

17 July 2018

Mr Josh Carlon
Environmental Field Team Coordinator
South 32-Illawarra Coal
Cordeaux Colliery
Picton Road
Mount Keira West NSW 2500

Via email: josh.carlon@south32.net

Dear Josh,

Re: Dendrobium Colliery Longwall 13 End of Panel Report - Aboriginal Heritage Assessment

Niche Environment and Heritage (Niche) has undertaken a site assessment and review of the predicted and observed impacts on Aboriginal heritage sites and their associated values resulting from the extraction of coal at Longwall 13 at Dendrobium Colliery. This assessment is attached for inclusion in the South 32-Illawarra Coal (Illawarra Coal) End of Panel Report for Longwall 13.

There were no new observable impacts noted during the site inspections.

Illawarra Coal should continue to monitor the Aboriginal sites as outlined in Condition 7 (b) of Aboriginal Heritage Impact Permit 1132005.

Please do not hesitate to contact me on 0488 224 758 should you require any further information.

Yours sincerely,



Renée Regal
Team Leader- Heritage
Niche Environment and Heritage

Dendrobium Colliery, Longwall 13 End of Panel Report: Aboriginal Heritage Assessment

Background and Introduction

Illawarra Coal commissioned Niche to conduct an End of Panel (EoP) assessment of the Aboriginal cultural heritage and archaeological sites within the limit of subsidence effects of Longwall 13 at Dendrobium Colliery. This area has been defined as the ‘Subject Area’ and is shown in Figure 1, which is reproduced from MSEC459REVB 2012: 141 Figure MSEC792-13

This EoP Aboriginal heritage assessment report includes a summary of:

- previous monitoring;
- the results of the Subsidence Report prepared by MSEC;
- the results of a site inspection;
- a discussion; and
- conclusions and recommendations.

Monitoring of Aboriginal archaeological sites at Dendrobium Colliery to-date has been carried out as recommended by Biosis Research (2007 and 2012).

Subsidence Monitoring Results Summary (MSEC)

The End of Panel Subsidence Report for Longwall 13 is being prepared by MSEC. This assessment includes a comprehensive report which addresses all aspects of the recorded subsidence parameters resulting from the extraction of Longwall 13. For this assessment, the initial MSEC predictions have been referred to in order to address any potential impacts at the sites.

Specifically, in relation to matters that may affect Aboriginal cultural heritage values, MSEC (Section 5.23 Archaeological sites) provides maximum predicted total conventional subsidence, tilt and curvature for the archaeological sites resulting from the extraction of the proposed longwalls (MSEC459REVB 2012:84). The predictions are reproduced below:

Table 1: Maximum predicted subsidence movements for Aboriginal cultural heritage sites relevant to Longwall 13

Aboriginal site (AHIMS)	Maximum predicted total conventional subsidence (mm)	Maximum predicted total conventional tilt (mm/m)	Maximum predicted total conventional hogging curvature (km ⁻¹)	Maximum predicted total conventional sagging curvature (km ⁻¹)
Browns Road Site 12 (52-2-1628)	225	8	0.20	0.02
Browns Road Site 11 (52-2-1626)	2900	25	0.50	0.65
Site 1-DB1 (52-2-2229)	3450	18	0.25	0.80
DM16 (52-2-3640)	20	1	10.05	<0.01
DM17 (52-2-3641)	<20	<0.5	<0.01	<0.01

None of the aforementioned Aboriginal sites were located over Longwall 13. As highlighted by this assessment there were no impacts resulting from mining identified at any of the monitored sites.

Site inspection and results

The five Aboriginal archaeological sites inspected as part of this assessment include:

- AHIMS #52-2-1628 (Browns Road Site 12) shelter with art;
- AHIMS # 52-2-2229 (Site 1-DB1) shelter with art;
- AHIMS # 52-2-3641 (DM17) shelter with deposit;
- AHIMS #52-2-3640 (DM16) shelter with art; and
- AHIMS #52-2-1626 (Browns Road Site 11) shelter with art (See Figure MSEC459 B MSEC459 REVB 2012:141).

These five sites were inspected as they were all located within the possible zone of subsidence movements associated with Longwall 13.

The site inspection was carried out on 4 July 2018 by Renée Regal (Niche). A summary of the findings of the site visit are outlined in Table 2.

Important information about this report

Information relating to Aboriginal cultural heritage sites, including some details, images and maps showing the locations of sites, has been redacted from this report at the request of Registered Aboriginal Parties.

Table 2: Summary of the site visits to the Aboriginal heritage sites in proximity to Longwall 13

AHIMS site numbers	Site name	Results of inspections	Photograph of current condition of site
52-2-1628	Browns Road Site 12	<p>This shelter was in the same condition as described by Biosis in 2012 and 2016. There has been no movement of the horizontal bedding plane joints of the shelter and no cracking or exfoliation observed in relation to the extraction of Longwall 13. There has been no altered seepage or water movements in the shelter, and there is no evidence of water flow or recent micro-vegetation growth associated with any movement. The site remains the same as previously described.</p> <p>The art panel remains in the same condition as described in Biosis Research 2008, 2009 and Niche 2017.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 1: General photograph of Browns Road Site 12, facing south.</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 2: General photograph of art panel Browns Road Site 12, at the northern end of the shelter.</p>
52-2-2229	Site 1-DB1	<p>This shelter was in the same condition as described by Biosis in 2012. There has been no movement of the horizontal bedding plane joints of the shelter and no cracking or exfoliation observed in relation to the extraction of Longwall 13. There has been no altered seepage or water movements in the shelter, and there is no evidence of water flow or recent micro-vegetation growth associated with any movement.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 3: General photograph of Site 1-DB1.</p>

		<p>The site remains the same as previously described.</p> <p>The art panel remains in the same condition as described in Biosis Research 2008, and 2009.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 4: General photograph of location of art at Site 1-DB1.</p>
<p>52-2-3641</p>	<p>DM17</p>	<p>This shelter was in the same condition as described by Biosis in 2012. There has been no movement of the horizontal bedding plane joints of the shelter and no cracking or exfoliation observed in relation to the extraction of Longwall 13.</p> <p>There has been no altered seepage or water movements in the shelter, and there is no evidence of water flow or recent micro-vegetation growth associated with any movement.</p> <p>The site remains the same as previously described.</p> <p>The artefact could not be relocated during this assessment.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 5: General photograph of shelter DM17.</p>

52-2-3640	DM16	<p>This shelter was in the same condition as described by Biosis in 2012. There has been no movement of the horizontal bedding plane joints of the shelter and no cracking or exfoliation observed in relation to the extraction of Longwall 13.</p> <p>There has been no altered seepage or water movements in the shelter, and there is no evidence of water flow or recent micro-vegetation growth associated with any movement.</p> <p>The site remains the same as previously described.</p> <p>The art panel remains in the same condition as described in Biosis Research 2008, and 2009.</p>	<div><p>This information has been redacted For more information please contact GM3.</p></div> <p>Plate 6: General photograph of shelter DM16.</p> <div><p>This information has been redacted For more information please contact GM3.</p></div> <p>Plate 7: General photograph of the art at DM16.</p>
-----------	------	--	--

<p>52-2-1626</p>	<p>Browns Road Site 11</p>	<p>This shelter was in the same condition as described by Biosis in 2012 and 2016. There has been no movement of the horizontal bedding plane joints of the shelter and no cracking or exfoliation observed in relation to the extraction of Longwall 13. There has been no altered seepage or water movements in the shelter, and there is no evidence of water flow or recent micro-vegetation growth associated with any movement. The site remains the same as previously described. The art panel remains in the same condition as described in Biosis Research 2008, and 2009.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 8: General photograph of Browns Road Site 11</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>This information has been redacted For more information please contact GM3.</p> </div> <p>Plate 8: General photograph of the art at Browns Road Site 11.</p>
------------------	----------------------------	--	---

Discussion and conclusion

There were no new observable impacts noted during the site inspections. The Trigger Action Response Plan (TARP) (Table 3) contains the Performance Measures along with the proposed Corrective Management Actions (CMA) for Aboriginal heritage sites, as outlined in the Dendrobium Area 3B Subsidence Management Plan (SMP).

It is recommended Illawarra Coal continue to monitor the Aboriginal sites as outlined in Condition 7 (b) of Aboriginal Heritage Impact Permit 1132005.

Table 3: Dendrobium Approval Performance Measures Table

Feature	Performance Measures	Observations	Actions as a result of LW 13
<p>Browns Road Site 12 (52-2-1628) Site 1-DB1 (52-2-2229) DM17 (52-2-3641) DM16 (52-2-3640) Browns Road Site 11 (52-2-1626)</p>	<p>Level 1</p> <ul style="list-style-type: none"> Change in shelter conditions not attributable to natural weathering or preservation-mineral growth of micro organism growth (as observed by comparing pre-mining photographs with post-subsidence/ mining photographs) Changes external to the shelter that affect the site context (e.g ground cracking, boulder slumping, rock and/or tree falls) 	<p>N/A</p>	<ul style="list-style-type: none"> Continue monitoring program Condition assessment and photographic record Notify relevant specialists and key stakeholders (e.g Aboriginal community groups) Summarise impacts and report in the End of Panel report and AEMR <p>NONE REQUIRED.</p>
	<p>Level 2</p> <ul style="list-style-type: none"> Change in shelter conditions not attributable to natural weathering or preservation-change in drip line or seepage, cracking or exfoliation of overhang or shelter, movement or opening of existing planes and joins in panel, block fall within shelter or overhang, shelter or overhang collapse. 	<p>N/A</p>	<ul style="list-style-type: none"> Actions as stated for Level 1 Modify monitoring program if necessary Consider development of site management plan to mitigate effects in consultation with Registered Aboriginal Groups and Landowner (WaterNSW) <p>NONE REQUIRED.</p>
	<p>Level 3</p> <ul style="list-style-type: none"> Level 2 impacts at greater frequency than predicted Level 2 impacts attributable to mining remote from the mining area 	<p>N/A</p>	<ul style="list-style-type: none"> Actions stated for Level 2 Immediately notify OEH, DoPI, DPI, SCA (WaterNSW), other resource managers and relevant technical specialists and seek advice in any CMA required

			<ul style="list-style-type: none">• Site visits with stakeholders if required• Review monitoring program and notify if necessary within 1 month• Implement increased monitoring if required within 2 weeks• Develop site CMA in consultation with key stakeholders within 1 month, (pending stakeholder availability) and seek approvals• Completion of works following approvals• Issue CMA report within 1 month of works completion• Conduct initial follow up monitoring and reporting within two months of CMA completion• Review the relevant TARP and Management Plan in consultation with key stakeholders. <p>NONE REQUIRED.</p>
--	--	--	---

References

BHP Billiton Illawarra Coal (2007) *Dendrobium Area 3B: Subsidence Management Plan*. An unpublished report for DPI

Biosis Research (2007) *Dendrobium Area 3 Archaeological and Cultural Heritage Assessment*. An unpublished report for BHP Billiton Illawarra Coal

Biosis Research (2012) *Dendrobium Area 3B Longwalls 9 to 18: Aboriginal Cultural heritage Assessment Report*. An unpublished report for BHP Billiton Illawarra Coal

Biosis Pty Ltd (2013) *Baseline recording of Aboriginal sites in Dendrobium Area 3B Longwall 9-18*. Report for BHP Billiton Illawarra Coal

MSEC459 REV B (Sept 2012) *BHP Billiton Illawarra Coal: Dendrobium Area 3B-Longwalls 9 to 18*. An unpublished report for BHP Billiton Illawarra Coal

Niche Environment and Heritage (2017) *Dendrobium Colliery Longwall 13 End of Panel Report - Aboriginal Heritage Assessment*. An unpublished report for South 32- Illawarra Coal