



Walka Water Works - Aboriginal Archaeological Assessment

Maitland City Council

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Abbreviations

Abbreviation	Description
AAA	Aboriginal Archaeological Assessment
ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ALR Act	<i>Aboriginal Land Rights Act 1983</i>
ATR	Archaeological Technical Report
CoP	<i>The Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i>
DCP	Development Control Plan
ELA	Eco Logical Australia Pty Ltd
EPI	Environmental Planning Instrument
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
GPS	Global Positioning System
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
MCC	Maitland City Council
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NPW Regulation	<i>National Parks and Wildlife Regulation 2019</i>
NSW	New South Wales
PAD	Potential Archaeological Deposit
SEPP	State Environmental Planning Policies
SHI	State Heritage Inventory
SHR	State Heritage Register
WWW	Walka Water Works

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1. Introduction

1.1. Project background

Eco Logical Australia (ELA) have been engaged by Ramboll Australia, on behalf of Maitland City Council (MCC), to prepare an Aboriginal Archaeological Assessment (AAA) for the Walka Water Works site in Oakhampton Heights, New South Wales (NSW) (hereafter referred to as 'the Project Site'; Figure 1). The AAA will be used to inform master-planning related to the proposed revitalisation of the Walka Water Works into a visitor attraction.

1.2. Project Site

The Project Site comprises of the Walka Water Works, adjacent reservoir and surrounding land at 55 Scobies Lane, Oakhampton Heights NSW. The Project Site is located within Lot 445 DP 722263 in the Maitland Local Government Area (LGA). The Project Site is approximately 2.6 kilometres northwest of Maitland town centre, within the Parish of Gosforth in the County of Northumberland. The Project Site is within the boundaries of the Mindaribba Local Aboriginal Land Council (LALC).

1.3. Purpose and objectives of the archaeological assessment

The purpose of this AAA is to establish whether any known or additional unrecorded Aboriginal objects are present, and to assess the likelihood of archaeological deposits within the Project Site. The assessment will determine whether further archaeological investigations are required.

This assessment documents the archaeological values within the Project Site and has been undertaken in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a).

1.4. Authorship

This assessment has been prepared by ELA Archaeologists Chloe Verman and Charlotte Bradshaw. It was reviewed by ELA Principal Heritage Consultant, Karyn McLeod, ELA Associate Heritage Consultant Dr Gary Marriner, and approved by ELA Principal Environmental Consultant Konrad Grinlaubs.

Chloe Verman and Charlotte Bradshaw both have a BA (Archaeology) from the University of Sydney and Karyn has a BA (Honours in Archaeology) from the University of Sydney and a Master of Cultural Heritage from Deakin University. Dr Gary P. Marriner has a (BA/MA [Archaeology and Anthropology] University of Cambridge, MPhil [Archaeological Research] University of Cambridge, PhD [Archaeology] University of New England, and is a Full Member Australian Association of Consulting Archaeologists Inc. (AACAI).

1.5. Legislative context

NATIONAL PARKS AND WILDLIFE ACT 1974

Aboriginal cultural heritage in NSW is afforded protection under the provisions of the *National Parks and Wildlife Act 1974* (NSW) [NPW Act]. The Act is administered by Heritage NSW, which has responsibilities under the legislation for the proper care, preservation, and protection of 'Aboriginal objects' and 'Aboriginal places'.

Under the provisions of the NPW Act, all Aboriginal objects are protected irrespective of their level of significance or issues of land tenure. Aboriginal objects are defined by the Act as, *any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains)*. Aboriginal objects are limited to physical evidence and may be referred to as 'Aboriginal sites', 'relics' or 'cultural material'. Aboriginal objects can include scarred trees, artefact scatters, middens, rock art and engravings, as well as post-contact sites and activities such as fringe camps and stockyards. Heritage NSW must be notified about the discovery of Aboriginal objects under section 89A of the NPW Act.

Part 5 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to destroy, deface, damage, or move them from the land. *The Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (CoP) (DECCW 2010b) as adopted by the and the National Parks and Wildlife Regulation 2019 (NPW Regulation) made under the NPW Act, provides guidance to individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects. The CoP also determines whether proponents should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP) under section 90 of the Act. The CoP can be used for all activities across all environments. The NPW Act provides that a person 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 unknowingly harm an object without an AHIP. However, if an Aboriginal object is encountered in the course of an activity work must cease and an application should be made for an AHIP.

The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) assists in establishing the requirements for undertaking archaeological investigation without an AHIP or establishing the requirements that must be followed when carrying out archaeological investigation in NSW where an application for an AHIP is likely to be made. Heritage NSW recommends that the requirements of this Code also be followed where a proponent may be uncertain about whether or not their proposed activity may have the potential to harm Aboriginal objects or declared Aboriginal places.

The *Guide to investigating, assessing, and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) sets out the requirements for investigation and assessment of Aboriginal cultural heritage. The assessment is undertaken to explore the harm of a proposed activity on Aboriginal objects and/or declared Aboriginal Places and to clearly set out which impacts are avoidable, and which are not. Harm to significant Aboriginal objects and declared Aboriginal Places should always be avoided wherever possible. Where harm to Aboriginal objects and declared Aboriginal Places cannot be avoided, proposals that reduce the extent and severity of harm to significant Aboriginal objects and declared Aboriginal places should be developed. The Aboriginal cultural heritage assessment will support any application that you may make to Heritage NSW for and AHIP where harm cannot be avoided.

ABORIGINAL LAND RIGHTS ACTS 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) established Aboriginal Land Councils (at State and Local levels). Division 1A outlines the functions of LALCs and their statutory obligation under the ALR Act to:

- (a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and
- (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The Project Site is within the boundary of the Mindaribba LALC.

ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act 1979* (NSW) [EP&A Act] requires that consideration is given to environmental impacts as part of the land use planning process. In NSW, environmental impacts are interpreted as including cultural heritage impact. Proposed activities and development are considered under different parts of the EP&A Act, including:

- Major projects (State Significant Development under Part 4.1 and State Significant Infrastructure under Part 5.1), requiring the approval of the Minister for Planning.
- Minor or routine developments, requiring local council consent, are usually undertaken under Part 4. In limited circumstances, projects may require the Minister's consent.
- Part 5 activities which do not require development consent. These are often infrastructure projects approved by local councils or the State agency undertaking the project.

The EP&A Act also controls the making of environmental planning instruments (EPIs) such as Local Environmental Plans (LEPs) and State Environmental Planning Policies (SEPPs). LEPs and SEPPs commonly identify and have provisions for the protection of local heritage items and heritage conservation areas.

Each LGA is required to develop and maintain an LEP that includes Aboriginal and historical heritage items which are protected under the EP&A Act and the *Heritage Act 1977*. The Project Site is located in the Maitland LGA. One of the aims of the Maitland LEP 2011, Part 5.10, Clause 1 (a) and (d) is to 'to conserve the environmental heritage of Maitland' and 'to conserve Aboriginal objects and Aboriginal places of heritage significance'.



Figure 1: The Project Site

2. Environmental Context

Landscape, geomorphic history, and extent of disturbance within a given area all play a role in the presence and/or preservation of Aboriginal objects. As outlined in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a), this section aims to assist in the prediction of:

- The potential of the landscape to contain Aboriginal objects
- The ways Aboriginal people have used the landscape in the past, with reference to the presence of resource areas, surfaces for art and other focal points which may have been used for particular activities and settlement
- Disturbance, including historical land-use, which may have removed earlier archaeological evidence and
- The likely distribution of the material traces of Aboriginal land use based on the above.

To investigate these elements, this section focuses on the environmental context of the current Project Site, including geomorphology and soils, vegetation, hydrology, and previous land use to identify potential disturbance. The Project Site is located within the Hunter subregion of the Sydney Basin bioregion. A summary of the geology, landforms, soils and vegetation typical within this subregion is provided in Table 1 below:

Table 1: Hunter subregion located within the Project Site (NSW National Parks and Wildlife Service, 2003)

Hunter Subregion	
Geology	A complex of Permian shales, sandstones, conglomerates, volcanics and coal measures. Bounded on the north by the Hunter Thrust fault and on the south by cliffs of Narrabeen Sandstone. Pleistocene coastal barrier system in Newcastle bight.
Characteristic Landforms	Rolling hills, wide valleys, with a meandering river system on a wide flood plain. River terraces are evident, the highest with silicified gravels. Streams can be brackish or saline at low flow. Numerous small swamps in upper catchment, extensive estuarine swamps behind the coastal barrier of beach and dunes.
Typical Soils	A variety of harsh texture contrast soils on slopes and deep sandy loam alluvium on the valley floors. Small number of source bordering dunes on southern tributaries of the Hunter. Deep sands with podsol profiles in dunes on the barrier, saline, organic muds in the estuary. Soil salinity is common on some bedrocks in the upper catchment.
Vegetation	Patches of rainforest brush in the lower valley. Forest and open woodland of white box, forest red gum, narrow-leaved ironbark, grey box, grey gum spotted gum, rough-barked apple and extensive stands of swamp oak in upper reaches and foothills. River oak and river red gum along the streams. Coastal dune vegetation of blackbutt, smooth-barked apple, coast banksias and swamp mahogany. Mangroves, salt marsh and freshwater reed swamps in the estuary.

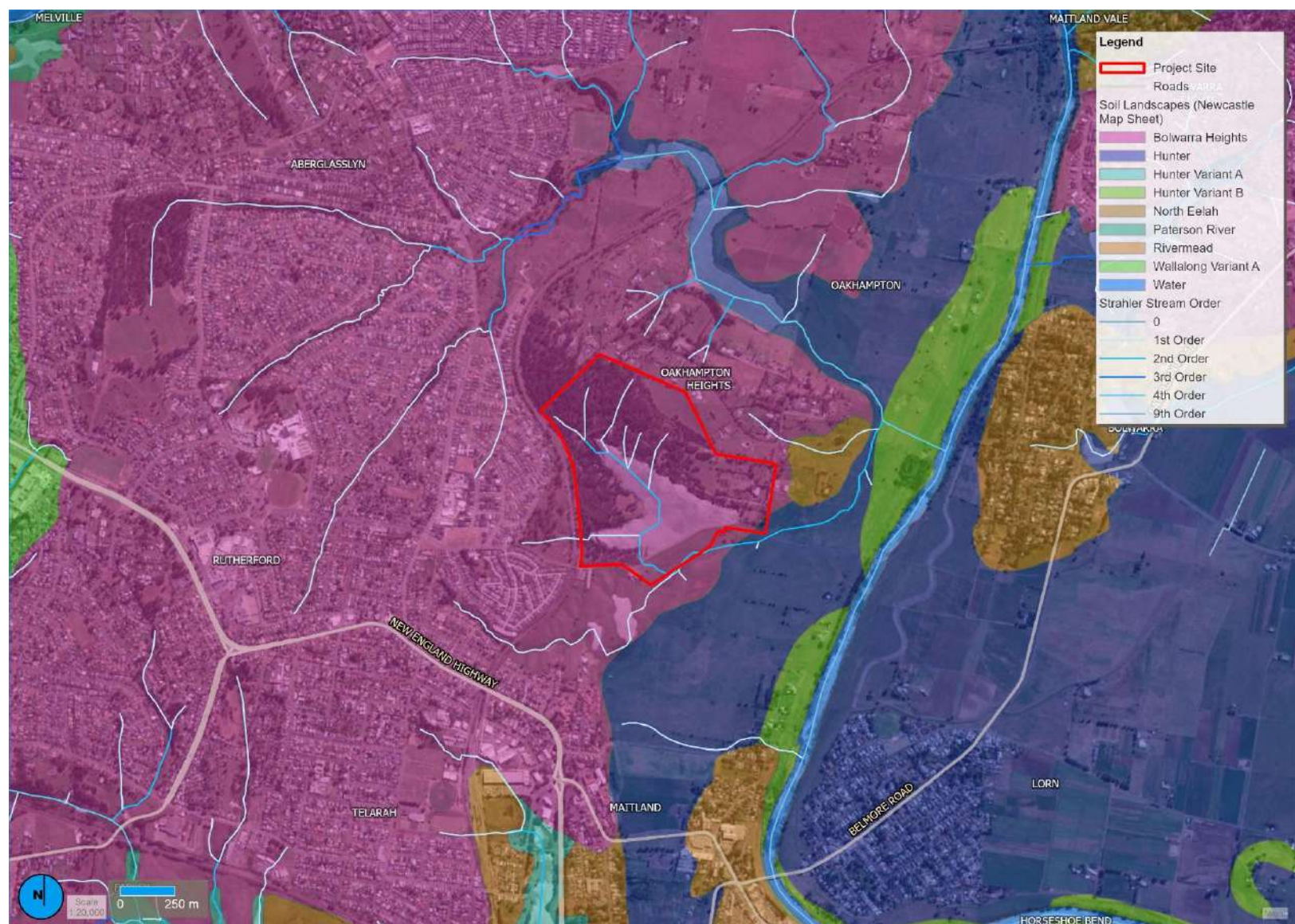


Figure 2: Soil landscapes and hydrology within the Project Site

BOLWARRA HEIGHTS SOIL LANDSCAPE

The Project Site is located within the Bolwarra Heights (bh) soil landscape (Figure 2), which occurs on rolling low hills on Permian sediments in the East Maitland Hills region. The landscape comprises of slopes with an 5-20% incline and an elevation of 100 metres. The underlying geology of the area is characterised by Greta coal measures and the Branxton Formation of the Maitland Group, including sandstone, siltstone, and conglomerate.

Well-drained yellow, brown, and red podzolic soils are located on crests, with moderately deep and yellow soloths on the lower slopes. The Bolwarra Heights soil landscape has four major stratigraphic layers. Soils in the area commonly have a brownish black gravelly loam topsoil (A Horizon), overlaying a darker A2 Horizon comprised of gravelly fine sandy clay loam. Conglomerate pebbles are common in both layers, with a stone line common at the base of the A2 Horizon. The A Horizon is generally between 200 to 500 millimetres thick; however, it may reach up to 600 millimetres on some well drained upper slopes and crests.

The Bolwarra Heights soil landscape is further characterised by moderately reactive subsoils and a strong to very strongly acidic topsoil. The reactivity of subsoils has the potential to disrupt the integrity of archaeological deposits, while a strongly acidic A Horizon severely limits the survivability of organic (shell, bone and wood) Aboriginal artefacts.

HYDROLOGY

The availability of water is one of the most important factors influencing patterns of past Aboriginal land use. The Project Site is 650 metres west of the Hunter River (*Coquun*), one of four major rivers in the Hunter Valley. The natural hydrology has been drastically modified through the construction and operation of the Walka Water Works, primarily through the formalisation of the Walka Reservoir. The Walka Reservoir was created by constructing a large embankment along a narrow point of the pre-existing Walka Lagoon, which extended to the southeast. The Project Site is generally low-lying and situated between the Hunter River to the east and ridgelines to the north and west. Prior to the construction of the embankment, Walka Lagoon was part of a series of lagoons and lakes in the wider area, fed by smaller first and second order creeks. The Lagoon eventually emptied to the Hunter River to the southeast.

VEGETATION

The Upper Hunter Region would have provided a vast range of flora and fauna resources for past Aboriginal groups. The Project Site has been largely cleared for the Walka Water Works and associated reservoir. Vegetation clearing has also occurred throughout the broader area for grazing and residential development. The majority of the remaining vegetation is immature open forest. *Eucalyptus maculata* (spotted gum) is the most dominant species, while *E. fibrosa* (broad-leaved ironbark) and *E. tereticornis* (forest red gums) are also common (New South Wales Department of Planning and Environment, 2024).

LAND USE HISTORY

The land on which the Walka Water Works was constructed, now comprising of the Project Site, was largely owned by Houston Mitchell, and then John Eales, before being resumed by the NSW government in 1881 for the purpose of the construction of the Walka reservoir and associated works. Prior to development, the land had remained largely untouched by its various owners as it is much of the area was too swampy for the crops or orchards. That said, The Scobie family, who leased land on the western side of the Lagoon, had success with orchards in the area, despite their farm being regularly beset with flooding issues. Mitchell acknowledged that the land was used by Aboriginal people prior to his arrival and used their language to name his new estate, writing in his diary:

The Aboriginal name for the hilly part of my grant is Walka and the lake is called Potay. This information I distinctly received from about 50 natives who were seated at their respective fires on the prettiest part of Walka. (Mitchell 1831).

A Maitland Parish map dating from 1912 shows the original shape of Walka Lagoon, prior to the enlargement of the lagoon (see Figure 3). Between 1884 and 1887, there were large scale earthworks to construct the pumphouse and a substantial coffer dam constructed to support the reservoir.

The waterworks began operating in January 1887. By 1913, the pumphouse had been extended, excavation works had been undertaken for the installation of new filter beds, and additional buildings had been constructed on surrounding land to allow the expansion of operations. Historical aerial imagery from 1938 shows the layout of the Walka Water Works and the lagoon (Figure 4). The Walka Waterworks closed in 1945 and served as an electricity generating plant until 1976. The demolition of the electricity generating plant and cut activities associated with the Walka rail line are shown in Figure 4 and Figure 5. Since 1984, the site has been preserved as a recreation and wildlife reserve.



Figure 3: Parish of Maitland map 1912 (HLVR, Parish of Maitland, Historical Parish Maps, Sheet 1 Addition 7)



Figure 4: Historical aerial imagery 1938 (NSW Spatial Services)



Figure 5: Historical aerial imagery 1976 (NSW Spatial Services)



Figure 6: Historical aerial imagery 1993 (NSW Spatial Services)

3. Aboriginal Context

3.1. Ethnohistory

Aboriginal people have continuously occupied Australia for at least 65,000 years (Clarkson et al 2017), utilising the land and available resources, though dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken.

Ethnographic resources attribute the original inhabitants of Maitland to either the Wonnarua or the Awabakal. Tindale's mapping of Aboriginal traditional lands situates the Project Site on the boundary of both Awabakal and Wonnarua lands (Tindale 1974). While the Maitland area is more broadly recognised as the traditional lands of the Wonnarua the proximity of the Project Site to the Awabakal border suggests the area may have been used as a transitional boundary between the two nations. Brayshaw (1987) maps the Project Site within Awabakal lands, the southeastern neighbours of the Wonnarua. Brayshaw suggests that, like the Wonnarua, the Awabakal may have been affiliated with the Kamilaroi nation, who were a dominant cultural influence in the on the southeastern coast of New South Wales.

Today, Aboriginal and Torres Strait Islander people account for 7.5% of the population of Maitland LGA (Australian Bureau of Statistics, 2021). Strong cultural ties to the landscape are maintained through Dreamtime stories. The traditional inhabitants of the Hunter Valley, including the Wonnarua, Awabakal, Worimi, Wiradjuri and other groups, shared Dreamtime stories. The formation of the Hunter Valley is explained in the Dreamtime as being the work of the spirit Baiame. Baiame was the creator of the rivers and hills, and gave the people their laws of life, traditions and culture. This includes the Hunter River, a major river in the Hunter Valley, known as *Coquun* by the Wonnarua peoples. Baiame was believed to return to the earth to work magic or to punish transgressors of marriage rules. The story of the Dreaming is recounted by James Miller:

'The Valley was always there. It was there in the Dreaming, though mountains, trees, animals and people were not yet formed. The river as we know it today was yet to be born. Everything was sleeping. For some unknown reason there was movement. The movement stirred form invisible forces... The spirits interacted, shaping what was nothing into something. They gave life to the whole valley... The land held both human and animal life and was the home of the spirits who were born in the Dreaming' (Miller, 1985).

Aboriginal people in the lower slopes and plains of the Hunter region were hunter-gatherers who would seasonally move from large, semi-permanent camps comprised of complex huts made from grass and tree branches or grass and mud over a frame along riverbanks in the summer, while in the winter months groups would disperse into smaller hearth-groups (AECOM, 2009). Men hunted for food including kangaroos, emus and wallabies and women gathered bush fruits, yams, grubs, and roots (Miller, 1985). Food was often caught with nets in wooded areas, although sections of the landscape were often burnt to create favourable conditions to access game (Miller, 1985).

The material culture of the Lower Hunter region was seemingly dominated by wood and bark materials. Canoes were made from grass tree bark which was softened and shaped through the use of fire and tied with vines at either end. A hearth of clay was sometimes constructed in the centre of the canoe to cook fish. Shields were constructed from both wood and bark and often painted with white and red ochre. Wide shields were used to protect against spears, while narrow shields were used against clubs or "waddies". Waddies were always made from hard wood and were used in both hunting and warfare. Other raw materials, including kangaroo bone for awls, shell for scrapers and possum skin for headbands and cloaks, were widely used in the region. Lithic raw materials within the region are most commonly

mudstone/tuff, though silcrete and chert is also observed in the archaeological assemblages of the Upper Hunter.

3.2. Archaeological context

3.2.1. Database searches

AHIMS Search

The Aboriginal Heritage Information Management System (AHIMS) database is maintained by Heritage NSW and regulated under Section 90Q of the NPW Act. The AHIMS database holds information and records regarding the registered Aboriginal archaeological sites (Aboriginal objects, as defined under the NPW Act) and declared Aboriginal places that exist in NSW.

A search of the AHIMS database was conducted on 26 August 2024 to identify if any registered Aboriginal sites were present within, or adjacent to, the Project Site (Figure 7). This represents the Project Site and 3 kilometres surrounding the Project Site.

Table 2: Search parameters for the AHIMS database search and results

Search Parameters		Search Result	
GDA Zone	56	Aboriginal sites recorded	66
Eastings	361387 - 267387	Aboriginal places declared	1
Northings	6376462 - 6382462		

One site, AHIMS ID 38-4-0120, was not included in the subsequent site analysis as it is listed as 'Not a site'.

The most frequently occurring site features are artefact sites (64.4%), followed by grinding grooves (15.4%). The frequency of site types within the search parameters is shown in Table 3.

Table 3: Frequencies of site types

Site Features	Number	Percentage (%)
Artefact	42	64.6
Artefact, Potential Archaeological Deposit	5	7.7
Burial	1	1.5
Burial, Aboriginal Ceremony and Dreaming	1	1.5
Grinding Groove	10	15.4
Grinding Groove, Potential Archaeological Deposit (PAD)	1	1.5
Modified Tree (Carved or Scarred)	2	3.1
Potential Archaeological Deposit (PAD)	3	4.6
Total	65	100

Four sites have been identified in the Project Site (Figure 8). All four sites are listed as valid, with three recorded by Helen Brayshaw in 1986 and one by Warren Bluff in 1989. The three sites recorded by Brayshaw were recorded during an archaeological survey of the Walka Water Works.

Table 4: Descriptions of sites located within the Project Site

AHIMS ID	Site Name	Site Type	Description
38-4-0142	WW2	Artefact scatter	This site was recorded by H. Brayshaw in 1988 during an archaeological survey of the Walka Waterworks Reserve. The site condition was listed as disturbed and was located one metre north of the railway embankment, close to the cutting. The site comprised of two silcrete flakes, both with distal modifications and one indurated mudstone pebble.
38-4-0143	WW1	Artefact scatter	This site was recorded by H. Brayshaw in 1988 during an archaeological survey of the Walka Waterworks Reserve. The site condition was recorded as disturbed, likely as a result of the railway construction. WW1 was located within the southern portion of the disused railway cutting. The site is comprised of two unmodified silcrete flakes, both located within a ground exposure of reddish clay. Silcrete and quartz pieces were observed in the area, with much of the silcrete appearing heat treated.
38-4-0144	WW3	Grinding groove	This site was recorded by H. Brayshaw in 1988 during an archaeological survey of the Walka Waterworks Reserve. The site was recorded within a disturbed context near the northern boundary of the Walka Waterworks lot boundary along a ridge line. The site comprises of one grinding groove adjacent to a slight depression in the rock shelf, capable of holding water immediately after rain. The groove is 16cm in length; this was noted by Brayshaw as considerably shorter than the average groove length of 25-30 centimetres.
38-4-0155	Walka	Grinding groove	This site was recorded by W. T. Bluff for unknown reasons in 1989. Site card references AHIMS ID 38-4-142 and notes, "grinding grooves supposed to be on site". No further site location or description is given. This site card is likely a duplicate of the grinding groove site AHIMS 38-4-0144 'WW2'.

Local, State and National Heritage Registers

Searches of the Australian Heritage Database, the State Heritage Inventory (SHI) and the Maitland Local Environmental Plan (LEP) 2011 were conducted on 26 August 2024 in order to determine if any places of archaeological significance are located within the Project Site.

No Aboriginal archaeological sites were recorded on these databases within the Project Site.

The Project Site is a listed heritage item of state and local significance, 'Walka Water Works' (SHR no. 00466) (Maitland LEP item no. I222). The State Heritage Register (SHR) listing notes that the site may have some evidence of Aboriginal occupation.



Figure 7: AHIMS sites within vicinity of the Project Site



Figure 8: Listed AHIMS sites within or close proximity of Project Site

3.2.2. Regional Archaeological Context

Several surveys and Aboriginal archaeological investigations have been undertaken across the wider Lower Hunter region over the past 15 years in relation to coal mining and residential developments. A summary of some key reports is provided below:

RPS, 2013. ARCHAEOLOGICAL EXCAVATION AND SURFACE COLLECTION AT FARLEY UNDER AHIP #1131144. PREPARED FOR HUNTER WATER CORPORATION.

RPS was engaged by Hunter Water Corporation to conduct salvage works of seven registered AHIMS sites prior to the construction of a new pipeline at the Farley Wastewater Treatment Works, three kilometres southwest of the Project Site. Following the identification of ten new Aboriginal sites during initial pedestrian surveys in 2010 and 2011, AHIP 1131144 was issued for the surface collection of eight of the ten sites and for excavation of areas identified in the AHIP.

A test excavation program was undertaken between 2011 and 2012 under AHIP 1131144. Seventy-two pits were excavated, and 4,364 artefacts were recovered. Two distinct concentrations were identified, Stony Creek Bank (SCB) and Wentworth Swamp Elevated Area (WSEA). These areas were registered as PADs and were partially salvaged. The assemblages at SCB and WSEA contained a wide variety of artefact types, including Bondi points, scrapers, and backed artefacts. The high proportion of backed artefacts was seen to suggest specialised production of scrapers and backed artefacts occurred in the area. Use wear analysis further showed skin and hide working were also taking place. The raw materials used also varied greatly. While silcrete was the most dominant material, mudstone, tuff, quartz, quartzite, chalcedony, jasper, chert, petrified wood and basalt were also present. The occupation area at Farley was seen as a base camp and a transition camp, containing both tertiary and secondary tool reduction.

RPS concluded the site supports the swamp/riparian model proposed for the region that swamp margins were commonly used as base camps and riparian corridors as transit camps.

1995, BRAYSHAW. BOLWARRA HEIGHTS ARCHAEOLOGICAL SURVEY. PREPARED FOR MAITLAND CITY COUNCIL.

Brayshaw was engaged by Lester Firth Associates, who were preparing a Local Environmental Plan for Landcom (previously the New South Wales Land Commission) and MCC. Brayshaw surveyed an area approximately 120 hectares and identified one open site and one possible scarred tree. Two surveys were conducted, the second to account for changes in requirements by the National Parks and Wildlife Service in archaeological procedures.

The survey identified two new open camp sites in the study area. A tree recorded in 1984 as a possible scarred tree was re-examined and the scar was assessed as natural and as not being culturally modified.

MCCARDLE CULTURAL HERITAGE PTY LTD, 2011. PROPOSED ROSEBROOK SAND AND GRAVEL EXTENSION AT MAITLAND VALE: INDIGENOUS ARCHAEOLOGICAL ASSESSMENT. PREPARED FOR ADW JOHNSON PTY LTD.

McCardle Heritage carried out an Aboriginal archaeological assessment of the proposed sand and gravel extension at Maitland Vale for ADW Johnson Pty Ltd. The proposed extension was located 2.2 kilometres north of the Project Site, on the opposing bank of the Hunter River. Both a desktop assessment and a pedestrian survey of the study area were undertaken to assess the Aboriginal archaeological potential of the area. The study area was divided into four survey units, the pedestrian survey identified no sites within any of the study areas. The effective coverage was considered low across the entire study area. Dense grass cover was the main factor limiting visibility. One PAD was identified along the Hunter River due to the sensitivity of the landform. The PAD is situated within a sloping landform adjacent to the Hunter River,

with a total width of 100 metres and an approximate length of 750 metres along the river. Test excavations were recommended prior to any further works at the PAD.

3.2.3. Local Archaeological Context

AMAC, 2023. OAKHAMPTON HEIGHTS FLOOD ACCESS ROUTE ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT. PREPARED FOR MAITLAND CITY COUNCIL.

AMAC was engaged by MCC to prepare an Aboriginal Cultural Heritage Assessment for flood access works south of Scobies Lane and South Willards Lane in Oakhampton Heights NSW. The report assessed an area immediately east of the Project Site at Walka Water Works. This Assessment followed on from a Due Diligence report, also undertaken by AMAC in March 2023, which recommended further assessments be conducted to investigate the potential for Aboriginal objects.

A test excavation program occurred over three days. Twenty trenches were dug, however two were abandoned due to the presence of service pipes. The soil was consistent with the Bolwarra Heights (bh) soil landscape. All areas excavated showed evidence of fill below a modified A Horizon topsoil. Areas associated with greater development, such as in proximity to a former residence, showed greater evidence of significant surface disturbances. An A2 Horizon was absent across all trenches. In areas of agricultural disturbance, a compacted A Horizon followed by a clay B Horizon was common.

In total, 19 artefacts were identified during the test excavation program. The artefacts comprised of flakes or broken flakes. Silcrete accounted for 79% of the assemblage, while Merewether Chert and Nobby's tuff accounted for 16% and 5% respectively. AMAC noted the finds were consistent with local and regional open camp site assemblages.

The archaeological significance of the site was assessed as low to moderate. This was due to the low density and consistency of the assemblage with the broader archaeological record. The site was further recorded as significantly disturbed, due to regular inundation of the area by flooding events associated with the Hunter River.

1986, BRAYSHAW. WALKA WATER WORKS RESERVE ABORIGINAL ARCHAEOLOGICAL SURVEY. PREPARED FOR TRESEV ON BEHALF OF WALKA WATERWORKS TRUST.

Brayshaw conducted a survey of the Walka Water Works reserve, located in the northern portion of the Project Site. Brayshaw conducted a pedestrian survey of the vegetated area in the north of the Walka Water Works pumphouse and identified one grinding groove site and two small artefact scatters. All three sites were registered on AHIMS as AHIMS ID 38-4-0142, 38-4-0143 and 38-4-0144. One grinding groove (AHIMS ID 38-4-0144) was located on a small sandstone exposure on a crest near a pond of water. The sandstone exposure was situated along a ridge, which runs along the northwestern boundary, channelling drainage into the Walka lagoon. Two small artefact scatters were identified along a railway cutting within a disturbed context (AHIMS ID 38-4-0142 and 38-4-0143). Silcrete artefacts were present at both locations, and one flaked pebble of indurated mudstone was identified within the assemblage. Quartz and silcrete debitage from the underlying bedrock was present, with further evidence of heat fracture, from either sun or fire.

STREAT ARCHAEOLOGICAL, 2009. PRELIMINARY ABORIGINAL ARCHAEOLOGICAL ASSESSMENT WALKA WATERWORKS, SCOBIES LANE, OAKHAMPTON. PREPARED FOR MAITLAND CITY COUNCIL.

Streat Archaeological was engaged by MCC to prepare a preliminary Aboriginal archaeological assessment for a proposed amenities block within the Walka Water Works. The site of the proposed development is within the Project Site. The preliminary study consisted of a desktop assessment of the Project Site.

The results found that the most likely site types expected within vicinity of Walka Water Works are open artefact scatters and isolated artefacts. Both site types are likely to be visible when ground cover is low, and erosion is occurring. Stone tool typology is likely to date from the middle to late Bondian Period, with likely presence of silcrete, quartz, quartzite, indurated mudstone, tuff and chert. PADs are also likely to occur in the area, especially when the soil profile remains intact. Rock shelters with art and engraved rock art sites are not common in the area, as the geology of the landscape is unlikely to contain sandstone overhangs. However, grinding grooves are possible on suitable outcrops.

4. Regional character and predictive model

4.1. Regional character

Previous archaeological assessments across the Hunter Valley provide important data on Aboriginal archaeological site distribution and typology from which an understanding of the archaeological landscape within the Project Site can be developed.

Aboriginal people have continuously occupied Australia for at least 65,000 years, utilising the land and available resources. Dates of earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. Aboriginal people have occupied the Upper Hunter region for at least 20,000 years (Brayshaw 1987), with a reported date of >20,000 years from a hearth at Glennies Creek (Koettig, 1987), located approximately 47 km to the north-west of the Project Site, though the majority of dated Aboriginal archaeological sites in the Hunter Valley are less than 4,000 years of age (Kuskie & Clarke 2004).

A review of archaeological investigations undertaken within the vicinity of the Project Site have found the most commonly occurring site types are isolated artefacts and low-density stone artefacts. These sites are primarily located adjacent to waterways and within the floodplains and gently inclining hills within vicinity of primary waterways, such as *Coquun* (now known as the Hunter River) (McCardle 2011). Open artefact scatters and isolated finds are the most common site types recorded throughout the Hunter Valley (McCardle 2011, ERM 2008). Both site types are commonly exposed by erosional and agricultural processes. Archaeological subsurface testing across the region has identified silcrete as the most commonly exploited raw material (RPS 2013, ERM 2008). Mudstone and tuff have also been noted in significant quantities across identified assemblages (RPS 2013). Other site types common in the region are grinding grooves and culturally modified trees. Grinding grooves are often associated with waterways, while modified trees may be possible wherever old growth trees remain.

Previous studies have further supported a swamp/riparian occupation model across the Lower Hunter region. This model suggests that swamp margins were commonly used as base camps, while sites along riparian corridors are more likely to be transit camps. This suggests that riparian landforms, such as creek terraces and gently undulating hills adjacent to waterways, as well as the margins of swamp systems, are sensitive landforms for Aboriginal cultural heritage.

High levels of disturbance across the region related to natural creek meandering, erosional processes and human activities, such as the growth of the Maitland city and suburbs, agricultural activities and mining, have damaged and disturbed many sites across the region. The redirection of the Hunter River near Maitland city centre and Oakhampton has further impacted the integrity of many sensitive landforms. All these forms of disturbance have limited the potential for intact subsurface deposits and indicate that Aboriginal objects are unlikely to be located in areas of high disturbance.

4.2. Predictive model

Predictive models are a commonly utilised tool in the planning and management of Aboriginal cultural heritage. These models aim to identify specific landforms and places within the landscape which may contain archaeological material. They usually begin as geographically broad models, constructed through extensive reviews of the available literature to determine basic patterns of site distribution, before being refined according to specific landforms and the environmental characteristics of a Project Site.

Predictive models are primarily based upon a cultural ecological perspective of the landscape. This is because landforms and environmental characteristics provided a distinct set of subsistence constraints which meant the landscape could only be occupied in particular ways in order to minimise distance to portable water, maximise biodiversity, and provide shelter from the elements. As such, land use patterns are expected to vary between environmental zones due to differing constraints, a difference that manifests in varying spatial distributions of archaeological material. Social factors may have also influenced communities to venture through or avoid certain landscapes, regardless of environmental conditions, which is why we must consult with local Aboriginal knowledge holders and community members to understand to understand the cultural context of certain landscapes.

4.2.1. Site types

There are several common Aboriginal cultural heritage site types that may be found in the Project Site.

Open camp sites / stone artefact scatters represent past Aboriginal subsistence and stone knapping activities and may include archaeological remains such as stone artefacts and hearths. This site type usually appears as surface artefact scatters in areas where vegetation is limited, and ground surface visibility is high. They are also often exposed by erosion, agricultural events (such as ploughing), and the creation of informal, unsealed vehicle access tracks and walking paths. Open campsites are often located on dry, relatively flat land along or adjacent to rivers and creeks. Sites that contain surface or subsurface deposits resulting from repeated or continuous occupation are more likely to occur on elevated ground near permanent, reliable water sources. Flat, open areas associated with creeks and their resource-rich environments would have offered ideal camping areas to the Aboriginal inhabitants of the local area.

Isolated artefacts may represent a single item discard event or the result of limited stone knapping activity. The identification of isolated artefacts may indicate the presence of a more extensive, subsurface *in situ* archaeological deposit, or a larger deposit obscured by low ground visibility. Isolated artefacts are likely to be located on landforms associated with a range of activities, such as ridge lines that would have provided ease of movement through the area and level areas with access to a water source. Artefact scatters and isolated artefacts are the most common site types found in association with fresh water and/or food resource gathering areas.

Potential Archaeological Deposit (PAD) are areas where there is no surface expression of stone artefacts, but, due to a landscape feature or isolated artefact, there is a strong likelihood that the area will contain subsurface *in situ* archaeological deposits. Landscape features that may indicate a PAD include proximity to reliable water sources, particularly terraces and flats, ridge lines and ridge tops, and sand dune systems.

Culturally modified trees exhibit evidence of the deliberate removal of the *periderm* (outer bark), *phloem* (inner bark), and, in some cases, the sapwood. These materials can be used to manufacture a variety of items, including shields, Coolamon (bowls or trays), watercraft, containers, and a range of wooden tools and implements. Trees may also have been scarred in order to gain access to food resources (such as cutting toeholds so as to climb the tree and catch possums or birds) or to mark locations (such as tribal territories). In some instances, Aboriginal people marked important features or locations (such as ceremonial grounds) by carving patterns or motifs into the sapwood of established trees or bending and grafting the branches of saplings to create rings.

Grinding grooves are the physical evidence of tool making or food processing activities undertaken by Aboriginal people. The manual rubbing of stones against other stones creates grooves in the rock; these are usually found on flat areas of abrasive rock such as sandstone in close proximity to water courses.

Bora grounds / ceremonial sites are locations that have spiritual or ceremonial values to Aboriginal people. Such sites may comprise natural or altered landforms and, in some cases, will also contain archaeological material. For example, bora grounds are a ceremonial site type usually consisting of a cleared area around one or more raised earth circles connected by a pathway. Bora grounds are often accompanied by ground drawings or mouldings of people, animals or deities, or geometrically carved designs on the surrounding trees.

Burials often took place in proximity to camp sites, as most people tended to die in or close to camp and it is difficult to move a body over a long distance. Soft, sandy soils on or close to rivers and creeks allowed for easier removal of earth for burial. Similarly, rock shelters or middens also provided accessible burial places. Burial sites may be marked by stone cairns, modified trees, or a natural landmark. They may also be identified through historic records or oral histories.

Contact / historical sites can include a wide variety of sites and may be identified through artefactual evidence or oral histories. Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics or may have social significance regarding the interaction between Aboriginal people and European settlers.

4.2.2. Site occurrence

Based on the results from the landscape assessment, searches of the AHIMS database and examination of the regional and local Aboriginal archaeological context, the below predictive model (Table 5) has been designed for the Project Site.

Table 5: Predictive Model

Site Type	Description	Likelihood of occurrence
Open camp sites / stone artefact scatters / isolated finds	Artefact scatters and isolated artefacts are the most common site types found in association with fresh water, and/or food resource gathering areas. Artefact scatters and isolated finds are reported to be the most common archaeological site type in the vicinity of the Project Site, occurring within close proximity to water sources and in undisturbed contexts. Two stone artefact scatter sites have been previously recorded within the Project Site, and several artefact sites have been recorded in proximity to the Project Site indicating this is likely to occur.	High
Potential Archaeological Deposits	Two artefact scatters and grinding grooves are recorded in the Project Site, and several artefact sites have been recorded in proximity to the Project Site indicating areas of archaeological potential are likely to occur in areas that have not been disturbed, in proximity to water sources.	Moderate
Culturally modified trees	Culturally modified trees may be present wherever tree specimens of an appropriate age are present. No scarred trees have been recorded within the Project Site, and the Project Site has largely been cleared of native vegetation indicating this is unlikely to occur.	Low
Axe grinding grooves	Grinding grooves have been recorded in the Project Site. There are also potential sandstone outcroppings in the northern section of the Project Site. This area has undergone a low to moderate degree of historical disturbance associated with vegetation clearance. there is moderate likelihood of grinding grooves occurring in the area.	Moderate
Bora grounds / ceremonial sites	There are no reported bora/ceremonial sites within the vicinity of the Project Site.	Low

Site Type	Description	Likelihood of occurrence
Burials	There is one recorded burial site in proximity to the Project Site, located within a similar estuary nearby the Hunter River. The Project Site is not located within a sand dune system; however, it is within 200m of a major water source. Burials are unlikely due to the degree of subsurface impacts in the Project Site associated with the various phases of construction of the Walka Water Works and the railway line.	Low
Contact / historical sites	Contact sites may occur in any area where Aboriginal people encountered early European settlers, however there is no evidence to suggest this has occur within the Project Site.	Low

5. Archaeological survey

5.1. Purpose

The purpose of the survey was to assess the current condition of the site and to identify any unrecorded Aboriginal sites or objects. Areas of subsurface archaeological potential identified in the desktop assessment were also inspected and potential areas for archaeological testing were considered.

5.2. Survey strategy

Archaeological survey of the Project Site was conducted on foot, in accordance with the Code of Practice. The overall strategy was to complete a full coverage survey, as the exact locations of the impacts are not yet known. A handheld Global Positioning System (GPS) was used to track the survey area covered and record the location of key features (disturbances, areas of archaeological sensitivity/potential). The coordinate system projection used for all site recording was GDA94 MGA 56.

The field survey methodology was as follows:

- Record the landform, general soil information, surface conditions and vegetation conditions encountered during the survey and how these impact on the visibility of objects
- Define the boundaries of any Aboriginal sites and areas of PAD based on landmarks and historical maps
- Reinspect previously identified Aboriginal sites and areas of archaeological potential within the Project Site
- Identify areas of disturbance which may have impacted the presence of intact soils and archaeological features
- Consultation with Aboriginal representatives to discuss the potential intangible cultural heritage values of the Project Site
- Collect information to ascertain whether further archaeological investigation is required.

All ground exposures were examined for Aboriginal objects (stone artefacts, imported shell, or other traces of Aboriginal occupation and old growth trees were examined for signs of cultural scarring and marking.

A photographic record was kept during the survey. Photographs were taken to record aspects of survey units including vegetation and disturbance. Scales were used for photographs where appropriate.

5.2.1. Site definition and recording

An Aboriginal site is generally defined as an Aboriginal object or place. An Aboriginal object is the material evidence of Aboriginal land use, such as stone tools, scarred trees, or rock art. Some sites, or Aboriginal places can also be intangible and although they might not be visible, these places have cultural significance to Aboriginal people.

The Heritage NSW *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) guidelines state, in regard to site definition, that one or more of the following criteria must be used when recording material traces of Aboriginal land use:

- The spatial extent of the visible objects, or direct evidence of their location.
- Obvious physical boundaries where present, e.g., mound site and middens (if visibility is good), a ceremonial ground.

- Identification by the Aboriginal community on the basis of cultural information.

For this study an Aboriginal site would be defined by recording the spatial extent of visible traces or the direct evidence of their location.

5.2.2. Protocol for recording Potential Archaeological Deposits

Where areas of PAD are identified towards the margins of each survey unit, efforts must be made by the survey team to delineate each area of potential beyond the survey unit. Where the extent of the PAD extends beyond the survey unit, efforts must be made to map the extent of that feature up to approximately 70 metres outside the survey unit. If it is likely that these PADs continue beyond that point, the survey team must justify that the distance is adequate to provide an accurate representation of the PAD with regard to future planning and design for the project.

5.3. Survey results

The field survey was conducted on 10 October 2024 by ELA Archaeologists Dr Gary Marriner and Charlotte Bradshaw and Mindaribba LALC Senior Culture and Heritage Officer Jason Brown.

The Project Site was divided into four (4) survey units according to landform (Figure 9). The results of the archaeological survey is shown in Figure 43.

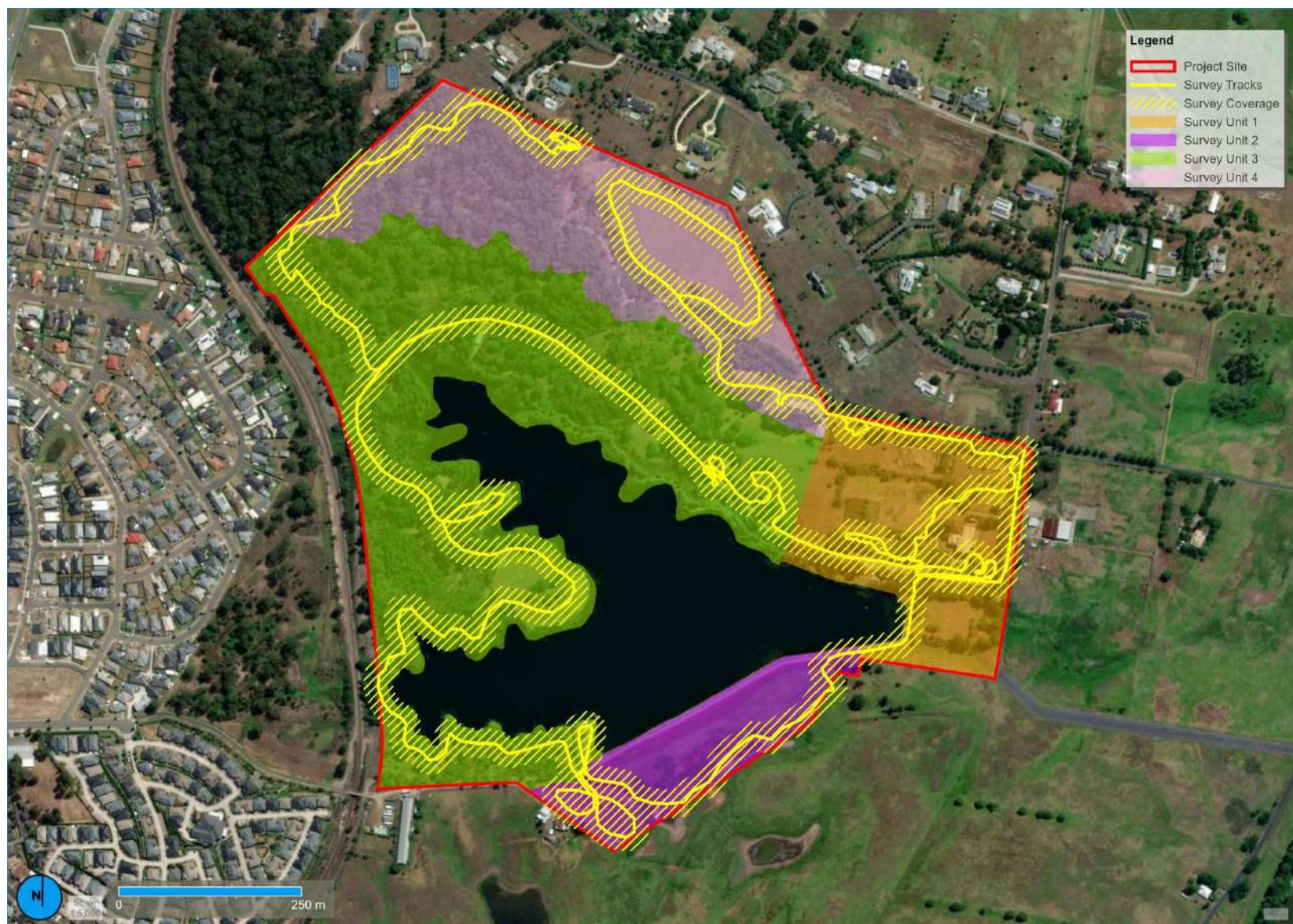


Figure 9: Survey coverage and survey units

SURVEY UNIT 1

Survey Unit 1 (SU1) is located in the eastern portion of the Project Site across a relatively flat landform which has been heavily modified and disturbed for the construction of the water works and associated infrastructure. SU1 is transected east-west by the main access road and contains multiple structures associated with the water works, including the main pumphouse (Figure 10), seven filter beds, a settling tank and clean water tank (Figure 14; Figure 15). Immediately south of the main access road there is a sealed walking trail which runs along the perimeter of the reservoir (Figure 13). There are steep undulations across SU1 due to land modifications, including battering works surrounding the pumphouse and tanks (Figure 11; Figure 14).

The location of AHIMS ID 38-4-0155 was thoroughly inspected for any evidence of grinding grooves or bedrock exposures, although none were identified (Figure 12). The location of the site is within the vicinity of the pumphouse which has been historically levelled multiple times. A portion of SU1, located immediately south of the access road, was not accessible due to asbestos contamination, however, was observed at a distance, showing low surface visibility and a levelled landform. SU1 has been entirely cleared of the original vegetation and consists of landscaped plantings and no mature growth native trees.

Overall, SU1 has been highly disturbed through the construction and use of the waterworks and associated infrastructure. The original landform has been highly modified through the construction of the pumphouse, reservoir, in-ground tanks, pipes and basins. The surface visibility was low due to grass coverage (10%), with discrete areas of surface visibility revealing mixed deposits and fill. No exposures were identified. The likelihood of intact archaeological deposits within SU1 is very low to nil.



Figure 10: View north-west, showing the pumphouse and public recreation facilities



Figure 11: View north from the main access road, showing landscaping and battering surrounding the western portion of the pumphouse



Figure 12: Location of AHIMS ID 38-4-0155



Figure 13: View south within walking trail on perimeter of reservoir



Figure 14: View west next to filter bed, showing battering



Figure 15: View south, showing overall view of tanks, beds and basin located west of the pumphouse

SURVEY UNIT 2

Survey Unit 2 (SU2) is located on a moderate to steep north-south sloping landform. SU2 is located immediately south of the reservoir and is transected by the walking trail along the north boundary (Figure 16). In its existing and historic land use, SU2 is utilised as pastoral land for grazing cattle.

SU2 is low-lying and at the time of visiting was boggy and water-logged in areas. The area surrounding the reservoir has been extensively built up (Figure 17; Figure 20). The western portion of SU2 is transected north-south by the reservoir spillway, which has been built into the landform and battered along the perimeters (Figure 19; Figure 23). SU2 has been entirely cleared of vegetation and there are few trees within SU2. Immediately south of the original engineer's cottage, a macadamia tree has been planted (Figure 21). There are no mature growth native trees in SU2.

Surface visibility was low due to grass coverage but was present within exposures which were identified within the cuts for the spillway and surrounding a livestock pen (Figure 18; Figure 22). The exposures showed homogenous brown clay loam and layers of gravel fill. No intact deposits were identified within the exposures and were indicative of deep ground disturbance.

Overall, SU2 has undergone localised high ground disturbance within and surrounding the spillway and reservoir. The low-lying areas have undergone moderate disturbance associated with vegetation clearance, grazing and damming. No Aboriginal objects were identified within SU2. The likelihood for intact archaeological deposits is considered to be low.



Figure 16: View west, showing the overall sloping landform



Figure 17: View north, showing the north-south sloping landform towards the reservoir



Figure 18: Exposure identified near the spillway, showing homogenous brown clay loam, with a pocket of gravel fill



Figure 19: View north, showing the brickwork reservoir spillway



Figure 20: View east, showing the sloping landform and the built up landform surrounding the reservoir



Figure 21: View south, near the footings of the engineers cottage with macadamia tree



Figure 22: Exposure near livestock pen, showing mixed loamy clay deposits



Figure 23: View south, from the top of the spillway

SURVEY UNIT 3

Survey Unit 3 (SU3) is located on a gently to moderately sloping landform, sloping west-east and north-south towards the reservoir. SU3 is connected by a walking trail which runs along the perimeter of the reservoir. There are other ancillary walking tracks which lead off from this track. SU3 has historically been cleared of vegetation although is populated by sparse to dense regrown bushland. Areas of this trail have been cut and levelled on the slope, resulting in the removal and/or displacement of the upper deposits. This part of the trail runs along an old railway line built in the 1950s.

Various structures associated with public recreation have been installed along the trail in SU3, including a jetty, viewing platforms, picnic tables and other park furniture. Some drainage works have been undertaken, including drainage culverts which run below the track and into the reservoir. Surface visibility was present within the unsealed walking trail, showing brown loam mixed with blue gravel. The overall surface visibility was low (10%) and no exposures were identified.

AHIMS ID 38-4-0143 was re-identified. The site consists of a small, discrete scatter which extends along the south and north corridors of the walking trail. An exact artefact count was not taken, and many artefacts were embedded in the ground surface. Silcrete was the most commonly observed lithic raw material in the surface scatter, predominately red silcrete with some grey and yellow silcrete identified, as well as a grey quartzite artefact.

The artefacts are located in a disturbed context, as the walking trail has been formed by levelling the sloping landform, and the original upper deposit has been displaced and re-deposited along the south side of the trail. Further artefacts are eroding from the north side of the track where it slopes up to a flat, cleared area. There is potential for intact archaeological deposits further up slope.

AHIMS ID 38-4-0142 was also inspected and three silcrete artefacts were identified eroding from the slope north of the walking trail, in a disturbed context. They are likely eroding from the area immediately north, which is relatively flat and elevated above the reservoir.

Overall, SU3 has undergone low to moderate disturbance, associated with extensive tree clearance, with localised areas of high disturbance associated with the construction of the reservoir, construction of the old railway line and more recent track formation work and public recreation facilities. The Aboriginal objects identified have all been located within disturbed contexts due to cutting and levelling. Areas with potential for archaeological deposits were identified associated with low disturbance, in close proximity to the artefact surface expressions and approximately 200 m from the original creek alignment.



Figure 24: View south, showing sloping landform towards reservoir



Figure 25: View north, showing the walking trail which has been cut and levelled



Figure 26: Surface visibility within walking track, showing loam mixed with blue gravel



Figure 27: Drainage culvert constructed below walking trail



Figure 28: View south, showing park furniture within SU3



Figure 29: View south-east, showing western-most extent of AHIMS ID 38-4-0143



Figure 30: View north-west, showing cut and levelled walking trail transecting AHIMS ID 38-4-0143



Figure 31: Grey silcrete flaked core (left) and yellow silcrete flake



Figure 32: Red silcrete flakes (still in ground)



Figure 33: Retouched grey quartzite flake with pressure flaking on margins



Figure 34: View north-east, showing sloping landform with artefacts eroding out, within AHIMS ID 38-4-0143



Figure 35: View south-east, showing the cut and levelled landform associated with AHIMS ID 38-4-0142, in which artefacts are eroding out



Figure 36: A grey silcrete flake and two red silcrete flakes (AHIMS ID 38-4-0142)

SURVEY UNIT 4

Survey Unit 4 (SU4) is located across a relatively flat landform, with some minor undulations. SU4 has been historically cleared of vegetation, however, is now populated by dense bushland. There are multiple walking trails across SU4 (Figure 37). Due to dense bushland, leaf litter and grass coverage, there was low surface visibility (20%), with areas of surface visibility within the walking trails and areas of sandstone outcropping (Figure 38; Figure 40). Areas of surface visibility revealed brown loams and grey sandstone.

The location of AHIMS ID 38-4-0144 was targeted and a large, sandstone outcropping was identified approximately 15 m north-east of where the site was plotted (Figure 39). The outcropping is approximately 40 m (E→W) x 20 m (N→S) with a water hole within it (Figure 41). The presence of rushes and aquatic plants indicate a perennial source of water. The sandstone was thoroughly inspected for grinding grooves, as described in the AHIMS ID 38-4-0144 site card, however none were identified. At the time of visiting, large areas of sandstone were obscured by leaf litter and soil.

Overall, SU4 has undergone low to moderate disturbance from the historic clearing of vegetation. No Aboriginal objects were identified. The location described in the AHIMS ID 38-4-0144 site card was identified, however the site features (grinding grooves) were not identified.



Figure 37: View north-east, showing the walking trail and flat landform



Figure 38: Surface visibility next to walking trail, showing clay loam with sub-angular gravels



Figure 39: Rock outcrop associated with AHIMS ID 38-4-0144



Figure 40: Surface visibility surrounding rock outcrop, showing brown loam



Figure 41: Water hole within sandstone outcropping



Figure 42: Sandstone exposure next to water

SURVEY COVERAGE

In accordance with the Heritage NSW *Code of Practice* (DECCW, 2010b), the Project Site was surveyed in relation to survey units, landforms and landscapes.

Table 6: Survey Coverage

Survey Unit	Landform	Survey Unit Area (m ²)	Visibility (%)	Exposure (%)	Effective coverage (ECA)	Effective coverage
1	Flat	81,214	10	0	0	0
2	Slope	43,774	5	5	109	0.25
3	Slope	253,534	10	0	0	0
4	Flat	122,534	20	5	1,225	1.0

Table 7: Landform Summary

Landform	Landform area	Area effectively surveyed	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Flat	203,748	1,225	1.0	1	0
Slope	297,308	109.4	0.25	2	20+

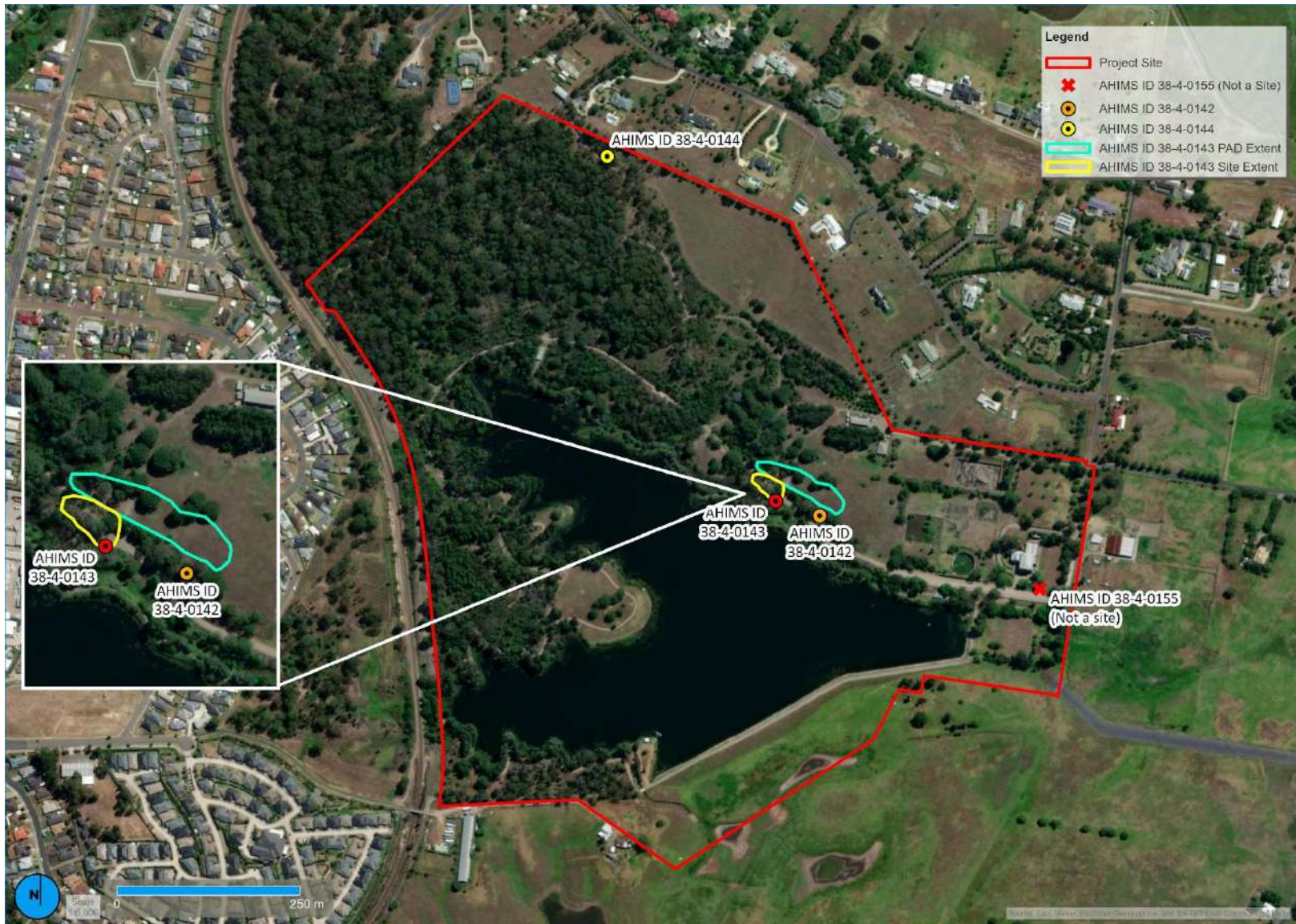


Figure 43: Results of the archaeological survey

6. Discussion

Landscape features, the presence of Aboriginal objects and ample exploitable resources suggest the Project Site would have been utilised by Aboriginal people in the past, most likely for resource procurement. Prior to post-contact land modifications, the Project Site would have been an estuarine landscape with a chain of lagoons.

The desktop assessment identified that widespread and extensive ground disturbance has occurred within the Project Site, associated with the construction and use of the Project Site as the Walka Water Works, which included the formalisation of the reservoir and construction of the pump house, in-ground tanks, pipes, basins and filter beds, as well as other ancillary infrastructure and buildings. Furthermore, the construction of the railway included has disturbed the upper deposits through cutting and levelling.

The archaeological survey resulted in the re-identification of AHIMS ID 38-4-0142 AHIMS ID 38-4-0143, as well as an identifying area of PAD directly north of the sites (Figure 43). All artefacts were identified within a disturbed context, either within the spoil of the railway line cut or eroding from the slope. The PAD extent is located across a gentle slope above where the artefacts have eroded from, approximately 200 m from the original creek alignment. Historical aerials show the area of PAD has undergone vegetation clearance in the past, however no additional past disturbance activities are evident.

Furthermore, the archaeological survey confirmed that AHIMS ID 38-4-0155 is not a site as no rock outcropping is present and therefore a grinding groove site is not possible. It is likely that this site is a duplicate of AHIMS ID 38-4-0144 which has also been incorrectly plotted. AHIMS ID 38-4-0144 was also inspected and, whilst no grinding grooves were identified, the location is consistent with the site card. The area surrounding AHIMS ID 38-4-0144 is considered sensitive due to past evidence of Aboriginal land use.

Overall, the Project Site has undergone varying levels of ground disturbance. Some areas have undergone total removal of the upper deposits (the reservoir, tanks, basins, filter beds) and former high disturbance activities, while other areas are more intact, having only undergone past vegetation clearance.

6.1. Significance Assessment

SIGNIFICANCE ASSESSMENT CRITERIA

This significance assessment has been undertaken in accordance with the *Guide to Investigating Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011). Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised by using the archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/ or states natural and cultural history?
- Representativeness: how much variability (outside and/or inside the Project Site) exists, what is already conserved, how much connectivity is there?
- Rarity: is the Project Site important to demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the Project Site contain teaching sites or sites that might have teaching potential?

6.1.1. Scientific significance assessment

This significance assessment addresses only the archaeological significance. Cultural significance can only be informed by consultation with the local Aboriginal community.

AHIMS ID 38-4-0142 ('WW2') is an artefact scatter, identified eroding from a slope north of the existing walking trail and old rail line. Originally recorded by Brayshaw (1988), the site was assessed as disturbed due to the rail line construction and subsurface pipe installation. The archaeological survey re-identified the site and confirmed the disturbed context. The scatter is considered very low density and was identified in areas with disturbance evident and are therefore not *in situ*. On the basis of the density and integrity, the scatter has low representative significance as an artefact site. AHIMS ID 38-4-0142 has low rarity, as artefact sites (including scatters and isolated finds) are the most frequently occurring site feature within the AHIMS search parameters, accounting for 64.4%.

AHIMS ID 38-4-0143 ('WW1') is an artefact scatter, identified within a mound of up-turned deposit south of the walking trail in a disturbed context. Originally recorded by Brayshaw (1988), the site was assessed as disturbed due to the rail line construction. The archaeological survey re-identified the site and confirmed the disturbed context. The scatter is considered low density and was identified in areas with disturbance evident and are therefore not *in situ*. On the basis of the density and integrity, the scatter has low representative significance as an artefact site. AHIMS ID 38-4-0143 has low rarity, as artefact sites (including scatters and isolated finds) are the most frequently occurring site feature within the AHIMS search parameters, accounting for 64.4%. The archaeological survey identified a Potential Archaeological Deposit associated with AHIMS ID 38-4-0143 to the north of the observable surface artefacts. Without archaeological investigations, the significance of the PAD is unknown.

AHIMS ID 38-4-0144 ('WW3') is a grinding groove site, located on a sandstone outcropping. Originally recorded by Brayshaw (1988), the site is described as disturbed. The area, as described in the site card, was able to be identified; however, the grinding groove was not located. Grinding grooves are a common site feature in the region, accounting for 15.4% of known sites in the AHIMS search parameters (3 km surrounding the Project Site). On the basis of Brayshaw's description, WW3 is not considered to be significantly representative of grinding groove sites, with only one small groove identified. The research and educational potential are considered low. The site was overall assessed as having low scientific significance.

A summary of the scientific significance of AHIMS sites is presented in Table 8.

Table 8: Scientific significance assessment

Site Name (AHIMS ID)	Research potential	Representative	Rarity	Education potential	Scientific significance
WW2 (38-4-0142)	Low	Low	Low	Low	Low
WW1 (38-4-0143)	Low*	Low*	Low*	Low*	Low*
WW3 (38-4-0144)	Low	Low	Low	Low	Low
Walka (AHIMS ID 38-4-0155)	Nil	Nil	Nil	Nil	Nil

*significance of PAD is unknown until archaeological excavations are conducted

6.2. Impact Assessment

Maitland City Council (the proponent) have not provided specific plans of works and therefore the impact footprint is not known at this time. As such, no impact assessment is possible, however this assessment will provide recommendations for avoidance and guidance for future works (see Section 7).

7. Management and mitigation measures

7.1. Avoidance and Conservation

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved, and all attempts made to avoid impacts to Aboriginal sites. If conservation is not practicable, measures should be taken to mitigate against impacts to Aboriginal sites.

7.2. Further archaeological investigation

7.2.1. Areas of nil sensitivity

In areas determined to possess nil sensitivity for the presence of Aboriginal objects and/or sites, an unexpected finds procedure must be followed (Figure 44). Aboriginal objects are protected under the NPW Act, regardless of whether they are registered on AHIMS or not.

If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.

In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, Heritage NSW may also be contacted at this time to assist in determining appropriate management.

7.2.2. Areas of low sensitivity

In areas determined to possess low sensitivity for the presence of Aboriginal objects and/or archaeological deposits, it is recommended at minimum an Aboriginal Due Diligence (ADD) assessment be prepared (Figure 44).

These areas require further archaeological investigations in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b). If Aboriginal objects or areas of potential are identified, an impact assessment is required in accordance with the *Guide to Investigating, Assessing, and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH, 2011) with full Aboriginal community consultation is required to identify cultural values in accordance with *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010b).

7.2.3. Areas of moderate sensitivity

In areas determined to possess moderate potential for Aboriginal objects, further archaeological investigations in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) is required (Figure 44). Depending on the impacts, this may include a test excavation program and accompanying Archaeological Technical Report (ATR). If Aboriginal objects or areas of potential are identified, an impact assessment is required in accordance with the *Guide to Investigating, Assessing, and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH, 2011) with full Aboriginal community consultation is required to identify cultural values in accordance with *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010b).

7.2.4. Areas of high sensitivity

As there are known Aboriginal objects within or in close proximity to these areas, further archaeological investigations in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) with full Aboriginal community consultation in accordance with *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010b) is required (Figure 44).

If impacts are proposed to the PAD associated with AHIMS ID 38-4-0143 and AHIMS ID 38-4-0142, a test excavation program and accompanying Archaeological Technical Report (ATR) is required. If impacts to AHIMS 38-4-0144, AHIMS ID 38-4-0143 or AHIMS ID 38-4-0142 are proposed and cannot be avoided, an Aboriginal Heritage Impact Permit (AHIP) must be sought.



Figure 44: Mapped archaeological sensitivity within the Project Site s

8. Recommendations

The following recommendations were based on consideration of the *Statutory requirements under the National Parks and Wildlife Act 1974*, *Aboriginal cultural heritage in NSW* (OEH 2011), *Code of Practice* (DECCW 2010) and *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010b):

- Designs of any future works must take into account the known Aboriginal sites and likely archaeological potential identified by this report.
- Where possible, impacts to the sites and areas of high to moderate sensitivity identified by this report must be avoided.
- Where impacts to the sites and areas of high to moderate sensitivity identified by this report cannot be avoided, additional archaeological investigation must be undertaken, including an AHIP where impacts to Aboriginal sites cannot be avoided.
- The AHIMS site card for AHIMS ID 38-4-0142 and AHIMS ID 38-4-1043 will be updated to reflect the findings of the archaeological survey and the identified site extent. Furthermore, AHIMS ID 38-4-0155 will be updated in AHIMS as 'Not a Site' to reflect the findings of the archaeological survey.

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Appendix A – AHIMS Search Results

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Appendix B – Site Cards

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