

**Proposed Yass Valley Wind Farm
Archaeological and Heritage Assessment
Addendum – Transmission Line**

September 2012

A report to Yass Valley Wind Farm Pty Ltd



Julie Dibden
New South Wales Archaeology Pty Limited
PO Box 2135 Central Tilba NSW 2546
Ph 02 44737947 mob. 0427074901
www.nswarchaeology.com.au

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1. SUMMARY

In 2008, New South Wales Archaeology Pty Ltd conducted an archaeological and heritage assessment of the proposed Yass Valley Wind Farm (Dibden 2008).

The current proposal consists of two geographically separate *precincts* (Coppabella and Marilba) that would contain wind turbine generators and electrical plants (substations and power lines) required to connect into the existing transmission network. This report documents an assessment of the proposed 132kV power line easement (approximately 45m wide) which would connect the Coppabella and Marilba Precincts, and thereafter, transport the wind generated energy south to the existing TransGrid 330kV line.

This document forms an Addendum report to the Proposed Yass Valley Wind Farm Heritage and Archaeological Report (Dibden 2008).

An archaeological field survey and assessment of the proposed transmission line and associated substations has been undertaken. Three previously recorded Aboriginal object sites (as listed on the NSW OEH AHIMS) have been relocated. In addition, a number of new Aboriginal object sites have been recorded.

The field survey results are in keeping with the patterns of site distribution identified in respect of the proposal during the 2008 assessment (Dibden 2008). The recorded sites do not pose a constraint to the proposal, however, management and mitigation measures are proposed, as outlined in Section 7.2 of this report.

One European historic feature has been recorded, a dead tree with a surveyors mark. It is recommended that the tree be avoided during construction.



Figure 1. Location of the proposed Yass Valley Wind Farm transmission line route (1: 50,000 topographic map).

2. INTRODUCTION

New South Wales Archaeology was commissioned by Yass Valley Wind Farm Pty Ltd in September 2012 to undertake an archaeological assessment of the proposed transmission line for the proposed Yass Valley Wind Farm Development. The Wind Farm would be located at the interface of the Southern Tablelands and the South West Slopes, between 20 and 35 kilometres west and south-west of Yass, New South Wales.

The proposed wind farm is defined as a Major Project under Part 3A of the Environmental Planning and Assessment Act 1979. The Director General, of the former NSW Department of Planning issued requirements for the preparation of an Environmental Assessment in which it is stated that an archaeological/cultural heritage assessment is required to be prepared which addresses the potential impact of the proposal on Aboriginal heritage values and items.

In 2008, New South Wales Archaeology Pty Ltd conducted an archaeological and heritage assessment of the proposed Yass Valley Wind Farm (Dibden 2008).

This report documents an assessment of the proposed 132kV power line easement (approximately 45m wide) which would connect the Coppabella and Marilba Precincts, and thereafter, transport the wind generated energy south to the existing TransGrid 330kV line.

This document forms an Addendum report to the Proposed Yass Valley Wind Farm Heritage and Archaeological Report (Dibden 2008).

The field work component of this project has been conducted by NSW Archaeology Pty Ltd and Buru Ngunawal Aboriginal Corporation. This report has been written by Julie Dibden and Andrew Pearce.

3. DESCRIPTION OF IMPACT

Transmission line

Overhead cabling would require an easement measuring approximately 45 metres wide and is proposed to be erected on 17- 20 metres high single wood or concrete poles spaced 150 - 300 metres apart, with spans avoiding all wet areas. Postholes would be 1.5 - 2 metres deep and c. 0.5 metres in diameter.

Substations

A substation is required at each of the two precincts from which the 132kV power lines would commence, to convert power from onsite reticulation voltage, to a transmission voltage of 132kV suitable to connect to the existing transmission system. An additional substation would be located adjacent to the TransGrid 330kV line.

Substations would each occupy an area measuring approximately 200 x 150 metres. The substation would be fenced and the ground covered with crushed rock and partly by concrete pads for equipment, walkways and cable covers.

Summary

It is noted that the proposed impacts are discrete in nature and will occupy a relatively small footprint within the overall area; accordingly impacts to the archaeological resource across the landscape can be considered to be partial in nature, rather than comprehensive.

4. RESULTS

Previously Recorded Sites

A NSW Office of Environment and Heritage (NSW OEH) Aboriginal Heritage Information Management System (AHIMS) site search conducted on the 9th September 2012 (Client Service ID 79610) revealed that there are 48 Aboriginal object sites in the search area. Three of these are located in close proximity to where the transmission line would cross the Hume Highway (Figure 2), as described below.

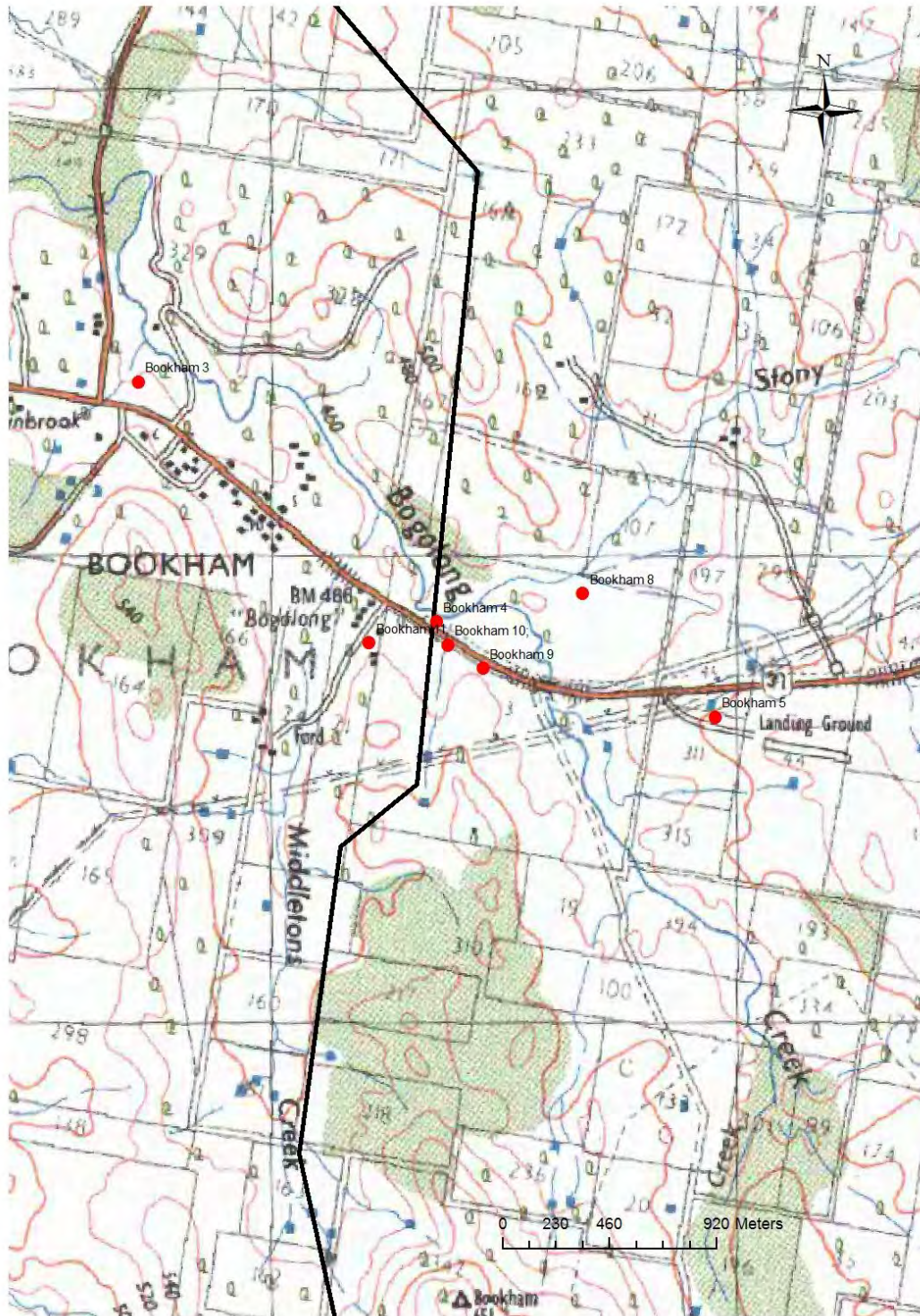


Figure 2. Location of AHIMS sites in vicinity of the proposed Transmission line near the Hume Highway.

Bookham 4 AHIMS 51-4-33

This is described as an open scatter of five artefacts on a 43 metre section of track which crosses a high flood terrace south of Bogolong Creek (Navin Officer 1993). The site was described as highly disturbed and a low density artefact scatter and assessed to be of low archaeological significance.

It is noted that a s90 consent permit was issued for this site in respect of Hume Highway roads works. A part of this site is believed to be located immediately to the north of the Hume Highway and within the proposal area. The Aboriginal object site, SU10/L2, recorded during the current survey, is probably the northern extent of this site and is described further in Table 3.

Bookham 10 AHIMS 51-4-036

This site is described as an open scatter of two stone artefacts, approximately 30m apart and located on either side of a track crossing Middleton's Creek (Navin Officer 1993). Despite the reference to Middleton's Creek, which is located further to the west, based on the grid reference provided and a review of the map in the Navin Officer report, this site is believed to be located immediately to the south of the Hume Highway and within the proposal area. The Aboriginal object site, SU10/L1, recorded during the current survey, is probably a part of this site and is described further in Table 3.

Bookham 11 AHIMS 51-4-037

This site is described as an open scatter of three stone artefacts, in a 2 square metre area, located on an internal access track crossing a spur, near the outbuilding of the 'Bogolong' property (Navin Officer 1993). The site was described as disturbed and assessed to be of low archaeological significance. The Aboriginal object site, SU10/L1, recorded during the current survey, is probably a part of this one large site and is described further in Table 3.

The Bookham sites were recorded by Jan Klaver (Navin Officer 1993) who identified 7 artefact scatters near Bookham in respect of the proposed Hume Highway Bypass. The sites were all low density artefact scatters consisting mostly of chert and quartzite flakes.

It is noted that OzArk Environmental and Heritage Management (2007) conducted a survey of the Wagga Wagga – Yass 132kV transmission line. The proposal relates to pole replacement works in an existing easement. Four Aboriginal artefact scatters only were recorded during the field survey of the entire route, none of which are located near to the current proposal area.

Field Survey

The field survey was designed to encompass the entirety of the proposed transmission line route (and associated substations) and, in so doing, assess all areas of proposed impacts. The field survey was undertaken over a three day period and entailed a foot survey undertaken by two people on each day.

The Transmission Line study area has been divided into 27 Survey Units. These Survey Units are described in Table 1; their location is shown in Figures 3 and 4.

SU	Proposed Impacts	Morphological Landform	Slope	Aspect	Geology	Abundance Rock	Abundance Quartz	Soil	Geomorphology	Agents	Erosion Type	Predicted artefact density
SU1	powerline route	simple slope	gently inclined	west	shale	low	low	silty clay loam	eroded	precipitation; wind	sheet, surface wash	generally very low
SU2	powerline route	drainage depression	gently inclined	open	shale	low	low	silty clay loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU3	powerline route	simple slope	gently to moderately inclined	east	shale / volcanic	low to rocky	low	silty clay loam / lithosol	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low
SU4	powerline route	crest	gently to moderately inclined	open	volcanic	rocky	low	lithosol	eroded	precipitation; wind	sheet, surface wash	negligible
SU5	powerline route	simple slope	gently to moderately inclined	east	shale / volcanic	low	low	silty clay loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU6	powerline route	drainage depression	gently to moderately inclined	open	shale	low	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low to low
SU7	powerline route	crest; gently undulating	gently inclined	west	shale	slightly rocky	low	silty loam	eroded	precipitation; wind; also mechanical	sheet, surface wash	generally very low
SU8	powerline route	simple slope	very gently inclined	west	shale	low	low	silty loam	eroded or aggraded	precipitation; wind; also mechanical	sheet, surface wash	generally very low to low
SU9	powerline route	crest; gently undulating	very gently inclined	open	volcanic	rocky	low	lithosol	eroded	precipitation; wind	sheet, surface wash	generally very low
SU10	powerline route	simple slope	very gently inclined	east	shale	low	low	silty loam	eroded	precipitation; wind; also mechanical	sheet, surface wash	generally low to moderate
SU11	powerline route	drainage depression	gently to moderately inclined	north	volcanic	rocky	moderate	silty loam	eroded	precipitation; wind	sheet, surface wash	generally low
SU12	powerline route	simple slope	gently to moderately inclined	north	volcanic	slightly rocky to rocky	low	silty loam	eroded	precipitation; wind; also mechanical	sheet, surface wash	generally very low to low
SU13	powerline route	saddle	very gently inclined	open	volcanic	slightly rocky	low	silty loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU14	powerline route	crest	moderate to steeply inclined	open	volcanic	rockland	moderate	lithosol	eroded	precipitation; wind	sheet, surface wash	negligible
SU15	powerline route	simple slope	moderately inclined	west	volcanic	slightly rocky to rocky	moderate	silty loam / lithosol	eroded	precipitation; wind	sheet, surface wash	generally very low to low

SU	Proposed Impacts	Morphological Landform	Slope	Aspect	Geology	Abundance Rock	Abundance Quartz	Soil	Geomorphology	Agents	Erosion Type	Predicted artefact density
SU16	powerline route	drainage depression	very gently inclined	north	volcanic	negligible	low	silty loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU17	powerline route	crest	moderately inclined	open	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low to low
SU18	powerline route	simple slope	very gently inclined	west	volcanic	negligible	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally low to moderate
SU19	powerline route	simple slope	very gently inclined	west	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low to moderate
SU20	powerline route	crest; gently undulating	gently to moderately inclined	open	volcanic	slightly rocky	low	silty loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU21	powerline route	flat	level	open	volcanic	nil	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally low to moderate
SU22	powerline route	drainage depression	very gently inclined	open	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally low
SU23	powerline route	crest	gently to moderately inclined	open	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low
SU24	powerline route	simple slope	very gently inclined	east	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low to low
SU25	powerline route	drainage depression	very gently inclined	north	volcanic	slightly rocky	low	silty loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU26	powerline route	simple slope	very gently inclined	west	volcanic	slightly rocky	low	silty loam	eroded or aggraded	precipitation; wind	sheet, surface wash	generally very low to low
SU27	powerline route	crest	gently to moderately inclined	open	volcanic	slightly rocky	low	silty loam	eroded	precipitation; wind	sheet, surface wash	generally very low

Table 1. Survey Unit descriptions.

Survey Coverage

The area surveyed during this assessment measured approximately 106 hectares (Table 2). It is estimated that approximately 61 hectares of that area was subject to survey inspection. Ground exposures inspected are estimated to have totaled about one hectare. Of that ground exposure area archaeological visibility (the potential artefact bearing soil profile) is estimated to have been approximately 0.43 hectares. Effective Survey Coverage is therefore relatively low and calculated to have been 0.41%. The low ESC was due to low levels of ground exposure due to abundant rain and hence consistent ground cover.

SU	Area Sq m	Area inspected %	Area inspected Sq m	Ground exposure %	Ground exposure Sq m	Archaeological visibility %	Archaeological visibility Sq m	ESC %
SU1	61350	60	36810	0.5	184.05	40	73.62	0.12
SU2	5050	70	3535	4	141.4	50	70.7	1.4
SU3	74750	60	44850	0.1	44.85	30	13.455	0.018
SU4	9550	60	5730	0.1	5.73	30	1.719	0.018
SU5	91350	60	54810	10	548.1	60	328.86	0.36
SU6	5900	70	4130	4	165.2	40	66.08	1.12
SU7	48750	60	29250	2	585	40	234	0.48
SU8	101750	50	50875	8	4070	30	1221	1.2
SU9	36650	60	21990	0.2	43.98	20	8.796	0.024
SU10	15700	80	12560	7.5	942	50	471	3
SU11	7050	60	4230	0	0	0	0	0
SU12	142650	50	71325	4	2853	60	1711.8	1.2
SU13	46100	60	27660	0.2	55.32	50	27.66	0.06
SU14	24100	50	12050	0	0	0	0	0
SU15	10900	50	5450	0	0	0	0	0
SU16	11300	50	5650	10	56.5	40	22.6	0.2
SU17	16500	60	9900	0	0	0	0	0
SU18	2650	70	1855	0.5	9.275	60	5.565	0.21
SU19	96250	60	57750	0	0	0	0	0
SU20	121200	60	72720	0.1	72.72	40	29.088	0.024
SU21	17350	60	10410	0	0	0	0	0
SU22	3400	70	2380	0.2	4.76	40	1.904	0.056
SU23	39400	60	23640	0.1	23.64	30	7.092	0.018
SU24	13200	60	7920	0	0	0	0	0
SU25	11450	70	8015	2	160.3	50	80.15	0.7
SU26	21500	60	12900	0	0	0	0	0
SU27	31050	50	15525	0	0	0	0	0
total	1066850		613920		9966		4375	0.41

Table 2. Survey Coverage Data.

A total of nine Aboriginal object locales were recorded within the proposed transmission line easement. These sites are listed in Table 3; their location is shown in Figures 3 and 4. All locales are stone artefacts. Stone artefacts are listed and described in Table 4.

Artefacts were recorded in eight of the 27 Survey Units inspected. It is recognised that Effective Survey Coverage was generally low across the study area, nevertheless, the majority of Survey Units are assessed on environmental grounds to be of low archaeological potential, being located on broad, amorphous crests or simple slopes of moderate gradient, and at some distance from reliable water sources. These landforms are not known to be archaeologically sensitive; that is, while they may contain artefacts, their density is likely to be very low to negligible.

Artefacts were generally recorded in close association with watercourses, and this is a product of both the tendency for higher densities of artefacts to be located in this environmental setting, and also as the result of increased ground surface exposure being present in these areas due to erosional processes. The survey coverage variables recorded at each of these artefact locales is listed in Table 3. Given the relatively large areas of exposure at these locales, and the very few artefacts recorded, it is concluded that artefact density, generally is very low in the proposed power line easement. This result is not unexpected and indeed consistent with the relevant predictive model of Aboriginal land use (see Dibden 2008).

SU	Locale	Easting GDA	Northing GDA	Area m	Exposure Type	Exposure Area m	Ground Exposure %	Archaeological Visibility %	Artefact #	Predicted Density	Condition	Subsurface potential at locale	Subsurface potential away from locale
SU1	L1 Plate 1	651506	6137392	5 x 2	erosion animal track bare earth	40 x 2	80	40	2	very low	highly disturbed: erosion	No – highly eroded	Yes - however probably very low density
SU5	L1 Plate 2	650432	6141073	70 x 30	erosion bare earth	100 x 100	80	90	16	low	highly disturbed: erosion	No – highly eroded	Yes - On southern side of highly eroded drainage line
SU6	L1 Plate 3	650425	6141995	5 x 5	bare earth	40 x 20	70	50	3	very low	highly disturbed: erosion	No – eroded	Yes – north of terrace, above eroding exposure
SU8	L1 Plate 4	650278	6143508	4 x 3	animal and vehicle tracks bare earth	20 x 3	50	50	1	very low	moderately disturbed: erosion, vehicle and stock traffic	No – highly disturbed	Yes - however probably low density
SU10 Note grid ref in centre of site	L1 Plate 5 5I-4-36 5I-4-37	650678	6145752	100 x 200	animal and vehicle tracks bare earth erosion	130 x 3	30	50	60 (estimate)	low	Moderately to highly disturbed; erosion, vehicle and stock traffic, bridge construction	Yes – though moderately to highly disturbed	Yes – though moderately to highly disturbed
SU10	L2 Plate 6 5I-4-33	650782	6145946	30 x 3	animal and vehicle tracks erosion bare earth	30 x 3	40	50	1	very low	highly disturbed; erosion, vehicle and stock traffic	No – area is highly disturbed	No – area is highly disturbed
SU13	L1 Plate 7	646634	6151081	5 x 1	animal tracks bare earth	50 x 0.5	60	80	2	very low	moderately disturbed	Yes - however probably very low density	Yes - however probably very low density
SU18	L1 Plate 8	645319	6151957	30 x 10	animal tracks bare earth	30 x 10	40	80	9	low	moderately disturbed	Yes - however probably very low density	Yes - higher densities probable closer to drainage depression
SU20	L1 Plate 9	650762	6148164	5 x 2	animal tracks	100 x 5	30	70	2	very low	moderately disturbed	Yes - however probably very low density	Yes - however probably very low density

Table 3. Summary of Aboriginal object locales recorded in the survey area.

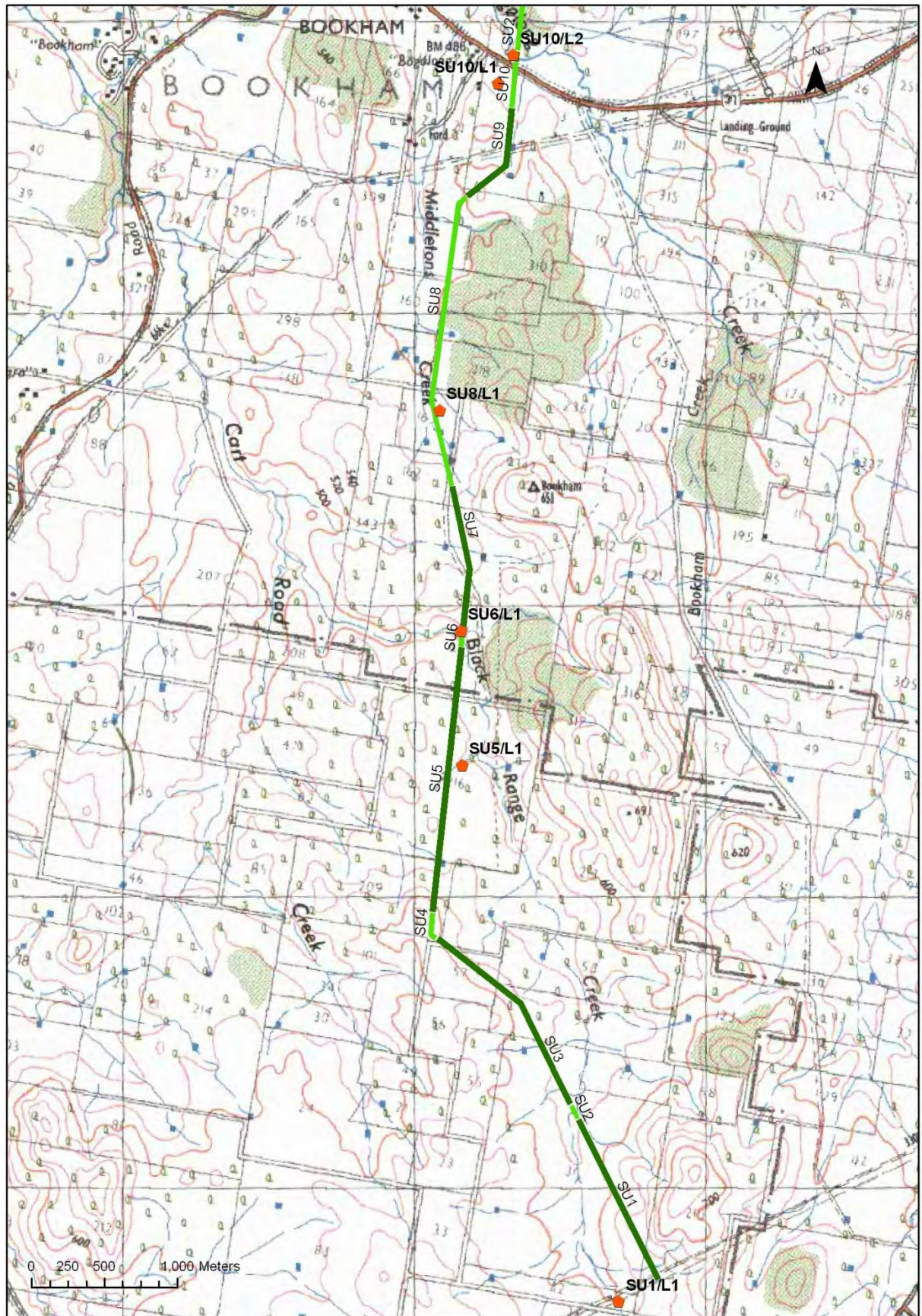


Figure 3. Location of Survey Units and Aboriginal Object locales identified during the subject survey in the southern section of the Yass Valley Wind Farm Power Line route.

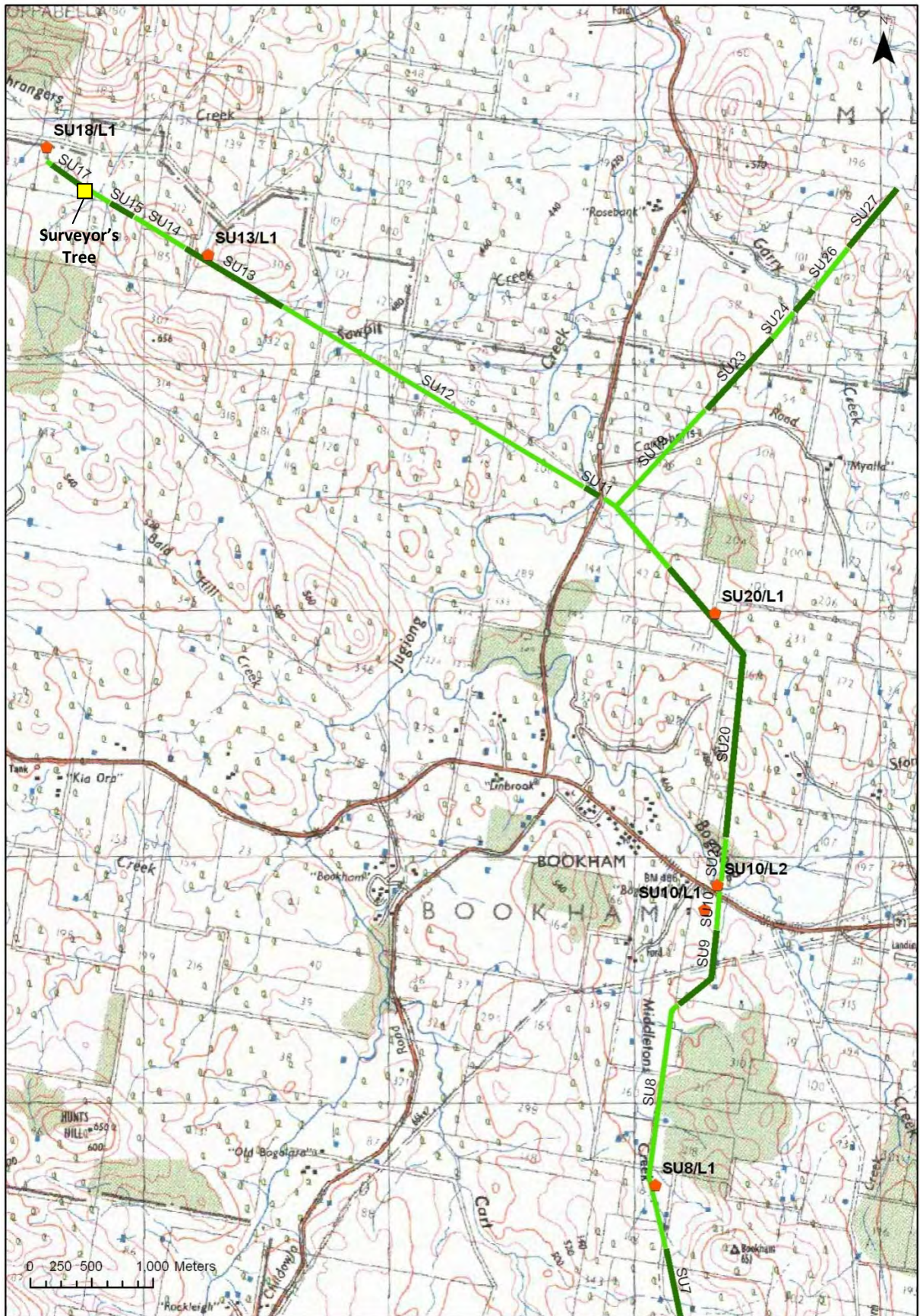


Figure 4. Location of Survey Units, Aboriginal Object locales and Surveyor's Tree, identified during the subject survey in the northern section of the Yass Valley Wind Farm Power Line route.

Locale	Type	Size (size class unless otherwise indicated)	Material	Comments
SU1/L1	Flake - distal portion	38 x 28 x 9 mm	Grey silcrete	
SU1/L1	Flake - distal portion	21 x 32 x 8 mm	Grey silcrete	
SU5/L1	Broken flake	32 x 27 x 12 mm	Grey silcrete	
SU5/L1	Flake - distal portion	19 x 15 x 4 mm	Grey silcrete	
SU5/L1	Flake	18 x 20 x 3 mm	Grey silcrete	
SU5/L1	Flake	11 x 24 x 5 mm	Grey silcrete	
SU5/L1	Flake fragment	24 x 14 x 3 mm	Grey silcrete	
SU5/L1	Flake fragment	21 x 12 x 2 mm	Grey silcrete	
SU5/L1	Flake fragment	22 x 12 x 4 mm	Grey silcrete	
SU5/L1	Flake fragment	14 x 12 x 2 mm	Grey silcrete	
SU5/L1	Flake – proximal portion	10 x 8 x 2 mm	Grey silcrete	
SU5/L1	Flake – distal portion	8 x 9 x 2 mm	Grey silcrete	
SU5/L1	Flake – medial portion	8 x 6 x 1 mm	Grey silcrete	
SU5/L1	Flake - distal portion	22 x 23 x 9 mm	Grey silcrete	
SU5/L1	Flake - distal portion	21 x 22 x 4 mm	Grey silcrete	
SU5/L1	Flake	11 x 8 x 2 mm	Grey silcrete	
SU5/L1	Flaked piece	9 x 8 x 3 mm	Grey silcrete	
SU5/L1	Broken flake	46 x 27 x 7 mm	Brown volcanic	Longitudinally split
SU6/L1	Flake	22 x 31 x 9 mm	Brown silcrete	
SU6/L1	Flake	24 x 13 x 5 mm	Red silcrete	
SU6/L1	Pebble	122 x 61 x 18 mm	Grey volcanic	Tabular, tapering at one end, flaking present along one side of broader end.
SU8/L1	Flake	25 x 23 x 7 mm	Grey silcrete	10% terrestrial cortex
SU10/L1	Flaked piece	34 x 25 x 20 mm	Grey silcrete	
SU10/L1	Flake	40 x 31 x 11 mm	Grey silcrete	Hertzian
SU10/L1	Flaked piece	45 x 32 x 15 mm	Grey silcrete	
SU10/L1	Flake	32 x 17 x 12 mm	Milky quartz	
SU10/L1	Flake - distal portion	11 x 12 x 3 mm	Milky quartz	
SU10/L1	Flake	4 x 10 x 2 mm	Milky quartz	
SU10/L1	Flake	54 x 26 x 7 mm	Grey chert	
SU10/L1	Flake	22 x 29 x 7 mm	Grey chert	
SU10/L1	Flake - distal portion	27 x 14 x 5 mm	Black chert	
SU10/L1	Flake	13 x 9 x 4 mm	Milky quartz	
SU10/L2	Flake	54 x 18 x 10	Grey silcrete	Hertzian
SU13/L1	Flake	35 x 19 x 12 mm	Grey chert	Hertzian
SU13/L1	Core	49 x 29 x 23 mm	Grey chert	Seven negative flake scars; three rotations
SU18/L1	Flake	65 x 46 x 14 mm	Grey quartzite	Hertzian
SU18/L1	Core	52 x 31 x 21 mm	Grey chert	Striated material; 4 negative flake scars
SU18/L1	Flake - proximal portion	33 x 24 x 9 mm	Grey chert	Hertzian
SU18/L1	Flake	43 x 28 x 6 mm	Grey chert	Hertzian; notch on one chord measuring 10 x 6 mm and showing usewear
SU18/L1	Flake fragment	26 per 25 x 6 mm	Grey chert	
SU18/L1	Core fragment	35 x 25 x 21 mm	Grey silcrete	
SU18/L1	Flake	28 x 24 x 5 mm	Grey silcrete	20% terrestrial cortex
SU18/L1	Flaked piece	17 x 18 x 5 mm	Grey silcrete	
SU18/L1	Flake	13 x 6 x 2 mm	Milky quartz	
SU20/L1	Flake fragment	26 x 20 x 9 mm	Grey chert	
SU20/L1	Flake	19 x 26 x 7 mm	Grey chert	Hertzian

Table 4. Summary of recorded artefacts.



Plate 1 SU1/L1 looking 5°.



Plate 2 SU5/L1 looking 225°.



Plate 3 SU6/L1 looking 340°.



Plate 4 SU8/L1 looking 330°.



Plate 5 SU10/L1 (part of AHIMS 51-4-36 & 51-4-37) looking 5°.



Plate 6 SU10/L2 (part of AHIMS 51-4-33) looking 130 °.



Plate 7 SU13/L1 looking 5°.



Plate 8 SU18/L1 looking 235°.



Plate 9 SU20/L1 looking 200 °.

During the field survey one Non-Indigenous heritage item was recorded in proximity to the proposed power line route. This item is a ‘surveyor’s tree’ with incised ‘shield’ and accompanying identifying marking, situated in Survey Unit 17 (grid ref: 645618. 6151607 GDA). The remnant tree is now dead, though still standing, and carries the carved blaze on its southern side, with the numeral ‘6’ chiseled within it (Plate 10).



Plate 10. Surveyor’s tree, located in Survey Unit 17, looking 330°.

5. STATUTORY CONTEXT

The Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act), its regulations, schedules and guidelines provides the context for the requirement for environmental impact assessments to be undertaken during land use planning (NPWS 1997).

Part 3A of the Environmental Planning and Assessment Act 1979

On 9 June 2005 the NSW Parliament passed the Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Bill. The Act was assented to on 16 June 2005 and commenced on 1 August 2005. This amendment contains key elements of the NSW Government's planning system reforms and makes major changes to both plan-making and major development assessment.

A key component of the amendments is the insertion of a new Part 3A (Major Projects) into the EP&A Act. The new Part 3A consolidates the assessment and approval regime for all major developments which previously were addressed under Part 4 (Development Assessment) or Part 5 (Environmental Assessment).

Part 3A applies to all major State government infrastructure projects, developments previously classified as State significant and other projects, plans or programs of works declared by the Minister. The amendments aim to provide a streamlined assessment and approvals regime and also to improve the mechanisms available under the EP&A Act to enforce compliance with approval conditions of the Act.

Under Part 3A Major infrastructure and other projects, the following relevant definitions apply:

approved project means a project to the extent that it is approved by the Minister under this Part, but does not include a project for which only approval for a concept plan has been given.

critical infrastructure project means a project that is a critical infrastructure project.

development includes an activity within the meaning of Part 5.

major infrastructure development includes development, whether or not carried out by a public authority, for the purposes of roads, railways, pipelines, electricity generation, electricity or gas transmission or distribution, sewerage treatment facilities, dams or water reticulation works, desalination plants, trading ports or other public utility undertakings.

project means development that is declared under section 75B to be a project to which this Part applies.

proponent of a project, means the person proposing to carry out development comprising all or any part of the project, and includes any person certified by the Minister to be the proponent.

The current report has been compiled for inclusion within an Environmental Assessment Report

Under the terms of Part 3A of the Environmental Planning and Assessment Act 1979 the following authorizations are not required for an approved project (and accordingly the provisions of an Act that prohibit an activity without such an authority do not apply):

- a permit under section 87 or a consent under section 90 of the *National Parks and Wildlife Act 1974*;
- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*.

6. SIGNIFICANCE ASSESSMENT

The scientific significance of the recorded Aboriginal artefact locales in the project area are listed below in Table 5:

SU	Locale	Predicted Density	Condition	Subsurface potential at locale	Subsurface potential away from locale	Significance	Criteria
SU1	L1	very low	highly disturbed: extreme erosion	No – highly eroded	Yes - however probably very low density	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted very low artefact density; highly disturbed and eroded: limited excavation potential
SU5	L1	low	highly disturbed: extreme erosion	No – highly eroded	Yes - On southern side of highly eroded drainage line	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted low artefact density; highly disturbed and eroded: limited excavation potential
SU6	L1	very low	highly disturbed: erosion	No – eroded	Yes – north of terrace, above eroding exposure	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: highly disturbed and eroded: predicted very low artefact density
SU8	L1	very low	moderately disturbed: erosion, vehicle and stock traffic	No – disturbed	Yes - however probably low density	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted very low artefact density in moderately disturbed context: limited excavation potential
SU10 <i>AHIMS 51-4-0036 51-4-0037</i>	L1	low to moderate	Moderately to highly disturbed; erosion, vehicle track, bridge construction and stock traffic	Yes – though moderately to highly disturbed	Yes – though moderately to highly disturbed	Potentially low/moderate scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low/moderate research potential: predicted low/moderate artefact density in moderate to highly disturbed context
SU10 <i>AHIMS 51-4-0033</i>	L2	very low	highly disturbed; erosion, vehicle and stock traffic	No – area is too highly disturbed	No – area is too highly disturbed	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted very low artefact density in highly disturbed context; eroded.

SU	Locale	Predicted Density	Condition	Subsurface potential at locale	Subsurface potential away from locale	Significance	Criteria
SU13	L1	very low	moderately disturbed	Yes - however probably very low density	Yes - however probably very low density	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted very low artefact density.
SU18	L1	Low to moderate	moderately disturbed	Yes - however probably very low density	Yes - higher densities probable closer to drainage depression	Potentially low/moderate scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Moderate research potential: predicted low to moderate artefact density; moderately disturbed.
SU20	L1	very low	moderately disturbed	Yes - however probably very low density	Yes - however probably very low density	Low local scientific significance	Common Aboriginal object and site type Low educational value Low aesthetic value Low research potential: predicted very low artefact density; moderately disturbed – eroded.

Table 5. Scientific significance of Aboriginal objects recorded in the power line easement.

7. MITIGATION AND MANAGEMENT STRATEGIES

The aim of this study has been to identify Aboriginal objects and Non-Indigenous items and to predict the archaeological potential within each Survey Unit, to assess site significance and thereafter, to consider the potential impact of the proposal upon this heritage.

In the following section a variety of strategies that can be considered for the mitigation and management of development impact to Aboriginal objects, Non-Indigenous items and Survey Units (including those without Aboriginal object recordings) are listed and discussed.

7.1 Management and Mitigation Strategies

Further Investigation

The field survey has been focused on recording artefactual material present on visible ground surfaces. Further archaeological investigation entails subsurface excavation which is generally undertaken as test pits for the purposes of identifying the presence of artefact bearing soil deposits and their nature, extent, integrity and significance.

Further archaeological investigation in the form of subsurface test excavation can be appropriate in certain situations. Such situations generally arise when the proposed development is expected to involve ground disturbance in areas which are assessed to have potential to contain high density artefactual material and when the Effective Survey Coverage achieved during a survey of a project area is low due to ground cover, vegetation etc. In certain situations subsurface investigation provides a necessary level of surety in regard to the archaeological status of a place so that informed management decisions can be duly made.

A strategy of subsurface test excavation is pro-active and enables the proponent to properly understand the nature of archaeological deposits prior to development activity occurring. However no Survey Units have been identified in the proposal area to warrant further archaeological investigation in order to formulate appropriate management and mitigation strategies. Based on a consideration of the predictive model of site type applicable to the environmental context in which impacts are proposed the archaeological potential of the proposed impact areas does not warrant further investigation.

In the study area, ridges contain eroded and skeletal soils as a result of high levels of erosion; generally these soils have low potential to contain intact and/or stratified archaeological deposit. Given the skeletal nature of these soils the potential to physically conduct subsurface excavation is limited. Furthermore, the ridges generally are not predicted to contain artefact density which would warrant test excavation.

Elsewhere in locations which contain deeper soil deposits such as landforms located in the lower valley contexts a number of additional factors have been taken into consideration to determine whether or not further investigation is necessary. Proposed impacts in these landforms are small scale, discrete and generally linear impacts; accordingly impacts are low. In addition, it is considered that in regard to the archaeology itself, subsurface testing is unlikely to produce results different to predictions made in respect of the subsurface potential of these landforms. Accordingly a program of subsurface testing is not considered to be necessary or warranted in regard to the proposal.

Conservation

Conservation is a suitable management option in any situation however, it is not always feasible to achieve. Such a strategy is generally adopted in relation to sites which are assessed to be of high cultural and scientific significance, but can be adopted in relation to any site type.

When conservation is adopted as a management option it may be necessary to implement various strategies to ensure sites and 'Aboriginal objects' are not inadvertently destroyed or disturbed during construction works or within the context of the life of the development project. Such procedures are essential when development works are to proceed within close proximity to identified sites.

In the case at hand, conservation of the artefacts locales is considered to be desirable if at all possible. However, given the nature and density of the stone artefacts recorded in the proposal area and the generally low scientific significance rating each artefact locale has been accorded, none are assessed to warrant conservation if impacts are proposed.

Mitigated Impacts

Mitigated impact usually takes the form of partial impacts only (i.e. conservation of part of an Aboriginal object locale or Survey Unit, and limiting the extent of impacts) and/or salvage in the form of further research and archaeological analysis prior to impacts. Such a management strategy is generally appropriate when Aboriginal objects are assessed to be of moderate or high significance to the scientific and/or Aboriginal community and when avoidance of impacts and hence full conservation is not feasible. Salvage can include the surface collection or subsurface excavation of Aboriginal objects and subsequent research and analysis.

Some of the recorded Aboriginal object locales and/or discrete areas within wider Survey Units are assessed to be of low/moderate archaeological significance. Accordingly it is generally recommended that limiting the extent of impacts to these locales, if at all feasible, should be given consideration.

For some Aboriginal object locales and/or discrete areas within wider Survey Units avoidance of impacts is unlikely to be feasible. Accordingly it is recommended a strategy of impact mitigation is appropriate.

Unmitigated Impacts

Unmitigated Impacts to Aboriginal objects can be given consideration when they are assessed to be of low or low/moderate archaeological and cultural significance, in situations where conservation is simply not feasible and when mitigation is not warranted.

Given the nature and density of the majority of artefact locales recorded in the proposal area and the low scientific significance rating they been accorded, unmitigated impacts would be appropriate if impacts are proposed.

7.2 Management Options

The table below summarises the management and mitigation strategies considered to be relevant to proposal areas. Management and mitigation strategies are addressed in relation to all Survey Units recorded during the study (noting that not all Survey Units contain Aboriginal object locales) and where relevant individual locales located within each Survey Unit. The assessed archaeological significance of each Aboriginal object locale is listed given that site significance forms the basis for rationalizing the proposed management strategy. The recommended management strategy listed for each Survey Unit and Aboriginal object locale is selected from the various management options as discussed above in Section 7.1. Finally, the rationale behind each recommendation is outlined, taking into consideration the nature of the Aboriginal object and its archaeological significance rating.

SU	Locales	Artefact density (predicted and as per analysis of ESC)	Significance	Recommended management strategy	Rationale
SU1	-	very low	-	No constraints Unmitigated impacts	Predicted very low artefact density in survey unit. Archaeological significance assessed to be low.
SU1	L1	very low	Low local scientific significance	n/a No proposed impacts	n/a
SU2	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU3	-	generally very low	-	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.
SU4	-	negligible	-	No constraints Unmitigated impacts	Predicted negligible artefact density. Archaeological significance assessed to be low.
SU5	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU5	L1	low	Low local scientific significance	n/a No proposed impacts	n/a
SU6	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution.

SU	Locales	Artefact density (predicted and as per analysis of ESC)	Significance	Recommended management strategy	Rationale
					Archaeological significance assessed to be low.
SU6	L1	very low	Low local scientific significance	No constraints Unmitigated impacts, however, avoid disturbance to the area if practicable	Very low artefact density. Disturbed and eroded, with archaeological significance assessed to be low.
SU7	-	generally very low	-	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.
SU8	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted very low to low density artefact distribution. Archaeological significance assessed to be low.
SU8	L1	very low	Low local scientific significance	No constraints Unmitigated impacts, however, avoid disturbance to the area if practicable	Very low artefact density. Moderately disturbed and eroded, with archaeological significance assessed to be low.
SU9	-	generally very low	-	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.
SU10	-	low	-	Mitigated impacts Keep all ground disturbance to an absolute minimum.	Predicted generally low to moderate density artefact distribution in a Survey Unit which has moderate to high levels of disturbance from erosion, fencing, bridge and vehicle track construction. Archaeological significance assessed to be low/moderate.
SU10	L1 51-4-0036 51-4-0037	low	Potentially low/moderate scientific significance	Conservation if feasible If feasible, avoid impacts between grid references: AGD 650702.6145507 and Bogolong Ck.	Low/moderate research potential: predicted low artefact density in moderately to highly disturbed context.
SU10	L2 51-4-0033	very low	Low local scientific significance	No constraints Unmitigated impacts	Very low artefact density. Highly disturbed and eroded, with archaeological significance assessed to be low.
SU11	-	generally low	-	No constraints Unmitigated impacts	Predicted low density artefact distribution. Archaeological significance assessed to be low.
SU12	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted very low to low density artefact distribution. Archaeological significance assessed to be low.
SU13	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted very low to low density artefact distribution. Archaeological significance assessed to be low.
SU13	L1	very low	Low local scientific significance	No constraints Unmitigated impacts	Very low artefact density. Moderately disturbed, with archaeological significance assessed to be low.
SU14	-	negligible	-	No constraints Unmitigated impacts	Predicted generally negligible density artefact distribution. Archaeological significance assessed to be low.
SU15	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU16	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU17	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU18	-	low to moderate	-	Conservation Relocate substation to	Predicted low to moderate artefact density. Archaeological significance

SU	Locales	Artefact density (predicted and as per analysis of ESC)	Significance	Recommended management strategy	Rationale
				SU17	assessed to be low to moderate.
SU18	L1	low to moderate	Potentially low/moderate scientific significance	Conservation Relocate substation to SU17	Predicted low to moderate artefact density. Archaeological significance assessed to be low to moderate.
SU19	-	generally low to moderate	-	Mitigated impacts Keep all ground disturbance in the area where the two TLs meet to an absolute minimum.	Predicted low to moderate artefact density. Archaeological significance assessed to be low to moderate.
SU20	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU20	L1	very low	Low local scientific significance	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.
SU21	-	generally low to moderate	-	Mitigated impacts Keep all ground disturbance in the area to an absolute minimum.	Predicted low to moderate artefact density. Archaeological significance assessed to be low to moderate.
SU22	-	generally low	-	No constraints Unmitigated impacts	Predicted generally low density artefact distribution. Archaeological significance assessed to be low.
SU23	-	generally very low	-	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.
SU24	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU25	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU26	-	generally very low to low	-	No constraints Unmitigated impacts	Predicted generally very low to low density artefact distribution. Archaeological significance assessed to be low.
SU27	-	generally very low	-	No constraints Unmitigated impacts	Predicted generally very low density artefact distribution. Archaeological significance assessed to be low.

Table 6. Recommended management strategies relating to Survey Units and Aboriginal object locales in the proposed transmission line easement.

7. RECOMMENDATIONS

The following recommendations are made on the basis of:

- A consideration of the Part 3A amendment to the Environmental Planning and Assessment Act (see Section 5 Statutory Information).
- The results of the investigation as documented in this report.
- Consideration of the type of development proposed and the nature of proposed impacts.

Management and mitigation strategies are outlined and justified in Section 7 of this report. The following recommendations are provided in summary form:

- No Survey Units have been identified in the proposal area to warrant further archaeological investigation such as subsurface test excavation.
- None of the Survey Units in the proposal area have been assessed to surpass archaeological significance thresholds which would act to entirely preclude proposed impacts.
- The majority of the Aboriginal object locales recorded are very low or low density distributions of stone artefacts. The archaeological significance of these locales is assessed to be low. Accordingly, a management strategy of unmitigated impact is considered to be appropriate.
- A number of the Aboriginal object locales and/or discrete areas within Survey Units are assessed to be of low/moderate archaeological significance. Accordingly, in regard to these areas it is generally recommended that avoidance or limiting the extent of impacts to these locales, if at all feasible, should be given consideration.
- It is recommended that additional archaeological assessment is conducted in any areas which are proposed for impacts that have not been surveyed during the current assessment. It is predicted that significant Aboriginal objects can occur anywhere in the landscape and accordingly if present they need to be identified and impact mitigation strategies implemented prior to impacts.

8. REFERENCES

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