Department of Primary Industries
Office of Water

Contact Tim Baker
Phone 6841 7403
Email tim.baker@water.nsw.gov.au
Our ref ER22843

Carl Dumpleton
Senior Planner, Mining Projects
NSW Department of Planning & Infrastructure
By email: carl.dumpleton@planning.nsw.gov.au

Dear Carl

Coalpac Expansion Modifications (Cullen Valley Mine & Invincible Colliery)_DA200-5-2003 MOD 2 & DA07-0127 MOD 4

The NSW Office of Water (Office of Water) appreciates the opportunity to review the draft EIS for the proposed Coalpac Expansion Modifications (MODs 2 and 4). Key issues identified by the Office of Water are outlined below, with further detail provided in Attachment A.

Broadly, the water related impacts should be manageable, however there are some points that require some clarification.

Key Issues

- Uncertainty exists as to the dewatering requirement and overall groundwater take for the project, in particular a significant discrepancy between the surface water and groundwater reports. This will require further discussion between the NSW Office of Water and the proponent with the aim of confirming these requirements during the public exhibition stage.
- NOW concurs that a numerical groundwater flow model may not be warranted in view of the relatively small groundwater drawdowns predicted. Despite this, confirmation of the dewatering predictions and associated impact using a tool such as SEEP-W is requested to demonstrate the robustness of the predictions.
- Further detail is requested regarding the source of the key parameters of the groundwater model. In particular the regional permeability values used in the modelling are requested along with information as to how the values were derived (e.g. pump testing or laboratory triaxial testing).
- Clarification is requested as to whether the predicted groundwater draw-downs from the proposed mine extensions could affect any local Box-Gum Woodland communities and proposed steps to avoid/mitigate these impacts (if present).
- Further information is requested as to the status of registered bores, and any unregistered bores (if known), within the area that could be potentially impacted (including their accessibility for monitoring purposes). This includes bores on neighbouring private land.
- Annual groundwater quality monitoring is not considered sufficient to establish baseline characterisation and it is not clear from the Groundwater Impact Study (Appendix E) what number of annual samples has been collected to date.

- The proponent should undertake regular groundwater model validation as part of the Groundwater Monitoring Plan.

If further information relating to this submission is required, please contact Tim Baker (Senior Water Regulation Officer) at our Dubbo Office on (02) 6841 7403.

Yours sincerely

Mitchell Isaacs
Manager Strategic Stakeholder Liaison
25 March 2014

NSW Office of Water Detailed Comments- Coalpac Expansion Modifications

1.Groundwater Assessment

1.1 Conceptual Model

- The modelling undertaken for this project was limited to conceptualisation of the mine as being mainly above the water table, with predictions of water take from the open cut and highwall drives which will intercept the water table calculated from a simple application of Darcy's Law on seepage through saturated mine walls.

1.2 Model Calibration Assessment

- Whilst it is accepted that detailed numerical flow modelling is not appropriate given the relatively small draw-downs predicted, it would be appropriate to use a relatively simple seepage model such as SEEP-W to verify that the predictions are reasonable. The key aspects of the predictions include the predictions of inflows into the mines, estimates of water required to dewater the flooded workings and the rate at which this will be performed, and to estimate the zone of influence and the likely drawdowns at the nearest externally owned water supply work.

1.3 Groundwater Monitoring

- The standing water level within the flooded workings of the Old Tyldesley Colliery (Cullen Valley Mine area) has been recorded within the Tyldesley Colliery Drainage Bore (GW804393) since 2000. Similarly, the standing water level within the flooded workings of the Invincible Colliery has been recorded within LD001 since 2010.
- An expanded groundwater monitoring bore network was installed in early 2011 to augment the existing bores at each mining area. Five monitoring bores (CP114, CP115, CP116, CP119, and CP123) were constructed in exploration drill holes. The sites were selected to provide sufficient spatial coverage over the area proposed to be mined for the CCP. Two more monitoring bores (CP131 and CP132) were installed in 2012 and one bore (BHW1) was installed in 2013.
- Although Appendix E of the EA states that groundwater levels in all monitoring wells are continuously monitored, it appears that only a single round, or at most three rounds, of water quality monitoring has been collected in these monitoring wells. It thus appears that baseline water quality has not yet been established.

1.4 Groundwater Licensing and Water Sharing Plans

- According to Appendix E of the EA, Coalpac currently holds three groundwater licences. The licences entitle Coalpac to take 106 ML/year from the Sydney Basin MDB Groundwater Source and 120 ML/year from the Sydney Basin Coxs River Groundwater Source. Of these, the 106ML entitlement may be most relevant, however no information is provided in the EA about how much of the entitlements are currently used and from which water source. Further detail is requested on the water sources where water take is currently occurring and predicted to occur, and associated volumes. This will need to also consider the volumes of surface water entering the underground workings to enable the surface water and groundwater components to be considered separately.
- The licences held by Coalpac are summarised in the table below which is extracted from Section 16 of Appendix E of the EA.
- Monitoring bores may require licensing under Part 5 of the *Water Act 1912* unless the bores meet the criteria for exempt monitoring bores as defined in the *Water Management (General) Regulation 2011*.

Table 8: WATER LICENCE DETAILS				
Water Management Act 2000 Licence Number	**Water Act 2012 Licence Number**	**Share Component (ML)**	**Water Source**	**Water Sharing Plan**
TWAL27898	-	80	Sydney Basin MDB Groundwater Source	NSW Murray-Darling Porous Rock Groundwater Sources
10AL118580 & 10WA118581	10BL602584	26		
-	10BL602586	120	Sydney Basin Coxs River Groundwater Source	Greater Metropolitan Region Groundwater Sources

- Appendix E states that approximately 2.2 ML/a will be required to dewater t*he expanded mining zones. An additional v*olume of around 125ML will be dewatered from the flooded workings in the Northern mining area over an unspecified period, but this is not included in the predicted "water take". Further to this an additional 1382ML of dewatering requirement is referred to in the Surface Water Assessment Report (Appendix D). The range of dewatering values indicates the water take requirements for the project will require further discussion between the NSW Office of Water and the proponent, to ensure that all water take is adequately accounted for and licensed.
- For clarity it is recommended that the water licence details table is updated with consistent format licence numbers, as it is currently a mix between "AL" and "WAL" numbers (both under the Water Management Act 2000) and "BL" numbers (under the Water Act 1912). It is recommended that WAL (water access licence) numbers are used. The Office of Water's records indicate that the relevant numbers are WAL27898 (80 shares), WAL35978 (26 shares) and WAL36485 (120 shares). The Water Act 1912 numbers are no longer applicable for these volumetric licences as they have all been converted to the Water Management Act 2000.

1.5 Aquifer impact assessment

- The only aquifer likely to be intercepted by the proposed works is the Lithgow Seam, which lies within the otherwise very low-permeability units of the Illawarra Coal Measures. The Lithgow seam daylights at the mine but becomes confined as it falls gently to the east beneath the cliff-forming Narrabeen Group.
- Appendix E of the EA provides a tabulated summary of the project impacts against the Aquifer Interference Policy (AIP) criteria for each of the two mine extension areas. Using the AIP assessment guidelines, Appendix E suggests that as water levels are unlikely to be lowered by any significant drawdown at the nearest water supply works, the impacts meet the Level 1 minimal impact considerations for both sites. This is deemed acceptable by the AIP. Although the location of the nearest water supply work is not stated, it is inferred to be the nearest private well which is located approximately 650m from the boundary of the Modification Area. Based on the information presented at this stage, this appears to be a reasonable conclusion but additional seepage analysis and information about the private wells would help to confirm the inference.

2. Surface Water Assessment and Licensing

- The Office of Water requests the proponent estimate the Maximum Harvestable Right Dam Capacity (MHRDC) applicable to the project site and any volumes of surface water take that may be excluded from harvestable rights under Schedule 5 of the *Water Management (General) Regulation 2011*. Any surface water taken above the MHRDC and any exemptions or exclusions need to be accounted for and detailed. Further detail on calculating MHRDC can be accessed at the following link: http://www.water.nsw.gov.au/Water-Licensing/Basic-water-rights/Harvesting-runoff/default.aspx
- The proponent is requested to provide details of any surface water entitlement required to account for water taken from the Turon Crudine River Water Source of the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*. It is recommended the proponent demonstrate an ability to source this entitlement where required.
- The Office of Water advises that any requirement by the proponent to trade surface water entitlements to account for surface water take will need to be consistent with the *Access Licence Dealing Principle Order 2004* and the relevant trading rules in the water sharing plan.

3. Recommendations

The NSW Office of Water recommends the proponent complete the following:

- Commit to liaise with the Office of Water to ensure that the volume of surface and groundwater taken for the modification proposals are accounted for by holding sufficient shares (entitlement) from each water source.
- Further information is requested to confirm the current and predicted surface water take requirements based on water sources and sites. The applicability of Harvestable Rights is also requested for the site, including any exclusions that may apply under the *Water Management (General) Regulation 2011*.
- Modifies the Environmental Assessment (EA) to reflect the understanding that water removed from or seeping into mine workings and water removed via evaporation does constitute water take. Clarification is requested over what time-frame the active pumping and any ongoing water take via groundwater seepage and any evaporative loss is predicted to occur. The key groundwater take figures referred to in the EA that need clarification include the 2.2ML/a at Cullen Valley mine and the 125ML and 1382ML at the Invincible Colliery.
- Further justification is required of how the hydrogeological impacts, and in particular the likely drawdown at the nearest groundwater supply work is calculated. Information on how the flooded mine dewatering volumes have been estimated and calculations of likely dewatering rates, and associated cone of influence in the water table during the dewatering, are required.
- Provide details regarding the source of the key parameters of the groundwater model. In particular the regional permeability values used in the modelling are requested, along with information as to how the values were derived (e.g. pump testing or laboratory triaxial testing).
- Whilst the Office of Water concurs that a numerical flow model appears unwarranted in view of the relatively small groundwater takes predicted by the consultants, confirmation is requested of the dewatering predictions using a tool such as SEEP-W to demonstrate the robustness of the predictions.
- Undertake regular model validation as part of the Groundwater Monitoring Plan. Further, it should be recognised that the monitoring and evaluation of the residual groundwater level drawdown, and model validation, will be required until groundwater levels have stabilised post-mining. This is critical in informing future licensing requirements at the site.

- Further information is requested on the status of the registered bores, and any unregistered bores if known, within the area that could be potentially impacted. It appears from Appendix E of the EA that at least two private wells may exist just outside the zone of predicted depressurisation, but no information is provided on the status of these or other local bores. In particular, the Office of Water would like to understand whether these wells will be accessible for monitoring and whether suitable baseline groundwater level and quality data is known or will be collected prior to commencement if the proposal is approved.
- The current groundwater monitoring system appears to be adequate provided it is fully functional (further details on the status and construction details of these wells would be helpful to include in the EA). Continuous monitoring of the groundwater levels is considered appropriate, but the annual quality monitoring is not considered sufficient for baseline characterisation and it is not clear what number of annual samples has been collected to date. Adequate baseline characterisation of water quality would normally require at least 8-10 rounds prior to commencement of the operation, and for this reason quarterly monitoring for a suitable period is recommended. Further information on the sampling and analysis methodologies and QA/QC procedures for water quality assessment are also requested.

End Attachment A