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Garry Bailey
General Manager of Mining Development
The Bloomfield Group
Via email: gBailey@bloomcoll.com.au

RE: Rix's Creek Continuation of Mining Project – consideration of final void filling

Dear Garry,

The following investigates the potential for air quality impacts to arise due to the potential final void filling at the Rix's Creek coal mine (hereafter referred to as the Project). This report provides an analysis of the potential dust emissions associated with the Project compared with the potential dust emissions associated with the Rix's Creek Continuation of Mining Project.

Overview

To achieve the filling of the final void and a flat self-draining landform at Rix's Creek, it is estimated that approximately 60 million bench cubic metres (MBCM) of material will need to be moved. An additional amount of material would also have to be emplaced to achieve a more visually acceptable (than flat) and geomorphically stable landform.

The required material to fill the final void would most likely be sourced from the Pit 3 southern dump, as this would result in the least disturbance to rehabilitated land and least effect on safety and operational matters.

The Pit 3 southern dump would have to be excavated from the top down for geotechnical stability and safety reasons to obtain the fill material. This necessary mode of operation affords nil or very limited opportunities to have lower level working areas that could be utilised in unfavourable wind and heat conditions (as done in best practice mines excavating undisturbed, in-situ material that is generally stable). This means that the operations will need to stop, rather than re-locate during unfavourable weather conditions, extending the estimated time frame for completion.

Figure 1 presents an indicative layout of the Project.

Assessment of potential air quality impacts

To investigate the potential effect of the Project, a qualitative analysis was undertaken for the estimated dust levels associated with the activity relating to filling of the final void, relative to the estimated dust levels associated with the Rix's Creek Continuation of Mining Project (**Todoroski Air Sciences, 2015**).

The significant dust generating activities associated with the filling of the final void have been identified as loading/unloading of material, hauling of material, dozer activity and windblown dust generated from exposed areas.

A summary of the total dust emissions from the dust generating activities associated with filling the final void are presented **Table 1**. We note that this is by necessity a simplified estimation given the limited available

time to prepare a mine plan, but based on experience we consider that it would likely be within 10% to 15% of the estimates that might be made with a detailed mine plan. The activity schedule to fill the void requires approximately 10 years of activity using the existing large size mine plant.

The estimated dust levels presented in **Table 1**, are relatively similar over the full range of material amounts that may be handled in any year, over the approximately 10 year period that this activity would require.

Table 1: Summary of estimated TSP emission rate for void filling activity

Activity	TSP emissions			
	5.1MBCM	5.3MBCM	7.2MBCM	8.3MBCM
Excavator loading overburden to haul truck	17,178	17,642	24,256	27,881
Rehandle overburden	1,718	1,764	2,426	2,788
Hauling to emplacement area	189,257	194,361	267,232	307,164
Emplacing overburden material	17,178	17,642	24,256	27,881
Dozer	196,377	196,377	196,377	196,377
Wind erosion	999,685	999,685	999,685	999,685
Total TSP emissions (kg/yr)	1,421,394	1,427,471	1,514,233	1,561,776
Average TSP emissions (kg/yr)	1,481,218			

Table 2 presents a comparison of the maximum estimated dust emissions due to filling the void with that for each of the four key stages over the life of the Rix's Creek Continuation of Mining Project (**Todoroski Air Sciences, 2015**).

Please note that the Rix's Creek Continuation of Mining Project includes activity occurring across a wide area of the whole site, including activities well away from void (such as coal handling and processing). As impacts at any receiver will be governed by the emissions and the location of a source, to allow a better like-for-like comparison, and also for the emissions estimates to serve as a proxy for potential dust impact, we have additionally considered only the activity occurring to the west of the New England Highway when making these comparisons.

Table 2: Comparison of estimated TSP emission rate for the Project and Rix's Creek Continuation of Mining Project

Scenario	TSP emissions from Rix's Creek Continuation of Mining Project		Dust from filling void as % of TSP emissions from Rix's Creek Continuation of Mining Project	
	Whole Site	West of New England Hwy	Site	West of New England Hwy
2017	1,768,914	1,152,934	84%	128%
2020	1,569,129	963,819	94%	154%
2023	2,432,562	2,143,049	50%	56%
2026	1,658,531	1,477,272	61%	69%
Final void filling	1,481,218		Average	
			82%	113%

Table 2 indicates that filling the void has the potential to generate, on average, approximately 82% of the annual dust emissions from the whole site of the Rix's Creek Continuation of Mining Project, and approximately 113% of the annual dust emissions from site activity occurring to the west of the New England Highway for the Rix's Creek Continuation of Mining Project.

In terms of impact at receptors near to the void, it is reasonable to expect approximately 10% greater impact on average due to the filling of the void than would occur in any year from the Rix's Creek Continuation of Mining Project. By reference to **Table 1**, the key factors appear to be the need to operate top-down, and the resulting wind erosion, given that progressive remediation is not possible in this situation.

Summary and conclusions

The activities associated with the final void filling have potential to generate a significant amount of dust relative to the Rix's Creek Continuation of Mining Project. Emissions in the area near the void would be similar to and greater than during the Rix's Creek Continuation of Mining Project.

Thus it is considered that the potential dust emissions due to the filling the void would be comparable to or worse than the emissions estimated to occur during the operation of the mine, and that these impacts would arise for an additional 10 years after the mine would have ceased.

We note that the final landform presently proposed in the Rix's Creek Continuation of Mining Project includes significant contour smoothing, without no residual cliffs, and is generally consistent with best practice.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences



Aleks Todoroski



Philip Henschke

References

Todoroski Air Sciences (2015)

"Air Quality and Greenhouse Gas Assessment Rix's Creek Continuation of Mining Project", prepared by Todoroski Air Sciences for AECOM Australia Pty Ltd on behalf of Rix's Creek Mine, August 2015.



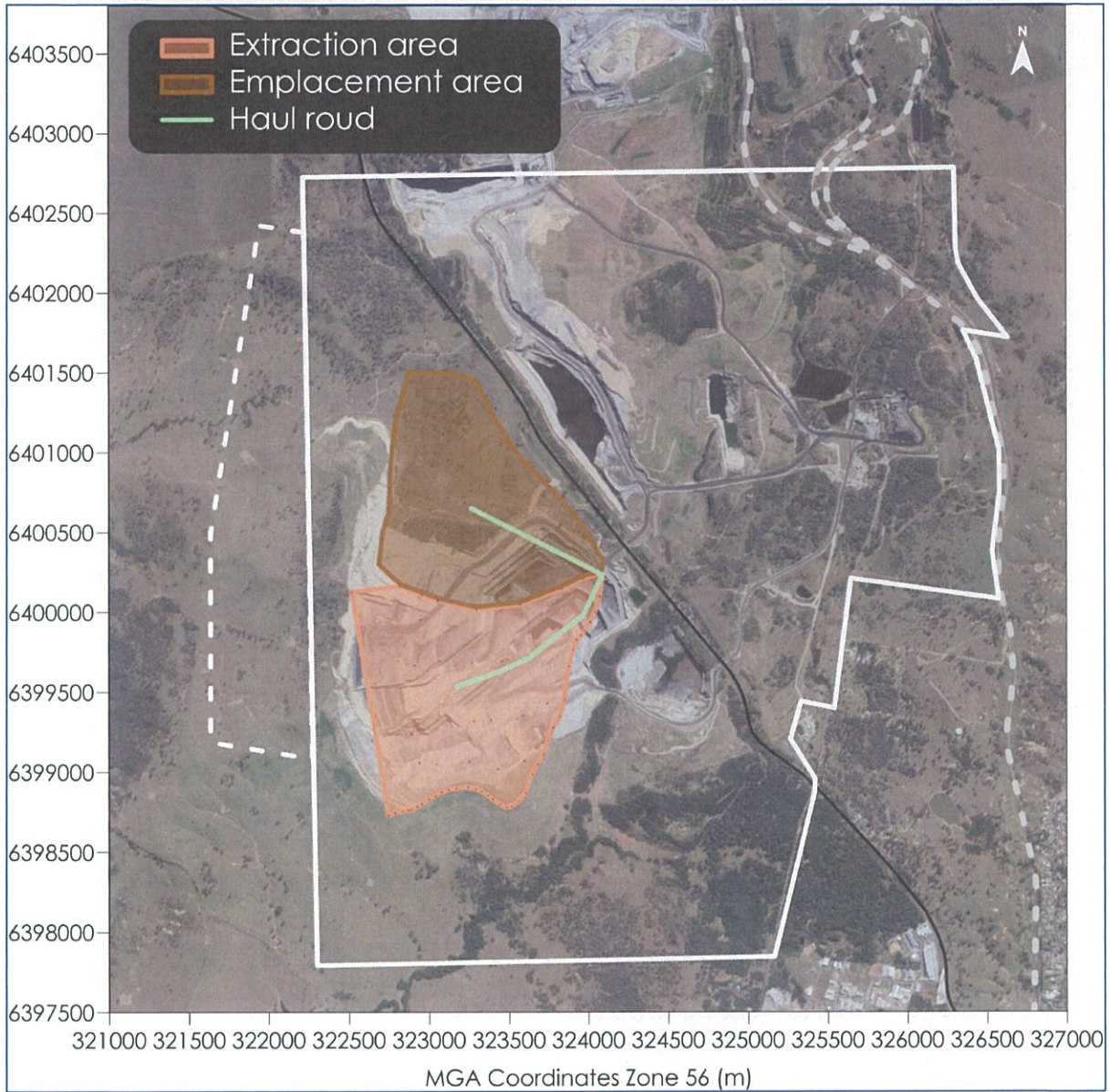


Figure 1: Indicative Project layout