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Assessment of a Reported Ochre Quarry at Bylong

BYLONG COAL PROJECT
Environmental Impact Statement

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ASSESSMENT OF A REPORTED OCHRE QUARRY AT BYLONG, NSW.

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27 January 2016

SUMMARY

The reported ochre quarry OQ001 at Bylong was visited by Laraine Nelson (RPS) and Cassie Jones (Worley Parsons) and myself for assessment on the 20th January 2016.

No evidence of Aboriginal quarrying or other signs of use was detected and, consequently, it cannot be regarded as an archaeological site.

Whether or not the ochre seam was mined in the past was not able to be determined during the field visit. If any archaeological evidence of mining by Aboriginal people once existed, it has been destroyed by natural erosion and disturbances by animals.

The previous recording of the site by RPS suggests that the site was seen to be of significance to contemporary custodians, implying that it was a cultural site. The basis for this claim has yet to be documented. The ochre outcrop, however, would doubtless have been known to local Aboriginal people prior to, and possibly for some time after, European settlement of the Hunter Valley region. Where evidence exists, ochre outcrops elsewhere in Australia are invariably recorded as places of spiritual significance to local Aboriginal people, whether or not the ochre was quarried for pigment.

RECOMMENDATIONS

1. The outcome of the assessment of the ochre source should be discussed with the local Aboriginal community as part of the consultation process for the Aboriginal Cultural Heritage Management Plan. As an outcome, OEH should be advised of the findings with the AHIMS amended to reflect the revised assessment

2. Obtain a chemical signature of the red ochre from the site and also from the Bylong Valley Way road cutting outcrop. If the two signatures are identical, or at least geologically comparable, then this would imply that the seam is part of a larger ochre body running through the sandstone. This in turn raises the possibility that site OQ0001 may not be unique and that further similar outcrops may be present within the region. The results of the chemical analysis should then be made available to the Australian Museum, Sydney, for reference purposes as the seam (not necessarily at the exposure at site OQ0001) may prove to be the pigment source for rock art production within the broader region.

INTRODUCTION

In January 2016, the consultant was engaged by RPS Australia East Pty Ltd to provide an assessment of a reported archaeological site at Bylong, in the Mid-Western Region of NSW (Fig. 1).

The site (RPS site OQ001) was recorded as an ochre quarry during an EIS archaeological survey of the proposed Bylong Coal Project by RPS (RPS 2015:A3-14).

The inspection was undertaken on the 20th January with the assistance of Laraine Nelson (RPS) and Cassie Jones (Worley Parsons Services). The weather during the survey was fine and warm and no problems were encountered that hindered the assessment.

PROJECT BRIEF

The consultant was engaged to inspect the Ochre Quarry (*the site*) and conduct archaeological recording, management and mitigation advice and produce a report documenting this.

THE SITE

The location of the potential Ochre Quarry is at Bylong is 170 WNW of Newcastle (Figs 1-2). The site lies in the rugged landscape of the Great Dividing Range and within the Bylong State Forest (Figs 2-4). The geology of the area is described in detail by Cockatoo Coal Ltd (2014) and will not be elaborated here other than to note that the ochre seam occurs within an outcrop of the Triassic Narrabeen Group sandstone that overlies the Singleton Coal Measure of the Permian Shoalhaven Group. Underground mining operations of Coal Measure may therefore affect the overlying rock strata.

The site consists of a maximum one metre thick, horizontal seam of poor quality mottled red ochre, running some 80m along the base of a section of cliff line, some 20m above the adjacent valley floor (Fig. 5).

The red colour of the ochre seam varied vertically, being strongest at the top and bleeding down to mottled pink-grey clay (Figs 6 and 7). A narrow seam of high quality (smooth texture and pigment rich) yellow ochre (Fig. 6) topped the red ochre seam. A broader band of yellow outcrops at the southern end of the site but there it is not associated with any red ochre (Fig. 8). At this southern end, nodules of high quality fine grey-white clay (possibly kaolin) were imbedded in the sandstone above the ochre seams (Fig. 9). While the RPS report noted 'the presence of small niches…where ochre collection had occurred' (RPS 2015:A3-14), it did not provide any specific details of sizes or locations, nor any photographs indicating the 'quarried' areas.

The largest area of undercutting of the seam occurs near the centre of the outcrop (Fig. 10). The two deepest pockets of undercutting (A and B) are located at either end of this section (Figs 11 and 12). Profiles of each pocket were drawn from tape and compass transects.

Pocket A is a near horizontal cleft 2.5m deep and 0.3m high. The presence of shallow depressions at the rear of the resultant shelf testifies to its use by small animals as a shelter. Ochre extraction of this section by humans would have been very difficult given the

height of the pocket and, given the softness of the ochre-clay layer, it would have been easy to remove the floor of the cleft to a manageable level had this been desired.

Pocket B is 1.5m deep and sloping outwards from zero to 1m high at the outer limit of the overhang (Fig. 12). The shape of the profile is consistent with the natural erosion of a permeable sandstone layer beneath an erosionally resistant ironstone band (Washington and Wray 2011). This erosion pattern can be seen as an example of height restricted cavernous weathering (cf. Hughes 1978; Johnson 2007; Young et al. 2009). Cavernous weathering is conspicuous in most rock outcrops and cliffs throughout these sandstone ranges (Fig. 13).

The area shown in Plate 81 of the RPS Report was re-photographed during this assessment (Fig. 14), as it revealed continued granular disintegration of the pocket over less than 12 months: indicated by grains and fragments of yellow and white overlying the underlying red ochre that was exposed at the time of the RPS report. This suggests that any signs of ochre collection by Aboriginal people prior to the 20th Century, would not have survived and also that the rate of erosion of the seam is rapid in geological and even historical terms.

RESULTS OF THE ASSESSMENT

The lack of any archaeological evidence at the site of Aboriginal quarrying, or other related or ancillary Aboriginal activities, indicate that it cannot be classified as an archaeological site (Aboriginal quarry). This does not mean, however, that the site is not of archaeological interest (see below).

ABORIGINAL SIGNIFICANCE

The survey by RPS of the cliff line was undertaken with the assistance of local Aboriginal people who had an interest in the area (Laraine Nelson, pers. comm., Bylong, 2016). The RPS report claims that the site is of 'high significance' but is non-specific in its reasoning. The text then supplies what appears to be information supplied by the Aboriginal people present, although no acknowledgement is given to support the statements.

It should be noted that there is considerable ethnography and archaeology indicating the significance of ochre quarries and/or source in the existing Australian literature (e.g. Spencer and Gillen 1899; Smith 2013:276-282), and often preferred pigment was often sourced from particular sites, often many hundreds of kilometres away (McBryde 2000). In nearly all cases the sites had both mythological and spiritual significance.

DISCUSSION

The ochre seam at the site is doubtless due to the presence of ironstone banding within the sandstone bedrock and which are prominent in the cliff-face above the ochre seam (Fig. 15). Ochre is an oxide of weathered iron (red: haematite, yellow: limonite) or clays heavily permeated with iron oxides (American Geological Institute 1962). The resultant ochres range from smooth and lipstick-like in texture to coarse and sandy. A second horizontal seam of red ochre, of similar one metre depth and with a white (kaolin?) clay capping, was located within a road cutting on the Bylong Valley Way some 20 km south of the study area (Fig. 2 & Fig. 16). The red colour of this seam, however, is considerably stronger than that identified within the study area. The similar depths of the two seams suggests a geological

connection of a common seam and that, therefore, there are doubtless other exposure of the ochre throughout the region.

Ochre sources occur throughout Australia and, where ethnographic or anthropological evidence is available, they are invariably of high significance to local (and sometime far distant) Aboriginal groups. Many of these sources do not have archaeological facets; they do however, by their presence, greatly assist in informing the broader archaeological interpretation of the pre-colonial Aboriginal landscape.

The previous recording of the site by RPS suggested that the site was seen of significance to local Aboriginal people. If this is the case, then the site can be a considered a cultural site. To present the argument, however, the reasons for the sites significance need to be fully documented.

One of the important questions in rock art research is the origin of the ochres used (Huntley et al. 2011). By obtaining a chemical signature of the pigments here, it then becomes available for comparison with pigment analyses done on ochre sources and rock art elsewhere in the region; such as the art sites within adjacent Wollemi National Park (e.g. Taçon et al. 2011).

In relation to the future management of the outcrop, the collapse of sandstone cliffs in the greater Sydney region due to undermining by coalmines is well documented (e.g. Washington and Wray 2011:137). In 2014, a Subsidence Predictions and Impact Assessment for Bylong (MSEC 2014) found that:

> In general, rock falls are predicted to occur "in approximately 20% of the cliffs and visible mining subsidence movements in approximately 50% to 70% of the sandstone formations greater than approximately 3 metres high" (MSEC 2015).

From a geological perspective, remnants of the ochre seam will still be present (either buried or within a newly exposed face). From an archaeological perspective, the preservation of the site is not a concern. However, given the note above, the location and chemistry of the site may prove important in the future.

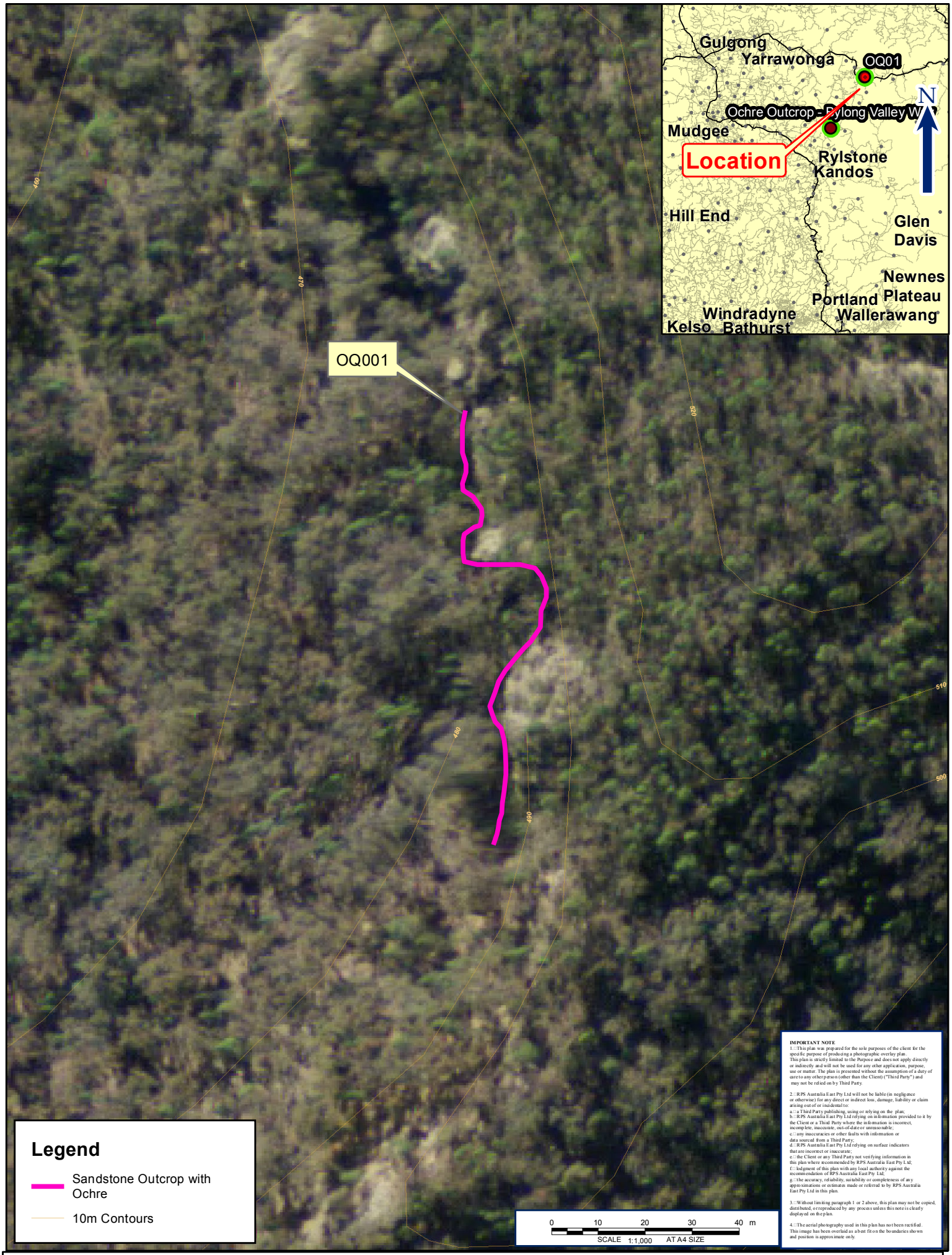
CONCLUSION

The lack of any archaeological evidence for quarrying at the site would warrant its exclusion as an archaeological site (Aboriginal quarry) under the *National Parks and Wildlife Act 1974*. Under the Act, a site comprises an Aboriginal object described as follows:

> An "Aboriginal object" means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

As the ochre deposit and immediate surrounds do not demonstrate any material evidence of Aboriginal habitation under the Act, it cannot be recorded on the OEH Aboriginal Heritage Information Management System (AHIMS) as an archaeological site.

However, the location of the ochre can be recorded on AHIMS as a cultural site, this designation reflects its significance to the local Aboriginal community.



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TITLE: Figure 1 - Location of Orchre Outcrop

LOCATION: Bylong NSW

DATUM: GDA94
PROJECTION: MGA Zone 56

Date: 5/02/2016
PURPOSE: Heritage

Technician: amy.obrien

CLIENT: Unspecified

JOB NO.: **PR113279**

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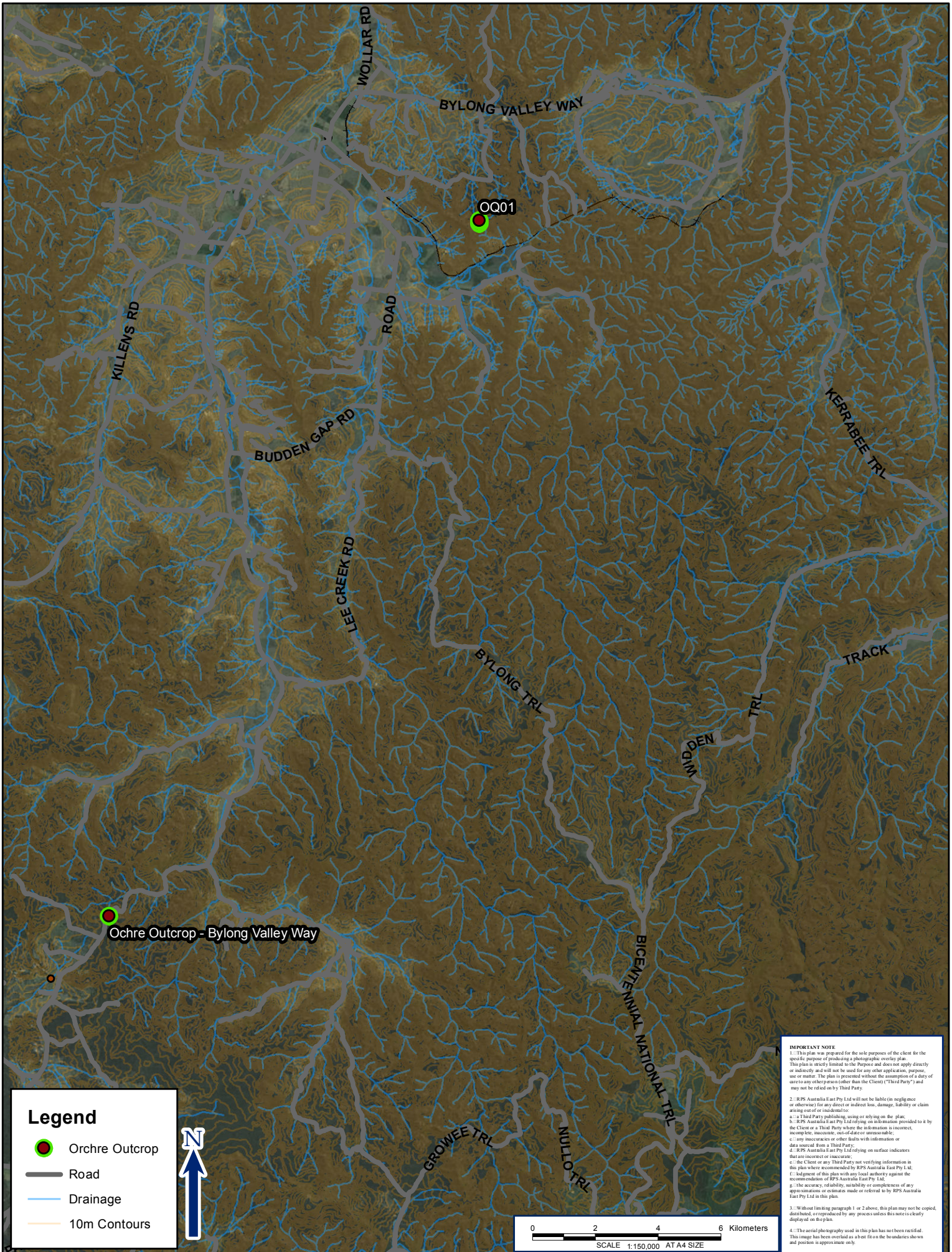

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TITLE: Figure 2 - Location of Orchre Outcrop and Orchre Outcrop on the Bylong Valley Way

LOCATION: Bylong NSW

DATUM: GDA94
PROJECTION: MGA Zone 56

Date: 5/02/2016
PURPOSE: Heritage

Technician: amy.obrien

CLIENT: Unspecified

JOB NO.: **PR113279**

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FIGURE 3: General view of the sandstone landscape approximately 20 km east of the study area

FIGURE 4: The location of the ochre outcrop from the west

FIGURE 5: Profile of the cliff wall with the ochre seam at its base

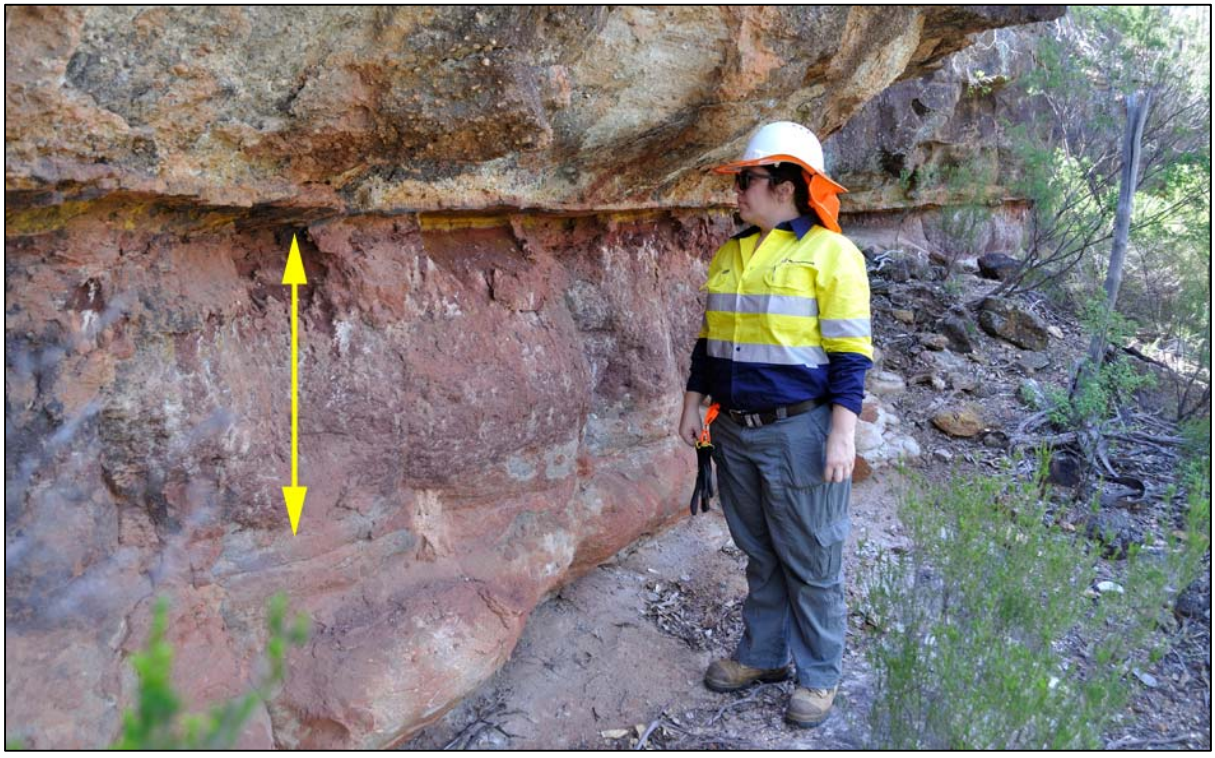

FIGURE 6: General view of the ochre seam

FIGURE 7: Upper yellow ochre layer above the mottled red and grey sandy-clay with red 'bleeding' from below the yellow layer

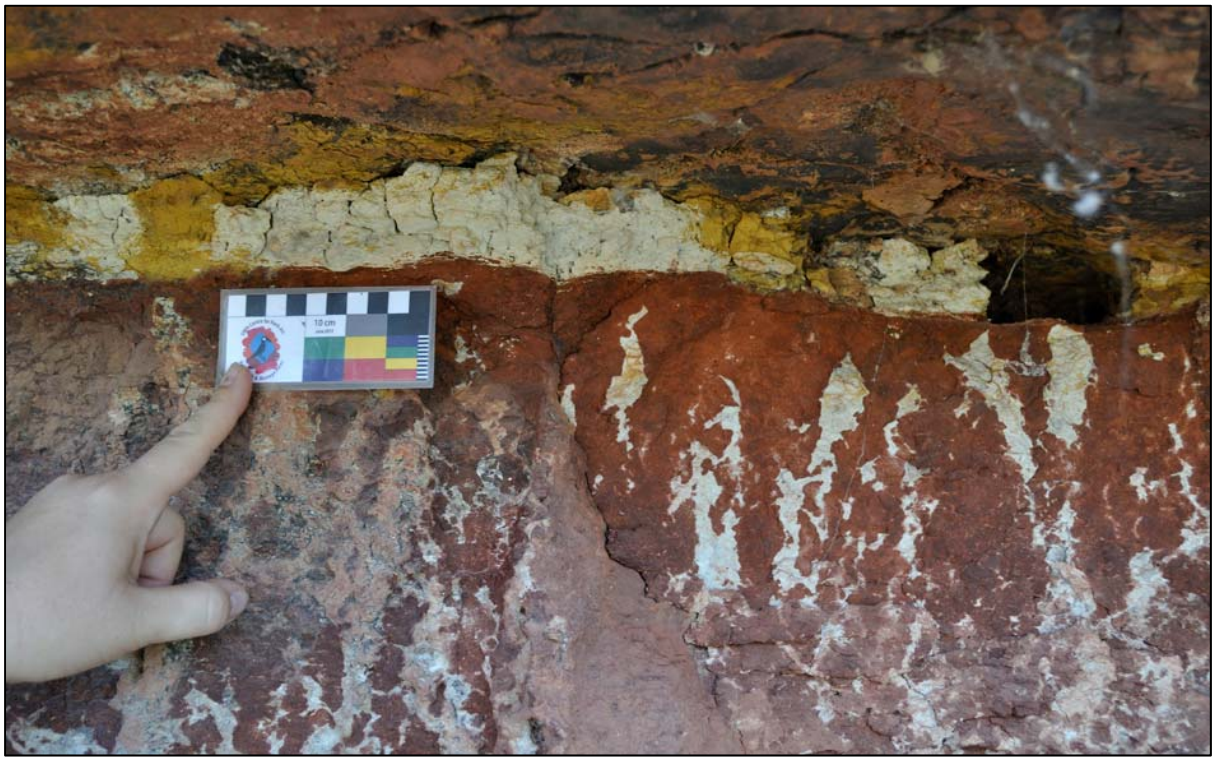

FIGURE 8: Detail of the red bleeding

FIGURE 9: Seam of yellow ochre at the southern end of the site

FIGURE 10: Nodules of soft and smooth grey-white clay within the sandstone

FIGURE 11: Main area of ochre erosion showing location of the two deepest pockets (A and B)

FIGURE 12: Fisheye-lens photograph of the Main area showing location of pockets A and B

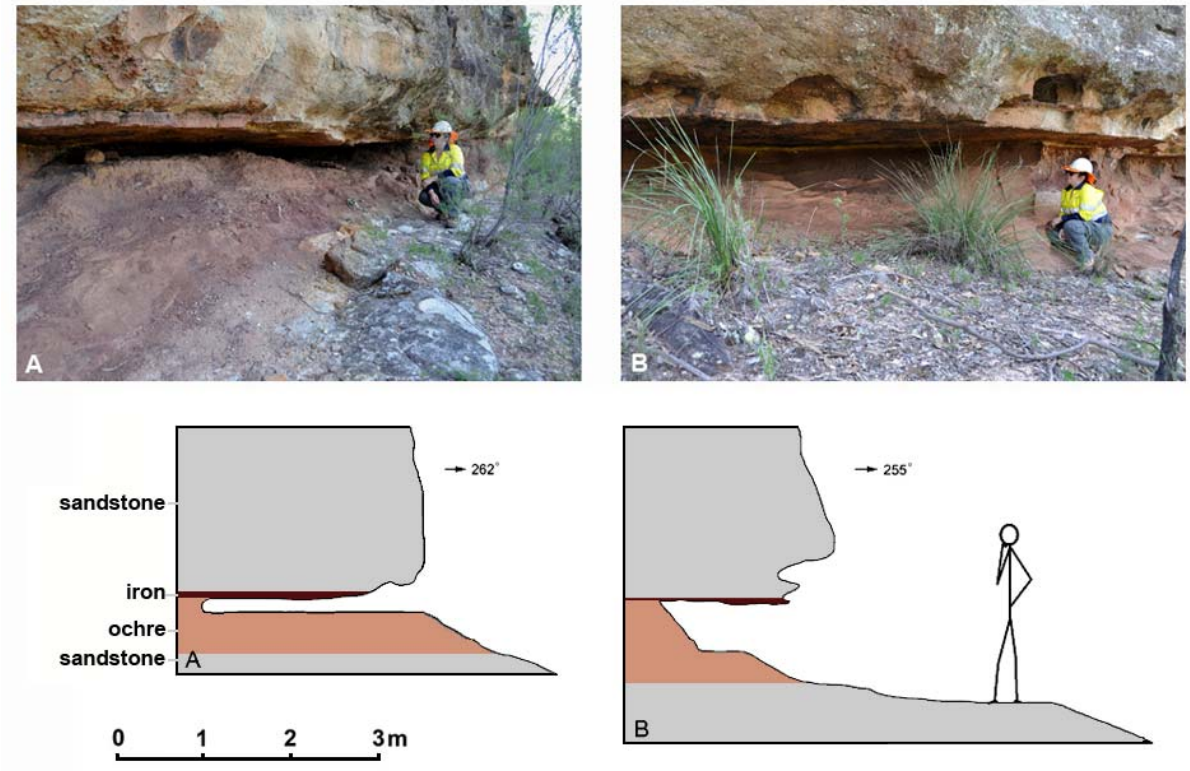

FIGURE 13: The two areas of deepest erosion at either end of the main erosion area

FIGURE 14: Conspicuous cavernous weathering in the sandstone cliffs some 20 km to the east of the study area

FIGURE 15: Re-photograph of the area of ochre highlighted in the RPS report

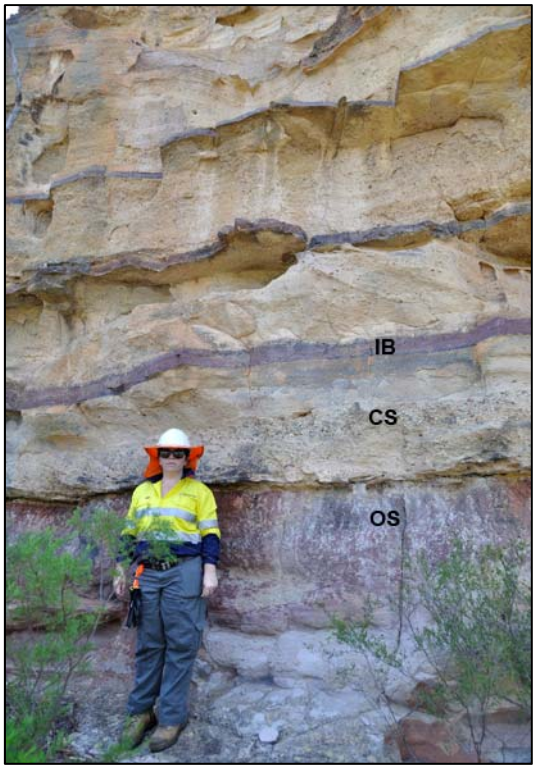

FIGURE 16: Horizontal bands of iron within the cliff wall
IB: Iron band CS: Conglomerate sandstone OS: Ochre seam

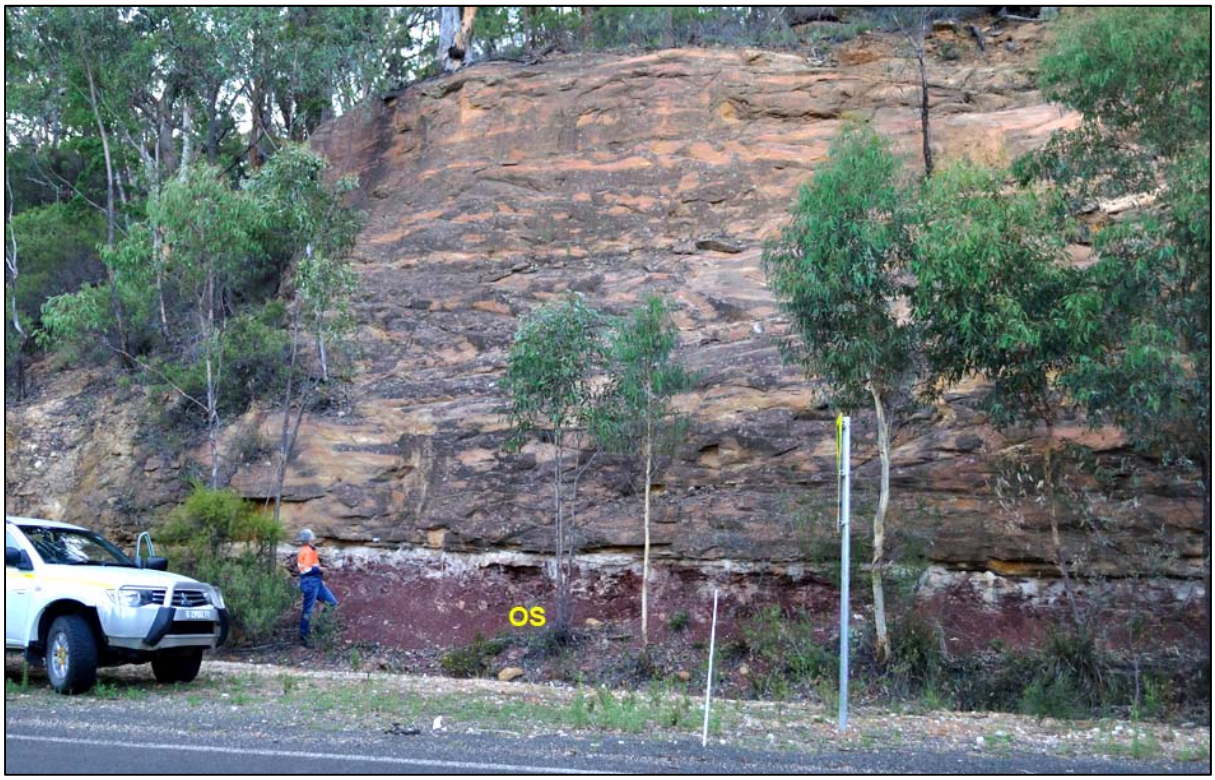

FIGURE 17: Red ochre seam (OS) capped by white (kaolin?) clay exposed in road cutting along Bylong Valley Way.

REFERENCES

American Geological Institute 1962 *Dictionary of geological terms*. New York: Dolphin Books.

Cockatoo Coal Ltd 2014 Bylong Coal Project: geology report. Report to Hansen Bailey, Brisbane. Accessed on 25.01.16 at http://www.hansenbailey.com.au/documents/bylong/Bylong_App_C_Geology_Report._pdf

Hughes, P.J. 1978 Weathering in sandstone shelters in the Sydney Basin and the survival of rock art. In C. Pearson (ed.), *Conservation of rock art*, pp: 36-41. Canberra: ICCM.

Huntley, J., A. Watchman and J. Dibden 2011 Characteristics of a pigment art sequence: Woronora plateau, New South Wales. *Rock Art Research* 28:85-97.

Johnson, A.R.M. 2007Cavernous weathering at Berowra, NSW. *Australian Geographer* 12(6):531-535.

McBryde, I. 2000 Travellers in storied landscapes: a case study in exchanges and heritage. *Aboriginal History* 24:152-174

RPS 2015 Bylong Coal Project Aboriginal Archaeology and Cultural Heritage Impact Assessment: Bylong Coal Project AACHIA. Report to Hansen Bailey, Brisbane.

Smith, M.A. 2013 *The archaeology of Australia's deserts*. Cambridge: Cambridge University Press.

Spencer, B. and F.J. Gillen 1899 *The native tribes of Central Australia*. London: MacMillan & Co.

Taçon, P.S.C., W. Brennan, and R. Lamilami 2011 Rare and curious thylacine depictions from Wollemi National Park, New South Wales and Arnhem Land, Northern Territory. *Technical Reports of the Australian Museum, Online* 23(11):165–174.

Washington, H.G. and R.A.L. Wray 2011 The geoheritage and geomorphology of the sandstone pagodas of the north-western Blue Mountains region (NSW). *Proceedings of the Linnean Society of New South Wales* 132:131-143.

Young, R.W., R.A.L. Wray and A.R.M. Young 2009 *Sandstone landforms*. Cambridge: Cambridge University Press.