CULTURAL HERITAGE CONNECTIONS

Aboriginal Heritage Due Diligence Assessment, Glenlee Precinct Rezoning.

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July 2014

Report Prepared for

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EXECUTIVE SUMMARY

Cultural Heritage Connections Pty Ltd (CHC) was commissioned in April 2013 by Sada Services Pty Limited on behalf of the Glenlee Consortium to undertake an Aboriginal Heritage assessment for the Glenlee Precinct as part of a rezoning application. The Glenlee Precinct is situated to the west of the South Western Freeway and Main Southern Railway, southwest of Australian Botanic Gardens (ABG), to the southeast of Spring Farm, south of the Mount Annan residential area, northwest of the proposed Menangle Park Residential Release Area and north and east of the Nepean River and its flood plain. The precinct is within both the Camden and Campbelltown LGAs.

An Aboriginal archaeological assessment was previously prepared by CHC in 2007-2008 (Hardy and Streat 2008). The approvals process and legislation protecting Aboriginal sites have changed since 2009. The project application is now required to follow the 'Gateway' process established by the Department of Planning and Infrastructure (DoPI). Accordingly a Planning Proposal (PP) has been prepared and approved by both Councils. As of 3 July 2013 the planning proposal has been approved by the Minister for Planning and Infrastructure subject to conditions. The assessment work required has been outlined in the Project Plan.

This due diligence assessment has been prepared in order to update the previous study to address both the changed legislative requirements and any new archaeological information available for the study area region. Further cultural heritage assessment requirements have been outlined in the Project Plan and further assessment will be undertaken in due course.

Four of the sites located or recorded during the previous study (Hardy and Streat 2008) are within the boundaries of the current study area.

Isolated artefact Glenlee IF 1 2007 (52-2-3961) was one white/brown indurated mudstone flaked piece with two flake scars and 40% cortex). It was located an unsealed access road immediately above a dam, below a significant coal shale dump and adjacent to a drilled gas well. The only natural landform present is the Nepean River some 100 metres to the west. The artefact was in a highly disturbed context with no potential for immediate associated archaeological deposit and is unlikely to be in situ. The site was assessed as having low archaeological significance.

Site 52-2-2280 is a small artefact scatter on disturbed ground adjacent to a modified drainage line. A buffer zone around the recorded site has been included to identify any areas of potential landforms where surface artefacts could occur. It is not predicted that sub-surface material could occur in this area. The buffer is very conservative and includes a larger than necessary area. The site has low archaeological significance largely due to the level of disturbance.

Site Glenlee OS 1 2007 (52-2-3963) is an open artefact scatter of two artefacts believed to include the quartz artefact recorded as NPWS site 52-2-2270. It was located on an unformed track on the crest of a spur. The site comprised one flaked piece of red silcrete as well one quartz flake. The visibility on the exposure was approximately 40% and the area had been subject to minor disturbance. There is a moderate potential for further archaeological deposit associated with this site. The site was therefore assigned a moderate archaeological significance (this would be subject to further assessment).

Site Glenlee OS 2 2007 (52-2-3964) is an open artefact scatter of three artefacts. The artefacts recorded were one flaked piece of yellow along with two grey silcrete flakes. There is no potential for associated deposit within the access track area. However it was noted that additional areas of potential archaeological deposit are located in the vicinity. The site's broader area therefore does present opportunities for further research and was assessed as having moderate archaeological significance (pending further investigation).

If appropriate protection measures and ongoing management were to be undertaken during and after construction, the sites could be preserved within the broader development. If impacts to these sites cannot be avoided an AHIP application would be required including consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a).

The majority of the study site has been assessed as having nil-low archaeological sensitivity. The potential for Aboriginal objects to occur in these areas is low. There is therefore no need for further archaeological assessment, no Aboriginal Heritage Impact Permit (AHIP) is required, and development can proceed with caution in these areas. Two sites have been recorded within the area of low archaeological potential, albeit in disturbed contexts. The sites are protected under the NP&W Act and if impact to them cannot be avoided an AHIP must be obtained prior to their disturbance or removal.

The proposed access corridor to the north of the study site is in the area of high archaeological potential. Requirements for site protection and further work would depend on the extent of development impact. There is an existing unsealed access road in the area and it may be possible to limit the development impacts to the areas of existing disturbance. Recorded sites 52-2-3963 and 52-2-3964 are both in close proximity to the existing track and there is some potential for further archaeological deposit in the vicinity of both sites. When the exact extent of the road development is known an archaeological impact assessment would be required in this portion of the study site to determine the best way to manage the recorded sites and any areas of archaeological potential. If it is found that sites or areas of potential are likely to be subject to impact by the development it may be necessary to undertake archaeological testing in accordance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) and/or apply for a AHIP. Consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a) must form part of any additional assessment where test excavation or AHIP application is required.

RECOMMENDATIONS

On the basis of the findings of the above archaeological assessment and the legislative framework for protecting and assessing Aboriginal archaeological sites in NSW, the following recommendations are provided.

1. All recorded sites within the study area boundaries are protected under the NP&W Act and an AHIP must be obtained prior to any disturbance to or removal of the sites.

2. Consultation with Aboriginal stakeholders should be undertaken where decisions relating to the management of Aboriginal cultural heritage are being made.
3. Outside of isolated artefact 52-2-3961 and the buffer area for site 52-2-2280, the area shown as having low archaeological potential does not require any further archaeological assessment. Development can proceed with caution within this area subject to appropriate management of the two sites (see recommendation 3).
4. Depending on the final development designs, sites 52-2-3961 and 52-2-2280 could be managed by:
    a) Protection during site works (fencing) and ongoing protection such as screening with vegetation etc. OR
    b) Application for an AHIP from OEH to salvage the sites.
5. Further impact assessment in the area of high archaeological potential is recommended when development impacts are known. Two sites with associated areas of archaeological potential (52-2-3963 and 52-2-3964) have been recorded within close proximity to the proposed road corridor. Archaeological testing in accordance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) or an application for an AHIP may be required.
6. Consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a) must form part of any additional assessment where test excavation or AHIP application is required.
7. If additional impacts outside the area assessed in this study are identified prior to construction, further archaeological assessment may be required.
8. On-site employees or contractors involved in ground surface disturbance should be made aware of the statutory obligations that apply to the discovery of Aboriginal objects.
9. If Aboriginal objects are uncovered during ground surface works, all works must cease and OEH should be contacted to advise on a course of action.
10. In the extremely unlikely event that suspected human remains are found all work must cease, the site should be secured and the NSW Police should be notified to advise on a course of action. If the remains are found to be archaeological, OEH and the LALC should be contacted to assist in determining appropriate management.
11. A copy of this report should be provided to the OEH AHIMS library.

1.0 INTRODUCTION

Cultural Heritage Connections Pty Ltd (CHC) was commissioned in April 2013 by Sada Services Pty Limited on behalf of the Glenlee Consortium to undertake an updated Aboriginal Heritage assessment for the Glenlee Precinct.

1.1 STUDY BACKGROUND

The precinct is traversed by the Camden/Campbelltown LGA boundary and in December 2006 Camden Council and Campbelltown City Council resolved to prepare a Local Environmental Study (LES) and Draft Local Environmental Plan (DLEP) for the area as part of a consideration of rezoning of the subject land. An Aboriginal archaeological assessment was prepared by CHC (Hardy and Streat 2008) as part of the background environmental studies required to inform the LES, DLEP and Development Control Plan (DCP) for the site.

A draft LES was submitted to both Councils in February 2009, accompanied by the various technical support studies including the archaeological assessment. The draft LES was not put on public exhibition due to a number of issues and the 2009 rezoning application has effectively lapsed.

The approvals process and legislation protecting Aboriginal sites have changed since 2009. An LES is not a requirement under the revised process. Such applications are now required to follow the 'Gateway' process established by the Department of Planning and Infrastructure (DoPI). Accordingly a Planning Proposal (PP) has been prepared and approved by both Councils. As of 3 July 2013 the planning proposal has been approved by the Minister for Planning and Infrastructure subject to conditions.

This due diligence assessment has been prepared in order to update the previous study to address both the changed legislative requirements and any new archaeological information available for the study area region. Further cultural heritage assessment requirements have been outlined in the Project Plan and further assessment will be undertaken in due course.

1.2 STUDY AREA

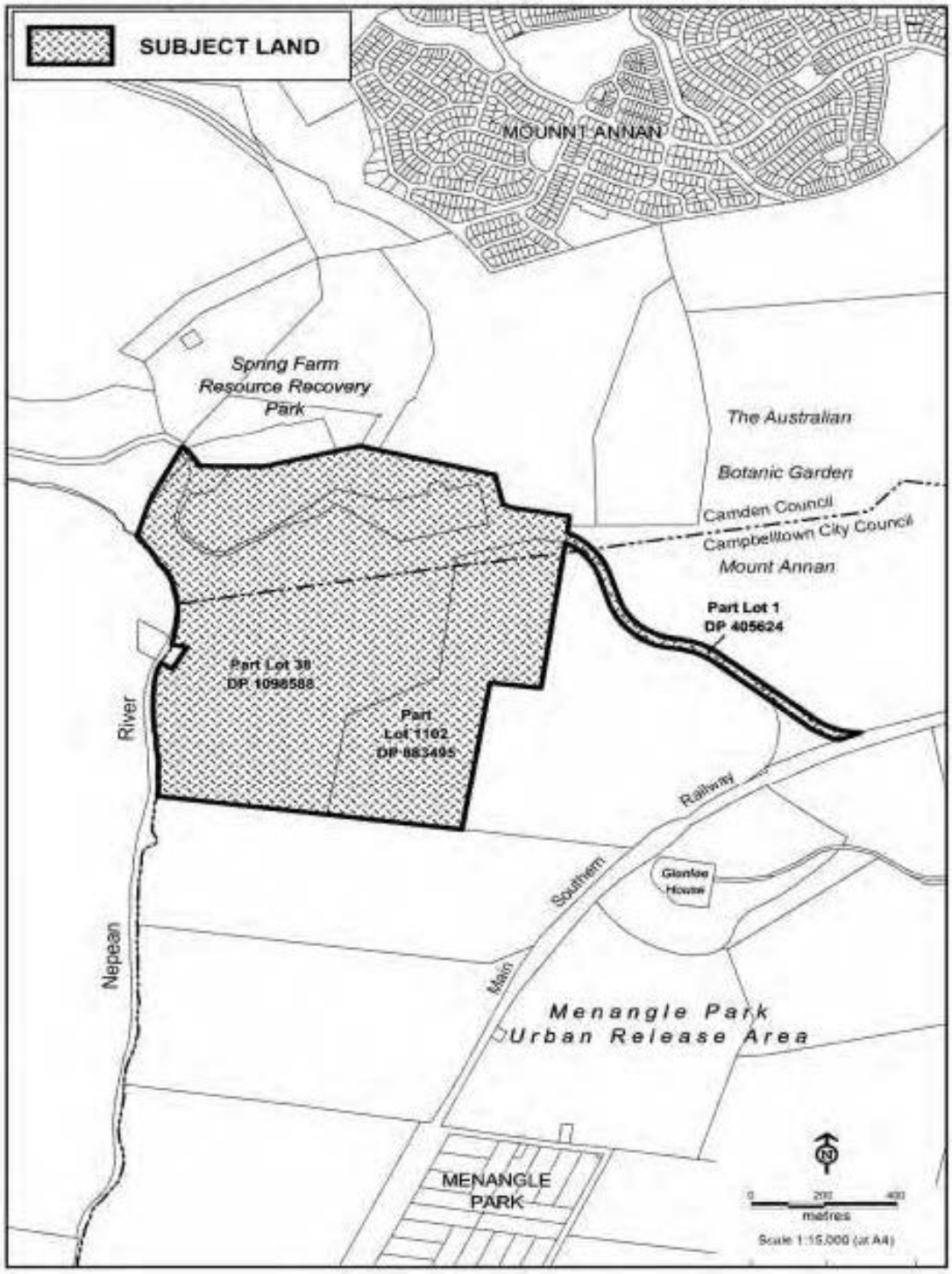
The Glenlee Precinct (also referred to as the study area or study site) is situated to the west of the South Western Freeway and Main Southern Railway, southwest of Australian Botanic Gardens (ABG), to the southeast of Spring Farm, south of the Mount Annan residential area, northwest of the proposed Menangle Park Residential Release Area and north and east of the Nepean River and its flood plain. The study area is shown in Figure 1.

The land has predominantly been used for industrial purposes not withstanding its current rural zoning. These industrial uses include the Sada Services landholding (truck maintenance and depot, coal washery and reject coal emplacement), Camden Soil Mix (truck maintenance and depot, greenwaste and recycling facility), and TRN (truck maintenance and depot).

The Precinct includes Lot 38 DP 1098588, Lot 1 DP 250033, part of Lot 1 DP 405624, Lot 1102 DP 883495 and Lot 54 DP 864754. These various ownerships have an area of

approximately 107.6 hectares of which approximately 60 hectares is considered to be suitable for more comprehensive industrial purposes (subject of detailed investigation).

Figure 1: Study area



The study area also includes the rail siding, which is approximately two kilometres in length, connects to the Main Southern Railway Line, is privately owned by Sada Services and is currently used by Queensland Rail Freight. At this stage there are no plans to upgrade the siding, but this may change depending on future uses of the Site.

1.3 STUDY CONTEXT & AIMS

This assessment has been designed to meet the requirements of the NSW Office of Environment and Heritage (OEH), *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010c) (hereafter 'Code of Practice').

The major aims of a due diligence assessment are to:

- identify whether or not Aboriginal objects are, or are likely to be, present in the area;
- if objects are present or likely to be present, determine whether or not the proposed development activities are likely to harm Aboriginal objects; and
- determine whether further assessment or an Aboriginal Heritage Impact Permit (AHIP) is required.

A summary of the generic due diligence process is presented in Figure 2. A discussion of the process as presented in Figure 2 is presented in Section 1.4.2 below. As the project is at PP stage and exact development details are subject to change, no specific impacts have been evaluated as part of this assessment. Rather, the assessment aims to present an analysis of the archaeological potential of the study area and provide advice on any further action required to protect the study site's Aboriginal heritage values, if any.

1.4 LEGISLATIVE CONTEXT

This section outlines the legislative framework protecting archaeological heritage sites in NSW. It does not purport to be legal advice. It presents an interpretation of the implications for the management of archaeological sites within NSW and the study area as understood by the consultant.

1.4.1 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) protects Aboriginal objects and Aboriginal places in NSW. It has been amended by the National Parks and Wildlife Regulation 2009 (NPW Regulation). Under the NPW Act, it is an offence to do any of the following things without an exemption or defence provided for under the Act:

- A person must not knowingly harm or desecrate an Aboriginal object
- A person must not harm or desecrate an Aboriginal object or Aboriginal place (strict liability)

Harm includes activities that "destroy, deface or damage" an Aboriginal object or Aboriginal Place, and in relation to an object, move the object from the land on which it has been situated. Section 91 of the Act also obliges any person who discovers an Aboriginal object to report it to the OEH.

An Aboriginal object is defined as:

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

An Aboriginal object is legally protected irrespective of land tenure, the significance of the object and whether or not it has been recorded.

"Aboriginal Places" are places so declared under Section 84 of the Act.

Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later harm an object. Due diligence can be exercised by complying with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010c)(or industry-specific codes of practice) that has been adopted under the National Parks and Wildlife Regulation 2009. The code provides a process to enable a reasonable determination of whether or not Aboriginal objects will be harmed by an activity or whether further investigation or an Aboriginal Heritage Impact Permit (AHIP) are required.

There is also a range of defined exemptions and low impact activities defined in the Regulation for which due diligence is not required. These include undertaking specified farming, land management, maintenance, surveying or environmental rehabilitation works.

Under the amended Act a permit will no longer be required to *look for* Aboriginal objects providing the investigation is undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). Archaeological test excavations that follow the code do not require an AHIP. If objects are present and harm cannot be avoided it is necessary to apply for an AHIP.

There are also requirements for consultation with Aboriginal people relating to AHIP applications. These are set out in the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

1.4.2 Due Diligence Process

The following discussion relates to the generic due diligence process shown in Figure 2, as applied to the study area.

Step 1 – Yes

It was determined that activity resulting from the rezoning could disturb the ground surface. It was not considered likely that any culturally modified trees would be located as the original vegetation has been entirely cleared.

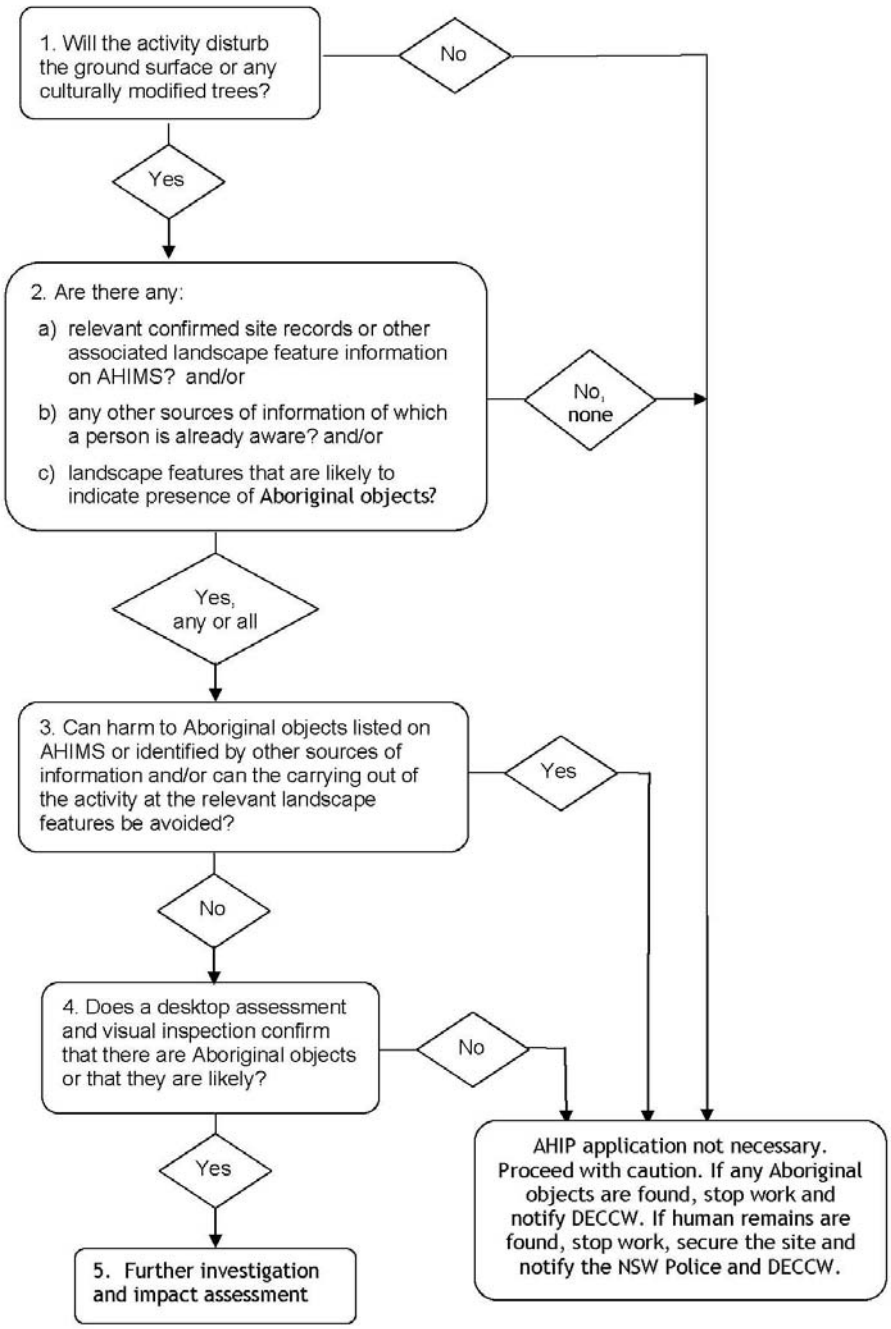
Step 2 – Yes

Sites have been recorded within the study area.

Step 3 – No

Although no specific development impacts are being considered as part of the PP for the subject land it has been assumed that ground disturbing works would take place and therefore it may not be possible to avoid harm.

Figure 2: The generic due diligence process (DECCW 2010)



1.4.2.1 Discussion

The remainder of this report is mainly focused on Step 4 as presented in Figure 2.

The Code of Practice states that Steps 3 and 4 and the consideration of landscape features in Step 2 only apply to land that is *not disturbed* and also provides a list of

landscape features which can indicate an area has potential to contain Aboriginal occupation evidence. These are listed as areas on land that is *not disturbed* that are:

- within 200 metres of waters;
- located within a sand dune system;
- located on a ridge top, ridge line or headland;
- located within 200 metres below or above a cliff face; or
- within 20 metres of or in a cave, rock shelter, or a cave mouth.

The *National Parks and Wildlife Regulation 2009 – Regulation 80B* defines disturbed land as land that:

"…has been the subject of human activity that has changed the land's surface being changes that remain clear and observable".

Although it is probable that the above definition applies to the majority of the study area, this does not always mean there is a low probability of Aboriginal objects being located. The assessment presented in this report aims to identify the likelihood of Aboriginal objects being present within the study area (as per the stated aims of the Code of Practice – (DECCW 2010c: 2)). As the project proposal is likely to require ground excavations, this assessment also includes a consideration of the sub-surface archaeological potential of the study area.

1.4.3 Environmental Planning and Assessment Act 1979

The *EP&A Act* requires that environmental impacts are considered in land use planning and decision-making. The definition of 'environmental impacts' includes impacts on the cultural heritage of the project area. The Act sets out specific statutory assessment processes including:

- Part 4: Development that requires consent under consideration of environmental planning instruments.

- Part 5: An assessment process for activities undertaken by public authorities and for developments that do not require a development consent but an approval under another mechanism.

1.5 LIMITATIONS AND AUTHORSHIP

This assessment is limited to a consideration of the Aboriginal archaeological potential of the study area. Mapping, definitions of the study area and likely impacts are based on information supplied by the client. No assessment of the cultural value of the area has been made by Aboriginal stakeholders; therefore the assessment is limited to a consideration of the archaeological (scientific) value and the likely presence of Aboriginal objects. Previous consultation generally supported the archaeological findings.

Analysis of the archaeological background, design of the methodology, field inspection and reporting for the assessment was undertaken by Vanessa Hardy (BA Hons), archaeologist and Director of Cultural Heritage Connections Pty Ltd.

1.6 REPORT OUTLINE

The following section (Section 2.0) of this report provides a summary of the environmental context of the study area. Section 3.0 examines the archaeological background. Section 4.0 presents an assessment of the archaeological potential of the study area. Analysis and recommendations arising from the assessment are presented in Section 5.0.

2.0 ENVIRONMENTAL CONTEXT

Analysis of the environmental context is essential for developing accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. Environmental characteristics influence the types of archaeological sites. An understanding of how the landscape looked and behaved in the past can help us to predict where Aboriginal people may have undertaken various activities and therefore the types of archaeological sites that may be found in the present. In addition, environmental processes influence the preservation of sites. Heavy erosion or acidic soils are likely to destroy or damage certain types of evidence, reducing the likelihood of locating evidence of past occupation.

The study area is located within the Cumberland Lowlands of the Sydney Basin. Its environmental setting is discussed below.

2.1 LANDSCAPE & GEOLOGY

The Cumberland Lowlands (also known as the Cumberland Plain) is an area of approximately 180,000 hectares of land within the Sydney Basin.

Most of the Cumberland Lowlands are underlain by Wianamatta Group shales. Triassic sediments of the Wianamatta Group overlay the Mittagong formation and divide into two formations: the Ashfield Shale and the overlying Bringelly Shale. The Ashfield Shale is the most extensive to the west of Sydney, comprising of black to dark grey siltstone and laminite. Extensive areas of Bringelly Shale are also present across the lowlands. Bringelly Shale typically comprises shale (claystone and siltstone), carbonaceous claystone, laminite and fine to medium grained lithic sandstone (Bannerman and Hazelton 1990).

The Lowlands are, in general, gently undulating plains on shale with a "dense drainage net of predominantly northward flowing channels" (Bannerman and Hazelton 1990). The topographic relief of the region is generally subdued with elevations typically less than 100 metres AHD. Slopes are typically less than 5%. The majority of the Cumberland Lowlands is within easy access (less than 500 metres) of a temporary or permanent water source.

Stone suitable for tool manufacture occurs across the Cumberland Lowlands. Recorded artefacts have been made from silcrete, chert, IMT[1], quartz, quartzite and basalt. Many of these materials can be commonly found as cobbles or boulders eroding out of deposits near creek lines. The most commonly recorded material type in the Lowlands is silcrete (Kohen 1986: 280-281).

The study area is toward the southern end of the Lowlands. It is on the eastern side of the Nepean River predominantly on the flood plain with part of the site located on the eastern bank of the river. The study site also lies on the ridge and the eastern side of the Camden Syncline. It extends over Quaternary alluvium which consists of quartz and

[1] A fine-grained siliceous stone known as either 'indurated mudstone' or 'silicified tuff'. While easily recognisable, this stone type is variable and various studies have been unable to conclude whether it sedimentary or igneous. Therefore, it has been suggested that a neutral term 'IMT' be used to describe the material. That term is used in this report.

fluvial sand silt and clay as well as Tertiary alluvium which consist of elevated alluvials and Triassic shales of the Bringelly group (Chapman and Murphy 1989).

2.2 SOILS

The soil landscape map for the Penrith 1:100 000 map sheet shows that the study area crosses three soil landscapes and an area mapped as 'disturbed terrain' (Hazelton, et al. 1989).

The majority of the study area is located on the Theresa Park soil landscape which is present along the banks and on the floodplain of the Nepean River. A portion of the study area at its northern boundary is within the Luddenham soil landscape. A portion of the study area namely the two access corridors (the proposed road access to the north and the rail corridor to the southeast corner) and a small portion at the northeast corner are within the Blacktown soil landscape.

The Theresa Park soil profile is located on the floodplain and Quaternary and Tertiary terraces of the Nepean River and its tributaries. The geology is quaternary alluvium made up of quartz and lithic fluvial sand, silt and clay. Soils within this landscape vary from red soils on terraces to alluvial soils on the floodplain. They include poorly structured brown, orange to red silty sandy loams and are subject to localised flooding, seasonal water logging and extensive soil erosion along the Nepean River and tributaries.

The total soil profile for the Nepean River floodplain and terrace edges is likely to exceed 250 centimetres and the boundaries between the soil horizons will be gradual to sharp (Hazelton and Tille 1990: 83). The total soil profile for the drainage lines is likely to exceed 150 centimetres and the boundaries between the soil horizons will be sharp (Hazelton and Tille 1990: 83).

The Luddenham soil landscape is an erosional soil landscape characterised as undulating to rolling low hills on Wianamatta Group shales and often associated with Minchinbury Sandstone (Bannerman and Hazelton 1990). The landscape occurs in the south and west of the Cumberland Plain. The dominant landform elements are slopes of moderate incline (10-15%). General topography is undulating to rolling low hills with narrow ridges, hillcrests and valleys. Local relief is 50-80 metres with slopes of 5-20%. Soils profiles vary slightly depending on the landform. On crests soils are typically very shallow, friable loam of up to 10 centimetres overlaying less than 40 centimetres of sandy clay on weathering shale bedrock. On upper and mid slopes soils are typically up to 40 centimetres of clay loam overlaying medium or heavy clays. Lower slopes and drainage lines have deeper soils and can contain up to 50 centimetres of loamy sand overlaying greater than 100 centimetres of sandy clay. Erosion is common and generally moderate to severe in disturbed areas (Bannerman and Hazelton 1990). Erosion impacts in this landscape can frequently reduce the likelihood of archaeological sites being preserved.

The Blacktown soil profile is located over much of the Cumberland Lowlands. The geology is Ashfield laminate and siltstone and Bringelly shale containing occasional claystone, laminite and coal. Soils are typically shallow to moderately deep red and brown podsols on crests and upper slopes and deeper yellow podsols and soloths on lower slopes along drainage lines. Soil acidity, ironstone and gravel shale fragments tend

to increase in quantity with depth (Hazelton and Tille 1990: 29). Typical soil profiles of the Blacktown soil landscape are - crests: up to 30 centimetres of friable brownish black loam to clay loam topsoil overlaying 10-30 centimetres of hard setting brown clay loam A2 horizon overlying B horizon and subsoils; upper slopes and midslopes: up to 30 centimetres of A1 horizon topsoil over 10-20 centimetres of A2 horizon overlying B horizon clay; lower sideslopes: up to 30 centimetres of A1 horizon and 10-30 centimetres of A2. Ironstone and gravel shale fragments tend to increase in quantity with depth. This suggests a maximum of 60 centimetres of soils that could contain archaeological deposits. These depths would vary across the landscape (Bannerman and Hazelton 1990).

2.3 FLORA AND FAUNA

The study area has been extensively cleared since European settlement of the region. In the past the area would have provided a wide variety of flora and fauna resources for the Aboriginal communities who lived there.

The vegetation communities of the greater Sydney area have over 200 species with edible parts (Attenbrow 2002). Many plants were exploited as a minor food resource, for example berries or plant nectars. Aboriginal firing of the landscape may have resulted in opening up of grasslands in the valleys and ridge tops, which, in turn, increased the habitat for large macropods.

The predominant indigenous vegetative landscape associated with the Theresa Park soil landscape is tall open forests (wet sclerophyll). This contained Cabbage Gum (*Eucalyptus amplifiolia*) and Broad Leaved Apple (*Angophora subvelutina*) communities. Understorey species included grasses, such as spear grass, shrub species such as Blackthorn, ferns including Bracken and vines such as Sarsparilla. This type of forest is typical of those located in the alluvial deposits adjacent to the Nepean River between Penrith and Camden. For the most part this indigenous vegetation was cleared due to the value of the soils which are now occupied by pastures, small hobby farms and citrus orchards (Hazelton and Tille 1990: 83; Walker 1975:12).

The Blacktown soil landscape prior to land clearance was associated with tall open-forest (wet sclerophyll) and Cumberland Lowland woodland (dry sclerophyll forest). The tall open woodland contained Cabbage Gum (*Eucalyptus amplifiolia*) and Broad Leaved Apple (*Angophora subvelutina*) communities. The Cumberland lowland woodland contained Sydney Blue Gum (*Eucalyptus salinga*), Blackbutt, (*Eucalyptus pilurius*) with occasional Forest Red Gum (*Eucalyptus teretcoris*) and Grey Box (*Eucalyptus hemipholia*) communities. Understorey species included grasses, such as spear grass, shrub species such as Blackthorn, ferns including Bracken and vines such as Sarsparilla. This type of forest is typical of those located in the podsolic deposits of the elevated areas close to the Nepean River between Penrith and Camden. For the most part this indigenous vegetation has been cleared across the region for farming and more recently urban residential and light industry land use. (Hazelton and Tille 1990: 27-28; Walker 1975:11-13).

The local Aboriginal population would have utilised many of the local plants in a variety of ways. Wood was used to make canoe poles, weapons, woomeras, boomerangs and was used for firewood. Plant resins were used to fix parts of tools together. Bark was used for huts, carrying vessels, canoes, shields, fishing lines, bedding, blankets and

torches, amongst other things (Attenbrow 2002: 113). Fibres were used to make ropes that could then be used in traps and nets for trapping animals, birds and fish. Local knowledge of medicine plants was also an important part of Aboriginal culture.

Animal resources were important to the Aboriginal people of the region, not only as a food source but because they could also be used for manufacturing. The use of animal skin clothing and animal bone tools has been well documented. Most Australian land mammals are available all year around as they are not migratory; however, some may be easier to catch at certain times, for example possums are less active in the winter months. Possums are frequently referred to as part of the diet of Aboriginal people in inland Sydney areas. It was thought that a marked difference would be found between the inland and coastal diet of groups in the Sydney area, due to the coastal availability of fish and shellfish. However, many of the same animal species are found in bone remains excavated at archaeological sites. In general, macropods are common and would have formed an important part of the diet (Attenbrow 2002: 71). Water based plants and animals would also have been exploited in local areas. Other less permanent resources include migratory birds, such as the mutton bird, and seasonally available eggs of both birds and reptiles.

Overall, the resources available to inhabitants of the study area region could have provided a varied and generally reliable resource to sustain the many economic and social requirements of large Aboriginal groups.

2.4 LAND USE HISTORY

Until the 1950s the Glenlee and Camden Park estates comprised an uninterrupted and relatively undisturbed rural landscape on the banks of the Nepean River. However, increasing production of coal from the Burragorang/Nattai River mines to the south-west and the need to transport it to the export loading plant at Balmain in Sydney, led to construction of a coal washery and shipment facility at Glenlee, between Mount Annan and the Nepean River on the current study area.

A two-kilometre rail spur to the facility (called Clinton's siding) was constructed from the Main Southern Railway and opened in December 1958. The line was electrified as part of the extension of metropolitan railway electrification to Campbelltown in 1968. The use of the coal facility peaked in the 1960s and 1970s but was scaled down from the late 1980s partly due to the closure of the Burragorang mine. The Jack's Gully Waste and Recycling Centre (WRC) was established by Camden Council in 1975, it lies to the north of the study area. It is now known as the Macarthur Resource Recovery Park.

3.0 ARCHAEOLOGICAL CONTEXT

It is generally accepted that the earliest Aboriginal habitation of Australia dates back at least 60,000 years. Occupation patterns would have changed through this time. For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. Historical records and ethnographic studies of more recent Indigenous communities are also used in combination with archaeological evidence to help to reconstruct past Indigenous behaviour patterns. This background enables testable predictive models for occupation to be proposed and can be used to provide a picture of behaviour in the past as well as indicate how evidence of that past behaviour might be preserved in the archaeological record.

3.1 REGIONAL ARCHAEOLOGY

Many hundreds of open artefact sites (also known as open campsites or artefact scatters) have been recorded within the Cumberland Lowlands. This is despite the fact that at least 50% of the Cumberland Plain has already been developed to such an extent that any archaeological evidence that may have once been present has been destroyed. Open artefact scatters can range from a few discarded stone pieces (resulting from a one-off use of an area) to large sites which may have been visited by a large number of people and/or been repeatedly used over many years. In these larger sites, distinct areas relating to specific activities can sometimes be located, such as knapping floors where individuals would have sat to manufacture stone tools. They can also include other habitation remains such as animal bone, shell or fireplaces (known as hearths).

With such a large number of artefact sites recorded, much of the archaeological research in the region has focused on stone artefacts and what they can tell us about past habitation. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied. The sequence of stone artefacts generally found in eastern Australian sites was first described by Fred McCarthy in the late 1940s. It is known as the Eastern Regional Sequence and it was based on direct dating of excavated sequences. The broad categories have been added to and refined over time. The timing of the various phases has also been refined specifically in light of archaeological data from the Sydney region (Jo McDonald CHM 2005b). There is still some debate about the precise nature and significance of the technological changes described in the sequence. The named phases with most recent updated information are described in Table 1.

Table 1: Proposed revised ERS (Jo McDonald CHM 2005b)

Pre-Bondaian	Before 9,000 BP	Preference for the use of silicified tuff, unless too great a distance from sources when augmented with quartz and unheated silcrete. Also grainy stone materials. Cores and tools vary widely in size, some quite large. No backed artefacts, elouera, or ground stone. Unifacial flaking predominant technique, bipolar flaking rare.
Early Bondaian	4,000 to 9,000 BP	Preference for the use of silicified tuff declines and more use is made of local stone materials, especially at sites occupied for the first time. Backed artefacts appear sporadically. Bipolar flaking widely in use but rarely at individual sites. Presume that unifacial flaking continues as predominant
Middle Bondaian	1,000 to 4,000 BP	The use of different raw material types varied between sites, and within sites over time. Main phase of backed artefacts and introduction of asymmetric alternating flaking. Substantially smaller cores and tools. Bipolar flaking increases. Ground stone artefacts appear, though infrequently and present at fewer than half the dated sites.
Late Bondaian	1,000 years BP to contact	The use of different raw material types continued to vary. Backed artefacts decline, becoming rare or absent from most sites. Bipolar flaking techniques at most sites. Ground stone at most dated sites in low frequencies. Elouera continued to be present but rare.

3.1.1 Occupation Modelling

Over the last 30 years, a series of models of occupation of the Cumberland Lowlands have been proposed. These are being continually refined as further work takes place across the Lowlands and the broader Sydney region

In the 1980s research by Kohen focused on the western areas between Richmond and Penrith/Blacktown in the south. His research was significant in that it divided the research area into five environmental zones. And found that Quaternary alluvium areas. seemed to have a greater concentration of sites than other landform types (Attenbrow 2002: 49). These Quaternary alluvial deposits are generally located along the rivers and major creek lines of the Cumberland Plain. Kohen noted that 65% of recorded sites were found within 100 metres of permanent water, while only 8% were located at a distance of more than 500 metres from water (Kohen 1986: 229-275) and that artefact scatters tend to be large, more complex and closer together the closer they are to large permanent creeks and rivers. His study also found that silcrete was the most common material for artefact manufacture (Kohen 1986: 280-281). Kohen's study was based on the presence of surface visible sites.

More recent investigations on the Cumberland Plain have added considerable information to analysis of Aboriginal occupation. An analysis of 666 sites recorded on the Cumberland Lowlands (Jo McDonald CHM 1997) found that open artefact scatters (89%) were the most common site type across the area, with scarred trees making up 2.1%. Shelters and axe grinding grooves accounted for only 3.6% of recorded sites, and these were concentrated at the junction of shale and sandstone geology along the periphery of the Lowlands. The study also highlighted difficulties associated with archaeological visibility on the Plain by assessing the potential for areas with no surface evidence to contain buried sub-surface deposits. The study found that an absence of surface evidence is not a reliable guide to the potential, nature or density of sub-surface material. The results of McDonald's studies clearly demonstrate the limitations of surface survey for identification of archaeological deposits.

The study also highlights the importance of test excavation in establishing the nature and density of archaeological material in the Cumberland Lowlands. The Rouse Hill test excavation program, undertaken throughout the 1990s and more recently, is the most extensive subsurface investigation conducted in the region. The investigations further demonstrated that existing predictive models based on analysis of surface sites were unreliable. It was concluded that one of the main reasons a high proportion of sites were recorded in creek flat areas was the increased visibility conditions rather than it being a reflection of past human behaviour patterns (Jo McDonald CHM 1998).

McDonald synthesised the various Rouse Hill studies (Jo McDonald CHM 1998, 2002a, 2002b, 2002c, 2002d, 2002e) and developed a predictive model for the local area based on sub-surface investigation as well as surface finds. This has broader application for the entire Cumberland Lowlands. McDonald's model includes the following key elements:

- Site complexity and density in the area is far greater than what analysis of material recorded during initial limited testing programs or analysis of surface remains suggests.
- Most areas, even those without identifiable surface remains, may contain sub-surface archaeological material.
- There is potential for stratified and/or intact deposits in some areas, particularly in stable or aggrading landforms including alluvial deposits.
- The potential for intact deposits is not necessarily greatly diminished by ploughing of an area, which only tends to affect the top 30 centimetres of a deposit.
- Extensive testing has revealed the presence of backed blade manufacturing sites, heat treatment locations, general camp sites and other specialised activity areas.
- Sites are more extensive and complex in landscapes with more permanent water.
- Sites with ephemeral water sources were found to be sparser and to contain evidence of more localised one-off behaviour.
- Grinding grooves may be found in the sandstone or shale/sandstone transition areas.
- Scarred trees may occur in stands of remnant vegetation.

- The most common raw material is silcrete, though some IMTand quartz artefacts may also be found.

After ground-truthing the model in a number of places, including at the Australian Defence Industries site (McDonald and Mitchell 1997), McDonald concluded that the three main factors influencing the density and complexity of open artefact sites in the Cumberland Lowlands are:

- stream order;
- landscape unit (ie landform type); and
- proximity to a stone source suitable for extracting stone for tool manufacture.

Baker (AMBS Consulting 2000) proposed a model based on excavation at Mungerie Park (near Caddies Creek). He suggested that three zones of 'archaeological complexity' could be described, namely

- a 'complex zone' of overlapping knapping floors or activity areas and high density artefact concentration due to repeated occupation;
- a 'dispersed zone' where activity areas are more spatially discrete due to either less frequent use or activities occurring away from main camp sites; and
- a 'sparse zone' of consistently low density artefact distribution likely to be resulting from discard events rather than knapping (AMBS Consulting 2000: 53-54).

McDonald reviewed this and other models in the light of excavations along Second Ponds Creek and nearby sites. She suggests that the earliest occupants of the Sydney region focused habitation on the Nepean River and large creek lines such as Shaws Creek, Springwood Creek and Jamisons Creek. As time progressed they gradually moved away from these locations and began to occupy more distant places such as the Rouse Hill area. At this point populations were highly mobile and transported stone material from the Nepean River Gravels. When this was not possible they made do with whatever local stone sources were available. As sea levels rose and then stabilised after 6,000 before present (BP), groups from the coast were forced inland. Population gradually increased and many new occupation sites were inhabited in different regions. People began to focus on local stone sources, in the Rouse Hill region people relied on silcrete. Heat-treating of the stone became more common. It is likely that stone was partially worked or prepared at its source and transported back to habitation camps. Backed artefacts became increasingly common. In the last 1,000 years ground stone becomes more common and it is possible that changes in frequencies of use of different raw materials points to 'more restricted social movement, and contact via exchange networks' (Jo McDonald CHM 2005a).

A recent review of the various occupation models based on the wealth of data in the Rouse Hill Development Area (McDonald and White 2010) produced the following key findings supporting some of the previous models:

- artefact distribution can better be seen as part of a landscape rather than discrete sites as implied by Kohen and others;
- artefact distribution does appear to be related to proximity to water, although this further varies with stream order;

- stream order does seem to be a significant factor in site distribution as suggested by McDonald and Mitchell (1997);
- artefact density does appear to vary significantly with landform (McDonald and Mitchell 1997);
- the orientation of open land surfaces seems to have an influence on the selection of artefact discard locations - with slopes facing north and north-east generally having higher densities;
- distance from known silcrete sources does not seem to have a large influence on artefact density;
- these trends in artefact density and distribution indicate long-term, large scale patterns; and
- social and/or symbolic factors may also have influenced site selection (AECOM 2011; McDonald and White 2010).

It is not certain to what extent this modelling applies to the more southerly parts of the Cumberland Plain, but many of the general findings are likely to hold true.

3.2 LOCAL ARCHAEOLOGICAL CONTEXT

As part of the previous archaeological assessment of the study area (Hardy and Streat 2008), a review was undertaken of archaeological work carried out within the area and in the immediate vicinity. A summary of the previous review updated to include relevant subsequent archaeological assessments is presented here.

Hanrahan (1981) conducted a survey in the Campbelltown Mine Subsidence District and located one open artefact scatter covering an area of 2600 square metres (130m x 20m) along the bank of a creek. This site consisted of five stone artefacts comprising two brown/orange silcrete flakes, one quartz piece, one dark red secrete flake and one red secrete flake. These artefacts were deemed to have "a low priority" and "not considered an obstacle to development" (Hanrahan 1981). The site was subsequently destroyed following receipt of a permit under Section 90 of the *NPW Act*.

McDonald (1990) conducted a survey of a large area in the South Campbelltown Mine Subsidence area in relation to a proposed housing development for Campbelltown City Council. This survey located two open artefact scatters the first on a ridgeline and the second on a creek line. The first site consisted of two red silcrete flakes and covered an area of twelve square metres. Both artefacts had focal platforms but were not retouched. The second site consisted of a total of seven artefacts covering an area of 400 square metres. These artefacts were three red silcrete flakes and two tuff flakes that showed no evidence of retouch. The remaining two artefacts of this assemblage provided some indication of the site's timeframe. The first a geometric microlith (backed blade) made of red silcrete and the other a thumbnail scraper of a similar material both indicative of the Bondaian period. In the absence of a clear development plan no detailed management recommendations were made for this site.

Navin Officer (1992) surveyed two separate corridors for the easement of a proposed gas pipeline running from Appin to Rosemeadow. This survey located six potential archaeological deposits (PAD's) three isolated artefacts, one open artefact scatter, one

rock shelter with deposit and one possible scarred tree. All of the six PADs took the form of rock shelters with deposits however no art or artefacts were visible in any of these shelters. The three isolated artefacts consisted of a red silcrete blade a grey silcrete core and a grey silcrete broken flake. The open scatter covered an area of eighteen square metres and comprised three artefacts. These were two chert cores and a chert flake. The rock shelter contained a chert piece and a red silcrete piece. As the assemblage was small it did not really give any indication as to a timeframe for the sites. The possible scarred tree was located along a creek line. The isolated artefacts and the open scatter were deemed to be of "low or negligible archaeological significance" (Navin Officer 1992). The rock shelter and the possible scarred tree were deemed to be of "moderate archaeological significance" (Navin Officer 1992). No further action was recommended for the isolated artefacts. It was recommended that the six PADs be left intact by slightly altering the route of the gas pipeline, the same recommendation was made for the possible scarred tree. It was recommended that a permit be applied for to destroy the open scatter.

Silcox (1994) conducted a survey in relation to the laying of an optic fibre cable between Narellan and Cobbitty. This survey located a total of three isolated artefacts. The first of these artefacts was a quartz core, the second was an indurated mudstone flake and the third was a quartz bipolar core. Even though these were isolated artefacts the fact that one of these artefacts exhibits bipolar technology and two artefacts are made from quartz this would suggest and they represent the late Bondaian period. The recommendation of this report was that as these three isolated finds were located after the laying of the fibre optic cable, no other construction was due to take place and the sites were of " low archaeological value" (Silcox 1994) that no further action be required.

In 1982 a survey conducted in the area of Curran's Hill and Menangle Park as part of a proposed land release for a housing development located eight open artefact scatters and two isolated artefacts. (Hanrahan 1982). The two isolated artefacts were deemed insignificant and subject to no further action. Of the artefact scatters one was deemed a "major find" (Hanrahan 1982) within the context of the Cumberland Plain and the sites were viewed as a network and were subject to further investigation. All these sites were subject to some spade testing to established the integrity of the potential sub surface deposit (Bonhomme 1986) and of these six were found to either disturbed or of "low archaeological potential" (Haglund 2001) and were subject to, what was then a Section 90 consent to destroy under the *NPW Act*. The remaining two sites which were named Glenlee 2 and Glenlee 5 were subject to extensive test excavation (Haglund 1989). These sites are located to the north of the study site.

Glenlee 2 was the more extensive of the two sites with a high artefact density despite the fact that there had been some site disturbance due to erosion and the construction of a nearby dam. Haglund suggested that the artefact assemblage and the presence of several undisturbed cultural horizons points to the site being occupied for the entirety of the Bondaian period with a particular focus the mid to late Bondaian period. The site was interpreted as a base camp. It contained a large number of cores, implements and debitage found in close association (Haglund 1989). Glenlee 5 had been subject to considerably more erosion due to the dam located to the west of both the sites and as a consequence yielded less substantive information. The site consisted of sparse artefact scatters rather than the areas of high concentration as in Glenlee 2 however it is unclear

if this is a result of disturbance or the original site structure. The recommendations of this report were that Glenlee 2 be preserved due to is "considerable Aboriginal, public and scientific interest" (Haglund 1989) and Glenlee 5 be considered destroyed as a result of previous disturbance and/or natural agencies.

A small test excavation undertaken for a proposed power line at Spring Farm approximately 700-800 metres from the study area recovered ten artefacts from nine test pits located along a transect at the locations of proposed power poles (Navin Officer 2010). The artefacts were chert and quartz. The assemblage was described as 'low density flaking products' with no tools, retouched artefacts or cores. It was determined that due the low density nature of the artefacts in the area the proposed development impacts would be minimal and no further work was recommended (Navin Officer 2010).

An excavation was undertaken of a PAD at Spring Farm approximately 1.5 kilometres northwest of the study area (Jo McDonald CHM 2010). The site had not contained any surface artefacts. The testing involved excavation of 12 test pits along a single transect. Artefacts were recovered from 11 of these. A total of 1,028 'cultural lithics' were recovered during the excavations.

The results of the testing were notable in that they did not support the previously suggested 'distance-decay' element of the overall predictive model for the Cumberland Plain (ie that artefact sizes would be smaller the further away from a stone source).

A number of explanations for this were suggested by the authors

- The distance-decay model, developed using data from the northern Cumberland Plain is not applicable for the southern Cumberland Plain;
- The site was located in proximity to a source of silcrete which archaeologists do not yet know about;
- The distance-decay model is valid but operates on a larger scale and it is possible it swamped variation between individual knapping concentrations; or
- the distance-decay model may not have applied in proximity to an important resource such as the Nepean River as it would have provided such resources that Aboriginal people would have transported quantities of materials to meet their needs regardless of the effort required (Jo McDonald CHM 2010: 59-60).

3.2.1 OEH AHIMS Search Results

An updated search of the AHIMS database was undertaken on the 26/4/2013. It was undertaken via the online map based search option for and covered the following area Latitude, Longitude from: -34.103, 150.7266 to Latitude, Longitude: -34.0651, 150.7867 with a Buffer of 50 metres. The number of sites recorded within that area was 94. It was also discovered that the sites previously recorded as part of the 2008 assessment were not entered on the AHIMS database. These have since been re-submitted and have been entered making a total of 99 sites. The AHIMS search results are included in Appendix 1.

The approximate locations of the registered sites are shown in Figure 3. The location information for sites recorded within the AHIMS is subject to variation in recording

Figure 3: OEH AHIMS sites near the study area

Figure 3 deleted at request of Council

methods. Coordinates provided are often indicative rather than exact. The accuracy of locations cannot always be relied on. The author cannot vouch for the accuracy of the information provided by OEH or other agencies.

3.3 PREVIOUS ASSESSMENTS OF THE STUDY AREA

In 2002, Dibden conducted a survey that covered the entirety of the current study area and some areas in the immediate vicinity as part of assessments for the Glenlee Coal Bed Methane Project (Dibden 2002). One open artefact scatter (52-2-2280 discussed below) was recorded within the current study area. It was noted that the site was in a highly disturbed area of an artificial drainage line and there was no potential for further archaeological deposit.

The previous archaeological assessment for the Glenlee precinct was carried out in 2007-2008 (Hardy and Streat 2008). It covered an area larger than the current study. The assessment included a review of site cards for 12 sites mapped as being within or in close proximity to the study area. This was in order to check the locations and ascertain how many known sites were within the study site boundaries.

Of the 12 sites, five (Sites 52-2-0914, 52-2-0915, 52-2-0916, 52-2-0917 and 52-2-0918) are listed as having been destroyed in accordance with a permit under Section 90 of the *NPW Act*. The remaining sites (Sites 52-2-1887, 52-2-1888, 52-2-2270, 52-2-2272, 52-2-2279, 52-2- 2280 and 52-2-3819) are listed on the AHIMS database as being intact and were reviewed further.

Two of the recorded sites were within the 2007 study boundaries. Site 52-2-2280 is an open artefact scatter on a disturbed drainage line occupying an area of 250 square metres (25 x 10 metres). It consisted of five stone artefacts distributed over this area. These artefacts were: one red/yellow silcrete flaked piece, one white quartz flaked piece, one red silcrete flaked piece with 20% cortex, one yellow silcrete flaked piece and one yellow silcrete flake. These artefacts were all less than 50 mm in length or width and possessed little or no cortex. The re-inspection of the site showed that it had been subject to disturbance as a result of modifications to the drainage line and extensive vegetation clearing. It was noted that much of the topsoil in the area had been removed or substantially modified. It was assessed that there is only a low potential for further artefacts to be present in the area and if present they are likely to have been subject to disturbance (Hardy and Streat 2008). The site falls within the current (2013) study boundaries. Overall the archaeological significance of the site was assessed as low.

A site matching the description of site number 52-2-2270 was relocated in 2007 in the approximate area shown on the site card. The site was assessed as being associated with another site recorded during the 2007 survey: OS1 (52-2-3963). This is discussed further below, and may be on the border of the current study area access corridor.

A total of five sites were recorded as part of the previous study undertaken in November 2007 (Hardy and Streat 2008). Only three of these are within the boundaries of the current study area.

Isolated artefact site Glenlee IF 2 2007 (52-2-3962), one red IMT flaked piece with two flake scars and approximately 40% cortex was recorded on an unsealed access road on a steep slope below the crest of a hill. It is likely that this artefact has been disturbed by erosion and slope wash and is unlikely to be in situ. There is no potential for further

associated deposit in the area as the topsoil has been eroded from the track. Although the site itself was highly disturbed it was assessed that there could be other potential archaeological deposits in the vicinity. It falls outside the current study boundaries.

Five artefacts were recorded as part of site Glenlee OS 3 2007 (52-2-3965). The site was spread over 50-60 metres along a graded access track. The artefacts included one grey silcrete flake two red silcrete flakes, one yellow IMT flaked piece and one red silcrete core with four flake scars and no cortex. The site itself was assessed as being disturbed without further potential for intact deposit. It was noted that there was the possibility of further areas of archaeological potential in the adjacent areas that were not disturbed by the existing road. The site is outside the 2013 study area.

Although the sites detailed above are outside the current study area the presence of these artefacts contributed to the assessment of high archaeological potential for the potion of land to the north of the main study site that includes the proposed access corridor. The following three sites are within or immediately adjacent to the current study area.

Isolated artefact Glenlee IF 1 2007 (52-2-3961) was one white/brown IMT flaked piece with two flake scars and 40 % Cortex). It was located an unsealed access road immediately above a dam, below a significant coal shale dump and adjacent to a drilled gas well, the only natural landform present is the Nepean River some 100 metres to the west. The artefact was in a highly disturbed context with no potential for immediate associated archaeological deposit and is unlikely to be in situ. The site was assessed as having low archaeological significance.

Site Glenlee OS 1 2007 (52-2-3963) is an open artefact scatter of two artefacts believed to include the quartz artefact recorded as NPWS site 52-2-2270. It was located on an unformed track on the crest of a spur. The site comprised one flaked piece of red silcrete with no flake scars and no cortex as well one quartz flake with no flake scars and no cortex. The visibility on the exposure was approximately 40% and the area had been subject to minor disturbance. There is a moderate potential for further archaeological deposit associated with this site. The site was therefore assigned a moderate archaeological significance (this would be subject to further assessment).

Site Glenlee OS 2 2007 (52-2-3964) is an open artefact scatter of three artefacts. The artefacts recorded were one flaked piece of yellow silcrete with four flake scars and 30% cortex along with two grey silcrete flakes. The first of these had no flake scars and no cortex while the second had approximately 20% cortex and no flake scars. There is no potential for associated deposit within the access track area. However it was noted that additional areas of potential archaeological deposit are located in the vicinity. The site's broader area therefore does present opportunities for further research and was assessed as having moderate archaeological significance (pending further investigation).

4.0 ARCHAEOLOGICAL POTENTIAL OF THE STUDY AREA

It should be noted that this assessment pertains to the *archaeological* potential of the study area. It is acknowledged that areas with little or no archaeological potential could still have cultural significance to the Aboriginal community. In general, the Aboriginal consultation for the 2007-2008 assessment supported the archaeological findings.

As part of the previous study (Hardy and Streat 2008), a detailed analysis of the archaeological potential of the study area was undertaken. This was largely based on the level of previous disturbance to the area, the known sites and the results of the site inspection. The study area was divided into five zones to assist with categorising, namely:

- Zone One: Macarthur Resource Recovery Park
- Zone Two: Proposed Link/North Road
- Zone Three: SADA Coal Washery
- Zone Four SADA Coal Washery/Nepean River
- Zone Five: SADA Coal Washery/East

These zones are shown in Figure 4.

Zones One was assessed as having low to nil archaeological potential based on the extent of previous disturbance and lack of intact original landforms. Zone One is no longer within the 2013 study area.

One portion to the northeast of the then study area (Zone Two in Figure 4) was assessed as having high archaeological potential due to the limited disturbance and the presence of known sites. This area has largely been removed from the current study but still includes the proposed Link/North Road corridor (see Figure 1). It was noted that two previous assessments ((Dibden 2002) and (Jo McDonald CHM 1996)) covered Zone Two of the 2007 study area and sites 52-2-2270, 52-2-1887 and 52-2-1888. Sites 52-2-2272, 52-2-2279 and 52-2-3819 are also identified as being within, or in close proximity to, Zone Two. Onsite inspections confirmed that there is a large amount of the original landscape left intact and the zone has a high potential to contain further Aboriginal objects and/or areas of archaeological potential. The disturbance in the area seemed to be limited to several unsealed access roads and gas wells 4 and 5 (part of the Glenlee Coal Bed Methane Project). The Zone was therefore assessed as lightly disturbed with high archaeological potential.

Zone Three is the site of the SADA Coal Washery established in 1952. Activity in this zone included deposition of the waste product of the coal washery (coal shale) along the eastern and southern edges of the study area. This material was dumped to an estimated depth of between 30 and 40 metres covering the entirety of this zone. As a result of the closure of the Burragorang mine in 1981 and developments in technology the dumped waste material was excavated and rewashed between 1982 and 1991 and the subsequent waste material was again dumped over this zone of the study area. After 1992 a third process took place that of the reprocessing of superfine material to be rewashed and again the waste material was dumped over this zone of the study area. In addition to this, a rail line was constructed on the northern edge of the zone resulting in extensive

Figure 4: Assessment Zones from the previous assessment of the area (Hardy and Streat 2008)

excavation and deposition of material. A two-kilometre rail spur to the facility was constructed from the Main Southern Railway and opened in December 1958. The line was electrified as part of the extension of metropolitan railway electrification to Campbelltown in 1968. The use of the coal facility peaked in the 1960s and 1970s but was scaled down from the late 1980s due principally to the closure of the Burragorang Valley mines. Onsite inspections confirmed that there is no original landscape left intact and that Zone Three has no archaeological potential.

Zone Four, located along the western extremity of the study area between the coal washery fill area and the Nepean River, was found to be subject to heavy impact. In order to reduce the potential environmental impact of coal shale dumping on the

Nepean River a small corridor approximately 1200 metres long and between 115 and 175 metres wide was left relatively free of fill. This zone has an unsealed access road constructed through it as well as gas well 8 (part of the Glenlee Coal Bed Methane Project). In addition to this activity a weir was constructed across the river of which remnants are still present. Extensive erosion of the nearby coal shale dump as well as deposition of sand from floods as a result of the weir have added to the impacts. It was assessed that there is very little of the original landscape left intact and the zone has a low archaeological potential. One isolated artefact in a highly disturbed context (52-2-3961) was located in this zone.

Zone Five was assessed in the 2007-2008 study as having low-moderate archaeological potential. This zone is located along the eastern extremity and the southeastern corner of the study site between the coal washery fill area and the southern and eastern borders. This zone has an unsealed access road constructed through it and gas well 9 (part of the Glenlee Coal Bed Methane Project). In addition to this, the area was revegetated during the 1980's which resulted in significant ground disturbance. There has also been extensive deposition of material from the nearby coal shale dump. Dibden's (2002) previous assessment covered this zone of the study area and identified NPWS site 52-2 2280. The potential for intact archaeological deposit at the site was assessed as low due to the level of development in the area. Subsequent onsite inspections (Hardy and Streat 2008) confirmed that there is only a small part of the original landscape remaining and that this has been subject to some disturbance. The recorded site 52-2-2280 does not have potential for in situ sub-surface deposit and is a dispersed scatter on moderately disturbed ground. As noted by Dibden the site is on a modified drainage line. The remainder of the zone is moderately-highly disturbed and therefore would be assessed as having low archaeological potential.

The area was previously categorised as having low-moderate potential rather than universally low, largely because there is an existing site (52-2-2280) recorded there. The site itself does not have potential for in situ sub-surface deposit and is a dispersed scatter on moderately disturbed ground. This was confirmed by both the original site recording and the subsequent site visit by Hardy and Streat. The remainder of the Zone is moderately to highly disturbed. Clarification of the area where further disturbed, dispersed artefacts associated with site 52-2-2280 may be located has been indicated by providing a buffer around the site. The buffer is a conservative one (ie the actual area of potential may be smaller). The remainder of the Zone is assessed as having low archaeological potential (see Figure 5).

4.1 SUMMARY

In summary the majority of the study area was assessed as having nil or low archaeological potential. Only one area of high archaeological potential is recorded along the proposed northern access road portion of the study site. The archaeological potential map, updated to show the 2013 study area is shown in Figure 5.

Four recorded sites are within or adjacent to the study area (52-2-2280, 52-2-3961, 52-2-3963 & 52-2-3964). These would require protection or further testing and/or an AHIP if any disturbance to the sites were required. Appropriate management for each of the sites and the area of archaeological potential is discussed in Section 5.0 below.

Figure 5: Archaeological potential of the study area

Figure 5 deleted at request of Council

5.0 DISCUSSION & RECOMMENDATIONS

This section provides a summary of the results of the assessment and a discussion of the due diligence requirements for the project. It also presents recommendations for ongoing management based on the assessment findings and the legislative context. It does not include input from Aboriginal stakeholders. As the development is at PP stage, options have been provided for management of the sites rather than an assessment of defined impacts.

5.1 DISCUSSION

The study site is within the Cumberland Plain, an area known to contain preserved archaeological sites, predominantly stone artefact scatters. Four sites have been recorded within or adjacent to the study area (52-2-2280, 52-2-3961, 52-2-3963 & 52-2-3964).

The majority of the study site has been assessed as having nil-low archaeological sensitivity. The potential for Aboriginal objects to occur in these areas is low. Therefore, as outlined in the Code of Practice the answer to Step 4 (see Figure 2) is 'no' Aboriginal objects are not likely. There is therefore no need for further archaeological assessment, no AHIP is required, and development can proceed with caution in these areas. These areas are shown in Figure 5.

Two sites have been recorded within the area of low archaeological potential, albeit in disturbed contexts. The sites are protected under the NP&W Act and an AHIP must be obtained prior to their disturbance or removal. It is possible that impacts to these sites could be avoided if they are to be preserved within an open space portion of the broader development. This would be the preferred archaeological option. If appropriate protection measures and ongoing management were to be undertaken during and after construction, the sites could be preserved within the broader development (this is discussed further below). If impacts to these sites cannot be avoided an AHIP would be required. As both sites have been assessed as having low archaeological potential it is recommended that any AHIP application seek salvage (ie removal) of the artefacts with no further archaeological testing.

Site 52-2-3961 is an isolated artefact with no associated area of potential archaeological deposit. If the site is outside the area of direct development impact it should be re-assessed and its location marked for its protection. A protective fence should be placed around the artefact for the duration of works and it should be ensured that the site is sufficiently screened following development to protect it from ongoing impacts. If it is not possible to find the site (eg if natural erosion process have removed the artefact) an updated site card should be submitted to the AHIMS register and OEH should be consulted about an appropriate way to proceed. If the development is likely to directly impact the site an AHIP application would be required including consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a).

Site 52-2-2280 is a small artefact scatter on moderately disturbed ground adjacent to a modified drainage line. A buffer zone around the recorded site has been included (see Figure 5) to identify any areas of potential landforms where surface artefacts could occur. It is not predicted that sub-surface artefacts would occur in this area. The buffer

is very conservative and includes a larger than necessary area. The site has low archaeological significance largely due to the level of disturbance. If the site can be retained within an environmental zone as part of the development it should be re-assessed and its location marked for its protection. A protective fence should be placed around the artefact for the duration of works and it should be ensured that the site is sufficiently screened following development to protect it from ongoing impacts. If the development is likely to directly impact the site an AHIP application would be required including consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a).

The proposed access corridor to the north of the study site is in the area of high archaeological potential (see Figure 5). Requirements for site protection and further work would depend on the extent of development impact. There is an existing unsealed access road in the area and it may be possible to limit much of the development impacts to the areas of existing disturbance. Recorded sites 52-2-3963 and 52-2-3964 are both in close proximity to the existing track and there is some potential for further archaeological deposit in the vicinity of both sites. When the exact extent of the road development is known an archaeological impact assessment would be required in this portion of the study site to determine the best way to manage the recorded sites and any areas of archaeological potential. If it is found that sites or areas of potential are likely to be subject to impact by the development it may be necessary to undertake archaeological testing in accordance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) and/or apply for a AHIP. Consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a) must form part of any additional assessment where test excavation or AHIP application is required.

5.2 RECOMMENDATIONS

On the basis of the findings of the above archaeological assessment and the legislative framework for protecting and assessing Aboriginal archaeological sites in NSW, the following recommendations are provided.

1. All recorded sites within the study area boundaries (see Figure 3) are protected under the NP&W Act and an AHIP must be obtained prior to any disturbance to or removal of the sites.
2. Consultation with Aboriginal stakeholders should be undertaken where decisions relating to the management of Aboriginal cultural heritage are being made.
3. Outside of isolated artefact 52-2-3961 and the buffer area for site 52-2-2280, the area shown as having low archaeological potential (Figure 5) does not require any further archaeological assessment. Development can proceed with caution within this area subject to appropriate management of the two sites (see recommendation 3).
4. Depending on the final development designs, sites 52-2-3961 and 52-2-2280 could be managed by:
    a) Protection during site works (fencing) and ongoing protection such as screening with vegetation etc. OR

b) Application for an AHIP from OEH to salvage the sites.

5. Further impact assessment in the area of high archaeological potential is recommended when development impacts are known. Two sites with associated areas of archaeological potential (52-2-3963 and 52-2-3964) have been recorded within close proximity to the proposed road corridor. Archaeological testing in accordance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) or an application for an AHIP may be required.
6. Consultation with Aboriginal stakeholders according to the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a) must form part of any additional assessment where test excavation or AHIP application is required.
7. If additional impacts outside the area assessed in this study are identified prior to construction, further archaeological assessment may be required.
8. On-site employees or contractors involved in ground surface disturbance should be made aware of the statutory obligations that apply to the discovery of Aboriginal objects.
9. If Aboriginal objects are uncovered during ground surface works, all works must cease and OEH should be contacted to advise on a course of action.
10. In the extremely unlikely event that suspected human remains are found all work must cease, the site should be secured and the NSW Police and should be notified to advise on a course of action. If the remains are found to be archaeological, OEH and the LALC should be contacted to assist in determining appropriate management.
11. A copy of this report should be provided to the OEH AHIMS library.

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APPENDIX 1 – AHIMS SEARCH RESULTS

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 04189 glenlee

Client Service ID : 99080

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-2116	TLC4	AGD	56	294802	6227005	Open site	Valid	Artefact : 6	Open Camp Site	
	Contact	**Recorders**	Annie Nicholson					**Permits**		
52-2-1598	Mengal Park 2;	AGD	56	293470	6225080	Open site	Valid	Artefact : -	Open Camp Site	2038,2149
	Contact	**Recorders**	Doctor.Jo McDonald,Ms.Tessa Corkill					**Permits**		
52-2-0911	Glenlee 1;Mount Annan;	AGD	56	293505	6227553	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	2	
52-2-0913	Glenlee 3;Mount Annan;	AGD	56	293037	6228093	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1	
52-2-0914	Glenlee 4;Mount Annan;	AGD	56	292953	6227725	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267,98692
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1993	
52-2-0915	Glenlee 5;Mount Annan;	AGD	56	292953	6227725	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267,98692
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1993	
52-2-0916	Glenlee 6;Mount Annan;	AGD	56	292409	6227440	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267,98692
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1993	
52-2-0917	Glenlee 7;Mount Annan;	AGD	56	292133	6227526	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267,98692
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1993	
52-2-0918	Glenlee 8;Mount Annan;	AGD	56	292495	6227716	Open site	Valid	Artefact : -	Open Camp Site	393,1193,1677, 98267,98692
	Contact	**Recorders**	Jenny Hanrahan					**Permits**	1993	
52-2-1887	Clutha 1;	AGD	56	292300	6227300	Open site	Valid	Artefact : -	Open Camp Site	3687,98267
	Contact	**Recorders**	Huw Barton					**Permits**		
52-2-1888	Clutha 2;	AGD	56	292000	6227500	Open site	Destroyed	Artefact : -	Open Camp Site	3687,98267
	Contact	**Recorders**	Huw Barton					**Permits**	3455	
52-2-1219	MT.Annan Tunnel.	AGD	56	293920	6227320	Open site	Valid	Artefact : -	Open Camp Site	32
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
52-2-2251	SF-ST-1	AGD	56	290104	6227704	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker					**Permits**		
52-2-2279	Glenlee 1	AGD	56	292842	6227700	Open site	Valid	Artefact : 7		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2280	GL10	AGD	56	292331	6225733	Open site	Valid	Artefact : 5		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2281	GL16	AGD	56	293956	6225876	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Doctor.Julie Dibden,Heritage Concepts					**Permits**		
52-2-3676	MenParkWestPAD	GDA	56	292000	6225200	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Ms.Elizabeth White					**Permits**	3137	
52-2-2269	GL14	AGD	56	293448	6225840	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2270	GL4	AGD	56	292711	6227060	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2271	GL 16-14	AGD	56	293803	6226072	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2272	GL2	AGD	56	292547	6227620	Open site	Valid	Artefact : 16		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2274	GL15	AGD	56	293932	6225688	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2275	GL12	AGD	56	293050	6226340	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2276	GL11	AGD	56	293190	6226000	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-2277	GL18	AGD	56	294961	6226573	Open site	Valid	Artefact : 4		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-3041	CP-OS-12	AGD	56	290750	6224310	Open site	Destroyed	Artefact : 9		
	Contact T Russell	**Recorders**	Doctor.Julie Dibden					**Permits**	2107	
52-2-3042	EMAI-2	AGD	56	290626	6225728	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2148	
52-2-3043	EMAI-3	AGD	56	290589	6225427	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2148	
52-2-3046	Sugarloaf Farm 1	AGD	56	294984	6224049	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2173	
52-2-3047	Sugarloaf Farm 2	AGD	56	295026	6224214	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2173	
52-2-3048	Sugarloaf Farm 4	AGD	56	294954	6224379	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2173	
52-2-3049	Sugarloaf Farm 5	AGD	56	294780	6224847	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2173	

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 04189 glenlee

Client Service ID : 99080

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-3050	Sugarloaf Farm 3	AGD	56	294990	6224323	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden					**Permits**	2173	
52-2-3189	Aboriginal Site	AGD	56	292718	6227537	Open site	Valid	Artefact : 3		
	Contact T Russell	**Recorders**	Doctor.Julie Dibden					**Permits**		
52-2-3196	EM8 - EM6	AGD	56	291054	6224772	Open site	Valid	Artefact : 5		
	Contact T Russell	**Recorders**	Mr.Mark Dibben					**Permits**		
52-2-3057	IF 6	AGD	56	295014	6227116	Open site	Valid	Artefact : 5		
	Contact Searle	**Recorders**	Matthew Kelleher					**Permits**		
52-2-3058	IF 7	AGD	56	294893	6227450	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Australian Museum Business Services (AMBS)					**Permits**		
52-2-3059	UWS 2	AGD	56	295089	6227211	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	Matthew Kelleher					**Permits**		
52-2-3060	UWS 3	AGD	56	294944	6227145	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Australian Museum Business Services (AMBS)					**Permits**		
52-2-3061	UWS 4	AGD	56	295636	6228123	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Matthew Kelleher					**Permits**		
52-2-3062	UWS 5	AGD	56	295279	6227890	Open site	Valid	Artefact : 5		
	Contact Searle	**Recorders**	Matthew Kelleher					**Permits**		
52-2-3316	Mt Annan, Macarthur Sub Station Site - 1	GDA	56	294062	6226305	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3317	Mt Annan, Macarthur Sub Station Site - 2	GDA	56	293667	6226178	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3318	Mt Annan, Macarthur Sub Station Site - 3	GDA	56	293657	6226175	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3319	Mt Annan, Macarthur Sub Station Site - 4	GDA	56	293573	6226020	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3320	Mt Annan, Macarthur Sub Station Site - 5	GDA	56	293580	6226025	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3321	Mt Annan, Macarthur Sub Station Site - 6	GDA	56	294020	6225949	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		
52-2-3322	Mt Annan, Macarthur Sub Station - 7	GDA	56	293946	6225904	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	**Recorders**	Heritage Concepts					**Permits**		

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-3246	CP - ST - 08	AGD	56	290930	6224120	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact T Russell	**Recorders**	Phil Hunt					**Permits**		
52-2-3247	CP - ST - 07	AGD	56	290610	6224390	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Phil Hunt					**Permits**		
52-2-3248	CP - ST - 06	AGD	56	290680	6224330	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3250	CP - OS - 12	AGD	56	290710	6224450	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3256	Gundungurra Reserve OC2	AGD	56	291021	6228114	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	3455	
52-2-3260	Gundungurra Reserve IF1	AGD	56	291307	6228187	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
52-2-3237	CP - OS - 21	AGD	56	290910	6224190	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3238	CP - ST - 20	AGD	56	291400	6226180	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3239	CP - ST - 19	AGD	56	291420	6225920	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3240	CP - ST - 18	AGD	56	291400	6225340	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	**Recorders**	Phil Hunt					**Permits**		
52-2-3261	Gundungurra ISF1	AGD	56	291120	6228175	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists,Biosis Research Pty Ltd Sydney Office					**Permits**	3369,3455	
52-2-3262	ISF3	AGD	56	291103	6228126	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	3455	
52-2-3680	Spring Farm 1: SF1	GDA	56	290576	6227799	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**	3218	

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-3637	MA2 (Campbelltown)	GDA	56	295150	6226387	Open site	Valid	Artefact : 5		101160
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
52-2-3681	Spring Farm 2: SF2	GDA	56	290479	6227810	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
52-2-3682	Spring Farm 3: SF3	GDA	56	290401	6228087	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
52-2-3723	CG-IA-16	GDA	56	294120	6226374	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Renee Regal					**Permits**		
52-2-3752	Spring Farm 6: SF6	GDA	56	291048	6228263	Open site	Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**	3455	
52-2-3753	Spring Farm 7: SF7	GDA	56	291130	6228296	Open site	Destroyed	Artefact : 11		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**	3455	
52-2-3754	Spring Farm 8: SF8	GDA	56	291231	6228340	Open site	Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Kayandel Archaeological Services					**Permits**	3369,3455	
52-2-3756	Spring Farm 10: SF10	GDA	56	291390	6228318	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
52-2-3757	Spring Farm 11: SF11	GDA	56	291550	6228182	Open site	Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Kayandel Archaeological Services					**Permits**	3369,3455	
52-2-3758	Spring Farm 12: SFPAD12	GDA	56	291231	6228289	Open site	Destroyed	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Kayandel Archaeological Services					**Permits**	3369,3455	
52-2-3759	Spring Farm 13: SFPAD13	GDA	56	291550	6228182	Open site	Destroyed	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Kayandel Archaeological Services					**Permits**	3369,3455,3563	
52-2-3741	CG-IA-08	GDA	56	295094	6228196	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3742	CG-IA-09	GDA	56	294892	6227751	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3743	CG-IA-10	GDA	56	294858	6227665	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3744	CG-IA-11	GDA	56	294790	6227496	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3745	CG-IA-12	GDA	56	294656	6227263	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3780	Spring Farm PAD5 SFPAD5	GDA	56	290800	6227750	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -, Artefact : 1000		102013
	Contact	**Recorders**	Jo McDonald Cultural Heritage Management ,Ms.Rachel O'Hara					**Permits**	3258,3324,3455	
52-2-3749	CG-OCS-11	GDA	56	294871	6227709	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Miss.Melanie (Duplicate of #6086) Thomson					**Permits**		
52-2-3805	SFTL 1	GDA	56	291050	6227300	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Kelvin Officer					**Permits**		
52-2-3806	SFTL PAD1	GDA	56	290820	6227500	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Kelvin Officer					**Permits**		
52-2-3807	SFTL PAD2	GDA	56	290801	6227200	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Kelvin Officer					**Permits**	3329	
52-2-3808	SFTL PAD3	GDA	56	291400	6227300	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Kelvin Officer					**Permits**	3329	
52-2-3794	Spring Farm 15: SF15	GDA	56	290650	6228275	Open site	Valid	Artefact : 14		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
52-2-3798	Spring Farm 20: SF20	GDA	56	290564	6228166	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Kayandel Archaeological Services					**Permits**		
52-2-3837	Menangle Park AGL	GDA	56	292942	6225236	Open site	Valid	Artefact : 12, Potential Archaeological Deposit (PAD) : -		

Report generated by AHIMS Web Service on 26/04/2013 for Vanessa Hardy for the following area at Lat, Long From : -34.103, 150.7266 - Lat, Long To : -34.0651, 150.7867 with a Buffer of 50 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 04189 glenlee

Client Service ID : 99080

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Biosis Research Pty Ltd Wollongong Office,Mr.Paul Howard					**Permits**		
52-2-3810	SFMTA01	GDA	56	291679	6228172	Open site	Destroyed	Artefact : 1		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Biosis Research Pty Ltd Sydney Office,Mr.Dor					**Permits**	3369	
52-2-3811	SFMTA02	GDA	56	291468	6228241	Open site	Destroyed	Artefact : 1		
	Contact	**Recorders**	Biosis Research Pty Ltd Sydney Office,Biosis Research Pty Ltd Sydney Office,Mr.Dor					**Permits**	3369	
52-2-3908	MPRP 1 Menangle Park Rezoning Project 1	AGD	56	292945	6225926	Open site	Valid	Artefact : 12		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Enviros ciences),Ms.Norma Richardson					**Permits**		
52-2-3909	MPRP 2 Menangle Park Rezoning Project 2	AGD	56	292556	6225920	Open site	Valid	Artefact : -		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Enviros ciences),Ms.Norma Richardson					**Permits**		
52-2-3915	MPRP 8 Menangle Park Rezoning Project 8	AGD	56	292822	6225013	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Norma Richardson,AECOM-Canberra					**Permits**		
52-2-3917	MPRP 10 Menangle Park Rezoning Project 10	AGD	56	292062	6224608	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Enviros ciences),Ms.Norma Richardson					**Permits**		
52-2-3918	MPRP 11 Menangle Park Rezoning Project 11	AGD	56	292891	6225411	Open site	Valid	Artefact : 3		
	Contact	**Recorders**	Ms.Norma Richardson,AECOM-Canberra					**Permits**		
52-2-3919	MPRP 12 Menangle Park Rezoning Project 12	AGD	56	293700	6225988	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Enviros ciences),Ms.Norma Richardson					**Permits**		

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