Western Coal Unloader
Pipers Flat, NSW

Cultural Heritage Assessment

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A Report to KDC

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EXECUTIVE SUMMARY

Energy Australia proposes to construct a rail unloader facility to source coal from a wider selection of mines to supply it power stations. The loop would connect to the Mudgee rail line branch between Portland and Wallerawang. The proposed rail track would connect to the Mudgee rail line and form a loop, before connecting back to the Mudgee line. A feasibility study identified a potential suitable location for construction of a rail loop and unloader facility at Pipers Flat (Figure 1.1). Subsequently Energy Australia is now looking to realign the approved rail loop (Figure 1.2).

The coal would be transferred from the unloader to the power station via a conveyor. The conveyor would run in a northerly direction from the rail loop to the Mount Piper power station.

Sinclair Knight Merz commissioned a cultural heritage assessment of the development works area in 2007 which included a review of relevant heritage literature and databases, Aboriginal consultation and field inspections. This report has been updated as part of the current assessment of the realignment.

Background research indicated that no historic sites were listed on heritage registers as occurring in the Pipers Flat study area. Background research indicated that two Aboriginal sites (#45-1-0075 and #45-1-0076) and an area of archaeological potential (PAD7) had been previously recorded as occurring in the Pipers Flat study area.

Results:

A single isolated find (WCU 1 (45-1-0076)) and seven areas of potential archaeological deposit (WCU PAD1-7) were identified in the course of the field survey of the Pipers Flat study area in 2007. One historic site complex (WCU H1), a former farm site, was recorded.

The proposed Pipers Flat rail loop modification would directly impact four areas of Aboriginal PAD (WCU PAD 3 - 6) and potentially impact PAD WCU PAD7. The modified rail loop will not directly impact historic site WCU H1. The approved project was to directly impact one Aboriginal site (WCU 1 (45-1-0076)) and directly impact six areas of Aboriginal PAD (WCU PAD 1-6). The modification project will therefore impact fewer sites and PADs than the approved project.

The Statement of Commitments for the approved project as they relate to heritage are:

Preservation of Aboriginal Cultural Heritage:

- A program of archaeological subsurface testing would be conducted for the PADs. Testing should aim to determine the nature and significance of any Aboriginal cultural material present at each location;

- The artefact scatter identified as 45-1-0076 will be completely salvaged, including an archaeological excavation prior to construction works commencing;

- The salvage and archaeological investigation will be undertaken in consultation with the local Aboriginal community;

- Information pertaining to the salvage and preservation of artefacts at site 45-1-0076 will be included in the Construction EMP.

Protection of Indigenous Heritage relics if uncovered:

- In the event that artefacts of indigenous heritage significance are

- uncovered during the course of construction, works in the immediate area would cease, DECC would be notified and expert advice would be sought from an appropriately qualified professional.

Investigation of farm site:

- Historic site WCU H1 would be subject to an archival level recording prior to its removal from the site.

Based on an assessment of the possible impacts of the modification proposal on the known and potential archaeological resource, the following new recommendations are provided:

1. Only those areas of PAD that will be directly impacted by the project should be the subject of archaeological subsurface testing.

2. Site 45-1-0076 will not be impacted by the modified project, it should therefore be left in-situ and not disturbed.

3. Historic site WCU H1 not be impacted by the modified project, no further action is therefore required.

4. In order to avoid inadvertent impacts all sites or parts of sites that will not be impacted should be fenced during all construction works and its location placed on project maps as a no-go zones.

5. Consultation should continue with the relevant Aboriginal community and should include the conduct of the OEH *Aboriginal cultural heritage consultation requirements for proponents 2010.*

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1. INTRODUCTION

Energy Australia operates two power stations near Lithgow in the central west of NSW. Coal for the power stations is provided via local mines through conveyor or road transport. Energy Australia propose to construct a rail unloader facility to source coal from a wider selection of mines.

A feasibility study identified a potential suitable location for construction of a rail loop and unloader facility at Pipers Flat (Figure 1.1). Subsequently Energy Australia is now looking to realign the approved rail loop (Figure 1.2).

The loop would connect to the Mudgee rail line branch between Portland and Wallerawang. The proposed rail track would connect to the Mudgee rail line and forms a loop, before connecting back to the Mudgee line. Construction of the rail loop is likely to involve some cut and fill and importation of fill from the nearby Lamberts Gully Mine for the rail embankments. The fill would be trucked from the mine down the alignment of the conveyor to the rail loop.

The coal would be transferred from the unloader to the power station via a conveyor. The conveyor would run in a northerly direction from the rail loop to the Mount Piper power station.

This report documents the results of an Aboriginal and historical cultural heritage assessment of the proposed development. This assessment was first conducted in 2007 to supplement an environmental assessment for the rail loop and conveyor.

The assessment of the realigned rail loop has been commissioned by KDC on behalf of Energy Australia. The modified project will impact fewer sites and Potential Archaeological Deposits (PADs) than the approved project. This report has been updated as part of the current assessment of the realignment.

1.1 Report Outline

This report:

- Documents the methodology implemented for the Pipers Flat study;
- Describes the environmental setting of the Pipers Flat study area;
- Provides a background of local and regional archaeology and history for the Pipers Flat study area;
- Documents the results of the study; and
- Provides management recommendations based on the results of the investigation.

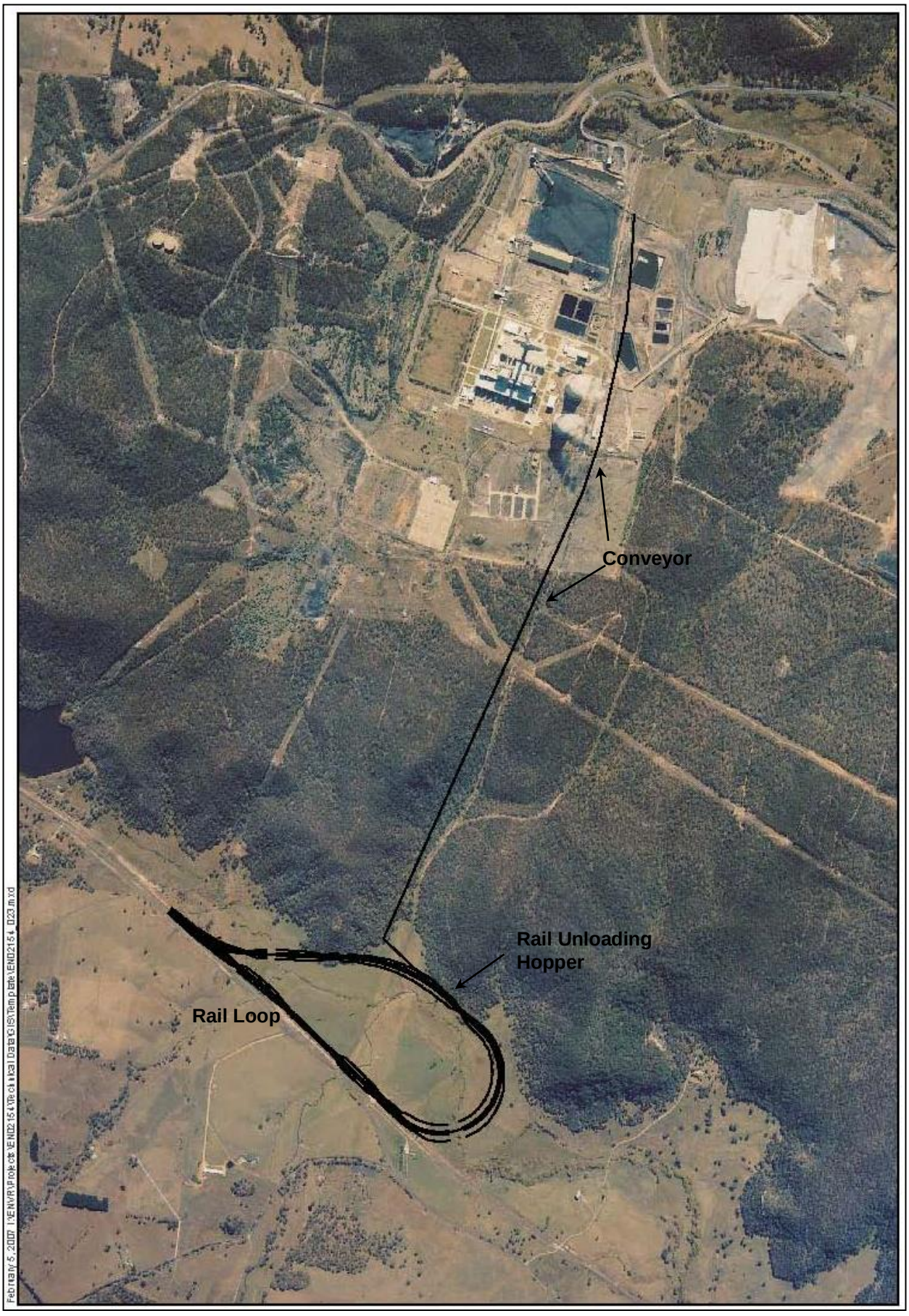

Figure 1.1 Location of Pipers Flat study area showing the indicative 2007 Rail Loop and conveyor alignment (Map supplied by SKM)

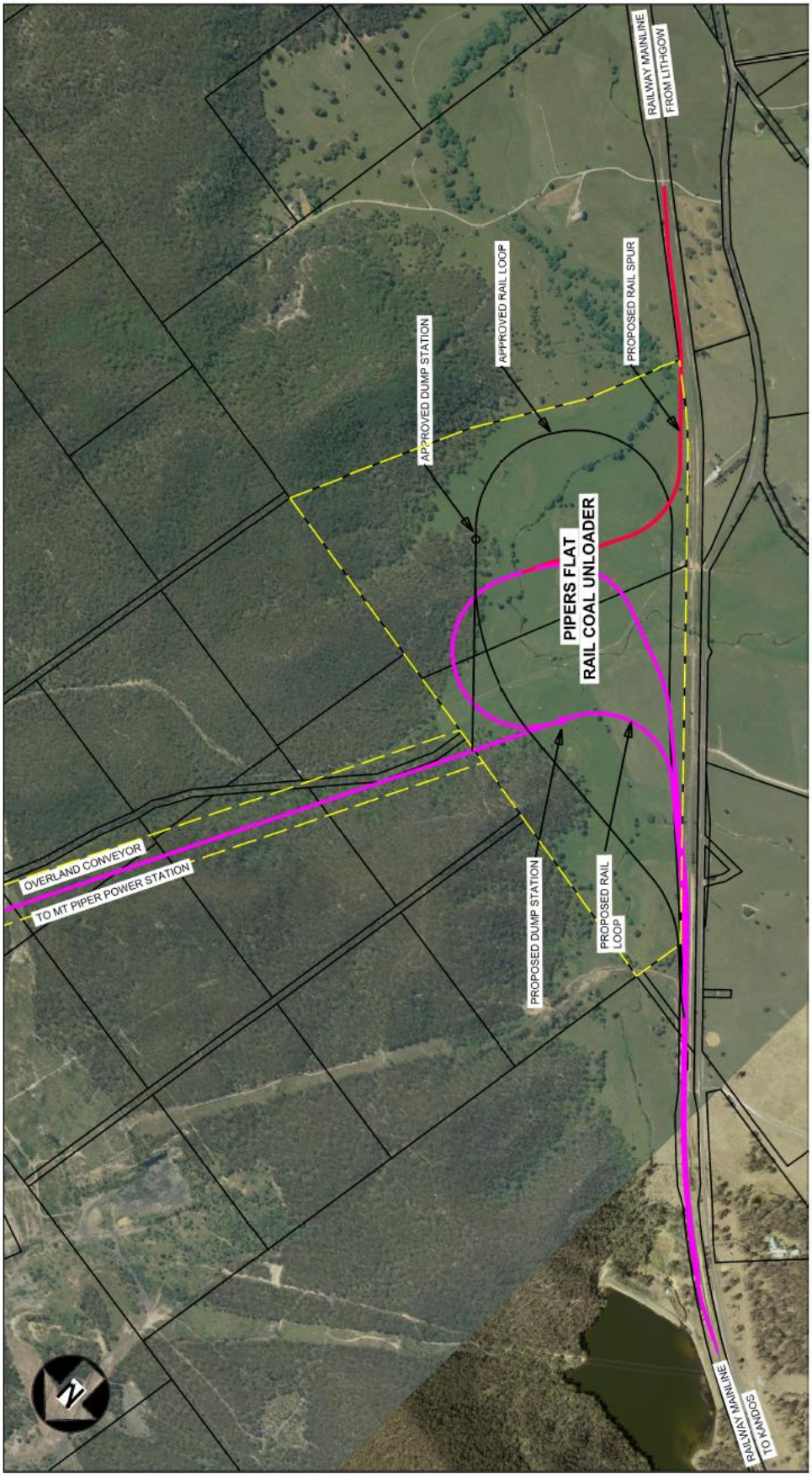

Figure 1.2 Indicative detail of the proposed modified rail loop realignment 2018 (Map supplied by KDC).

2. ABORIGINAL PARTICIPATION

The study area falls within the boundaries of the Bathurst Local Aboriginal Land Council (BLALC). The BLALC was contacted by phone prior to the field study and informed of the project. It was arranged that Mr Richard Peters would attend and assist in the field survey. *Records of Aboriginal Participation* are provided as Appendix 1.

Brief discussions were held with Mr Peters on completion of fieldwork about possible recommendations for the Aboriginal heritage items identified in the study area. Mr Peters indicated that he would prepare a report based on the results of the survey. The Land Council's report is attached as Appendix 2. The report indicates that the BLALC is supportive of conducting additional archaeological investigations in the identified areas.

A copy of the 2007 report was forwarded to the BLALC for their comment and no comments were received.

3. STUDY METHODOLOGY

3.1 Literature and Database Review

A range of documentation was used in assessing archaeological and historical knowledge for the Pipers Flat study area and its surrounds. This background research was used to determine if known Aboriginal and historical sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. The review of written and documentary sources included heritage registers, local histories and archaeological reports.

Aboriginal literature sources included the NSW Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS) and associated files and catalogue of archaeological reports.

Sources of historic information included published monographs and parish maps.

The following heritage registers and schedules were searched:

- The National Heritage List (Australian Heritage Council);
- The Commonwealth Heritage List (Australian Heritage Council);
- The Register of the National Estate (Australian Heritage Council);
- The State Heritage Register (NSW Heritage Office);
- The State Heritage Inventory (NSW Heritage Office);
- Heritage Schedule(s) from the Lithgow Local Environmental Plan 1994;
- Register of the National Trust of Australia (NSW).

3.2 Fieldwork

Fieldwork was conducted by three people over a period of two days in August 2006. Areas subject to survey included the proposed location of the rail loop and a 50 m wide corridor of the proposed alignment for the conveyor. Other areas within the loop were also inspected including sections of the creek line. The survey also sampled areas outside the immediate impact areas and attempted to identify the location of previously recorded sites within and near the study area.

The archaeological survey aimed to identify material evidence of Aboriginal and historical occupation as revealed by surface artefacts and areas of archaeological potential not associated with surface artefacts. An assessment of landscape disturbance and archaeological sensitivity/potential was made for all subject areas.

3.3 Project Personnel

Field survey was conducted by archaeologists Matthew Barber and Tom Taverner, with assistance provided by Richard Peters of the Bathurst LALC.

This report was prepared by Matthew Barber and edited by Kerry Navin, Lindsay Smith and Nicola Hayes.

3.4 Recording Parameters

3.4.1 Aboriginal

The Aboriginal archaeological survey aimed at identifying material evidence of Aboriginal occupation as revealed by surface artefacts and areas of archaeological potential un-associated with surface artefacts. Potential recordings fall into four categories: isolated finds, sites, background scatter and potential archaeological deposits.

3.4.1.1 Isolated finds

An isolated find is a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres. Isolated finds may be indicative of:

- Random loss or deliberate discard of a single artefact'
- The remnant of a now dispersed and disturbed artefact scatter; and
- An otherwise obscured or sub-surface artefact scatter.

Except in the case of the latter, isolated finds are considered to be constituent components of the *background scatter* present within any particular landform.

The distance used to define an isolated artefact varies according to the survey objectives, the incidence of ground surface exposure, the extent of ground surface disturbance, and estimates of *background scatter* or *background discard* densities. In the absence of baseline information relating to background scatter densities, the defining distance for an isolated find must be based on methodological and visibility considerations. Given the varied incidence of ground surface exposure and deposit disturbance within the study area, and the lack of background baseline data, the specification of 60 metres is considered to be an effective parameter for surface survey methodologies. This distance provides a balance between detecting fine scale patterns of Aboriginal occupation and avoiding environmental biases caused by ground disturbance or high ground surface exposure rates. The 60 metre parameter has provided an effective separation of low density artefact occurrences in similar southeast Australian topographies outside of semi-arid landscapes.

3.4.1.2 Sites

A site is defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity.

Frequently encountered site types within south-eastern Australia include open artefact scatters, coastal and freshwater middens, rock shelter sites including occupation deposit and/or rock art, grinding groove sites and scarred trees. For the purposes of this section, only the methodologies used in the identification of these site types are outlined.

Most Aboriginal sites are identified by the presence of three main categories of artefacts: stone or shell artefacts situated on or in a sedimentary matrix, marks located on or in rock surfaces, and scars on trees. Artefacts situated within, or on, a sedimentary matrix in an open context are classed as a site when two or more occur no more than 60 metres away from any other constituent artefact. The 60 metre specification relates back to the definition of an isolated find (*Refer above*). In a rock shelter, a site is defined as one or more artefacts occurring within or immediately adjacent to the sheltered space. Unlike a single artefact in an open context, a rock shelter provides a probable occupational focus to the interpretation of a single artefact and can therefore be considered to be indicative of a site. An exception would be a single artefact which may have been deposited in the shelter through natural processes.

3.4.1.3 Potential Archaeological Deposits

A potential archaeological deposit, or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. The potential for subsurface material to be present is assessed using criteria developed from the results of previous surveys and excavations relevant to the region. Where necessary, PADs can be given an indicative rating of their 'archaeological potential' based on a combined assessment of their potential to contain artefacts, and the potential archaeological value of the deposit. Table 3.1 illustrates the matrix on which this assessment is based. Locations with low potential for artefacts fall below the threshold of classification. In such cases the potential incidence of artefactual material is considered to be the same as, or close to that for background scatter. Where there is moderate potential for artefacts, the predicted archaeological potential parallels the potential significance of the deposit. For deposits with high potential for artefacts, the assessed archaeological potential is weighted positively.

The boundaries of PADs are generally defined by the extent of particular micro-landforms known to have high correlations with archaeological material. A PAD may or may not be associated with surface artefacts. In the absence of artefacts, a location with potential will be recorded as a PAD. Where one or more surface artefacts occur on a sedimentary deposit, a PAD may also be identified where there is insufficient evidence to assess the nature and content of the underlying deposit. This situation is due mostly to poor ground surface visibility.

Table 3.1 Matrix showing the basis for assessing the archaeological potential (shown in bolded black text) of a potential archaeological deposit.

		Potential to contain Aboriginal objects		
		Low	*Moderate*	*High*
Potential archaeological significance	*Low*	---	**low**	**moderate**
	Moderate	---	**moderate**	**high**
	High	---	**high**	**high**

In the case of rock shelters contexts, the following criteria are used as guidelines for identifying the presence of potential archaeological deposits:

- Shelter should contain a sediment floor at least around one square metre in area;
- Deposit must be at least 15 cm deep (determined by inserting tent pegs);
- Deposit should be relatively compact and show evidence for a significant period of accumulation (deposit should not be spongy and contain only clean sand derived from recent stone weathering);
- The shelter space should be at least one metre high and one metre deep (but exceptions may occur, such as where the deposit is deep); and
- The shelter should be relatively dry.

3.4.1.4 Background scatter

Background scatter is a term used generally by archaeologists to refer to artefacts which cannot be usefully related to a place or focus of past activity (except for the net accumulation of single artefact losses).

There is, however, no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocused activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focused activity' are camping, knapping and heat-treating stone, cooking in a hearth, and processing food with stone tools. In practical terms, over a period of thousands of years an accumulation of 'unfocused' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.

3.4.2 Historical

As with Aboriginal archaeological field surveys, the effectiveness of historical archaeological field survey is to a large degree related to the obtrusiveness of the sites being sought and the incidence and quality of general and ground surface visibility. The methods used to investigate sites are based on trained observation, skilled interpretation and accurate recording of the physical remains, combined with the archaeologist's own experience of what is likely to be found.

Unlike Aboriginal archaeological field surveys, in many instances historical surveys are aided by the availability of historical documents that assist in locating sites. In this regard, a range of historical research techniques may include the use of early town and rural directories, land title searches, analysis of early maps, photographs and aerial photographs, technological encyclopaedia, immigrant's guides, trade and popular journals, mail order catalogues, bankruptcy records, government records and other specialised sources. In some instances, oral histories may also be available to assist the archaeologist to locate sites.

Some sites are wholly below ground surface while others are partially or wholly above ground. They may be derelict, ruinous or still functioning.

For the most part, the visibility of wholly above ground historic standing structures, such as buildings, fences, etc., poses little problem for the field surveyor. This of course can be variable, particularly where the structure is partially or completely covered by vegetation, or has been covered or enclosed by additional construction.

For those structures or items that are partially above ground, visibility and full identification can be difficult. In such cases it may be necessary to undertake an archaeological excavation to ensure that the item is correctly and completely identified and recorded.

For items that are wholly below ground, there may be no visible indications of their presence on the surface, or in some cases only a few indications, such as an earth platform or fragmentary artefacts, visible on the surface of the site. In such cases it may also be necessary to undertake an archaeological excavation to ensure the item is correctly and completely identified and recorded. However, the option not to excavate should be a primary consideration for any site that is subject to development. Where a site is not under threat, archaeological deposits are safer left in the ground.

4. ENVIRONMENT

The study area is located about 14 km northwest of Lithgow within the Portland Plateau. It is on the western margin of the Sydney Basin which dominates east central New South Wales. The Sydney Basin is a large sedimentary basin consisting of various, approximately horizontally bedded sedimentary facies that accumulated during a marine transgression at the end of the Late Palaeozoic glaciation, and which was subsequently followed by a marine regression during the Late Permian and Triassic eras.

The Great Dividing Range is situated just to the west of the study area, in the vicinity of Portland. The major water course in the study area, Pipers Flat Creek, drains eastwards into the Cox River, which is part of the Hawkesbury/Nepean catchment. Watercourses to the west of Portland drain northwards to the Turon River and then westwards to the Macquarie River, within the Murray Darling Basin. The study area is therefore close to a major watershed within south-eastern Australia.

Local geology is characterised by the Permian-age Illawarra coal measures, comprising interbedded shales, sandstone, chert and conglomerate and the Wolgan, Lidsdale and Lithgow coal seams which have provided the focus of coal mining operations throughout the region since the late nineteenth century. The Narrabeen group comprising sandstone, shale and tuff is more dominant to the east of Lithgow but outcrops in small areas within the hills north of the rail loop.

The topography of the main area of the rail loop is situated in the valley floor of Pipers Flat Creek, which is dominated by alluvial and colluvial deposits. Topographically, the rail loop crosses the valley floor creek flat and terraces of the creek and basal slopes of the adjacent sandstone hills. Sandstone escarpments exist on the mid slopes between the creek and the crest of the ridgeline on which Mount Piper (1077 m AHD) is located. The rail loop and the conveyor avoid the escarpment but cross the basal slopes of the ridgeline.

To the north of the rail loop the proposed coal conveyor alignment traverses the shale, sandstone and conglomerate geology of the Illawarra coal measures. The conveyor alignment generally follows a narrow valley with an ephemeral creek up to a saddle and from there along the side slope of a ridgeline to join the existing conveyor.

Most of the vegetation within the rail loop area has been cleared for grazing purposes. There are exotic willow trees along the margins of Pipers Creek and the occasional stand of regrowth Eucalypts within the valley floor.

In the hills to the north of the rail loop, the vegetation comprises native vegetation of open Eucalypt forest with some acacia and a sparse understorey of shrubs. Main tree species are red Stringybark, Brittle Gum and Scribbly Gum. Some clearance has occurred for vehicle tracks and high voltage power lines.

5. ABORIGINAL CONTEXT

5.1 Ethnographic Background

The study area falls within a larger area which was, at the time of European settlement, inhabited by members of the Wiradjuri linguistic group, and which falls into the tribal area delineated by Tindale (1974) as 'Wiradjuri'. This territory extends from Dubbo and Bylong in the north to Tallangatta in the south, and west from Lithgow to the Hay Plain and Ivanhoe.

It should be noted, however, that tribal boundaries within Australia are based largely on linguistic evidence and it is probable that boundaries, clan estates and band ranges were fluid and varied over time. Consequently 'tribal boundaries' as delineated today must be regarded as approximations only, and relative to the period of, or immediately before, European contact. Social interaction across these language boundaries appears to have been a common occurrence.

Wiradjuri territory extended into three general physiographic regions: the highlands (central tablelands) in the east, the riverine plains in the west and the transitional western slopes zone in-between (White 1986:39). The rail loop and conveyor study area is located in the central tablelands section.

Early explorers noted the presence of Aboriginal people throughout the Blue Mountains by the fires apparently deliberately lit across the area (Gorecki 1982). Ethnographic and archaeological evidence indicates that a small population inhabited the high plateaux, probably during the warmer months of the year, for at least 12 000 years (Johnson 1979 in Gorecki 1982).

5.2 Regional Archaeological Setting

To date few academic archaeological studies have been conducted in, and immediately around, the study area. However, broad range and regional studies have been undertaken in the surrounding region within an academic research framework (Pearson 1981; White 1986).

In 1981 Pearson completed the only major and regionally based research investigation relevant to the study area. His thesis was an investigation of Aboriginal and early European settlement patterns within the Upper Macquarie River region of NSW. The majority of his field coverage was directed by information from informants and was thus skewed toward large or obtrusive sites which had been recognised by local residents. Pearson excavated three rock shelter sites (Botobolar 5, and Granites 1 and 2) which provided a regional record of Aboriginal occupation dating back to around 7000 years before present.

Pearson's analysis of the patterns of Aboriginal occupation involved an examination of site location characteristics in four sample areas. The following points summarise Pearson's results relevant to the present investigation:

- There is a strong relationship between site location and distance from water sources. Distance to water varied from 10 to 500 m, but in general the average distance from water decreased as site size increased;

- Sites were found on hilly or undulating places rather than on river flats or the banks of waterways. However it was found that the regional incidence of landform variation biased this sample;

- Good drainage and views over watercourses and river flats were also considered to be important site location criteria;

- Most sites were located in contexts which would originally have supported open woodlands, with small numbers in original grassland or forest contexts. However, this result is skewed by the predominance of the first vegetation type;

- Burial sites and grinding grooves were situated as close to habitation areas as geological constraints would allow;
- Ceremonial sites such as earth rings ('bora grounds') were located away from campsites;
- Stone arrangements were also located away from campsites in isolated places and tended to be associated with small hills or knolls or were on flat land;
- Quarry sites were located where stone outcrops with desirable working qualities were recognised and were reasonably accessible; and
- Based on ethnohistoric information, Pearson suggests that Aboriginal campsites were seldom used for longer than three nights and that large sites probably represent accumulations of short visits.

Archaeological excavation of rock shelters in the region, including Capertee Valley, Noola and other shelters in the western Blue Mountains have provided dates of Aboriginal occupation back to about 12,000 to 14,000 years ago (Tindale 1961; McCarthy 1964; Stockton 1970; Stockton and Holland 1974, Johnson 1979).

It has been argued that after this early phase of occupation there was a decline in occupation until about 3,000 years ago when there was an increase in population. This coincided with a change in stone technologies from the Core Tool and Scraper Tradition to the Small Tool Tradition. Part of the intensification has been attributed to change in diet with more carbohydrate based foods becoming available or exploited. The intensification of Aboriginal occupation has recently been challenged (Boot 1994).

Within the Lithgow region MacIntyre (1990) and Haglund (1990) proposed that Aboriginal site distribution was based on larger site complexes occurring at the head of open valleys where there was a range of resources. Large sites could also be found on the western edge of the plateau where streams entered the Coxs River. Smaller sites were to be found at the end of long ridgelines and ephemeral sites could occur anywhere below the cliff line.

Survey of open sites in the Blue Mountains has established a consistent picture of sparse, low density surface scatters with quartz as the predominant raw material. These sites were often located on elevated ground above swamps or permanent streams (Barton and McDonald 1994:11).

5.3 Local Archaeological Surveys

The Mount Piper area has been subject to a number of archaeological surveys as part of development-driven assessments, particularly in association with the coal mining industry and establishment of the Mount Piper power station.

Wright undertook a cultural heritage survey in 1980 as part of the Environmental Impact Statement for the Mount Piper Power Station. Wright did not find any Aboriginal sites or artefacts in either the main station area or the ash disposal area (Wright 1980:43).

In 1982 Haglund investigated eight areas from Portland Road in the north to Thompsons Creek in the south (1982a). Haglund recorded nine sites, including seven artefact scatters, a shelter with deposit and an axe grinding groove site. One of her survey areas was the escarpment and basal slopes of the ridge north of Pipers Flat Creek, part of which is within the present study area (see below). All of the artefact scatters were found on low spurs or creek flats elevated above flood-prone land. The artefacts were mostly low density and quartz was the dominant raw material, and Haglund noted that the sites probably had shallow soil profiles.

Haglund (1982b) undertook some subsurface testing at one of the sites (AHIMS Site No. 45-1-0067). Thirty artefacts were located in three test pits. The artefacts comprised flakes and fragments, a notched blade, a split pebble scraper and a pebble with a polished surface. Quartz dominated the assemblage, with quartzite the only other material recorded. The deposit was shallow (less than

15 cm) and the artefacts were found in a four centimetre band close to the surface. No other cultural features such as hearths were identified at the site.

Rich (1985) undertook a preliminary survey of the proposed conveyor and pipeline routes between the Mount Piper power station and the Angus Place colliery to the east of the present study area. Rich recorded a scarred tree and two open artefact scatters close to the Coxs River, and a small scatter of artefacts at Rydal Mount (Rich 1985 in Brayshaw and Dallas 1993:27).

Aitken (1985) reported on a survey conducted from Bayswater to Mount Piper for the proposed transmission line between the two locations. Aitken concluded that most sites occurred in the northern part of the study area, and sites were notably absent from the area near Mount Piper which she described as an area of 'adverse climate and poverty of resources on the more elevated plateaux' (Aitken 1985:25).

McIntyre conducted an archaeological survey ahead of construction of a dam across Thompsons Creek and augmentation of the water supply to the Mount Piper Station (McIntyre 1988). Two Aboriginal sites (AHIMS Nos. 45-1-73 and 45-1-75) were located in the course of her survey. Five Aboriginal sites and four historic sites were also identified south of Pipers Creek and the present study area. The pipeline route surveyed by McIntyre for her 1988 study is the same as that followed by the present conveyor proposal. No sites were recorded by McIntyre.

Brayshaw and Dallas (1993) surveyed an extended corridor of land for the proposed 500 kV transmission line between Mount Piper and Marulan in 1993. Twenty-six Aboriginal sites were located during the route survey. Two of these were located within relatively close proximity to the Pipers Flat study area. Site No. 45-1-239 was an open artefact scatter situated 300 m west of the confluence of Pipers and Irondale Creeks. This site is on the southern side of the railway line and therefore just outside of the rail loop study area.

The second site, No. 45-1-238, comprised a shelter with archaeological deposit, art and axe grinding grooves located approximately 300 m north of the rail loop study area, on a hillslope adjacent to a tributary of Pipers Flat Creek.

5.4 Archaeological Surveys within the Study Area

A number of archaeological surveys have included sections of the Pipers Flat study area.

A rockshelter with artefacts (Site No. 45-1-0018) was recorded on the escarpment just outside the eastern end of the study area in 1977. As this was an old recording there was some potential that the grid reference for the site was inaccurate (as it would have been based on smaller scale maps). Field survey conducted in the course of the current investigation confirmed that this site was located outside of the Pipers Flat study area (see Section 7 below).

Two Aboriginal sites, a shelter with deposit (No. 45-1-0075) and an open artefact scatter (No. 45-1-0076), were recorded in the Pipers Flat study area by Haglund in 1982 (Haglund 1982a). The shelter was noted as small, 4.5 metres long and 3.4 m deep, with a height of only 0.9 metres. The floor was mostly a flat rock shelf with only thin deposit about 10 cm deep. Haglund noted the presence of poor quality quartz artefacts outside the dripline and concluded that the site was likely to be poor in archaeological material.

The artefact scatter site was found 50-60 m downslope from the shelter. It consisted of a sparse scatter of about 12 quartz artefacts on a flat topped spur. The spur, which had only been partially cleared, was elevated about 12 m above the creekline. Haglund noted that the deposit was probably shallow but that testing would be required to prove this assumption. She also noted that the site should be subject to testing if threatened by development.

The shelter site, No. 45-1-0075 is located upslope of the proposed rail loop alignment. However the open artefact scatter 45-1-0076 is situated within an area likely to be impacted by the proposed rail alignment and coal unloading facility.

In 1998, Mills undertook a survey for the proposed Ivanhoe No 4 Colliery that included part of the present coal conveyor study area. Her study area, which comprised 375 hectares to the north of Pipers Flat Creek, included ridges and hill crests, steep hill slopes, gentle hill slopes and mostly ephemeral creeklines and swampy areas.

Mills recorded a total of six artefact scatters, two isolated finds and identified eight areas of potential archaeological deposit (PAD). One of these recordings, PAD 7, is located within the current investigation area. The PAD was situated on a series of raised creekline terraces stepping up from an ephemeral creekline. Mills noted that the northern and eastern areas of the terrace had been impacted by road construction and soil dumping associated with the construction of the Mount Piper Power Station. Mills further noted that the western side of the creekline appeared intact. Visibility was poor and no artefacts were observed (Mills 1998:19). PAD7 is crossed by the proposed conveyor from the rail loop and unloader facility.

Mills concluded that the survey confirmed the general model of site location within the district, that is, Aboriginal people used the ridgecrest areas and accessed the slopes and plateau through broad, ephemeral drainage lines from Pipers Flat.

In summary, two Aboriginal sites (Nos. 45-1-0075 and 45-1-0076) and an area of archaeological potential (PAD7) have been previously recorded as occurring in the Pipers Flat study area.

A revised AHIMS search was completed for the rail loop realignment in May 2018, see Appendix 4 for the results. No new sites are recorded on AHIMS within or in the vicinity of the project area, other than those sites recorded by NOHC in 2007 as part of this study (45-1-2602/WCU1).

Sites identified close to the current rail and conveyor alignments are shown in Figure 5.1.

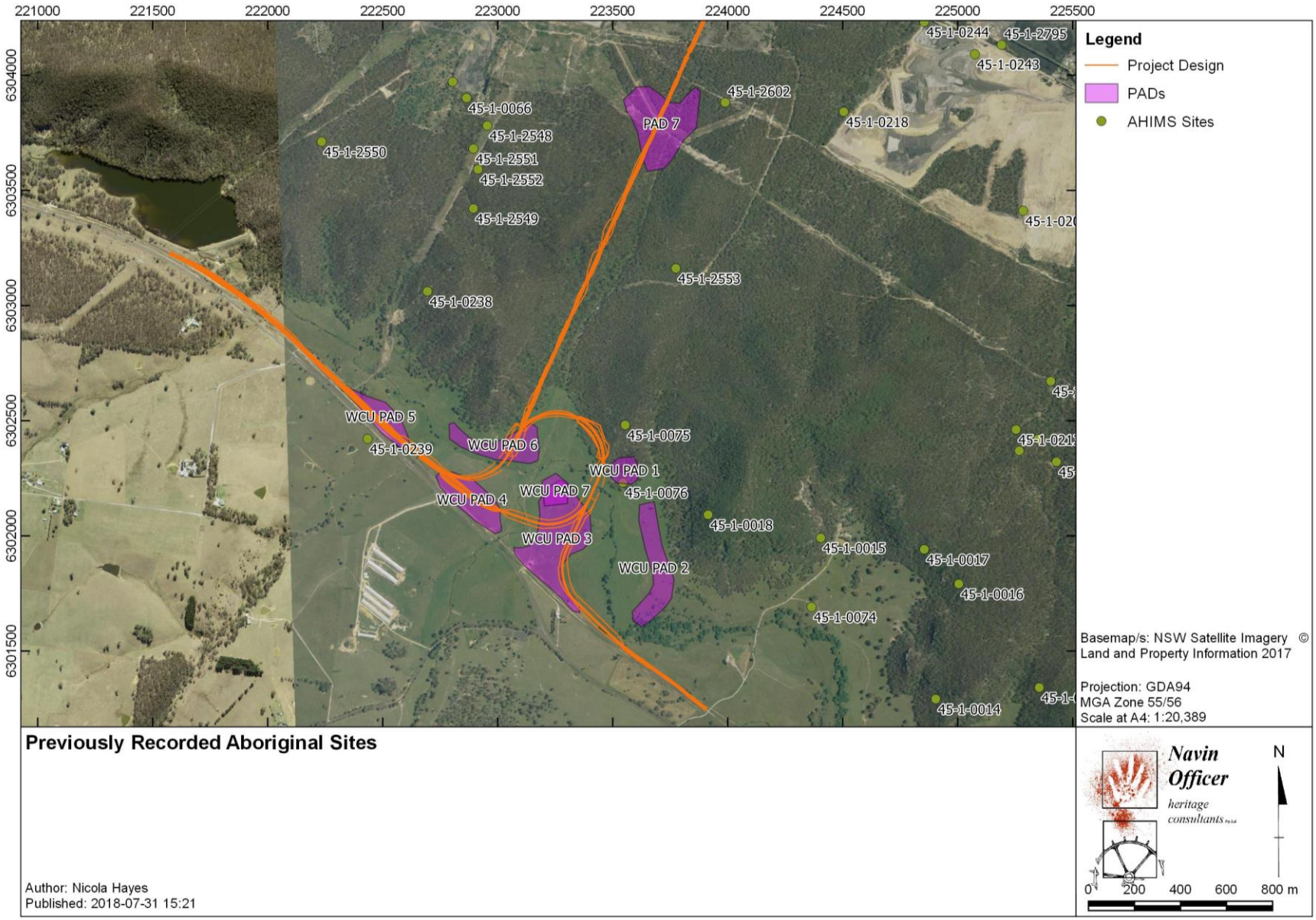

Figure 5.1 Aboriginal sites in proximity to indicative rail loop and conveyor.

6. HISTORICAL CONTEXT

6.1 Regional Overview

European access was gained to the Lithgow region after a route was found over the Blue Mountains by Blaxland, Wentworth and Lawson in 1813. A road was surveyed by Evans in 1814 and construction commenced in 1815. The road to Bathurst was completed in six months, opening up the region for exploration and grazing opportunities.

In 1822, James Walker was given a grant of 2,000 acres and named it Wallerowang [sic]. The first mention of the name Wallerawang was by the surveyor McBrien, who was surveying the road from Bathurst to Collitts Inn at Bowenfels in 1823. Upon crossing a stream, McBrien noted it was called Wallerawang by the natives, and meant 'place of wood and water' (Winchester 1972). Walker used the Wallerawang property as a base for an expansive empire that consisted of over five million acres, spread across, NSW and Queensland. Much of this was actually claimed by Walker through squatting.

Charles Darwin visited the area on his way from Sydney to Bathurst in 1836. He stayed at the Wallerawang property at the invitation of Andrew Brown. Darwin was impressed by the farm and the number of convicts employed but commented on the lack of comforts and how there was not a single woman in the area.

Walker had brought Andrew Brown with him to Australia. Brown was employed as an overseer of the Wallerawang property but also was given a grant of 200 acres at Bowenfels, just west of present day Lithgow. Here, Brown built a business that included a flour mill (1837) which was subsequently converted to a woollen mill (1867). Brown used coal to power the mill and is likely to be the first person to utilise the coal of the area from about the mid 1850s.

The railway line from Sydney to Bathurst was completed in 1869. Lithgow became a centre of industrial activity, centring on coal.

Coal mining became a major industry from the early 1860s, when it was vital for the railways. A number of coal mines were opened around Lithgow and the outlying towns. Some of the mines in the Wallerawang, Mount Piper, Lidsdale and Blackmans Flat area, generally following the railway line, included Irondale Colliery (1883), Ivanhoe Colliery (1893) and Commonwealth Colliery (1895), which became the first open cut mine in NSW (1940). The mines became the source of coal for powering Lithgow and to supply the Wallerawang power station, built in 1957.

Other early industries in the Lithgow area included copper and iron smelting, brickworks, wool milling and shale oil refining.

Rail was extended to Wallerawang in 1870. The Cobb and Co Coach Service provided transport between the station at Wallerawang and Bathurst and Mudgee, utilising the route approximating the current Castlereagh Highway.

Portland was established on what was the 1893 land selection of Thomas Murray. Portland was well known a as a source of lime and the first Australian cement was made in 1889. A number of coal mines also operated around Portland.

The Mount Piper power station existed as a series of open cut mine pits prior to its current use as a power station. Construction of the Mount Piper Power Station commenced in 1992. Following construction of a conveyor belt between the Springvale Coal Mine and Mount Piper in 1992, and construction of the Thompsons Creek Dam to supply water to Mount Piper in 1993, the power station was operational by 1993-1994.

The land on which the rail loop is proposed appears to have been selected early in the history of the area. The 1887 Parish map of Falnash (Edition 2) shows that 800 acres was owned by Thomas Walker, a nephew of James Walker. Thomas Walker came to Australia in 1822 and joined his uncles, William and James, in business in Sydney.

The 1887 Lidsdale Parish map shows that the proposed conveyor alignment passes through a series of 50 acre lots owned by Thomas Chalder or H. W. Hammond. From these lots the alignment crosses into portion 19 of the Parish of Cox, which on the 1884 Parish map was owned by James Bishop. Figure 6.1 shows the development proposals in relation to the early Parish maps.

The study area has not been mined previously and the rail loop area seems to have been used solely for farming activities. The conveyor alignment is within forested areas that were probably at least partially cleared for grazing.

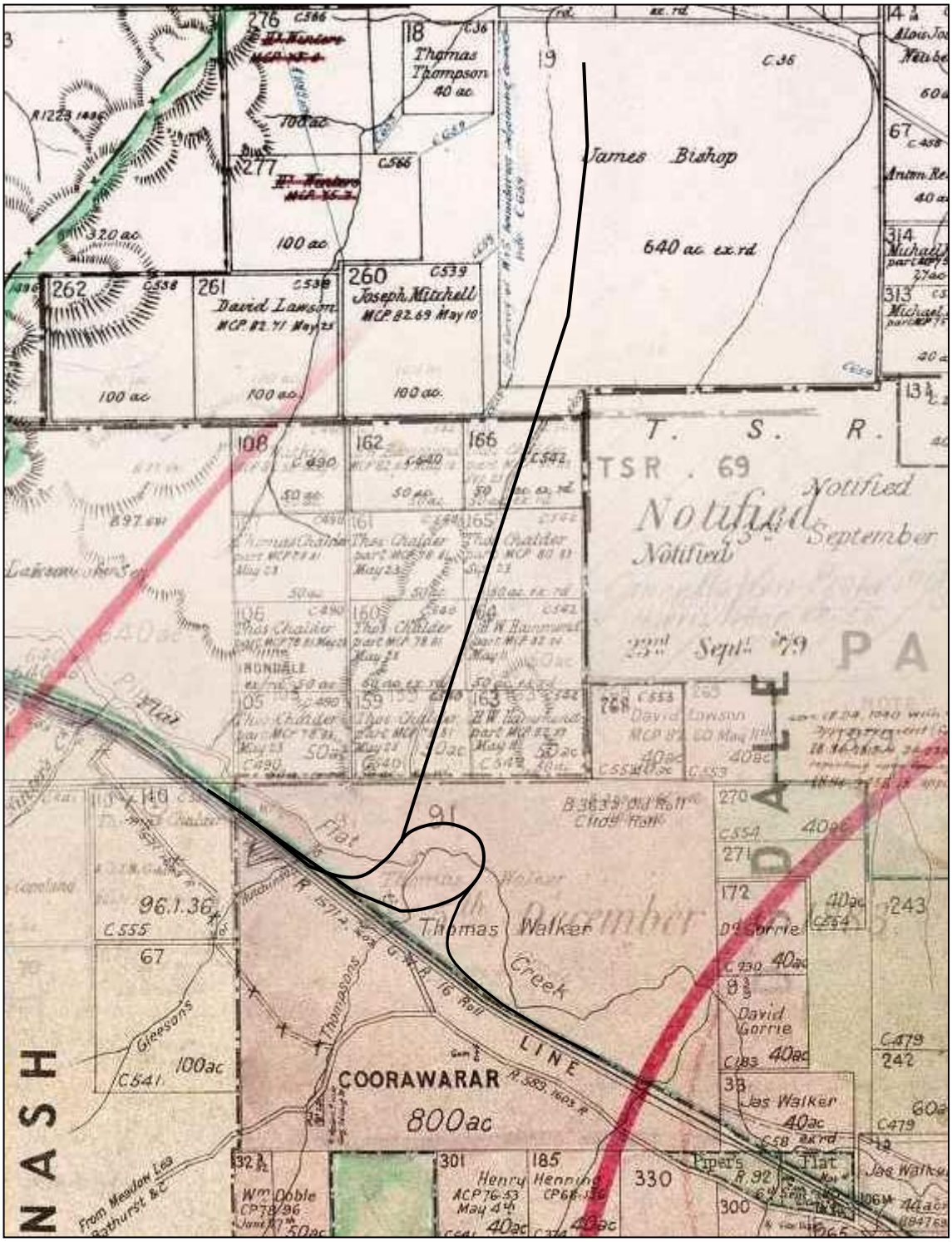

Figure 6.1 Approximate indicative location of the proposal in relation to early parish maps (Extracts from parish maps of Lidsdale 1892, Cox 1884 and Falnash 1887).

6.2 Predictive Historical Archaeology Statement

The types of places or items that may form part of the historical archaeology context include:

- Below-ground evidence, including building foundations, occupation deposits, features and artefacts; and above ground evidence, including buildings, works, industrial structures and relics that are intact or ruined; and

- Areas of land that display evidence of human activity or occupation.

Unrecorded historic sites and features of heritage significance may occur within the Pipers Flat study area.

- Structures of historic interest and heritage significance may be standing, ruined, buried, abandoned or still in use;

- Nineteenth century structures such as farm dwellings, outbuildings, selector's and timber-getters huts may survive as standing buildings, ruins or archaeological deposits and are most likely to survive on less developed rural properties, on early portion numbers, and in or near established farm building complexes;

- Traces of agricultural and industrial processing or extractive sites such as dairies, factories, and quarries may be found throughout agricultural lands on the valley floor and adjacent low ranges;

- Sites associated with early roads will be closely associated with early cadastral road reserves, watershed ridgelines, and related to early river and creek crossing points;

- Archaeological sites such as the occupation remains of former dwellings including homesteads, houses and huts, will be distributed in close association with land settlement patterns, and correlated with favourable agricultural lands, trading nodes and transport corridors;

- Transport and access routes such as bridle paths, stock routes, and road alignments of varying forms and ages, may survive as abandoned remnants adjacent to modern transport routes, or as alignments now followed by more modern or upgraded road and track infrastructure; and

- Old fence lines (such as post and rail fencing) may occur along road easement boundaries and farmlands, Other indications of field systems such as drainage channels and ridge and furrow ploughlands are likely to survive in low lying agricultural ground, especially in areas which are now used for grazing, rather than cropping.

6.3 The Pipers Flat Study Area

Register searches conducted for this investigation indicate that no historic sites are listed as occurring in the Pipers Flat study area.

7. RESULTS

7.1 Aboriginal Features

A single isolated find (WCU 1) and seven areas of potential archaeological deposit (WCU PAD1-7) were identified in the course of the field survey of the Pipers Flat study area. The site and the PADs have been given the prefix WCU (Western Coal Unloader) and are described below.

The survey relocated the two previously recorded rockshelters, Site Nos. 45-1-0018 and 45-1-0075, and identified the location of the artefact scatter, Site No. 45-1-0076 although no artefacts were visible at this latter site area. PAD7, recorded by Mills, was also inspected during the survey but no artefacts were identified. Previously recorded sites are discussed below.

Site and PAD locations are shown on Figure 7.17. All site grid coordinates were taken with a hand held GPS.

7.1.1 Previously Recorded Sites

45-1-0018 Rockshelter with artefacts

GDA 223914.6302092

This site was recorded in 1977 and was potentially within the current study area, however, the site location was confirmed in the 2006 survey and the site is outside the boundary of the rail loop study area. It is located approximately 160 m east of the eastern section of the rail loop. The site consists of a long shelter at the base of a sandstone escarpment of Mount Piper. The shelter is approximately 20 m long and about 6 m deep, with a maximum height to the dripline of about 4 m.

The floor of the shelter is mostly flat sandstone but the main alcove contains a light coloured sandy deposit. The light colour of the deposit does not show any evidence of hearths.

There is a ledge of compacted, sandy clay deposit at the front of the shelter. One particular feature was an exposed bank of deposit which was semi-circular in shape and appeared to have been built up behind either a tree of rock (probably a tree). The tree since fallen or rotted away (no obvious evidence remains) leaving the deposit. Aboriginal artefacts were observed exposed in the deposit, which is about 1.2 m deep. Aboriginal artefacts were observed inside and outside the shelter. No evidence of art or grinding grooves was noted.

45-1-0075 Rockshelter with artefacts

GDA 223550.6302485

This site was identified by Haglund (1982a) and was relocated during the current survey. It is located approximately 60 m north of the eastern section of the rail loop The shelter is very small with no headroom (height <1 m) and a rock platform floor with only recent, shallow sandy deposit. It is considered that there is no potential for archaeological deposit to be present within the shelter. Although the area outside the shelter is mostly level and offered good visibility (25%), no artefacts were found. Some natural pieces of quartz were observed in this area. There may be moderate potential for artefacts to occur based on the generally level area and the presence of a scatter of artefacts further down the slope.

45-1-0076 Artefact Scatter

GDA 223544.6302232

This site was identified by Haglund (1982a) and is approximately 60 m downslope from rockshelter Site No. 45-1-0075. The site was identified on a flat spur crest elevated about 12 m above Pipers Flat Creek. The flat is localised, about 80 x 20 m in area, and has gravelly loam deposit (Figure 7.1).

Haglund found 12 artefacts on stock tracks but visibility during the present survey was poor (15%) and these artefacts were no longer visible. The alignment of the rail loop crosses this spur and the coal unloading facility is also situated on part of the spur. The development is therefore likely to impact the site.

PAD 7

GDA 223805.6303790

PAD7, identified by Mills (1998) is crossed by the proposed coal conveyor. The eastern side of the PAD was noted by Mills to be disturbed and she indicated that the western side of the PAD was more intact, intimating that this was more likely to contain undisturbed deposits.

An assessment of the PAD 7 area and the ground surrounding the isolated find (WCU 1) during the current survey found that the area was a mostly gentle basal slope, elevated above the head of an ephemeral drainage line. It is considered that the drainage line was not likely to carry water except after a heavy storm and therefore was a poor source of water. Although an artefact was identified in the general area, the soil profile was very shallow, and offered little in the way of stratigraphic profile.

Using the matrix outlined in Table 3.1, the PAD is assessed as having only low to moderate potential to contain artefacts and the significance of any site found is likely to be low. The PAD does not therefore meet the threshold to require additional investigation.

7.1.2 Sites Recorded in the Current Survey

WCU 1 Isolated Find (45-1-2602)

GDA 224093.6304071

This site was found on a flat bench on a gentle side slope of a ridgeline, elevated above the head of a shallow, ephemeral drainage line. It is approximately 200 m east of the proposed conveyor from the rail loop and unloader facility and about the same distance north-east of PAD7. The artefact was found embedded in the soil at the base of a fallen tree (Figure 7.2). The exposure showed a predominantly clayey deposit which is likely to be shallow. Ground surface visibility in the general area was poor (10%) due to thick leaf litter.

Artefact:

1. Quartzite flake, 75% pebble cortex, 65 x 32 x 10 mm.

WCU PAD 1

GDA 223509.6302240

This PAD comprises a flat spur crest, approximately 80 x 20 m, elevated about 12 m above Pipers Flat Creek. It is located on a section of the proposed rail loop. The area is considered to have high archaeological potential. Any site found would likely to be of low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 2

GDA 223668.6302041

This PAD is located on a section of the proposed rail loop. It extends across the gentle to flat basal slopes of Mount Piper, which are elevated on a terrace-like feature about 5-8 m above the creek flats. Overall, the PAD extends for about 450 m around the base of the mountain, parallel to the meander of the creekline (Figure 7.3). Visibility was generally low at about 10%.

Soil was generally fine brown loam. A small peninsula of sandy deposit was identified on the southeastern end of the terrace feature. This area was only elevated about 2-3 m above the creek

flats. Despite wombat burrows offering increased visibility in this area, no artefacts were located in this area.

The sandy area is considered to have high archaeological potential. Any site found is likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 3

GDA 223217.6301881

This PAD is situated on the southern side of Pipers Flat Creek on a section of the proposed rail loop. The PAD comprises a high, flat terrace elevated well above the creek flats with a steep bank dropping down to the creek flats (Figure 7.4). The PAD extends over an area of approximately 200 x 250 m, north towards the confluence of Thompsons Creek and Pipers Flat Creek. It gradually descends towards this junction until it is only a localised elevated, low spur crest. This area was recorded separately as WCU PAD 7 (see below).

The deposit mostly consists of sandy loam. Some disturbance has occurred through construction of a shed and cattle yards but most of the flat is relatively undisturbed. Visibility was generally poor, at only about 15%.

It was concluded that the flat area was of moderate to high archaeological potential. Any site found is likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 4

GDA 222959.6302059

This PAD comprises a high, relatively flat, elevated terrace situated south of Pipers Flat Creek, between Thompsons Creek and Irondale Creek (Figure 7.5). It is located on a section of the proposed rail loop. The elevated area extends for approximately 400 m between the creeks and from the existing rail line fence for about 100 m towards Pipers Flat Creek. A steep creek bank forms an obvious boundary to the area of potential. Soil was fine silty loam. Visibility was generally poor at about 15%.

It was concluded that the flat area was of moderate to high archaeological potential. Any site found is likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 5

GDA 222458.6302602

This PAD is situated on an elevated flat terrace between Irondale Creek and Winters Creek, south of Pipers Flat Creek, on a section of the proposed rail loop. The PAD is elevated well above the flood-prone creek flats (Figure 7.6) and extends over an area of about 380 x 80 m. The deposit is silty loam. Visibility was poor at about 10%.

The western end of the terrace feature has been partly disturbed. There is a vehicle track accessing a former borrow pit from the main road, and there are small earth mounds noted that may be the result of rabbit warren ripping. Some of these mounds contain European rubbish such as corrugated iron and fencing wire. There is also a drain (?) excavated from a culvert under the existing rail line to Pipers Flat Creek. Part of the PAD area had also been disturbed as a result of the presence of a European historic site, comprising a small farm complex (see section 7.2).

The archaeological potential within this disturbed area is reduced by this landscape disruption. The area is nevertheless considered to have moderate to high archaeological potential. Any site found is

likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 6

GDA 223176.6302526

This PAD comprises the gentle basal hillslopes on the northern side of Pipers Flat Creek, on a section of the proposed rail loop. The PAD is quite extensive, incorporating a large topographic feature (Figure 7.7), however the most sensitive areas of the basal slopes are the low gradient elevated areas above the creek flats. These areas extend from the steeper break of slope out into the floodplain. These characteristics are not common across the entire basal slope area.

One area of particular potential was noted where the rail loop crosses a small micro-spur with a flat crest which is elevated above the creek flats. The GPS reading provided above is taken from this feature. Deposit in the PAD area is loam. Visibility was generally poor, at only about 10%.

The low gradient to level areas are considered to have moderate to high archaeological potential. Any site found is likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

WCU PAD 7

GDA 223297.6302197

This PAD is an extension of WCU PAD 3 on the southern side of Pipers Flat Creek. It is a micro-topographic spur feature situated below the main high terrace of WCU PAD 3 (Figure 7.8). The feature is elevated above the creek flats and contains loam deposit. Visibility of 30% was afforded by a farm track but no artefacts were observed, while visibility off the track was only 10%.

The area is considered to have high archaeological potential. Any site found is likely to be assessed as low to moderate significance. The PAD therefore meets the threshold for conducting additional investigation.

Figure 7.1 View north along spur of 45-1-0076 Artefact Scatter and PAD (WCU PAD 1)

Figure 7.2 View southwest across site WCU 1

Figure 7.3 View east to WCU PAD 2

Figure 7.4 View southwest up to elevated terrace of WCU PAD 3

Figure 7.5 View east from WCU PAD 4 across Thompsons Creek to WCU PAD 3

Figure 7.6 View west along rail alignment up to elevated terrace of WCU PAD 5

Figure 7.7 View west across basal slopes of WCU PAD 6

Figure 7.8 View south along WCU PAD 7

7.2 European Features

One historic site complex, a former farm site, was identified during the field survey of the Pipers Flat study area. The location of this site, on a section of the proposed rail loop, is shown on Figure 7.17.

WCU H1 - Former Farm complex

GDA 222556.6302515 to 222537.6302534

This site consists of eight archaeological features most likely representing a former farm complex comprising a house and outbuildings. The site is on the flat, elevated ground between Irondale and Winters Creeks, immediately north of the railway line. A description of each feature is provided below.

Feature 1 This feature incorporates a benched platform outlined by quarried sandstone blocks with an apparent thin concrete internal slab. A partial brick-lined drain is evident at the northeastern corner (Figure 7.9). The bricks are probably early twentieth century in age. Two steel pins have been driven into the north (downslope) end of the platform, to possibly prevent downslope creep of the sandstone blocks. The area of the platform is approximately 3.8 x 5.1 m. The southern end of the platform abuts the property fenceline that forms a common boundary with the rail line easement.

Feature 2 Located approximately 40 m north of feature 1, this feature is a mound of dirt and rubble including broken bricks, stones and tin. The mound is approximately 11 m in diameter and there is a small hollow at the southern end containing modern bricks, rocks and galvanised tin. The mound appears to be the result of bulldozing the remains of a structure. No timber or other artefacts were observed.

Feature 3 This feature is situated about 17 m west of feature 2 and incorporates the platform of a building with a concrete slab. The slab is approximately 3.5 x 3.5 m in size. The concrete slab is associated with a rectangular earthen depression, which is 8 x 4.2 m in area. At the southwestern end of this depression, is a concrete footing (Figure 7.10). The footing is 2.8 m long and about 6 cm deep. The concrete is scalloped on the inside - where the building would have stood - and appears to mirror the edge of a vertical timber slab structure (Figure 7.11).

Feature 4 Situated 11 m west of feature 3, this feature is the base of a collapsed stone chimney (Figure 7.12). The chimney comprises large, quarried sandstone blocks, with one measuring 95 x 35 x 15 cm. There are broken bricks in cement render associated with the chimney. It appears that the hearth opened to the east, towards the elongated depression of item 3.

Feature 5 This is a small platform located about 9 m south of the collapsed chimney. The feature comprises broken concrete slabs, broken bricks and scattered sandstone blocks. The feature measures about 5.5 x 4.4 m in area (Figure 7.13).

Feature 6 This is a brick lined well that has been filled with rocks, bricks and concrete blocks. It is located about 6.5 m west of the collapsed chimney and is 1.5 m in diameter. The red bricks lining the well (Figure 7.14) are characteristic of others within the site complex and probably date to the early to mid-twentieth century (1920s-1950s).

Feature 7 This is a three sided, rectangular shaped feature, about 3 m south of the well. The feature appears to be a concrete base or footings of a small storage area or building (Figure 7.15), possibly to an outhouse. It was difficult in the field to determine if the construction was concrete with a very coarse aggregate (pebbles ranging in size from 0.25 to 4 cm in diameter) or was a conglomerate. It is more likely to be a concrete.

Feature 8 This feature is a concrete platform situated about 24 m west of Feature 1. It is 4.3 x 3.2 m in area, elongated along the property and rail easement fence. There are no other artefacts associated with this feature, except the mature exotic tree, located about 10 m to the north.

Other features noted were exotic trees close to the complex (Figure 7.16). None of the trees had leaves so it was not possible to identify them, but it is possible that some are fruit trees. A track was also noted leading from the site to a gate in the fenceline to the west to the site. The general site area was clearly disturbed and it appears that the structures were deliberately demolished as there was no evidence of other artefacts such as glass or structural timber left at the site.

All of these items appear to represent the remains of a small farm complex. The collapsed chimney is likely to represent the location of either the main house or separate kitchen building. The well is likely to have been used for domestic purposes, being located close to the house. It is possible that the platform with the brick-lined drain was either a slaughterhouse or more likely a milking shed, as drainage is important for this activity. Based on evidence of the bricks, the site is likely to date from between the 1920's to about the 1950's.

The site is located opposite the former Irondale Public School. The school location is shown on the Parish map of Falnash from 1929 but not before. Another public school shown on the earlier parish maps at Thompsons Creek, was also called Irondale. The school was first established in 1881 but changed variously from full time to provisional and half time with Mount Lambie. It was known as Pipers Flat School until 1902 and finally closed in 1932 (Fletcher and Burnswoods 1983).

The location of the school clearly changed during this time from the original location near Thompsons Creek to adjacent to the railway line. It is possible that the site complex identified during this study has some relationship with the former school but this cannot be determined on the current evidence. An association is also problematic as the school and site complex are on opposite sides of the railway which runs through a deep cutting at this location.

Figure 7.9 View south to Feature 1, scale in brick-lined drain

Figure 7.10 View east along Feature 3, scale adjacent to concrete edging

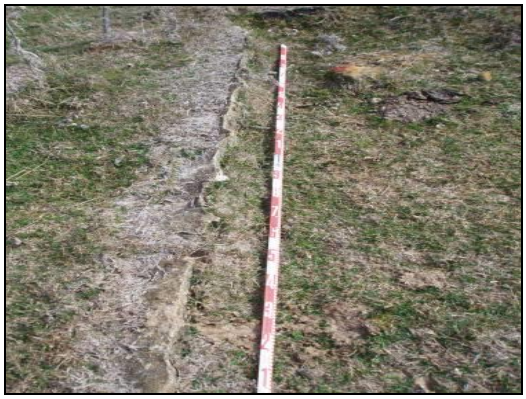

Figure 7.11 Close up of scalloped concrete edging to Feature 3

Figure 7.12 View west to collapsed stone chimney (Feature 4)

Figure 7.13 View east to Feature 6 (foreground) and Feature 5 (background)

Figure 7.14 View east of brick lined well (Feature 6)

Figure 7.15 Feature 7

Figure 7.16 View south across the site complex

7.3 Inventory of Site Locations

Thirteen heritage recordings were reviewed and/or made during the field survey of the Pipers Flat study area. Ten of these recordings are located within the study area, being PAD7, 45-1-0076, WCU PADs 1 to 7, and WCU H1. Table 7.1 provides an inventory of recorded sites and PADs

Table 7.1 List of sites identified during the study

Recording Type	Recording Code	GDA Reference	Location relative to the modified project
Rockshelter with artefacts	45-1-0018	223914.6302092	Outside study area (approx. 470 m east of eastern part of rail loop)
Rockshelter with artefacts	45-1-0075	223550.6302485	Outside study area (approx. 105 m north-east of eastern part of rail loop)
Artefact scatter	45-1-0076	223544.6302232	Outside study area (approx. 80 m east of the of eastern part of rail loop)
Potential Archaeological Deposit	PAD 7	223805.6303790	PAD7 is crossed by the proposed conveyor from the rail loop and unloader facility
Isolated Find	45-1-2602 (WCU 1)	224093.6304071	Outside study area (approx. 200 m east of the proposed conveyor from the rail loop and unloader facility.
Potential Archaeological Deposit	WCU PAD 1	223509.6302240	On rail loop
Potential Archaeological Deposit	WCU PAD 2	223668.6302041	Outside study area (approx. 180 m east of the of eastern part of rail loop)
Potential Archaeological Deposit	WCU PAD 3	223217.6301881	On rail loop
Potential Archaeological Deposit	WCU PAD 4	222959.6302059	On rail loop

Recording Type	Recording Code	GDA Reference	Location relative to the modified project
Potential Archaeological Deposit	WCU PAD 5	222458.6302602	On rail loop
Potential Archaeological Deposit	WCU PAD 6	223176.6302526	On rail loop
Potential Archaeological Deposit	WCU PAD 7	223297.6302197	Inside rail loop, possible impacts by the site access track
Historic Farm complex	WCU H1	222556.6302515 to 222537.6302534	Outside study area (approx. 40 m north of the rail line)

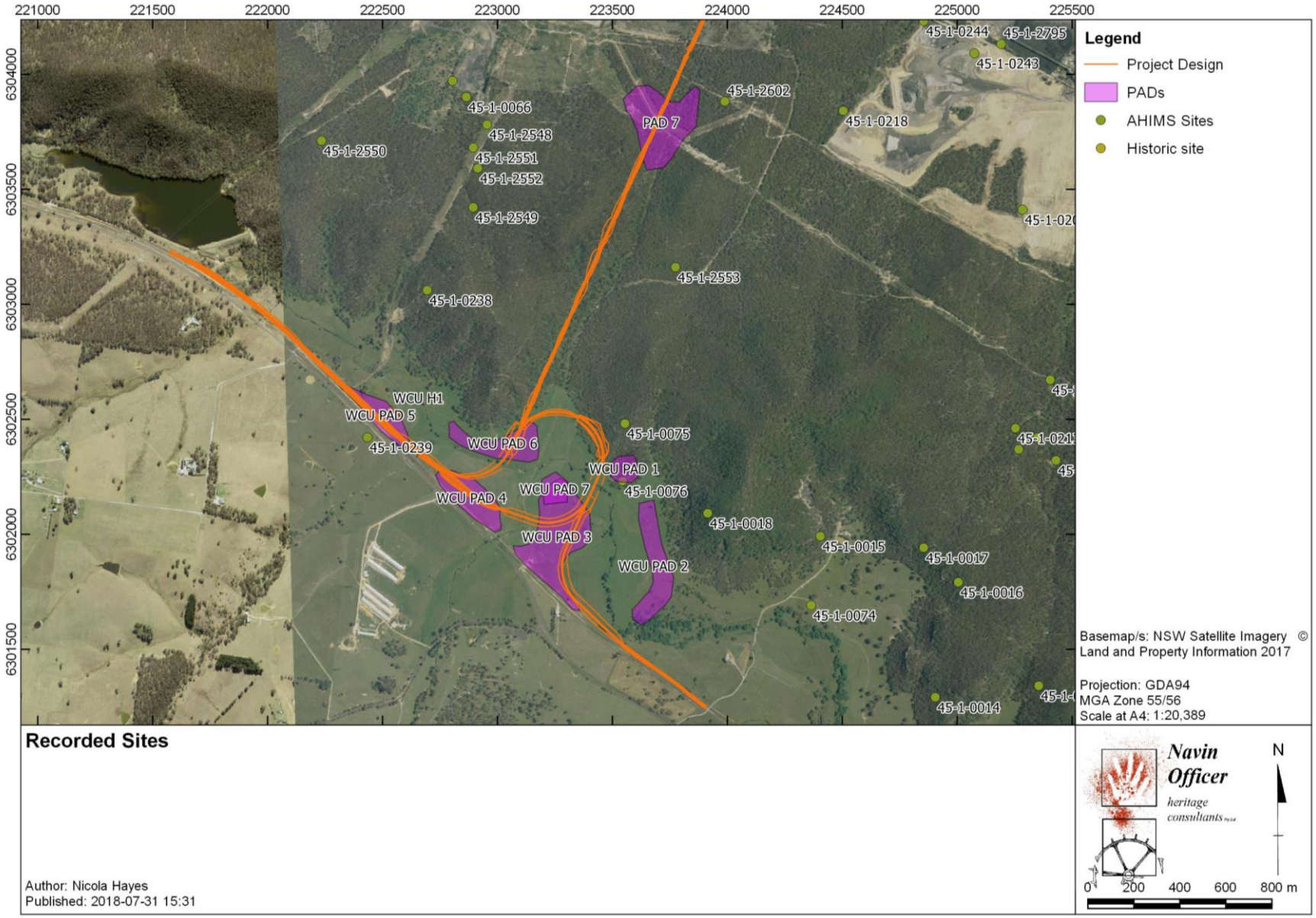

Figure 7.17 All recorded sites relative to the indicative project design

7.4 Survey Coverage and Visibility Variables

The effectiveness of archaeological field survey is to a large degree related to the obtrusiveness of the sites being looked for and the incidence and quality of ground surface visibility. Visibility variables were estimated for all areas of comprehensive survey within the study area. These estimates provide a measure with which to gauge the effectiveness of the survey and level of sampling conducted. They can also be used to gauge the number and type of sites that may not have been detected by the survey.

Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility, the frequency of exposure encountered by the surveyor and the quality of visibility within those exposures. The predominant factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels. Two variables of ground surface visibility were estimated during the survey:

- A percentage estimate of the total area of ground inspected which contained useable exposures of bare ground;
- A percentage estimate of the average levels of ground surface visibility within those exposures. This is a net estimate and accounts for all impacting visual and physical variables including the archaeological potential of the sediment or rock exposed.

The obtrusiveness of different site types is also an important factor in assessing the impact of visibility levels. Sites based on rock exposures, such as rock shelters, open engravings and grinding grooves are more likely to be encountered than sites with no surface relief located on, or within, sedimentary matrices. Rock platform sites are still subject to visibility constraints in the form of obscuring ground litter, flood debris and sedimentation, however, rock shelters are less likely to go uninspected. The inspection rate of rock shelters is likely to be 100% in a comprehensive survey, however the extent of leaf litter and recent sediment on a rock shelter floor may be an important factor in a recorder's ability to detect either a site, or simply a potential archaeological deposit.

In another example, artefacts made from locally occurring rock such as quartz may be more difficult to detect under usual field survey conditions than rock types that are foreign to the area. The impact of natural gravels on artefact detection was taken into account in the visibility variables estimates outlined above. The natural incidence of sandstone platforms suitable for grinding grooves or engraving, together with the incidence of old growth trees, are important considerations in identifying both survey effectiveness and site location patterns outside of environmentally determined factors.

Table 7.2 summarises estimates for the degree to which separate landforms within the study area were examined and also indicates the exposure incidence and average ground visibility present in each case. A total of 36.7% of the ground area in the study area was inspected during the survey, with 10.6% providing useable archaeological exposures. A graphic approximation of the surface survey coverage achieved within the study area is shown in Figure 7.18.

Taking into account survey coverage, archaeologically useable exposures, and visibility variables, the effective survey coverage (ESC) was 1.4% of the total survey area. The ESC attempts to provide an estimate of the proportion of the total study area that provided a net 100% level of ground surface visibility to archaeological surveyors.

Subsequent to the field survey and completion of the draft report, the rail loop and conveyor were subject to realignment. Not all of the conveyor alignment was therefore inspected. Some of the realignment was within the heavily modified ground within the Mount Piper Power Station, where there is no chance of sites remaining. Part of the realignment was to the west of the original surveyed portion. Although this section was not subject to direct survey, the general terrain and topography was similar to the original alignment. The survey is therefore considered adequate to assess the archaeological potential of sites occurring. The realignment of the rail loop was only minor and most of the areas surveyed were comparable to the realignment. The results of the survey are therefore considered to be reliable and a reflection of the surface archaeological record.

Table 7.2: Survey Coverage Data

Survey division	Survey unit	Landform	Survey mode	Main exposure types	Estimated Survey Unit area (ha)	Proportion of unit surveyed %	Area of unit surveyed (ha)	Exposure incidence %	Average exposure visibility %	Net effective exposure (ha)	Effective survey coverage of survey unit %	Aboriginal Archaeological recordings
Conveyor alignment	1	basal slopes	foot	vehicle track	5	50	2.5	20	50	0.2500	5.0	nil
	2	drainage line	foot	animal tracks	5	25	1.25	5	20	0.0125	0.3	nil
	3	saddle	foot	vehicle track	1.25	60	0.75	10	30	0.0225	1.8	PAD 7
	4	mid slopes	foot	vehicle track, animal tracks	5.5	40	2.2	10	30	0.0660	1.2	WCU 1
Rail Loop	1	basal slopes/terrace	foot	animal tracks	3.2	40	1.28	10	25	0.0320	1.0	45-1-0075, 45-1-0076, WCU PAD 1, WCU PAD 2
	2	creek flats	foot	animal tracks	2.5	30	0.75	5	20	0.0075	0.3	nil
	3	terrace	foot	vehicle track,	1.25	30	0.375	5	20	0.0038	0.3	WCU PAD 3,
	4	creek flats	foot	stock tracks	0.75	25	0.1875	5	20	0.0019	0.3	nil
	5	terrace	foot	stock tracks	1.75	30	0.525	5	20	0.0053	0.3	WCU PAD 4
	6	creek flats	foot	stock tracks	1	30	0.3	5	20	0.0030	0.3	nil
	7	terrace	foot	vehicle track, stock tracks	1.75	40	0.7	15	30	0.0315	1.8	WCU PAD 5
	8	creek flats	foot	erosion, stock tracks	1.25	35	0.4375	10	20	0.0088	0.7	nil
	9	basal slopes	foot	stock tracks	1.5	25	0.375	10	20	0.0075	0.5	WCU PAD 6
Total					*31.7*		*11.63*			*0.4521*	*1.4*	

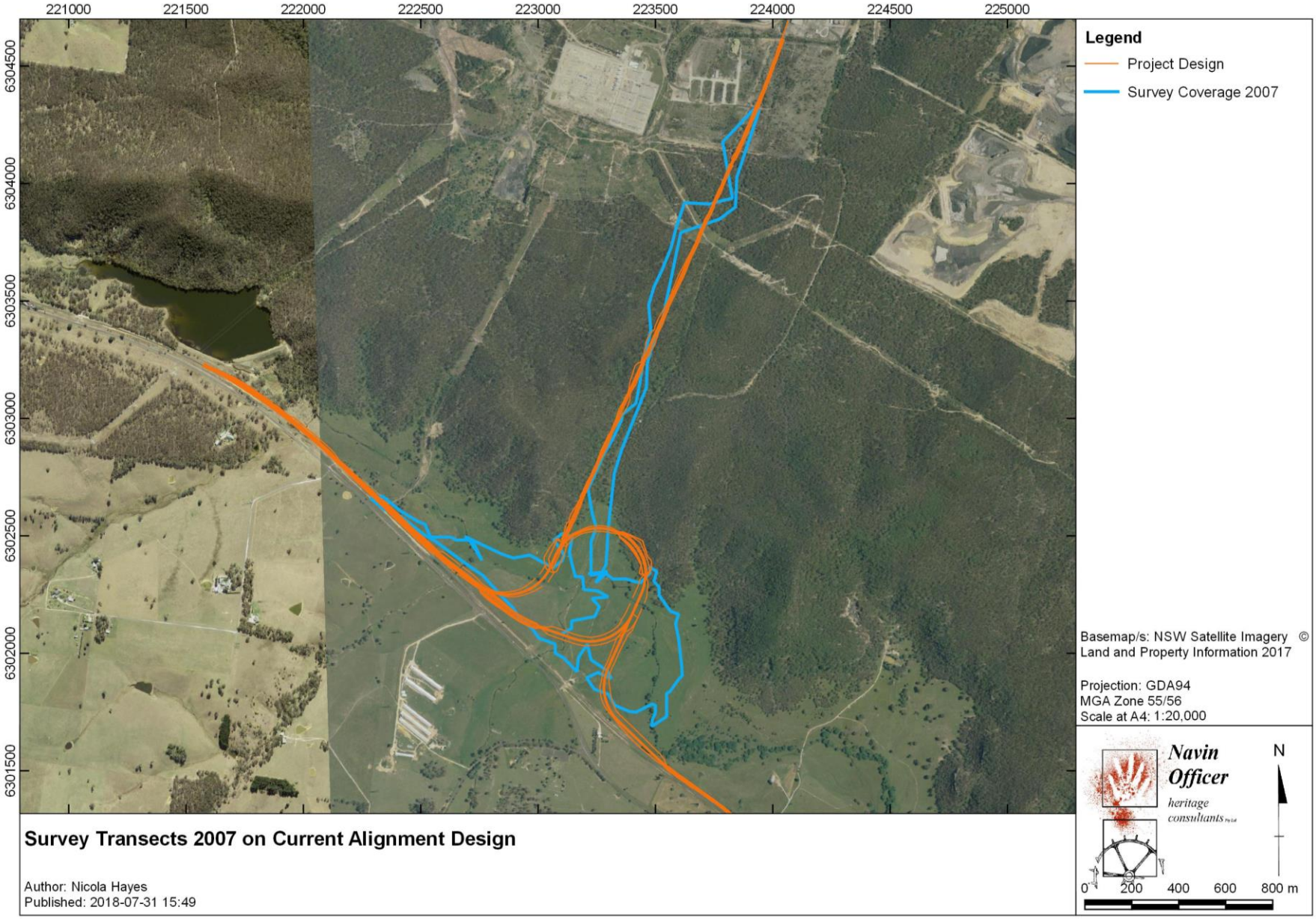

Figure 7.18 Approximate location of survey transects relative to the indicative project design

8. SIGNIFICANCE ASSESSMENT

8.1 Aboriginal Heritage

8.1.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' (Aust. ICOMOS 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- Significance to contemporary Aboriginal people;
- Scientific or archaeological significance;
- Aesthetic value;
- Representativeness; and
- Value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Aboriginal significance can be defined as the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the result of several factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site.

Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information which is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a larger significant structure such as a site complex.

2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.

The cultural significance of a place can be usefully classified according to a comparative scale which combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However, it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.

The following assessments are made with full reference to the scientific, aesthetic, representative and educational criteria outlined above. Reference to Aboriginal cultural values has also been made where these values have been communicated to the consultants. It should be noted that Aboriginal cultural significance can only be determined by the Aboriginal community, and that confirmation of this significance component is dependent on written submissions by the appropriate representative organisations.

8.1.2 The Study Area

Isolated finds are not normally considered significant based on any of the criteria defined above. Site **WCU 1** is considered to be of low significance based on the above criteria.

Haglund identified rock shelter site **45-1-0075** and noted that there were quartz artefacts in front of the shelter. No artefacts were identified when the site was re-inspected for the current survey. The shelter is considered too small to have been extensively occupied and as it has a rock floor it does not contain archaeological deposit. There is only limited archaeological research potential outside the shelter. A number of other shelters which contain cultural material have been identified within the local area, so this shelter is not classed as rare or representative. The site is assessed as having low archaeological significance.

The artefact scatter **45-1-0076** was identified by Haglund as containing 12 artefacts and the current survey identified an area of associated PAD (**WCU PAD 1**). The scatter is the largest that is known within the current study area but is small compared to other recorded sites in the wider region. The site is likely to be limited in terms of its research value, as the artefacts noted by Haglund are typical quartz artefacts of the region. The site is assessed as having low archaeological significance.

The large rock shelter **45-1-0018** lies outside the study area and will not be directly impacted by the proposals. The shelter contains artefacts and potential archaeological deposit, although the deposit is probably shallow. The research potential would be moderate and the shelter site type is not rare for this region. The site is assessed as having moderate archaeological significance in a local context.

These assessments are based on the results of the present surface investigations. All of the sites have potential to be associated with additional cultural material which could alter the present assessment.

8.2 European Heritage

8.2.1 Assessment Criteria

The NSW Heritage Office has defined a methodology and set of criteria for the assessment of cultural heritage significance for items and places, where these do not include Aboriginal heritage from the pre-contact period (NSW Heritage Office & DUAP 1996, NSW Heritage Office 2000). The assessments provided in this report follow the Heritage Office methodology.

The following heritage assessment criteria are those set out for Listing on the State Heritage Register. In many cases items will be significant under only one or two criteria. The State Heritage Register was established under Part 3A of the Heritage Act (as amended in 1999) for listing of items

of environmental heritage that are of state heritage significance. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, Heritage Act 1977).

An item will be considered to be of State (or local) heritage significance if, in the opinion of the Heritage Council of NSW, it meets one or more of the following criteria:

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's

- cultural or natural places; or
- cultural or natural environments.

or a class of the local area's

- cultural or natural places; or
- cultural or natural environments.

An item is not to be excluded from the Register on the ground that items with similar characteristics have already been listed on the Register. Only particularly complex items or places will be significant under all criteria.

In using these criteria it is important to assess the values first, then the local or State context in which they may be significant.

Different components of a place may make a different relative contribution to its heritage value. For example, loss of integrity or condition may diminish significance. In some cases it is constructive to note the relative contribution of an item or its components. Table 8.1 provides a guide to ascribing relative value.

Table 8.1 Guide to ascribing relative heritage value.

Grading	Justification	Status
Exceptional	Rare or outstanding item of local or State significance. High degree of intactness Item can be interpreted relatively easily.	Fulfils criteria for local or State listing.
High	High degree of original fabric. Demonstrates a key element of the item's significance.	Fulfils criteria for local or State listing.

Grading	Justification	Status
	Alterations do not detract from significance.	
Moderate	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfils criteria for local or State listing.
Little	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for local or State listing.
Intrusive	Damaging to the item's heritage significance.	Does not fulfil criteria for local or State listing.

8.2.2 The Study Area

The historic site complex **WCU H1** contains a number of elements that would be typical of farm complexes in the region and across the State. The features that comprise the complex are in poor condition due to the demolition of all above ground structures and removal of the debris. There is no known association with particular people or groups from the local area. The lack of artefacts at the complex suggests that there is little potential for excavation of archaeological remains. The site does not fulfil any of the Heritage Office criteria and has little relative value. It therefore does not meet the threshold for State or local listing.

9. MANAGEMENT CONSIDERATIONS

9.1 Site Impacts

The proposed Pipers Flat rail loop modification would directly impact four areas of Aboriginal PAD (WCU PAD 3 - 6) and potentially impact PAD WCU PAD7. The modified rail loop will not directly impact historic site WCU H1. The approved project was to directly impact one Aboriginal site (45-1-0076 – an artefact scatter) and directly impact six areas of Aboriginal PAD (WCU PAD 1-6). The modification project will therefore impact fewer sites and PADs than the approved project.

The proposed Pipers Flat coal conveyor will directly impact one area of Aboriginal Potential Archaeological Deposit (PAD 7). As noted in section 7.1.1 it is not considered that PAD 7 meets the threshold required for testing.

The potential impact to the identified Aboriginal sites and areas of archaeological potential cannot be avoided by realignment of the rail line and conveyor. Since 2007 the rail loop has been realigned and there will be different impacts compared to those assessed in 2007, however impacts cannot be negated entirely given the abundance of PADs identified in the area. Some form of assessment of the presence and significance of sites within the PADs is therefore required. The potential impact of the development proposals on the archaeological record could then be defined and informed management and mitigative measures could be provided for these areas.

The most effective method for assessing the presence of Aboriginal archaeological sites in the current proposal area is through conducting a subsurface testing program. This would involve excavation of a series of test pits across the proposed disturbance area of each PAD and sieving the deposit. Any cultural material recovered would then be examined and the significance of the site assessed.

Although it is likely that any sites identified would be of low to moderate significance, the need for testing is high as the true archaeological record within the study area, and therefore the impacts from development is unknown based on current information.

9.2 Legislative Framework

The current project is approved under a Part 3A development approval. The current project approval states for Heritage Impacts:

2.33 Prior to the commencement of construction, the Proponent shall undertake an archaeological investigation of the site identified as 45-1-0076 in the document referred to under condition 1.1b) in consultation with the local Aboriginal community and the DECC. The site shall be completely salvaged and information pertaining the salvage and preservation of any artefacts identified shall be documented to the satisfaction of the DECC.

Additionally, the management Aboriginal and historic sites are defined in the Statement of Commitments for the project (see below).

10. RECOMMENDATIONS

The Statement of Commitments for the approved project as they relate to heritage are:

Preservation of Aboriginal Cultural Heritage:

- A program of archaeological subsurface testing would be conducted for the PADs. Testing should aim to determine the nature and significance of any Aboriginal cultural material present at each location;
- The artefact scatter identified as 45-1-0076 will be completely salvaged, including an archaeological excavation prior to construction works commencing;
- The salvage and archaeological investigation will be undertaken in consultation with the local Aboriginal community;
- Information pertaining to the salvage and preservation of artefacts at site 45-1-0076 will be included in the Construction EMP.

Protection of Indigenous Heritage relics if uncovered:

- In the event that artefacts of indigenous heritage significance are
- uncovered during the course of construction, works in the immediate area would cease, DECC would be notified and expert advice would be sought from an appropriately qualified professional.

Investigation of farm site:

- Historic site WCU H1 would be subject to an archival level recording prior to its removal from the site.

Based on an assessment of the possible impacts of the modification proposal on the known and potential archaeological resource, the following new recommendations are provided:

1. Only those areas of PAD that will be directly impacted by the project should be the subject of archaeological subsurface testing.

2. Site 45-1-0076 will not be impacted by the modified project, it should therefore be left in-situ and not disturbed.

3. Historic site WCU H1 not be impacted by the modified project, no further action is therefore required.

4. In order to avoid inadvertent impacts all sites or parts of sites that will not be impacted should be fenced during all construction works and its location placed on project maps as a no-go zones.

5. Consultation should continue with the relevant Aboriginal community and should include the conduct of the OEH *Aboriginal cultural heritage consultation requirements for proponents 2010.*

In addition to the above:

6. A copy of this report should be sent to the Aboriginal community for their review and comment:

Bathurst LALC
PO Box 1500
BATHURST NSW 2795

7. A copy of this report should be sent to OEH.

11. REFERENCES

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APPENDIX 1

ABORIGINAL PARTICIPATION FORM

Record of Aboriginal Representative Participation*

Name(s) of Aboriginal Representative: RICHARD PETERS

Name of Aboriginal Organisation: BATHURST LALC

Archaeologist(s): name & address MATTHEW BARBER

Navin Officer Heritage Consultants Pty Ltd
4/71 Leichhardt Street, Kingston, ACT 2604

Project Name: WESTERN COAL UNLOADER

Client: name & address: CHRIS HAVELOCK
(please send your SINCLAIR KNIGHT MERZ
invoice *to this address*)
100 CHRISTIE ST
ST LEONARDS NSW

Type of participation:

- ☐ Guided inspection of study area and sites
- ☑ Accompanied/participated in archaeological survey/salvage
- ☐ Separate inspection or survey
- ☐ Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
15-3-06	10.00	5.00
16-3-06	8.30	12.00

Issues raised:

Signed *(archaeologist)*: M Barber

Signed *(Aboriginal representative(s))*: Richard J. Peters

* *please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.*

APPENDIX 2

BATHURST LALC REPORT

BATHURST
LOCAL ABORIGINAL LAND COUNCIL
149 Russell Street
Bathurst NSW 2795
PO Box 1500
Bathurst NSW 2795
Phone: 02 6332 6835
Fax: 02 6332 3623

WESTERN RAIL COAL UNLOADER

A survey was conducted on behalf of Delta Electricity on the 15 and 16 August 2006 for the proposed Western Rail Unloader situated at Pipers Flat between Wallerawang and Portland NSW.

CONVEYER LINE SURVEY

One single artefact was located east of the Delta Mt Piper Power Station during this section of the survey areas.

Records from 1998 show that archaeologist Robyn Mills reported Possible Archaeological Discovery No: 7 in the Conveyer line area. After an extensive investigation of the area, it was decided that an archaeological dig in this area would not be required.

The Bathurst Local Aboriginal Land Council has no objection to the Conveyer Line proceeding.

LOOP UNLOADER SURVEY

Previously Open Scatters and two rock shelters had been recorded in this area. However the rock shelters are outside of the survey zone so they are protected while the open scatters are in the middle of the Loop Unloader section and their location will not be disturbed by the proposed project.

Due to the high sensitivity and potential of the Loop Unloader section several Possible Archaeological Discovery areas have been recorded. These Possible Archaeological Discovery areas can be located on the map provided by Archaeologist Matthew Barber. These areas are not to be disturbed by Delta Electricity until after the archaeological process has been completed and both the archaeological team and Bathurst Local Aboriginal Land Council are satisfied that this areas has been cleared as a potential aboriginal habitats.

The Loop Unloader survey area was concealed by heavy ground cover that made for poor visibility.

Present at this survey were:

Matthew Barber	Archaeologist	Navin Heritage Consultants Pty Ltd
Tom Taverner	Archaeologist	Navin Heritage Consultants Pty Ltd
Richard Peters	Sites Officer	Bathurst Local Aboriginal Land Council

Richard J Peters

RICHARD J PETERS
SITES OFFICER
18 August 2006

APPENDIX 3

STATUTORY OBLIGATIONS

Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and decision making. Environmental impacts include cultural heritage assessment. The Act was reformed by the *Environmental Planning and Assessment Amendment (Infrastructure and other Planning Reform) Act 2005*.

The Part 5 assessment system was created as part of the EP&A Act. The purpose of the Part 5 system is to ensure public authorities fully consider environmental issues before they undertake or approve activities that don't require development consent. As such, it has commonly been used to assess activities such as roads, railways, dredging and forestry works which don't require consent. If these activities are judged by the relevant public authority to significantly affect the environment, then an environmental impact statement will need to be prepared and considered by this authority.

Changes to the EP&A Act which commenced on 1 October 2011 means that some activities under the Part 5 assessment system will be determined by the Minister for Planning and Infrastructure, following an assessment by the Department.

Part 3A of the EP&A Act

Part 3A of the Act was an amendment which established a separate streamlined and integrated development assessment and approvals regime for major State government infrastructure projects, development that was previously classified as State Significant development, and other projects, plans or programs declared by the Minister for Planning.

Part 3A (Section 75U) removed the stop-the-clock provisions and the need for single-issue approvals under eight other Acts, including the *National Parks and Wildlife Act* 1974 and the *Heritage Act* 1977. Environmental planning instruments such as the heritage provisions within REP and LEPs, (other than State environmental planning policies) do not apply to projects approved under Part 3A (Section 75R, paragraph 3).

New South Wales' Parliament passed a Bill in June 2011 that repealed Part 3A of the Environmental Planning and Assessment Act 1979 and replaced it with an alternative system for assessing projects of state significance.

Transitional arrangements were announced which covered projects which were lodged under Part 3A. (These transitional arrangements are found in the *State Environmental Planning Policy (Major Development) Amendment 2011* (Major Development SEPP), published on 13 May 2011).

Project applications for residential, commercial or retail projects and coastal subdivision development for which Director General's environmental assessment requirements (DGRs) had been issued on or before 8 April 2011, remained as Part 3A applications, unless the DGRs were issued more than two years before 8 April 2011 and the proponent had not lodged an environmental assessment by 8 April 2011. The Project remains a project to which Part 3A applies.