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3 July 2014

EN04281_Jacobs_Drayton AQ Peer Review_Retracted Mine Plan_Quantitative_2.docx

Dear Matthew

Review of quantitative air quality impact assessment for the Drayton South Coal Project

I have completed a review of recent work undertaken by Anglo American relating to the potential air quality impacts of the Drayton South Coal Project.

The following documents have been reviewed:

- *"Anglo 'Drayton Sth Justification' - Response to PAC Review.pdf"*. Appendix 6 (from Appendix A Response to Planning Assessment Commission Report) provides details of the Response to Planning Assessment Commission and EPA Submission – Air Quality by Pacific Environment Limited (PEL), dated 7 February 2014.
- *"Consequential EIA for Retracted Mine Plan.pdf"*. Appendix B provides a qualitative assessment of air quality impacts by PEL, dated 12 March 2014.
- *"Drayton South Coal Project – retracted mine plan – quantitative assessment of air quality impacts"*. Letter from PEL to Hansen Bailey, dated 23 June 2014.
- *"Briefing Note: Monte Carlo and cumulative 24-hour average PM_{10} concentrations"*. Document prepared by PEL, dated 25 June 2014.

The scope of this review was as follows.

a) consider the sensitivity analysis (undertaken by PEL as part of Anglo's Justification Report and reflected in Anglo's Consequential EIS for the retracted mine plan) and advise whether this analysis resolves any residual uncertainty/matters that arose during the original SKM peer review of the Drayton South Coal Project and the subsequent SKM review of Anglo's Response to the SKM review;

b) provide comments regarding the reasonableness of PEL's revised quantitative assessment of the retracted mine plan (dated 23 June 2014) and the associated sensitivity analysis for 24-hour PM_{10} (dated 25 June 2014), and any additional concerns that arise during your review; and

c) advise the Department whether the air quality modelling for the retracted mine plan (dated 23 June 2014) and the associated sensitivity analysis for 24-hour PM_{10} (dated 25 June 2014) provide a reasonable, reliable and suitable prediction of the likely project impacts, and consequently, whether this modelling provides a reasonable basis for the Department's assessment of the likely impacts associated with the retracted mine plan.

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1. Overview

In March 2014, Anglo American proposed a retracted mine plan to accommodate recommendations of the Planning Assessment Commission. Appendix B of the *"Consequential EIA for Retracted Mine Plan.pdf"* provided a qualitative assessment by PEL of air quality impacts, due to the proposed retracted mine plan (dated 12 March 2014). A quantitative assessment was subsequently prepared (PEL, dated 23 June 2014) and accompanied by a briefing note which provided a sensitivity analysis for the cumulative 24-hour average PM_{10} predictions.

The key aspects of the retracted mine plan proposal which will influence the potential air quality impacts have been identified as follows:

- Removal of the Houston mining area;
- A reduction in the southeast extent of the Whynot mine area;
- A reduction in the southern extent of the Redbank mine area; and
- Modifications to the quantities of overburden and ROM coal handled each year and over the life of the project.

PEL's air dispersion modelling for the retracted mine plan indicated that no privately owned residences would experience particulate matter concentrations or deposition levels above annual criteria. For some residences, up to four (4) additional days above the 24-hour average criterion for PM_{10} (50 µg/m^3) were predicted. No residences were predicted to experience 24-hour average PM_{10} concentrations above the 50 µg/m^3 criterion due to the Project emissions only. Anglo American is proposing to mitigate these short-term impacts through the implementation of a best-practice predictive and real-time dust management system.

2. Peer review outcomes

No specific issues have been identified from the review of PEL's quantitative assessment (dated 23 June 2014). The model predictions at residences are as expected, given the history of emission estimates and modifications to the project since the Environment Assessment was completed. A summary of this history is outlined in **Table 1** below.

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- **Table 1 History of emission estimates for Year 10 operations**

Reference	Estimated TSP emissions (kg/y)	Comments
PAEHolmes 25 Oct 2012	6,343,931	Original estimate for Environmental Assessment.
PEL 9 Apr 2013	4,599,468	Emissions developed after Response to Submissions. Calculations included site-specific data on silt and moisture contents.
PEL 7 Feb 2014	4,825,169	Recalculation of emissions due to updating the assumed silt and moisture contents.
PEL 12 Mar 2014	-	Qualitative assessment of potential impacts due to the retracted mine plan.
PEL 14 May 2014	3,836,630	Quantitative assessment of potential impacts due to the retracted mine plan. Considers the retracted mine plan and previous outcomes on silt and moisture contents.

PEL's quantitative assessment (23 June 2014) indicates that the retracted mine plan will lead to a reduction in potential air quality impacts, compared to the original mine plan. This outcome is supported and, based on my review, the air quality modelling for the retracted mine plan provides a reasonable, reliable and suitable prediction of the likely project impacts. My reasons for supporting this outcome are as follows.

- The total material handled in each year (overburden and coal) is anticipated to reduce.
- The reduced quantities of material handled each year (for the retracted mine plan) have been used in the emission calculations. The data in Table 2-1 are consistent with the data in Appendix A, although the ROM coal tonnage from the Redbank mining area in Year 10 (2,163 kt) is different to the value used in the inventory (3,342 kt). However this difference errs on the conservative side.
- There will be a reduction to the exposed areas susceptible to wind erosion and potential emissions from these areas. From review of the emission inventories, the exposed areas are anticipated to reduce by approximately 157 ha.
- The inventories and modelling for the retracted mine plan address previous issues relating to the silt and moisture contents used in the dust emission calculations.
- The statement that "*Year 5 and Year 10 were considered to be the worst case"* is justified because the material movement for these years are near maximum and in areas closest to sensitive receptors. Year 15 also has near maximum material movement but the main mining area (Whynot) would be further from sensitive receptors.

PEL's *Briefing Note: Monte Carlo and cumulative 24-hour average PM_{10} concentrations* (25 June 2014) provides predictions of cumulative 24-hour average PM_{10} concentration for two datasets:

1) Including HV2a data collected pre-2006, and
2) Excluding HV2a data collected pre-2006.

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The Monte Carlo method relies on repeated random sampling of input data to generate results. The main limitation of this approach is random combinations. In practice, elevated background dust concentrations are likely to have some association with elevated concentrations from mining sources (for example, hot, dry, windy days are likely to lead to elevated background levels and also higher emissions from a typical mine site). The Monte Carlo does not consider this potential association, however it is an approach which has been accepted by the EPA for quantifying cumulative air quality impacts from these types of projects.

No specific issues have been identified following review of the results presented by PEL in their *"Briefing Note"* (dated 25 June 2014). Based on the information reviewed to date, it is recommended that the Department of Planning & Environment base their assessment of cumulative 24-hour average PM_{10} concentrations on results that exclude the use of data collected pre-2006 by the HV2a monitor. This is because the data collected at HV2a post-2006 are more representative of existing air quality conditions in the vicinity of the Project.

Please contact me if you have any questions on these outcomes.

Yours sincerely

Shane Lakmaker
Senior Atmospheric Scientist