

Matthew Sprott  
Resource Assessments  
Department of Planning & Environment  
GPO Box 39  
SYDNEY NSW 2001

**UNITED WAMBO OPEN CUT COAL MINE PROJECT AND HUNTER VALLEY  
OPERATIONS MODIFICATION 5 – CUMULATIVE AIR QUALITY IMPACT  
ASSESSMENT PEER REVIEW**

Date 21/11/2017

Dear Matthew,

Ramboll Environ Australia Pty Ltd (Ramboll Environ) has completed a review of the response to peer review report prepared by Jacobs Group (Australia) Pty Limited (Jacobs) and Todoroski Air Sciences (TAS), dated 9 November 2017.

The response to peer review report addresses the three issues raised for additional clarification by Ramboll Environ in the peer review report dated 1 November 2017. These matters and the review of the response are listed in the following letter.

1. Overburden Density

Clarification was sought by Ramboll Environ relating to the revision of adopted overburden density in the HVOS emissions inventory. The Jacobs/TAS response letter identified that the material density value was revised from a generic assumed value to a site specific value provided by Yancoal. This revision to the emissions inventory is accepted and the matter is considered appropriately addressed.

2. Background PM<sub>2.5</sub> Concentrations

A recommendation of the Ramboll Environ peer review was to strengthen the rigour of the cumulative assessment by revising the background PM<sub>2.5</sub> concentration applied to a value linked to ambient PM<sub>2.5</sub>/PM<sub>10</sub> relationships from monitoring in the Hunter Valley region. Using the method recommended by Ramboll Environ, Jacobs/TAS response letter identified that derived background would be lower than the adopted background of 6µg/m<sup>3</sup>. On this basis, Jacobs/TAS claim that there is no clear reason to issue revised cumulative annual PM<sub>2.5</sub> results.

As stated in the Ramboll Environ peer review, the use of an annual PM<sub>2.5</sub> background derived from the Camberwell PM<sub>2.5</sub>/PM<sub>10</sub> relationship would not likely alter the conclusions of the cumulative assessment which used a background of 6µg/m<sup>3</sup>, which was ultimately

Ramboll Environ  
Level 3  
100 Pacific Highway  
PO Box 560  
North Sydney  
NSW 2060  
Australia

T +61 2 9954 8100  
F +61 2 9954 8150  
[www.ramboll-environ.com](http://www.ramboll-environ.com)

proven to be the case by the Jacobs/TAS response letter. The recommendation was however made to improve the scientific rigour of the cumulative assessment for the purpose of any potential future external review, regardless of the change in cumulative concentrations. It remains the opinion of Ramboll Environ that the cumulative assessment would be better served through the application of a background concentration derived from PM<sub>2.5</sub>/PM<sub>10</sub> relationship at the NSW OEH Camberwell station.

### 3. 24-hour Average PM<sub>10</sub> and PM<sub>2.5</sub> Concentrations

Ramboll Environ requested the provision of tabular results for model predicted 24-hour average concentrations relating to HVOS-only, UWOC-only and HVOS+UWOC Combined. The Jacobs/TAS response letter provides the HVOS-only and UWOC-only concentrations but does not present the HVOS+UWOC Combined increment concentrations.

Instead, the Jacobs/TAS response letter provides cumulative time series plots (combining daily-varying concurrent HVOS, UWOC and background concentrations) for the six private receptors considered to be representative of Warkworth Village (19-77) and Moses Crossing (16-308, 39-310, 17, 43-312 and 320-451) and have the greatest potential for experiencing cumulative impacts from the two projects in combination.

For cumulative 24-hour average PM<sub>10</sub>, the most appropriate local monitoring dataset (AQ01 for 19-77, AQ04 for 16-308, 39-310, 17, 43-312 and AQ03 for 320-451 as per the Jacobs/TAS response letter) is combined with the corresponding predicted concentrations from HVOS and UWOC. For receptor 19-77 (Warkworth village), the analysis presents 51 additional exceedances of the NSW EPA assessment criteria beyond those already occurring in the background dataset. As identified by the Jacobs/TAS response letter, this magnitude of additional exceedances highlights that cumulative exceedances would not be avoided at this location.

For the other receptors presented, up to two additional exceedance days are predicted, however these additional days are dominated by elevated background levels. The Jacobs/TAS response letter states that the predicted additional exceedances are consistent with the number of existing recorded exceedance days in local datasets, concluding that the cumulative effects of the two Projects will not significantly alter existing air quality levels in the Moses Crossing area. Ramboll Environ agree with the analysis and conclusions for cumulative 24-hour PM<sub>10</sub>.

For cumulative 24-hour average PM<sub>2.5</sub>, the time-series analysis was completed using a fixed background concentration of 6µg/m<sup>3</sup> across all days, corresponding to the annual background concentration value that was adopted in the cumulative annual average PM<sub>2.5</sub> analysis. Justification provided in the Jacobs/TAS response letter for the use of a fixed average background concentration was the absence of a suitable local monitoring dataset, however this justification is not accepted. As was recommended for annual PM<sub>2.5</sub>, it is the opinion of Ramboll Environ that combining the relationship between PM<sub>10</sub> and PM<sub>2.5</sub> recorded at the NSW OEH Camberwell monitoring station (not the actual Camberwell measurements) with the daily-varying PM<sub>10</sub> background datasets (I.e. AQ01, AQ03 and AQ04) would provide more rigorous basis for accounting for PM<sub>2.5</sub> background at the receptors analysed.

As was acknowledged for annual PM<sub>2.5</sub>, it is considered unlikely that the recommended changes to background PM<sub>2.5</sub> would alter the ultimate conclusions of the cumulative analysis presented for 24-hour PM<sub>2.5</sub> in the Jacobs/TAS response letter. Predictions at receptor 19-77 aside, the combined HVOS/UWOC 24-hour average PM<sub>2.5</sub> concentrations illustrated in Figure 2 for receptors 16-308, 39-310, 17, 43-312 and 320-451 are low across the modelled period. Nevertheless, this recommendation to revise the background PM<sub>2.5</sub> concentration is made in the interests of improving the scientific rigour of the analysis presented.

It is considered that the majority of outstanding issues with the cumulative assessment of the HVOS and UWOC projects raised by Ramboll Environ have been addressed. However, the technical validity of the background PM<sub>2.5</sub> dataset adopted is considered questionable, particularly for cumulative 24-hour average PM<sub>2.5</sub> analysis. While it is acknowledged that the ultimate conclusions of the cumulative assessment would not likely change, updating the cumulative PM<sub>2.5</sub> analysis presented with a background dataset that is supported by scientific discussion would strengthen the findings of the cumulative assessment report.

Yours sincerely



**Scott Fishwick**  
Manager  
Air Quality

[sfishwick@ramboll.com](mailto:sfishwick@ramboll.com)