

Cadia Valley Operations
Modification 10
Molybdenum Recovery Plant Relocation

Aboriginal Cultural Heritage Assessment



Report to Cadia Holdings Pty Ltd

27 February 2018

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Cadia Valley Operations

Modification 10

Molybdenum Recovery Plant Relocation

Aboriginal Cultural Heritage Assessment

Local Government Area: Orange City Council

Nearest Town: Orange



Landscape

Natural and Cultural Heritage Management

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Executive Summary

Cadia Holdings Pty Limited (CHPL) intends to increase the processing rate at Cadia Valley Operations (CVO). Part of the proposed upgrades involves constructing the approved molybdenum recovery plant at a modified location.

The proposed molybdenum recovery plant would be within the CVO Mining Leases, near Orange in central western New South Wales (NSW). The proposed relocated work area has been extensively disturbed by previous forestry operations.

In order to investigate the potential impact on Aboriginal cultural heritage resulting from installation of the proposed infrastructure, Landscape Natural and Cultural Heritage Management was engaged by CHPL to conduct an Aboriginal cultural heritage assessment in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Department of Environment, Climate Change and Water, 2010a).

No Aboriginal cultural heritage sites have been previously identified in the proposed work area and the present assessment did not encounter any additional Aboriginal cultural heritage places or objects.

Based on the results of this Aboriginal cultural heritage assessment, including consultation with registered Aboriginal stakeholders the Orange Local Aboriginal Land Council (OLALC) in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (Department of Environment, Climate Change and Water, 2010b), it is concluded that:

- The footprint proposed for the molybdenum recovery plant relocation is an area where harm to Aboriginal cultural heritage places or objects will not occur as they are not present, or likely to be present. The proposed works would be in an area where there is no risk to any known cultural heritage and the potential for uncovering any previously unidentified cultural heritage is also negligible to low.
- In accordance with the existing CVO Aboriginal Heritage Management Plan (AHMP), in the unlikely event any previously unidentified Aboriginal cultural heritage places or objects are encountered during the course of proposed works, all activities likely to affect the material shall cease and management measures and/or salvage works will be developed in consultation with the NSW Office of Environment and Heritage (OEH) and OLALC cognisant of the cultural significance of the site; and,
- In the unlikely event that human skeletal remains are encountered during the course of activities associated with the Modification, all work in that area must cease.

Remains must not be handled or otherwise disturbed except to prevent further disturbance. If the remains are thought to be less than 100 years old, the Police or the State Coroner's Office (tel: 02 9552 4066) must be notified. If there is reason to suspect that the skeletal remains are more than 100 years old and of Aboriginal origin, CHPL should contact the OEH's Environmental Line (tel: 131 555) for advice. In the unlikely event that an Aboriginal burial is encountered, strategies for its management would need to be developed with the involvement of the local Aboriginal community.

- CHPL should review, and if necessary, revise the AHMP for the CVO to include the Modification area.
- CHPL should continue to provide training to all on-site personnel regarding the AHMP strategies relevant to their employment tasks.

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1 Introduction

1.1 The Proponent

Cadia Holdings Pty Limited (CHPL) is owner and operator of the Cadia Valley Operations (CVO) located at Cadia, approximately 25 km south of Orange in central western New South Wales (NSW) (Figure 1).

1.2 The Modification

The CVO Molybdenum Recovery Plant Relocation Modification (the “Modification”) would include construction and operation of the copper/molybdenum separation plant approved under Project Approval PA 06_0295 in a different location within the CVO Mining Leases (Figures 2 and 3). Ancillary works include the construction of a new access road off Cadia Road and carpark. The proposed relocated work area has been extensively disturbed by previous forestry operations.

The Modification to PA 06_0295 is sought under section 75W of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

1.3 Aim and Objectives of the Assessment

The objective of this assessment is to provide CHPL with an Aboriginal Cultural Heritage Assessment (ACHA) to support an application for the Modification from the NSW Minister for Planning under section 75W of the EP&A Act and the NSW *Environmental Planning and Assessment Regulation, 2000*.

This assessment involves a description of the context of the Modification area and surrounds, identification of Aboriginal cultural heritage sites, items and values within the Modification area, an assessment of the potential impacts to Aboriginal cultural heritage as a result of the Modification, and development of recommendations to minimise, manage and mitigate any potential impacts.

This assessment has been undertaken in accordance with the relevant requirements of the various advisory documents and guidelines. These guidelines and documents include:

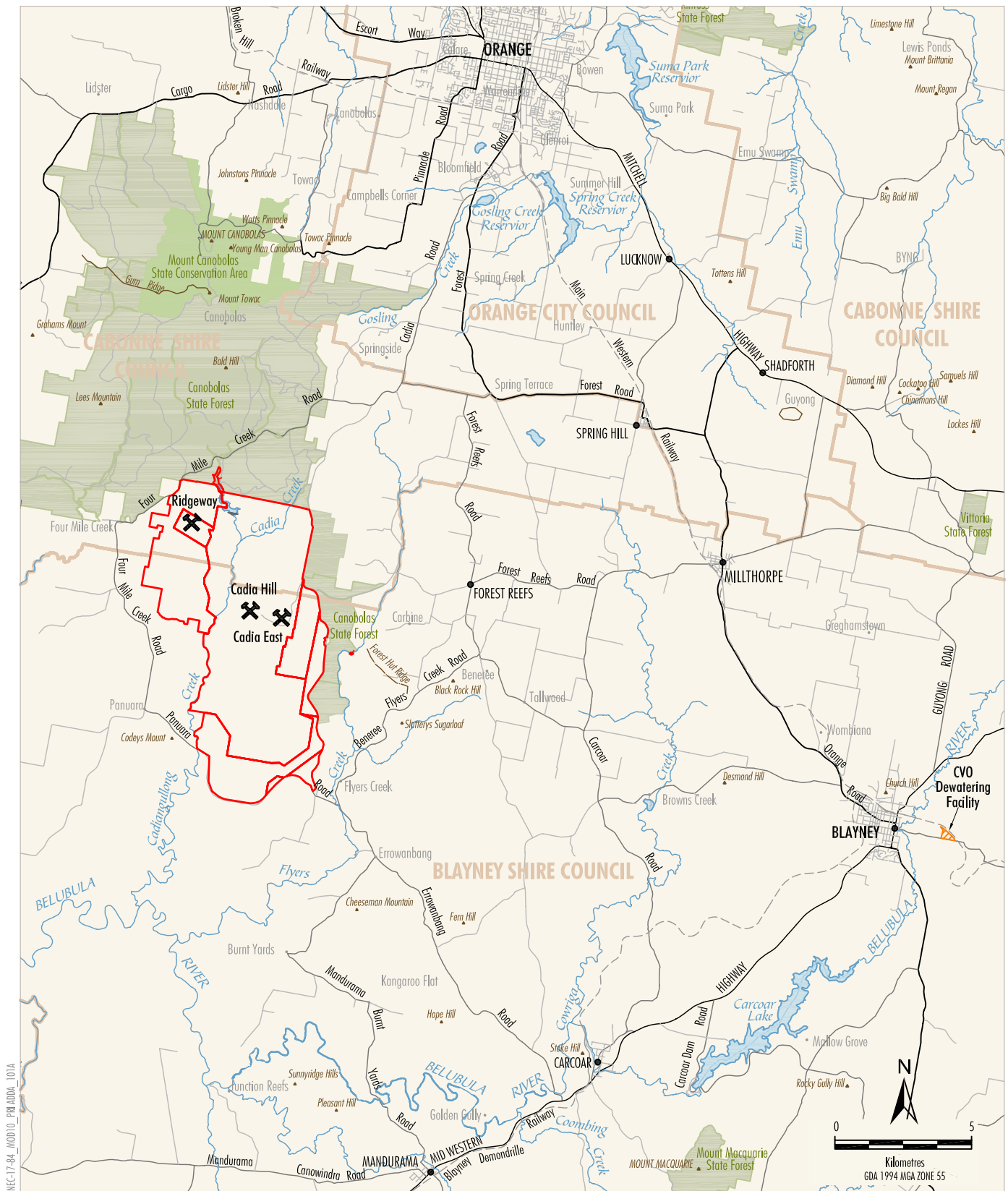
- *Aboriginal cultural heritage consultation requirements for proponents 2010 (Part 6 National Parks and Wildlife Act 1974)* (Consultation Guidelines) (NSW Department of Environment, Climate Change and Water [DECCW], 2010a).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).

- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage [OEH], 2011).
- *(Draft) Part 3A EP&A Act Guidelines for Aboriginal Cultural Impact Assessment and Community Consultation* (NSW Department of Environment and Conservation [DEC], 2005).
- The Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS, 2013).
- *Aboriginal Cultural Heritage: Standards and Guidelines Kit* (NSW National Parks and Wildlife Service, 1997).
- *Ask First; A Guide to Respecting Indigenous Heritage Places and Values* (Australian Heritage Commission, 2002).
- *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* (NSW Minerals Council, 2010).

1.4 Structure of this Report

This ACHA has been prepared in consideration of the requirements of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and as such includes the following specific information:

- Section 1: Outlines the Modification and the objectives and structure of this report.
- Section 2: Lists the investigators and contributors involved with this report.
- Section 3: Provides a summary description of the development proposal.
- Section 4: Details the consultation and partnership with Indigenous communities.
- Section 5: Outlines the landscape context and includes descriptions of land use history, geology and vegetation within the Modification area.
- Section 6: Provides background information relevant to previous archaeological works including relevant ethno-history, the regional archaeological context and previous predictive models for the Modification area.
- Section 7: Describes predictions for the Modification area and documents the archaeological survey and data collection, and includes information regarding the method of the survey and a description of the area surveyed.
- Section 8: Lists the results of the survey and provides a discussion and analysis of these results.
- Section 9: Assesses the cultural heritage significance of the Modification area.
- Section 10: Assesses the impact of the Modification on Aboriginal cultural heritage.
- Section 11: Lists the management, mitigation measures and recommendations.
- Section 12: Lists the references cited in this report.



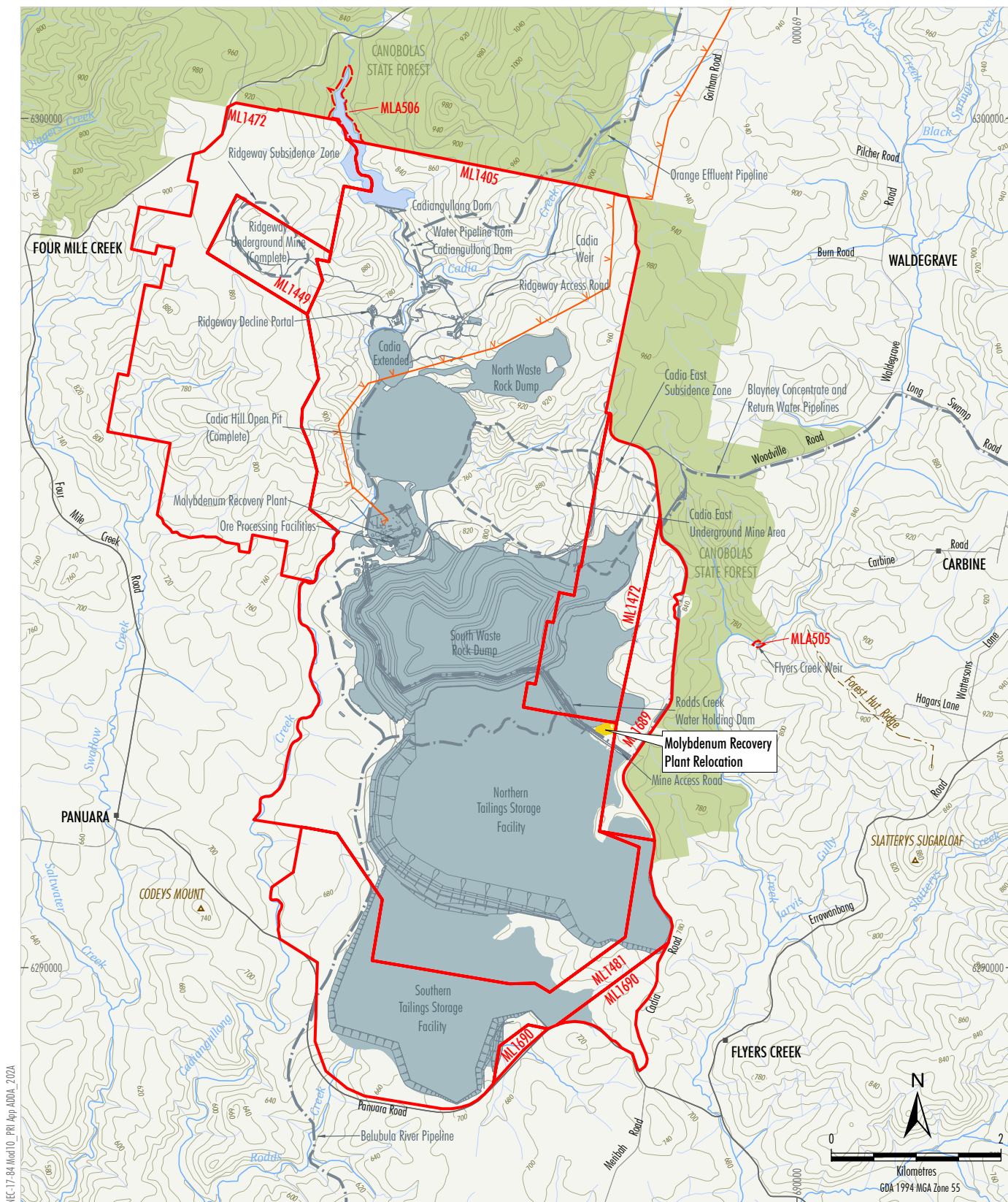
- LEGEND**
- Mining Lease/Mining Lease Application Boundary
 - Local Government Area
 - Road
 - Railway
 - NSW State Forest - Forest Commission Land
 - NPWS Reserve

Source: Department of Lands NSW (2006);
Department of Industry (2017)



CADIA VALLEY OPERATIONS MODIFICATION 10
Regional Location

Figure 1



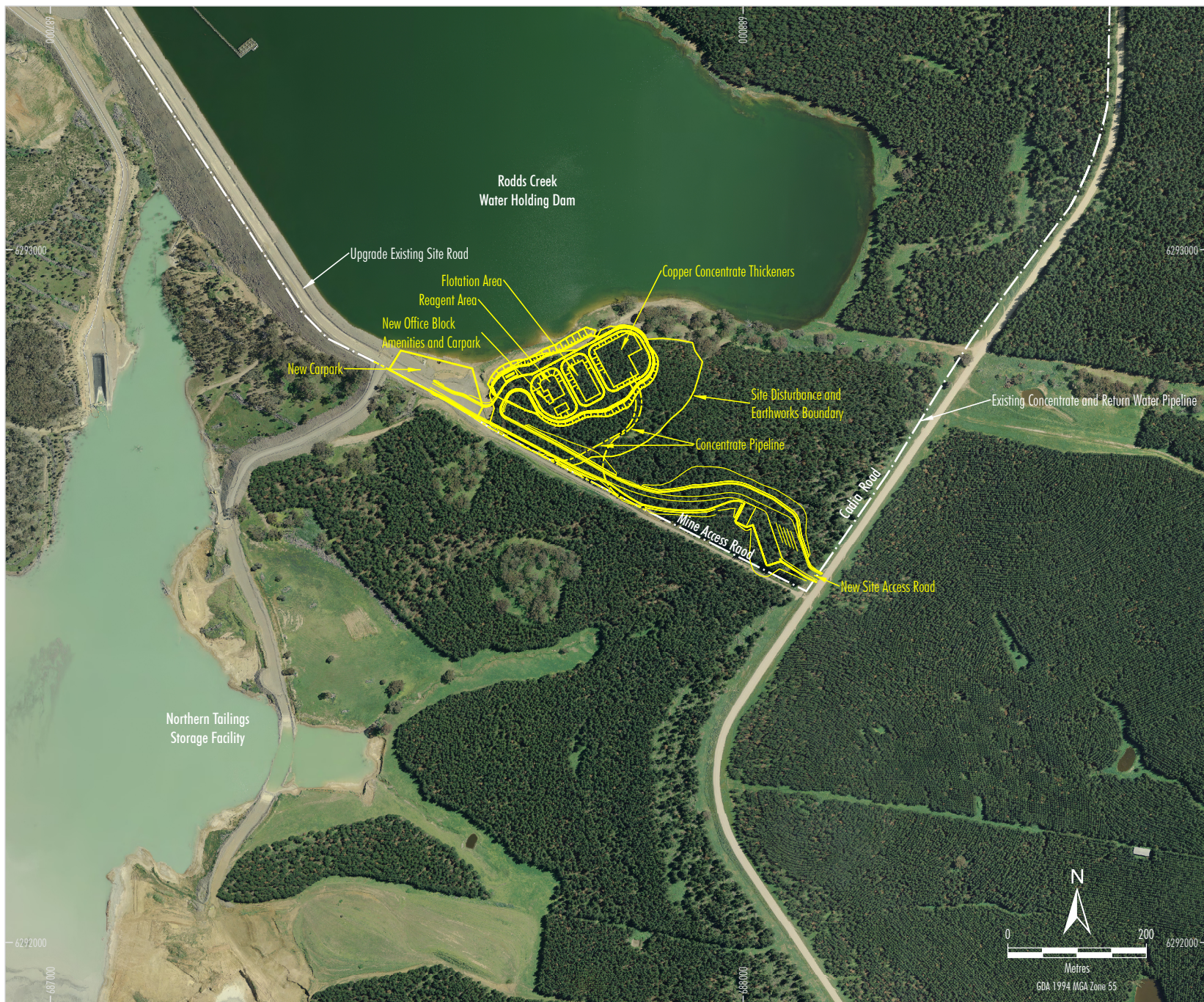
- LEGEND**
- Mining Lease Boundary
 - Mining Lease Application Boundary
 - State Forest
 - V Powerline
 - Existing/Approved Mine Infrastructure and Landforms
 - Proposed Modification Infrastructure



CADIA VALLEY OPERATIONS MODIFICATION 10
Cadia Valley Operations
Modification 10 General Arrangement

Source: Land and Property Information (2017);
NSW Planning & Environment Resource & Energy (2017)

Figure 2



LEGEND

Proposed Modification Infrastructure

Source: CHPL - Orthophoto (Nov 2016)



CADIA VALLEY OPERATIONS MODIFICATION 10
Relocated Molybdenum Recovery Plant
Location

Figure 3

2 Investigators

Landscape was commissioned by CHPL in March 2017 to complete the ACHA for the Modification and to prepare this report.

Dr Matt Cupper, a qualified archaeologist and geoscientist with 19 years' experience as a cultural heritage advisor, was Landscape's project archaeologist.

Fieldwork was undertaken on 3 April 2017 and 6 July 2017 by project archaeologist Dr Cupper with the assistance of registered Aboriginal stakeholder representatives from Orange Local Aboriginal Land Council (OLALC), Heritage Officers Greg Ingram and James Reilly. CHPL's Approvals Manager Andrew Wannan and Environmental Officer Jack Bowen were available in the field to explain the proposed works to the registered Aboriginal stakeholder representatives.

3 Proposed Modification

The Modification would include construction and operation of the approved copper/molybdenum separation plant in a different location (Figures 2 and 3). Ancillary works include the construction of a new access road off Cadia Road and carpark.

4 Aboriginal Stakeholder Consultation

4.1 Introduction

In accordance with the Consultation Guidelines (DECCW, 2010a), this assessment has been prepared in consultation with the Aboriginal community (via the registered Aboriginal stakeholders).

The following sections describe involvement by the registered Aboriginal stakeholders and demonstrate that the input of the Aboriginal community has been considered when determining and assessing impacts, developing management measures, and making final recommendations relevant to Aboriginal cultural heritage within the Modification area.

4.2 Aboriginal Stakeholder Involvement

The registered Aboriginal stakeholders were consulted throughout the preparation of this assessment, including:

- review and comment on a proposed methodology;
- during the field survey with the representatives of the registered Aboriginal stakeholders;
- during the review period for the draft ACHA; and,
- encouraged to provide feedback and input throughout the assessment process.

One Aboriginal community organization, the Orange Local Aboriginal Land Council (OLALC), registered as Aboriginal stakeholders for the CVO on 22 February 2006. OLALC has maintained connection with the CVO via review and implementation of the AHMP and other CVO projects.

The proposed works and proposed methodology were discussed with OLALC CEO Annette Steele at the start of preparation of the ACHA on 31 March 2017.

OLALC representatives, Heritage Officers Greg Ingram and James Reilly, participated in the archaeological field assessments on 3 April 2017 and 6 July 2017 and discussions were held with them in the field to ascertain their views about the proposed works.

A draft of this ACHA will be provided to the OLALC for review.

5 Environmental Context

5.1 Introduction

The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) requires a review of the environmental context to assist in the determination or prediction of the potential of a landscape to have accumulated or preserved Aboriginal cultural heritage items, the ways Aboriginal people may have used the landscape in the past, with regard to identifiable resources or focal points for activities, and the likely distribution of the material traces of Aboriginal land use based on these factors.

Detailing the landscape context is an integral procedure in modelling potential past Aboriginal land use practices and/or predicting site distribution patterns. The natural environment of an area influences the availability of local resources such as food and raw materials for artefacts, rock platforms for engravings and axe sharpening, and rock outcrops that may provide shelter. The landscape also provides the sediments that may bury objects and archaeological features, as well as the erosive processes that might expose or disperse them.

Geomorphic (land formative) processes may impact upon the type and frequency of archaeological remains. Past climate may also influence the location and types of resources available, which in turn shapes settlement and mobility patterns of past Aboriginal groups in the area. The location of different site-types (such as middens, stone artefact scatters, etc.) are strongly influenced by factors such as these along with a range of other associated features, which are specific to different land systems.

5.2 Geographical Setting, Geology, Landforms and Soils

The Modification is located at CVOs existing mining leases at Cadia, approximately 25 km south of Orange in central western NSW. Climate is warm temperate, receiving approximately 900 mm annual rainfall (Bureau of Meteorology 2018). The Modification is located on the mid-slope of a spur within undulating hills of the dissected Rodds Creek catchment, a tributary of Cadiangullong Creek, which flows into the Belubula River (Bewert *et al.* 2003). The bedrock is Tertiary basalt derived from lava flows of the Mt Canobolas volcanic complex, overlying Cadia Coach Shale of the Silurian Ashburnia Group (Kovac *et al.* 1990). Stony dark reddish brown clay soil derived from weathered basalt forms the surface of the proposed work area.

5.3 Vegetation and Existing Land Use

The Modification area would have originally had a vegetation cover of Eucalypt woodland including taxa such as *Eucalyptus albens* (White Box), *E. blakelyi* (Blakely's Red Gum), *E. bridgesiana* (Apple Box), *E. goniocalyx* (Bundy Box), *E. macorhyncha* (Red Stringybark) and *E. melliodora* (Yellow Box) (Bewert *et al.* 2003). However, the proposed work area has been extensively disturbed by previous forestry operations, which has included clear felling of all of the original vegetation, deep ripping and replanting to a Radiata Pine plantation (Figure 4).



Figure 4. Pine Plantation at the Location of the Proposed Molybdenum Recovery Plant.

6 Aboriginal Cultural Heritage Context

6.1 Ethno-Historical Context

Aboriginal people of the Wiradjuri language group occupied central western NSW at the time of first contact with Europeans (Sturt 1833, Hovell and Hume 1837, Mitchell 1839, Tindale 1974, McVicker 1991). The Wiradjuri were traditionally associated with the region encompassing the Macquarie, Lachlan and Murrumbidgee Rivers.

There may have been around 60 different dialects of Wiradjuri, whose speakers shared similar material culture and social organization (Howitt 1904, White 1986). Perhaps the greatest regional variation was between speakers of the northern dialect (*Wirraaydhuurray*) and those of the south (speakers of the *Wirraayjuurray* dialect) (White 1986). For example, the practice of carving zigzag motifs into tree trunks appears to have been particular to the Wiradjuri of the Macquarie and Lachlan River valleys, but is absent from the Murrumbidgee and Murray Rivers (Etheridge 1918, Bell 1982). Such carved trees are thought to have perhaps marked ceremonial areas and burial grounds. The *Burbung* ceremony was another of the Wiradjuri customs and traditions (Howitt 1904). This ceremony was associated with male initiation and involved the preparation of special earth mounds and usually the application of red ochre.

The Wiradjuri were hunter-fisher-gatherers and appear to have had a semi-sedentary lifestyle. They caught fish including eels, freshwater crayfish, yabbies, tortoises and freshwater mussels in the Lachlan, Macquarie and Murrumbidgee Rivers and other streams and wetlands in the region (Howitt 1904). Watercraft were manufactured from large slabs of bark cut from river red gum trees. Fish were caught using fishing lines and nets made from reed fibre.

Nets were used to catch waterbirds, whose eggs were also collected. Some of the other animals that the Wiradjuri hunted include kangaroos, wallabies, emus, possums, echidnas, lizards, snakes and frogs (Howitt 1904). In summer, some Wiradjuri journeyed southeast to the high plains of the Great Dividing Range, where bogong moths were collected in large quantities (Flood 1980). Plant foods included native millet, panic grass, pigface fruits, wild cherries, kangaroo apple, tubers, yams, roots and other grass grains (Gott 1983, Howitt 1904).

Aspects of the initial interaction between Europeans and the Wiradjuri led to violent conflict. Aboriginal people were shot, poisoned and displaced from their land by pastoral settlers and, in retaliation, cattle, sheep, stockmen and shepherds were speared.

Surveyor-General of NSW Lieutenant John Joseph William Molesworth Oxley had explored the region during his 1818 expedition of the Macquarie River (Johnson 2001). Over the following few years new pastoral runs were taken up in the Orange area. Settlement resulted in conflict with the local Aboriginal population. Intense fighting occurred between 1822-1824 in what were termed the Bathurst Wars (Pearson 1984). In 1824, a period of martial law was instituted by Governor Brisbane over the region between Bathurst, Orange and Wellington. There was considerable resistance by local Aboriginal people led by Windradyne a senior Wiradjuri guerrilla leader, but by the end of the year the violent resistance had been quashed. Martial law was repealed on 11 December 1824, and on 28 December 1824 Windradyne travelled to Parramatta, where he was pardoned by Governor Brisbane (Pearson 1984).

Within a decade of the first contact with Europeans many of the Wiradjuri around Orange were living adjacent to pastoral homesteads, often working as shepherds or engaged in other labouring activities (Günther 1837-1842). Those Aboriginal people who resided on pastoral holdings in central western NSW continued to live a semi-traditional existence into the second half of the nineteenth century (Günther, 1837-1842). This included collecting plant and animal foods to supplement station rations. Historical sources record a rapid decline in Wiradjuri numbers, caused by dispossession of land and the consequent destruction of habitat and social networks (Günther 1837-1842, Pearson 1984). Diseases including smallpox and malnutrition also took their toll (Günther 1837-1842, Pearson 1984). Traditional social networks collapsed. Other social structures, such as marriage laws, were also abandoned.

Grants of land were set aside for church and government Aboriginal reserves from the 1830s. One of the earliest was Wellington Mission operated by the Church Missionary Society for Africa and the Far East between 1832 and 1844 on the Macquarie River at Wellington, some 80 kilometres (km) north of the study area (Günther 1837-1842). One of the ministers, Reverend Watson, had a policy of removing Aboriginal children from their families, which led to bitter confrontations between Watson and other missionaries. Watson was dismissed by the Church Missionary Society in 1839 (Pearson 1984). Watson and his wife left the mission along with a small group of Wiradjuri People and established a private mission, known as Apsley Mission, just outside the boundary of the Wellington Mission. Approximately eight years after establishing Apsley Mission, Watson, his wife Ann and their small Aboriginal community of about thirty people moved to a new site on the bank of the Macquarie River, which became known as the Blake's Fall Mission (Pearson 1984).

Many of the contemporary Aboriginal people of central western NSW live in regional centres such as Dubbo, and the region has a population of around 13,600 Aboriginal people, or some 6% of the total population (Australian Bureau of Statistics 2016).

6.2 Prehistoric Context

Accounts of Aboriginal land use of central western NSW during the nineteenth century provide an insight into possible settlement patterns in the prehistoric period. Pearson (1984) concludes that the Upper Macquarie catchment encompassing the present study area was inhabited by large localised clans of Aboriginal people prior to European settlement, with a total regional population of 500-600 people.

During normal conditions clans divided into bands of up to twenty people, who may have used a territory with a radius of 20-30 km. These bands coalesced relatively quickly into groups of 80-150 people to take advantage of a guaranteed or desirable resource, such as seasonal food resources or goods offered by the Wellington mission (Pearson 1984).

The material record of this occupation is preserved in the Aboriginal sites of central western NSW, most of which probably date to the period since the last Ice Age (after around 18,000 years ago). All that remains at many of these sites are flakes of stone debris from the making and resharpening of stone tools. These were made both at Aboriginal open habitation areas (campsites) or special activity areas such as axe-grinding groove sites.

As well as being the sites of manufacture and maintenance of stone implements, open habitation areas usually contain evidence of domestic and other activities such as cooking and food preparation. Campfires or oven hearths are common, marked by charcoal and heat retaining stones or hearthstones. Organic remains consist of marsupial, rodent, bird, lizard, snake and fish bones, eggshell and freshwater mussel shell. Trees show where bark may have been removed by Aboriginal people to manufacture canoes, shelters and dishes.

6.3 Types of Aboriginal Cultural Heritage Sites in the Region

Based on the results and analytical conclusions of previous archaeological surveys in similar landscape contexts in central western NSW, it is possible to predict the types and topographic contexts of Aboriginal cultural heritage sites in the area surrounding the CVO. The occurrence and survival of Aboriginal sites is, however, dependent on many factors including micro-topography and the degree of land surface disturbance.

The types of Aboriginal cultural heritage site previously recorded in central western NSW are described in Sections 6.3.1 to 5.3.11.

6.3.1 Stone Artefact Scatters

Scatters of stone artefacts exposed at the ground surface are one of the most commonly occurring types of Aboriginal site in the region. The remains of fire hearths may also be associated with the artefacts. In rare instances, sites that were used over a long period of time may accumulate sediments and become stratified. That is, there may be several layers of occupation buried one on top of another.

Stone artefact scatters are almost invariably located near permanent or semi-permanent water sources. Local topography is also important in that open campsites tend to occur on level, well-drained ground elevated above the local water source. In central western NSW they are commonly located on river terraces and along creek-lines and also around the margins of lakes and swamps.

6.3.2 Axe-grinding Grooves

These result from Aboriginal people having rubbed the edges of stone axe-heads repeatedly against a soft abrasive rock in order to shape or sharpen them. Grinding grooves are normally located adjacent to creeks where suitable stone for grinding may be present. In most instances, sandstone outcrops provided the most suitable surface for grinding.

6.3.3 Modified Trees

Slabs of bark were cut from trees by Aboriginal people and used for a variety of purposes including roofing shelters and constructing canoes, shields and containers. Scars also resulted from the cutting of toeholds for climbing trees to obtain honey or to capture animals such as possums. Some trees were carved, whereby Aboriginal people cut designs through the bark onto the wood beneath. Ethnohistoric records indicate that some carved trees were associated with burials whilst others may have been sacred or totemic sites.

In central western NSW, River Red Gums and Box are the most commonly scarred species. Carvings are often on Cypress Pine. The classification of scarred trees as natural, European or Aboriginal is often problematic. However, if the scar is of Aboriginal origin the tree must now be more than ~200 years old.

6.3.4 Hearths

Hearths consist of lumps of burnt clay or stone cobble hearthstones. Sometimes ash and charcoal are preserved. Other materials found in hearths include animal bone, freshwater mussel shell, emu eggshell and stone artefacts. Hearths probably represent the remains of cooking ovens, similar to those described in ethnographic accounts by Major Thomas Mitchell (1839). These were lined with baked clay nodules and stone cobbles, possibly to retain heat. Hearths may be isolated or occur in clusters and may be associated with open campsites or middens. They are sometimes located on floodplain terraces of central western NSW.

6.3.5 Rockshelter Sites

Caves or shelters in cliff lines and beneath boulder overhangs were often used by Aboriginal people as campsites. Because of the confined area in these shelters and because of repeated Aboriginal occupation of such sites, the occupation deposits that they contain are often richer than open campsites and are usually stratified.

Rockshelters will only be found where suitable geological formations are present. They may occur as sandstone overhangs, shelters beneath granite tors or as limestone caves.

6.3.6 Rock Art Sites

Rock art consists of paintings, drawings and/or engravings on rock surfaces. In most instances in the wider region, rock art is related to the distribution of rockshelters but it may also be found on freestanding rocks.

6.3.7 Quarry Sites

These are locations where Aboriginal people obtained raw material for their stone tools or ochre for their art and decoration. Materials commonly used for making flaked stone tools include chert, silcrete, quartz and quartzite. These materials were obtained from exposed sedimentary formations or picked up as loose rock on the surface. Stone quarries may also be associated with volcanic rock outcrops, which provided the raw material for ground stone tools such as stone axes.

6.3.8 Freshwater Shell Middens

Shell middens are deposits of shell and other food remains accumulated by Aboriginal people as food refuse. In inland NSW these middens typically comprise shells of the freshwater lacustrine mussel (*Velesunio ambiguus*) or the freshwater riverine mussel (*Alathyria jacksoni*). Freshwater middens are most frequently found as thin layers or small patches of shell and often contain stone or bone artefacts and evidence of cooking. Such sites are relatively common along the watercourses of central western NSW and their associated lakes and other wetlands.

6.3.9 Earth Mounds

Earth mounds may have been used by Aboriginal people as cooking ovens or as campsites. Originally they appear to have ranged from 3 to 35 metres (m) in diameter and from 0.5 to 2 m in height. Today, however, they may be difficult to recognize because of the effects of ploughing, grazing and burrowing rabbits. Earth oven material, stone artefacts, food refuse and the remains of hut foundations have been exposed in excavated earth mounds.

6.3.10 Stone Arrangements, Ceremonial Rings and Ceremony and Dreaming Sites

Stone arrangements range from cairns or piles of rock to more elaborate arrangements such as stone circles or standing slabs of rock held upright by stones around the base. Some stone arrangements were used in ceremonial activities whilst others may represent sacred or totemic sites. Other features associated with the spiritual aspects of Aboriginal life are those now called 'ceremony and dreaming' sites. These can be either stone arrangements or natural features such as rock outcrops, waterholes or mountains, which may be associated with initiation ceremonies or the activities of ancestral creators.

6.3.11 Burials

Aboriginal burial grounds may consist of a single interment or a suite of burials. In the drier parts of the Murray-Darling Basin skeletal material is regularly found eroding from sand deposits (Bonhomme 1990, Hope 1993) but in the higher central western NSW burial sites are rarely found because conditions for the preservation of bone are poor. Knowledge of Aboriginal burial grounds is best sought from local Aboriginal communities.

6.4 Previous Aboriginal Cultural Heritage Investigations

An understanding of the past Aboriginal occupation of central western NSW has begun to emerge from a number of studies including some undertaken in and near the study area. However, there have been few systematic regional investigations, with most undertaken in discrete areas for management studies. These include surveys by Pearson (1979), Ross (1981), Haglund (1984a, 1984b), Kohen (1991, 1995, 1996, 1998, 2000), Navin (1996), Pardoe (2005, 2007a, 2007b, 2009) and Kayandel Archaeological Services (2008a, 2008b, 2009). Also relevant is Flood's (1980) broad-scale study of the uplands further east, which identified general features of the regional archaeological record.

Aboriginal occupation of central western NSW is known to date from at least 29,000-34,000 years ago. The oldest ages have been obtained from the Pleistocene sites of Cuddie Springs and Tambar Springs at the downstream end of the Macquarie River catchment (e.g. Field and Dodson 1999). Early radiocarbon ages have also been obtained from cultural sequences for rockshelter sites in the ranges to the east. For example, Gaynor (1974) has obtained a 20,000 year old age from Crazy Man Rock Shelter in the Warrumbungles National Park.

Surface scatters of flaked stone artefacts are the most common site type in central western NSW, although they are not abundant around Orange. These stone assemblages are dominated by flakes and flaked pieces mostly struck from quartz, and less commonly, silcrete and quartzite (e.g. Pearson 1979, Ross 1981, Haglund 1984a, 1984b). Few formalized tool types have been recorded, but include ground-edged axes and grinding dishes. Eucalypt trees with scars possibly made by Aboriginal people are also well represented along creeklines of central western NSW and are particularly abundant on the adjacent plains of the Macquarie River. Other site types on the plains include earthen features such as hearths and mounds. Rockshelters, rock art sites, axe-head grinding grooves, stone sources and stone arrangements also occur in the foothills of central western NSW.

The Cadia Mining Lease (1405) was surveyed prior to the development of the Cadia Hill open pit. Only a limited number of Aboriginal sites were identified during the survey, two sites with multiple artefacts and six isolated artefacts (Ross 1981, Kohen 1991, 1995). It was concluded that due to previous disturbance associated with historical mining, grazing and forestry, the likelihood of identifying significant Aboriginal sites in the vicinity of Cadia was severely limited (Kohen 1995).

Subsequent archaeological surveys (e.g. Kohen 1996, 2008, 2000, Pardoe 2005, 2007a, 2007b, 2009, Kayandel Archaeological Services 2008a, 2008b, 2009) for expansions to the mine area and ancillary infrastructure have identified few additional Aboriginal cultural heritage sites. Kohen (2000) concluded although the most likely locations for sites would be along creek lines, previous clearing has reduced the archaeological potential of the area to very low (Kohen 2000).

Flood's (1980) regional investigation of the higher uplands to the east of the present study area suggested that there was little Aboriginal occupation of the region before 4,000 years ago after which the region was occupied at low intensity. Flood (1980) found that lowland sites often either comprised large base camps, open occupation areas covering two or three square kilometres found on sand dunes and near lakes and rivers, or smaller camps distributed along river banks in a lineal pattern.

Flood (1980) noted typical landscape settings of Aboriginal campsites. All sites are within 1 km and most within 100 m of a river, creek, lake or spring. However, no sites are located right at the water's edge. All sites are located on well-drained ground with a reasonably good view of the approaches. When sites occur on the side of a mountain range or valley their aspect is usually east or north thus obtaining shelter from the prevailing westerly winds (Flood 1980).

6.5 Aboriginal Cultural Heritage Sites Previously Recorded near the Proposed Works Area

According to the Aboriginal Heritage Information Management System (AHIMS), accessed on 10 April 2017 (AHIMS search number 275861; Appendix 1), no Aboriginal cultural heritage sites have been located previously in or near the proposed disturbance area for the works (Table 1). The closest recorded sites are a stone artefact scatter (AHIMS site number 44-1-0038) in the area of the open cut, approximately 5 km northwest (NW) of the proposed molybdenum recovery plant, and an isolated find of a stone artefact (AHIMS site number 44-1-0133) near one of the waste rock emplacements, approximately 4 km NW of proposed molybdenum recovery plant. Pardoe (2007a) also registered a potential archaeological deposit (AHIMS site number 44-5-0133) on Rodds Creek, approximately 4 km south (S) of the proposed proposed molybdenum recovery plant.

The proposed works would not harm any of these Aboriginal cultural heritage sites.

Table 1. Previously recorded Aboriginal cultural heritage sites at some distance from the proposed work area.

AHIMS site number	Name	Type	Distance from Proposed Works
44-1-0038	C-OS-1	Artefact Scatter	~5 km NW
44-1-0133	CCIF6	Isolated Find	~4 km NW
44-5-0133	Rodds Creek South PAD7	Potential Archaeological Deposit	~4 km S

7 Project Design and Survey Methodology

In accordance with standard archaeological practice and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) a project design and survey methodology was prepared as a key component of the cultural heritage assessment. Details of the archaeological design and survey methodology are presented in the following sections.

7.1 Site Predictive Model

Previous archaeological studies indicate that the most frequently recorded Aboriginal cultural heritage places in the Orange region and wider central western NSW are stone artefact scatters. Other site types include stone sources, culturally significant trees, rock shelters, rock grinding grooves and stone arrangements. Based on these observations of Aboriginal site types and their distribution and landscape setting, the following predictive model of Aboriginal cultural heritage site locations for the proposed works can be proposed. A summary of the predictive model is presented in Table 2.

Past Aboriginal occupation of the Orange region and wider central western NSW would have focussed on the area's creeks and other wetlands because these areas offered the richest resource zone. Consequently, most Aboriginal sites can be expected adjacent to freshwater sources. Although Aboriginal people would have regularly journeyed away from water to collect plants, hunt animals and exploit mineral resources, these areas have a much lower probability of containing Aboriginal cultural heritage places and objects.

Based on observations of Aboriginal sites and their distribution and landscape setting, the following predictive model of site types and locations within the proposed work area can be proposed:

- **Stone artefact scatters** and **isolated finds of stone artefacts** have a very low potential to occur within the work area. The density of these types of sites is predicted to be very low, given the previous levels of disturbance and the general absence of nearby permanent sources of water.
- **Stone quarry** sites are unlikely because there are no rock outcrops amenable for lithic procurement.
- **Rock shelter** sites will not occur in the proposed upgraded work area because suitable overhangs and caves are absent from the study area.

- **Scars made by Aboriginal people** have the potential to occur on any mature Gum and Box trees, although these have been cleared from the study area.
- The chance of encountering **shell middens** is predicted to be negligible, as they are usually found near permanent water sources, absent from the study area, as are **burial** sites. Source-bordering dunes and lunettes adjacent to rivers and lakes are the landforms most likely to contain human skeletal remains.
- Although **stone arrangements** have been recorded in central western NSW, they are not common and are considered unlikely to be encountered in the study area, given the degree of previous land disturbance.

Table 2. Probability of encountering Aboriginal cultural heritage sites within the proposed work area.

	Site type					
	Scarred trees	Stone artefacts	Shell middens	Stone quarries	Rock shelters	Burials
Probability	Negligible	Low	Negligible	Negligible	Negligible	Negligible

7.2 Field Methodology

The archaeological field surveys were conducted based on the sampling strategy developed in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and Requirement 5a of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and outlined in Section 7.2.2.

The objective of the field survey was to identify sites of Aboriginal cultural significance within the Modification area.

7.2.1 Logistics

The fieldwork was undertaken on 3 April 2017 and 6 July 2017 by project archaeologist Dr Matt Cupper with the assistance of OLALC Heritage Officers Greg Ingram and James Reilly. CHPL's Approvals Manager Andrew Wannan and Environmental Officer Jack Bowen were available in the field to explain the proposed infrastructure upgrade to the Aboriginal community representatives.

7.2.2 Survey Methods

The archaeologist and Aboriginal representatives inspected the entire area of the proposed works with a pedestrian survey whereby the team members walked abreast across them in a series of transects. Transects were equally distributed across the

survey area and approximately 10 m apart. Due to the openness of the landscape it was possible to identify likely site locations from at least 10 m and deviate from the transects to make closer inspections. This meant that very high coverage of the work area was achieved given the small size of the proposed disturbance area.

The team examined the ground surface for archaeological traces such as stone artefacts, hearths, hearthstones, shells and mounds. Particular attention was paid to areas with high ground surface visibility such as in scalds and eroded gullies.

7.3 Survey Coverage Data

7.3.1 Conditions of Visibility

Conditions of ground surface visibility will affect how many sites are located. Visibility may also skew the results of a survey. If, for example, conditions of ground surface visibility vary dramatically between different environments, then this in turn will be reflected in the numbers of sites reported for each area. The area with the best visibility may be reported as having the most sites (because they are visible on the ground) while another area with less visibility but perhaps more sites will be reported as having very little occupation. It is important therefore to assess ground surface visibility.

Conditions of ground surface visibility were typically around 20%, with generally low understorey cover and scalded and gullied areas and tracks with surface exposure (Table 3).

Table 3. Visibility conditions of the proposed work area.

Survey Unit	Landform	Vegetation	Visibility	Exposures
Molybdenum Recovery Plant	Undulating Hills	Radiata Pine Plantation	20%	Tracks, scalds, gullies

7.3.2 Coverage Analysis

Coverage analysis is a useful measurement to allow cultural resource managers to assess surveys from adjacent areas and it also allows some meaningful calculation of the actual sample size surveyed. The *actual* or *effective* area surveyed by a study depends on the conditions of ground surface visibility. Conditions of surface visibility are affected by vegetation cover, geomorphic processes such as sedimentation and erosion rates and the abundance of natural rock that may obscure the remains of cultural activities.

Approximately 21% of the surface area of the proposed work area was inspected (Table 4). This is considered an acceptable coverage given that extensive previous

disturbance over all of the proposed work area means that Aboriginal cultural heritage sites are unlikely to occur in this area.

Table 4. Effective coverage of the proposed work area.

Survey Unit	Area	Visibility	Exposure	Coverage		Effective coverage	
	(ha)	(%)	(%)	(ha)	(% area)	(ha)	(%)
Molybdenum Recovery Plant	7	20	20	1.5	21	0.3	4
Total	7			1.5	21	0.3	4

Landform	Landform Area (ha)	Landform Effectively Covered		Cultural Heritage Sites
		(ha)	(%)	
Undulating Hills	7	0.3	4	-
Total	7	0.3	4	-

Note: ha = hectares

8 Results and Discussion

No Aboriginal cultural heritage places or objects were located in the Modification area and none are considered likely to occur. This does not mean that ground surface visibility was inadequate. Rather, it is largely attributable to the degree of land surface modification that has occurred since European settlement, coupled with the fact that the study area contains sparse water sources, which tended to be the focus of past Aboriginal occupation. Additionally, the relatively steep slopes of the Modification would not have been conducive to past Aboriginal habitation sites. Moreover, archaeological surveys of relatively small disturbance areas such as the proposed works area only rarely encounter Aboriginal cultural heritage sites.

Scarred trees were not identified, because of past felling of all mature trees. Quarry sites are also definitely not represented in the study area as rock outcrop is lacking. Landforms such as lunettes or source-bordering sand dunes that might contain sensitive sub-surface archaeological material such as burials do not occur in the proposed work area.

The sediments of the proposed works area have been so disturbed by past earthworks including land clearing and deep ripping that it can be concluded there is little probability that archaeological material could have survived on the surface or been buried beneath the soil. The proposed works would be installed in an area where there is no risk to any known cultural heritage and the potential for uncovering any previously unidentified cultural heritage is also negligible to low.

9 Aboriginal Cultural Heritage Values

9.1 Aboriginal Social and Cultural Information About the Modification Area

Aboriginal people of central western NSW are concerned about any development that might impact upon Aboriginal sites on land that is traditionally theirs. All land has high cultural significance for individual Aboriginal people and for the Aboriginal community collectively. It should also be noted that any development upon, or disturbance of land is contrary to principal Aboriginal beliefs regarding land, its values and its inherent cultural significance.

OLALC representatives Greg Ingram and James Reilly participated in the archaeological field assessments and discussions were held with them in the field to ascertain their views about the proposed works. The proposed works were also discussed with OLALC CEO Annette Steele.

Aboriginal community representatives involved in this cultural heritage assessment were invited to provide specific information about the social and cultural values of the Modification area.

The local Wiradjuri Aboriginal community is particularly concerned about the preservation of Aboriginal sites. However, the registered Aboriginal stakeholder representatives involved in the assessment did not have any specific information about any Aboriginal social and cultural values of the Modification area.

10 Impact Assessment

In accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011), the principles of ecologically sustainable development were considered in assessing the likely harm of the Modification to Aboriginal objects.

No Aboriginal cultural heritage was identified in the Modification area, so no known Aboriginal cultural heritage sites, items or values would be potentially impacted by the Modification. The potential for previously unidentified Aboriginal cultural heritage to occur in the Modification area is however considered in Section 10.1.

10.1 Potential For Previously Unidentified Aboriginal Cultural Heritage To Occur In The Modification Area

All of the Modification area was inspected for cultural heritage sites during the field survey. There is a very low possibility that some archaeology was obscured by soil. Such previously unidentified features, should they occur, would probably be isolated finds or low-density concentrations of stone artefacts (based on the predictive model outlined in Section 7.1 and informed by the results of the current survey, summarised in Section 8). However, the occurrence of any site or value is considered unlikely, at best.

Further sites of a type or significance not previously encountered at the CVO are improbable.

The shallow soils of the Modification area, coupled with past disturbance from pastoralism, means that significant *in situ* subsurface cultural deposits are highly improbable.

The Modification area does not contain culturally sensitive landforms such as lunettes or source-bordering sand dunes where subsurface Aboriginal cultural deposits (e.g. burials) have been recorded previously.

A strategy for managing any newly identified Aboriginal objects during the life of the Modification is outlined in Section 11.

10.2 Potential Cumulative Impacts of the Modification

Given that no Aboriginal cultural heritage has been identified in the Modification, coupled with the very low potential for such heritage to occur, the Modification would not increase cumulative impacts to Aboriginal cultural heritage in the region.

10.3 Flexibility of the Design of the Modification

The locations of the proposed components associated with the Modification are currently within their optimum design locations and could not be modified to avoid impacts to Aboriginal cultural heritage, particularly because no such impacts are predicted or considered likely.

11 Management Strategies for Cultural Heritage

11.1 Introduction

This section presents proposed strategies for the management of cultural heritage values within the Modification area that may be subject to direct impacts by the Modification.

The footprint proposed for the molybdenum recovery plant relocation is an area where harm to Aboriginal cultural heritage places or objects will not occur as they are not present, or likely to be present. The proposed works would be in an area where there is no risk to any known cultural heritage and the potential for uncovering any previously unidentified cultural heritage is also negligible to low.

Based on the known and predicted Aboriginal cultural heritage values within the Modification area, it is concluded that impacts to any Aboriginal cultural heritage (should it occur) as a result of the Modification can be effectively managed or mitigated through the following actions and strategies.

11.2 Specific Recommendations

11.2.1 Aboriginal Heritage Management Plan

An Aboriginal Heritage Management Plan (AHMP), which outlines the management and mitigation measures for Aboriginal cultural heritage, has been previously prepared for the CVO in consultation with the registered Aboriginal stakeholders and the OEH. CHPL should review, and if necessary, revise the AHMP for the CVO to reflect the results and recommendations of this assessment. The AHMP should continue to remain active for the life of the Modification and define the tasks, scope and conduct of all Aboriginal cultural heritage management activities.

11.2.2 Role of the Local Aboriginal Community

CHPL is committed to involving the local Aboriginal community as an integral participant in the management of Aboriginal cultural heritage values associated with the CVO.

11.2.3 Site Management and Cultural Awareness Training

The effective application of the AHMP and its strategies is dependent on an appreciation of its content and function by on-site staff and employees.

It is proposed to provide training to all on-site personnel regarding the AHMP strategies relevant to their employment tasks.

11.3 Summary Recommendations

Based on the results of this cultural heritage investigation and consultation with representatives of the registered Aboriginal stakeholders the following is recommended:

- In accordance with the existing CVO Aboriginal Heritage Management Plan (AHMP), in the unlikely event any previously unidentified Aboriginal cultural heritage places or objects are encountered during the course of proposed works, all activities likely to affect the material shall cease and management measures and/or salvage works will be developed in consultation with the NSW Office of Environment and Heritage (OEH) and OLALC cognisant of the cultural significance of the site; and,
- In the unlikely event that human skeletal remains are encountered during the course of activities associated with the Modification, all work in that area must cease. Remains must not be handled or otherwise disturbed except to prevent further disturbance. If the remains are thought to be less than 100 years old, the Police or the State Coroner's Office (tel: 02 9552 4066) must be notified. If there is reason to suspect that the skeletal remains are more than 100 years old and of Aboriginal origin, CHPL should contact the OEH's Environmental Line (tel: 131 555) for advice. In the unlikely event that an Aboriginal burial is encountered, strategies for its management would need to be developed with the involvement of the local Aboriginal community.
- CHPL should review, and if necessary, revise the AHMP for the CVO to include the Modification area.
- CHPL should continue to provide training to all on-site personnel regarding the AHMP strategies relevant to their employment tasks.

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Appendix 1

NSW OEH Aboriginal Heritage Information Management System Search Results

LandScape - Natural & Cultural Heritage Management

Date: 10 April 2017

P O Box 246

Merbein Victoria 3505

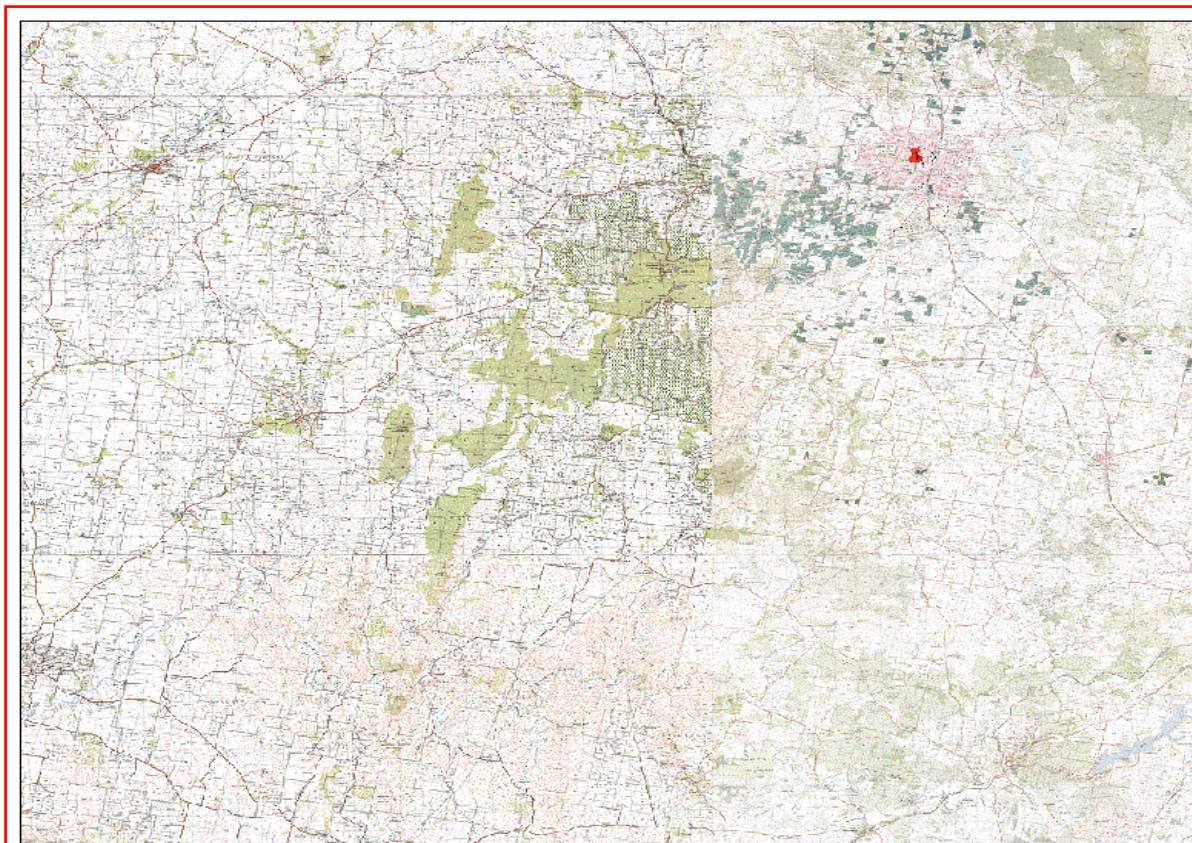
Attention: Matt Cupper

Email: landscape@telstra.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.5993, 148.6896 - Lat, Long To : -33.2659, 149.2183 with a Buffer of 1000 meters, conducted by Matt Cupper on 10 April 2017.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

109	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Cadia

Client Service ID : 275861

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-1-0038	C-OS-1	AGD	55	685270	6295530	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0034	C-IF-3;"Canomodine";	AGD	55	664610	6292060	Open site	Valid	Artefact : -	Isolated Find	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0035	C-IF-2;"Canomodine";	AGD	55	664610	6292060	Open site	Valid	Artefact : -	Isolated Find	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0036	C-IF-1 Canomodine	AGD	55	664610	6292060	Open site	Valid	Artefact : -	Isolated Find	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0037	C-OS-1 Canomodine	AGD	55	664540	6291960	Open site	Valid	Artefact : -	Open Camp Site	
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0030	C-ST-1 Near Cargo-Canowindra Rd.	AGD	55	666460	6299630	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	4748
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0031	C-ST-2 Near Cargo-Canowindra Rd.	AGD	55	666460	6299330	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	4748
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-2-0115	O-C1;Orange Cadia;	AGD	55	690650	6300100	Open site	Valid	Artefact : -	Open Camp Site	1996
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-2-0116	O-C-IF 1;Orange Cadia;	AGD	55	690650	6303120	Open site	Valid	Artefact : -	Isolated Find	1996
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-2-0117	O-C2;Orange Cadia;	AGD	55	690650	6303120	Open site	Valid	Artefact : -	Open Camp Site	1996
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-5-0007	Browns Creek (YLS/5)	AGD	55	701236	6289609	Open site	Valid	Artefact : -	Open Camp Site	1027
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-5-0008	Longview (YLS/6)	AGD	55	699490	6289402	Open site	Valid	Artefact : -	Open Camp Site	1027
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-5-0009	Newbridge;	AGD	55	671840	6286010	Open site	Valid	Artefact : -	Open Camp Site	2009
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0014	Cadia 1	AGD	55	686745	6298127	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	630
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
44-1-0017	CA/1, Cadia 1	AGD	55	685370	6297600	Open site	Valid	Artefact : -	Open Camp Site	2326
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Cadia

Client Service ID : 275861

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-1-0018	MT 1;	AGD	55	684500	6306800	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr.Mark Rawson							
44-1-0020	MC 1;	AGD	55	683900	6308100	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.Mark Rawson							
44-1-0021	MC 2;	AGD	55	684400	6307700	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.Mark Rawson							
44-1-0022	MC 3;	AGD	55	684700	6308500	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.Mark Rawson							
44-1-0023	Davy's Plain 1;	AGD	55	664900	6310900	Open site	Valid	Artefact : -, Burial : -	Burial/s,Isolated Find	
	Contact	Recorders	Bill Allen							
44-1-0025	CC-OS-1 (Cudal)	AGD	55	685200	6296600	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Bill Allen							
44-1-0027	GMC 4;	AGD	55	684400	6308700	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.Mark Rawson							
44-2-0001	Carlton Road	AGD	55	696827	6310546	Open site	Not a Site	Art (Pigment or Engraved) : 0	Not an Aboriginal Site	1310
	Contact	Recorders	Sharon Sullivan							
44-5-0070	Dirty Creek;DC-ST-1;	AGD	55	694500	6280570	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Mr.Mark Rawson							
44-2-0095	Rifle Range;	AGD	55	694300	6312400	Open site	Valid	Stone Quarry : -, Artefact : -	Open Camp Site,Quarry	
	Contact	Recorders	R Bjaaland							
44-2-0113	CC-OS-1 (Millthorpe)	AGD	55	687450	6299630	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd							
44-1-0005	Paling Yards Creek;	AGD	55	677490	6307172	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	ASRSYS							
44-3-0106	BSC-IF-1;	AGD	55	690930	6317440	Open site	Valid	Artefact : -	Isolated Find	103106
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd							
44-4-0003	Belubula River;	AGD	55	673712	6280336	Open site	Valid	Modified Tree (Carved or Scarred) : -	Carved Tree	65,1496
	Contact	Recorders	ASRSYS							

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Extensive search - Site list report

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-1-0044	Wide Lane	AGD	55	666177	6312690	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>								<u>Permits</u>	
44-1-0045	Wide Lane 2	AGD	55	666173	6312791	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>								<u>Permits</u>	
44-1-0046	Wide Lane 3	AGD	55	666163	6312788	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>								<u>Permits</u>	
44-1-0051	TW-IF-1	AGD	55	684510	6307910	Open site	Valid	Artefact : -		
	<u>Contact</u>								<u>Permits</u>	
44-1-0039	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			1157
	<u>Contact</u> Bill Allen								<u>Permits</u>	
44-1-0040	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			1157
	<u>Contact</u> Bill Allen								<u>Permits</u>	
44-1-0041	Canomodine Creek	AGD	55	671561	6296262	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>								<u>Permits</u>	
44-1-0042	Canomodine Creeck 2	AGD	55	671597	6296265	Open site	Valid	Modified Tree (Carved or Scarred) : 2		
	<u>Contact</u>								<u>Permits</u>	
44-1-0043	Nanamai Lane	AGD	55	667153	6304825	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>								<u>Permits</u>	
44-2-0129	SPR-6	AGD	55	700042	6315126	Open site	Destroyed	Artefact : -		
	<u>Contact</u>								<u>Permits</u>	
44-2-0130	SPR-7	AGD	55	699951	6315386	Open site	Destroyed	Artefact : -		
	<u>Contact</u>								<u>Permits</u>	
44-2-0131	SPR-8	AGD	55	699999	6315593	Open site	Destroyed	Artefact : -		
	<u>Contact</u>								<u>Permits</u>	
44-2-0124	SPR-1	AGD	55	699800	6314620	Open site	Destroyed	Artefact : -		

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Extensive search - Site list report

Your Ref/PO Number : Cadia

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Bobbie Oakley					Permits		
44-2-0125	SPR 2	AGD	55	699572	6315703	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Bobbie Oakley,Mr.NICHOLAS HARROP					Permits		
44-2-0126	SPR-3	AGD	55	699422	6315783	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Bobbie Oakley,Mr.NICHOLAS HARROP					Permits		
44-2-0127	SPR-4	AGD	55	699062	6316183	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Bobbie Oakley,Mr.NICHOLAS HARROP					Permits		
44-2-0128	SPR-5	AGD	55	699100	6316250	Open site	Valid	Artefact : -		
	Contact	Recorders	Bobbie Oakley					Permits	3710	
51-1-0058	Preston's Paddock Burial	AGD	55	658000	6288000	Open site	Valid	Burial : -	Burial/s	102779
	Contact	Recorders	Ms.Adrienne Howe-Piening					Permits		
44-1-0079	Gum Ridge ST1	AGD	55	681825	6306787	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Steve Woodhall					Permits		
44-2-0140	Rifle Rage SQ	AGD	55	694250	6312400	Open site	Valid	Stone Quarry : 1		
	Contact T Russell	Recorders	Bill Allen					Permits		
44-2-0141	Rifle Range ST2	AGD	55	694100	6312460	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	Bill Allen					Permits		
44-2-0142	Rifle Range ST1	AGD	55	694250	6312400	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	Bill Allen					Permits		
44-2-0139	Area B Artefact Scatter	AGD	55	690823	6317377	Open site	Valid	Artefact : 28		103106
	Contact T Russell	Recorders	Lori Sciusco (ERM)					Permits		
44-2-0144	Burrendong 1	AGD	55	694600	6318044	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.John Appleton					Permits		
44-2-0143	M-OS1 with PAD	AGD	55	702495	6298249	Open site	Valid	Artefact : 40		102055
	Contact	Recorders	OzArk Environmental and Heritage Management					Permits	3097,3117,3197,3210	
44-2-0147	Bloomfield Hospital Grounds	AGD	55	695300	6317000	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		100685
	Contact T Russell	Recorders	Jim Wheeler					Permits		

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Extensive search - Site list report

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-1-0082	Cadia Valley Operations CMT 2	AGD	55	683695	6297830	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Doctor.Colin Pardoe					Permits	2989	
44-4-0347	GoQ-ST3	AGD	55	658880	6280663	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management					Permits		
44-4-0348	GoQ-ST4	AGD	55	658957	6280770	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management					Permits		
44-4-0349	GoQ-ST2	AGD	55	658870	6280659	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management					Permits		
44-4-0350	GoQ-ST1	AGD	55	658876	6280662	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management					Permits		
44-1-0032	C-ST-3 Near Cargo-Canowindra Rd.	AGD	55	667110	6299660	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	4748
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits		
44-4-0362	Cudal/Canowindra Mod Tree 1	GDA	55	656653	6289397	Open site	Valid	Modified Tree (Carved or Scarred) : 1		101794
	Contact	Recorders	Doctor.Jodie Benton					Permits		
44-1-0100	Cudul/Canowindra Mod Tree 2	GDA	55	656576	6292713	Open site	Valid	Modified Tree (Carved or Scarred) : 1		101794
	Contact	Recorders	Doctor.Jodie Benton					Permits		
44-2-0156	Rural Fire Service Scar Tree	GDA	55	693634	6310295	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Orange LALC					Permits	3231,3234	
44-1-0103	Bourimbla 1	GDA	55	657052	6306555	Open site	Valid	Artefact : 3		
	Contact	Recorders	Doctor.Colin Pardoe					Permits		
44-5-0126	FCWF-IF-03	GDA	55	690131	6289577	Open site	Valid	Artefact : -		102269
	Contact	Recorders	Austral Archaeology Pty Ltd,Mr.Alan Hay					Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-5-0127	FCWF-PAD-01	GDA	55	693875	6283030	Open site	Valid	Potential Archaeological Deposit (PAD) : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0128	FCWF-PAD-02	GDA	55	690238	6289870	Open site	Valid	Potential Archaeological Deposit (PAD) : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0129	FCWF-S-01	GDA	55	690308	6283001	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0130	FCWF-S-02	GDA	55	692802	6283859	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0131	FCWF-S-03	GDA	55	694720	6283765	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0132	FCWF-S-04	GDA	55	691021	6288725	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-2-0157	The Springs, Orange	GDA	55	693607	6311611	Open site	Valid	Artefact : -, Habitation Structure : -, Potential Archaeological Deposit (PAD) : -		
	<u>Contact</u>	<u>Recorders</u>	Mr.Toivo Kim Tuovinen							
44-5-0124	FCWF-IF-01	GDA	55	690470	6284243	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay							
44-5-0125	FCWS-IF-02	GDA	55	693507	6286597	Open site	Valid	Artefact : -		102269
	<u>Contact</u>	<u>Recorders</u>	Austral Archaeology Pty Ltd,Mr.Alan Hay,Mr.David Marcus							
44-1-0129	Mount Canobolas Isolated Find 1	GDA	55	684118	6309204	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	OzArk Environmental and Heritage Management							
44-1-0134	HOARE'S CREEK	AGD	55	685250	6296750	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen							
44-2-0183	MPA1	GDA	55	699166	6317107	Open site	Partially Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey,Mr.NICHOLAS HARR							
44-1-0128	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Partially Destroyed			
	<u>Contact</u>	<u>Recorders</u>	OzArk Environmental and Heritage Management,Mr.Joshua Noyer							
								<u>Permits</u>	3526	

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
44-1-0135	CCIF1	GDA	55	685859	6297095	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>		
44-1-0136	CCIF2	GDA	55	685189	6296724	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>		
44-2-0166	W20 PAD 5	GDA	55	705548	6313675	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd					<u>Permits</u>		
44-2-0167	W20 PAD 6	GDA	55	705967	6313522	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd					<u>Permits</u>		
44-2-0172	W20 A22	GDA	55	697812	6316118	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd					<u>Permits</u>		
44-2-0173	W20 A23	GDA	55	702978	6314740	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1, Stone Arrangement : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd					<u>Permits</u>		
44-2-0174	W20 A24	GDA	55	704378	6314070	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Navin Officer Heritage Consultants Pty Ltd					<u>Permits</u>		
44-4-0373	FC/1	GDA	55	683359	6283574	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>		
44-2-0158	WOODVILLE ROAD PAD	GDA	55	688529	6295504	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>	<u>Recorders</u>	Kayandel Archaeological Services					<u>Permits</u>		
44-2-0159	WOODVILLE ROAD 3	AGD	55	688530	6295486	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Kayandel Archaeological Services					<u>Permits</u>		
44-2-0160	WOODVILLE ROAD 2	AGD	55	688539	6295531	Open site	Valid	Artefact : 1		
	<u>Contact</u>	<u>Recorders</u>	Kayandel Archaeological Services					<u>Permits</u>		

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