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Our Ref: P031 .L10

15 November 2018

EDO NSW  
Level 5, 263 Clarence Street  
SYDNEY NSW 2000

Attention: NADJA ZIMMERMANN

Dear Ms Zimmermann

## **BYLONG COAL PROJECT – COMMENTS ON PAC FINAL ASSESSMENT REPORT AND RESPONSES RELATING TO GROUNDWATER**

### **1. INTRODUCTION**

This letter is in response to a brief from EDO NSW dated 14 October 2018, on behalf of Bylong Valley Protection Alliance. I have read the Expert Witness Code of Conduct (Division 2, Part 31 and Schedule 7 of the Uniform Civil Procedure Rules 2005) for the Land and Environment Court, and have prepared this report in accordance with those rules. This report has been prepared by Dr Steven Pells and reviewed by Dr Philip Pells

In accordance with the Brief I understand that the primary purpose of this report is “to assist the decision maker for the Project” in respect to matters within our expertise and provide responses to three questions as listed below, following review of the documents on the Bylong Coal Project located here:

- [http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6367](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367).

Of the available reports at this location, the following were considered in preparation of this present letter:

- PAC Review
  - Bylong Final Assessment Report (Executive summary, pp 2-4; Water resources pp 10-15 of 53)
- KEPCO's Response to PAC
  - Main Report (Executive summary, Water resources p 21)
  - Appendix F - Bylong Water Management Plan-part A

- Appendix F - Bylong Water Management Plan-Part B
- Appendix K - Groundwater Response to Planning Assessment Commission
- Appendix L - Letter to DPI-Water
- Appendix M - Surface Water Response
- Appendix N - Water Balance Peer Review
- DPE Final Assessment Report
  - Bylong Final Assessment Report (Executive Summary pp 3-16, Water Resources pp 37-51 of 122)
  - Supplementary Information\_ Main Report (Groundwater and Surface Water pp 34-40 of 85)
  - Appendix A DPE Revision of Mine Plan Letter
  - Appendix G Review of Groundwater Impacts
  - Appendix H Updated Surface Water and Flooding Impact Assessment
  - Advice from AGE\_ Drawdown due to mining only
  - Recommended Conditions to IPC

## 2. SUMMARY OF PREVIOUS ADVICE IN RELATION TO CURRENT PLANNING

Pells Consulting previously provided the following advice to EDO on this matter:

1. Pells Consulting Ref S002.R1 dated 4 November 2015 “KEPCO, Bylong Coal Project, Some responses to the Environmental Impact Statement of September 2015”
2. Pells Consulting Ref S002.R2 dated 18 May 2017 “KEPCO Bylong Coal Project May 2017 Consideration of Responses to Submissions”

In the Pells Consulting Ref S002.R1, the following issues were raised:

1. The general absence of absolute criteria for assessment of acceptability of impacts. In this instance, it was noted that relatively extreme predicted mining effects on groundwater and the environment were suggested to be acceptable based upon KEPCO’s ownership of the affected land.
2. We found the magnitude of surface settlements, strains and tilts to have been reasonably estimated, but noted that the predicted cracking would result in substantial degradation effects on the land, upon river systems and upon cliff-line stability. The predicted effects were shown to be larger, in many cases, than those accepted at comparable mine sites.
3. We found that the actions suggested for remediation, such as crack grouting or regrading to be ineffective and non-specific.
4. We found that the predicted settlement on Bylong Valley Way were very large and the impacts of these settlements was understated.
5. We found that environmental flows in creeks were poorly defined and hydrological modelling did not address the impacts to flow frequency.
6. There was insufficient evidence that the groundwater volumes required to support mining requirements could be provided by the alluvial aquifer system.
7. There was insufficient description of impacts to groundwater within the Triassic aquifers.
8. Predicted drawdowns and impacts on adjacent properties should have considered other aquifer parameters, and uncertainty in those parameters.

In the Pells Consulting Ref S002.R2, the following issues were raised:

1. Response plans should not simply rely on closure of the Bylong Valley Way, but should include possible changes to the mine schedule or mining plan
2. That subsidence impacts were not disputed, but land ownership was still suggested as a basis of acceptability for these impacts.
3. That predicting likelihood of cracking was not disputed, but no suitable incentives to limited cracking existed, and no suitable remediation options were proposed.
4. That no response to the issue of environmental flows (item 5 above) was given.
5. That further work was required to prove the sustainable yield from a proposed borefield in the alluvial aquifers
6. That further field testing was required to prove predicted impacts on adjacent landowners.
7. That uncertainty in numerical modelling appears to have been suitably considered by the Proponent, but it was unclear how ranging predictions were incorporated in mine planning.

This present letter does not revisit all of our previous commentary; rather I note only where the Revised Project alters our previous advice.

In general, we find that the PAC final assessment report demonstrates appropriate understanding and response to the issues identified above, excepting only the matter of definition of environmental flows which consider impacts upon flow frequency in creeks.

It follows that the Proponent has not considered this issue in further responses. For example, the Proponent considers impacts on Dry Creek (RTS Section 5.7.2) in terms of total annual loss of water, which is notably small, given that Dry Creek does not often flow. This is missing the point. The environmental values of this creek are expected to be in equilibrium with its natural ephemeral flow condition. Impacts to those values are not reasonably described with an annual loss quantity, but rather by impacts to its natural conditions – i.e. impacts to its natural flow frequency. For example, if a creek only naturally flows on average twice a year, but the flows are consumed completely by cracks due to mining, then in such a case the quantity of flow lost (expressed annually) is small. However, the impacts to the creek are major, given that it now no longer flows at all.

### **3. ANSWERS TO QUESTIONS IN THE BRIEF**

#### **a. In your opinion, is the hydrogeological impact assessment for the Revised Project adequate? Please provide reasoning for your answer.**

As expressed in our previous advice, we consider that, in general, hydrogeological studies for the Project have been undertaken to an acceptable standard. The major question is whether the predicted impacts, which are large, can be considered to be acceptable, and whether having those large impacts constrained to land owned by KEPCO can be considered to be a suitable basis for acceptance of those impacts.

There have now been numerous numerical model studies of groundwater conditions, predictions and assessments of uncertainty. The PAC final assessment report notes

the length and the detailed and specialist nature of these studies. It is not considered reasonable for community groups to be able to interpret what these studies imply for their properties and values. It is noted that the PAC has required summaries of the groundwater studies to be presented, and that the Proponent has listed the studies chronologically and attempted to clarify their purpose. With respect to this complexity, it is recommended that the determinations made by the IPC consider advice from a completely independent and disinterested expert, who has appropriate experience and a sufficient scope to properly review and interpret the studies.

**b. In your opinion, what, if any, are the hydrogeological impacts arising from the Revised Project as proposed?**

The hydrological impacts from the Revised Project remain as described in our previous reports, as listed above.

**c. Provide any further observations or opinions which you consider to be relevant.**

We do not consider that the effects of subsidence and cracking on long term agricultural values or on the environmental values of creek systems have been adequately assessed.

Despite the proponent considering the proposed remediation methods for cracking (re-grading, natural filling, grouting) to be current practice, we remain of the understanding that such current practice has shown little or no efficacy in actual remediation.

We consider it to be a complex matter to assess the long-term effects of surface cracking on the hydrological regime of large land areas, and therefore upon their long-term environmental values.

Yours faithfully



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