/yr)	81,391																	

Appendix B: Greenhouse Gas Emissions

Greenhouse Gas Emissions

Year	Scope 1 Emissions (t CO^2-e)				Scope 2 Emissions (t CO^2-e)	Scope 3 Emissions (t CO^2-e)				
	Diesel	Coal Seam Methane	Blasting	*Total*	Electricity	Diesel	Electricity	Use of Thermal Coal	Rail	*Total*
Construction										
Y1	17,009	0	13	*17,022*	0	1,290	0	0	0	*1,290*
Y2	17,009	0	0	*17,009*	0	1,290	0	0	0	*1,290*
Operation										
Y3	51,786	46,211	158	*98,155*	15,387	3,927	2,326	5,893,985	7,395	*5,907,633*
Y4	77,005	57,453	213	*134,670*	17,249	5,838	2,607	7,758,506	9,733	*7,776,685*
Y5	67,086	57,452	496	*125,035*	17,213	5,086	2,602	8,306,218	10,421	*8,324,327*
Y6	75,844	58,298	1,085	*135,227*	19,626	5,751	2,967	9,244,337	11,598	*9,264,652*
Y7	79,770	64,001	1,292	*145,063*	32,850	6,048	4,966	9,933,272	12,462	*9,956,748*
Y8	84,072	57,717	1,357	*143,146*	27,620	6,375	4,175	8,929,796	11,203	*8,951,549*
Y9	65,058	70,724	485	*136,267*	62,986	4,933	9,521	8,682,462	10,893	*8,707,809*
Y10	40,183	44,915	0	*85,098*	49,932	3,047	7,548	5,699,538	7,150	*5,717,283*
Y11	4,360	70,533	0	*74,893*	70,739	331	10,693	9,178,336	11,515	*9,200,875*
Y12	4,430	75,456	0	*79,886*	75,579	336	11,425	10,074,918	12,640	*10,099,319*
Y13	4,411	74,086	0	*78,497*	74,229	334	11,221	9,966,014	12,503	*9,990,071*
Y14	4,260	62,740	0	*67,000*	61,656	323	9,320	9,243,300	11,596	*9,264,539*
Y15	4,384	70,563	0	*74,947*	68,615	332	10,372	10,986,072	13,783	*11,010,559*
Y16	4,401	70,133	0	*74,534*	66,234	334	10,012	11,111,530	13,940	*11,135,817*
Y17	4,188	57,108	0	*61,296*	55,289	318	8,358	8,657,887	10,862	*8,677,425*
Y18	4,391	78,641	0	*83,032*	77,923	333	11,779	8,010,038	10,049	*8,032,199*
Y19	4,333	67,932	0	*72,265*	67,136	329	10,149	7,400,389	9,284	*7,420,150*
Y20	4,341	68,615	0	*72,956*	67,901	329	10,264	7,360,852	9,235	*7,380,680*
Y21	4,308	66,457	0	*70,765*	65,932	327	9,966	7,298,587	9,157	*7,318,038*
Y22	4,263	69,714	0	*73,977*	68,971	323	10,426	8,192,939	10,279	*8,213,967*
Y23	4,420	73,639	0	*78,059*	72,455	335	10,952	9,056,519	11,362	*9,079,168*
Y24	4,194	59,020	0	*63,214*	59,174	318	8,945	6,793,465	8,523	*6,811,250*
Y25	4,344	74,724	0	*79,068*	74,102	329	11,202	9,132,511	11,457	*9,155,499*
Total	**639,851**	**1,496,132**	**5,099**	**2,141,081**	**1,268,798**	**48,516**	**191,795**	**196,911,470**	**247,040**	**197,398,821**