Appendix C Heritage Report

ABORIGINAL AND EUROPEAN HERITAGE REPORT:

BAMARANG GAS FIRED POWER STATION

MODIFICATION FOR A 330 KV NETWORK CONNECTION, WEST OF NOWRA, NSW.

Report prepared by

OzArk Environmental and Heritage Management P/L

for

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on behalf of

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1. INTRODUCTION

This report was commissioned by Sinclair, Knight and Merz Australia P/L (SKM) on behalf of Delta Electricity (Delta). It details the results of an Aboriginal and European heritage assessment, along the preferred easement for the proposed Bamarang 330kV transmission line easement, Nowra, NSW (**Figures 1** & **2**).

1.1 Project Scope

The consultant was briefed to undertake survey and assessment of Aboriginal and European heritage issues arising from the proposed construction of the Bamarang 330kV electricity transmission line (ETL), NSW. This investigation included the following aspects:

- A search of all relevant registers of information for both Aboriginal and European heritage: the NSW Department of Environment and Climate Change (DECC) Aboriginal Heritage Information Management System (AHIMS); the NSW Heritage Office State Heritage Register and State Heritage Inventory; the National Trust of Australia (NSW) Register; the Australian Heritage Database and the Shoalhaven Local Government Area LEP (1985, amended 2008);
- Review of the relevant literature including previous consulting reports, academic theses and articles and heritage studies undertaken for local councils;
- Consultation with the Nowra Local Aboriginal Land Council (LALC) and other registered stakeholders as per the ICCR guidelines;
- Pedestrian field survey to identify and record cultural heritage sites along the proposed easement for the Bamarang 330kV ETL. This field inspection was undertaken between GPS points of proposed tower locations along the easement where access was feasible, see section 1.4. The specific survey methodology can be found in section 4.6;
- Assessment of the significance of recorded sites; the potential significance of the heritage resource along the corridor and the formulation of general and specific management options; and
- Completion of documentary evidence (e.g. DECC AHIMS Site Cards, NSW Heritage Council Inventory sheets for any sites/objects located during the survey for the notification of the relevant authorities.

1.2 Project Background

Delta Electricity was granted approval for the construction of a gas turbine power generation facility at Bamarang, west of Nowra, under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). The approval also included the new 132 kV transmission line connecting the Bamarang facility to the 132kV Shoalhaven Substation and associated Integral Energy 132 kV sub-transmission system at West Nowra.

The proposed 132 kV transmission line for connection of the Bamarang Gas Turbine Facility to the Shoalhaven Substation, under certain demand conditions, may place

constraints on the output from the facility. Delta Electricity is therefore seeking an alternative higher voltage electricity grid connection that would allow for output from the facility to a 330 kV network. The existing TransGrid Kangaroo Valley-Canberra 330 kV Transmission Line (Line 6), located approximately five kilometres to the west of the proposed Bamarang Gas Turbine Project site, was identified as the best 330 kV grid connection option (**Figures 1** & **2**).

Delta seeks to retain the already approved option of constructing and operating a 132 kV transmission line between the approved facilities site and the existing Integral Energy electricity grid to the east. The decision on which transmission line connection will be constructed will be made during the selection of the plant and preparation of final design.

The Bamarang Gas Turbine Facility has been the subject of a previous environmental heritage and cultural heritage investigation in 2005 (by Navin Officer 2005 and Hardy 2005).

An initial ETL feasibility study concluded that the project was feasible and identified six main potential corridors varying between five and eight kilometers in length and noting that no existing line is available as a rebuild option. The identification of these corridors was based on major constraints such as the position of the substations, existing habitation, National Parks, the township of Nowra, heritage listed properties and the Shoalhaven River Delta. The topography includes steep ridges and hills (part of Bamarang Nature Reserve) which constricted the proposed corridors at several locations. Some of the land within these identified corridors has been set aside as recreational and conservation reserves and could absorb the impacts of a transmission line.

A heritage desktop review was carried out for the six potential corridors identified by SKM (see OzArk 2008). Results of this assessment indicated that all corridor options have potential for both European and Aboriginal heritage, while the complete environmental route determination report chose the current alignment as the preferred alignment. Full heritage assessment of the preferred alignment option is the subject of this report and will be submitted with the complete environmental assessment for consideration by the NSW Department of Planning (DOP) in the hope of obtaining development approval by a determination made through the Part 3A process.

1.3 Proposed Works

A concept design was prepared to enable adequate assessments of proposed impacts for the proposal. In this concept design the 330 kV ETL will consist of 21 tower structures spaced between 175 m and 373 m apart within a 60 m wide easement (**Table 1**). These will be constructed along an easement at locations that, engineering and design considerations have the least environmental and aesthetic impact (**Figure 3**). The current proposed location of the tower structures along the ETL is preliminary only, and can be seen in detail in Table 1 and Appendix 2. Overall, the ETL will consist of a variety of structures including strainer towers, suspension towers and strainer poles, between 42 m and 47 m tall that will carry three conductors and an overhead earth wire (**Table 1**).

Although the direct impact area is limited, a broader area of disturbance will be associated with construction at each tower location for vehicle parking, equipment storage and crane pads, likely to cover an area of approximately 50 x 50 m. The approximate length of the line will be 5.2 km.

Existing tracks will be used where possible to access the easement with some requiring upgrading. New access roads will also be required, some of which may be needed at creek crossings. Infrequently, sites for cranes and elevated work platforms and sites for conductor drums and stringing plant will be required. Access roads will be used for construction purposes and also for ongoing line maintenance. Tracks will be generally 4 to 5 m in width. The locations of the proposed access roads are not known at this stage and will require further assessment once determined. Very little ground disturbance should be associated in the inter-tower span distances, although the easement will require vegetation removal. For all designs, trees that could infringe electrical clearance requirements or fall on the line will be removed. Although the proponent has nominated the need for a 60 m wide clear zone along the width of the easement, this may be reduced with the approval of the Principal where tree heights permit. Ground and low level cover (up to 10 m) will be retained and only tall trees will be lopped or removed.

Table 1: GPS coordinates of proposed angle positions and structure type (Zone 56 AGD).

Structure No.	Easting (m)	Northing (m)	Span Ahead (m)	Deviation Angle (deg)	Structure Type	Structure Height
1	269453.939	6134637.173	175.437	0	DC Strain Tower	42
2	269613.26	6134563.722	190.233	0	DC Suspension Tower	47
3	269786.017	6134484.077	254.448	-17.3262	DC 45deg Strain Tower	42
4	270038.332	6134451.196	265.867	0	DC Suspension Tower	47
5	270301.97	6134416.84	180.488	0	DC Suspension Tower	47
6	270480.945	6134393.517	335.816	-12.934	DC 45deg Strain Tower	42
7	270815.209	6134425.757	231.551	0	DC Suspension Tower	47
8	271045.691	6134447.988	256.147	15.6194	DC Strain Pole	43
9	271297.86	6134403.024	214.655	59.4786	DC Strain Pole	45
10	271372.723	6134201.846	177.248	-43.2232	DC Strain Pole	45
11	271531.533	6134123.131	206.614	0	DC Suspension Pole	47
12	271716.656	6134031.375	327.464	-41.6206	DC Strain Pole	45
13	272032.581	6134117.537	373.755	23.3614	DC Strain Pole	43
14	272402.601	6134064.833	215.615	0	DC Suspension Tower	47
15	272616.062	6134034.43	326.734	0	DC Suspension Tower	47
16	272939.532	6133988.357	371.409	0	DC Suspension Tower	47
17	273307.23	6133935.984	341.903	0	DC Suspension Tower	47
18	273645.717	6133887.773	314.056	-80.2144	DC Strain Tower	42
19	273742.201	6134186.64	324.756	0	DC Suspension Tower	47
20	273841.974	6134495.69	187.196	-13.4932	DC 45deg Strain Tower	42
21	273856.331	6134682.334	0	0	DC 45deg Strain Tower	42

1.4 Project Constraints and Limitations

Physical survey was limited to accessible areas along the proposed ETL alignment (**Figures 2)**.

The ETL route was plotted on an A4 aerial photograph supplied by SKM, which indicated the location of tower structures (**Figure 2** & **Appendix 4**). The ETL easement was delineated in the field by via aerial, topographic and route maps with GPS positions of tower structures provided by the client. The tower structure positions are preliminary and are not definitive locations of ground surface disturbing activities, although these were assessed when accessed. The current easement alignment is shown in **Figure 2** and is considered final for the purposes of this report. Any subsequent detailed design amendments will be minor and will be subject to assessment.

Property access was arranged for the length of the ETL, although access to one property was denied (Lot 1 DP 876682). Not all properties were able to be accessed due to hazardous topography. Where access was feasible, full easement assessment was undertaken between each proposed tower structure. In inaccessible areas, information on heritage issues was derived from community consultation if possible and predictive modelling to assess the archaeological potential of these areas, which will eventually require full survey prior to ETL construction.

1.5 Report Authorship

This investigation was undertaken by Dr Jodie Benton and Heidi Kolkert (OzArk Environmental and Heritage Management P/L) and Jason Davison (Nowra LALC). This report was written by Dr Jodie Benton and Heidi Kolkert.

Figure 1: Locality map, easement delineated in yellow (Basemap source: SKM 2009).

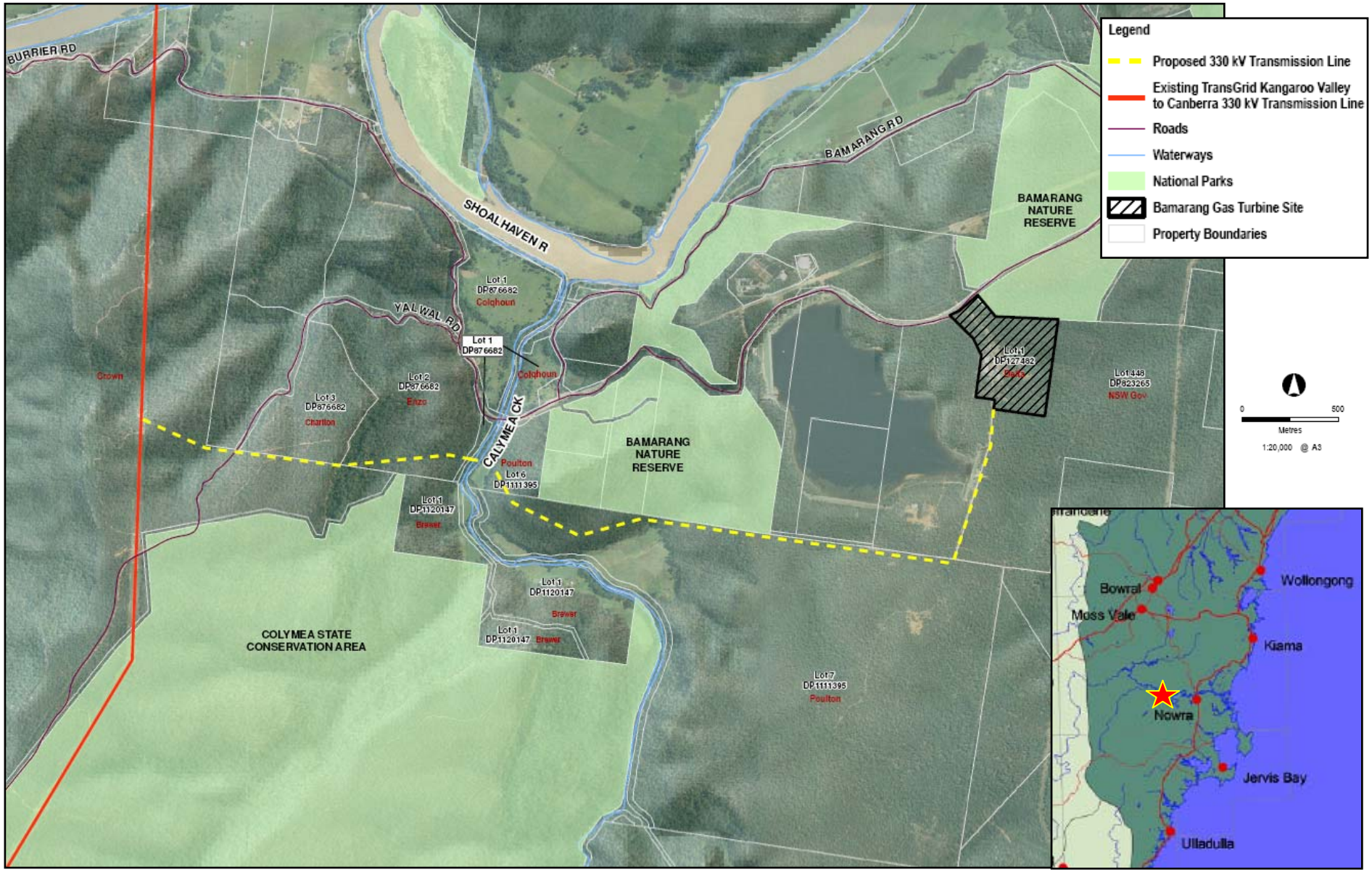
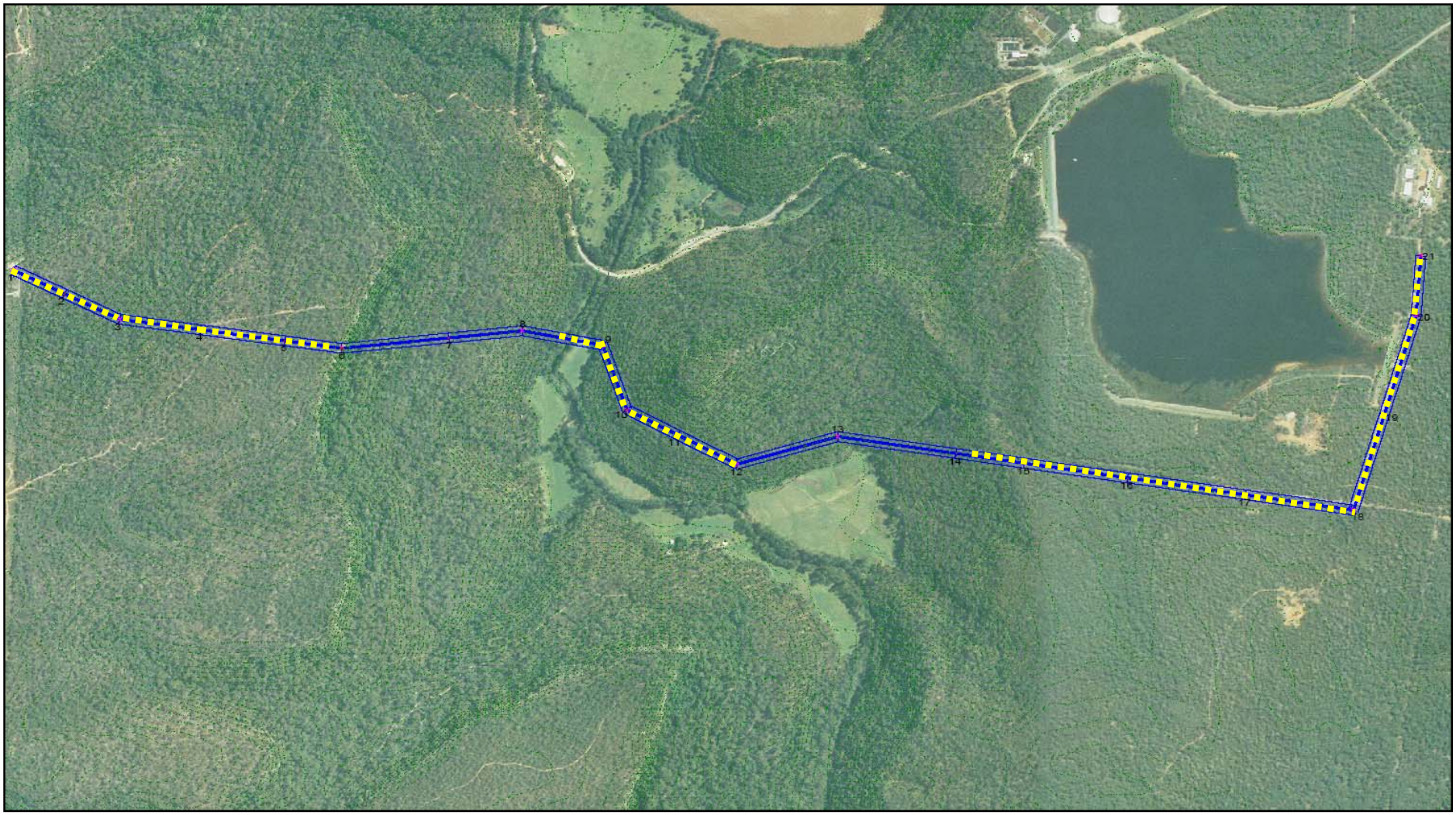


Figure 2: Bamarang 330kv easement as identified by SKM with surveyed portions of the easement delineated by the yellow broken line (Basemap source: SKM 2009).



2. COMMUNITY INVOLVEMENT

2.1 Aboriginal Community Involvement

The study corridor falls within the boundaries of the Nowra Local Aboriginal Land Council (LALC).

Following the *DECC Interim Community Consultation Requirements* (ICCR's) an advertisement seeking expressions of interest from Aboriginal community organisations or individuals was placed in the South Coast Register on the 12th of March 2009. Letters were also issued to Aboriginal groups, individuals or organisations known to have an interest in Aboriginal heritage within the Study Area. As a result of the Stage 1 ICCR notification phase, several more groups were identified and contacted regarding the project.

The Nowra LALC and Jason Davison replied and now form the Registered Stakeholder group for this project. Letters regarding the proposed assessment methodology for the upcoming heritage survey were sent to the registered stakeholder groups on the 5th of May 2009. Jason Davison representing the Nowra LALC accompanied OzArk in the field on the 13th and 14th of May 2009.

Discussions were held in the field along the easement between the archaeologist and the Aboriginal representatives to develop potential requirements for mitigation or management measures.

A signed participation form from Jason Davison regarding the results of the field assessment can be found in **Appendix 2**.

Nowra LALC and Jason Davison reviewed the draft report and overall appear to support the recommendations made by OzArk, however do document their desire to monitor all construction works. It is OzArk's opinion that monitoring by a member of the Aboriginal community is not required along the whole easement. If sites were to be impacted including any newly discovered sites following further survey (management recommendations will occur on site) with all monitoring occurring under the auspices of an Aboriginal Heritage Impact Permit. Written feedback on the draft report can be found in **Appendix 2**.

Although a search of the National Native Title Tribunal website showed that no Native Title claims exist over the current Study Area, the project area lies on the northern cultural boundaries of the Registered Aboriginal owners Biamanga and Gulaga National Parks which is further south of the Study Area (**Appendix 2**). An attempt was made to contact these groups however no response was received.

Appendix 2 lists correspondence with the Aboriginal communities while **Appendix 3** provides a log of all consultation with Aboriginal groups.

3. THE STUDY AREA

The 'Study Area' is the proposed Bamarang 330kV ETL easement that will connect the existing 6 Kangaroo Valley – Canberra 330 ETL to the Bamarang Gas Turbine Facility (**Figures 1** & **2**). The corridor length is approximately 5.2 km and traverses lands administered by the Shoalhaven Council, Nowra. The easement partly occurs within crown land, private property and NSW government owned land south of the Shoalhaven River bordering both the Bamarang Nature Reserve and the Bamarang Reservoir (**Figures 1)**.

3.1 Topography, Hydrology and Climate

The Study Area falls within the NSW Sydney Basin Bioregion which is an extensive area of major landscape features including coastal plains, foothills, isolated ranges, the lower inland slopes of the Great Dividing Range and forested mountains of the Illawarra Escarpment (Christian and Hill as cited in Roach 2002; DECC 2008).

The Shoalhaven River Delta (SRD) and hinterland includes the township of Nowra which occurs in the Ettreme Catchment Management Authority (CMA), approximately 150 km SSE of Sydney (**Figure 1**). The area is subject to a mild temperate climate with mean daily temperatures typically reaching 15.8ºC in the winter and 25.8ºC in the summer. Nowra experiences a mean annual rainfall of approximately 1,029 mm, with a range of 700 mm to 1,600 mm (BOM). In terms of human habitation, these climatic factors are ideal for all year round occupation.

The proposed Bamarang 330kv easement lies on the broad alluvial plains of the Shoalhaven delta located in the Shoalhaven River catchment. Calymea Creek traverses the Study Area with Barringella Creek occurring west of the proposed ETL. Both creeks are tributaries of the Shoalhaven River.

Since stabilisation of the climate c. 6,000 years ago, the area would have had similar climatic features to today, and therefore would have been habitable throughout the year.

3.2 Geology and Soils

Generally the Illawarra area is characterised by permian siltstones, shale, sandstones and interbedded volcanics on and below the coastal escarpment with Quaternary alluvium and coastal sands in areas (DECC 2008). The Shoalhaven area specifically consists of the volcanics of the Shoalhaven group. Comprised of laterite, tuff and tuffaceous sandstone (NSW 1:500,000 geological series).

- Characteristic landforms include: Vegetated cliff faces on coastal escarpment with waterfalls and steep streams. Boulder debris slopes with sandy clay matrix and low hills and alluvial valleys on coastal ramp. Barrier systems at Lake Illawarra and Nowra. (DECC 2008).
- Structured red and red brown loams and clay loams with some areas of mellow texture contrast soils. Fertility high and good water holding capacity. Siliceous sands on beaches and dunes, podsol profiles in older dunes, peaty sands and organic silts in swamps and estuaries (DECC 2008).

The Study Area easement is specifically characterised by rocks from the Shoalhaven Group including Nowra Sandstone mainly consisting of quartz and sandstone with Wandrawandian Sandstone on the western part of the easement including siltstone, silty sandstone, pebbly in part (NSW 1:500,000 geological series).

In terms of stone resources for the manufacture of Aboriginal tools, these deposits have potential to provide raw materials for making tools however, in reality stone resources are more likely to be sourced from the bed of the locally occurring creeks and rivers.

3.3 Vegetation and Fauna

The native vegetation around the area has been greatly altered as a result of European settlement and associated land use. Generally, the Nowra area consists of mixed warm temperate and subtropical rainforest complexes on rich shale soils and alluvium under the escarpment.

Eight native vegetation communities and two modified communities were identified along the proposed ETL easement comprising: Scribbly Gum - Red Bloodwood Heathy Forest; Spotted Gum - Red Bloodwood Forest; Blackbutt - Peppermint Forest; Wet Heath; Escarpment Heathy Woodland; Red Bloodwood - Apple Banksia / Paperbark Forest; Rainforest; Blue Gum / Bangalay Riparian Forest; Cleared - Powerline Easement; and Cleared – Pasture (SKM, 2009).

Prior to European occupation the general area would have provided a rich resource base for animals including fish, fresh and saltwater invertebrates, gliders, possums, macropods and bandicoots and a large variety of reptiles and amphibians. The wetlands and permanent creeks within close proximity would have undergone inundation and seasonal movements of fauna would have supported a greater diversity and number of species, predominantly birds but including other species such as: swamp wallabies, grey kangaroos, koala, rock wallabies, swamp rats, frogs and tortoise, as well as predator species such as the red bellied black snake and carpet python. A myriad of different migratory bird species would have also utilised these swamp areas and the flowering eucalypts present on site would have attracted nectar and insect feeding birds, including parrots and honey eaters and also a large number of species of bats.

3.4 Existing Levels of Disturbance

The proposed ETL easement has undergone various levels of disturbance along its length.

The ETL traverses the Shoalhaven River floodplain, up to escarpments north of Colymea State Conservation Area. Most of the easement had been previously logged and is now comprised of semi-mature to mature regrowth, while the remainder appears relatively intact apart from historic selective logging. Outside the eastern portion of the ETL easement small areas have been cleared for grazing cattle with disturbances from the creation of the Bamarang reservoir and Bamarang gas/power facility.

The eastern portion of the Study Area lies within the floodplain of the Shoalhaven River Delta, alluvial and colluvial processes will have moved topsoil. Most of the ranges,

ridges and hills have been selectively logged over the centuries although areas have been recolonised by thick regrowth. It is likely that the only portions of land remain relatively undisturbed would be inaccessible to machinery and generally unsuited for grazing agriculture (i.e. hill sides and tops of steep rocky escarpments). Some Aboriginal sites within the Study Area will have been affected by these land use impacts and changes in hydrological behaviour, either resulting in their complete removal (i.e. scarred trees) or in their disturbance (artefact sites).

4. ABORIGINAL HERITAGE

4.1 Ethnohistoric sources of past Aboriginal culture

Prior to European settlement the Study Area was situated within the territory of people belonging to the Wandandian language group (Tindale 1974). The Wandandian language group area extends south of the Shoalhaven River down the coast towards Ulladulla.

The Shoalhaven River forms the boundary of the Dharrawal-Dhurga territory to the north and Wandandian tribal territory to the south. Ethnographic descriptions also separate the Nowra region into the Dhurga language which extends down the coast to around Narooma with Thurumba considered to be the northern dialect of the Dhurga language.

According to Howitt (1904) the Wandandian people spoke Dhurga and formed part of a larger inter-tribal community that shared many customs. Howitt described the distribution of this group, which he re-named ‘Murring’, as extending from the NSW coast north towards Double Bay and the Shoalhaven and inland to the Wiradjuri eastern boundary. More recently the Aborigines and linguistics of the Shoalhaven have been described in terms of one district, equivalent with the Shoalhaven Jervis Bay watershed. (Navin Officer 2007).

Europeans arrived in the country of the Dharug people in 1788 and had profound impacts on the Aboriginal populations of the Sydney Basin. By the 1830’s European settlement had reached the Aboriginal camps in the Shoalhaven region (Navin Officer 2007).

As in most parts of NSW, European diseases were a precursor to white settlement and the Aboriginal population encountered by early settlers had already been impacted by this. Smallpox epidemics wiped out most of the Aboriginal coastal peoples and soon after spread to the inland Dharug communities around the Hawkesbury-Nepean area (Navin Officer 2007). Tales of early white settlement include stories of clashes including massacres of the natives and revenge attacks. Some Aboriginals were recruited by Europeans to assist with exploration cedar cutting.

References concerning the Aboriginals in the Nowra area are few. Nonetheless, there are some interesting anecdotes that build a limited picture of these early times. A ‘history of the people of the Illawarra’ (DECC 2005) tells the story of Aboriginal people using this land. Below are a few excerpts from this book that relate to the Aboriginal inhabitants:

The battle of Fairy Meadow occurred in 1830 following the abduction of a Bong Bong Dharawal woman by a Bong Bong man. Martin Lynch witnessed the battle saying:

> *The Bong Bong blacks came down the mountain range from their own country, making the decent opposite the Dapto, to wage war with the Illawarra tribe, at whose hands they sustained defeat in the pitched battle as stated – the survivors returning again by the same route over the mountain to Bong Bong to tell their tales of blood and daring deeds by the way.*

One white man noted a ceremonial meeting to discuss tribal punishment, in the following instance for one man stealing another mans 'gin'.

> *They were all painted, after the fashion of savage warriors, with pipeclay, and they wore feathers and other things to give them a warlike look. On enquiry I found the culprit was to stand a certain number of spears being thrown at him. This was his punishment. The man whose gin was taken was the man who threw the spears. The culprit was allowed a shield behind which he could nearly shield himself.*

Accounts of Illawarra Aboriginal protests to save an 800 year old fig tree at Moreton Bay are the first of a series of protests arising from white settlement:

> *So as the men sharpened their axes they were watched by scores of Aborigines camped in the vicinity. To them, the tree, probably a meeting place for hundreds of years was sacred. So desperate was their mood that the convict gang had to withdraw. The road was diverted.*

There are also first person accounts of fishing and missionaries watching kangaroo hunting:

> *Mum used to go in there and get cockles and mussels. She used to have long dresses in those days and used to haul her dress up and go in there and get whatever we needed, fish everything out of there.*

> *Appearing, probably, to the creature like a dark-coloured stump of a tree, of which there are many in the woods, it continues to feed, without fear – he always moving a few steps while it is looking down, and becoming motionless as soon as it looks up. He thus gradually approaches and at length comes within the cast of a spear from his victim. His fate is almost then inevitable.*

Europeans also recorded the Illawarra people peeling off soft eucalyptus bark to pad the ground and make an insulating layer

> *The natives do this by cutting a circle round the tree with diagonal cuts like these: VV using their Tomahawk, then they cut in a vertical straight line as high as they can reach and from there, by using small notches cut into the bark for their big toes, they climb whatever height they wish to peel the bark off the tree, cutting through the bark all the way then cutting a horizontal*

> *line round the tree, as lower down. To do this they swing their hatchet…with a peculiar cross stroke above their heads.*

Traditional stories of the Dharawal on the Lyrebird and the Kookaburra and other stories on vicious birds are centred on the Illawarra and Shoalhaven area (DECC 2005).

4.2 Previous Archaeological Studies

The south coast of NSW has a rich history of Aboriginal occupation dating back to the late Pleistocene (DECC 2005). Carbon dating of a rock shelter on Burill Lake established that Aboriginal occupation on the south coast started at least as early as 20,000 years ago (Lampert 1971: 64), with another excavation of a rock shelter at Bass point near Wollongong yielding the same results (Bowdler 1976: 254; McDonald 1999, Kuskie and Clarke 2006; DECC 2005). Due to fluctuating sea levels, however, it is certain that archaeological records for coastal areas are incomplete. There is evidence to suggest that sea levels in the Sydney Basin may have been as much as 80 m lower than their present levels which were only reached in the Holocene period c. 6,000 yrs BP. This means that midden sites and evidence of Aboriginal settlement along the present coast are likely to post date 6,000 yrs BP and indicate marine exploitation at the current sea level (Morris 1986). Evidence of a change in the content and structure of these middens is also debated to coincide with the introduction in shell fish hooks (Bowdler 1976).

Coastal Aborigines would have had an obvious broad utilisation of the marine environment and exploited marine resources for jewellery, food and tools, using shell and bone to barb their spears, while inland tribes used stone (Collins 1798: 586 in McDonald 1999). Shell was also used on spear throwers, and implements also used for digging and cutting, using stone only to make adzes and axes. However the logical expected bias towards fish and shellfish for the protein portion of their diet is not evidenced at all sites. Excavations at the Angophora Reserve sites indicate that fish and shell fish contribute only 8% of the calorific content as represented by the sites' food remains (McDonald 1990:11).

Pre European contact, diet data available on coastal Aborigines has been summarised by Lampert (1971:118) reinforcing their reliance on these resources:

- Coastal Aborigines were seemingly completely dependent on seafood for the protein portion of their diet;
- They used specialised equipment for fishing, such as multi-pronged barbed fishing spears and shell fish hooks; and
- Had an apparent strict sexual division of labour. Women fished with a hook and line and men always[1] used spears.

Results of previous work indicate that all of the available environments (rocky shore, estuarine, beach and swamp) were exploited by the Aboriginal populations, thus it is

[1] 'always?' is subjective, men are believed to have undertaken spear fishing whilst women fished with line and hook.

viable that Aboriginals utilised the coastal headlands and plain, forested hinterland and parts of the escarpment to hunt and gather food (DECC 2005).

Lampert (1971a) classified these coastal occupation sites into three main groups

- Specialised foreshore sites which centre on the utilisation of coastal resources such as shellfish, fish and aquatic birds (eg. Durra North, Wollumboola and Wattamolla) where specialised fishing equipment was used, including shell fish and hooks and spears tipped with bone points;
- Specialised estuarine sites which focussed on exploiting inland, terrestrial resources (eg. Bomaderry Creek, Baringella Creek and Calymea Creek); and
- Sites located next to creeks or rivers opening onto the sea where a broader range of resources were utilised, including coastal and terrestrial (eg. Burrill Lake and Currarong).

Studies by Pearson (1981)[2] and Koettig (1985), despite being primarily focussed on inland areas, are also relevant in giving a broad understanding of the distribution of Aboriginal archaeological sites within the landscape.

According to Pearson archaeological site types can be divided into two main categories, occupation sites and non-occupation sites (which included grinding grooves, scarred or carved trees, ceremonial and burial sites etc.). An analysis of the location of these sites led him to build a model for site prediction along the following lines (Pearson 1981: 101 as quoted in Koettig 1985: 47):

- Site distance to water varied from 10 to 500 m, but in general larger sites are found closer to water;
- Good soil drainage and views over watercourses are important site location criteria;
- Most sites were located in contexts, which would originally have supported open woodlands (for inland environments);
- Burial sites and grinding grooves were situated as close to habitation areas as geological constraints would allow;
- Ceremonial sites such as earth rings (‘bora grounds’) were located away from campsites;
- Stone arrangements were also located away from campsites in isolated places and tended to be associated with small hills or knolls;
- Quarry sites were located where stone outcrops with desirable working qualities were recognised and were reasonably accessible;

[2] M. Pearson’s 1981 study is an unpublished PhD thesis from the ANU. The authors have been unable to directly access this work and rely heavily on summaries presented in Koettig (1985).

- Based on ethnohistoric information, Pearson suggests that Aboriginal campsites inland were seldom used for longer than three nights and that large archaeological sites probably represent accumulations of material over a series of short visits.

The location of non-occupation sites was dependent on various factors relating to site function. For example, grinding grooves only occur where there is appropriate outcropping sandstone, but as close to the occupation site as possible. Scarred trees were variably located with no obvious patterning, other than proximity to watercourses, where camps were more frequently located.

4.3 Local Context and Desktop Results

A search was undertaken of the DECC AHIMS database encompassing a rectangular area that included all potential corridors, being an area of c. 15 x 15 kms. This search revealed forty one (41) previously recorded sites. Shelters and open camp sites are the most frequently recorded, however there is a diversity of site types known for the area (**Table 2)**.

Table 2: Previously recorded sites within the Bamarang area

Site Type	Number	% Frequency
Shelter with Deposits	11	26.8
Open Camp Site	8	19.5
Isolated find	5	12.2
Shelter with Art	5	12.2
Axe Grinding Groove	5	12.2
Modified Tree	4	9.9
Stone Arrangement	1	2.4
Shelter with PAD	1	2.4
Burial ground	1	2.4
Total	***41***	***100***

In 1963 an unknown author undertook an archaeological study in the Calymea Creek / punt area on the edge of Bamarang Dam and recorded a large rock shelter site complex (DECC # 52-5-0005) including rock engravings, stone arrangements, rock paintings, axe grooves, carved trees and a quarry. The shelter has two well preserved paintings as well as Bondaian period points. Also recorded (a couple of miles west) were a few points and microscrapers at another site near Bundanon Punt. Near this site, a large rock shelf along the river with a number of axe grinding grooves was also recorded (#52-5-0093 and #52-5-0094).

A survey along Calymea creek was undertaken by Bindon (1976) for an Honours thesis. The large rock shelter Bindon recorded has since been amalgamated into the previously recorded site complex (#52-5-0005) and is two km from the Shoalhaven River. Slabs on the floor of the shelter have marks consistent with anvil usage. Bindon re-visited this site in (1977) as part of PhD studies on rock paintings in the Shoalhaven Area, giving a more detailed description of the site complex. Clarke and Kuskie further re–recorded this site during their study in 2006 (details below), however, no art was recorded within the shelter during their assessment.

The Bamarang Reservoir area was originally surveyed in 1981 by Attenbrow for the Nowra to Cunjurong Pipeline. Two sites (#52-5-0146 and #52-5-0158), both shelters with deposits, were recorded and both occur north of the Study Area. The shelters are located 1.5 km south of the Shoalhaven River over a low ridge. These sites are associated with other previously discussed sites; the shelter with art, occupation deposit and two axe grinding grooves located around 100 m on the opposite side of the creek (#52-5-0005); and a shelter with occupation deposit (on the opposite side of the creek).

Kuskie, Navin and Officer conducted an archaeological study of the Eastern Gas Pipeline (EGP) route (1995). This traversed the western portion of the current Study Area up Yalwal Road. Three Aboriginal sites were recorded as a result of this survey (sites #52-5-0304 to #52-5-0306) being a scarred tree, shelter with deposit and an open artefact scatter. Changes to the EGP easement led to other archaeological surveys (reports not available) close to the Study Area. These assessments recorded an isolated find ('Duke 1' #52-5-0371) and shelter with deposit ('Duke 2' #52-5-0368). According to Navin Officer (2005), the coordinates pertaining to the shelter are in error as no sandstone exposures are present at the GPS location. The other 'Duke' sites are all east of the Study Area.

An Aboriginal heritage and cultural mapping project for Nature Reserve Management was undertaken by Clarke and Kuskie in (2006). They recorded several sites within the Bamarang Nature Reserve with one open site with artefacts located within the current Study Area (#52-5-0457). The two artefacts were located on top of a spur crest south of Calymea Creek.

The Bamarang Gas Turbine Facility and pipeline easement was the subject of a desktop review by Hardy (2005). Hardy noted that there is a high potential for artefact scatters to be located in undisturbed areas with rockshelters present in areas of sandstone outcropping. A survey of this area was then undertaken by Navin Officer (2005a). they recorded three aboriginal sites, an artefact scatter with potential archaeological deposit, an isolated find and a possible foothold / toehold tree. The artefact scatter included flakes, cores and a possible hammerstone / grinding stone.

4.4 Predictive Model for Aboriginal Site Location

There has been extensive archaeological research in the NSW coastal region to establish a predictive model based on the predominant patterns of Aboriginal site distribution in coastal and hinterland areas combined with the results of the regional and local contexts described above. Corkhill (1986 as summarised in Navin Officer 2005a) included the Shoalhaven Dealtic deposits and Holocene embayment in predictive modelling for archaeological sites. Limited survey work prevented full confirmation that sites would be located on remnant landscape features associated with the Holocene embayment (Navin Officer 2005a).

Proximity to a permanent water supply is the primary factor appearing to determine the location of Aboriginal campsites. Results of an integrated series of studies including a significant excavation component, suggests a high correlation between the permanence of a water source and the permanence and / or complexity of the areas' Aboriginal occupation (McDonald 1997). This was further reflected in the lithic assemblages from sites close to permanent water, which suggested that a greater range of activities were

represented (e.g. tool use, manufacture and maintenance, food processing and quarrying). Sites near ephemeral water sources had evidence for one-off occupation (e.g. isolated knapping floors or tool discard), and creek junctions were also proven to be foci for site activity, with sites frequently occurring on well-drained elevated flats adjacent to alluvial flats

Ridgelines are suggested to provide access tracks through the rugged hinterland (Byrne 1982 in Navin Officer 2005a) where flats and saddles were favoured as site locations.

Using the concept of stream ordering, the following general predictions can be made regarding the nature of sites and their location in the current Study Area (not taking into account factors of site preservation):

- The area surrounding first order streams and headwaters (i.e. first line drainage gullies) may contain evidence of sporadic occupation that may consist of little more than a background scatter of artefactual material;
- In the vicinity of second order creeks, archaeological evidence may be sparse, but may indicate focussed activity (one-off camp sites and knapping events);
- In the lower reaches of tributary creeks (third order, Calymea Creek), archaeological evidence may be more frequent and intense, indicating more permanent or repeated occupation by small groups and may show evidence of concentrated activities;
- On major creek lines and rivers (fourth order, the Shoalhaven River) more permanent and repeated occupation may be evidenced by a more diverse stone tool assemblage indicating a greater range of lithic activities. Sites in this location may even be stratified;
- Creek junctions also provide a popular location for occupation and the size of the confluence (in terms of stream ranking nodes) may influence the size of the site; and
- Ridgetop locations between drainage lines are likely to contain limited archaeological evidence in the form of one-off activities, although can be home to stone arrangements or ceremonial sites.

From the known sites of the region outlined previously in Sections 4.2 and 4.3, it is possible to say that the most likely sites to be encountered in the Study Area are:

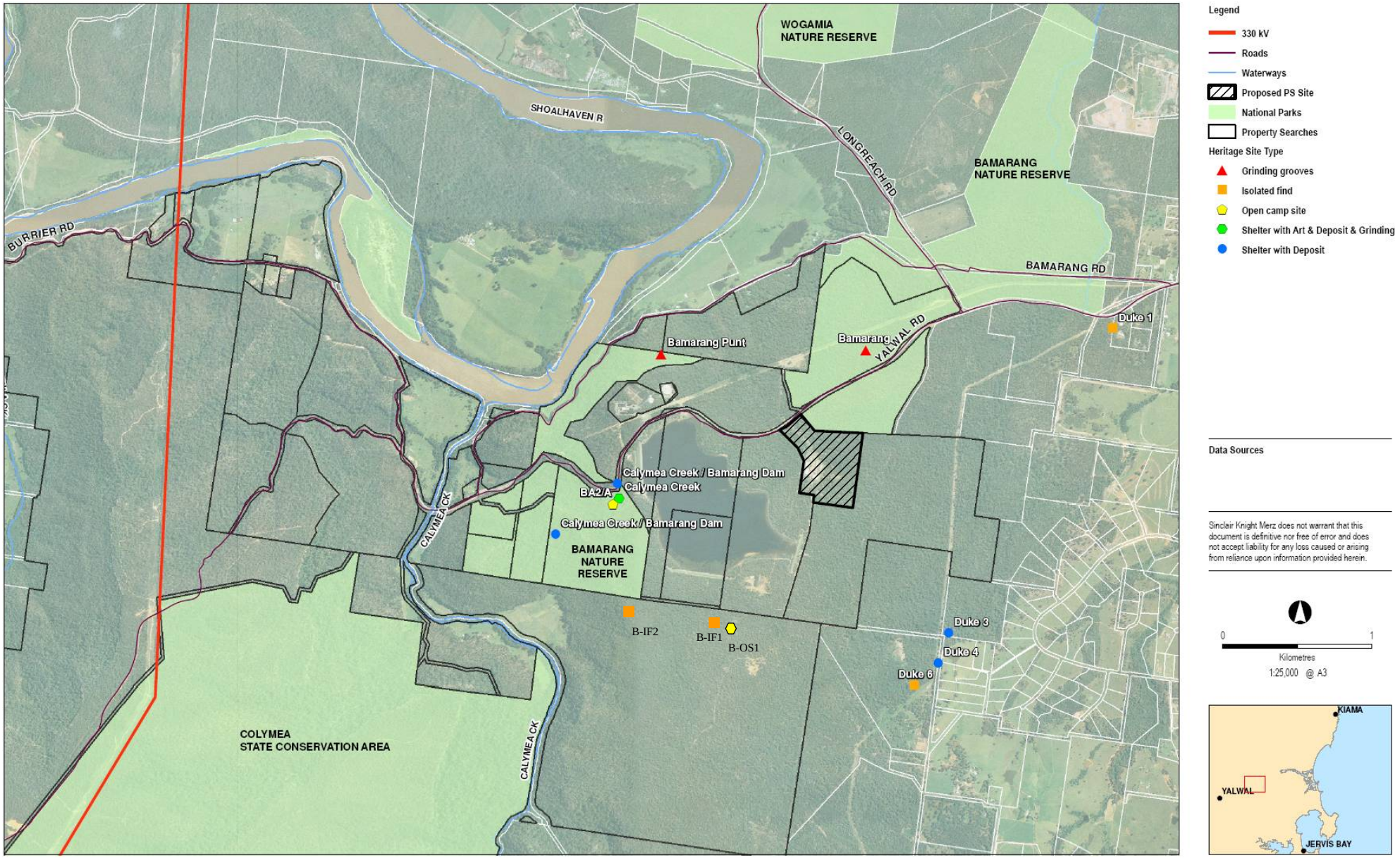
- Scarred trees (frequently close to creeks and rivers but also found further afield). Few mature trees of an age to bear cultural scars are likely to remain in the Study Area (due to logging), although some remnant individuals may be present. Rarely, carved trees may also be present (unlikely, although two have been previously recorded in the area);
- Open camp sites are likely (on elevated terraces and low spurs close to water);
- Isolated finds may occur anywhere, especially in disturbed locations near water sources on red soil or in areas close to ephemeral water – i.e. headwaters;
- Rock shelter sites may occur wherever there are suitable overhangs / caves. The quality and extent of such features will determine the nature and type of potential occupation. The geomorphology of the Bamarang area lends itself to the occurrence of rockshelters on deeply incised gullies or near creek lines where sandstone is exposed;

- Midden deposits may occur in level, well drained rockshelters / terraces relatively close to an estuary or on elevated river banks;
- Natural mythological or cultural / ceremonial sites may occur anywhere, although are less likely on significant slopes; and
- Grinding grooves may be recorded in areas where appropriate sandstone is present, particularly near water and are known to occur in the mountain escarpment and close to Calymea Creek.

For the purposes of the current study, the site type definitions are presented in **Appendix 5.**

Finally where ground surface disturbance and clearing are minimal, sites that may be present will be better preserved and hence have greater integrity and possibly therefore greater significance. These sites may be more important to preserve than sites that have been heavily impacted already. Hence, agricultural land is more appropriate than undisturbed natural landscapes for potential developments.

Figure 3: Map of previously recorded sites and sites recorded during this assessment (Base map source: SKM 2008).



4.5 Survey Methodology

Using desktop predictive modelling as described above, aerial photographs of the Study Area (**Figures 1** & **2**, **Appendix 4**) were examined to detect landscape features (including vegetation), waterways and potential food resources. This process identified areas of potentially high archaeological sensitivity (including creeklines and escarpments) to be targeted for assessment, although full pedestrian survey of the easement was attempted. Landform hazards and property access however meant that the entire easement was not surveyed.

On the properties accessed, the whole ETL easement was walked, with field officers spaced between 5 and 20 m apart at times to optimise accessible areas, high ground surface visibility locations and hence the probability of encountering heritage sites. The usual survey efficacy issue of visibility remained a key factor of survey effectiveness and overall visibility was extremely low.

The portions of the easement surveyed include from: tower structure 21 through to 75 m east of tower structure 14, between tower structure 12 and half way between tower structure 8 and 9, and between tower structures 1 and 6. The portions not surveyed were left due to the challenging nature of the topography and OH&S concerns.

After project approval, these small unsurveyed ETL portions should be assessed prior to construction, along with proposed access tracks and compound areas. Any Aboriginal sites present are likely to be small and manageable within the development context or able to be avoided by project impacts. The same principles of management as developed within the current assessment can then be applied to newly recorded sites. It is noteworthy that this approach has worked well on other ETL projects where complete land access can be problematic during the environmental impact assessment phase (i.e. Wollar-Wellington 330kV ETL, Parkes Manildra 132kV ETL).

4.5.1 Estimated effective survey coverage

Ground surface visibility does not affect the detection of all site types. It is predominantly open sites, isolated finds, deposits associated with shelters and to a lesser degree grinding groove sites that are impacted by this factor. For these sites, the degree of ground surface visibility combined with archaeological post-formation processes (i.e. whether sites are obtrusive as a result of factors that have occurred since they were formed) will both influence the effectiveness of archaeological field survey. Consequently, it is considered important to document and assess variables associated with ground surface visibility in relation to the landforms surveyed. The following variables are recorded:

1. The area of landforms / survey units determined to have exposures or patches of ground surface visibility; and
2. The quality of the visibility within these exposures, a factor which is usually influenced by the degree of ground cover from either live vegetation or leaf litter, or from siltation (e.g. floodplains) or imported soil deposits (e.g. tracks, roads).

Ground surface visibility along the current study corridor was very variable, as may be expected in a survey which covers such a variety of landforms with shifting degrees of land-

use disturbance. The majority of the easement was thickly vegetated with ground surface visibility of between 0% and 10%. Vehicle tracks, access tracks, creek banks and creek crossings often had a higher incidence of erosion and offered limited areas of increased ground surface visibility of around 90 %, where wooded slopes and forested undulating hillsides had almost no ground surface visibility.

All mature native trees (of which there were few) along the assessed portions of the ETL easement were inspected for scarring, ensuring good survey coverage of this site type, while sandstone outcrops were inspected for engravings or grinding grooves, providing equally appropriate survey coverage for these site types.

The primary area for potential rock shelters / overhangs was the escarpment adjacent to structure position 6 (**Figure 2** & **Table 1**), which was not safe for the survey team to access.

4.6 Survey Results

One open site and two isolated finds were recorded as a result of the field survey.

Table 3 summarises the GPS coordinates, site type and property details of the sites recorded, as follows:

Table 3: Summary of Aboriginal sites recorded.

Property #	Site Name	Site Type	Eastings GDA	Northings GDA
Lot 7 DP 1111395	B-OS1	Open Camp Site	273127	6133985
Lot 7 DP 1111395	B-IF1	Isolated find	272590	6134030
Lot 7 DP 1111395	B-IF2	Isolated find	273207	6133966

B-OS1 Nowra 1:50k 56 GDA 273127 E 6133985 N

Open site B-OS1 is located along an access track on private property (Lot 7 DP 1111395). The site lies near angle position 17 for the Bamarang 330kV transmission line and is located on an exposed vehicle track within a tall eucalyptus forest at an elevation of 99 m (**Plate 13**).

Two artefacts were recorded within the 2 by 2 m track area with 80 % visibility on the track exposure and 5 % visibility off the exposure. It is considered likely that more artefacts may occur in the surrounding area though limited ground surface visibility prevents their discovery and thin topsoil make sub surface deposits unlikely. The first artefact measures 2.6 x 2.6 x 1 cm and is made from silcrete (**Plate 14**). The second artefact measures 2.5 x 1.5 x .05 cm and is made from indurated mudstone (**Plate 15**).

B-IF1 Nowra 1:50k 56 GDA 2723127 E 6134030 N

Isolated find B-IF1 is located along an access track on private property (Lot 7 DP 1111395). The site lies near angle position 17 for the Bamarang 330kV transmission line and is located on an exposed vehicle track within a tall eucalyptus forest at an elevation of 99 m. This isolated find is a chert broken flake with three negative scars on the dorsal surface and small platform development (**Plate 16**). This isolated find is located approximately 150 m west of B-OS1 and may be considered associated

B-IF2 Nowra 1:50k 56 GDA 273207 E 6133966 N

Isolated Find B-IF2 is located along an access track on private property (Lot 7 DP 1111395). The site lies near angle position 15 for the Bamarang 330kV transmission line and is located on an exposed, rarely used vehicle track on an elevated ridge top in a tall eucalyptus forest at an elevation of 107 m (**Plate 11**). This isolated find is a silcrete flake with two negative scars on the dorsal surface and small platform development. The silcrete a stone inclusion within the material (**Plate 12**).

It is likely that the artefact is not *in situ* and may be a drop artefact rather than part of a formal campsite. There is therefore a low likelihood for sub-surface archaeological deposits to be present in the immediate vicinity of the find due to the skeletal nature of the soils.

4.7 Discussion

4.7.1 Aboriginal Site Distribution

The location of sites recorded during the present survey overall conforms to the predictive model set out in section 4.4.

The predominance of artefact related sites, which comprise all of the recorded sites (albeit a small sample) is thought to reflect the enduring nature of Aboriginal stone artefacts in the face of land use practices that can be very deleterious to other site types, e.g. scarred trees; stone arrangements, bora grounds etc. as well as the fact that these would have been the most common site types along with scarred trees.

The main factor influencing Aboriginal site detection was visibility. There were few areas that had high visibility and these were often on low potential landforms, generally some distance from permanent water (over 600 m) and on low potential of landform for long term occupation sites.

Overall the ETL alignment traverses landforms such as slopes / wooded spurs that have a low potential for occupation sites and are relatively distant from permanent water.

<u>Predictive modelling for inaccessible corridor sections</u>

The topography of the easement between proposed tower structures 6 and 8 is comprised of a high sandstone escarpment dropping off to the east into Calymea Creek. Consequently, due to proximity to water and possibly appropriate landform, these locations are preliminarily assessed as having moderate archaeological sensitivity for the presence of Aboriginal sites including shelters or grinding grooves. This assessment of potential Aboriginal sites is further supported by several rock shelters with deposits or art previously recorded in the immediate vicinity in congruent sandstone escarpment (**Figure 3**).

4.7.2 Aboriginal Site Assessment

Cultural Significance

This area of assessment concerns the importance of a site or features to the relevant cultural group - in this case the Aboriginal community. Aspects of cultural significance include assessment of sites, items, and landscapes that are traditionally significant or that have contemporary importance to the Aboriginal community. This importance involves both traditional links with specific areas as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of significance may not be in accord with interpretations made by the archaeologist - a site may have low scientific significance but high Aboriginal significance, or *vice versa*.

The significance of the archaeological sites located within the Study Area was addressed with the community representatives during survey.

Scientific significance

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of significance relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether or not a site can contribute to current research also involves defining 'research potential' and 'representativeness'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region? In general terms, any Aboriginal object has the ability to either add to our knowledge about an area's Aboriginal history, comment on the technological developments of a people or may act as potential markers for subsurface deposits.

Open Sites

The scientific significance of open sites is extremely variable and dependent upon several factors relating to:

- Preservation: Their integrity and potential to be conclusively proven to be Aboriginal in origin;
- Representativeness: Is this the type of site one may expect in this landscape (i.e. does it relate back to the predictive model)?; Do many such sites occur nearby? etc; and
- Are there artefacts or other sites present (material, types or combinations thereof) that are rare in the area or unusual concentrations/ or rarity for the area?

Public significance

Sites that have public significance do so because they can educate people about the past. By reducing ignorance about why sites are important to the Aboriginal and scientific community, important sites can be protected from ignorant or inadvertent destruction. Educating the public to understand the need for site preservation should increase the likelihood of maintaining an archaeological resource into the future. For a site to have high public significance it should contain easily identifiable and interpretable elements, and be relatively easily accessed. If an artefact scatter is in some way outstanding (either in terms of spatial size or artefact density) it may be recognisable by the lay person and hence interpretable, but if not this site type is usually assessed as having low public significance.

Artefact sites are generally difficult for the lay person to appreciate without interpretative aids.

4.7.3 Assessed significance of the recorded Aboriginal sites

Cultural

Conversations held with the representatives of the Nowra LALC, (see **Appendix 3**) determined that all site types are culturally significant to the Aboriginal community because they provide physical evidence of Aboriginal occupation of the local area. In this respect, all Aboriginal sites located on this survey are considered to be of **high significance** to the Aboriginal community and potentially the community at large. Written feedback from Nowra LALC detailing their assessment of the recorded sites is presented in **Appendix 2** of this report.

Scientific

The scientific assessment of sites, as described above, revolves around the known local context of the site type (i.e. are there many, some or no such features known locally). The overall location of sites discovered during the current survey conforms to the general archaeological settlement pattern that has already been established throughout the broader region.

The small open camp site and isolated finds recorded along disturbed access tracks, provided few artefacts, which impacts upon their on their scientific significance because it is a limiting factor in the amount of information they may be able to provide. Overall the scientific significance of isolated finds is low unless they are in some way rare. Both isolated finds are not rare examples of artefact types or materials and are assesses as having low scientific significance.

Table 4 provides a summary of disturbance, potential and scientific significance. Each site has been assessed according to levels of disturbance (low, moderate or high) to the archaeological deposits or site manifestations that comprise each site. Ranking has also been accorded to sites based on their assessed archaeological potential. In the case of simple open sites or isolated finds, this column refers to the likelihood of further surface artefacts being present or some degree of likelihood that sub-surface material may occur, although potentially not as intact archaeological deposits. The assessments in this column have been arrived at

through overlaying the overall sensitivity of the landform (from the predictive model) with assessed levels of disturbance so as to arrive at their archaeological potential. The final column details the assessed scientific significance of the recorded sites.

Table 4: Scientific assessment of sites recorded during this survey

Site Number	Type of Site	Disturbance Levels	Archaeological Potential	Preliminary Scientific significance
B-OS1	Open Site	Moderate	Low	Low
B-IF2	Isolated Find	Moderate	Low	Low
B-IF3	Isolated Find	Low-Moderate	Low	Low

Public

Both the open site and isolated find located during the present survey are assessed as having **low public significance** due to their small artefact manifestation on eroded unmapped tracks. They are also all located on privately owned land causing them to be inaccessible to the general public. Sites such these are difficult for the lay person to interpret or access.

4.7.4 Likely impacts of the Bamarang 330kV ETL to the recorded Aboriginal sites

Although the general impacts of this project are known through the description of proposed works (section 1.3), the precise location of tower structures in relation to Aboriginal sites recorded is not known. Thus, exact impacts of the proposed Bamarang 330kV ETL are unknown at this stage as final design detail has not been undertaken. It is however recommended that if possible the design should take into account the location of these sites and attempt to avoid them. In terms of the small portions of ETL not assessed, these will require survey post approval and pre ETL construction.

4.7.5 Management Options

General Management Options

Appropriate management of cultural heritage items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development. Section 4.7.3 describes the significance of the recorded sites from a cultural, scientific and public-interest perspective, while Section 4.7.4 acknowledges that exact impacts to the recorded heritage resource are not known.

The following management options are based on general principles, in terms of best practice and desired outcomes. Specific management options for the identified Aboriginal sites based on known site impacts are presented in Section 4.7.6 and 4.9.

- Avoid impact - by altering the development proposal or designing around the locations of known sites. If this can be done, then a suitable curtilage around the recorded sites must be determined so as to ensure their protection both during the short term construction phase of development and in the long term use of the area. Specific mitigative measures may be designed to minimise potential adverse impacts. If plans are altered, care must be taken to ensure that sites previously assessed as not impacted,

remain so. This may be facilitated where necessary through the fencing off of sites during construction so as to minimise inadvertent impacts.

- If impact is unavoidable - Under Part 3A of the EP & A Act, the Section 87 and 90 AHIP permits that are required for impacts to Aboriginal heritage under the NP&W Act, are not required. Instead, a Statement of Commitments (SoC) in terms of heritage is presented within 3A applications, which then form the basis for the Minister's approval which will usually contain a series of Conditions, including a requirement for the preparation of an Aboriginal Heritage Management Plan (AHMP) as part of the Construction Environment Management Plan (CEMP) for the Project. These conditions include similar checks and balances as required by the AHMP process, such as test excavation programmes or site destruction mitigation development etc., however, without the need to obtain permits.

  Evidence of coherence to the ICCR process is also required as part of the Part 3A Approval process. Development of the AHMP should also be developed in consultation with Aboriginal stakeholders and the appropriate government agency (in this case DECC).

4.7.6 Proposed management for recorded Aboriginal sites

As the proposed project is the construction of an electricity transmission line, there is potential for the avoidance of recorded archaeological sites within the ETL easement, as impacts of this type of project are not wholesale (in contrast to roads for example). Although the easement trajectory is final the structure positions are still subject to final detailed design.

For the additional impacts of access tracks, and any changes to assessed structure locations, design of the location of these impacts should take into consideration the location of heritage sites and attempt to avoid them. Strategies including the spanning of waterways and escarpment areas will also reduce potential impacts to these landforms that have generally higher archaeological potential.

Assessment of the ETL portions not accessed to date is required prior to construction such that results can feed into the AHMP process.

4.8 Relevant Legislation

Base line principles for the conservation of heritage places and relics can be found in the Burra Charter[3], which recognises that there are places worth keeping because they can enrich our lives on many levels. The significance of such places may be embodied in fabric (physical material), environmental setting, contents, use or its meaning to people, and should be assessed through methodical data collection. Since its adoption in 1979, The Burra Charter has become the standard of best practice in the conservation of heritage places in Australia,

[3] The Burra Charter defines the basic principles and procedures to be followed in the conservation of all kinds of places such as monuments, buildings, Aboriginal sites, roads, archaeological sites, whole districts or even regions. It was first adopted in 1979, based on the Australian ICOMOS (International Council on Monuments and Sites) review (1977) of the 1966 Venice Charter (Australian ICOMOS Inc. 1998).

and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The Burra Charter generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a State level.

A number of Acts of parliament provide for the protection of Aboriginal heritage at various levels of government (NSW Heritage 1998: 3). The three most important statutes in New South Wales are the:

- *Environmental Planning and Assessment Act 1979* (EP&A Act), amended by the *Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005* (EP&AAAct).
- *National Parks and Wildlife Act 1974* (NPW Act).
- *Heritage Act 1977* (H Act).

While at Commonwealth level, the following statutes are relevant:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) amended by the *Environment and Heritage Legislation Amendment Act (no. 1) 2003,* the *Australian Heritage Act 2003* (AHC Act) and the *Australian Heritage Council* (*Consequential and Transitional Provisions*) *Act 2003 (*AHC (CT) Act).

4.8.1 Environmental Planning and Assessment Act 1979 (as amended)

Amendments were made to the *Environmental Planning and Assessment Act 1979* by the Planning Reform Bill of 2005. Essentially this provides a new method for project assessment that places major infrastructure projects, or those deemed to be of state significance as defined in Schedule 1 of the *State Environmental Planning Policy (Major Projects) 2005,* under Part 3A of the Act.

Under Section 75U of *The Environmental Planning and Assessment Act 2005* (EP&A Act), if the current project is granted project approval under Part 3A of the EP&A Act, the following approvals, which may have otherwise been relevant, will not be required to carry out the Project:

- *Heritage Act 1977*: Disturbance to an item listed on the State Heritage Register or Interim Heritage Order – Excavation Permit; and

- *National Parks and Wildlife Act 1974*: A section 87 preliminary research / collection permit; or section 90 consent to destroy objects.

Although the provisions of other relevant Acts, including the *National Parkes and Wildlife Act 1974,* do not apply for developments assessed under Part 3A of the EP&A Act, their intent has been considered and remains part of the assessment requirements, with independent expert panels being utilised to assess the veracity of environmental assessment reports. Under Part 3A, the Section 87 and 90 permits that are required for impacts to Aboriginal heritage under the NP&W Act, are not required for projects assessed under Part 3A. Instead, a Statement of Commitments in terms of heritage is presented within 3A applications, which

then form the basis for the Minister's approval which will usually contain a series of Conditions, including a requirement for the preparation of an Aboriginal Heritage Management Plan as part of the Construction Environment Management Plan for the Project. These conditions include similar checks and balances as required by the NP&W Act, such as test excavation programmes or site destruction mitigation development etc. as is currently required under the permitting process, however, without the need to obtain permits.

Application to the Study Area

Some of the Aboriginal sites recorded during the current assessment may be impacted by the Bamarang ETL project with the potential for further sites to be recorded within the ETL portions not surveyed.

Under Part 3A of the EP& A Act, permits are required to impact Aboriginal sites, however a SoC including an AHMP may be required to develop and guide the management of Aboriginal sites.

4.9 Aboriginal Heritage Recommendations

Under Section 91 of the NP & W Act (1974 as amended) it is mandatory that all Aboriginal sites recorded under any auspices be registered with the NSW DECC Aboriginal Heritage Information and Management System (AHIMS). As a professional in the field of cultural heritage management it is the responsibility of OzArk EHM P/L to ensure this process is undertaken.

To this end it is noted that three (3) Aboriginal sites were recorded as a result of the current study, all of which have been registered on the DECC AHIMS.

The following recommendations are made on the basis of:

- Legal requirements under the terms of the National Parks and Wildlife Act of 1974 (as amended) whereby it is illegal to damage, deface or destroy an Aboriginal relic/object without the prior written consent of the Director, NPWS;
- The findings of the current investigations undertaken within the Study Area; and,
- The interests of the Nowra Local Aboriginal Land Council and other Aboriginal community members and groups and the broader community.

The current Study Area covers a variety of landforms including gullies with associated ephemeral drainage features, spurs and ridgelines as well as some small areas of escarpment, creeks and floodplain. Based on the broader regional archaeological context and local recordings, it is considered that the Study Area has the potential to bear a number of different site types depending on the local environmental conditions. As a result, the following recommendations are made:

1. All proposed works are to remain within the ETL easement as defined;
2. Of the three recorded Aboriginal sites along the proposed Bamarang ETL easement, all may be avoided by the project impacts, although they may require the implementation of mitigation measures to ensure no inadvertent impacts occur;

3. All management of Aboriginal sites in relation to the Bamarang ETL should form part of the Statements of Commitments for the project which will eventually be embodied into an AHMP or CEMP. Development of these documents should occur in consultation with the Aboriginal community. Management measures may include that:

   a) If identified sites can be avoided, they should be identified in the field prior to any construction impacts occurring. An appropriate curtilage should be delineated around these sites using a highly visual physical barrier (i.e. 1 m high orange roadwork fencing). This will ensure all sites can be easily identified and protected from inadvertent machinery impacts. Should sites be in areas where tracks are required, mitigation may include protecting sites from the impacts of vehicles through the use of geofabrics, matting and materials imported to cover site areas for the construction period;

   b) If sites cannot be avoided, depending on the assessed level of significance, their management may include the test/salvage excavation of these sites, or simply the collection of artefacts prior to construction impacts occurring;

4. In designing the remaining project impacts, the following guiding principles will help reduce impact to the Aboriginal heritage resource:

   a. Attempts to avoid direct impacts within 100 m of any waterway that the ETL transects, as there are 'sensitive' in terms of Aboriginal site location. Such areas should be spanned where possible;

   b. Avoid any sandstone overhangs. Although most of the ETL surveyed to date did not possess overhangs suitable for human habitation, the area east of the proposed structure 6 (unsurveyed) has potential;

   c. Ensure that the inaccessible portions of the ETL are assessed once design detail has determined where impacts in these areas will be; and

   d. Ensure survey is undertaken for all access tracks – existing, those to be upgraded and newly proposed.

5. Members of the construction team, including sub-contractors, machine operators and truck drivers should undergo site induction concerning cultural heritage issues, prior to working on the site. This would preferably be undertaken by an individual who has a good working knowledge of Aboriginal sites and of the legislation protecting them. This induction should inform workers/contractors of the location of nearby sites, and of their legislative protection under Section 90 of the NSW National Parks and Wildlife Act 1974. These inductions should be recorded in a register, with all those present signing their complicity with these guidelines and the Conservation Environmental Management Plan (CEMP).

6. Should any previously unidentified 'objects' or other Aboriginal sites (such as burials) be uncovered during the course of construction, work in that area should cease and the DECC Regional Archaeologist (Queanbeyan Office), and the Nowra Local Aboriginal Land Council be contacted to discuss how to proceed;

7. One copy of this report should be sent to members – Nowra LALC:

   Members: Nowra LALC

   Attn: Chairperson/CEO

PO Box 528

Nowra NSW 2541

Email: nlalc@westnet.com.au

8. Two copies of this report should be sent to:

Department of Environment and Conservation

Central Environment Protection and Regulation Division

PO Box 1967

HURSTVILLE, NSW, 2221

5. EUROPEAN HERITAGE

5.1 Brief History of Shoalhaven

In 1797 George Bass noted the mouth of the Shoalhaven River. Exploration of the inland Shoalhaven region by James Meehan in 1812 lead to the commencement of cedar cutting by privateers (NSW Heritage Office and Department of Urban Affairs and Planning 1996:188).

Settlement in the area by Alexander Berry and Edward Wollstonecraft began with a 14,000 acre allotment of land called Berry Estate. Convict labour was used to cut cedar, grow tobacco and produce maize for cattle and pigs. By 1840 their estate had grown to 40, 000 acres and was being run as a cattle station with timber cutting on the side (NSW Heritage Office and Department of Urban Affairs and Planning 1996:188). Soon the region encouraged other proprietors to settle in the area, such as Richard Gladville who established Bamarang and Wogamia in 1830 and Richard Brown who established Bundanon, opposite Bamarang in the bend of the Shoalhaven River in 1837 (Navin Officer 2005b). Bundanon and its surrounding landscape are listed on the Illawarra Regional Environment Plan No 1 (1896) and the 'Bamarang Homestead' and Bamarang Homestead and Cemeteries' listed as a heritage items on the Shoalhaven Council Local Environment Plan Schedule 7.

Taking its name from the Aboriginal word meaning "camping place" or "black cockatoo", Nowra was surveyed in 1850 and became the City of Shoalhaven in 1979. However it wasn't until 1860 and then again in the 1870's that a series of major flooding of the Shoalhaven River forced the migration of people from the delta floodplains of the Shoalhaven River to the hillside town of Nowra. Subsequent to the flooding, goods and produce were shipped from Nowra whilst the small villages become slowly abandoned. According to Navin Officer (2005) the small villages had established services supporting workers of the estates as well as independent industries with Bamarang even having a Presbyterian school/church which had opened in July 1864. With more settlers arriving overland and by ship, a ferry service commenced across the river to Nowra, with a bridge erected in 1881.

The township of Berry was surveyed in 1890 and soon had established churches, post offices, banks and a large butter factory in 1986 (NSW Heritage Office and Department of Urban Affairs and Planning 1996:188).

Bomaderry, a large manufacturing suburb of Nowra with a substantial Aboriginal population also became an estate in 1891. Bomaderry Railway established in 1893 became the rail terminus for the south coast line and the industrial area and remains so today.

The large Berry estate of 75,000 acres was subdivided and sold off around the 1900's following drainage of the river flats.

The land containing the Bamarang Power facility was not leased from the Crown until after 1968. The area was initially cleared and developed as an abattoir in the 1980's. Stockyards, administration buildings and processing buildings were built on the site but never used (Navin Officer 2005).

The Shoalhaven region is presently experiencing considerable urban and industrial growth around the Nowra/Bomaderry area with the floodplains housing the richest dairy farming

areas in NSW. http://www.oceanwatch.org.au/pdf/CS1-Shoalhaven-Catchement.pdf. Accessed 27 2008.

5.2 Register Searches for European heritage

There are 106 items listed on the National Heritage Register located within the Shoalhaven Local Government Area and nine items listed on the NSW State Heritage Inventory and 143 listed on the Local Environment Plan.

Although no heritage listed items occur within the current Study Area, three items occur just outside:

- 'Bundanon' and its surrounding landscape are listed on the Illawarra Regional Environment Plan No 1 (1896) (no: 14325) and is located on the opposite side of the Shoalhaven River; and
- "Bamarang" Victorian Sandstone Homestead and "Bamarang" Homestead Cemeteries are located north of the Study Area along Bamarang Road on the Shoalhaven River Delta (Lot 21 DP746233).

5.3 Previous Historical Archaeological Studies

No archaeological surveys had been previously undertaken along the ETL easements in the Study Area. The most recent Aboriginal and European survey was undertaken by Navin Officer in 2005 for the proposed Bamarang power facility site (**Figure 1**).

Easements through the current Study Area were the subject of several assessments for the Eastern Gas Pipeline and of a desktop assessment by Hardy (2005). Hardy's desktop report assessed the area of the Bamarang Power facility, five ETL easement options and a proposed gas pipeline route along Yalwal Road.

As a result, it is only smaller, unregistered historic sites that may be recorded during future survey such as sites that may relate to remnants of the timber cutting era. These will be able to be managed within the context of the project impacts and are not predictable such that a model can be developed for their potential location.

5.4 Survey Results – European Heritage

No items of European heritage were recorded during field assessment of the portions of the proposed Bamarang 330kV ETL easement accessed to date. One possible of item of heritage significance has been discovered through landholder consultation, although verification of this site has not been feasible to date.

5.5 Significance Assessment – General Principles

As no actual items of European heritage were recorded during the current assessment and none previously recorded will be impacted by the proposed Bamarang 330kV ETL easement, the remainder of this section has been omitted.

5.6 Likely Impacts of the Proposed Works to European Heritage

None of the proposed works will have any impact on European heritage identified to date.

5.7 Relevant Legislation

The Heritage Act 1977 (as amended) protects the State's natural and cultural heritage and contains measures to protect archaeological remains. More specifically, the Heritage Act provides protection for European/historic relics and sites. Under Section 139, a relic is defined as "those buildings, works, relics or places of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance for the State".

A relic is further defined by the Act as "…any deposit, object or material evidence –

- which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; and

- which is 50 or more years old."

As there will be no impacts to items of European heritage as a result of the current project, the remainder of this section has been omitted.

5.8 European Heritage Recommendations

1. No items of European heritage significance have been recorded as a result of the current assessment over the portions of the ETL currently assessed and no previously recorded heritage items will be impacted by the current project.

2. Survey of unassessed impact locations (access tracks) should precede construction.

3. Work should stop if any unidentified archaeological finds or evidence is uncovered during construction and stringing of the Bamarang 330kV ETL.

4. Historic heritage items may occur anywhere and their location can not be easily predicted. Items of high significance, however, are likely to already be listed on registers and no such sites are present within the Bamarang ETL Study Area.

6. REFERENCES

Attenbrow, V.J. 1981. Mangrove Creek Dam, Salvage Excavation Project. Volumes 1 and 2. Report to NPWS NSW on behalf of PWD.

Bindon, P. 1976. *The Devil's Hands. A Survey of the Painted Shelters of the Shoalhaven River Basin*. Unpublished BA(Hons) Thesis, Department of Prehistory and Anthropology, ANU, Canberra.

Bureau of Meteorology . 2008 www.bom.gov.au.

Bowdler, S. 1976. *Hook line and dillybag: An interpretation of an Australian coastal shell midden*. Mankind 10:248-258.

Christian, A. T, and Hill, S. M. *Regolith-landform mapping of the Shoalhaven River Delta and hinterland, NSW: towards a model for landscape change and management*. In Roach, I. C (eds). Regolith and Landscape in Eastern Australia, pp8-13.

Collins, D. 1798-1802. An Account of the English colony in New South Wales. 2 Vols London: Cadell and Davies. In Jo McDonald CHM 1999. *Aboriginal and European Heritage Assessment: the proposed Gerringong-Gerroa Sewage Treatment Plant and associated sewage pumping stations and pipeline routes Gerringong and Gerroa, NSW*.

Department of Environment and Conservation (Now DECC). 2005. A history of Aboriginal People of the Illawarra 1770 to 1970.

Department of Conservation and Climate Change (DECC) 2008. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Subregions.htm. Accessed on the 26 of November

http://www.oceanwatch.org.au/pdf/CS1-Shoalhaven-Catchement.pdf. Accessed 27 2008. On this day a history of SHoalhaven.

Hardy, V. 2005. Proposed Gas Turbine Power Station at Bamarang, Nowra NSW. Indigenous and non-indigenous Archeaolgoical and Heritage Assessment. Report by Cultural Heriateg Connections Pty Ltd to Parsons Brinkerhoff.

Howitt, A. W. 1904. *The Native Tribes of South East Australia,* Macmillan and

Company, Melbourne.

Illawara Regional LEP number 1. 1896.

Koettig, M. 1985 *Assessment of Aboriginal sites in the Dubbo City area*. Report to Dubbo City Council.

Kuskie, P. Navin, K. and Officer, K. 1995. *An Aboriginal Archaeological and Anthropological Assessment of the Proposed Eastern Gas Pipeline between Longford, Victoria and Wilton*, New South Wales. Report to Eastern Gas Pipeline Project, Melbourne.

Lampert, R. J. 1971. *Burril Lake and Currarong: Coastal sites in Southern New South Wales*. Terra Australis Vol 1. Australian National University Canberra.

Lampert, R. J. 1971a. Coastal aborigines of southeastern Australia in J. Mulvaney and J. Golsen (eds,) *Aboriginal man and environment Australia.* Australian National University Press, Canberra: 114-132.

McDonald, J CHM. 1990. *Sydney Basin Aboriginal Heritage Study: Engravings and shelter art sites*. Stage 3, Volume 1. Report to NSW NPWS.

McDonald, J CHM 1999. *Aboriginal and European Heritage Assessment: the proposed Gerringong-Gerroa Sewage Treatment Plant and associated sewage pumping stations and pipeline routes Gerringong and Gerroa, NSW*.

Morris, A.K. 1986. An Archaeological Survey of North Port Jackson. Report held at NSW NPWS, C-1293.

Navin Officer Heritage Consultants. 2005a. Environment Assessment and Aboriginal Cultural Heirtage: Gas and Power Facility and Associated Infrastructure at Bamarang , Nowra, NSW.

Navin Officer Heritage Consultants. 2005b. Environment Assessment and Historical Cultural Heritage: Gas and Power Facility and Associated Infrastructure at Bamarang , Nowra, NSW.

Navin Officer Heritage Consultants. 2007. Gerringong to Bomaderry Princes Highway Upgrade. Preliminary Indigenous and Non-Indigenous Assessment.

NSW Heritage Office and the Department of Urban Affairs and Planning 1996, Regional Histories of NSW. NSW Government Press.

NSW 1:500,000Geological Map Series.

Shoalhaven Council Local Environment Plan (LEP) no 7. Accessed from Shoalhaven Council web site. www.shoalhaven.nsw.gov.au

Sinclair Knight Merz. 2009. Bamarang 330kV Network Connection: Flora and Fauna Assessment.

Pearson, M. 1981 Seen through different eyes: changing land use and settlement patterns in the Upper Macquarie River region of NSW from prehistoric times to 1860. PhD Thesis, Department of Prehistory and Anthropology, Australian National University, Canberra.

Tindale, N.B. 1974 *The Aboriginal Tribes of Australia.* ANU Press, Canberra.

Whitehead, J. 2003 "Tracking and Mapping The Explorers" Volume 1 The Lachlan River Oxley, Evans, and Cunningham. Southern Cross University Printery: Lismore.

APPENDIX 1

PLATES

Plate 1:

Access road to the proposed position of tower structure 1 where the ETL will connect to the existing 330kV line.

Plate 2:

Position of tower structure 1 where the ETL will connect to the existing line. There is a considerable amount of loose quartz in this area.

Plate 3:

Environs surrounding tower position 2. The sandstone is outcropping and does not overhang.

Plate 4:

Creek line between tower structure 2 and 3 (within 50 m of tower 3).

Plate 5:

Environs surrounding proposed tower structure 3. The topography here is high plateau, a landscape that supports a different vegetation type than the western portion of the ETL.

Plate 6:

View over edge of sandstone escarpment at position of tower structure 6. The face of this escarpment over the cliff connecting through to tower structure 8 has considerable potential for shelters, rock engraving and grinding grooves.

Plate 7:

Photo of steep vegetated hill side in the vicinity of tower structure 9. There is no rock outcropping and 0 % ground surface visibility.

Plate 8:

Photo near position of proposed tower structure 10 at the top of a sandstone spur.

Plate 9:

Near position of proposed tower structure 11. This area is characterised by large outcropping sandstone boulders.

Plate 10:

Photo of hillslope leading up to the proposed position of tower structure 13. This area was visually assessed from the paddock below.

Plate 11:

Photo of location of isolated find B-IF2 near proposed tower structure 17.

Plate 12:

Photo of silcrete artefact recorded as B-IF2.

Plate 13:

Photo of location of site B-OS1 near proposed tower structure 17.

Plate 14:

Photo of indurated mudstone artefact recorded as part of site B-OS1

Plate 15:

Photo of silcrete artefact recorded site B-OS1

Plate 16:

Photo of chert artefact recorded as part of site B-IF1

Plate 17:

View west along easement span between proposed tower structures 18 to 17. The ground surface visibility is limited to exposure on the track

Plate 18:

ETL easement follows access track up the fenceline. At the position of proposed tower structure 18 the land is relatively flat and visibility on the track is good although the substantial vegetation regrowth and leaf litter leave ground surface visibility off the track at 10%.

	**Plate 19:** Position of proposed tower structure 19 in regrowth vegetation with little ground surface visibility.
	**Plate 20:** View north. Picture taken at the end of the transmission line easement in the position of proposed tower structure 21. The Bamarang gas power facility is behind the trees in the background.

APPENDIX 2

ABORIGINAL COMMUNITY CONSULTATION

Shoalhaven City Council

City Administrative Centre
Bridge Road, Nowra NSW Australia 2541
Phone: (02) 4429 3111 • Fax: (02) 4422 1816 • DX 5323 Nowra
Address all correspondence to
The General Manager, PO Box 42, Nowra NSW Australia 2541

COUNCIL REFERENCE: 27069
CONTACT PERSON: Andrew Lissenden

30 March 2009

Ozark Environmental & Heritage Management P/L
PO Box 2069
DUBBO NSW 2830

Dear Sir/Madam,

RE: Aboriginal Assessment for the proposed electrical transmission works located in the Bamerang/Nowra area, NSW

With reference to your letter dated 23 March 2009, please be advised that advice has been sough from Council's CDO Aboriginal Officer, Joanne Scott in relation to contact details for any known Aboriginal groups.

Should you require any additional information, please contact Joanne Scott on (02) 44293 440.

Yours faithfully

Andrew Lissenden
Senior Development Planner

council@shoalhaven.nsw.gov.au • www.shoalhaven.nsw.gov.au

Our reference : DOC09/14515
Contact : Stephen Free (02) 6298 0372

Ms Cheryl Burke
OzArk
PO Box 2069
DUBBO NSW 2830

FAXED
2:20 pm
31/03/09

Dear Ms Burke,

WRITTEN NOTIFICATION OF PROPOSAL AS REQUIRED UNDER DEC INTERIM COMMUNITY CONSULTATION REQUIREMENTS FOR APPLICANTS RE: PROPOSED DELTA ELECTRICITY TRANSMISSION LINE, BAMARANG/NOWRA, NSW – CULTURAL HERITAGE ASSESSMENT

I refer to your letter dated 23 March 2009 to the Department of Environment and Climate Change (DECC) Albury and Coffs Harbour offices regarding the above matter.

Attached is the list of known Aboriginal parties that DEC feels is likely to have an interest in the development. Please note this list is not necessarily an exhaustive list of all interested Aboriginal parties and receipt of this list does not remove the requirement of a proponent/consultant to advertise in local print media and contact other bodies seeking interested Aboriginal parties, in accordance with the Interim Requirements.

If you wish to discuss any of the above matters further please contact myself on (02) 6298 0372.

Yours sincerely

STEPHEN FREE
Senior Aboriginal Heritage Officer/Archaeologist
Planning & Aboriginal Heritage
Climate Change & Environment Protection Group South
31 March 2009

PO Box A290 Sydney South NSW 1232
59-61 Goulburn St Sydney NSW 2000
Tel: (02) 9995 5000 Fax: (02) 9995 5999
TTY (02) 9211 4723
ABN 30 841 387 271
www.environment.nsw.gov.au

Fax sent by : 0262297004 DECC+QUEANBEYAN 31-03-09 14:17 Pg: 2

Organisation/Individual Name	Address	Contact Details
Jerrinja Local Aboriginal Land Council	PO Box 167, Culburra Beach NSW 2540	Ph: (02) 44474207 Fax: (02) 44474230 Mobile: 0417 402271 jlalc@bigpond.com
Jerrinja Consultants Pty Ltd Primary Contact: Graham Connolly, representing the Jerrinja Traditional	PO BOX 5009, Nowra DC NSW 2541	Ph: (02) 44480960 Fax: (02) 44223878 Mobile: 0421457090
South East Coast Gadu Elders Aboriginal Corporation (SECGEAC) Secretary: Maureen Davis	193 Vulcan Street, PO Box 219, Moruya NSW 2537	Ph: (02) 44744188 Mobile: 0412089958
Merrimans Local Aboriginal Land Council	13 Umbarra Rd, Wallaga Lake NSW 2546	Ph: (02) 44737288 Mobile: 0408 118798 Fax: (02) 44737478 merrimanslalc.ozinet.net.au
Ulladulla Local Aboriginal Land Council	66 Deering Street, P.O. Box 520 ULLADULLA NSW 2539	Ph: (02) 4455 5883 Fax: (02) 4454 0440 ulladulla_lalc@aho.tcl.com.au
South Coast Aboriginal and Elders and Friends Group Organisation Secretary: Lena Bloxsome	6 Ernest Street, Nowra NSW 2541	Ph: (02) 44214026 Mobile: 0417 691879
South East Coast Gadu Elders Aboriginal Corporation	193 Vulcan Street, PO Box 219, Moruya NSW 2537	Ph: (02) 4474 4188 Fax:(02) 4474 4181 Mob: 0412 089 958
Mr Lionel P Mongta, Yuin Traditional Owner	137 Princes Highway, PO Box 143, Bodalla NSW 2545	Mob: 0405 216 690

0447696502

68820630 31/03/2009 13:23 RECEIVED FROM: 0262297004 #0842-002

NOWRA LOCAL ABORIGINAL LAND COUNCIL

ABN: 73 721 213 191

Chairperson: Gerry Moore
Deputy Chairperson: Lois Sutherland
CEO: Adell Hyslop

Phone: 02 4423 3163
Fax: 02 4423 0083
Mobile: 0432 114 123
Address: 59 Beinda Street Nowra
Postal: PO Box 528 Nowra NSW 2541

Ref No: NL0055
File No: 09/10072

Cheryl Burke
Oz Ark Environmental & Heritage Management P/l
PO Box 2069
Dubbo NSW 2830

Dear Cheryl,

I am writing in response to your letter received 30 March 2009 regarding nominations to register an interest in the proposed cultural heritage evaluation for Delta Electricity Transmission works, Bamarang.

The Nowra LALC wishes to be registered on the stakeholders list for the proposed cultural heritage evaluation in accordance with the DECC Community Consultation guidelines.

We look forward to working with your organisation during this project. If you have any further enquiries please feel free to contact the office on 02 4423 3163.

Regards

A Hyslop

Adell Hyslop
CEO

6/4/09

06-APR-2009 14:03 From: To:68820630 Page:1/2

Nowra Local Aboriginal Land Council
ABN: 73 721 213 191

Address: 2/59 Bolinda St Nowra NSW 2541
Postal: PO Box 528 Nowra NSW 2541
Phone: 02 4423 3163 **Fax:** 02 4423 0083
Email: nlalc@westnet.com.au

FAX

TO: Cheryl Burke	**FROM:** Adell Hyslop
COMPANY: Oz Ark Environmental & Heritage	**DATE:** 6 APRIL 2009
FAX NUMBER: 6882 0630	**NO. OF PAGES INCLUDING COVER:** 2
PHONE NUMBER: 6882 0118	**OUR REF NO** NL0055
RE: Request to nominate for proposed works – Shoalhaven Water	**FILE NO:** 09/10072

URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY X

Hi Cheryl,

Please find following letter to register for the cultural heritage evaluation for transmission works at Bamarang with Delta Electricity. Original will be in the mail, just wanted to make sure I made the deadline.

Look forward to speaking with you soon.

Regards

Adell Hyslop

NOWRA LOCAL ABORIGINAL LAND COUNCIL

ABN: 73 721 213 191

Chairperson: Gerry Moore
Deputy Chairperson: Lois Sutherland
CEO: Adell Hyslop

Phone: 02 4423 3163
Fax: 02 4423 0083
Mobile: 0432 114 123
Address: 2/59 Beinda Street Bomaderry
Postal: PO Box 528 Nowra NSW 2541

Ref No: NL0080
File No:09/10072

Heidi Kolkert
OZ Ark EHM P/L
PO Box 2069
Dubbo NSW 2830

Dear Heidi

Re: Bamarang Transmission Upgrade Heritage Assessment – Delta Electricity

The Nowra LALC would like to thank OZ Ark for the opportunity to participate in the heritage assessment undertaken for this project. Although the Land Council has a statutory role in the protection and preservation of cultural heritage, as Aboriginal people we too have a custodial obligation to protect and preserve cultural as an integral part of our history and identity. And the participation in such assessments provides an opportunity to have access to lands that predominantly may not have been there in the past to undertake studies to obtain new information on sites and their relationship to the landscape.

After reviewing the report, the Nowra LALC would like to ensure that while the sites that have been located maybe considered of low significance, that recognition be given that potentially other Aboriginal objects (artefacts, trees, etc) maybe uncovered during excavation works due to the little ground disturbance.

Nowra LALC Sites Officer, Jason Davison has made the following recommendations:

1. Further monitoring and study to be completed upon access being granted to property that wasn't surveyed and upon the construction access paths being established and survey pegs put in place.
2. Provisions to be put in place to allow Nowra LALC site officer to monitor ground disturbance activities during construction of towers and paths.

The Nowra LALC again would like to thank OZ Ark and look forward to the final report and further opportunities to work on this project.

If you have any questions regarding the above please contact me at the Office on 4423 3163.

Regards

Adell Hyslop
CEO

22/6/09.

OFFICE OF THE REGISTRAR
ABORIGINAL LAND RIGHTS ACT 1983 (NSW)

11-13 Mansfield Street
Glebe NSW 2037
PO Box 172, Glebe NSW 2037
T 02 9562 6527 F 02 9562 6550

Cheryl Burke
Project Officer
OzArk Pty Ltd
PO Box 2069
DUBBO NSW 2830

Dear Cheryl

Re: **Request - Search for Registered Aboriginal Owners**

I refer to your letter dated 25 March 2009 regarding an Aboriginal heritage project at Nowra, NSW.

I have searched the Register of Aboriginal Owners and the subject land may have Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights Act* 1983 (NSW).

The project area lies on the northern cultural boundaries of the Registered Aboriginal owners of Biamanga and Gulaga National Parks which is further south of the area in question.

I suggest you contact the Chairpersons of the Boards of Management for Biamanga and Gulaga National Parks to confirm whether they wish to be involved in the project.

John Mumbler is the Chairperson of Biamanga National Park Board of Management and Mary Duroux is the Chairperson of Gulaga National Park Board of Management. Both John and Mary can be contacted by mail at:

PO Box 282

NAROOMA NSW 2546

I trust you are in contact with the Nowra Local Aboriginal Land Council regarding this project. They may also be able to assist you with information and contact details for other interested groups.

Yours sincerely

Senior Project Officer
Office of the Registrar, *Aboriginal Land Rights Act 1983*

24 March 2009

APPENDIX 3

COMMUNITY CONSULTATION LOG

Bamarang ETL Stage 2 - SKM				
ICCR - YES				
STAGE 1, NOTIFICATION & REGISTRATION				
AD FOR LOCAL PRESS	***DATE AD WRITTEN***	***DATE AD APPEARING***	***DATE CLOSURE EXPRESSION OF INTEREST***	
South Coast Register	12.03.09	25.03.09	**08.04.09**	Emailed Draft EOI Advert & Stage 1 Letters to Wendy Stevenson @ SKM. Received amendments and directive to go ahead with advert & letters 20.03.09. Advert sent to South Coast Register 23.03.09, proof okay, advert to go in Wednesday's edition.
LETTERS SENT STAGE 1	***Date sent***	***Contact details of who the letter was sent to***	***Date reply required***	**ALL LETTERS POSTED 30.09.08**
DECC	24.03.09	Attn: Mr S Free Senior Aboriginal Heritage Officer/Archaeologist DECC PO Box 733 Queanbeyan NSW 2620 stephen.free@environment.nsw.gov.au	08.04.09	03.04.09 Received letter recommending that the following groups should be advised of the project. *Jerrinja LALC * Jerrinja TO Group * South East Cost Gadu Elders Ab.Corp * Merrimans LALC * Ulladulla LALC *South Coast Aboriginal&Elders&Friends Group * Mr Lionel P Mongta, TO
Natitive Title Service	24.03.09	Mr. Nathan Ryan NSW Native Title Services PO Box 982 Dubbo NSW 2830	08.04.09	
Register of Aboriginal Owners	24.03.09	Megan Mebberson Office of the Registrar, ALRA Tranby Aboriginal College 11 - 13 Mansfield Street Glebe NSW 2037 E: megan.mebberson@daa.nsw.gov.au	08.04.09	24.03.09 Received letter recommending that the following groups should be contacted * Biamanga National Park Board of Mgmt * Gulaga National Park Board of Mgmt

Shoalhaven Shire Council	24.03.09	Mr R Pigg Shoalhaven City Council PO Box 42 Nowra NSW 2541 E: council@shoalhaven.nsw.gov.au	08.04.09	03.04.09 Received letter advising that advice has been sought from Council's CDO Aboriginal Officer, Joanne Scott.
Nowra LALC	24.03.09	Members: Nowra LALC Attn: Chairperson/CEO PO Box 528 Nowra NSW 2541 Email: nlalc@westnet.com.au	08.04.09	06.04.09 Received via fax letter confirming that NLALC would like to be included as Registered Stakeholders
RESPONSES TO STAGE 1 AND EOI ADVERT				
Jason Davison	26.03.09	Mr Jason Davison 2 Copperleaf Place Worrigee NSW 2540 PH: 0412 569 319		Mr Davison phoned to express interest, he had read the EOI advert in the South Coast Register. Mr Davison registered as an individual, his knowledge of the area is vast and he has worked as a sub-consultant for the Nowra LALC on survey work before.
Nowra LALC	06.04.09	Nowra LALC Adell Hyslop / CEO PO Box 528 Nowra NSW 2541 Email: nlalc@westnet.com.au		06.04.09 Received via fax letter confirming that NLALC would like to be included as Registered Stakeholders
STAGE 1 ROUND 2				
Shoalhaven Aboriginal Corporation of Elders & Friends	31.03.09	Attn: Members c/- Lena Bloxsome 9 Ernest Street Nowra NSW 2541	16.04.09	As recommended by SKM, Wendy Stevenson, an EOI stage 1 letter was mailed to Shoalhaven Ab Corp. Wendy had also wanted to ensure we had made contact with Nowra LALC & Delia Lowe, Wandrawandian Elders Group
Wandrawandian Elders Group		attn: Members c/- Delia Lowe	Ken Robinson advised that they did not have contact details for this group.	although this organisation are listed in Delta Electricity's 2006 Submission report contact address is not in this document. Emailed Wendy (31.03.09) requesting this information as we do not have it on file nor can it be found on 'google'.

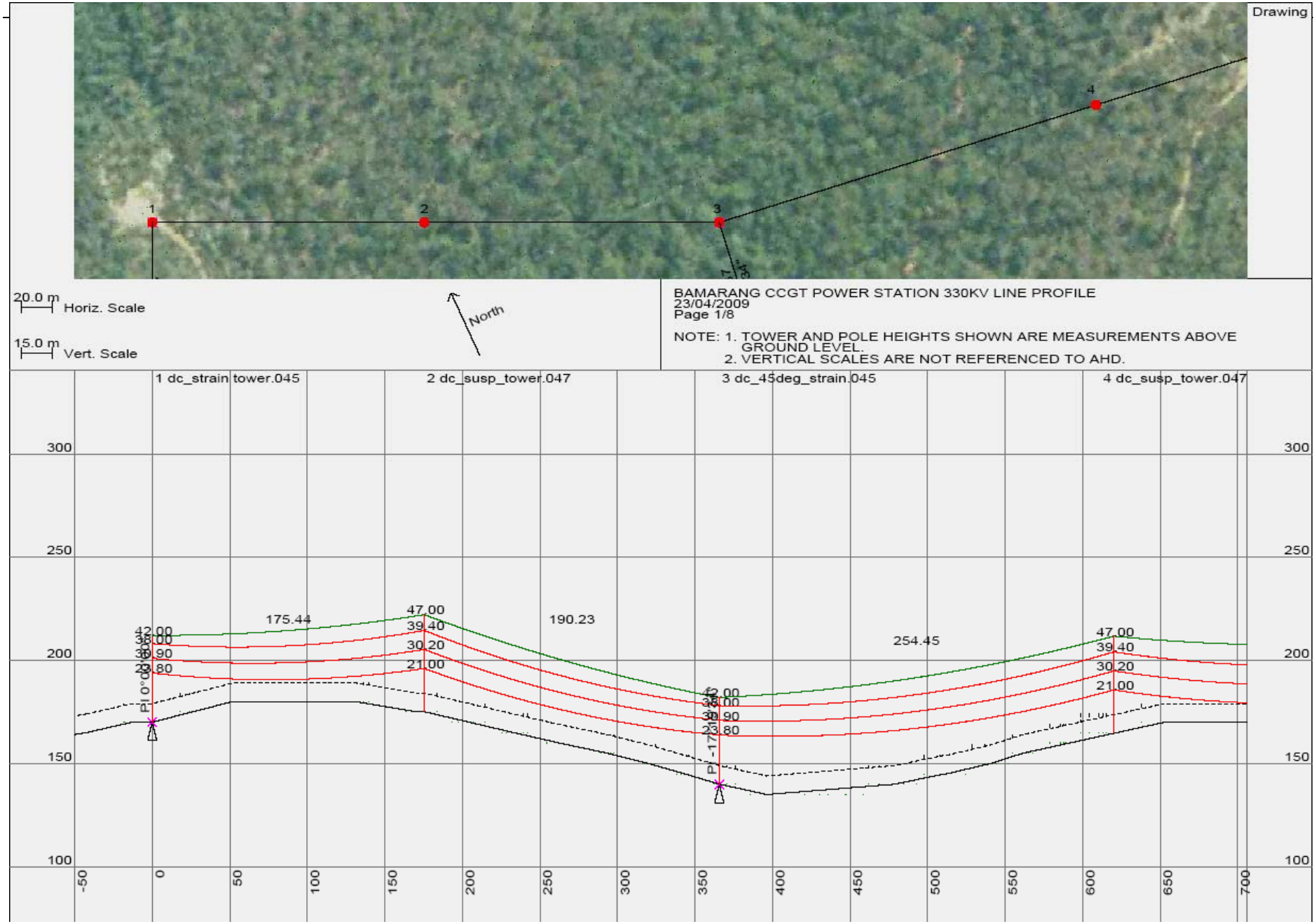
Jerrinja LALC	07.04.09	ATTN: Members Jerrinja LALC po Box 167 Culburra Beach NSW 2540	28.04.09	As recommended by DECC EOI letter was sent to this organisation
Jerrinja Tradional Owners	07.04.09	Attn: Graham Connolly Jerrinaj Traditional Owners Po Box 5009 Nowra NSW 2541	28.04.09	As recommended by DECC EOI letter was sent to this organisation
South East Coast Gadue Elders Aboriginal Corp	07.04.09	ATTN: Members / SECGEAC po Box 219 Moruya NSW 2537	28.04.09	As recommended by DECC EOI letter was sent to this organisation
Merrimans LALC	07.04.09	Attn: Members Merrimans LALC 13 Umbarra Rd Wallaga Lake NSW 2546	28.04.09	As recommended by DECC EOI letter was sent to this organisation
Ulladulla LALC	07.04.09	ATTN: Members Ulladulla LACL po Box 520 Ulladulla NSW 2539	28.04.09	As recommended by DECC EOI letter was sent to this organisation
Yuin Traditional Owner	07.04.09	Mr Lionel P Mongta PO Box 143 Bodalla NSW 2545	28.04.09	As recommended by DECC EOI letter was sent to this organisation
STAGE 2, Methodology Letter				***Comments***
LETTERS SENT TO THE FOLLOWING REGISTERED STAKEHOLDERS	***Date sent***	***Contact details of who the letter was sent to***	***Date reply required***	
Nowra LALC	05.05.09	Members: Nowra LALC Attn: Chairperson/CEO PO Box 528 Nowra NSW 2541 Email: nlalc@westnet.com.au	ASAP. Received on 05.05.09	HK- Stage 2 Letter emailed to adell
Jason Davison	05.05.09	Mr Jason Davison 2 Copperleaf Place Worrigee NSW 2540 PH: 0412 569 319	ASAP	HK- Stage 2 Letter mailed stage 2 letter to Jason Davison
RESPONSES Stage 2 Name of Individual or Organisation	***DATE***	***Contact details***	***Information taken by (name of Ozark staff)***	***Comments***

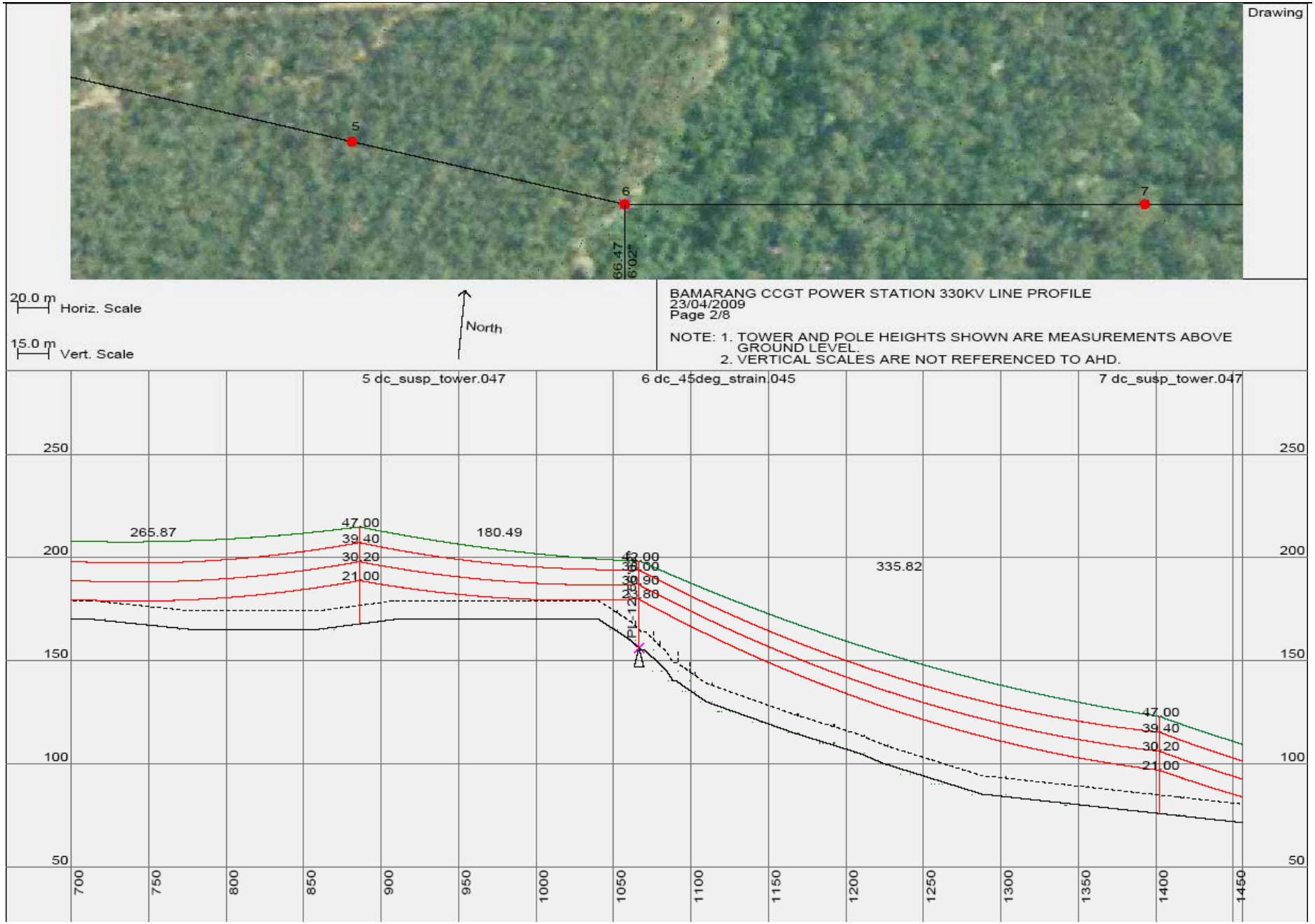
			and by (method (phone, fax etc)	
NLALC	5.05.09	Adell NLALC (02) 4423 3163	Re field work	HK Rang NLALC. Spoke to Adell regarding stage 2 letter, methodology and pay. She confirmed that if her field officer was availble on the 13th and if needed on the 14th of May for field work then it would be fine to send them a stage two letter today via email. She confirmed that the price NLALC charge is $90.00 per hour inc GST. This price is inclusive of everything. I siad that OzArk does not get involved in pricing as SKM deals directly with the client.
NLALC	5.05.09	NLALC@westnet.com.au'	Re field work	HK emailed adele, to follow up phone conversation and requested a response as to whether the field officer was availble for field work next week.
Jason Davison	7.05.09		Re: Stage 2 letter	Jason rang JB on mobile to discuss FW. He was concerned that not enough time had been given to respond to the stage 2 letter and will send through documentation of workers comp today. If the workers comp certificate is current JB said she would talk to the client about the possibility of making another field position available. Documentation was not received by OzArk office
NLALC	08.05.09	Adell NLALC (02) 4423 3163	email - cb	Adell Hyslop emailed copy of NLALC certificate of currency for w/comp and advised Peter Moore will be the rep for their organisation. Emailed details of time and meeting place to NLALC for the FW date.
NLALC	12.05.09	Adell NLALC (02) 4423 3163	email - cb	Adell contacted OzArk to advise that Jason Davison would now be representing NLALC, not Peter Moore as previously noted. Rep to meet with OzArk team 13th May @ 8.30am at Professionals Clyde Poulton R/E, 85 North St, Nowra
FIELDWORK	**DATE**	***Contact details***	**Information taken by**	**COMMENT**

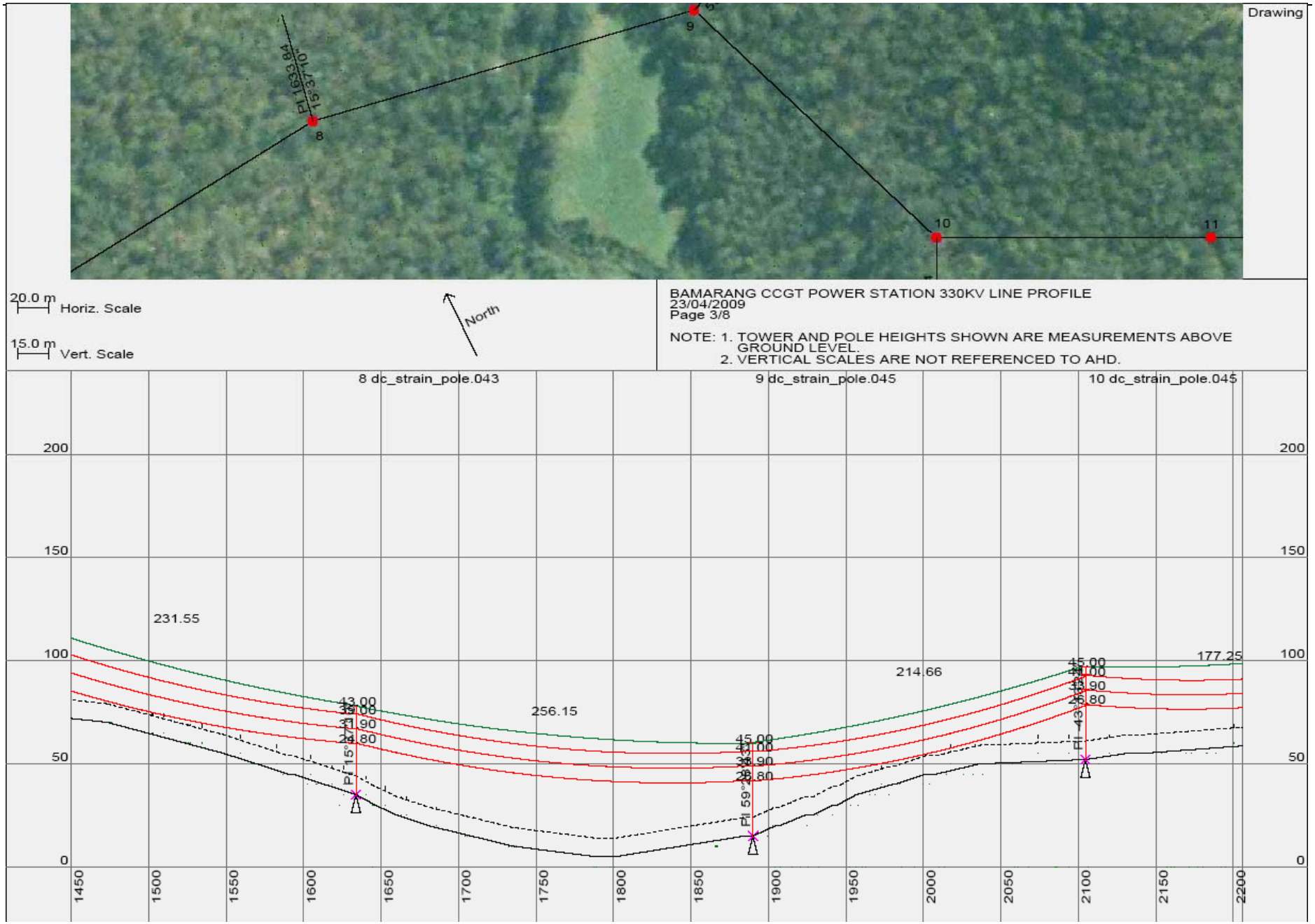
Jason Davison representing the NLALC	13 th to 14 th of May	Mr Jason Davison 2 Copperleaf Place Worrigee NSW 2540 PH: 0412 569 319	HK	Recommendations will follow
Incidental conversations	**DATE**	***Contact details***		**COMMENT**
Emailed Adell (NLALC)	22.06.09	Adell NLALC (02) 4423 3163	HK	Email sent reminding Adell that today is the last day NLALC is able to respond
Adell NLALC	22.06.09	Adell NLALC (02) 4423 3163	HK	Letter in response to the draft report received.

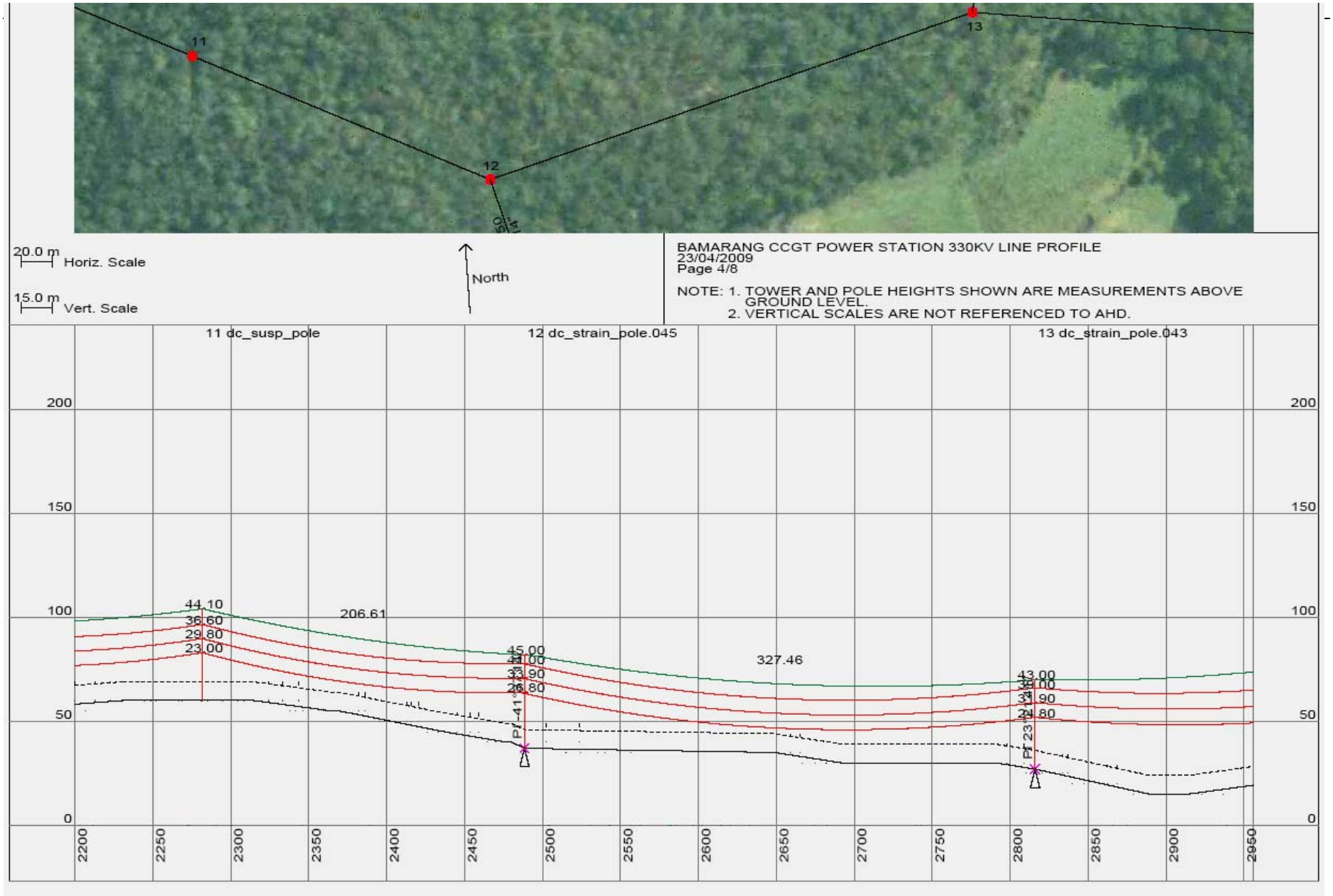
APPENDIX 4

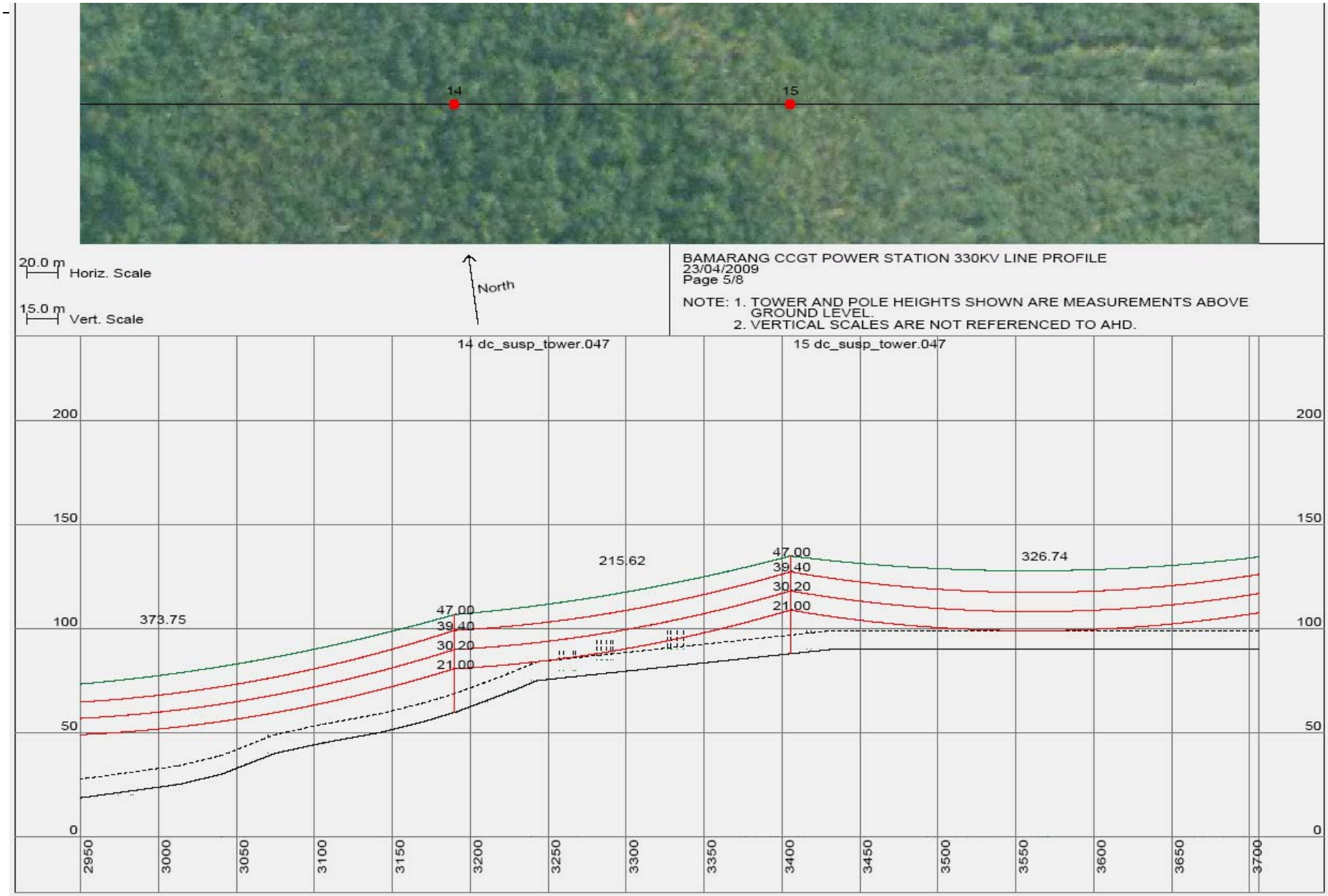
BAMARANG 330KV ETL LINE DETAIL


Drawing
1
2
3
4
20.0 m Horiz. Scale
15.0 m Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 1/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
1 dc_strain tower.045
2 dc_susp_tower.047
3 dc_45deg_strain.045
4 dc_susp_tower.047
175.44
190.23
254.45
42.00
39.40
30.20
21.00
38.00
30.90
23.80
47.00
300
250
200
150
100
-50
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700


Drawing
5
6
7
66.47
6'02"
20.0 m
Horiz. Scale
15.0 m
Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 2/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
5 dc_susp_tower.047
6 dc_45deg_strain.045
7 dc_susp_tower.047
265.87
180.49
335.82
47.00
39.40
30.20
21.00
250
200
150
100
50
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450


Drawing
PI 1633.84
15°37'10"
8
9
10
11
20.0 m Horiz. Scale
15.0 m Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 3/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
8 dc_strain_pole.043
9 dc_strain_pole.045
10 dc_strain_pole.045
231.55
256.15
214.66
177.25
43.00
39.00
31.90
24.80
45.00
41.00
38.90
28.80
200
150
100
50
0
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150
2200


11
12
13
20.0 m Horiz. Scale
15.0 m Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 4/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
11 dc_susp_pole
12 dc_strain_pole.045
13 dc_strain_pole.043
206.61
327.46
44.10
36.60
29.80
23.00
45.00
41.00
33.90
26.80
43.00
39.00
33.90
24.80
200
150
100
50
0
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950


14
15
20.0 m Horiz. Scale
15.0 m Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 5/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
14 dc_susp_tower.047
15 dc_susp_tower.047
373.75
215.62
326.74
47.00
39.40
30.20
21.00
47.00
39.40
30.20
21.00
200
150
100
50
0
2950
3000
3050
3100
3150
3200
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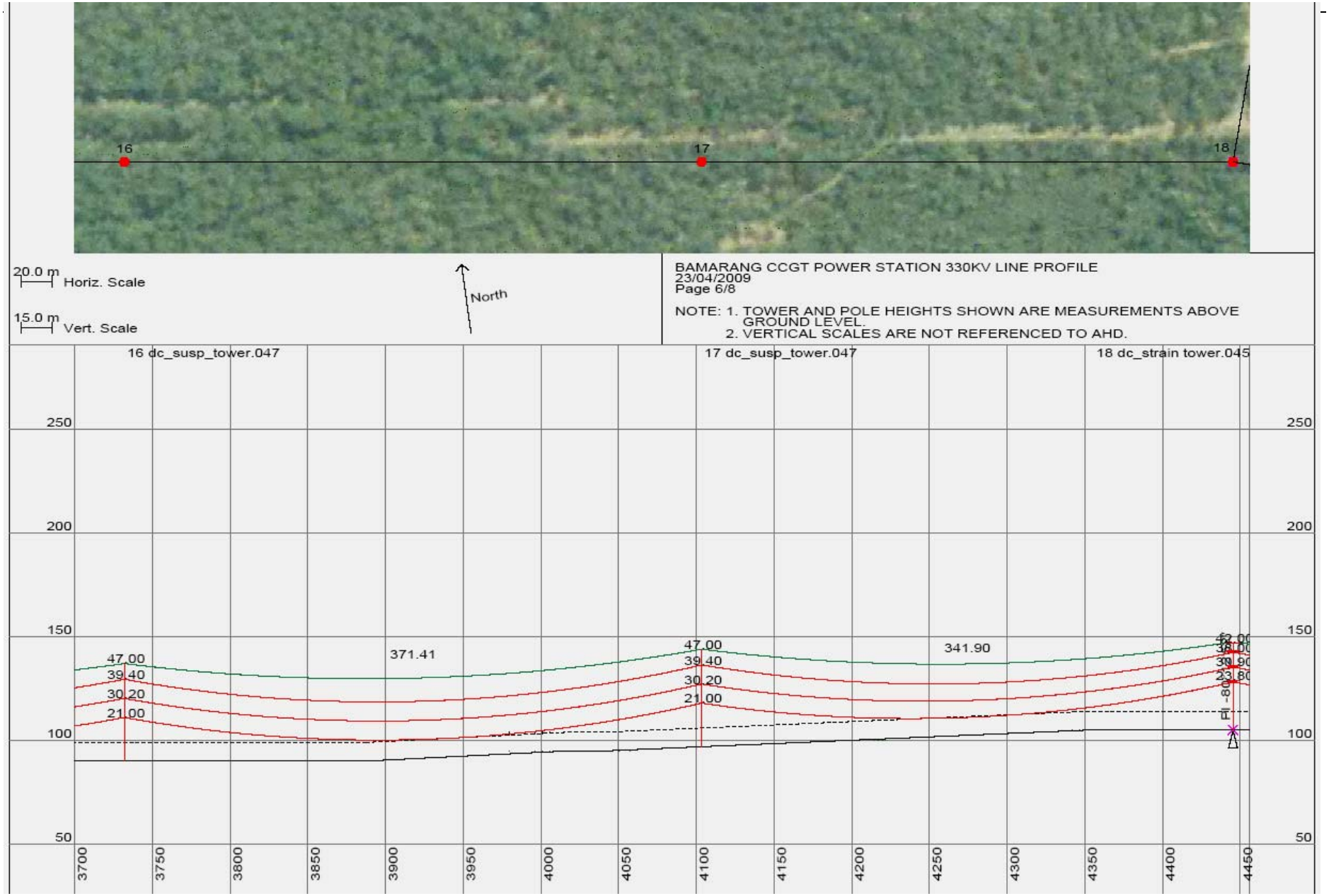
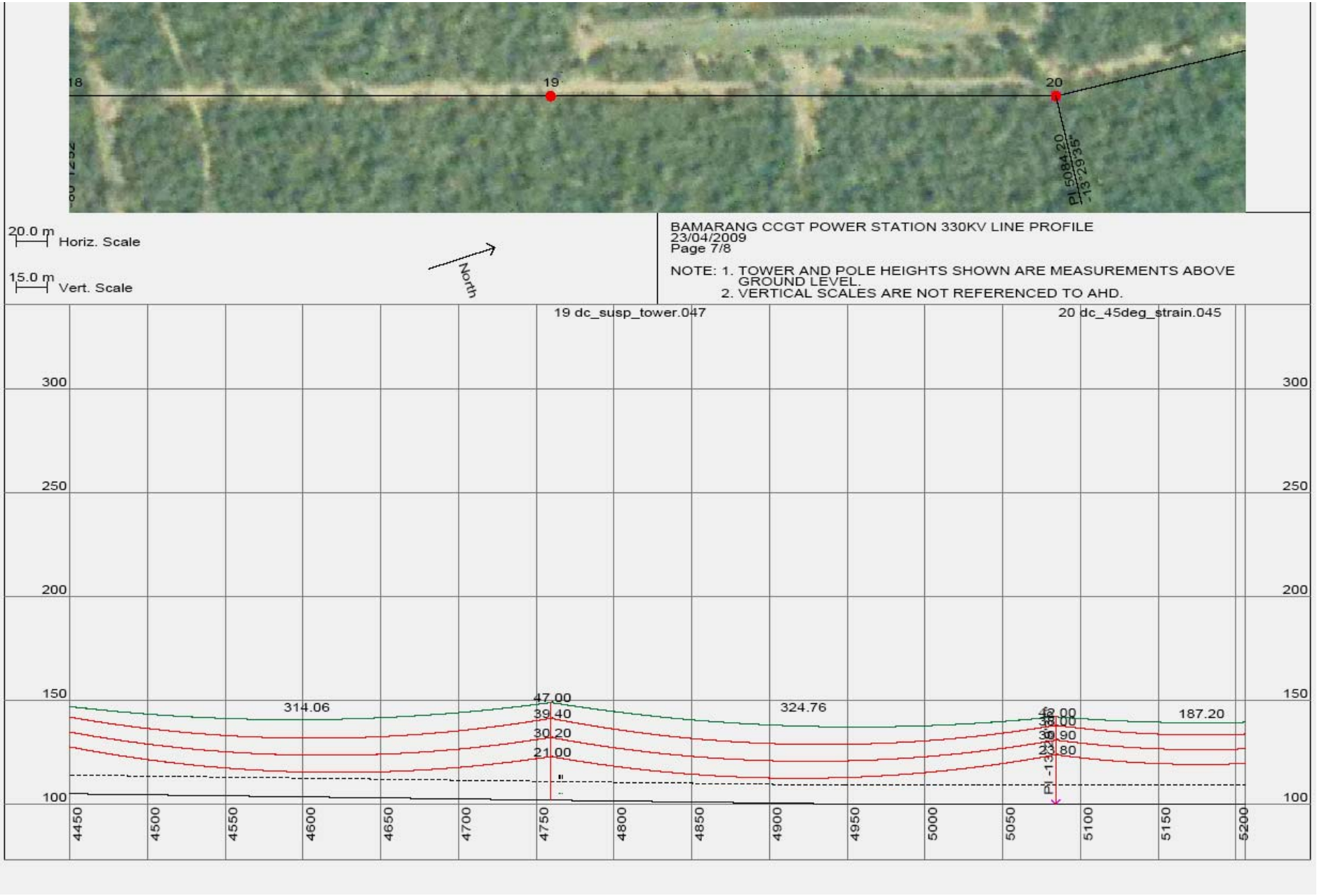
3350
3400
3450
3500
3550
3600
3650
3700


16
17
18
20.0 m
Horiz. Scale
15.0 m
Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 6/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
16 dc_susp_tower.047
17 dc_susp_tower.047
18 dc_strain tower.045
250
200
150
100
50
47.00
39.40
30.20
21.00
371.41
47.00
39.40
30.20
21.00
341.90
3700
3750
3800
3850
3900
3950
4000
4050
4100
4150
4200
4250
4300
4350
4400
4450


18
19
20
PI 5084.20
-13°29'35"
20.0 m Horiz. Scale
15.0 m Vert. Scale
North
BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 7/8
NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.
19 dc_susp_tower.047
20 dc_45deg_strain.045
300
250
200
150
100
314.06
47.00
39.40
30.20
21.00
324.76
187.20
4450
4500
4550
4600
4650
4700
4750
4800
4850
4900
4950
5000
5050
5100
5150
5200

20.0 m Horiz. Scale

15.0 m Vert. Scale

North

BAMARANG CCGT POWER STATION 330KV LINE PROFILE
23/04/2009
Page 8/8

NOTE: 1. TOWER AND POLE HEIGHTS SHOWN ARE MEASUREMENTS ABOVE GROUND LEVEL.
2. VERTICAL SCALES ARE NOT REFERENCED TO AHD.

21 dc_45deg_strain.045

300
250
200
150
100

42.00
38.00
36.90
23.80
PI 0°00'00"

5200
5250

APPENDIX 5

SITE TYPE DEFINITIONS

Open camp sites

Often called stone artefact scatters, these sites (for the purposes of the DEC AHIMS database) were in the past defined by the presence of two or more stone artefacts located within 50 m of one another. Current guidelines, however, delineate no hard and fast determinations on requisite artefact numbers, more loosely describing these campsites as places exhibiting evidence of past human activity. This can be, and is most frequently, in the form of stone artefacts, but may also include other evidence such as hearths or midden material. Such sites provide evidence for the range of activities that may have been undertaken at a particular place, including the production of stone tools and the preparation of food including the butchering of animals or grinding of seeds. However, the distinction between a single, isolated artefact versus a place where numerous artefacts have been recorded together provides a necessary division in terms of the possible information that a site can reveal about past activities. Further information recorded about open sites includes assessments of the sites' integrity (how intact the site is) and subsequently whether sub-surface deposits are thought to be present.

Isolated Finds

An artefact, usually of stone, but possibly of other materials, that is located but has no relationship to other identifiable archaeological features.

Rockshelter sites (with art and/or deposit)

Rockshelter sites can only occur where this is suitable topographic and geological factors present, forming overhangs or caves in the eroding bedrock. The size (both horizontal and vertical dimensions) of the space available, the aspect of the opening and the proximity to resources will determine the length and intensity of human occupation. Art in the form paintings may be found in caves, but often suffer considerably from erosion of the sandstone.

Axe Grinding Grooves

Aboriginal axe heads were usually made from very hard igneous rock, which was first flaked roughly to the appropriate shape and then pecked or ground to an even surface. To keep the edges of these axes sharp, they were ground on the surface of a relatively softer stone (usually sandstone). As the axe is rubbed repeatedly in the same location, a groove forms to fit the shape of the axe. This groove has a roughly elliptical shape and a smooth, regular surface along its base. Arrowheads may also have been sharpened in grooves, which generally appear narrower and deeper.

Grinding groove sites are most often located on the floodplains of rivers and creeks, although they can be in elevated positions above water as well. Sometimes, sandstone flats near water may exhibit hundreds of such grooves, and it is thought that once an axe blank has its edge ground in a groove, then it can only be sharpened in the same groove. Hence, if the owner of the axe is away from its place of origin, then a new groove has to be created for the sharpening of that

particular axe head[4]. Grooves are also frequently recorded in smaller groups, especially along more ephemeral water courses.

Scarred Trees

This site type results from the deliberate removal of bark (and sometimes wood) from trees, for the purpose of obtaining raw material for the manufacture of various items of material culture – i.e. shields, coolamons, shelters, canoes, and cradles. They may also result from foraging and hunting - for instance, toe holes cut in trees to allow access to upper branches and hollows, and axe marks around natural hollows for the extraction of small tree-living fauna (such as possums or birds) or honey.

The identification and interpretation of a scar as being Aboriginal in origin can often be difficult, as bark can be removed from trees by a variety of means e.g. animal and bird foraging, the natural breaking off of tree limbs, lightning strikes to the tree, the result of machinery damage to trunks and the removal of bark by Europeans to define land boundaries. To assist archaeologists in the accurate identification of Aboriginal scarred trees, the DEC Western region provides a set of criteria against which each scar must be assessed.

These diagnostic criteria are as follows:

1. *The scar must not touch the ground* - (scars resulting from fire, fungal attack or lightning nearly always reach the ground). Such a termination does not necessarily preclude an Aboriginal origin. Ethno-historic accounts of canoe manufacture occasionally demonstrate scarring to ground level. If the scar does run to the ground, the sides must be relatively parallel (i.e. not triangular). It must be noted that discussion with Native Title from other areas suggests that scars may indeed extend to the ground, especially when the bark is planned for use in a shelter. This information is derived from oral histories recorded in Dubbo and observations from further afield;

2. *The ends of the scar should be squared off or evenly tapered* - Different shapes at the top and bottom (e.g. pointed at top, squared at bottom; round at top, flaring at bottom) are suggestive of natural processes (e.g. branch loss);

3. *The sides of the scar should be parallel or symmetrical* - Few natural scars are likely to have these properties, with the possible exception of fire scars which may be symmetrical but are usually wider at their base. Modern surveyors' marks are typically triangular, and often adzed. These also (regardless of shape) usually have a number carved in the wood, within the scar;

4. *The length of the scar must be on the same axis as the tree and not oblique or slanting across the tree or the branch* - Scars which are natural in origin tend to have irregular outlines, sometimes have irregular regrowth and may occur against the axis of the tree.

5. *The tree should be reasonably old – i.e. over 100 years* - The tree upon which the scar is found should be old enough (i.e. of sufficient age) to have been used by Aboriginal people in (at

[4] As read at the Terramungamine Reserve grinding groove interpretation sign.

least) a semi-traditional manner. This means the tree should be at least approximately 100 years old. The age of the scar should also be reflected in the thickness of the regrowth. Young scars (e.g. some natural scars caused by branches falling or birds or horses gnawing, have characteristically thin regrowth);

6. *There must be no obvious natural or other artificial cause* such as a branch rip, lightening strike, cockatoo chewed bark or healed bark tears from machinery damage or car impact – Any signs that the scar may not be Aboriginal should be carefully assessed; and,

7. *The tree must not be an introduced species* – For obvious reasons, the tree upon which the scar is found should be endemic to the region, i.e. this excludes historic (exotic) plantings.

Also helpful in scarred tree identification, but not within the DEC criteria are the following points:

8. *Axe or adze marks* - A scar with cut marks on the original wood is likely to be anthropogenic in nature (i.e. as a result of human actions). The location and shape/size may lend support to the scar's origin. For example stone axe marks would indicate an Aboriginal origin, while steel axe marks post-date the arrival of Europeans. These of course could still have been made by an Aboriginal person in the post-contact era; and,

9. *The presence of epicormal growth* – Many scars of Aboriginal origin tend to have an epicormal shoot originating at the base of the scar. This is a new branch shooting from the point of damage and is part of the trees self preservation mechanism.

As noted in the DEC criteria, any tree that does not fit these rules cannot be accepted as likely to be of Aboriginal origin. This may mean that a few authentic scars are omitted from the Aboriginal Sites register, but it is the only means to establish consistency in identification.

However, even when applied, the above criteria cannot always provide a definitive classification, and a natural origin for the scar cannot be ruled out. For this reason interpretations of Aboriginal origin are qualified by the recorders degree of certainty. The following categories are used:

- DEFINITE ABORIGINAL SCAR

This is a scar which conforms to all of the criteria stated above and/or has in addition a feature or characteristic that provides definitive identification, such as diagnostic axe or adze marks, or a historical identification. All conceivably natural causes of the scar can be reliably discounted.

- ABORIGINAL SCAR

This is a scar which conforms to most of the criteria, and where an Aboriginal origin is considered to be the most likely. Despite this, a natural origin cannot be completely ruled out.

- POSSIBLE ABORIGINAL SCAR

This is a scar which conforms to most of the criteria but where an Aboriginal origin would appear unlikely[8].

For the purposes of the current study, on the advice of Allan Hutchins (DEC Western Region), only scars of the first two categories have been recorded as sites to be entered into the DEC ASR. As a general rule, the "Aboriginal scar" and "Probable Aboriginal scar" categories have been collapsed into one, called "Aboriginal scar".

Natural Mythological or Cultural / Ceremonial sites

Natural mythological sites can be any natural feature and like a cultural / spiritual are not detectable without the traditional knowledge of specific areas.