

Koettig (1989a, 1989b), all of which report on archaeological investigations undertaken within the immediate vicinity of the current study area.

JMCHM (2002) investigated a 615ha area of land, including the Vineyard property which is located immediately to the north of the current study area. This investigation located 22 new sites, bringing the total number of recorded sites in the area to 53 (35 open camp sites, 17 isolated finds and one scarred tree associated with an open camp site).

Following on from this study, JMCHM (2004) undertook test and salvage excavations of Austral PAD 1, AUS 1, and isolated finds AUS 2 and AUS 3, under DECC permit #1994. Initially, 37 test pits were placed across the landscape, at approximately 15m intervals. Salvage pits were located in the vicinity of test pits from which high numbers of artefacts were recovered; however, testing in some areas with lower artefact numbers was also undertaken. A total of 121m² was excavated, from which 2029 flaked stone artefacts were recovered. The artefacts were predominantly manufactured on silcrete (72%), with 23% made from silicified tuff and 4% from quartz. Small amounts of quartzite, silicified wood, igneous & fine grained siliceous stone were also used as raw materials for flaking. The deposit appears to be Bondaian (i.e. dating to the last c.7,000-8000 years; cf. Hiscock 2002; Hiscock and Attenbrow 1998, 2004), based on the presence of 21 backed artefacts (1%) and 3 bipolar cores. Also recovered was an anvil, and 44 artefacts with retouch/usewear (2%). A highly variable density of artefacts was noted throughout the excavation; however, the average density was 17 artefacts/m². The site was interpreted as a dispersed low density artefact scatter with isolated areas of medium-high density representing localised knapping/activity areas. It was concluded to represent multiple phases of low intensity prehistoric occupation of Reedy Creek. However, it was also noted that 'more permanent occupation may have taken place in closer proximity to the creek and its water holes' (JMCHM 2004:76).

The development of the Western Sydney Orbital (now the M7 motorway) was subject to a number of archaeological investigations, including those by Mills (1996, 2001), Brayshaw & White (1999), Kelton (2001a, 2001b) and Mills & Kelton (2002). The M7 passes immediately to the east of the current study area; however, the closest sites recorded are an isolated find (WSO-IF-2, located within c.250m of the south east corner of the study area), a scarred tree (SO-ST-1, located c.1km north of the study area), and an open campsite (SO-OS-2, located c.1.2km north of the study area).

Koettig (1989a) surveyed an area proposed for the extension of the Waste Disposal Depot at Eastern Creek, approximately 500m east of the current study area. Given the vicinity of the area to the archaeologically sensitive Eastern Creek (Smith 1988), and the total lack of ground surface visibility during the survey, Koettig (1989b) undertook test excavations in the area prior to the development. A total of 30 backhoe test pits and one 0.25m² shovel pit were excavated in six locations across the lower slopes and flats on the western side of Eastern Creek, and on the ridgetop and along the slopes above a major creekline in the western portion of the area. The excavations uncovered 69 flaked stone artefacts, including one hammerstone and a backed artefact. The artefacts were predominantly manufactured on silcrete (63%), with 15% made from indurated mudstone, 13% made from chert, 6% made from quartz and 3% from basalt. It was concluded that knapping took place in the area, although the assemblage was too small for meaningful interpretation. The highest density of artefacts was recovered from the slope above (within 80m of) Eastern Creek.

In short, archaeological investigations in the vicinity of the current study area have generally identified a background scatter of artefacts, with high densities of artefacts in areas near Eastern Creek, and to a lesser extent, Reedy Creek.

3.3.3 Aboriginal Heritage Site Predictive Modelling

On the basis of the registered archaeological sites in the region, and review of previous archaeological studies, the following conclusions can be drawn regarding the potential presence and location of Aboriginal heritage sites within the landscape of the study area:

- stone artefact sites are the most common site type occurring across the landscape, and are the most likely site type to be present in the study area. This site type usually appears as low density open artefact scatters or isolated finds, although high density scatters may also be present. Stone artefact sites are found in all environmental contexts, but are most readily identified in areas where vegetation is limited and ground surface is visible. Larger sites with higher densities of artefacts tend to be found close to permanent water sources, such as Eastern and Ropes Creeks;
- sites situated on relatively undisturbed alluvial soils have the potential to be associated with stratified subsurface archaeological deposits. Excavations within the region indicate that high densities of artefacts can be present up to 250m from water sources, and that subsurface material may be much greater than indicated by surface numbers of artefacts. It is anticipated that stone artefact density will be greater in closer proximity to Reedy Creek and the unnamed tributary on the south west boundary of the study area, possibly particularly near the confluence which turns Reedy Creek into a third order stream;
- excavations in the region have indicated that high densities of artefacts can be present up to 250m from water sources, and that subsurface material may be much greater than indicated by surface numbers of artefacts. The slope and crest in the central south of the study area may also have evidence of occupation related to proximity to the creek and confluence; and
- occupation deposit in the north west section of the study area is likely to have been moderate-high, given proximity to the third order stream, however excavation of the area for the dam and use of some of the land for a cattle pen indicates that much of this deposit will no longer remain in situ.

On the basis of the archaeological sites registered in the region and review of previous archaeological studies, the following types of site are unlikely to be present in the study area:

- stone quarry sites, axe grinding grooves, stone engravings/art and shelter sites are highly unlikely to be found in the study area because of the lack of suitable stone outcrops;
- scarred or carved trees are unlikely to be present in the study area as the majority of the study area has been extensively cleared of vegetation, although there are some mature trees adjacent to the creek; and
- burials and ceremonial sites (including stone arrangements) are highly unlikely to be present in the area given the disturbance caused by early pastoralism, agriculture, roads and more recent development.

4 Historic Heritage Context

4.1 European Settlement

Captain Arthur Phillip established the first permanent British settlement in Sydney on 26 January 1788. However, the land was too sandy for farming, so explorations to find arable lands were undertaken along the coast and into the hinterland later that year. By the following year, cultivation was underway in Parramatta and in 1791, Phillip granted lands for farming to the first emancipated convicts. Also by the 1790s, the fertile alluvial soils along the Hawkesbury, Nepean and Georges Rivers, the area around South Creek and the head of the Parramatta River, were being farmed for wheat and maize. However, these areas often flooded, and throughout the 1790s the colony was under the ever-present threat of famine.

European occupation of the County of Cumberland began around 1792, with settlement expanding from Parramatta north-west to Windsor and Richmond. This westward expansion was further encouraged by the crossing of the Blue Mountains in 1815, and the construction of the Great Western Road (now the Great Western Highway) from Parramatta to Emu Plains, which crossed over Ropes Creek and Eastern Creek (Casey & Lowe 2002:9).

Land grants issued by Governor Macquarie, from ca.1816-1817, to encourage pastoral and agricultural exploitation of the land, also encouraged settlement particularly following the expiration of leases on part of the Prospect Hill Common, established ca.1802-3 (Casey & Lowe 2002:9). Many of these grants were made to notable free settlers and emancipated convicts. Large and well known estates within the wider context of the study area include: Bayly Park (Nicholas Bayly); King's Gift or Horsley Park (George Johnston Snr); Lockwood (George Johnston Jnr); Exeter Farm (James Badgery); Mt. Vernon (Anthony Fenn Kemp); Erskine Park (James Erskine); Minchinbury (William Minchin) and Regentville (James Jamison).

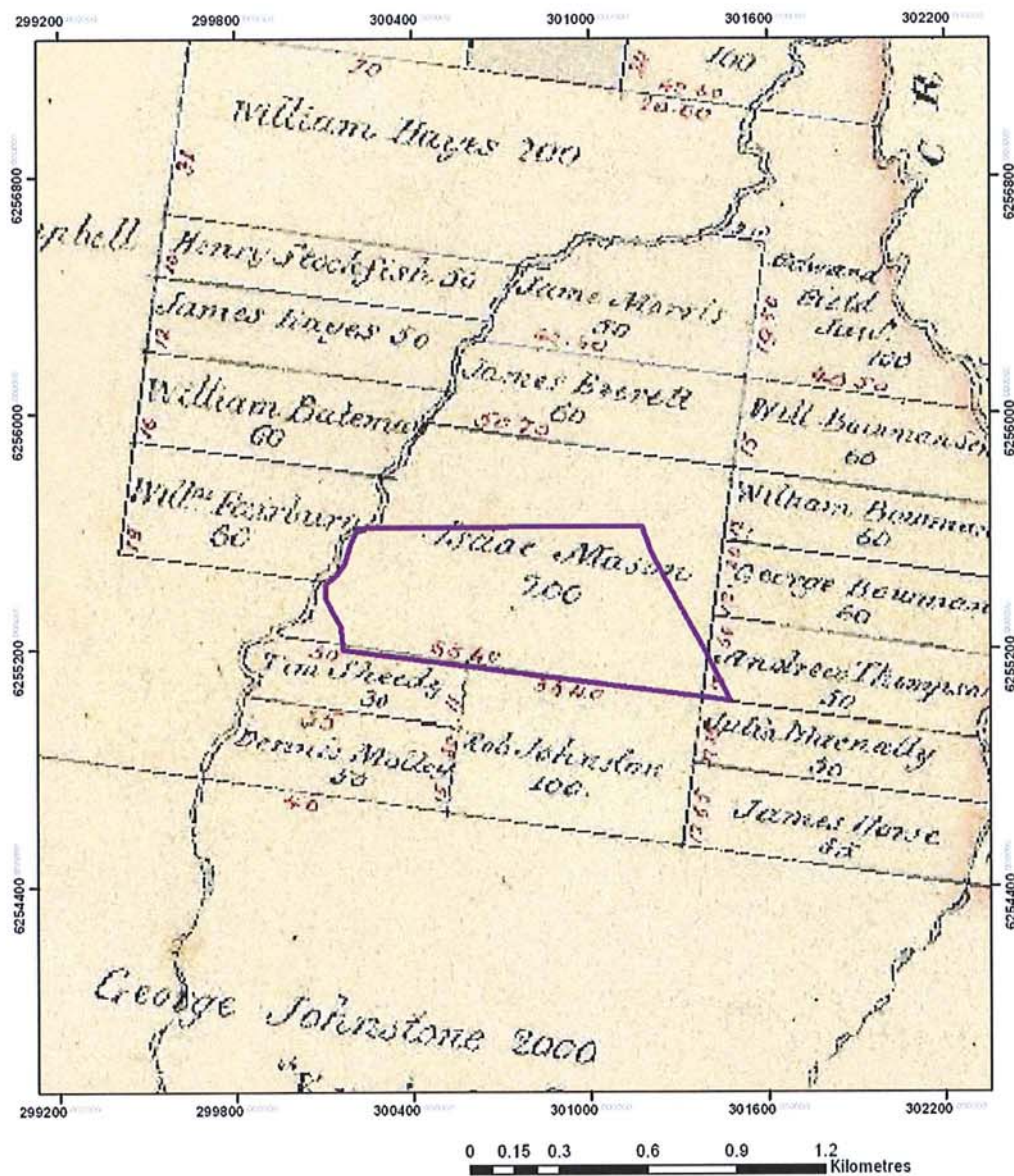
Large land parcels (ranging from a couple of hundred acres to over one thousand acres) were also granted to some former government officials, such as George Johnston, while smaller parcels (usually less than a couple of hundred acres) were granted to emancipated convicts and free settlers (Casey & Lowe 2002:10). The study area is predominantly situated on the 200ac of land granted to Isaac Mason, with a small part of the south-eastern corner situated on the 50ac granted to Andrew Thompson (Figure 4.1).

In addition to grazing and pastoralism, timber-getting is identified early as an activity in this area.¹ Timber-getting generally preceded settlement as an activity associated with the process of land clearance for pasturage and agriculture. However, timber-getting in this area continued into the mid and late nineteenth century in order to supply sawn ironbark for railway girders and sleepers (Thorp 1986:115).

Early farming ventures met with varying degrees of success, which may have been due to a lack of familiarity with the Australian climate. This is supported by instructions issued by Governor King in 1804 regarding the protection of riverbanks from erosion and later, by scientific articles concerning farming in the Sydney Gazette under Governor Bligh (Rosen 1996:25). Following the 1809 floods in the Hawkesbury, Acting Governor Colonel Patterson began to 'encourage settlers to occupy the Cumberland Plain forest lands'. It is likely that settlers moved their houses and other domestic and commercial structures onto higher ground to avoid inundation (Rosen 1996:28).

¹ Reference to the Crown requiring timber for ship building purposes is noted in the Register Book 8, p94 for Lockwood (see Grants Index 1792-1826 Vol. 1).

The type of farming undertaken is likely to have been, in part, dependant on the resources of the early land holders. Land use practices appear to be dominated by the pasturing of cattle, horses, sheep and goats. Agriculture included crops such as maize, wheat, vegetables and fruits supplemented with poultry and pigs (Rosen 1996:25). Orchard farming (particularly stone fruits), dairying, horse breeding and quarrying have been undertaken within the Kemps Creek and surrounding areas.



Legend

— Study Area

Soil data © Copyright Commonwealth of Australia (Geoscience Australia) 2001
Horizontal datum: GDA94/MGA Zone 56



Figure 4.1 The study area in relation to the original land grant boundaries.

4.1.1 Isaac Mason's Grant

The study area is predominantly situated on the 200ac of land granted to Isaac Mason on 17 August 1819 (Casey & Lowe 2002:36). Historical information on Mason is very limited, although it is possible that some early newspaper articles may refer to him. One such article identifies that a Mr Isaac Mason was "a native of this colony" (*The Monitor*, Sydney, NSW: Friday 25 August 1826). Another article, if referring to the relevant Isaac Mason, would seem to suggest that Mason lived in Sydney city, rather than on his Eastern Creek/Horsley Park grant:

MR. Isaac Mason preferred a complaint before the police on Saturday last, against two butchers of Mr. Sparks's establishment in King-street. He deposed to their being in the habit of rising in the night and encouraging their dogs to worry to death the dogs of their neighbours, which were casually attracted to Mr Sparks's putrid establishment, and which said exhalations will in all probability create next summer some horrid fever in the town. Instead of calling off their dogs, they encouraged them and aided their ferocity, by dealing heavy blows ever and anon to the strange dogs until they died. One of the ruffians was flogged some time ago on the prosecution of the Editor of this paper, for thrusting a stick into the eyes of a bullock that he was helping his master to slaughter. Mr. Mason did not see the men he was in bed, and could only hear, being afraid to rise he swore to the voices of the men... (*The Monitor*, Sydney, NSW: Friday 1 September 1826.)

It would seem that Mason's grant passed to John Smith prior to 1841, thence becoming part of James and Ann Maria Smith's estate, which passed to Herbert Percy Smith by the 1890s. Smith grazed stock on the land, and it appears that the current study is still used for this purpose. The land was converted to Torrens Title in 1903, and in 1909 Smith transferred it to John Henry Smith Angus. A 1938 map of the parish of Melville shows a trig station called Smithville on the southern boundary of Mason's former grant (Figure 4.2). John Henry Smith Angus, of Rooty Hill, was the son of James Angus, who had obtained the Lucan Park and Minchinbury estates to the north, and who transferred pastoral portions of these large estates to his son. After John Henry Smith Angus's death in 1938, the Angus properties (including the current study area, formerly Mason's land) were managed by the Permanent Trustee Company of New South Wales, and continued to be used for animal grazing (Casey & Lowe 2002:36).

From the 1880s or earlier, there was right-of-way access to Johnston's family grants at Horsley, which went through Mason's grant. Wallgrove Road approximately follows this right-of-way, with the road officially resumed through part of Mason's property in 1942 (Figure 4.2; see also Section 4.2 below). A transmission line had been erected along the majority of the southern boundary of Mason's grant by 1938 (Figure 4.2). The property was also bisected by a water pipeline in the 1940s (Casey & Lowe 2002:36-37)

The Permanent Trustee Company put the 550-acre Smith Angus estate (including the current study area) up for sale in 1950, and 319 acres was purchased by Patrick Paul Cleary, a contractor from Parramatta. Other subdivision of the area occurred in the 1950s, and several sections were purchased by Austral Brick (Casey & Lowe 2002:37). Today, the study area is surrounded by Austral Brick clay quarry pits, to the west, north and east.



Figure 4.2 1938 map of the parish of Melville, showing a transmission line along most of the southern boundary of Isaac Mason's original land grant, as well as a trig station called Smithville. Also shown is the alignment of Wallgrove Road through the north eastern corner of the property.

4.1.2 Andrew Thompson

Andrew Thompson established St Marys Tannery (located between Saddington and Vincent Streets) in 1881, and lived in 'Mimosa' at St Marys from 1894. By the beginning of the twentieth century, technological advances brought widespread development of the dairy industry in the region, and Thompson established a 'model' dairy farm on the Lenore estate at Erskine Park, to the west of the current study area. Thompson had purchased the property in 1898. The outer paddocks were used for grazing and the inner paddocks were cultivated for feed for the cattle, with post and rail and post and wire fencing used. It is reported that corn was grown, and this would have been stored in silos at the end of the milking shed. Next to the dairy was a piggery, with milking waste products fed to the pigs. Water came from farm dams on the property, being pumped by windmills to a boiler at the top of Lenore Hill, thence being fed by gravity down into the farm. At the bottom of the hill was the main homestead, associated farm buildings, an orchard, a vineyard and gardens. The formal entry appears to have been off Mamre Road. Dairying is not known to have been significant industry in Western Sydney at this time, so it is thought that Thompson sold his milk in the Sydney market. Thompson died in 1918 at his country home 'Tyrone', which was built sometime between 1906 and 1918 on top of a hill on the existing Enviroguard recycling site within Erskine Park (HLA 2004:7-8).

It is uncertain whether Thompson also used his property to the east of Mason's grant for grazing or cultivation, although this is a possibility, since he did not live permanently on either of his Eastern Creek or Erskine Park properties. However, the right-of-way would have truncated the corner of Thompson's property which is within the current study area, so this corner may not have been utilised by Thompson.

4.2 Wallgrove Road

The road that eventually became Wallgrove Road was originally a surveyed public road extending south from the Great Western Road between two land grants, to allow access to southern land grants; however, it became a private right-of-way through a number of properties from approximately 1.5km

north of the current study area. The road was originally called Hayes Lane, Wallgrove Lane and Lucan Park Road (Casey & Lowe 2002:46).

The name Wallgrove is derived from Lieutenant Colonel William Wall of the 3rd Regiment. The Regiment came to New South Wales in 1822, whereafter Wall settled in the colony. In 1827, he purchased grants along Eastern Creek and named them Wallgrove, and the name remained even after Wall sold the land in 1832. The early Wallgrove Road was extended and formally notified as Old Wallgrove Road in June 1885 (Casey & Lowe 2002:46).

By 1942, Wallgrove Road was paved with bitumen along its current alignment between the Great Western Highway and Elizabeth Drive, being gazetted as State Highway 515. It was constructed as the Ingleburn Strategic Road, to facilitate the movement of troops and defence supplies during World War II. However, after the war it was only maintained as a sealed road between the Great Western Highway and Old Wallgrove Road. By 1951 it was known as New Horsley Road in 1951 (Casey & Lowe 2002:46-47).

4.3 Warragamba-Prospect Pipeline

Construction of Prospect Reservoir was completed in 1888 to store water fed from the Upper Nepean Scheme via the Upper Canal. From Prospect, water was fed to Pipehead at Guildford, via the Lower Canal, from whence it was piped to the Potts Hill and Crown Street reservoirs. By the 1930s, it was recognised that the Upper Nepean Scheme was inadequate to Sydney's water needs, particularly when a severe drought lasting from 1934 until 1942 saw the water supply almost depleted. The construction of Warragamba Dam began in 1946, and was officially opened on 14 October, 1960.

Water from Warragamba Dam is fed to Prospect Reservoir via two pipelines. The original pipeline, constructed in 1938, had a diameter of 48 inches, which was replaced in 1957 by a new 84 inch cement-lined steel pipeline. This increased capacity resulted in an increase in the pumping rate such that 97 million gallons per day was pumped from Warragamba. The second 84 inch pipeline was constructed in 1959, and the Warragamba Dam infrastructure was complete. The two pipelines are parallel with an access road running between, and travel for 27km from Warragamba to Prospect Reservoir with three cross-connections; adjacent to Mulgoa Road, Luddenham Road and Main Road. The curtilage includes all associated infrastructure; cross-connections, valve houses, flow meters and pumping stations and is generally within a fenced off area.

4.4 The Twentieth Century

Clay for making brick and tiles has been extracted from the area since at least the 1950s, as the clays in inner Sydney were becoming exhausted by that time. Austral Brick was originally based in Marrickville and Alexandria, and was the second highest producer of bricks in the state in 1957, continuing its business by purchasing several properties around Wallgrove Road in the 1950s and 1960s. On the western side of Wallgrove Road, Austral had a clay pit immediately to the north of the water pipeline and the current study area, where clay was extracted to a 3m depth. This pit was no longer used by 1977, when Austral's main operation was a quarry on the eastern side of Wallgrove Road. Another operation site at the time was to the west of the current study area, where clay was extracted to a 5m depth (Casey & Lowe 2002:45-46). The latter two quarries are still in use today, while the area to the north of the study area has now been redeveloped as an industrial centre. The Sydney West Substation is also located to north-west of the study area. In the later part of the twentieth century, the area was recognised as a potential suburban growth area. The land adjacent to the M4 Western Freeway has subsequently been re-developed for suburban housing and surrounding areas are being developed as industrial estates; however, many areas of land to the south and west of the study area, as well as the study area itself, retain a semi-rural character.

5 Aboriginal Heritage Survey

5.1 Survey Methodology

The Aboriginal cultural heritage survey was undertaken on 21 March 2013 by AMBS archaeologist Jenna Weston, accompanied by Aboriginal community representatives (see Table 3.1). The fieldwork methodology, the context of the Aboriginal heritage assessment and available mapping information were discussed with Aboriginal representatives prior to fieldwork. The findings of the survey and recommendations were discussed with Aboriginal representatives in the field, and their comments have been incorporated into this report.

The purpose of the survey was to inspect the area for any archaeological sites and to identify the potential for archaeologically sensitive areas to be present within the study area.









The survey involved pedestrian transects throughout the entire study area, focussing particularly on areas of ground exposure (unfortunately, no tracklog map is available, due to an error with the handheld GPS). Photographs of the study area were taken using a Fuji Finepix HS20 EXR digital camera. Geocentric Datum of Australia (GDA94) site co-ordinates were recorded using Garmin Oregon 300 handheld GPS units. Where Aboriginal artefacts were encountered, notes were made regarding their type, size, and material; and descriptions of the site were recorded including the environmental setting and details of any disturbance to archaeological material in the site's vicinity. Where older mature native trees were observed within the study area, they were examined for the presence of Aboriginal cultural scarring.

5.2 Survey Coverage

Survey coverage data was gathered during the archaeological field survey to allow quantification of ground exposure and visibility, as adverse observation conditions can affect the detection of Aboriginal sites and material. This data does not reflect the extent of the area that was physically surveyed, but represents an estimate of the area of ground surface examined, and presents an estimate of the effectiveness of the survey, given environmental conditions and ground visibility. Survey coverage data is presented in accordance with the OEH Code of Practice guidelines (DECCW 2010).

The pedestrian survey focussed on areas of ground exposure, where grazing and erosion had exposed the ground surface. Survey coverage data for the current study is presented in Table 5.1 and Table 5.2. The area covered during the survey was considered adequate for the purposes of this heritage assessment.

Table 5.1 Survey coverage table.

Transect	Landform	Description	Total Area (m ²)	Area Surveyed (m ²)	Visibility	Exposure	Effective coverage (m ²)	Effective coverage (%)	Transect Photograph
1	Gentle slopes	Track along northern part of study area	70000	4250	50%	90%	1912.5	2.7	
2	Lower slope	Exposure near gate into horse paddock, east of cattle pen	10000	650	90%	100%	585	5.85	
3	Lower slope	Eastern side of cattle pen	20000	2750	5%	60%	82.5	0.4	
4	Creek flat	South of cattle pen, next to creek and confluence	5000	375	50%	80%	150	3	
5	Lower slope	South-west corner of property	10000	2400	5%	90%	108	1.1	
6	Mid-lower slopes	North-western side of hill, between dam and horse sheds	40000	4000	2%	80%	64	0.2	
7	Mid-lower slope	North-eastern side of hill, on rough unpaved vehicle track	14500	800	10%	80%	64	0.4	
8	Lower slope	Northern end of cattle pen and western side of large dam	15000	1400	70%	100%	980	6.5	




9	Creek flat	North-eastern corner of property	20000	1000	1%	40%	4	0.02	
	Upper slope/crest	Hill in centre/south of property	62500	0	0%	0%	0	0	
	Lower slope	Eastern side of property	200000	0	0%	0%	0	0	
			467000	17625			3954	0.8	

Table 5.2 Landform summary for sampled areas.

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Gentle slopes	70000	1912.5	2.7%	0	N/A
Lower slopes	255000	1755.5	0.7%	1 (site WR2)	4
Mid-lower slopes	54500	132	0.25%	0	N/A
Upper slope/crest	62500	0	0%	0	N/A
Creek flats	25000	154	0.6%	1 (site WR1)	4

5.3 Survey Results

One previously recorded site and one new site were located within the study area, and are designated WR1 and WR2. These sites are discussed in detail below.

The majority of the study area was covered in long grass, including the location of previously recorded site WR1. Although the site was originally recorded in 2008 on an eroded vehicle track in the soil excavated from the dam, this area has since been overgrown with vegetation, and separated from the cattle pen by a fence (Figure 5.1). Nevertheless, the site location coordinates recorded during the 2008 survey, and registered on the AHIMS, are considered accurate. The site description from the original survey is provided below. A map of sites within the study area is provided in Figure 5.2.



Figure 5.1 New fence along dam, separating cattle pen from dam.

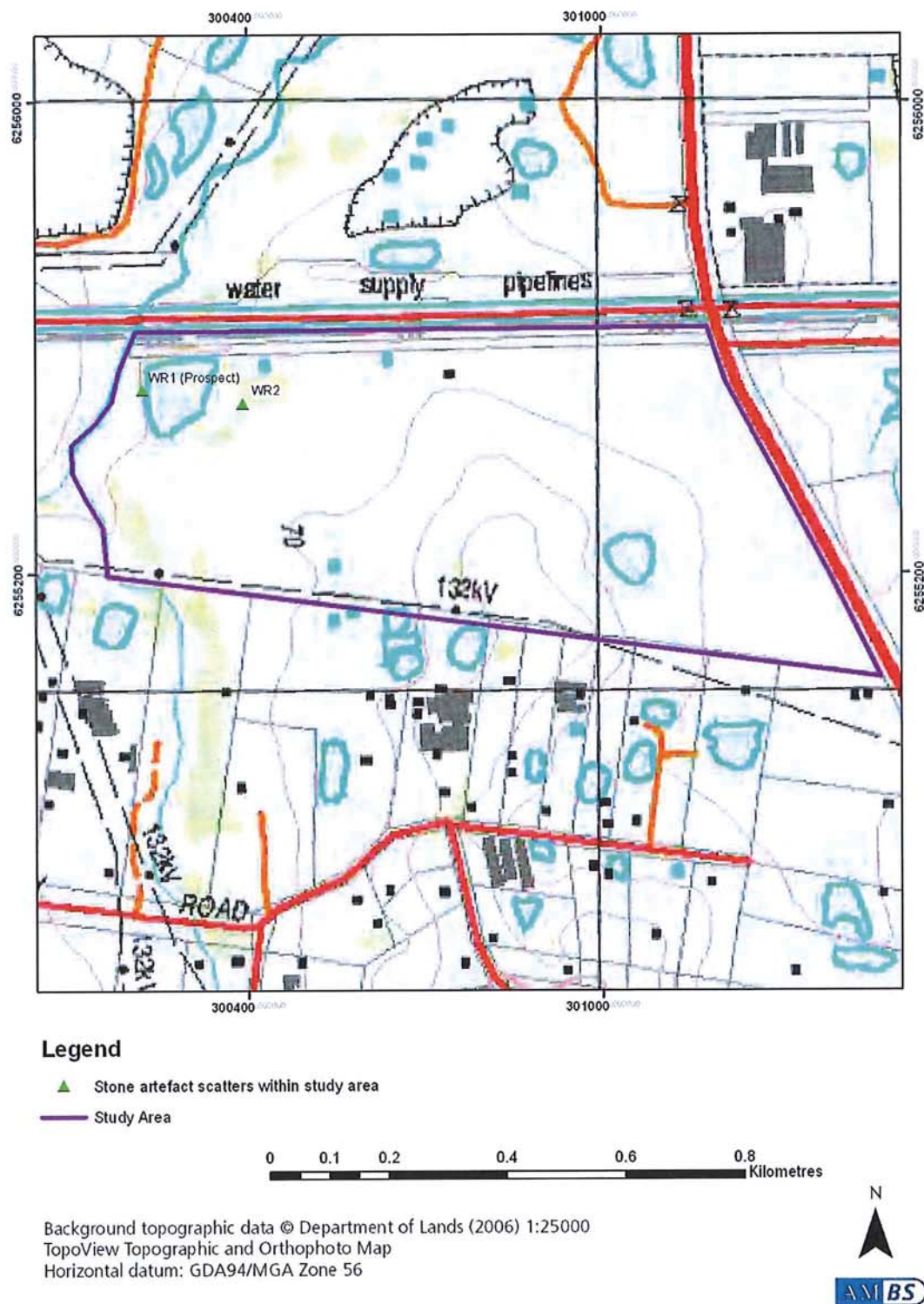


Figure 5.2 Aboriginal heritage sites located within study area.

5.3.1 WR1 – Stone Artefact Scatter

Location: AGD E 300227, AGD N 6255510

Landform: Modified – dam wall

Site Size: 2m x 4m

Exposure: Wall of dam, comprised of spoil excavated during dam construction

Site Description: The site is located c.40m east of Reedy Creek, within Lot 5 DP 24094 (see Figure 6.4). Four artefacts have been exposed adjacent to the north west corner of the dam wall, in spoil excavated from the construction of the dam, indicating that the artefacts are not in situ, but were originally located in the area currently occupied by the dam. The artefacts appear to have been damaged by excavation of the soil for the dam. The exposure appears to have resulted from vehicle use around the northern and north west wall of the dam. The exposure measures approximately 3m x 10m, while the artefacts were located within an approximate area of 2m x 4m within this larger exposure. Ground surface visibility within the exposure was approximately 90%.

Table 5.3 WR1 artefact details.

Material	Colour	Maximum Size (cm)	Artefact Type
Silcrete	Red	3	Broken flake
Mudstone	Brown	3	Flaked piece
Silcrete	Red	3	Heat shatter
Silcrete	Red	2	Proximal flake



Figure 5.3 Exposure where WR1 was located in 2008, in soil excavated from dam (view to south).



Figure 5.4 Exposed soil from dam excavation in 2008 (artefacts arrowed; view to south east).



Figure 5.5 Silcrete and mudstone artefacts exposed in soil excavated from dam, in 2008.

5.3.2 WR2 – Stone Artefact Scatter

Location: GDA E 300395, GDA N 6255487

Landform: Lower slope

Site Size: 1m x 5m

Exposure: Eroded area adjacent to gate and unpaved vehicle track

Site Description: The site is located c.220m east of Reedy Creek, within Lot 5 DP 24094 (see Figure 6.4). Four artefacts have been exposed in an eroded area near a gate into a horse paddock, east of the cattle pen at the western side of the property, and south of the main track into the property. The exposure appears to have resulted from vehicles entering the paddock from the main track through the gate. The exposure on the southern side of the gate measures approximately 10m x 20m, while the artefacts were located within an approximate area of 1m x 5m within this larger exposure. Ground surface visibility within the exposure was approximately 90%. The erosion of the area appears to have left relatively little topsoil, making it unlikely that a depth of archaeological deposit will remain. Further, as Reedy Creek is over 200m away, it is unlikely that the area was used extensively by past Aboriginal people. Rather, it is considered that more intensive use was made of the area closer to Reedy Creek.

Table 5.4 WR2 artefact details.

#	Material	Colour	Length (cm)	Width (cm)	Thickness (cm)	Artefact Type
1	Silcrete	Red	3	2.5	1	Flake
2	Fine-grained siliceous	Grey/green	1.5	1.5	0.5	Proximal flake
3	Silcrete	Red/orange	1	0.5	0.5	Proximal flake
4	Silcrete	Grey/pink	1.5	1	0.5	Heat shatter



Figure 5.6 Location of artefacts (arrowed) within exposure near gate (at middle left of photo). Tape measure is 1m. View to north east.



Figure 5.7 Site WR2, view to south east. Tape measure is 1m.



Figure 5.8 Site WR2 artefacts #1-4. Scale divisions are 1cm.

5.4 Discussion of Survey Results

It is considered that the eastern part of the study area, from the eastern slope to Wallgrove Road, is unlikely to contain extensive evidence of previous occupation by Aboriginal people, given its distance from and lack of view to major resources, namely Eastern Creek (c.1.2km east) and Reedy Creek (c.750m west). Should any Aboriginal heritage material exist in this area, it is likely to comprise a low density, background scatter of stone artefacts, representing relatively infrequent visitation and movement throughout the area.

Given the presence of a confluence of two second order creeks near the south western part of the study area, which forms Reedy Creek into a third order creek on the western and north western boundary of the study area, it is considered likely that the western part of the study area, adjacent to Reedy Creek, is more likely to retain evidence of more frequent occupation and activity, probably including knapping of stone artefacts. However, the north western part of the study area has been substantially disturbed by the construction of a dam. Further, a cattle pen has been constructed to the south of the dam, with resultant continual trampling of this area by cattle. These disturbances indicate that *in situ* archaeological deposit in these areas is not likely to be present. However, the presence of artefacts in the north western part of the study area, within a very small section of ground surface exposure, and obviously having been excavated from the spot currently occupied by the dam, suggests that a high density of archaeological deposit remains in this area. This is also supported by the presence of artefacts c.180m away, although topsoil in this area appeared to be quite shallow, having been eroded by vehicle use.

There is a relatively undisturbed area in the south west of the study area, between the cattle pen and the second order tributary, in the vicinity of the confluence. The main form of disturbance in this area has been dumping of cattle carcasses on the surface, which is unlikely to have had an impact on subsurface archaeological deposit. This area is slightly raised above the level of the creek, indicating that it is unlikely to be prone to flooding, and thus would have been a favourable location for Aboriginal occupation. Further, there may be alluvial soils near the confluence which have the potential for stratified deposit, and the apparent lack of modification to the landscape in this area suggests that any such deposits may remain intact. Therefore, this area has been identified as having archaeological sensitivity (see Figure 5.9), although a lack of visibility prevented identification of any surface artefacts.

The crest in the central south of the study area is one of the highest points in the surrounding landscape, and commands an impressive view in all directions. However, it is quite steep to traverse, and is located approximately 650m east of the second order tributary, c.700m south east of the confluence, and c.1.7km west of Eastern Creek, which is a substantial distance from major water resources. Further, ridgetops/crests between major creeklines on the Cumberland Plain are often found to have limited archaeological evidence. As such, although it is possible that this crest may have been a useful location for camping, and thus may have been subject to somewhat more frequent occupation or movement than other crests or ridgetops in the area, it is unlikely to contain enough archaeological deposit to warrant salvage. Further, a lack of visibility prevented identification of any surface artefacts.

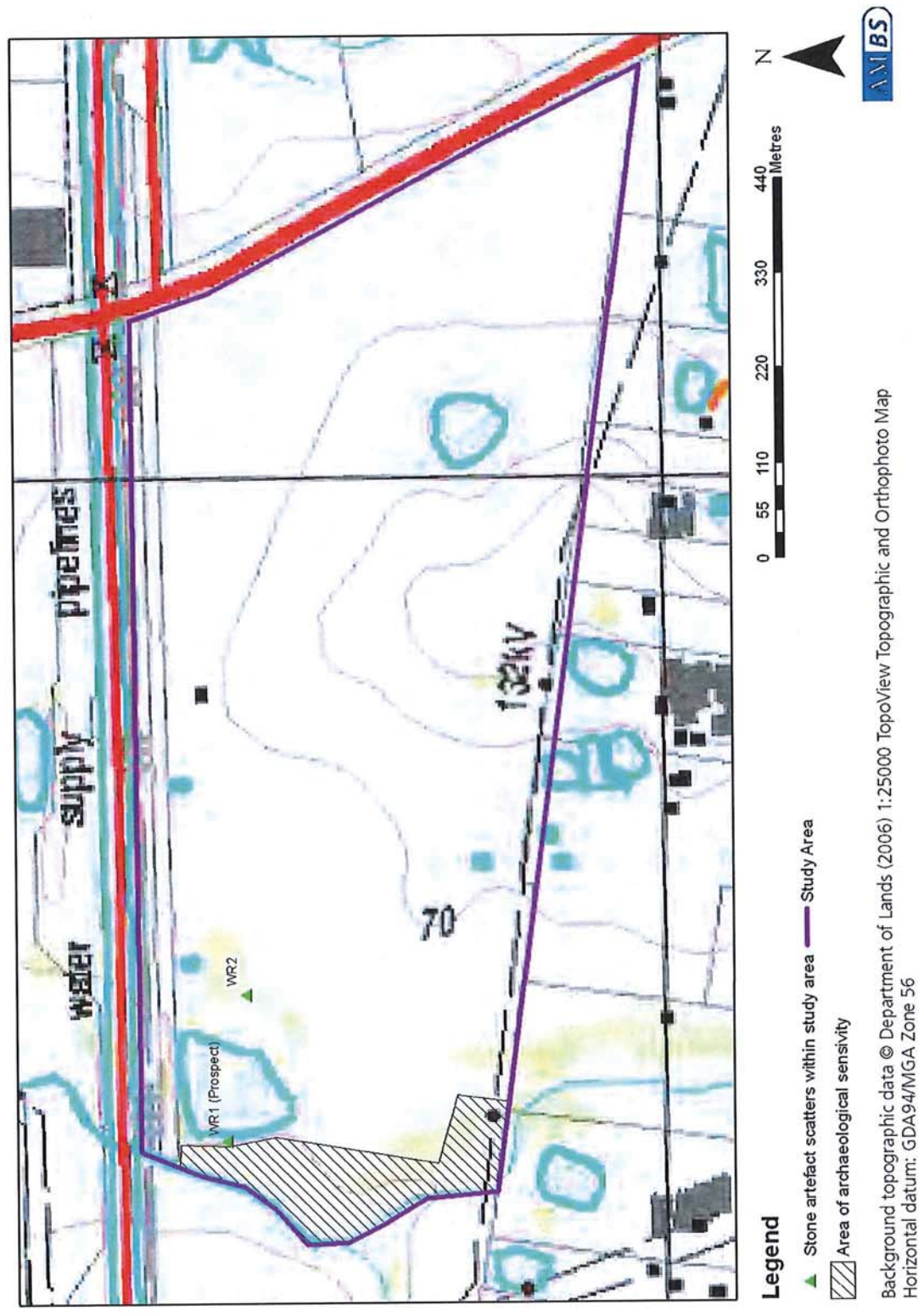


Figure 5.9 Aboriginal sites and area of archaeological sensitivity within the study area.

6 Assessing Heritage Significance

6.1 Preamble

A primary step in the process of Aboriginal cultural heritage management is the assessment of significance. Heritage significance relating to Aboriginal sites, objects and places in NSW is assessed in accordance with the criteria defined in the OEH guidelines, and cultural significance is identified by Aboriginal communities. In accordance with best practice, archaeological values should be identified and their significance assessed using criteria reflecting assessment processes set out in the Burra Charter.

The criteria for assessing Aboriginal heritage significance are derived from the Burra Charter criteria of aesthetic, historic, scientific, social or spiritual value, for assessing cultural significance for past, present and future generations (Article 1.2). OEH guidelines for assessing significance reflect the Burra Charter criteria, and require consideration of the following aspects of heritage sites:

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

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a site is not fixed for all time; what is considered as significant at the time of assessment may change as similar items are located, more research is undertaken and community values change. This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why also changes over time (Pearson and Sullivan 1995:7).

6.2 Assessment against Criteria

This assessment of heritage values against the OEH criteria is informed by the results of the environmental and heritage context, the predictive model for Aboriginal sites in the region, and the results of the Aboriginal heritage field survey. Aboriginal heritage sites are considered to be of heritage significance if they meet one or more of the following criteria:

Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons? – social value

Aboriginal sites WR1 and WR2 are representative of past activity by Aboriginal people. Although such archaeological sites/deposits retain cultural significance, a sense of place, and heritage value for local Aboriginal people, individually they are not rare at a local or regional level. Consultation undertaken to date with the stakeholder Aboriginal communities has indicated that, while all Aboriginal sites contain intrinsic cultural value, sites WR1 and WR2, and the area adjacent to Reedy Creek identified as having archaeological sensitivity, do not have any specific cultural significance to the local Aboriginal community.

Is the subject area important to the cultural or natural history of the local area and/or region and/or state? – historic value

Surface stone artefact sites WR1 and WR2, and potentially sub-surface deposits within the area adjacent to Reedy Creek identified as having archaeological sensitivity, provide evidence of stone tool manufacturing processes, and use of the lower slope adjacent to the creek as a camp site by Aboriginal people. Such site types represent a continuity of Aboriginal occupation in the Horsley Park/Eastern Creek area, and it is considered likely that a background scatter of such artefacts is present throughout similar landforms in the Cumberland Plain and the rest of NSW, although such sites are increasingly coming under threat by development of the Cumberland Plain. Sites WR1 and WR2 are not considered to have archaeological potential for substantial or intact Aboriginal stone artefact deposits, given previous disturbance and lack of artefact-bearing topsoil respectively, and therefore have low historic value. However, the area of archaeological sensitivity adjacent to Reedy Creek is considered to have archaeological potential for substantial, potentially intact Aboriginal stone artefact deposits, and therefore may have moderate-high historic value, particularly if intact alluvial deposits are present.

Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state? – scientific (archaeological) value

Aboriginal stone artefact sites are the most common site types in the region, and therefore sites WR1 and WR2 are not considered to have archaeological rarity. Further, these sites have been disturbed by various land uses, particularly construction of a dam, and erosion from vehicle movement, and would have limited potential as teaching sites for educating the general public about the Aboriginal past. The sites are also not considered to have archaeological potential for substantial or intact Aboriginal stone artefact deposits, and are therefore of low scientific value. However, the area of archaeological sensitivity adjacent to Reedy Creek is considered to have archaeological potential for substantial, potentially intact Aboriginal stone artefact deposits, and therefore may have moderate-high scientific value, particularly if intact alluvial deposits are present.

Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state? – aesthetic value

Aboriginal sites WR1 and WR2 comprise small numbers of stone artefacts exposed on a dam and an unsealed vehicle track. This is similar to other Aboriginal sites in the region, and is comparable to sites in the rest of NSW. The area of archaeological sensitivity adjacent to Reedy Creek is a potential subsurface archaeological deposit with no surface exposure. As such, sites WR1 and WR2 have low aesthetic value, and the area of archaeological sensitivity adjacent to Reedy Creek has no aesthetic value.

6.2.1 Summary Statement of Significance

Aboriginal sites WR1 and WR2, and potentially the area of archaeological sensitivity adjacent to Reedy Creek, are representative of similar Aboriginal stone artefact scatters across the Sydney region and the rest of NSW. Although all Aboriginal heritage sites contain intrinsic cultural significance, the stakeholder Aboriginal communities did not identify any further specific cultural significance attached to these sites or the area of archaeological sensitivity. Based on current scientific evidence, sites WR1 and WR2 do not have potential for substantial, intact subsurface archaeological deposits, and as such, are considered to have low historic, scientific and aesthetic value. However, the area of archaeological sensitivity adjacent to Reedy Creek is considered to have archaeological potential for substantial, potentially intact Aboriginal stone artefact deposits, and therefore may have moderate-high historic and scientific value, particularly if intact alluvial deposits are present. However, as a potential subsurface archaeological deposit with no surface exposure, it has no aesthetic value.

7 Assessment of Heritage Impact

7.1 Historic Heritage

There are no listed or potential historic heritage items within the vicinity of the study area, which will be impacted by the proposed development. The Warragamba Supply Scheme pipelines, listed on the Sydney Catchment Authority (SCA) Section 170 Register, are aligned adjacent to the northern boundary of the site and secured within SCA land. The current proposal includes a road reserve along the northern boundary, which will provide an appropriate buffer to the pipelines.

7.2 Aboriginal Heritage

The following assesses the impacts of the proposed work on the significance of the identified Aboriginal heritage sites. As per the OEH Code of Practice, a summary of impacts is presented in Table 7.1, below.

Table 7.1 Impact assessment summary.

Site/Area of archaeological sensitivity	Type of harm	Degree of harm	Consequence of harm
45-5-3684 (WR1 Prospect)	Direct	Total	Total loss of value
WR2	Direct	Total	Total loss of value
Area of archaeological sensitivity next to Reedy Creek	Direct	Partial	Partial loss of value

7.3 Assessment of Impacts

7.3.1 AHIMS Site 45-5-3684 (WR1 Prospect)

AHIMS Site 45-5-3684 (WR1 Prospect) is in the north west corner of Lot 5 DP 24094. The artefact scatter is within the proposed alignment of a road corridor on the northern side of the Wallgrove Road industrial development area (Figure 7.1). The road alignment has been finalised and cannot be altered at this stage of the project. Construction of the road will result in the destruction of this site, with a total loss of value.

7.3.2 Site WR2

Site WR2 is in the north west part of Lot 5 DP 24094. The artefact scatter is within the proposed alignment of a road and parking area adjacent to a warehouse, within the Wallgrove Road industrial development area (Figure 7.1). The position of the warehouse, road and parking area has been finalised and cannot be altered at this stage of the project. Construction of the road and parking area will result in the destruction of this site, with a total loss of value.

7.3.3 Area of Archaeological Sensitivity

The area of archaeological sensitivity has been identified, within Lot 5 DP 24094, as encompassing the lower slopes within c.100m east of Reedy Creek and its confluence, which have not been impacted by construction of the dam and cattle pen on the eastern side of the property. Most of this area will be retained within a proposed riparian corridor, and possibly within an area of setback at the southern edge of the property. The remainder of the area will be impacted by the proposed alignment of the northern road corridor, a detention basin and a warehouse and adjacent road area (Figure 7.1), which will have a direct impact on any sub-surface archaeological deposit within this area of archaeological sensitivity, resulting in a partial degree of harm and a partial loss of value.

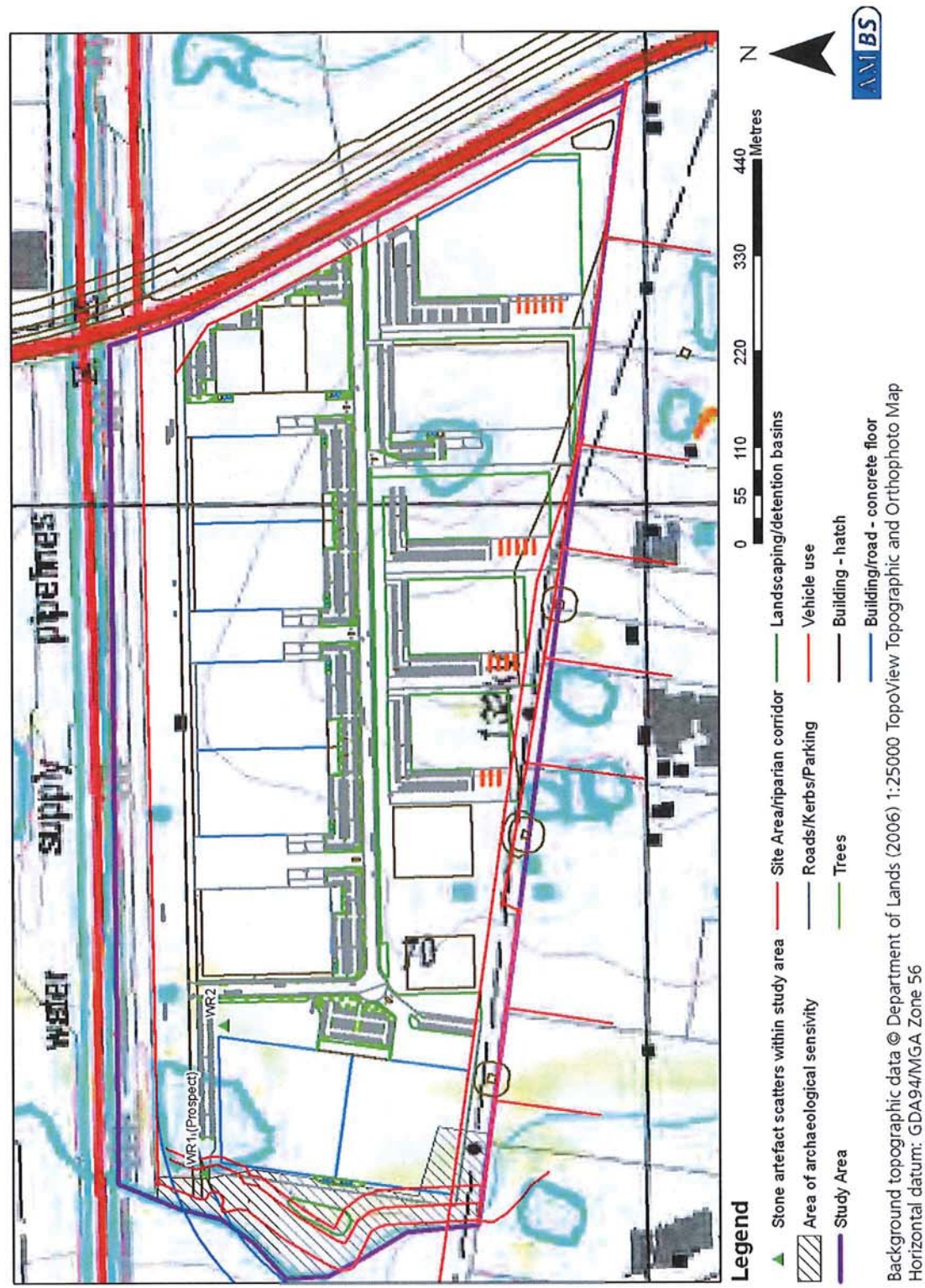


Figure 7.1 Proposed impacts on the sites and area of archaeological sensitivity.

8 Conclusion

The following recommendations are based on the statutory requirements, the results of the background research, Aboriginal community consultation, and archaeological field survey.

8.1 Recommendations

The proposed industrial development of Lot 5 DP 24094 will impact on Aboriginal artefact scatters AHIMS Site 45-5-3684 (WR1 Prospect) and site WR2, and partially impact on potential subsurface archaeological deposit within an area of archaeological sensitivity on the eastern side of Reedy Creek (Figure 7.1). As the development is proceeding under Part 4.1 of the EP&A, Gazcorp is not required to apply for an AHIP prior to undertaking the proposed development, but would need to comply with the Minister's Conditions of Approval for the project.

8.1.1 Aboriginal Sites

AHIMS Site 45-5-3684 and site WR2 have been assessed as having low research potential, and low overall scientific significance. As such, additional archaeological investigation of these sites prior to or during the proposed development is not necessary, as it is unlikely to enhance current archaeological understanding of the region or knowledge of past Aboriginal activities and land use.

Recommendation 1

The proposed development will impact AHIMS Site 45-5-3684 and WR2; however, given the low level of research potential, no further archaeological investigation of these sites are required prior to or during the proposed development works.

The proposed industrial development at Wallgrove Road is to include preservation of most of the area adjacent to Reedy Creek within a riparian corridor, and possibly within a setback at the southern side of the property. This area to be conserved encompasses a significant portion of the area of archaeological sensitivity identified adjacent to Reedy Creek, which is the most archaeologically sensitive landform within the study area. This area of conservation will provide an offset for the unavoidable loss of AHIMS Site 45-5-3684 and WR2, and the partial loss of the remainder of the area of archaeological sensitivity.

Recommendation 2

The extent of land to be retained adjacent to Reedy Creek is an appropriate offset for the destruction of Aboriginal heritage sites within areas proposed for roads and industrial development.

8.1.2 Area of Archaeological Sensitivity

It is considered that the lower slopes within c.100m east of Reedy Creek and its confluence, which have not been impacted by construction of the dam and cattle pen, may have moderate-high significance and research potential. This area of archaeological sensitivity (as identified in Figure 5.9) has the potential to reveal a continuity of activity within the landscape in the vicinity of Reedy Creek, and to complement the excavation by JMCHM (2004) further along Reedy Creek. The JMCHM excavation was located on the edge of the floodplain, which is further from the creek. Although this excavation was not near a confluence, the stream order was the same (third) as at the confluence. The JMCHM investigation was considered to have at least partially described the likely range of activities that may have occurred in closer proximity to the main creek channel, whereas an excavation near the confluence may recover high densities of artefacts (or bring to light further information regarding Aboriginal occupation around confluences, cf. ENSR 2009), which would therefore provide a more detailed picture of activity in close proximity to the creek. Further, it was noted that 'more permanent occupation may have taken place in closer proximity to the creek and its water holes' (JMCHM

2004:76), which includes the land adjacent to Reedy Creek and the confluence, within the area of archaeological sensitivity.

The potential alluvial soils along the creek and confluence may also have stratified deposit, and the apparent lack of modification to the landscape in this area suggests that such deposits may remain intact. This provides the potential for highly useful information to be gained from controlled excavation of this area.

As such, further archaeological investigation of this area of archaeological sensitivity, where it is proposed to be impacted by the road corridor and industrial development (see Figure 8.1), is likely to increase the current scientific knowledge of the region, and particularly has the potential to contribute to the regional predictive model regarding creek confluences and low-moderate (second/third) order creeks. A representative sample of the higher density of artefacts expected in the close vicinity of the creek and its confluence is recommended.

Recommendation 3

A program of test and salvage excavation should be undertaken on the slightly elevated land adjacent to the creek and its confluence, within the area of archaeological sensitivity that is proposed to be impacted (see Figure 8.1). Is it recommended that a series of 1m² pits positioned in a grid approximately 20m apart, may be appropriate for excavation.

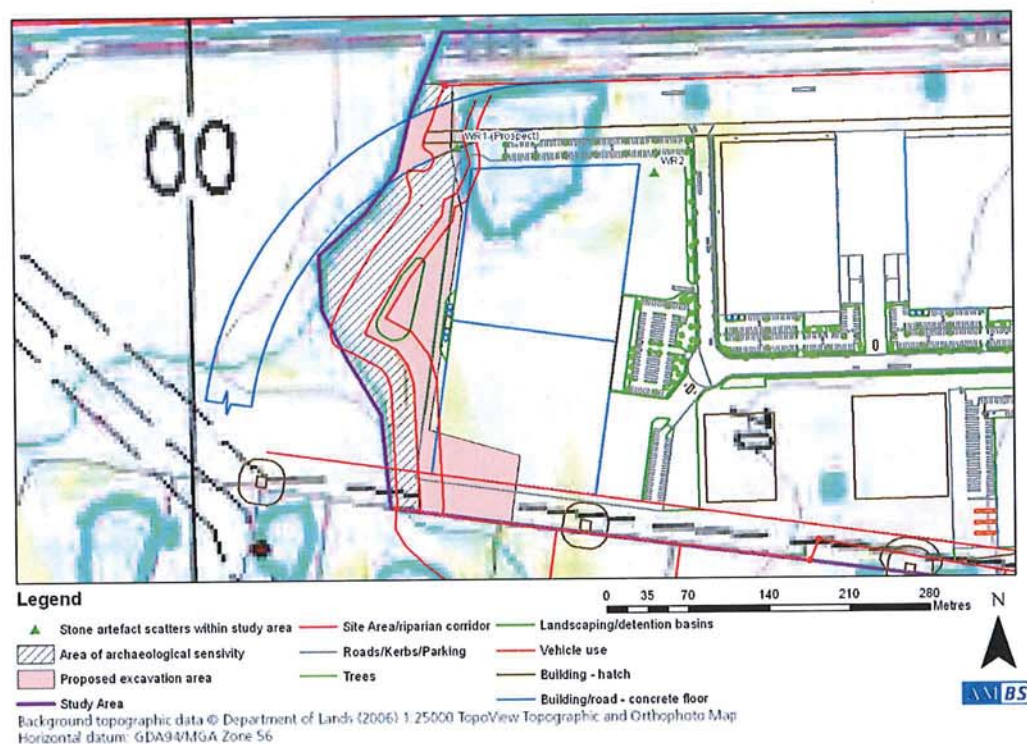


Figure 8.1 Area proposed for excavation.

8.1.3 Historic Heritage

There are no listed or potential historic heritage items within the vicinity of the study area, which will be impacted by the proposed development. As such, no further historic heritage assessment is considered to be warranted for the proposed development.

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