

25 February 2016

Department of Planning and Environment
Resource Assessments, Planning Services
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Mike Young, Director, Resource Assessments

Dear Mike,

**RE: METROPOLITAN COAL PROJECT APPROVAL (08_0149) – INDEPENDENT
ENVIRONMENTAL AUDIT**

In accordance with Condition 8, Schedule 7 of the Project Approval, an Independent Environmental Audit of the Project was commissioned by the end of December 2014. The Independent Environmental Audit was conducted from May to December 2015 by a team of experienced and independent experts endorsed by the Director-General. Metropolitan Coal received the final Independent Environmental Audit report (enclosed) on 18 January 2016.

In accordance with the correspondence from the Department of Planning and Environment (DP&E) dated 26 March 2015, the Independent Environmental Audit also included a detailed review and verification of water monitoring results.

Table 1 (attached) presents the recommendations made in the Independent Environmental Audit and Metropolitan Coal's response to these recommendations.

Please do not hesitate to contact the undersigned if you wish to discuss.

Yours sincerely,

A handwritten signature in black ink, appearing to be "R. Pascoe", written in a cursive style.

RYAN PASCOE
Manager - Safety & Environmental Services

Table 1
Independent Environmental Audit Recommendations and Metropolitan Coal Responses

Independent Environmental Audit Recommendation	Metropolitan Coal Response
<p>Recommendation – Research Program:</p> <p><i>It is recommended that the Research Program Significance of Chain Pillars on Simulated Groundwater Pressures Project Approval 08_0149 Schedule 3 condition 9 be progressed before the preparation of the next Extraction Plan.</i></p>	<p>The Research Program <i>Significance of Chain Pillars on Simulated Groundwater Pressures</i> will be progressed before the preparation of the next Extraction Plan.</p>
<p>Recommendation – Biodiversity</p> <p><i>It is recommended that should Littlejohn's Tree Frog be recorded in either the Spring or Autumn surveys for the project the Biodiversity Management Plan be amended to include a program specific to this species which would include winter survey and monitoring (i.e. targeted assessment and monitoring during the period of the species greatest activity).</i></p>	<p>In the event the Littlejohn's Tree Frog is recorded in spring or autumn amphibian surveys for the Project, Metropolitan Coal will develop a winter survey/monitoring program specific to this species. The program will be included in an appropriate Biodiversity Management Plan.</p>
<p>Subsidence Reporting Observations - Valley Closure Measurement Data:</p> <p><i>There are a few minor issues with the subsidence assessments to-date that could be clarified during the next reporting period, in regards to the reporting of measured v. predicted valley closure parameters:</i></p> <p>(i) <i>The end-of-panel reports present the measured Net Vertical Movement and the Upsidence only. Assuming that the Subsidence = Net Vertical Movement + Upsidence it is unclear how the Upsidence is measured without estimates of Subsidence at a given location.</i></p>	<p>Upsidence is defined by Mine Subsidence Engineering Consultants (MSEC) as follows:</p> <p>Upsidence is the reduced subsidence, or the relative uplift within a valley which results from the dilation or buckling of near surface strata at or near the base of the valley. The magnitude of upsidence, which is typically expressed in the units of <i>millimetres (mm)</i>, is the difference between the observed subsidence profile within the valley and the conventional subsidence profile which would have otherwise been expected in flat terrain.</p> <p>The equation then is: Net vertical movement (i.e. what is measured) = regular subsidence (i.e. profile expected if the valley was absent) + upsidence (i.e. localised uplift in the subsidence profile).</p> <p>In the case where movements are observed along a short cross line in the base of a valley, the observed net vertical movement includes the influence of upsidence in the valley base and it is not possible to compare this with the predicted subsidence. An estimate of the true observed subsidence (i.e. excluding upsidence) would require survey of the full valley profile in order to establish the extent of relative uplift, if any, in the base of the valley. For the purposes of upsidence calculation, the conventional subsidence profile over such a short distance across the base of the Waratah Rivulet valley for Metropolitan Colliery is taken to effectively be a straight line between the outer survey marks of the monitoring line and this line is used for measurement of upsidence in the end of panel reports. The conventional subsidence profile used for calculation of upsidence may in other cases be a curved line, which is interpreted by the subsidence engineer, subject to the length of the monitoring line and predicted subsidence parameters.</p>

Table 1 (Continued)
Independent Environmental Audit Recommendations and Metropolitan Coal Responses

Independent Environmental Audit Recommendation	Metropolitan Coal Response
<p><i>(ii) The compressive strains associated with valley closure mechanism have been shown graphically in the review reports, but are not compared to predictions in the Tables in the text.</i></p>	<p>The measurement of longitudinal strain along a monitoring line is a function of the distance over which the strain is calculated. Predicted closure strain values are based on a nominal survey peg spacing of approximately 20 metres and are provided as an indication of the magnitudes of compression that are to be expected in the bases of the valleys. The observed strains presented in the end of panel reports are based on much shorter peg spacing of 3 metres to 9 metres. The observed strains are also highly sensitive to the locations of the marks (i.e. relative locations to the rock bar joints where movements may concentrate) for these short bay lengths. The strains provide valuable information on the development of closure across the base of the valley and across a rock bar, however it is not appropriate to make comparisons of strain for these cross lines, as is done for other monitoring lines. For this reason, closure has been used as the comparison between observed and predicted.</p>
<p><i>(iii) It is also unclear why survey accuracy would decrease from +/-20 mm to +/-50 mm outside the limits of extraction. It is considered more likely that the apparent increase in subsidence is related to the elastic compression of the strata and coal seam under abutment loading conditions.</i></p>	<p>It is assumed that the reviewers are referring to the text on page 3 of the MSEC LW23 end of panel report in Section 1.1. In reference to the above comments, a distinction should be made between limit of survey accuracy and accuracy of subsidence predictions. The reference to predictions at low levels of subsidence being accurate to within 50 mm of subsidence is a reference to accuracy of predictions. The reference to the accuracy of 3D surveys of ± 20 mm for vertical subsidence is a reference to survey accuracy, and applies to all surveyed data, over goaf and over solid coal. MSEC will modify the text in future end of panel reports to improve the clarity of this paragraph.</p>