NAMOI MINING PTY LTD

ABN: 24 071 158 373

Sunnyside Coal Project

via Gunnedah

Aboriginal Heritage Assessment

Prepared by

Archaeological Surveys & Reports Pty Ltd

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Specialist Consultant Studies Compendium
Part 7

Aboriginal Heritage Assessment

of the

Sunnyside Coal Project
via Gunnedah

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ASR

**This report has been compiled in 'Plain English',
but presented in a format suitable for developing policies
for the management of the cultural resources,
and as a basis for scientific reference
in future research studies.**

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EXECUTIVE SUMMARY

This investigation was performed for Olsen Environmental Consulting Pty Limited (OEC) on behalf of Namoi Mining Pty Ltd (NMPL), "the Proponent". NMPL contracted OEC to prepare an Environmental Assessment for the proposed Sunnyside Open Cut Mine. The proposed activities are permissible under the Gunnedah Local Environment Plan (LEP 1998), Zone 1(a) – Rural (Agricultural Protection) Zone.

The Project Site is centred on the "Sunnyside" property, approximately 15 km west of Gunnedah, Northern New South Wales. The Project Site is located just north of the Oxley Highway and west of Coocooboonah Lane. The roughly rectangular-shaped property is bounded by the Oxley Highway to the south, by Coocooboonah Lane to the north, and by shared property boundaries elsewhere. Mining and associated activities would be undertaken within Lot 1 DP 393755 and Lot 12 DP 755503. The Project Site is an area of approximately 231 ha.

The area investigated included a proposed coal transport route, commencing at the northern end of "Sunnyside" and running south-eastwards to the east and parallel to Coocooboonah Lane, to an intersection with the "Plain View" property access road, and then to Coocooboonah Lane, and continuing to the Oxley Highway. This re-aligned road would be located on Lots 162 and 163 DP 755503, which are part of the "Plain View" property owned by R. and C. Howarth.

The scope of works was for Archaeological Surveys & Reports Pty Ltd (ASR) to conduct an archaeological investigation of the Project Site and adjacent areas with the assistance of a representative/s of the Red Chief Local Aboriginal Land Council (LALC) and Bigundi Biame Gunnedarr Traditional People (Bigundi Biame), and to identify any Aboriginal sites and relics that might be present that might be a constraint to open-cut coal mining and associated activities. The results of the investigation were to be presented in a report, which was to include an assessment of the significance of any cultural relics or places identified, an appraisal of the options and opportunities arising from the discoveries, and clear recommendations for the management of those cultural resources.

Four sites were recorded during the investigation, an axe-grinding groove, two isolated artefacts, and an artefact scatter. Each of the four sites would be recorded on Site Recording Forms, which would be lodged with DECC for listing on the AHIMS Site Register. None of the sites would be directly impacted upon by the proposed mine and support facilities, however there is some potential for the axe grinding-groove site to be damaged by indirect or peripheral impacts from coal mining.

As none of the sites recorded during this investigation would require Section 87 or 90 Consents there is no cumulative impact to consider.

Red Chief Local Aboriginal Land Council and Bigundi Biame Gunnedarr Traditional People have recommended that the isolated artefacts and artefact scatter would be fenced for their protection, and that all turf stripping would be monitored. ASR considers that fencing the sites is unnecessary as the route for the proposed coal transport route has been revised since the

survey of "Sunnyside" was undertaken, and none of the three sites would be within 500 metres of the footprint of potential impacts from the mine and its infrastructure. ASR agrees that all turf stripping would be monitored.

However, the proposed open cut pit stops short of the escarpment where the increased depth of overburden would have made open cut mining uneconomical. Thus, while the axe-grinding groove is some distance away from the proposed open cut site, there is some potential for it to be damaged by fly-rock (from blasting), or by vibration or shock from blasting within the open cut pit.

Protection of the site from fly-rock during the operation of the mine could be achieved simply by way of a straw-bale 'blanket' placed over the site. While this would be a low-cost protective measure, the bales would need to be checked periodically to ensure that they were still in place and effectively protecting the site, as they would deteriorate under attack from both animals and the weather.

Perhaps of greater potential threat to the safety of the axe grinding-groove is the possibility that the rock on which the groove occurs could be damaged by sub-surface impacts, such as vibration from blasting, and the destabilisation of the ground rock. There is some potential for blasting to destabilise the escarpment to the immediate south of the open cut pit, and cause the rock on which the axe-grinding groove occurs to fall and fragment, or for the pit to undermine the escarpment and cause the collapse of the escarpment with a similar result to the axe grinding grooves, or for vibration from blasting to cause fracturing of the rock on which the groove occurs. Such issues need to be addressed by an appropriately qualified geotechnical expert.

ASR recommends that NMPL commissions an appropriately qualified geotechnical expert to investigate the potential for the proposed coal mining activities to cause damage to the axe grinding-groove, either by destabilising the rock on which it occurs, thus causing it to fall and fragment, and/or, vibration from blasting to destabilise the rock on which the groove occurs, and thereby causing it to fracture or fragment.

If the results of the geotechnical investigation show that there is a potential for damage to be caused to the axe grinding-groove then further consultation with the Aboriginal stakeholders would be necessary. And such consultation would need to be in accordance with the requirements of "Interim Community Consultation Requirements for Applicants (National Parks and Wildlife Act 1974 [as amended], Part 6 Approvals). The Proponent is advised that this procedure has the potential to add at least three months to the lead-time before Consent can be obtained from DECC.

The Proponent is also advised that in addition to the recommendations above, that under the obligations and provisions imposed by the National Parks and Wildlife Act 1974 they are obliged to comply with the provisions which state that:

- The owners, and their employees, earthmoving contractors, subcontractors, machine operators and their representatives, whether working in the survey area or elsewhere, would be instructed that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work would cease immediately in the area of the find.

- In the event that any bone cannot be clearly identified by a qualified archaeologist as being of animal remains the police are to be informed of its discovery, and officials and/or their representatives of the Red Chief Local Aboriginal Land Council, Bigundi Biame, and the Cultural Heritage Division, Western Directorate DECC, advised that the bone is subject to police investigation.
- Work would not recommence in the area of the find, until both the police (if bone has been found) and those officials or representatives have given their permission to do so. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the National Parks and Wildlife Act 1974, as amended.

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1 INTRODUCTION

This investigation was performed for Olsen Environmental Consulting Pty Limited (OEC) on behalf of Namoi Mining Pty Ltd (NMPL), "the Proponent". NMPL contracted Olsen to prepare an Environmental Assessment for the proposed Sunnyside Open Cut Mine and associated activities in accordance with Part 3A of the Environmental Planning and Assessment Act 1979. The proposed activities are permissible under the Gunnedah Local Environment Plan (LEP 1998), Zone 1(a) – Rural (Agricultural Protection) Zone.

1.1 Scope

The scope of works was for Archaeological Surveys & Reports Pty Ltd (ASR) to conduct an archaeological investigation of the Project Site and adjoining areas with the assistance of a representative/s of the Red Chief Local Aboriginal Land Council (LALC) and Bigundi Biame Gunnedarr Traditional People (Bigundi Biame), and to identify any Aboriginal sites and relics that might be present that might be a constraint to open-cut coal mining and associated activities. The results of the investigation were to be presented in a report, which was to include an assessment of the significance of any cultural relics or places identified, an appraisal of the options and opportunities arising from the discoveries, and clear recommendations for the management of those cultural resources.

1.1.1 Report Objectives

The objectives of this report are to describe the archaeological investigation of the Project Site and adjoining areas and to record the archaeological relics and sites that were identified. Further, the report documents the participation of the Red Chief LALC and Bigundi Biame in the field survey, and their recommendations as to the future management of the sites identified during this investigation. In addition, the report includes a discussion of the results of the investigation in the context of other known sites in the area. Finally, the report includes a statement as to the recommendations for the future development of the proposed Sunnyside Open Cut Mine.

1.1.2 Report Format

The report is presented in the following format.

i Executive summary
ii Contents

1. Introduction
2. Aboriginal consultation
3. The environmental context

4. The archaeological record
5. Models for site location
6. The survey
7. The results
8. Discussion: The results
9. Discussion: Potential Cumulative Impacts of the Project
10. Significance assessment
11. Management options
12. Recommendations.

1.2 The Project Site and Survey Area

The Project Site is centred on the "Sunnyside" property, approximately 15 km west of Gunnedah, Northern New South Wales. The Project Site is located just north of the Oxley Highway and west of Coocooboonah Lane. The roughly rectangular-shaped property is bounded by the Oxley Highway to the south, by Coocooboonah Lane to the north, and by shared property boundaries elsewhere.

Mining and associated activities would be undertaken within Lot 1 DP393755, and Lot 12 DP 755503. The Project Site is an area of approximately 231 ha.

Subsequent to the investigation of the survey area described above it became necessary to survey an alternative coal transport route. The proposed route was from the north-eastern corner of the "Sunnyside" property, running south-eastwards to the east of and parallel to Coocooboonah Lane, to intersect the property access road of "Plain View", and then continuing to the Oxley Highway. This route would be located on Lots 162 and 163 DP 755503, which are part of the "Plain View" property owned by R. and C. Howarth.

The Project Site represents the area of potential maximum surface disturbance associated with all mining related activities. **Figure 1** places the Project Site in its regional context while **Figure 2** places the "Sunnyside" property in its local setting. **Figure 3** shows the Project Site and **Figure 4** shows the Project Layout. **Figure 5** is a plan of the proposed re-aligned Coocooboonah Lane.

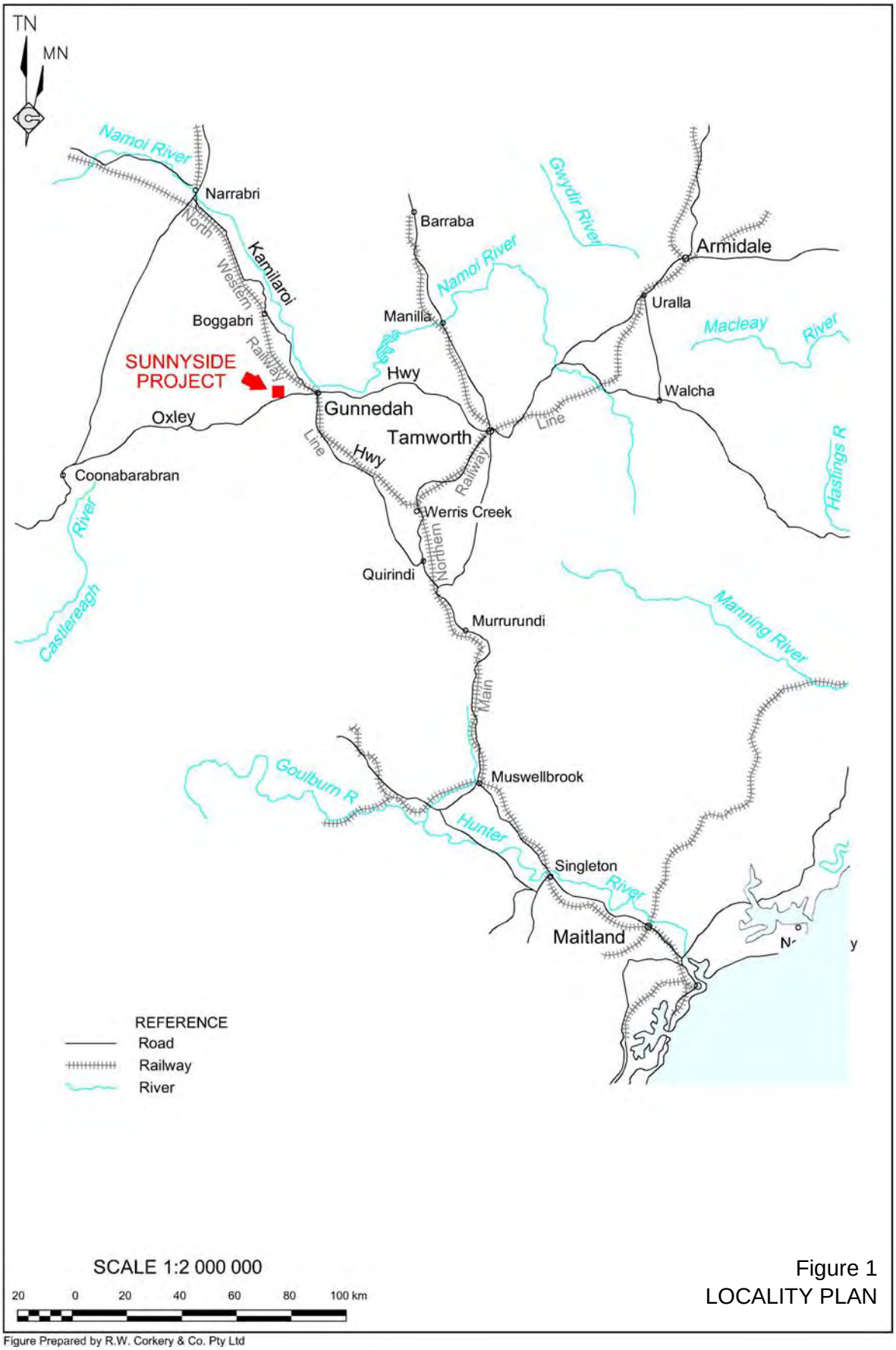

Figure 1
LOCALITY PLAN

Figure Prepared by R.W. Corkery & Co. Pty Ltd
Note: A colour version of this figure is presented on the Project CD

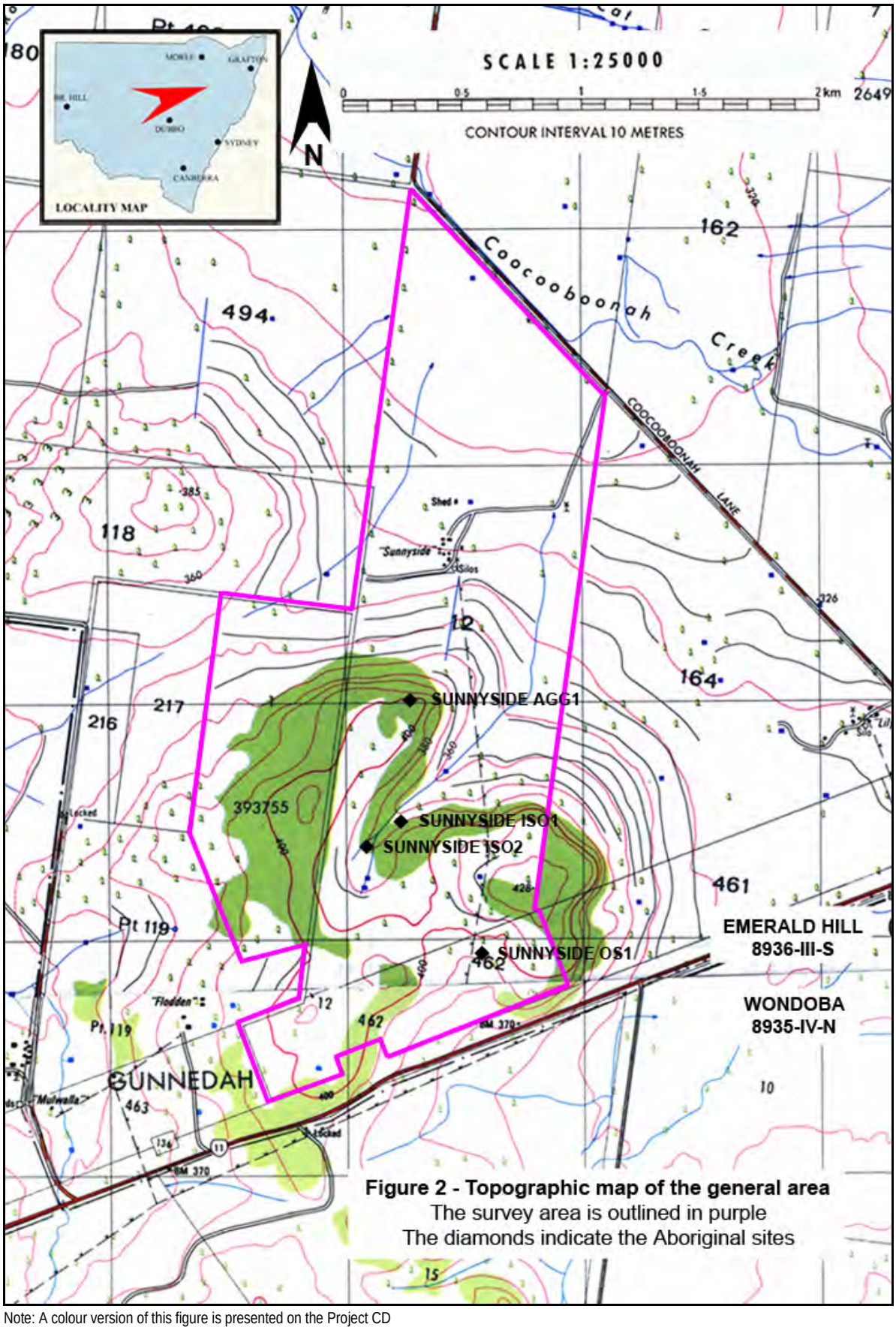

Figure 2 - Topographic map of the general area
The survey area is outlined in purple
The diamonds indicate the Aboriginal sites

Note: A colour version of this figure is presented on the Project CD

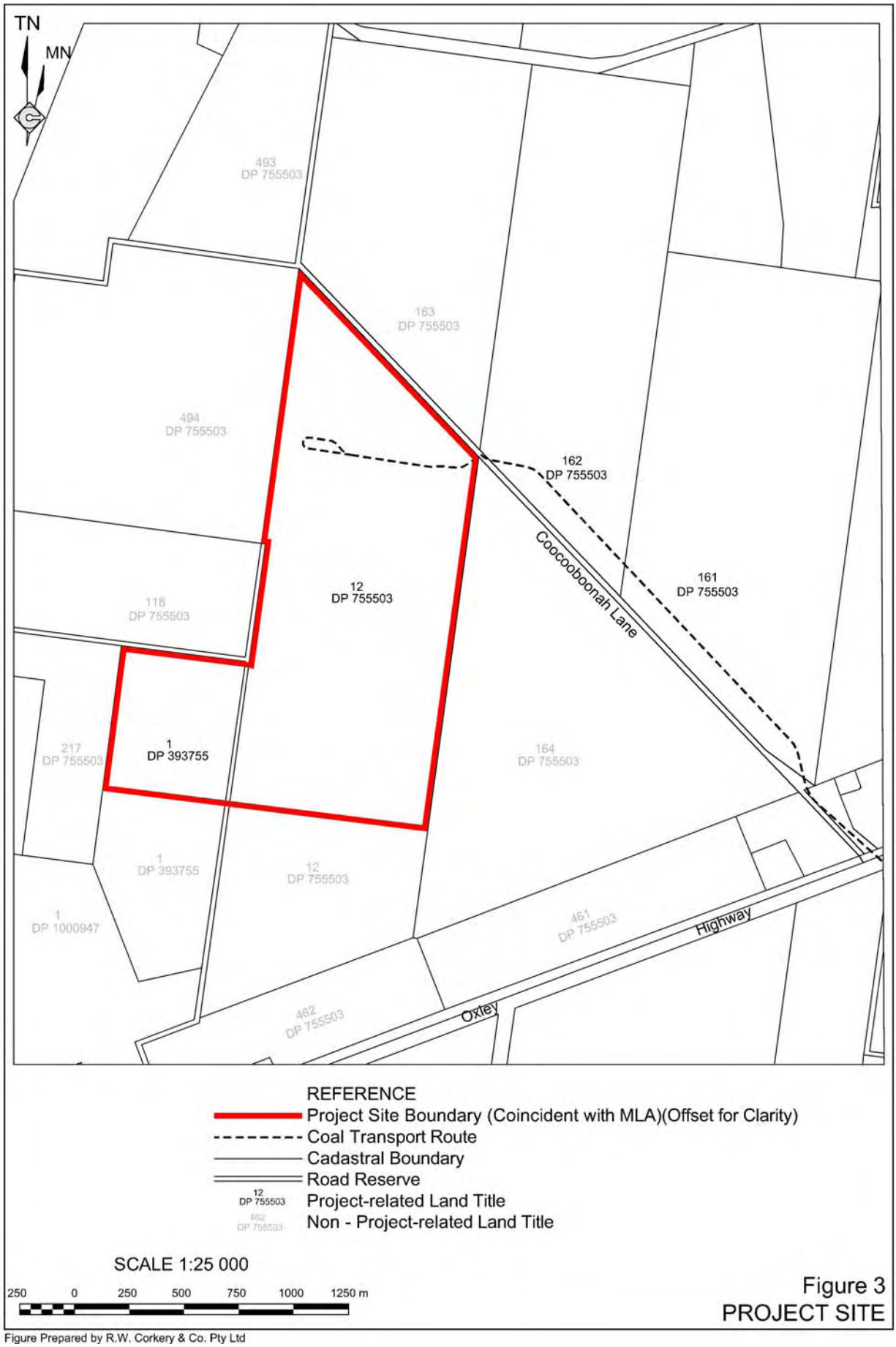

Figure 3
PROJECT SITE

Figure Prepared by R.W. Corkery & Co. Pty Ltd
Note: A colour version of this figure is presented on the Project CD

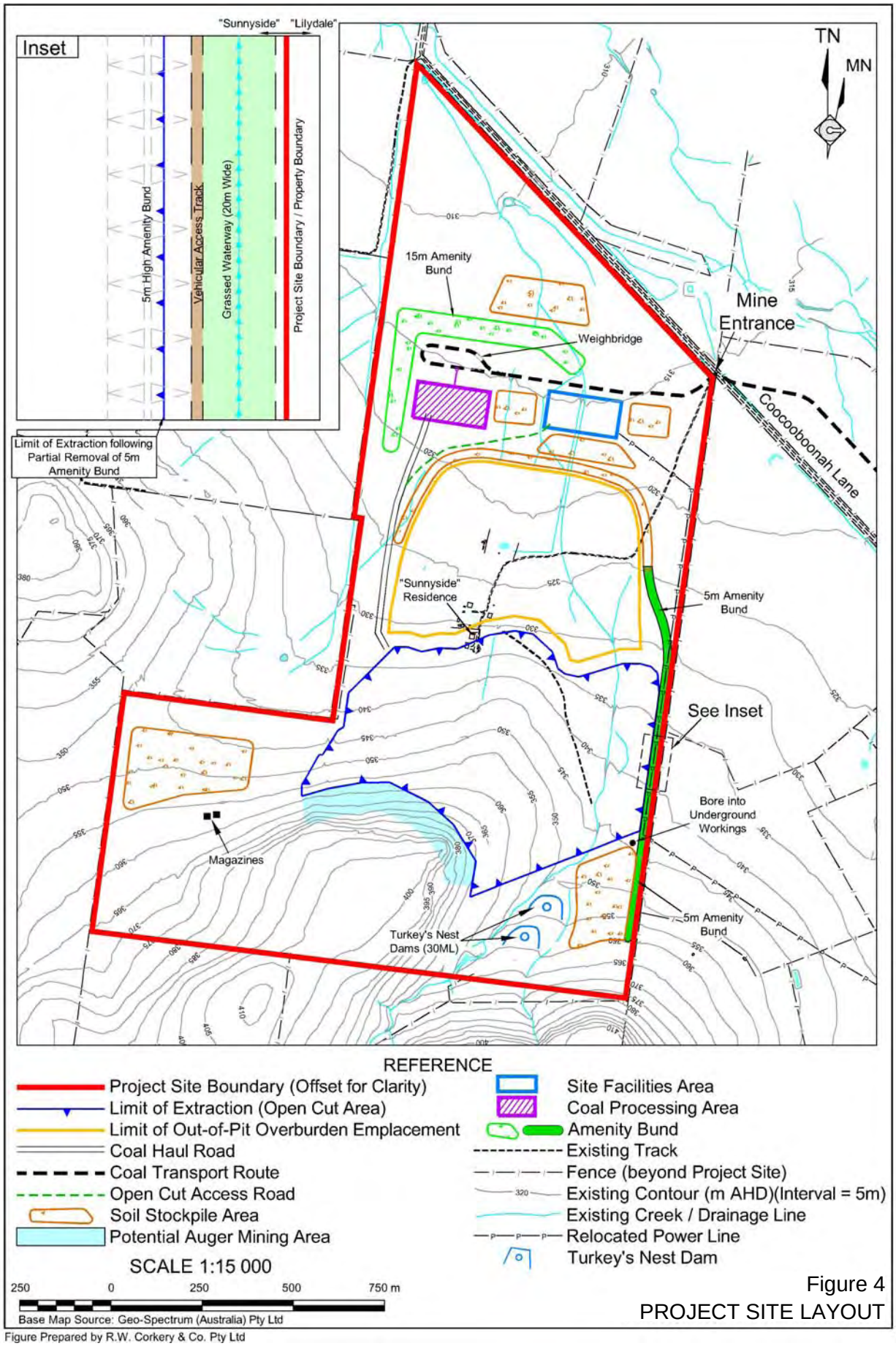

Figure 4
PROJECT SITE LAYOUT

Figure Prepared by R.W. Corkery & Co. Pty Ltd
Note: A colour version of this figure is presented on the Project CD

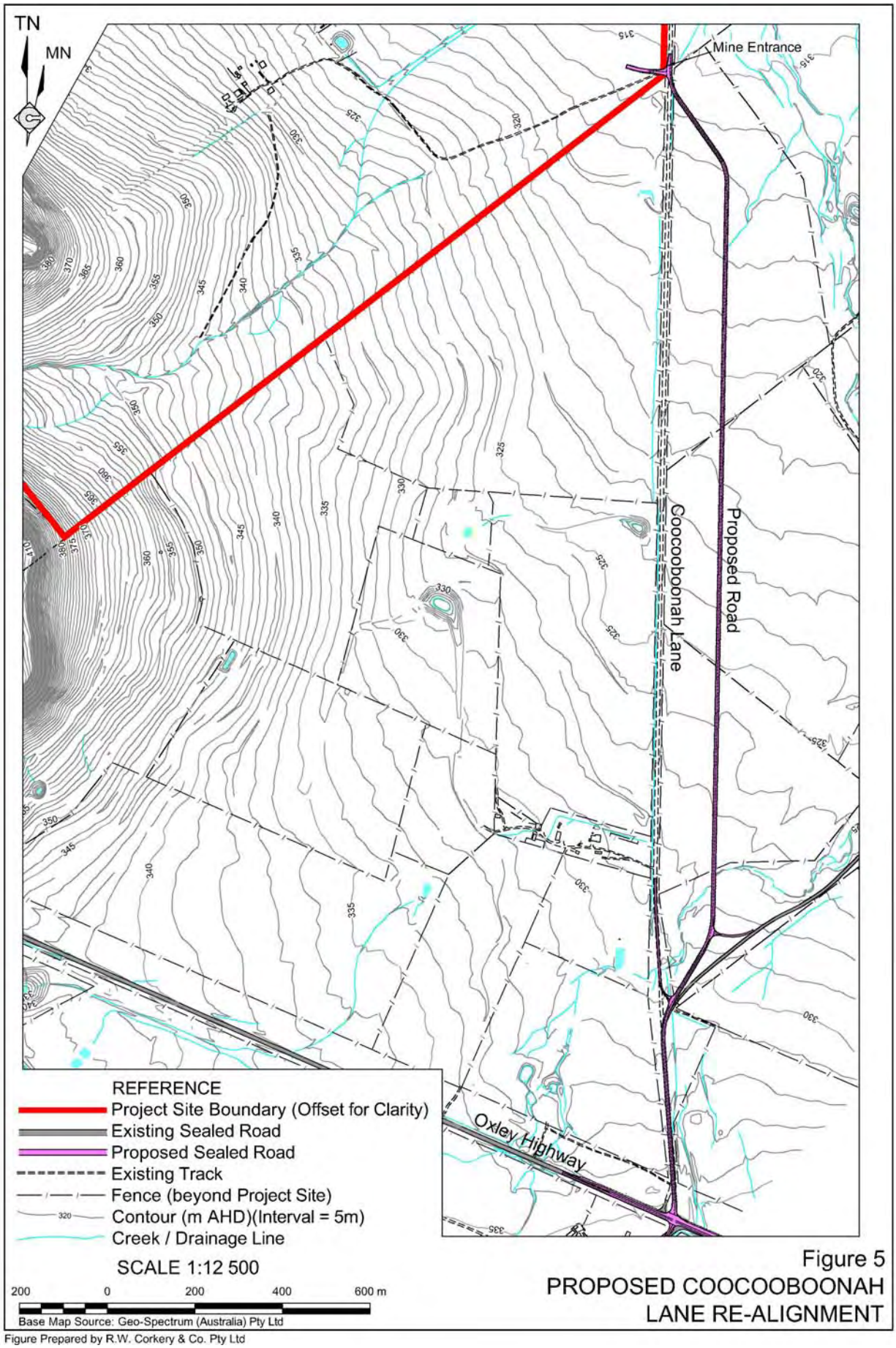

Figure Prepared by R.W. Corkery & Co. Pty Ltd
Note: A colour version of this figure is presented on the Project CD

1.3 Potential Impact of the Proposed Mine

The provisional concept plan for the Project provides for the following.

- A re-aligned section of road from the north-eastern corner of the "Sunnyside" property, running south-eastwards to the east of and parallel to Coocooboonah Lane, to intersect the property access road of "Plain View", and then continuing via Coocooboonah Lane to the Oxley Highway.
- A mine access road between the site facilities and Coocooboonah Lane.
- Coal mining would be by conventional open cut methods and potentially by highwall auger mining, over an area of approximately 43 hectares.
- After ramp establishment, mining would commence from a box cut area and then progress towards the east.
- The initial overburden from the box cut would be hauled to an out-of-pit emplacement area to the immediate north of the box cut. Subsequent overburden from progressive strip/block mining would be progressively placed in the box cut and later, into and over formerly mined areas of the open cut.
- Facilities would be established onsite within the Project Site for the ROM coal crushing, blending and temporary stockpiling of an unwashed thermal coal product.
- Facilities to be installed on the Project Site would include:

  Transportable offices, bath-house, crib room, fuel and lubricant storage facility, stores and first aid buildings, workshop facility, equipment lay-down and park-up area, light vehicle car park for the projected workforce of approximately 24 full-time and 7 part-time persons.

There is a potential for any archaeological contexts occurring within the footprint of any of the above to be severely impacted upon.

As a consequence of this survey, it is unlikely that the same area would ever be surveyed again, thus from an archaeological perspective, this was an opportunity to observe and record any sites that might be present, and to propose a strategy for the management of any known or potential archaeological and/or cultural material in the future development of the area.

2 ABORIGINAL CONSULTATION

Prior to the investigation, ASR contacted the Red Chief Local Aboriginal Land Council (Red Chief LALC) and Bigundi Biame Gunnedarr Traditional People (Bigundi Biame) to arrange for sites officers to assist in the survey. As a consequence, Greg Griffiths, representing Red Chief LALC, and Matthew Draper representing Bigundi Biame assisted in the survey of "Sunnyside", which was undertaken on 12th September 2006. Neither of the Aboriginal representatives was aware of any specific Aboriginal associations with the Project Site and adjacent areas.

Both prior to and during the survey, Griffiths, Draper and Appleton (ASR) discussed the potential for particular site types to be present, and the particular environments in which they might occur.

The survey strategy and results were considered and discussed throughout the survey and at the completion of each survey transect or survey unit. At the conclusion of the survey, the results were discussed with particular attention paid to the sites that might be impacted upon by the proposed mining activities. Finally discussion was focussed on the recommendations that both Griffiths and Draper would present to their respective groups for deliberation.

Copies of the reports and recommendations subsequently received from Red Chief LALC and Bigundi Biame are included as **Appendices i, ii**, and **iii**.

The survey of the proposed coal transport route was undertaken on 7th December 2006. Les Field, Sites Officer, Red Chief LALC, assisted Appleton in the survey. Both prior to and during the survey, Field and Appleton (ASR) discussed the potential for particular site types to be present, and the particular environments in which they might occur. Finally discussion was focussed on the recommendations that Field would present to the Land Council for deliberation.

Subsequently, a report of the survey was received from Red Chief LALC, a copy of which is included as **Appendix iii.**

3 THE ENVIRONMENTAL CONTEXT

Any discussion of the likely presence of Aboriginal cultural remains or of the basis why such remains might be discovered must be within the context of the environment and the resources that would have been available to any Aboriginal occupants of the area.

3.1 The General Geology and Topography

The Project Site occurs within the Sydney-Bowen Basin, a major structural basin, which extends from Batemans Bay in the south, to Collinsville, Queensland in the north. The New South Wales portion of the basin is divided into northern and southern sections by a transverse structural high to the north of Narrabri. The southern section of the Sydney-Bowen Basin has been divided into two lower category structural basins, the Sydney Basin and the Gunnedah Basin (Menzies 1974). The study area occurs in the Gunnedah Basin.

The geological structure in which the proposed Sunnyside Coal Mine would be located occurs in the central section of the Gunnedah Coal Basin, which occurs in the eastern half of the Gunnedah Basin, and extends from just north of Narrabri south-eastwards to Murrurundi (Menzies 1974).

The Project Site generally is dominated by a group of four hills connected by ridges and saddles that occupy the southern half of the Project Site. To the north the landscape descends over a steep, sometimes cliff-like scarp down gently undulating slopes to the edges of the Coocooboonah Creek floodplain, that dominates the northern third of the Project Site.

The soils in the study area vary from the almost stoneless floodplain soils that extend northwards from about 325 m AHD to the northern boundary, to the lag conglomerates and colluvial soils that predominate the soils on the slopes between 325 m AHD and 360 m AHD. Above 360 m AHD the landscape is dominated by outcropping conglomerate bedrock, overlain by ridges and summits of 'trap' or metamorphosed sedimentary rock. In addition, there are several piles of boulders, each up to a metre in diameter, on the saddle between the two southernmost hills. The boulders appear to be of granite or of igneous origin, but there is no evidence of either occurring as bedrock on the saddle, which is composed of weathered 'trap'. This may indicate that the boulders gravitated from the summits of the hills to either side (which were not investigated).

The proposed coal transport route occurs on a level flood plain or valley floor of loamy soils. The surface soils along the route vary slightly from north to south, but in part, reflect recent land use. The route crosses through three paddocks. The first or northernmost paddock contains a low-density lag deposit of angular conglomerate pebbles in an amorphous loamy matrix that has been regularly ploughed and sown with lucerne. The central paddock contains very little conglomerate material, but has also been regularly ploughed and sown with an unidentified feed crop. The third and southernmost paddock similarly contains very little stone, but appears to have been deep-ploughed and the surface is mostly very uneven and the exposed deposits tend to be chunky and clayey, and there is no clear evidence of a crop having been sown.

The outcropping conglomerates and the lag conglomerates on the hill-slopes on "Sunnyside" would have provided an abundant source of material for Aboriginal people, suitable for knapping into stone tools and implements, however as the description of the artefactual material below indicates the preferred material comprised of very siliceous material such as agates and chalcedony – both of which were available as pebbles in the conglomerates.

3.2 Vegetation

The bulk of the Project Site and at least 50% of the "Sunnyside" property has been cleared for pasture, and the bulk of the vegetation that remains occurs on the steep slopes where there was very little topsoil that would support pasture.

From the evidence of the surviving vegetation and from observations made of surviving vegetation on adjacent properties the natural vegetation of the area would have consisted of open dry sclerophyll woodland, with cypress on the steep slopes where there was little topsoil and groundwater. In terms of its usefulness to Aboriginal people it is unlikely that the vegetation within the Project Site and adjoining areas contained potential resources that could not have been found elsewhere within the general area.

3.3 Water Resources

Despite the presence of a deeply incised gully descending north-eastwards from the southern group of hills no reliable water resources were observed within the Project Site and adjoining areas. While the steepness of the slopes would have ensured that there was good run-off after heavy rain, very little of the run-off would have been 'captured' within the gully and it would have flowed quickly down onto the Coocooboonah Creek floodplain. However, the presence of artefacts adjacent to the gully suggests that people used the gully and probably soon after rain, when there was still some seepage or spring water at the head of the gully.

3.4 Stone Resources

As referred to previously there was an abundant source of stone in the form of conglomerates suitable for knapping into tools or implements within and adjacent to the Project Site, which would have included quartz, quartzite, jasper, chert, igneous rock, and highly siliceous material such as agate and chalcedony.

3.5 Previous Impacts

The photographic record shows that the Project Site and adjoining areas have been subject to several impacts. In addition to the areas cleared for pasture there was evidence for periodic logging of the ridges and slopes, either for strainer posts or for firewood. A large area around the homestead had been 'landscaped' and modified for numerous farm buildings, silos, barns and yards in addition to the homestead. Upslope of the homestead the slopes had been heavily contoured. Elsewhere there are a number of vehicle tracks and fencelines, and at least five dams had been constructed on the property to trap the little run-off there was.

As described above the proposed coal transport route occurs in three cleared paddocks, and the only extant vegetation comprises a ribbon of regrowth along Coocooboonah Lane.

4 THE ARCHAEOLOGICAL RECORD

The result of the search of the Aboriginal Sites Register (Aboriginal Heritage Information Management System – AHIMS) for all sites within the references Eastings 222000-223000, Northings 6562000-6572000 found that no sites had previously been recorded within the 100 square kilometre search area. A copy of the results of the search is included as **Appendix iv**.

The absence of sites, however, would not be seen as being indicative of the typical distribution and density of sites in the region, but merely indicates that no previous archaeological investigations have taken place in the area. Sites are generally recorded during investigations required to comply with Development Applications or to meet local or state government statutory requirements, and so in an area in which the only 'development' since 1979 (when the Environmental Planning & Assessment Act was enacted), has been the installation of optic fibre cable in the Oxley Highway road easement there have been very few opportunities in which sites might be observed and recorded.

5 MODELS FOR SITE LOCATION

5.1 Site Types and their Location

In order to design an investigative strategy, it is firstly necessary to develop a predictive model for site location. This is not to determine where the investigation would be conducted, but to establish a theoretical model for the distribution of archaeological material against which the effectiveness and subsequent analysis of the survey results can be tested, compared and reasoned. The basis upon which the predictive model is derived must, however, be one of consideration of which archaeological material might realistically be expected to not only be present, but also detectable.

The first objective of any archaeological investigation must be to observe and record sufficient of the archaeological record that is present to be able to propose that it is representative of the record as a whole. The investigative strategy is therefore directed and designed to detect that which is representative of the record in the particular study area, and naturally, as different study areas would comprise variations in environment, vegetation, topography, etc., so the investigative strategy must be designed to best suit the circumstances. The objective must be to detect material evidence, and so it is necessary to consider the extent to which artefactual material may be present, and the degree to which it is visible or might be discovered.

There are several factors, which are likely to affect, firstly, where Aboriginal people are most likely to have been, secondly, where they have left evidence of their activities, and thirdly, the degree to which that evidence is observable in the present record.

People visited places mainly to obtain resources, and in general places that were richest in resources were more likely to have been visited by people than those places with fewer resources. Important resources were permanent water, ephemeral water, food resources, stone raw material sources, shelter (from sun, wind, and rain), and perhaps suitable surfaces for rock art, and proximity to mythological natural features. Those resources may have been a factor in the suitability of a location for particular ceremonial activities but cultural boundaries also influenced the choice of ceremonial grounds. Alternatively, sites frequently occurred along preferred access routes and particularly where that route coincided with a watercourse.

However, the attractions of such an environment frequently resulted in the archaeological record becoming discontinuous or significantly disturbed, as stock and vehicles impacted upon it in the post-European contact phase.

Frequency of visits and use of particular locations was also determined by the ‘accessibility’ or freedom from environmental constraints in the area. For example, whether there were alternative, preferred or easier ways to travel around or over natural barriers, be they geological, geographical, cultural, or imposed by fauna or flora, or whether they were only seasonally accessible, such as mounds on flood terraces, or the availability of water during periods of drought, or whether or not floods, fire or snow hindered access.

Few past Aboriginal activities are represented by surviving material evidence. This in part is because many activities did not leave material evidence (eg. tools were reused), but it is also because very little cultural material survived. An exception to this was shellfish, which was very durable.

The survival of material that is durable was also affected by recent European land use. Cultivation has destroyed many archaeological sites. However, cultivation can also help expose sites that might otherwise be covered. This brings us to the other important point about site distribution, which is that to a great extent site distribution recorded by archaeologists reflects the distribution of places where the ground surface is sufficiently eroded to expose artefactual material.

By far, the majority of recorded sites have been stone artefact scatters or isolated stone artefacts, and in the vast majority of sites they were found in one or more of the following contexts:

i) On or adjacent to deposits containing quartz, quartzite, jasper, silcrete, chert, chalcedony, metamorphosed greywacke, and other indurated or siliceous sedimentary rocks, or redeposited fine-grained volcanics, or

ii) On river banks or adjacent to river banks where the watercourse contains river pebbles of quartz, quartzite, jasper, silcrete, chert, fine-grained volcanics, basalts, etc., and particularly at the junctions of watercourses, or

iii) On ridges and spurs overlooking watercourses or on high vantage points affording uninterrupted views of swamps, water holes, saddles, passes, and any other likely access path into the observer's area, or

iv) In the vicinity of outcrops of suitable raw material such as basalt, silcrete, chert, or other highly silicified sedimentary rock.

Other site types do occur and perhaps because of their lower and less predictable profile, are present in far greater numbers than we are aware of. People die but there are few recorded burials. One reason may be that in many instances the soils are too acid for the preservation of bone, but a far more likely reason is simply that burial frequently entailed subsurface internment, and a surface survey would only discover a burial where there has been erosion of significant disturbance to the surface deposits. As a consequence many burials have only been discovered when exposed by erosion of a sand body or river terrace.

Other site types such as carved trees, scarred trees, stone arrangements, Bora rings, etc., may once have been present, but are unlikely to have survived in easily accessible country from the attention of non-indigenous people. Thus, much of what might have existed is now lost or destroyed, and the archaeological record has become biased by the post-contact utilisation of resources, and by the selective exploitation and preservation of particular environments.

Other factors which affect the degree to which sites are recorded during an investigation include the time of year at which the fieldwork is performed (the seasonality of some vegetation growth) and the conditions under which the survey is performed – (wet, dry, cold, windy, poor light, etc.).

A brief description of site types such as isolated artefacts, open scatters, camp sites, knapping floors, quarries, middens, mounds, hearths, carved trees, scarred trees, stone arrangements, Bora rings, burials, engravings, paintings, grinding grooves, occupation deposits (and PADs), and ceremonial and mythological sites is included as **Appendix v**.

5.2 A Predictive Model for the Study Area

Based on all of the above, the following model for site distribution was proposed for the study area, in which there was no reliable water source. However, there was a potential for shelters or overhangs to occur, and an abundance of stone material, and exposed sandstone surfaces, and hills providing excellent vantage points from which to monitor the movements of both other people, and potential animal food resources:

- Isolated artefacts may be present and visible in erosion features
- Low-density artefact scatters may be present and visible in erosion features, but it is unlikely that any debitage (see glossary) would be visible
- There is a potential for trees more than 150 years old to exhibit scarred surfaces
- There is a potential for any trees more than 150 years old to exhibit carved surfaces
- There is a low potential for shelters and associated occupation deposits to exist.
- There is a potential for engravings, and/or grinding grooves to occur wherever there is suitable outcropping sandstone.
- There is some potential for PADs to occur.
- There is little potential for art sites to occur as the conglomerates provide poor surfaces on which to paint or draw.
- There would be no obvious stone quarries primarily because the loose stone can be collected from the surface as pebbles.
- There would be no shell middens
- There would be no visible evidence of burials
- There would be no surviving Bora rings
- There would be no surviving stone arrangements
- There are no known cultural associations with the area.

6 THE SURVEY

6.1 The Survey Strategy

Prior to the investigation, it had been proposed to fully investigate the entire “Sunnyside” property and Project Site on foot. But on arriving at the Project Site it soon became clear that as the floodplain area in the northern section was under new pasture, and as the proposed footprint did not extend that far north that it would only be necessary to inspect the edges of the paddocks in that section, where there was some ground exposure.

Similarly, when we reached the cleared areas in the south-western section, and the area from the southern saddle to the Oxley Highway, we found that the grass cover allowed for only very poor archaeological visibility, with the consequence that we concentrated on the few exposures there were at the edges of the cleared area, along contour banks, scalds and stock pads.

For the most part the investigators walked three abreast, approximately 20-40 metres apart, targeting exposures such as tracks, stock pads, dams, contour banks, scalds, and areas of disturbed soil. And while theses features frequently occurred in environments in which it had been predicted sites were most likely to occur, the environments in which it had been predicted sites were least likely to occur, were inspected in travelling between the targeted areas.

For the investigation of the proposed coal transport route the two investigators walked the route from north to south, approximately 10-15 metres apart, returning on a parallel path, thus covering a strip approximately 60 metres wide.

6.2 Details of the Survey

The field investigation of "Sunnyside" took place on 12th September 2006. Appleton (ASR), assisted by Greg Griffiths representing the Red Chief LALC, and Matthew Draper representing Bigundi Biame, undertook the survey.

Mr David West, Project Manager, met us on site and briefed us on the proposed project, pointing out the areas of potential impact etc.

The survey was made on foot, in dry conditions, in light ideal for observing any artefactual material present and observable. All of the areas shown shaded in pink in **Figure 6** were surveyed on foot. The figure shows the effective survey coverage based on the assumption that most artefactual material if exposed and visible can be observed for up to 5 metres to either side of the path of the observer. Clearly, this would vary significantly between a path walked through dense vegetation, and a path across a claypan, and is given as a guide only.

The field investigation of the proposed coal transport route was undertaken by Appleton (ASR) and Les Field representing Red Chief LALC on 6th December 2006.

The survey took place on hot, dry conditions, in light ideal for observing any artefactual material present and observable. All of the areas shown shaded in pink in **Figure 7** were surveyed on foot.

6.3 Site Recording

All relevant observations as to the topography, vegetation cover, and conditions, were recorded in a field-log, and photographs taken with an Olympus Camedia C-3030 Zoom Digital Camera, to record the character of the survey area, and to witness survey conditions. The site references were recorded using a Garmin "etrex" hand-held Global Positioning System (GPS).

6.4 Effectiveness of the Survey Technique

There was a dense groundcover throughout most of "Sunnyside", however there was good archaeological visibility in those areas in which it had been predicted sites were most likely to occur, such as along the creek banks, the southern saddle, and immediately below the 'cliff line' or vertical scarp.

As a consequence of the differences in archaeological visibility of the ground surface some environments were more effectively surveyed than others, but the survey took in all of the environments, landforms, soil and vegetation types and provided a broad sampling of the entire "Sunnyside" property and the Project Site.

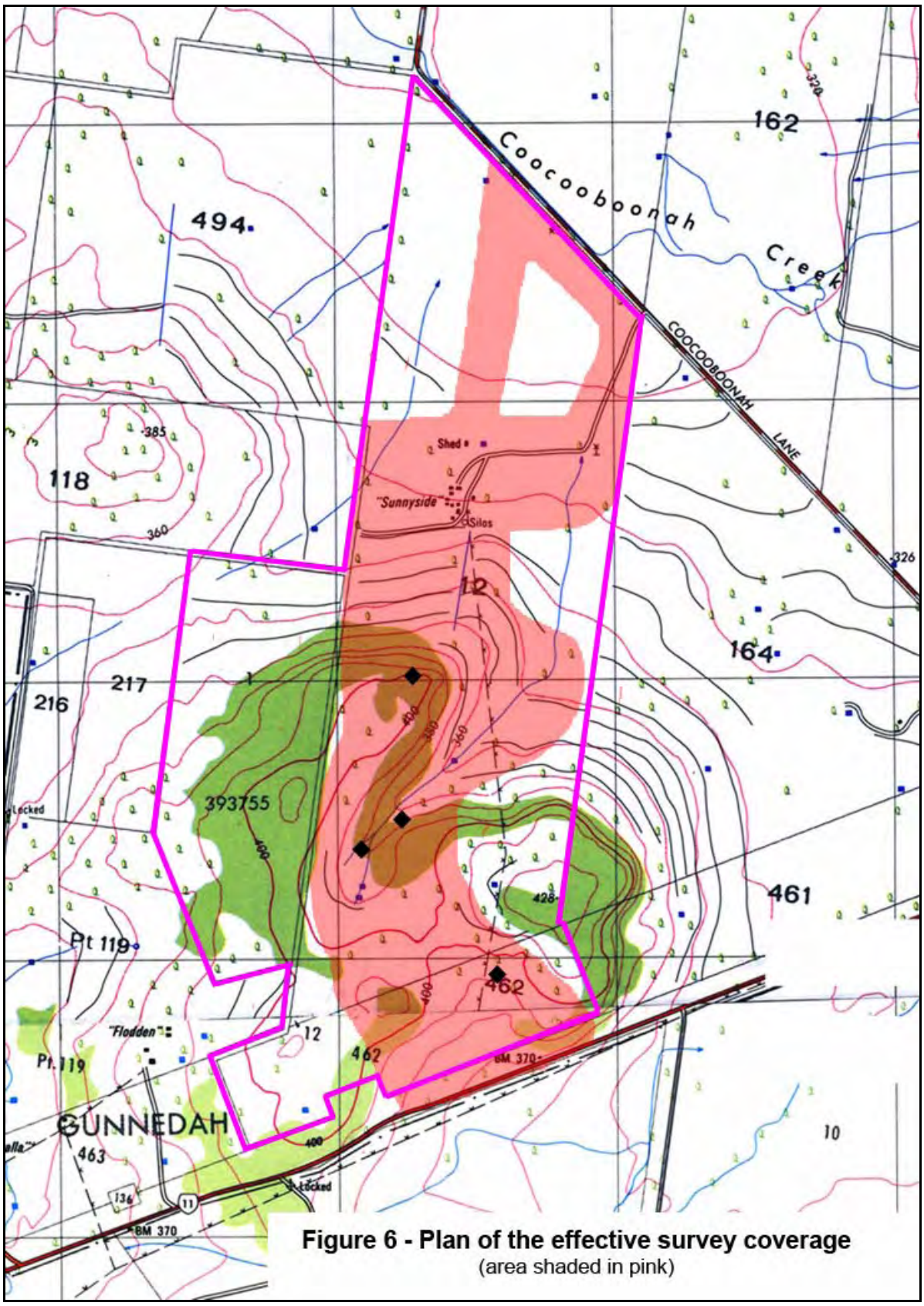

Figure 6 - Plan of the effective survey coverage
(area shaded in pink)

Note: A colour version of this figure is presented on the Project CD

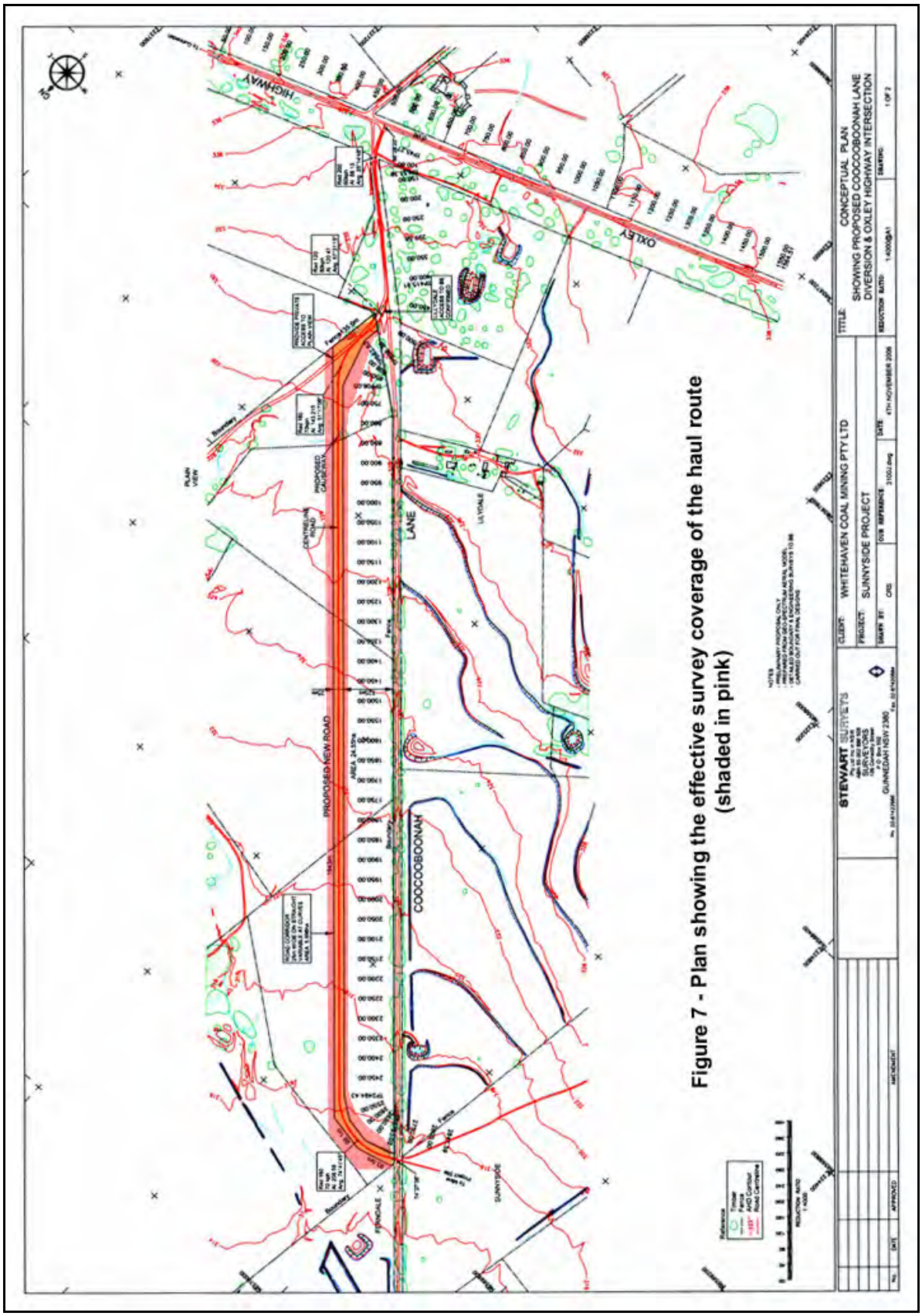

Figure 7 - Plan showing the effective survey coverage of the haul route (shaded in pink)

Note: A colour version of this figure is presented on the Project CD

The archaeological visibility varied along the proposed coal transport route. In the northernmost paddock archaeological visibility was good and generally in the order of 60-70%. In the second or central paddock cut stalks or chaff concealed much of the ground surface and archaeological visibility was in the order of 20-30%. Archaeological visibility in the southernmost paddock varied considerably, from 70% on upturned soils down to less than 5% where the groundcover was undisturbed. As a consequence the survey of the proposed coal transport route could be assessed to be 50% effective, and sufficient to obtain a representative result.

The survey technique was the most appropriate one to use in the circumstances, and the results are believed to be generally representative of the archaeological record in the survey area, in which it was predicted there might be artefactual material. The effectiveness of the survey technique is best demonstrated by the axe-grinding groove which was found in a context in which it could not reasonably have been predicted to occur, and similarly the artefact scatter was also found in an unusual context, although its location may be downslope of its depositional context – see discussion below.

6.5 Effective Coverage

The table following is divided into units delimited by observed topographical features, environments, and/or land use, briefly described in terms of 'horizontal' or map area, soil, and archaeological visibility, and the percentage of the area actually surveyed.

The photographic record that follows provides a visual reference for the survey conditions and various aspects of past impacts to the study area.

Plate 1 The Project Site viewed from the northern end (west of Coocooboonah Lane)

Note: A colour version of this plate is presented on the Project CD

Table 1
Effective Survey Coverage

Area	Description	Survey area (approximates only)	Rock/soil	Vegetation	Average surface visibility	Exposures	Approx area surveyed on foot	Average arch. visibility of exposures	Archaeology
1	"Sunnyside" - valley floor (below 330 m AHD)	900,000 sqm	Loamy colluvial metasedimentary soils	Cleared pasture	< 10%	Stock wear, vehicle tracks, and exposures along the paddock edges from recent sowing	30%	60%	Nil
2	"Sunnyside" - main saddle between the hills in the southern section	30,000 sqm	Weathering metasedimentary soils with exposed trap in gullies	Remnant dry sclerophyll woodland (more dense on steeper slopes)	40%	Slopewash, scalds, stock wear, dams and vehicle tracks	80%	95%	Two isolated artefacts
3	"Sunnyside" - lower and middle slopes (330 m AHD - 360 m AHD)	250,000 sqm	Weathering metasedimentary soils with low density conglomerate lag deposits	Remnant stands and isolated dry sclerophyll types	20%	Stock wear, vehicle tracks, and exposures along the paddock edges from recent sowing	60%	80%	Nil
4	"Sunnyside" - scarps (plan area) and upper slopes (360 m AHD - 400 m AHD)	150,000 sqm	Conglomerate bedrock scarp above weathering metasedimentary soils with high density conglomerate lag deposits	Remnant dry sclerophyll woodland (more dense on steeper slopes)	60%	Rock surfaces, slopewash, stock wear, native animal wear and driplines	50%	95%	Axe grinding-groove
5	"Sunnyside" - hill tops (above 400 m AHD) and the slopes between the southern saddle and Oxley Highway	170,000 sqm	Weathered trap deposits	Mostly cleared with isolated eucalypts	30%	Stock wear, dams and vehicle tracks	40%	80%	Artefact scatter
6	Proposed haul road route (50 m wide)	135,000 sqm	Loamy colluvial metasedimentary soils with minor conglomerate lag deposits towards northern end	Cleared pasture	50%	Extensive exposure from over-grazing and from tillage	99%	95%	Nil

Plate 2 Looking westwards along the central track to the north of the homestead.

Plate 3 Looking southwards towards the homestead from the central dam.

Note: A colour version of these plates are presented on the Project CD

Plate 4 Looking towards the western boundary in the central area

Plate 5 Contour banking to the south and immediately upslope of the homestead

These plates are presented in colour on the CD for the Sunnyside Coal Project

Plate 6 Looking southwards up the slopes behind the homestead

Plate 7 Large conglomerate 'floaters' beside the paddock on the upper slopes

Note: A colour version of these plates are presented on the Project CD

Plate 8 Looking southwards to the northern scarp of the hills

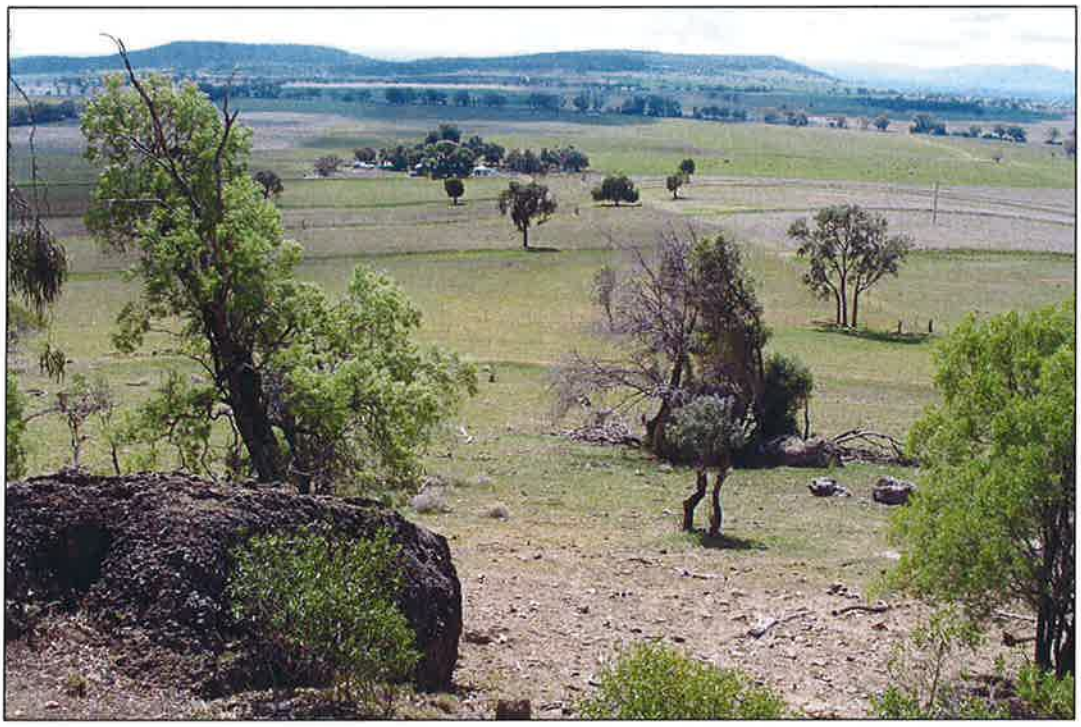

Plate 9 Looking northwards across the proposed open cut site from the top of the scarp

Note: A colour version of these plates are presented on the Project CD

Plate 10 Looking northwards along the eastern edge of the summit of the northern hill

Plate 11 Looking south-westwards up the main drainage line between the hills

Note: A colour version of these plates are presented on the Project CD

Plate 12 Looking north-eastwards down the main drainage line from about 370 m AHD

Plate 13 Looking up the main drainage line in the wooded section

Note: A colour version of these plates are presented on the Project CD

Plate 14 "Trap" bedrock exposed in the upper reaches of the main drainage line

Plate 15 Stock pads on the saddle at the southern end of the Project Site

Note: A colour version of these plates are presented on the Project CD

Plate 16 Piled boulders on the southern saddle

Plate 17 Looking downslope to the Oxley Highway (the tree-line crossing from left to right)

Note: A colour version of these plates are presented on the Project CD

Plate 18 The road easement of Oxley Highway

Plate 19 Looking south-eastwards from the northern end of the proposed Coocooboonah Lane re-alignment

Note: A colour version of these plates are presented on the Project CD

Plate 20 Looking westwards back to the northern end of the proposed Coocooboonah Lane re-alignment

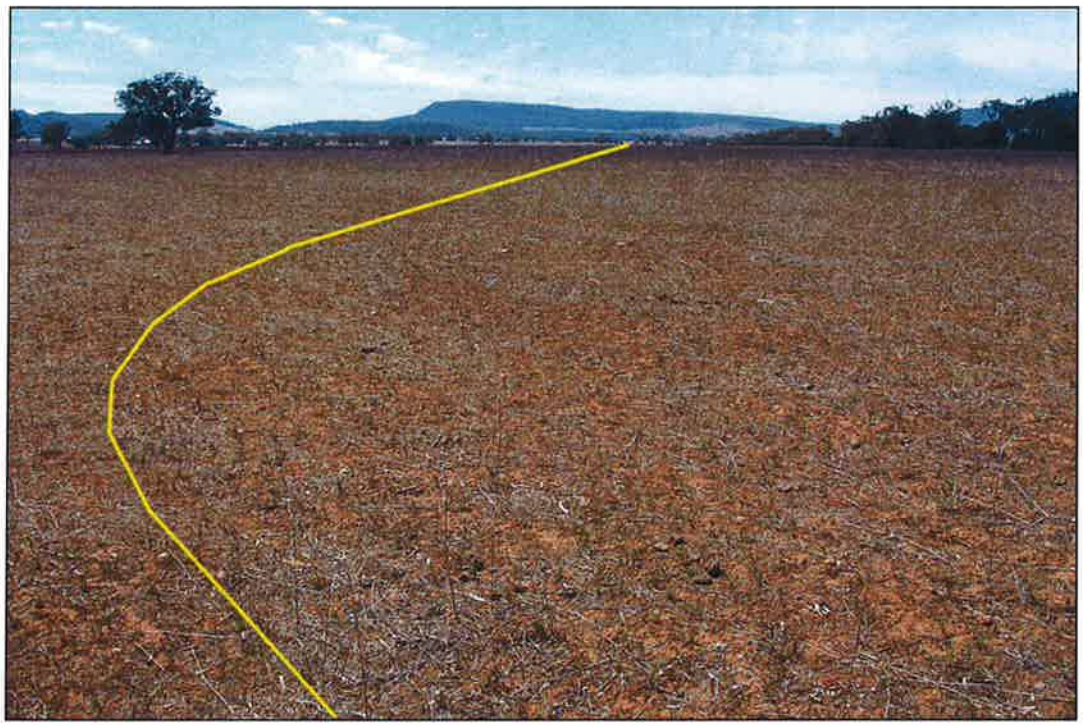

Plate 21 Looking south-eastwards down the proposed Coocooboonah Lane re-alignment (the yellow line)

Note: A colour version of these plates are presented on the Project CD

Plate 22 Archaeological visibility in the northern paddock of the proposed Coocooboonah Lane re-alignment

Plate 23 Archaeological visibility at the southern end of the northern paddock

Note: A colour version of these plates are presented on the Project CD

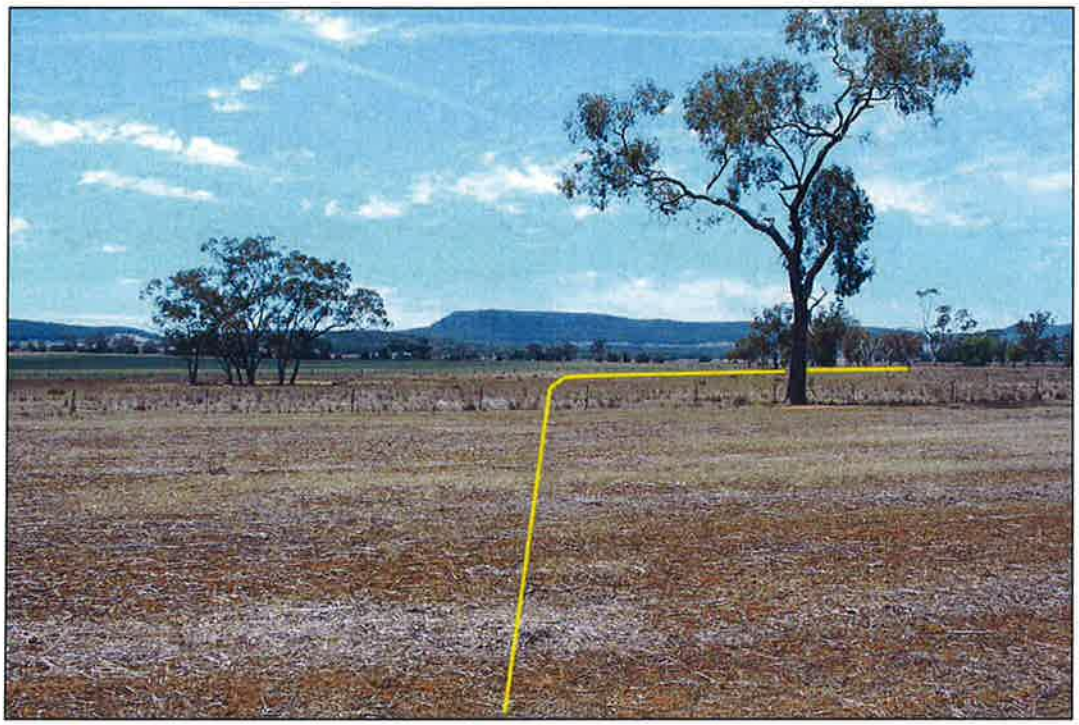

Plate 24 The southern end of the proposed Coocooboonah Lane re-alignment (the yellow line)

Plate 25 Looking northwards from the southern end of the proposed Coocooboonah Lane re-alignment, towards the "Plain View" homestead

Note: A colour version of these plates are presented on the Project CD

Plate 26 Looking southwards to the junction of the proposed Coocooboonah Lane re-alignment with Coocooboonah Lane.

Note: A colour version of this plate is presented on the Project CD

7 THE RESULTS

Four sites were recorded during the investigation, an axe-grinding groove, two isolated artefacts, and an artefact scatter.

Details of the sites were recorded as follows.

Site name: **"Sunnyside AGG1"**

Site type: Axe-grinding groove

Location: AMG: E.224359 N.6568031
Emerald Hill 8936-III-S 1:25,000 Topographic Map.

Topographical location.
At the rim of a cliff-like scarp (beside a small water-filled natural depression in the rock).

Environment: Dry sclerophyll woodland

Nearest water: Tributary (ephemeral) of Coocooboonah Creek.

Distance: Approximately 400 m.

Plate 27 The axe-grinding groove site “Sunnyside AGG1”.

Plate 28 Close up showing the groove below the scale (scale 25 cm).

Note: A colour version of these plates are presented on the Project CD

Other sites in the locality:
Two isolated artefacts and an artefact scatter.

Groove dimensions:
Length – Approx. 28 cm.
Width – Approx. 6 cm.
Depth – Approx. 2 cm.

Aspect: Northerly

Comment: The only axe-grinding groove observed in very dry country. The groove was found when the finder noticed the water. There is a possibility of other grooves occurring on sandstone surfaces in the vicinity of a water supply, that were not noticed because there was no water visible at the time of the survey.

Site name: **"Sunnyside ISO1"**

Site type: Isolated artefact

Location: AMG: E.224208 N.6567492
Emerald Hill 8936-III-S 1:25,000 Topographic Map.

Topographical location.
On the bank beside the upper reaches of a dry creek (on a vehicle track).Slope: Almost level area surrounded by sloping ground.

Environment: Dry sclerophyll woodland

Nearest water: Tributary (ephemeral) of Coocooboonah Creek.

Distance: Approximately 40 m.

Other sites in the locality:
An axe-grinding groove, an isolated artefact and an artefact scatter.

Artefact type: Flake with possible retouch to one margin.

Material: Highly siliceous, semi-transparent, orange chalcedony or highly siliceous quartzite.

Dimensions: 21 x 12 x 3 mm.

Broad platform: 8 x 3 mm.

Features: Dorsal ridge
Zero cortex.

Comment: Observed on eroded vehicle track. May have been brought in by vehicle tyre-tread but more likely to be in its disturbed depositional context.

Site name: **"Sunnyside ISO2"**

Site type: Isolated artefact

Location: AMG: E.224120 N.6567364
Emerald Hill 8936-III-S 1:25,000 Topographic Map.

Topographical location.
On the bank beside the upper reaches of a dry creek, some 20 m upstream of its confluence with a minor tributary.

Slope: 3-5 degrees.

Environment: Dry sclerophyll woodland

Nearest water: Tributary (ephemeral) of Coocooboonah Creek.

Distance: Approximately 15 m.

Other sites in the locality:
An axe-grinding groove, an isolated artefact and an artefact scatter.

Artefact type: Proximal fragment of a flake.

Material: Highly siliceous, semi-transparent, orange chalcedony or highly siliceous quartzite.

Dimensions: 22 x 22 x 5 mm.

Broad platform: 15 x 3 mm.

Features: Dorsal ridge
Snap termination or transverse snap
Zero cortex.

Comment: Observed on actively eroding creek bank subject to stock treadage. Probably downslope of its disturbed depositional context.

Site name: **"Sunnyside OS1"**

Site type: Artefact scatter of at least ten artefacts in a lozenge-shaped area of 30 x 8 m.

Location: AMG: E.224553 N.656922
Emerald Hill 8936-III-S 1:25,000 Topographic Map.

Topographical location.
On the upper slopes downslope of a contour bank downslope of a saddle

Slope: 5 degrees or more.

Environment: Cleared (dry sclerophyll woodland) pasture

Nearest water: Tributary (ephemeral) of Coocooboonah Creek.

Distance: Approximately 600 m.

Other sites in the locality:
An axe-grinding groove, and two isolated artefacts.

Artefact types: Flakes and flaked pieces, including a backed blade.

Material: Predominantly highly siliceous materials.

Examples:

i) Agate, flaked piece 30 x 13 x 8 mm, zero cortex.
ii) Igneous, flake 32 x 13 x 3 mm, broad platform 8 x 2 mm, dorsal ridge, zero cortex.
iii) Agate, backed blade 18 x 7 x 2 mm.
iv) Chalcedony, flake 30 x 22 x 6 mm, broad platform 9 x 4 mm, axial termination, zero cortex, eraillure.
v) Jasper (?), flaked piece 28 x 15 x 7 mm, retouch to one margin, zero cortex.
vi) Petrified wood (?), flake 18 x 13 x 3 mm, broad platform 5 x 2 mm, zero cortex.

Comment: Artefacts observed on actively eroding surface on a slope. Of the type not usually associated with camp-sites or tool manufacturing areas. It seems more likely that the artefacts have gravitated from further up slope and that they have washed down from the contour bank or have been displaced by ploughing, harrowing or stock wear.

Plate 29 The artefact at “Sunnyside ISO1” was found on the level ground to the rear of the vehicle

Plate 30 The satchel marks the location of “Sunnyside ISO2” (the creek line crosses diagonally beyond the site)

Note: A colour version of these plates are presented on the Project CD

Plate 31 "Sunnyside OS1" viewed from upslope. The artefacts occurred in the scald down as far as Greg on the right

Plate 32 "Sunnyside OS1". Note the steepness of the slope and the contour banking on the skyline

Note: A colour version of these plates are presented on the Project CD

8 DISCUSSION

8.1 The Results

As referred to previously the results were partly as predicted, but also, partly not as predicted. Firstly the presence of the two isolated artefacts and the locations in which they were found were as predicted. Isolated artefacts are the type of site most frequently found – although unfortunately many go unrecorded and unlisted on the Sites Register. They are perhaps the most representative of all site types in that they mark where people followed their normal daily lifeways, moving between resources or simply marking the most basic of activity sites. Isolated artefacts might be found in any environment but typically they are most frequently found along creek banks and drainage lines. They are not particularly remarkable but nevertheless they are important indicators of past land use by Aboriginal people.

The axe-grinding groove site was recorded in a surprising location, being found so far from a watercourse. However the only significant creek-line contains neither water, nor sandstone with a quartz grain that would make it suitable as a grinding surface. As the photographic record shows the creek-line contains 'trap' or metamorphosed sedimentary rock almost devoid of quartz grain, a rock type that would have been unsuitable as a grinding surface. In fact the surface on which the groove was found is the quartz-rich, pebble-free, sandstone surface of the conglomerate bedrock, and the depression in which the water that was used for the grinding is a naturally formed depression (sometimes referred to as a 'native well').

The artefact scatter is also in an unusual location being mid-slope of a steep incline, a location that would have been unsuitable for a campsite or activity area. However the artefacts are all small, smooth surfaced, and of highly silicified material, and would not require much of a flow of surface water to displace them, and as they are on a hard, smooth, clayey surface there was little to impede their slippery progress. My interpretation of the site location was that the artefacts probably derived from their depositional context upslope nearer the top of the saddle, either disturbed by clearing of the vegetation, or the construction of the contour banking, or by ploughing and/or harrowing. From previous observations during investigations I have undertaken between Warialda and Bingara, and at Belmont north of Gunnedah, and again at Attunga west of Tamworth, artefacts may be unearthed during contour bank construction. Slowly the soil on which they sit decomposes and is washed away, leaving the artefacts sitting on a hard, smooth, concave, sun-baked surface. Eventually with little to slow them down they too are washed downslope and may travel many metres from their original depositional context. I believe that the location in which the artefacts were recorded is not their depositional context, which was further upslope, and perhaps as far upslope as the contour banking.

Each of the four sites would be recorded on Site Recording Forms, which would be lodged with DECC for listing on the AHIMS Site Register. Under the provisions of the National Parks and Wildlife Act 1974 (as amended) anyone who knowingly or unknowingly damages or destroys, or causes damage or destruction to an Aboriginal site may be prosecuted, and if found guilty, may be imprisoned or fined, or both.

8.2 Potential Cumulative Impact of the Project

As none of the sites recorded during this investigation would require Section 87 or 90 Consents there is no cumulative impact to consider. No other sites have been recorded on the AHIMS Site Register within the 100 square kilometre search area, and so these four sites are relatively unique to the area, however as referred to previously the absence of sites on the Site Register reflects the fact that no investigations have previously taken place within the search area, rather than be representative of the archaeological record that might exist. But unless the proposed project plans are changed in such a way that any of the four sites are impacted upon, there is no requirement for an assessment of potential cumulative impacts.

9 SIGNIFICANCE ASSESSMENT

The NPWS policy to safeguard all sites, Aboriginal places, and archaeological material of significance wherever possible requires that some means of assessing the significance of the sites is necessary. This is not only for the purpose of determining whether coal extraction can proceed as proposed, but also to provide Cultural Resource Managers with the information for future management of the area.

9.1 Cultural Significance

The Aboriginal or cultural significance of Aboriginal relics and sites can only be assessed by the Aboriginal community, and in particular, the Elders. It is the responsibility of the archaeologist to ensure that the Elders, or elected representatives of the Aboriginal community are advised of the survey results, and are consulted as to their knowledge and opinion of the significance of the area, and to transcribe and present those expressions in report form.

In this instance, Greg Griffiths (on behalf of Red Chief LALC), has recommended that the isolated artefacts and artefact scatter would be fenced for their protection, and that all turf stripping would be monitored. In addition Red Chief LALC recommends that all mine employees and contractors would undertake a Cultural Awareness Induction and be made aware of the sites by Red Chief LALC, before commencing work on the Project Site.

Matthew Draper (on behalf of Bigundi Biame) has recommended that the two isolated artefacts would be collected (salvaged), and that all ‘excavations’ be monitored.

Copies of their reports have been included as **Appendix i** and **Appendix ii**.

9.2 Research Potential

While each of the sites recorded during this investigation has added to our archaeological knowledge of site types, distribution and content in the Gunnedah area none of the information is of sufficient potential for providing further additional new information that warrants research funding or commitment. The sites are assessed to be of low research potential.

10 MANAGEMENT OPTIONS

10.1 Protective Measures

None of the sites would be directly impacted upon by the proposed mine and support facilities, however there is some potential for the axe grinding-groove site to be damaged by indirect or peripheral impacts if some preventative measures are not put in place.

At the time "Sunnyside" was surveyed the coal transport route proposed would have passed close by to the two isolated artefacts, and its construction could have resulted in peripheral damage being caused to the artefact scatter site. However, because of faunal constraints to the use of that route, an alternative route was proposed to the east of Coocooboonah Lane. As a consequence, neither the isolated artefacts nor the artefact scatter site are within 500 metres of the nearest impacts from the proposed coal mine. Therefore, no protective measures are necessary for these sites.

The proposed open cut pit stops short of the escarpment where the increased depth of overburden would have made open cut mining uneconomical. Thus, the axe-grinding groove is some distance away from the proposed open cut site, however there is some potential for it to be damaged by fly-rock (from blasting), or by vibration or shock from blasting within the open cut pit.

Protection of the site from fly-rock during the operation of the mine could be achieved simply by way of a straw-bale 'blanket' placed over the site. While this would be a low-cost protective measure the bales would need to be checked periodically to ensure that they were still in place and effectively protecting the site, as they would deteriorate under attack from both animals and the weather.

Perhaps of greater potential threat to the safety of the axe grinding-groove is the possibility that the rock on which the groove occurs could be damaged by sub-surface impacts, such as vibration from blasting, and the destabilisation of the ground rock. There is some potential for blasting to destabilise the escarpment to the immediate south of the open cut pit, and cause the rock on which the axe-grinding groove occurs to fall and fragment, or for the pit to undermine the escarpment and cause the collapse of the escarpment with a similar result to the axe grinding grooves, or for vibration from blasting to cause fracturing of the rock on which the groove occurs. Such issues need to be addressed by an appropriately qualified geotechnical expert.

If the results of the geotechnical investigation show that there is a potential for damage to be caused to the axe grinding-groove then further consultation with the Aboriginal stakeholders would be necessary. And such consultation would need to be in accordance with the requirements of "Interim Community Consultation Requirements for Applicants (National Parks and Wildlife Act 1974 [as amended], Part 6 Approvals). The Proponent is advised that this procedure has the potential to add at least three months to the lead-time before Consent can be obtained from DECC.

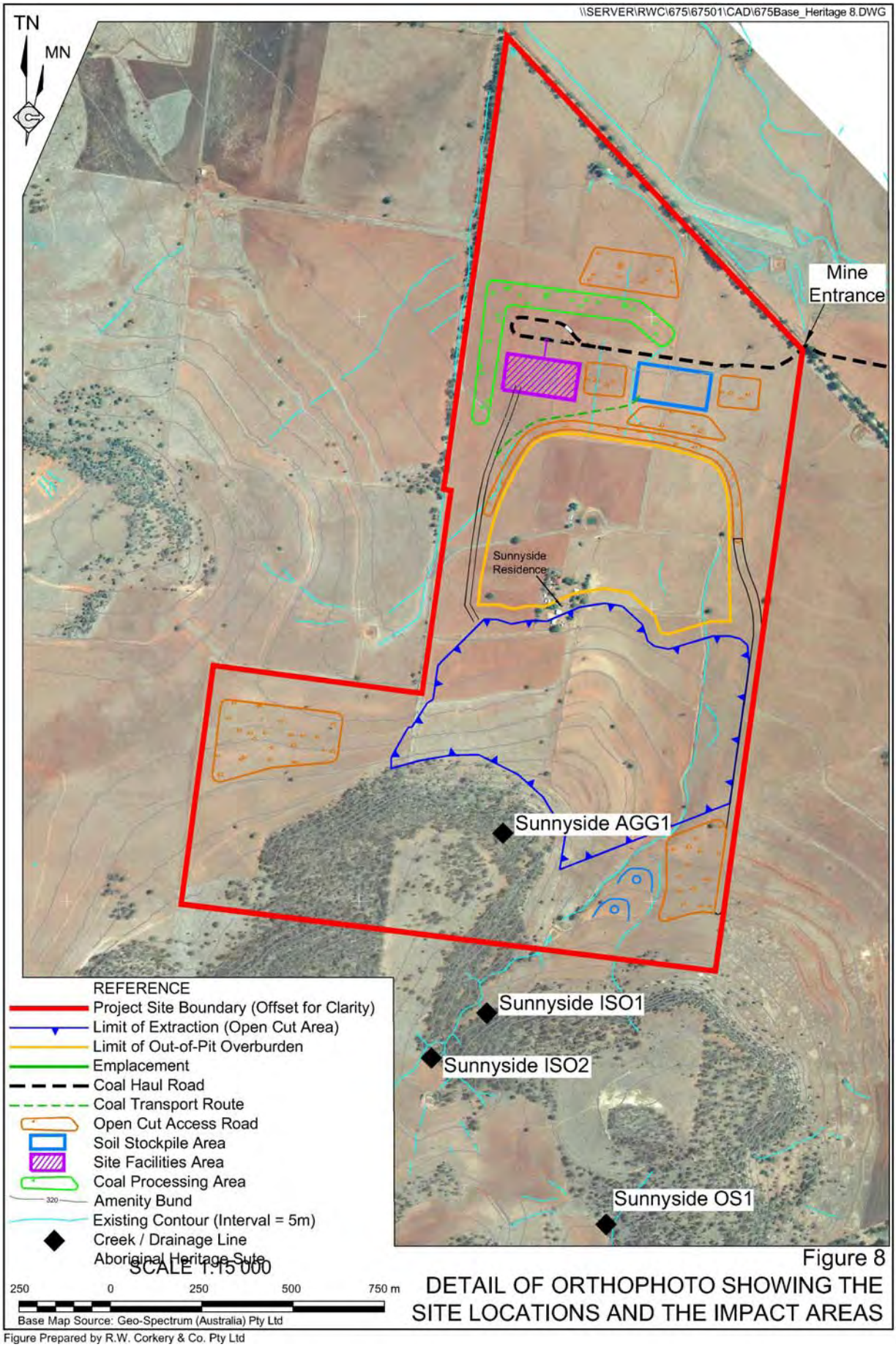

Figure 8
DETAIL OF ORTHOPHOTO SHOWING THE SITE LOCATIONS AND THE IMPACT AREAS

Figure Prepared by R.W. Corkery & Co. Pty Ltd
Note: A colour version of this figure is presented on the Project CD

10.2 Monitoring

Both Red Chief LALC and Bigundi Biame have recommended that their nominated representatives would monitor all turf stripping. The objective being to observe and record any cultural material that might be exposed, and if any is observed, to advise the Company to commission a qualified archaeologist to obtain the necessary Consent before work can continue in the area of the discovery.

11 RECOMMENDATIONS

As a consequence of this investigation, the Project Site and adjoining areas are known to contain four Aboriginal sites of which there was no prior knowledge. None of the four sites would be directly impacted upon by the proposed coalmine and associated activities, however there is a potential for indirect or accidental damage to occur to the one of the sites, an axe grinding-groove. As a consequence, ASR recommends that NMPL commissions an appropriately qualified geotechnical expert to investigate the potential for the proposed coal mining activities to cause damage to the axe grinding-groove, either by destabilising the rock on which it occurs, thus causing it to fall and fragment, and/or, vibration from blasting to destabilise the rock on which the groove occurs, and thereby causing it to fracture or fragment.

Also, ASR agrees with the recommendations of Red Chief LALC and Bigundi Biame, that representatives of Red Chief LALC and Bigundi Biame would monitor all turf stripping.

The Proponent is also advised that in addition to the recommendations above, that under the obligations and provisions imposed by the National Parks and Wildlife Act 1974 they are obliged to comply with the provisions which state that:

- The owners, and their employees, earthmoving contractors, subcontractors, machine operators and their representatives, whether working in the survey area or elsewhere, would be instructed that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work would cease immediately in the area of the find.
- In the event that any bone cannot be clearly identified by a qualified archaeologist as being of animal remains the police are to be informed of its discovery, and officials and/or their representatives of the Red Chief Local Aboriginal Land Council, Bigundi Biame, and the Cultural Heritage Division, Western Directorate DECC, advised that the bone is subject to police investigation.
- Work would not recommence in the area of the find, until both the police (if bone has been found) and those officials or representatives have given their permission to do so. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the National Parks and Wildlife Act 1974, as amended.

GENERAL GLOSSARY:

The definitions that follow are for terms used in this and other reports written by the author, and do not necessarily apply to their use in different contexts.

ADZE : A modified flake with at least one steeply-retouched working edge. While all adzes are generally considered to be wood-working tools it is probable that some also served as cores and others as scrapers. Adzes with a uniform butt were frequently hafted to make a chisel-like tool, but the intended use of the adze determined the size of the adze and whether it was hafted (Flenniken and White, 1985).

AHD: Australian Height Datum

ARCHAEOLOGICAL DEPOSIT :
Sediments which contain evidence of past Aboriginal use of the place, such as artefacts, hearths, burials etc.

ARTEFACT : Any object that has attributes as a consequence of human activity (Dunnell, 1971). In this report 'artefacts' has been used generally to describe pieces of stone that have been modified to produce flakes, flaked pieces, cores, hammerstones, or axes.

BACKED BLADE :
A stone tool manufactured from a flake on which one margin has been modified by the removal of small flakes to blunt the edge or margin opposite the cutting edge.

BORA GROUND :
A ceremonial site comprising of one or two connected circles composed of compacted or mounded earth, or defined by an arrangement of stones, of 2 to 30m diameter, generally used in male initiation rites.

CAMPSITE : A place at which the density of artefacts and the variety of material indicates that people 'frequently' used the place as a stopping or resting place. Such places are also likely to contain or be close to water resources, food resources, or stone material resources. In this report a campsite is used to describe artefact scatters that are associated with hearths or fireplaces, as distinct from scatters that are not associated with hearths or fireplaces, which are described as Open Scatters.

CHALCEDONY :
A form of silica (partially translucent), which occurs as linings in cavities in rocks. When banded it is known as AGATE (Department of Mines, 1973). Chalcedony is uniformly coloured and agate has curved bands or zones of varying colour (Cook & Kirk, 1991).

CHERT : Another name for sedimentary chalcedony. It occurs most frequently in limestones, or in marine sedimentary rock, or as pebbles in sedimentary rock. In its depositional context it is often concentrated in bedding planes. Chert found in deep-water limestones is formed from radiolaria and diatoms (siliceous planktonic micro-organisms) (Cook & Kirk, 1991).
Chert is a form of amorphous or extremely fine-grained silica, partially hydrous, found in concertions and beds. It is classified as a chemical sedimentary rock although it may be precipitated both organically and inorganically (Department of Mineral Resources, n.d.).

CONGLOMERATE :
Naturally cemented gravel. Conglomerate is a coarse-grained clastic sedimentary rock composed of generally rounded fragments of other rock types larger than 2 mm in diameter, set in a fine-grained matrix of sand, silt, or any of the common natural cementing materials (Department of Mineral Resources, n.d.).

CORE : A piece of stone from which flakes have been removed, that cannot otherwise be described as a retouched or modified artefact.

CORTEX : The naturally altered surface of stone – eg. the water-worn surface of river pebbles.

DEBITAGE : The small waste material observed in knapping floors. Generally, waste material is described as all those fragments having a maximum dimension of less than 10mm

FLAKE : A fragment of stone exhibiting features indicating that it has been deliberately removed from a core piece. These features are evident as:

i) Platform: Plane or point at which a blow was delivered to remove the flake.
ii) Bulb of Percussion: Convex surface that occurs on the face or ventral surface of a flake, radiating from the point of impact, produced as a consequence of the force pattern.
iii) Eraillure: see below.

Other terms:

i) Dorsal: The back or outer face of a flake as it would have been prior to removal from a core. Frequently either ridged or exhibiting negative flake scars when removed in secondary flaking, with a natural weathered cortex when removed in primary flaking.
ii) Ventral: The 'chest' or inner face of a flake as it would have been prior to removal from the core. The surface upon which the Bulb of Percussion occurs.
iii) Platform Preparation: The removal of flakes from a surface to produce a level platform. May be evidenced by retouch scars to the platform.
iv) Retouch: The removal of small flakes from an edge or margin of an artefact to modify its shape or resharpen its edge.
v) Proximal: The end of a flake closest to the striking platform.
vi) Distal: The end of a flake furthest from the striking platform.
vii) Margin: The edge of an artefact.
viii) Eraillure: A small circular to elliptical negative flake scar occurring on the surface of the bulb of percussion on flakes of very fine-grained or highly silicified material. It occurs 'naturally' as a consequence of internal forces generated at the time of flake removal.
ix) Split Cone: Occurs when the flake splits down its axis frequently removing part of the striking platform. Generally believed to be produced by faulty knapping technique, but is also probably a consequence of flawed material.
x) Transverse Snap: Occurs when a flake snaps across its axis. Generally believed to be caused by post-depositional impacts such as human or stock treadage, or vehicular traffic.

FLAKED PIECE :

A fragment of stone exhibiting flake scars indicating that it is an artefact, but not displaying diagnostic features, such as a Bulb of Percussion, Striking Platform, or an Eraillure.

GREYWACKE :

A type of sandstone, grey or greenish-grey in colour, tough and well indurated and typically poorly sorted (Clark & Cook, 1986).

A generally poorly sorted, dark sandstone containing feldspar and sand-sized rock fragments of metamorphic or volcanic rocks (Department of Mineral Resources, n.d.).

Usually a dark and coarse-grained rock compared to mudstones and siltstones that are much finer-grained and better sorted.

HOLOCENE PERIOD :

The period from 10,000 years ago to the present.

IGNEOUS ROCK :

Rock formed by the cooling and solidification of magma on or below the earth's surface (Geography Dictionary, 1985).

In situ : In its original place – as deposited.

ISOLATED ARTEFACT :

A solitary stone artefact, at least 50m from its nearest neighbour. This is based on NPWS policy that two artefacts within 50m of each other constitute a site.

KNAPPING FLOOR:

A discrete scatter of artefacts in which at least two artefacts are recognisably of the same material, and derive from the same piece of stone. Also described as a stone tool manufacturing site or floor.

LOCATION : The place at which an artefact is found, or a place identified as having either archaeological or Aboriginal significance.

MEASUREMENT :

I) Flake:
   i) Length: Measured along the percussion axis at right angles to the platform.
   ii) Width: The greatest width measured at right angles to the percussion axis.
   iii) Thickness: The greatest thickness measured at right angles to the percussion axis.

II) Flaked piece:
   i) Length: The longest dimension
   ii) Width: The greatest width measured perpendicular to the length.
   iii) Thickness: The greatest thickness measured perpendicular to the length.

III) Core:
   i) Length: The longest dimension.
   ii) Width: The greatest width measured perpendicular to the length.
   iii) Thickness: The greatest thickness measured perpendicular to the length.

MIDDEN : A refuse heap or stratum of food remains, such as mollusc shells, and other occupational debris (Dortch, 1984 – see also Meehan, 1982).

MUDSTONE : A fine-grained detrital rock, usually quite massive and well consolidated. May be black through grey to off-white, browns, reds and dark blues/greens. Frequently found in association with sandstones (Cook & Kirk, 1991).
Identification is often aided by colour variations in layering. A source for stone material tool manufacturing material found as river pebbles in creek beds, and artefacts often display a water-worn cortex.

NEGATIVE FLAKE SCAR :
A concave surface resulting from the removal of a flake, occurring on the surface of the rock from which a flake has been removed.

PLEISTOCENE PERIOD :
The period from about 10,000 years ago to 2 million years ago.

POTENTIAL ARCHAEOLOGICAL DEPOSIT (PAD) :
Synonymous with Potentially Archaeologically Sensitive : Having the potential to contain archaeological material although none is visible.

QUARTZITE :
Quartzites are formed by the regional or contact metamorphism of quartz arenites, siltstones, and flints (cherts). They are composed essentially of quartz, and usually have a fine-grained granoblastic (grains are roughly the same size) texture. Generally massive, but may sometimes show sedimentary structures (Cook & Kirk, 1991).

ROTATION :
The removal of flakes from a core by blows directed at different angles, to different platforms. May be evident on the dorsal surface of a flake as negative flake scars, which do not follow the same direction as the percussion axis of the flake. This may be confused with scars produced during core preparation.

SCAT : The solid waste material produced by an animal – dung, droppings, manure (Triggs, 1985).

SCATTER : Two or more artefacts occurring within 50 metres. Scatter may also be used in the context of 'background scatter', meaning the general distribution of artefacts across the landscape that cannot be recognised as discrete concentrations.

SILCRETE : A near surface or surface siliceous induration (Desen & Peterson, 1992).
A conglomerate consisting of surficial sand and gravel cemented into a hard mass by silica.
A siliceous duricrust (Bates & Jackson, 1980).

Crusts may form as a result of low, infrequent rainfall, on reasonably flat surfaces. These are known as duricrusts – those cemented by silica are known as silcretes (Clark & Cook, 1986), sometimes referred to locally as 'billy' (Gentilli, 1968), or 'grey billy'.
Silcrete on the northern tablelands of NSW forms at the surface contact between sediments of the Sandon Beds and the Armidale Beds with overlying basalt, where groundwater (more rich in silica than surficial water) interacts with surficial water and precipitates new quartz as the matrix to the sediments (N.D.J. Cook, Dept. of Geophysics, UNE, pers. Comm.).
In softer formations of quartz sands, groundwater has apparently been responsible for the formation of concretionary layers of silcrete. Under altered climatic conditions, the less competent beds erode away leaving concretions. Since they are often the size of old-fashioned woolsacks and are greyish and white, they are popularly known as gray billy (slang for billy goat) (Fairbridge, 1968).

SITE : A discrete area or concentration of artefactual material, place of past Aboriginal activity, or place of significance to Aboriginal people.

SOIL SCIENCE TERMS (taken from Banks, 1995, and others as referenced).

BEDROCK : Outcrop of *in situ* rock material below the soil profile.

BENCH : A strip of relatively level earth or rock breaking the continuity of a slope.

BLOWOUT : A closed depression formed in the land surface by wind eroding sands and depositing them on adjacent land.

CHERT: A very fine-grained amorphous silicate sedimentary rock, commonly a layer of chemical precipitate or micro-organism skeletal remains (Milford 1999).

CLAY: Soil material composed of very fine particles less than 0.002 mm size. When used to describe a soil texture group, such a material contains more than 35% clay (Milford 1999).

CLAYPAN : A depression caused by the aeolian deflation of sediments, or by the presence of a prior lake.

CONGLOMERATE: A poorly-sorted detrital sedimentary rock composed of rounded gravels, stones or cobbles in a matrix of much finer material (Milford 1999).

DUNE : A ridge built up by wind action composed of sands, silts, or sand-sized aggregates of clay.

FLOODPLAIN : A large flat area, adjacent to a watercourse, characterised by frequent active erosion and aggradation by channelled and overbank stream flow.

GIBBER : A level surface covered by a thick deposit of gravel or broken siliceous pebbles, occurring in the more arid parts of the continent, thought to have been formed from the break-up of a siliceous (silcrete) surface crust, and termed gibber plains (Whittow, 1984) – see also silcrete.

GILGAI : Surface microrelief associated with soils containing shrink-swell clays. Gilgai consists of mounds and depressions, or irregularly distributed small mounds and subcircular depressions varying in size and spacing. Vertical interval usually <0.3m; horizontal interval usually 3-10m, and surface almost level. Sometimes called 'crab-hole' soils.

GREYWACKE: A tough, well-indurated type of sandstone distinguished by detrital quartz crystals and rock fragments set in a finer-grained matrix (Milford 1999).

GULLY : An open incised channel in the landscape generally greater than 30cm deep and characterised by moderately to very gently inclined floors and steep walls (Milford 1999).

HUMMOCK : A small raised feature above the general ground surface.

LANDFORM ELEMENTS :

Crest : Landform element standing above all points in the adjacent terrain.
Flat : Neither a crest or a depression <3% slope.
Upper slope : Adjacent to and below a crest or flat but not a depression.
Midslope : Not adjacent to a crest, a flat or a depression.
Lower slope : Adjacent to and above a flat or a depression but not a crest.

LITHOSOLS : Shallow soils showing minimal profile development and dominated by the presence of weathering rock and rock fragments.

METAMORPHIC: Rocks whose composition, texture and/or structure have been altered through tectonic pressure and/or heat (Milford 1999).

METASEDIMENTARY: Partially-metamorphosed sedimentary rock (Milford 1999).

MUDSTONE: A fine-grained dark-coloured sedimentary rock, formed from lithified mud; similar to shale but more massive (Milford 1999).

pH A measure of the acidity or alkalinity of a soil. A pH of 7.0 denotes neutrality, higher values indicate alkalinity, and lower values indicate acidity. The pH scale is logarithmic, i.e., a pH of 4.0 is ten times as acid as a pH of 5.0, and one hundred times as acid as a pH of 6.0. (DLWC 1999).

RILL : A small channel cut by concentrated runoff through which water flows during and immediately after rain.
A small ephemeral channel, generally no more than 30 cm deep, created by concentrated runoff (Milford 1999).

RUNOFF : That portion of precipitation not immediately absorbed into or detained upon the soil and which thus becomes surface flow.

SCARP/CLIFF : A steep slope terminating a plateau or any level upland surface.

SCRUB : vegetation structure consisting of shrubs 2-8m tall.

SHEET EROSION : The removal of the upper layers of soil by raindrop splash and/or runoff.

SOIL PROFILE :

"A HORIZON": The top layer of mineral soil. This may consist of two parts:
A_1 HORIZON: Surface soil and generally referred to as the topsoil.
A_2 HORIZON: similar in texture, but paler in colour, poorer in structure, and less fertile.

" B HORIZON": The layer below the A Horizon. This consists of 2 parts:
B_1 HORIZON: A transitional horizon dominated by properties characteristic of the underlying B_2 horizon.
B_2 HORIZON: typically contains concentrations of silicate clay and/or iron, and/or aluminium and/or translocated organic material.

"C HORIZON": The parent rock. Recognised by its lack of pedological development, and by the presence of remnants of geologic organization.

"R HORIZON": Hard rock that is continuous (Charman & Murphy, 1993; 350-1).

SPUR : A ridge which projects downwards from the crest of a mountain as a water-parting (Whittow, 1984).

SUBSOIL : Sub-surface material comprising the B and C Horizons of soil with distinct profiles; often having brighter colours and higher clay contrasts.

SURFACE CONDITION :

Gravelly : Over 60% of the surface consists of gravel (2-69mm).
Hardsetting : Soil is compact and hard.
Loose : Soil that is not cohesive.
Friable : Easily crumbled or cultivated.
Self-mulching : A loose surface mulch of very small peds forms when the soil dries out.

SWALE : A linear level-floored open depression excavated by wind or formed by the build-up of two adjacent ridges.

SWAMP : Watertable at or above the ground surface for most of the year.

TOPSOIL: The surficial layers of the soil profile, typically the A Horizon, which is usually darker, more fertile, better structured and contains more organic matter than underlying soil materials (Milford 1999).

TERRACE : A flat or gently inclined surface bounded by a steeper ascending slope on its inner margin and a steeper descending slope on its outer margin (Whittow, 1984).

TOPSOIL : A part of the soil profile, typically the A_1 horizon, containing material that is usually darker, more fertile and better structured than the underlying layers.

UNDERSTOREY : A layer of vegetation below the main canopy layer.

WEATHERING: The physical and chemical disintegration, alteration and decomposition of rocks and minerals at or near the earth's surface by atmospheric and biologic agents (Milford 1999).

BIBLIOGRAPHY

Attenbrow, V. 2002. *Sydney's Aboriginal Past: Investigating the archaeological and historical records*. UNSW Press, Sydney.

Banks, R.G. 1995. *Soil landscapes of the Curlewis 1:100,000 sheet*. Department of Conservation and Land Management.

Bates, R.L., and J.A. Jackson (Eds). 1980. *Glossary of Geology.* Second Edition. American Geological Institute, Virginia.

Clark, I.F., and B.J. Cook. 1986. *Geological Science: Perspectives of the Earth*. Australian Academy of Science, Canberra.

Cook, D., and W. Kirk. 1991l. *Field Guide to the Rocks and Minerals of the World*. Kingfisher Books, London.

Charman, P.E.V., & B.W. Murphy. 1993. *Soil: Their Properties and Management*. Sydney University Press.

Department of Mineral Resources. 1992. *Metallogenic Study and Mineral Deposit Data Sheets. Sydney 1: 250,000 Metallogenic Map*.

Department of Mineral Resources. n.d. Information Sheet : Sedimentary Rocks.

Department of Mines. 1973. *Minerals and their Characteristics*. Geological Survey of New South Wales, Number 141.

Desen, J.L., and J. Peterson. 1992. Mapping the Australian Duricrusts: can Distribution be derived from Terrain Maps. *Australian Geographical Studies*, 30(1): 87-94.

Dortch, C. 1984. *Devil's Lair: a study in prehistory*. Western Australian Museum.

Dunnell, R.C. 1971. *Systematics in prehistory*. Free Press, New York.

Fairbridge, R.W. 1968. Induration. *Encyclopaedia of Geomorphology, Encyclopaedia of Earth Science Series,* Vol. III, pp.554-55. Reinbold Book Corporation, New York.

Fairley, A. 1976. *A field guide to the Sydney bushland*. Rigby Limited, Adelaide.

Flenniken, J.L., and L.P. White. 1985. Australian flaked stone tools: a technological perspective. *Records of the Australian Museum*, 36: 131-51.

Gentilli, J. 1968. Duricrust. In R.W. Fairbridge (Ed.), *The Encyclopaedia of Geomorphology, Encyclopaedia of Earth Science Series,* Vol. III, pp.296-7. Reinbold Book Corporation, New York.

Geography Dictionary. 1985. Longman Group, Harlow.

Meehan, B. 1982. *Shell bed to shell midden*. Australian Institute of Aboriginal Studies, Canberra.

Menzies, I.A. 1974. 'Sydney-Bowen Basin'. In N.L. Markham & H. Basden (Eds), *The Mineral Deposits of New South Wales*, pp.453-504, Department of Mines, Sydney.

NSW NPWS. 2004. AHIMS Search.

Simpson, B. 1966. *Rocks and Minerals*. Pergamon Press, Oxford.

Triggs, B. 1985. *Mammal tracks and signs: a fieldguide for southeastern Australia*. Oxford University Press, Melbourne.

Walker J., & M.S. Hopkins. 1990. Vegetation. In R.C. McDonald, R.F. Isbell, J.G. Speight, J. Walker & M.S. Hopkins (Eds), *Australian Soil and Land Survey*, pp. 58-86. Inkata Press, Sydney.

Whittow, J. 1984. *Dictionary of Physical Geography*. Penguin, London.

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APPENDICES

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Appendix ii	Report from Bigundi Biame Gunnedarr Traditional People
Appendix iii	Report from Red Chief Local Aboriginal Land Council (Proposed Coal Transport Route)
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Appendix i

Report from Red Chief Local Aboriginal Land Council

(No. of pages excluding this page = 2)

RED CHIEF LOCAL ABORIGINAL LAND COUNCIL

P.O. Box 745
Gunnedah NSW 2380

Phone: (02) 6742 3602
Fax: (02) 6742 3815
Email: redchief@westnet.com.au

Aboriginal Sites Survey "Sunnyside" Property

DATE: 12 September 2006

ATTENDANCE:

John Appleton – Archaeologist
Greg Griffiths – Red Chief LALC
Matthew Draper – Bigundi Biami Traditional Owners
David Wells – Whitehaven (Tool Box meeting at Site)

METHODOLOGY:

A discussion took place between the participants on the day. Due to very dense ground cover, it was decided to survey the more visible areas and onto the ridge line where an outcrop of sandstone and cave shelters were located. A visual search of identifiable areas was carried out.

RESULTS:

1. Axe grinding groove – high on point of Ridge
   Intermittent water hole in area

2. Two (2) Isolated Artefacts in saddle of Ridge, adjacent to proposed Haul road.

3. Open Artefact scatter – south side down slope left of proposed haul road

(1)

RECOMMENDATIONS:

1. Axe grinding groove is not in proposed development area, so it is to be left as is, and location noted on final construction plans.

2. Two (2) Isolated Artefacts adjacent to proposed Haul road be fenced off before development begins for their protection & conservation. Location to be noted on final construction plans.

3. Open Artefact scatter not on proposed Haul road to be fenced off before development begins for the conservation and protection of the site. Location to be noted on final construction plans.

4. All Mine employees and Contractors to be made aware of location of these sites prior to commencing work.

5. All Mine employees and Contractors undertake a Cultural Awareness Induction delivered by Red Chief LALC.

6. Owing to poor visibility only an estimated 10% of the project site could effectively be surveyed. Given the lineation of Sites and their close proximity to a creek line and nearby cave shelter, it is my strong belief the area is of Cultural sensitivity and significance and further monitoring by Red Chief LALC Sites Officers of the project area be carried out during all turf stripping and excavation work.

7. Mitigation and or conservation measures be put in place.

8. A Memorandum of Understanding be negotiated between Red Chief LALC and Developer before development begins.

Yours respectfully

Greg Griffiths
Sites Officer
Red Chief LALC

(2)

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Appendix ii

Report from Bigundi Biame Gunnedarr Traditional People

(No. of pages excluding this page = 2)

BIGUNDI BIAME GUNNEDARR TRADITIONAL PEOPLE
(IN THE MIST OF GOD)
16 SOUTH STREET
GUNNEDAH NSW 2380
PHONE: 02 6742 0311
FAX:02 6742 0311

ABORIGINAL CULTURAL SITE'S SURVEY
WHITEHAVEN MINE
"SUNNYSIDE" PROPERTY = SEE ATTACHED SHEET

PARTICIPANT'S MAT DRAPER – BIGUNDI BIAME
GREG GRIFFITHS – RED CHIGI LALC
JOHN APPLETON – ARCHEOLOGIST

RESULT'S

1/ 1 AXE GRINDING
2/ 2 ISOLATED ARTEFACT'S
3/ ARTEFACT SCATTER

RECOMMENDATION'S

1/ "AXE GRINDING GROOVE" IS OUT OF MINE FOOTPRINT AREA SO RECOMMEND TO BE LEFT AS IS.
2/ "2 ISOLATED ARTEFACTS" TO BE COLLECTED AND GIVEN BACK TO GUNNEDAH ABORIGINES
3/ "ARTEFACT SCATTER" TO BE FENCED OFF FOR PRESERVATION AND PROTECTION

BIGUNDI BIAME GUNNEDARR TRADITIONAL PEOPLE
(IN THE MIST OF GOD)
16 SOUTH STREET
GUNNEDAH NSW 2380
PHONE: 02 6742 0311
FAX:02 6742 0311

4/ MONITORS PUT ON ALL EXCAVATION WORKS TO ENSURE ABORIGINAL CULTURE AND HERITAGE VALUES ARE PROTECTED FOR PRESERVATION

YOURS IN UNITY
M. Draper
MATT DRAPER
FOR AND ON
BEHALF BIGUNDI BIAME
GUNNEDAH TRADITIONAL OWNERS GROUP

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Appendix iii

Report from Red Chief LALC
(Proposed Coocooboonah Lane Re-alignment)

(No. of pages excluding this page = 1)

RED CHIEF LOCAL ABORIGINAL LAND COUNCIL

P.O. Box 745
Gunnedah NSW 2380

Phone: (02) 6742 3602
Fax: (02) 6742 3815
Email: redchief@westnet.com.au

Attention
John Appleton
Archaeological Surveys & Reports Pty Ltd
16 Curtis Street
ARMIDALE NSW 2350

Aboriginal Sites Survey

"Sunnyside" Coal Mine – Alternative Haul Road
Carried out on 07 December 2006

PARTICIPANTS: *Les Field – Red Chief LALC*
John Appleton – Archaeologist

METHODOLOGY: *Visual Search*

RESULTS: *No artefacts or any evidence of Aboriginal Sites was found or recorded in the proposed alternative Haul Road area.*

RECOMMENDATIONS: *After discussion with Les and John, the alternative Haul Road proceed if necessary as planned.*

Red Chief LALC Sites Officers be present at the time of any turf stripping and excavation activity.

Yours in Unity

Greg Griffiths
Sites Officer
For & on behalf of Les Field(Sites Officer) - Red Chief LALC

Appendix iv

Results of the search of AHIMS Site Register

(No. of pages excluding this page = 3)

Department of
Environment and Conservation (NSW)

Your reference : Manilla # 20 A
Our reference : AHIMS #16911

Archaeological Surveys & Reports Pty Ltd
16 Curtis StreetJohn Appleton
Armidale NSW 2350

Wednesday, 20 September 2006

Attention: John Appleton

Dear Sir or Madam:

Re: AHIMS Search for the following area at Gunnedah 2 ;Zone: 56;E: 222000 - 223000;N: 6562000 - 6572000;

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW Department of Environment and Conservation (DEC) at the above location.

A search of the DEC Aboriginal Heritage Information Management System (AHIMS) has shown that *0* Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to DEC;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and DEC assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the DEC Director-General. An Aboriginal object is considered to be known if:

PO Box 1967 Hurstville NSW 2220
43 Bridge Street Hurstville NSW 2220
Telephone (02) 9585 6345
Facsimile (02) 9585 6094
ABN 30 841 387 271
ahims@environment.nsw.gov.au
www.environment.nsw.gov.au

- It is registered on AHIMS;
- It is known to the Aboriginal community; or
- It is located during an investigation of the area conducted for a development application.

If you considering undertaking a development activity in the area subject to the AHIMS search, DEC would recommend that an Aboriginal Heritage Assessment be undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely

Freeburn, Sharlene
Administrator
Information Systems Section
Cultural Heritage Division
Phone: (02) 9585 6471
Fax: (02) 9585 6094

AHIMS
Aboriginal Heritage Information Management System

Department of
Environment & Conservation

List of Sites (List - Short)

Gunnedah 2

Grid Reference Type = AGD (Australian Geodetic Datum), Zone = 56, Easting From = 222000, Easting to = 223000, Northing From = 6562000, Northing to = 6572000, Requestor like 6890%, Service ID = 16911, Feature Search Type = AHIMS Features

Site ID	Site Name	Datum	Zone	Easting	Northing	Site Features	Site Types (recorded prior to June 2001)	Recording (Primary)	Reports (Catalogue Number)

No Site Recorded

Number of Sites : 0 Page 1 of 1 20/09/2006 11:25:48

Appendix v

Site Types

(No. of pages excluding this page = 3)

Site types associated with Indigenous activities and culture

The definitions that follow are for terms used in this report, and do not necessarily apply to their use in different contexts.

Art sites are defined as places where any medium has been applied to a rock surface either as symbols, characters, drawings, paintings, or any other rendition, recognisable as not being a natural discolouration or feature. They also include markings to a rock surface, either by engraving, abrading, or pecking, and which cannot be identified as being a natural feature.

Bora rings are circles of 2-30 metres diameter of compressed earth (from repeated treading or dancing), or stone arrangements, at which men performed initiation ceremonies, and are the most frequently recorded ceremonial sites. Sometimes they occur as two rings joined by a central track in a barbel configuration. They usually occur on level or low-lying country, which is usually the first topographical unit to be cultivated, or utilised for highways and roads, but they may also occur as circular stone arrangements on elevated rock platforms and hilltops. If they are or were present then they are usually either already known and have been recorded, or they have long since been destroyed.

Carved trees are readily recognised by even the untrained observer. The carving is incised either into the outer bark, or more commonly, into the living wood after removal of a section of the bark. The designs frequently consist of ‘diamond cross-cuts’, but may also consist of stylised animal motifs. Previously unrecorded carved trees are still discovered in relatively remote or inaccessible areas. Carved trees frequently occur near burial sites and/or Bora rings, but in some regions they may have been tribal boundary markers.

Fish traps may occur either in rivers or on seashores. They are recognisable as unnaturally formed stone arrangements that were constructed to trap fish (or eels or turtles) carried into the enclosure in deep water, and which are left stranded within the enclosure as the water level drops. The fish were then caught by nets, hand, or by spear.

Grinding grooves are usually observed on the surfaces of large sedimentary boulders or exposed shelves and outcrops of sedimentary rock along creek banks and beds, or near water. They have been produced by Aborigines using the rock surface to shape and sharpen the edges of stone to produce ground-edged axes, or to sharpen wooden spears (the latter tend to be narrow and deep). Water was used to lubricate the surface of the rock. The grooves frequently occur as linear abraded depressions in the rock, and may each be between 10 and 50 centimetres long, up to 15 centimetres wide, and 2 to 5 centimetres deep. Some sedimentary rock surfaces may exhibit shallow ground depressions of roughly round or elliptical shape, and these are more likely to be associated with seed grinding, root crushing, or other food preparation.

Middens may be identified variously as beach, lagoon, lacustrine, or estuarine, and are most likely to be observed at or above the water line where erosion, topsoil removal, or mining has exposed the shell. The size of the midden can vary enormously, with the smallest comprising a 'one off', "dinner-time camp" (Meehan. 1982), with as few as two or three shells, or a shallow lens of only a few centimetres. The largest middens may extend for many kilometres and may comprise of a number of lenses and layers of shell and ash up to several metres deep. These large middens may be evidence of continuous exploitation of the resource over many thousands of years. Middens of fresh water mussel shell may be found in eroding creek banks or in eroding terraces, particularly near both existing and defunct water holes.

Isolated shell or fragments may occur on any surface and in any situation. A bird may have discarded a single shell, but the presence of use-wear would indicate Aboriginal use of the shell as a tool, which was discarded after use. Such occurrence is likely to be where there is no immediate source of stone material suitable for tool manufacture.

Natural Mythological sites are places of significance to Aborigines, either because they are described in mythological stories or songlines, or because they were used in religious ceremonies. They may occur anywhere and while some are more predictable than others – as for example, permanent water holes, waterfalls, rock promontories, etc., others may have no particularly remarkable features. Seldom is there any recognisable artefactual evidence or anything to distinguish it from similar features in the vicinity. Aboriginal people with an association with the place must of necessity identify these sites.

Open sites, campsites, knapping floors, scatters, and isolated artefacts, are most likely to occur on eroded and exposed creek banks, particularly where slope wash or stock trails has removed the humic layer, or on eroded ridges and spurs, particularly near the junctions in watercourses.

Open sites are most likely to be present in greatest numbers near a source of either raw stone material, or potential food resources, or in a natural corridor between two differentially preferred environmental zones, or at the contact between two environmental zones containing different resources.

Artefacts in open scatters are likely to be manufactured from the dominant raw material available; i.e. Greywacke on greywacke-sourced soils, quartz on granite-sourced soils, silcrete and chert on relict sedimentary soils.

Artefact assemblages in open scatters are likely to consist predominantly of discard material, i.e., cores, flakes, flaked pieces, and debitage.

Artefacts exhibiting retouch scars and backing are most likely to occur in sites where secondary activity took place peripheral to the central camp site, although this is a generality and can only be observed where there is sufficient surface visibility to identify peripheral sites. Fragments of flakes with retouch or backing may occur on knapping floors indicating breakage occurring during manufacture, or maintenance areas in which damaged tools have been replaced and discarded.

Isolated artefacts are likely to be most frequently observed where the groundcover obscures all but the larger artefacts, such as cores, and large flakes, or where there is little contrast between the texture of artefactual material and the surface upon which it lies. Artefacts of materials contrasting with the matrix may be visible regardless of size; eg. quartz artefacts may be far more visible than much larger basalt artefacts against a background of dark humic terrace soils.

PADs or Potential Archaeological Deposits are deposits, usually in shelters (but they may also be identified where there are intact deposits in open areas), which although not containing any visible archaeological material, are considered likely to contain archaeological material below the surface. These 'sites' are not recorded as sites on the Aboriginal Site Register, but are identified as places that require subsurface testing to establish whether a site exists or not.

Rock shelters with art or occupation deposits, are most likely to occur where the character of the parent rock is sufficiently massive or consolidated for it to retain a structure that weathers differentially to form shelters and overhangs.

Scarred trees are perhaps the most difficult site type to determine as having been caused by deliberate removal of the bark by humans and not as a consequence of natural events; such as abrasion from falling trees or branches, natural branch attrition, fire damage, or contact from vehicles or stock. They may occur in places wherever there are tree species that produce bark suitable for tool and implement manufacture. While some scars are clearly the consequence of deliberate bark removal by Aborigines (either evidenced by stone axe marks, or identified by Knowledge Holders), some scars were made by settlers, and stockmen, and surveyors who frequently blazed trails and property boundaries by scarring the trees, and by timber men who removed a strip of bark to test the suitability of a tree for logging.

Other site types such as hearths, burials, etc., are less easily predicted, although burials are frequently associated with carved trees, and Bora rings, and hearths with campsites, shelters, and shell middens.