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AGL Leafs Gully Power Project Environmental Assessment

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Appendix M

Cultural Heritage Assessment

URS



Switched on Business.



Gas Turbine Power Station Leafs Gully, NSW

Cultural Heritage Assessment

November 2008



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A Report to URS Australia Pty Ltd

EXECUTIVE SUMMARY

AGL is currently developing a gas turbine peaking project in Leaf's Gully, southwest Sydney, NSW. The size of the project is expected to be approximately 300MW for stage 1, with stage 2 comprising another 300MW. Stage 1 is scheduled to be operational by November 2009.

The project falls within Part 3A of the Environmental Planning and Assessment Act 1979.

URS Australia Pty Ltd has been contracted to prepare the Environmental Assessment for the project.

This report provides an Aboriginal and European cultural heritage assessment of the proposal. The assessment was conducted in May 2006 and included a review of literature and heritage listings, an archaeological surface survey of the development site, and consultation with representative local Aboriginal groups.

The conclusions of the cultural heritage investigation are as follows:

1. No Aboriginal objects or sites were located during the field survey of the Leaf's Gully Power Station study area.
2. A substantial area of potential Aboriginal archaeological deposit LGPAD 1 was identified in the study area. The area includes areas of moderate and low-moderate archaeological potential. This deposit would be subject to development impact.
3. It is recommended that a program of archaeological subsurface testing be conducted across a representative sample of the LGPAD1 deposits with the aim of determining the nature and significance of any Aboriginal objects present. If this testing program is to be conducted prior to project approval under Part 3A of the EP&A Act then a section 87 permit from the DEC would be required.
4. If Aboriginal objects are encountered within proposed development areas, then appropriate management strategies should be formulated with the aim of mitigating any development impacts to identified heritage values. These strategies should form part of a Statement of Commitments under any Part 3A approval.
5. A small section of the Sydney Water Supply Upper Canal System may potentially be impacted by the proposed power station development. This would result if an option for a water pipeline connection with the canal was constructed. The expected impact of the connection would be minor in nature.
6. If the option to construct a pipeline connection with the canal is developed further, it is recommended that:
 - The design of the connection should minimise direct and indirect impacts to the fabric and context of the canal;
 - All works and impacts on the canal should be consistent with the provisions of the existing Conservation Management Plan for the Upper Canal (Higginbotham and Associates 2002).
 - Any heritage impact mitigation actions as required by Conservation Management Plan should be included in a Statement of Commitments as part of any Part 3A approval.

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1. INTRODUCTION

AGL is currently developing a gas turbine peaking project in Leaf's Gully, southwest Sydney, NSW (Figures 1.1, 2 and 3). The proposed development is for a 300MW gas fired peaking power plant comprising two open cycle gas turbines.

The development proposal includes:

- an access road along an already formed road corridor;
- power lines linking with transmission lines to the east;
- a gas pipeline linking with a major supply pipeline to the east;
- visual buffer plantings to the north of the station; and
- an option for a water pipeline connection with the Sydney water supply Upper Canal.

The total study area consists of approximately 66 hectares.

The project falls within Part 3A of the Environmental Planning and Assessment Act 1979.

URS Australia Pty Ltd has been contracted to prepare the Environmental Assessment for the project.

This report documents the results of a cultural heritage assessment of the Leaf's Gully site and was commissioned by URS Australia Pty Ltd.

1.1 Report Outline

This report:

- Outlines the methodology implemented for the project;
- Describes the environmental setting of the Leaf's Gully study area;
- Provides a background of local and regional archaeology for the Leaf's Gully study area;
- Provides an historical background to the Leaf's Gully study area;
- Provides predictive statements for Aboriginal and European heritage places in the study area;
- Describes the results of the desktop analyses and field surveys of the subject site;
- Outlines the statutory obligations relevant to cultural heritage of the site; and
- Provides recommendations based on the results of the investigation and the impact of the proposed development on the known and potential archaeological resource.

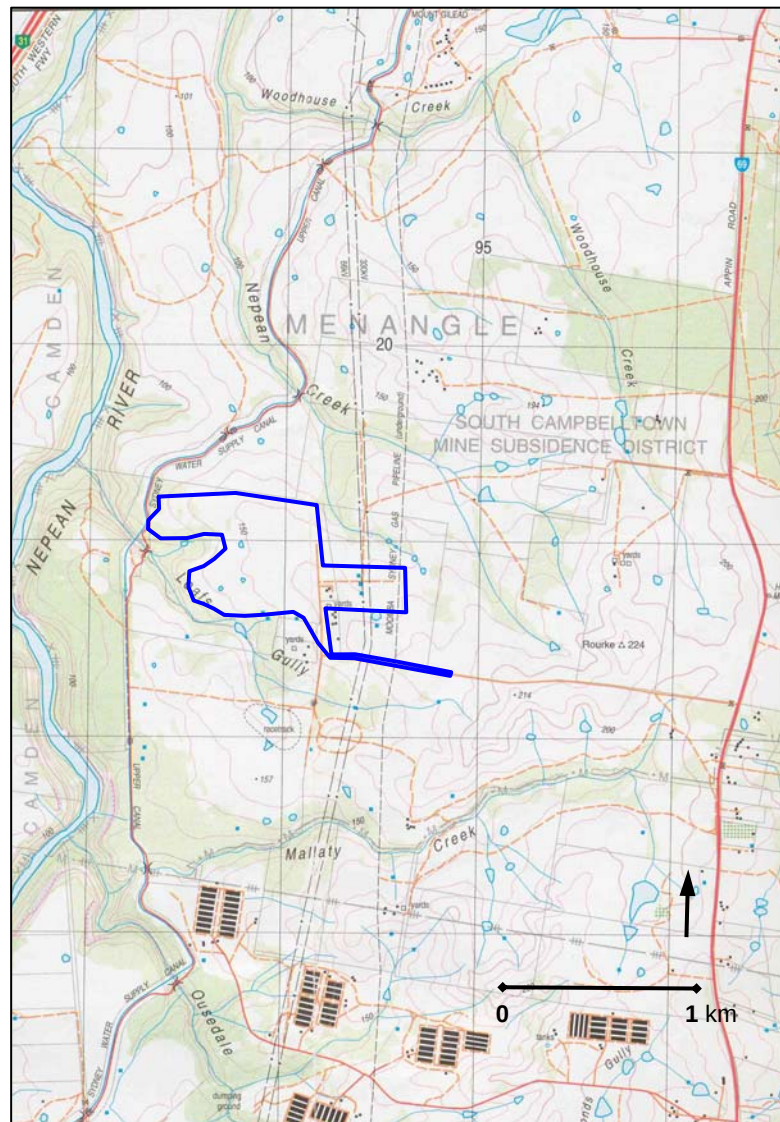


Figure 1.1 General location of Leafy Gully Power Station study area (blue boundary)
(base map: Appin 9029-1S 1:25 000 topo 3rd Ed, LIC 2000)



Figure 1.2 The Leafs Gully Power Station study area (blue)
(orthophoto map supplied by URS)

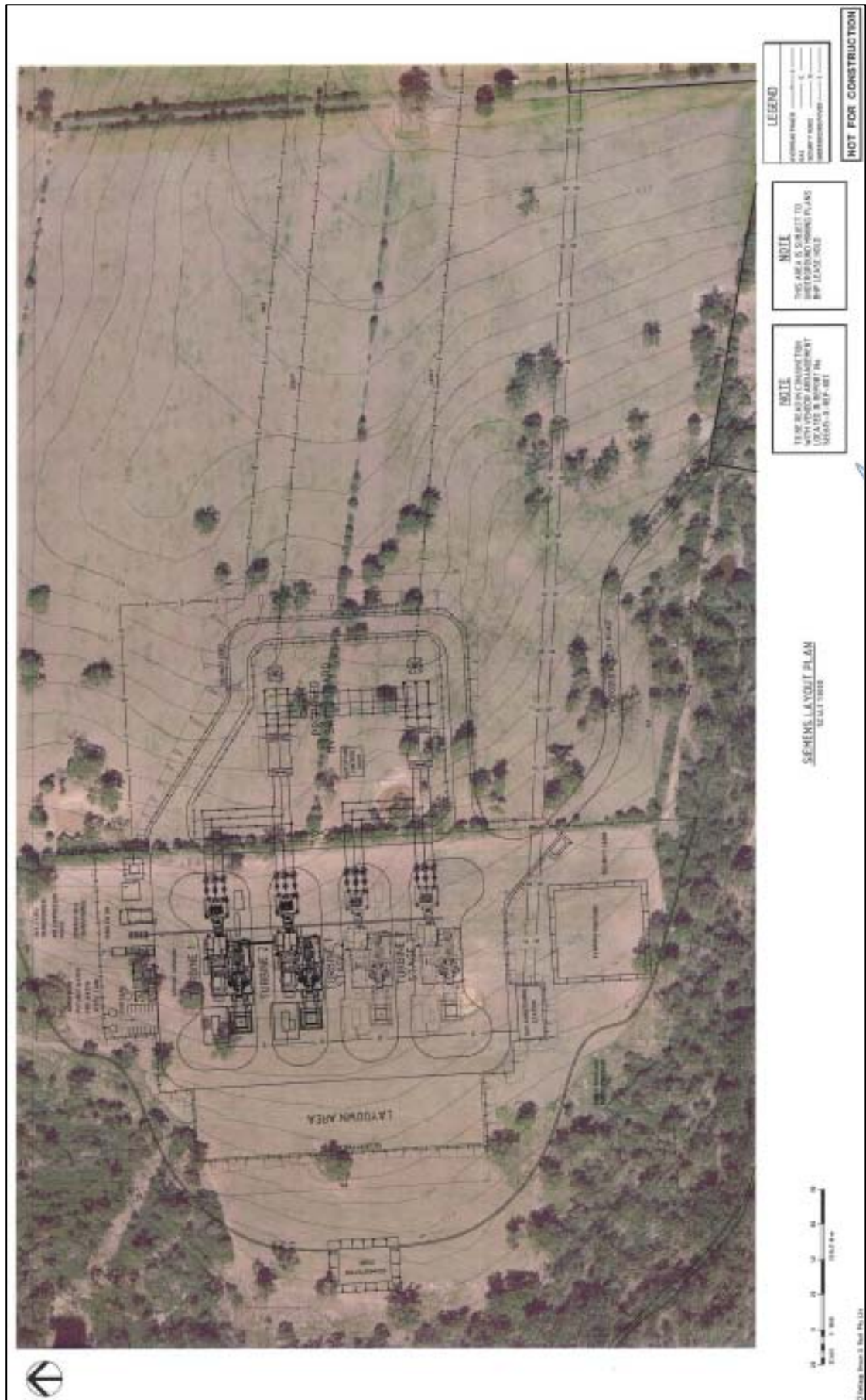


Figure 1.3 Proposed layout of Leafy Gully Gas Turbine
(original supplied by URS)



2. ABORIGINAL PARTICIPATION

Two Aboriginal stakeholder groups have an interest in the Leafs Gully study area. These groups are:

- the Tharawal Local Aboriginal Land Council (TLALC); and
- the Cubbitch Barta Native Title Claimant Group (CBNTCG).

These groups were contacted by telephone and an invitation was extended to the groups to provide representatives to participate in the archaeological field survey of the study area.

Kim Prophet represented the interests of the TLALC in the project. Glenda Chalker represented the interests of the CBNTCG in the project.

Kim and Glenda participated in the field survey of the Leafs Gully study area, which was conducted in May 2006.

A Record of Aboriginal Participation is provided in Appendix 1.

The DECC *Interim Guidelines for Aboriginal Community Consultation* were followed for this project after the field survey component was completed.

An advertisement was placed in the Campbelltown Advertiser on 13th October 2008 (see Appendix 1) and letters were sent to Tharawal Local Aboriginal Land Council, Register of Aboriginal Owners, Native Title Services, Campbelltown City Council and NSW Department of Environment and Climate Change requesting registration of interested parties for a project in the Appin region by 3rd November 2008.

As of Tuesday 4th November 2008 two responses were received. Responses were received from (See Appendix 1):

- the Tharawal Local Aboriginal Land Council (TLALC); and
- the Northern Illawarra Aboriginal collective inc. (NIAC).



3. STUDY METHODOLOGY

3.1 Literature and Database Review

A range of documentation was used in assessing archaeological and historical knowledge for the Leaf's Gully study area and its surrounds. This background research was used to determine if known Aboriginal and historical sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. The review of written and documentary sources included heritage registers, local histories and archaeological reports.

Aboriginal literature sources included the NSW Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS), associated files and catalogue of archaeological reports.

The following heritage registers and schedules were searched:

- Aboriginal Heritage Information Management System (AHIMS) (NSW Dept Environment and Conservation);
- The National Heritage List (Australian Heritage Council);
- The Commonwealth Heritage List (Australian Heritage Council);
- The Register of the National Estate (Australian Heritage Council);
- Register of Significant Twentieth Century Architecture (NSW) (Royal Australian Institute of Architects, NSW Chapter);
- The State Heritage Register (NSW Heritage Office);
- The State Heritage Inventory (NSW Heritage Office);
- Heritage Schedule(s) from the Campbelltown Local Environmental Plan 2002;
- Section 170 Heritage and Conservation Registers compiled by the Sydney Catchment Authority and the NSW Roads and Traffic Authority; and
- Register of the National Trust of Australia (NSW).

The searches undertaken for this study were repeated in June 2008.

3.2 Fieldwork

Fieldwork was conducted over one day in May 2006. Field survey was conducted on foot and involved inspection of all areas through the use of formal and opportunistic traverses. All areas of ground surface visibility within the study area were inspected. All other areas and landforms were sampled using straight line or opportunistic traverses.

All old growth trees were inspected for potential Aboriginal scarring.

Survey was conducted within the area of potential disturbance from development as proposed at the time of survey. This consisted of an area of approximately 31 hectares. Since that time the footprint of the proposal has changed in shape and expanded in size (to approximately 66 hectares) to allow for additional components to the projects such as a visual screening mound (refer Figure 7.2). As a consequence, approximately half of the current study area has not been directly inspected. Based on the preliminary results of the survey and the nature of the proposed development in the additional areas, it was agreed with URS that the unsurveyed areas could be effectively assessed without the conduct of further survey. These additional areas were included within the predictive assessment and



a majority were found to occur within identified potential archaeological deposits (refer Section 7.1). All landform types present within the uninspected areas also occur within the surveyed sample.

3.3 Project Personnel

Archaeologists Nicola Hayes and Rebecca Yit, and Aboriginal representatives Kim Prophet and Glenda Chalker conducted the fieldwork.

The report was written by Nicola Hayes and Kelvin Officer.

3.4 Recording Parameters

The archaeological survey aimed at identifying material evidence of Aboriginal occupation as revealed by surface artefacts and areas of archaeological potential unassociated with surface artefacts. Potential recordings fall into three categories: isolated finds, sites and potential archaeological deposits.

3.4.1 Background scatter

Background scatter is a term used generally by archaeologists to refer to artefacts which cannot be usefully related to a place or focus of past activity (except for the net accumulation of single artefact losses).

There is however no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocused activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focussed activity' are camping, knapping and heat-eating stone, cooking in a hearth, and processing food with stone tools. In practical terms, over a period of thousands of years an accumulation of 'unfocused' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.

3.4.2 Sites

A site is defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity.

Frequently encountered site types within southeastern Australia include open artefact scatters, coastal and freshwater middens, rock shelter sites including occupation deposit and/or rock art, grinding groove sites and scarred trees. For the purposes of this section, only the methodologies used in the identification of these site types are outlined.

Most Aboriginal sites are identified by the presence of three main categories of artefacts: stone or shell artefacts situated on or in a sedimentary matrix, marks located on or in rock surfaces, and scars on trees. Artefacts situated within, or on, a sedimentary matrix in an open context are classed as a site when two or more occur no more than 60 metres away from any other constituent artefact. The 60 metre specification relates back to the definition of an isolated find (*Refer above*). In a rockshelter, a site is defined as one or more artefacts occurring within or immediately adjacent to the sheltered space. Unlike a single artefact in an open context, a rock shelter provides a probable occupational focus to the interpretation of a single artefact and can therefore be considered to be indicative of a site. An exception would be a single artefact which may have been deposited in the shelter through natural processes.

Any location containing one or more marks of Aboriginal origin on rock surfaces is classed as a site. Marks typically consist of grinding features such as grinding grooves for hatchet heads, and rock art such as engravings, drawings or paintings. The boundaries of these sites are defined according to



the spatial extent of the marks, or the extent of the overhang, depending on which is most applicable to the spatial and temporal integrity of the site.

3.4.3 Potential Archaeological Deposits

A potential archaeological deposit, or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. The potential for subsurface material to be present is assessed using criteria developed from the results of previous surveys and excavations relevant to the region (refer section 5.5). Where necessary, PADs can be given an indicative rating of their 'archaeological potential' based on a combined assessment of their potential to contain artefacts, and the potential archaeological value of the deposit. Figure 3.1 illustrates the matrix on which this assessment is based. Locations with low potential for artefacts fall below the threshold of classification. In such cases the potential incidence of artefactual material is considered to be the same as, or close to that for background scatter. Where there is moderate potential for artefacts, the predicted archaeological potential parallels the potential significance of the deposit. For deposits with high potential for artefacts, the assessed archaeological potential is weighted positively.

The boundaries of PADs are generally defined by the extent of particular micro-landforms known to have high correlations with archaeological material. A PAD may or may not be associated with surface artefacts. In the absence of artefacts, a location with potential will be recorded as a PAD. Where one or more surface artefacts occur on a sedimentary deposit, a PAD may also be identified where there is insufficient evidence to assess the nature and content of the underlying deposit. This situation is due mostly to poor ground surface visibility.

		Potential to contain Aboriginal objects		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Potential archaeological significance	<i>Low</i>	---	low	moderate
	<i>Moderate</i>	---	moderate	high
	<i>High</i>	---	high	high

Figure 3.1 Matrix showing the basis for assessing the archaeological potential (shown in bolded black text) of a potential archaeological deposit.



4. ENVIRONMENTAL CONTEXT

4.1 The Sydney Basin

The Leaf's Gully study area is defined as the area of potential development impact for the Leaf's Gully Power Station, including buffer zones and easements (Figures 1.1, 2 and 3). The study area is located within the Sydney Basin, a large sedimentary basin that dominates the NSW central coast and its fluvial catchments. The Basin consists of various approximately horizontally bedded sedimentary facies that accumulated during a marine transgression at the end of the Late Palaeozoic glaciation, and which was subsequently followed by a marine regression during the Late Permian and Triassic.

There are two geological and structural divisions within the Sydney Basin which are relevant to the Leaf's Gully study area - the Cumberland Plain and the Woronora Ramp.

The surface of the Cumberland Plain is predominantly shales of the Wianamatta Group which have weathered to form low to moderately-graded and predominantly undulating landscapes. Surrounding the plain are extensive exposures of the underlying Hawkesbury sandstone, which is relatively resistant to erosion compared to the overlying shales. The Hawkesbury sandstones support steep slopes, minor overhangs and often extensive vertical, or near vertical, escarpments. Sandstone topographies dominate where drainage lines have down-cut through shales to lower valley levels, or where structural uplift has elevated extensive sandstone plateau which have subsequently become incised by fluvial erosion.

Where the Cumberland Plain and the Woronora Ramp come together, there is a transitional zone where the landscape includes features of both divisions. The Leaf's Gully study area falls within this zone.

4.2 The Transitional Zone

The Cumberland Plain and the Woronora Ramp grade into each other across a relatively narrow zone in which the landscape takes on features of both these major structural units. From a geological point of view, it could be argued that all of the incised terrain to the west of the Georges River represents a transitional zone due to the presence of Wianamatta Shales on the remnant plateau and ridgeline crests. Moving west from the River, these areas become larger and coalesce, whilst the intervening incised sandstone drainage lines become shallow and give way to open and moderately graded valleys formed on shale bedrock.

However, from an archaeological perspective, the transition between these two landforms is most meaningful when the dominant variable of bedrock geology is combined with topographic variables. Critical factors that define the transitional zone are the change:

- Between sandstone and shale in creek beds;
- In valley morphology between: narrow, moderate and steeply graded valleys, situated between distinct break-of-slopes and dominated by sandstone; and shale based, wide and open valleys, with moderate low gradient slopes, with no break-of-slope, and
- In ridgeline topography between: relatively flat remnant plateau land surfaces located between distinct break-of-slopes; and broad gently graded or rounded crests with relatively distinct watersheds.

4.3 The Impact of Landuse Practices on the Archaeological Record

The Leaf's Gully study area has undergone landscape disturbance, primarily as a result of its use for agricultural purposes. The area is substantially cleared of original vegetation and is now predominantly under pasture grass (Plate 4.1). Most of the property has been ploughed. Service easements (gas, electricity) and unformed roads and tracks traverse the property. The clearance of vegetation has a variable impact on archaeological sites, depending on the clearing methodology



and type of site. Scarred trees will be destroyed. Surface sites such as stone arrangements and ground relief features would be unlikely to survive clearing activities. Early nineteenth century clearing methods involving fire, hand cutting, ringbarking and specific stump removal would have had the least direct impact. Disturbance would have occurred to the subsoil where rootstock and stumps were removed. Mechanised, more intensive and faster clearing methods, such as those employed today and from the mid-twentieth century, would have caused more widespread subsoil impact and consequential dispersal of artefacts and disturbance of archaeological deposits. It is unlikely however that the direct effects of vegetation clearance would destroy most subsurface deposits. Impacts would have been limited to the dispersal and disturbance of artefactual material.

The indirect impacts of clearing would have been locally more severe, such as increased land surface run-off and sedimentation. Bank erosion would have destroyed riparian sites and increased sedimentation rates would have buried and concealed valley floor sites.

The impacts of agriculture and the establishment of agricultural pastures are potentially substantial. Surface site features such as stone arrangements and ground relief will not survive repeated tilling. All forms of ploughing and tilling have the effect of dispersing and disturbing artefacts within the plough zone. This may reduce the archaeological value of a deposit but does not reduce statutory constraints arising from the National Parks and Wildlife Act which protects Aboriginal objects (artefacts) regardless of levels of disturbance.

In many open archaeological sites the vertical position of artefacts within the soil profile is of little archaeological value due to natural post-depositional movement within the profile (bioturbation). The main impact of ploughing in these contexts is damage to artefacts from actual impact, and the spatial displacement of artefacts within a horizontal plane.

In rare situations, depending on sediment type and topographic context, open context archaeological deposits may retain vertical integrity and include layers which relate to older and younger occupation (stratigraphy). In these cases, ploughing will destroy the stratigraphic integrity of the deposit within the plough zone and significantly reduce the archaeological value of the deposit.

The indirect impacts of ploughing and cultivation include the sedimentation of sites located downslope and downstream and downstream erosion. Due to the downslope movement of eroded soil sediments from upper slopes a variably thick layer of historic sediment deposition is frequently encountered on basal slopes and valley floors. This overlies the original pre-European land surface and has the effect of concealing archaeological sites and preventing their detection during surface survey. With the exception of stream-bank sites which are vulnerable to erosion from increased run-off and peak-flow rates, the secondary deposition of sediments from agriculture often protects Aboriginal archaeological sites from further impact, provided they fall below the plough zone.



Plate 4.1 Typical view of study area.



5. ABORIGINAL CONTEXT

5.1 Tribal Boundaries and Traditional Groupings

There have been numerous attempts at mapping the pre-contact and contact territories of Aboriginal people in the Sydney region (Capell 1970; Eades 1976; Kohen 1986, 1988; Mathews 1901a, 1901b; Ross 1988; Tindale 1974). The exact boundaries that existed between Aboriginal people at 1788 are impossible to reconstruct because of the lack of reliable data available from that period of time.

The primary data are limited as the early observers (members of the First Fleet and settlers) did not document how Aboriginal people perceived their own groups, or how they differentiated themselves from one another. Early anthropological work that was carried out is also not totally reliable. The population of Aboriginal people around Sydney was depleted by disease and aggression by Europeans and many of the survivors would have quickly relocated and/or probably joined other groups.

Most tribal boundary reconstructions place the Leaf's Gully study area within the Dharawal (Tharawal) tribal area.

Tindale's map of tribal boundaries was constructed in 1940 from fieldwork and existing literature. The boundaries as defined by Tindale (1974) show the Tharawal's northern boundary in Botany Bay extending west to where it adjoins the Gandangara (Gandangarra) and south to just east of Picton then east to the coast above Woonona. Capell (1970) concluded that the territory of the Dharawal (Tharawal) started on the southern shore of Botany Bay and extended to Nowra and Jervis Bay. R.H. Mathews' wrote that 'The Dharook dialect ... was spoken at Campbelltown, Liverpool, Camden, Penrith, and possibly as far east as Sydney' (Mathews 1901a:151).

5.2 Local Aboriginal History

Few historical accounts mention or record details specific to the Aborigines who lived in the Campbelltown area.

Investigative field expeditions by early settlers to the Cumberland Plains and Cow Pastures are documented, including meetings with Aborigines in these areas. Typical are the references provided by Captain Tench in 1790 (Collins 1798) and Governor Macquarie in 1802 and 1815 (Macquarie 1956), which relate the observation of camp remains and notched trees, and actual encounters with 'natives'.

Aboriginal observations of the initial incursion of European culture are evidenced from the Cowpasture area by three drawings of bulls which probably represent the original polled cattle which escaped to the area from the First Fleet (Lyon and Urry 1979).

References from the early explorers indicate that there was little contact between coastal and inland tribes. Tench (1793) noted that coastal Aborigines had no knowledge of the region west of what is now known as Parramatta.

Although no reliable appraisal of the number of Aborigines living in the Sydney area was made by early observers, it has been estimated that the population density for the region was between five and 10 individuals per square mile (Maddock 1972). With European settlement this population was quickly decimated, and in less than a century traditional Aboriginal lifestyle patterns in the Sydney area were virtually destroyed.

First white contact with the Aborigines of the area is attributed to two explorers – Ensign Francis Barrallier who crossed through the area in November 1802, and George Caley, a servant of Joseph Banks, who reached the area in December 1802.

In January of 1805, George Caley made an expedition to the Georges River area which he later described as 'a Journey Towards Jugroy ...' (MacLeod Morgan 1955). The river itself prevented him from crossing, making impossible 'the idea of visiting Jugroy' which apparently lay to the east of the



river. Although the meaning of the possibly Aboriginal word 'Jugroy' is never revealed, Caley does comment on the apparently extensive occupation of the area: 'By the marks or notches on the trees it is much frequented by natives'. This observation was made in forested land in the vicinity of Long Point.

The natural grassy understorey of Cumberland Plains woodland was cleared for the production of wheat and other cereals during the period of agricultural expansion in the Campbelltown district in the early 1800s (Benson and Howell 1990:75).

There was considerable conflict between Aborigines and Europeans in the region. In 1809 Young Bundle with Tedbury (the son of Pemulwuy the legendary Aboriginal activist) were terrorising and stealing from travellers as well as driving sheep off properties around the Cook and Georges Rivers area (Liston 1988a; Keating 1996). There were more severe conflicts between 1814 and 1816 when the area was gripped by a severe drought (Perry 1963). This combined with the fact that Aborigines' staple food gathering and hunting areas were overtaken by European grazing and cultivation, caused Aborigines to raid crops, thus angering the farmers who retaliated. These conflicts between the increasingly dispossessed Aborigines and the expanding white colony indicate the importance of these fertile plains to Aboriginal subsistence (Officer 1984; Demkiw 1985).

Governor Macquarie advised caution and stated that the loss of part of ones' crop was a small price to pay for peace (Liston 1988a). Tensions however escalated and Aborigines and Europeans were killed in the ensuing struggles.

In 1816 Macquarie ordered the apprehension of Aborigines in the area and if they resisted their death (Liston 1988a). There were three punitive expeditions, two of which had Aboriginal guides (variously claimed to be Tharawal or Dharug) which were mostly unsuccessful. In 1816 a regiment headed by Wallis perpetrated a massacre of fourteen Aboriginal men, women and children at Appin (Keating 1996; Liston 1988a).

Aboriginal people lived and sought refuge on some properties in the Campbelltown area, especially during the 1814 to 1816 conflicts. The literature records that Charles Throsby sheltered wanted Aboriginal men from authorities in 1816 and there are other references to European farmers being accused of interfering with a punitive expedition led by Wallis (Liston 1988a).

The Macarthurs were known to have Aboriginal people living on their property *Camden Park* and Macarthur's daughter is quoted as writing to a friend praising them and begging her friend to accept them (Liston 1988a). In fact, in 1818 land was marked out on the Macarthur estate for Aborigines who wanted to live there under his protection (Liston 1988a). Many Aborigines did choose to live on the estate. There is oral information from a Tharawal informant that her ancestors lived on Camden Park from 1820 to 1973, being employed by the Macarthurs in various capacities (Aboriginal informant, pers. comm. 1997). After 1816 the Tharawal stayed in the Cow Pastures. This was an area that was mainly used for grazing, so it was more sparsely populated than some neighbouring areas.

The traditional food economy appears to have been predominantly replaced by the 1840s, with most Aborigines being employed by whites on farms, or selling their traditional food items for European goods (Hassell 1902; Jervis 1935, 1949). In a report to a Select Committee on the Aborigines in 1845, a local Campbelltown J. P. reported that:

'For the last five to ten years they [the Aborigines] have been gradually decreasing, from the number of about fifteen to twenty, until none can be said to belong to this police district, as a tribe. Their death may be attributed to natural causes' (Select Committee on the Aborigines 1845).

Dairying became the major agricultural industry in the region after the wheat industry collapsed in the 1860s.

In spite of the enormous continuing changes which occurred in tribal culture after the arrival of Europeans some aspects of traditional life appear to have continued in Sydney. Macarthur describes a corroboree which took place on his property (Liston 1988a) and Mathews documented ceremonies



in the late 1800s. There is another mention of a ceremony taking place at Denbigh near Camden in the 1830s (Kohen 1985), and a corroboree involving over 400 individuals at the same place in the mid 1820s (Hassell 1902).

5.3 Regional Archaeology

The Sydney Basin has been the subject of intensive archaeological survey and assessment for many years. This research has resulted in the recording of thousands of Aboriginal sites and a wide range of site types and features. The most prevalent sites or features are isolated finds, open artefact scatters or camp sites, middens, rock shelters containing surface artefacts and/or occupation deposit and/or rock art, open grinding groove sites and open engraving sites. Uncommon site types include scarred trees, quarry and procurement sites. Rare sites include burials, stone arrangements, carved trees, and traditional story or other ceremonial places.

Archaeological studies in the Sydney Basin have generated hundreds of reports and monographs and a number of academic theses. This database has been used to propose varying models regarding regional occupation sequences, exploitation patterns, regional characteristics in site content and site location parameters.

Aborigines have lived in the Sydney region for at least 20,000 years (Stockton and Holland 1974). Late Pleistocene occupation sites have been identified around the fringes of the Sydney Basin at Shaws Creek (13,000 years BP [Before Present]) in the Blue Mountain foothills (Kohen 1984), at Mangrove Creek (11,000 BP) and at Loggers Shelter (Attenbrow 1981). Nanson et al (1987) have suggested that artefacts found in gravels of the Cranebrook Terrace indicate Aboriginal occupation over 40,000 years ago; however, there is some doubt as to the contextual integrity of these artefacts.

The majority of both open and rockshelter sites in the Sydney region date to within the last 3,000 years. A similar trend in occupation age occurs in dated deposits in NSW coastal sites. This has led many researchers to propose that population and occupation intensity increased from this period (Attenbrow 1987; Kohen 1986; McDonald and Rich 1993; McDonald 1994). The increased use of shelters postdates the time when sea levels stabilised after the last ice age around 5,000 years ago (the Holocene Stillstand). Following the stabilisation of sea levels, the development of coastal estuaries, mangrove flats and sand barriers would have increased the resource diversity, predictability, and the potential productivity of coastal environments for Aborigines. In contrast, occupation during the late Pleistocene (prior to 10,000 years BP) may have been sporadic and the Aboriginal population relatively small.

The stone technologies used by Aborigines within the Sydney Basin have not remained static and a sequence of broad scale changes through time has been consistently identified. This is known as the Eastern Regional Sequence and can be applied with various degrees of success and allowances for regional differences, to sites throughout eastern seaboard of Australia.

Recent reviews of the Eastern Regional Sequence have called into question the accuracy of the divisions, pointing out that many of the diagnostic elements, such as bipolar flaking and microlith production, cross the temporal boundaries and vary across regions (Mulvaney and Kamminga 1999). As an alternative, the broad technological changes which were associated with the introduction of a microblade based technology and a smaller tool kit are identified as the 'Late Phase' or the Australian Small Tool Phase, which began around 5000-6000 years ago.

This phase was characterised by the successive introduction of different technological innovations that spread or appeared in differing parts of the continent at different times. Tools with a ground edge such as stone hatchets first appear at least 4300 years ago. The occurrence of microblades and retouched microliths dates to about 3000-4000 years ago in the Sydney region. From about 2000 years ago bipolar flaking of quartz begins to increase within southeastern Australian sites, and intensifies over the last 1000 years. A corresponding trend is the disappearance of microblade technologies over this time, however both trends are uneven and are not consistent across and within regions. The Elouera, a thick backed blade, resembling an orange segment appeared around about 1600 years ago. Shell fishhooks used for line fishing first appeared before 700 years ago, and possibly as early as 1100 years (Mulvaney and Kamminga 1999).



Most of the Aboriginal sites which have been located in the broader Campbelltown area were recorded in the context of archaeological surveys. These surveys have been focused on rock art sites and have been conducted by dedicated amateurs, academic researchers, and archaeologists for development impact assessment work. Site types recorded in the course of these studies include rock shelters with art and/or cultural deposit, grinding grooves, artefact scatters, isolated finds, scarred trees, and burials.

5.4 Leaf's Gully Study Area

A search of the AHIMS database indicated that there were no previously recorded Aboriginal sites within the study area. Nine sites, consisting of three artefact occurrences and six art sites – are listed within a two kilometre radius of the study area (Figure 5.1).

The closest of these sites (NPWS Site No. 52-2-2265, 250 m south of the study area boundary), is an open context scatter of two surface artefacts, situated on a low gradient, mid-slope context, spurline crest, 120 m south of Leaf's Gully. This site was recorded in 2002 by Navin Officer Heritage Consultants (2002a) as part of an assessment of a proposed West Cliff Colliery PED antenna route. The site was considered to be indicative of a zone of very low density artefact incidence associated with Leaf's Gully (Navin Officer Heritage Consultants 2002a:8). (Note that the GDA map reference for this site is erroneously tagged on the AHIMS register as an AGD reference).

Of the other two artefact occurrences, one is probably a rock shelter situated on the eastern side of the Nepean River gorge (52-2-2239, identified simply as an artefact occurrence in AHIMS), and the other is situated on an elevated spurline crest, just upslope of the break-of-slope which marks the northern edge of the Mallaty Creek gully.

All six of the recorded art sites consist of pigment art within rock shelters. All are situated within sandstone escarpments or outcrops exposed with the riparian zones of the Nepean River and its west draining tributaries (Woodhouse and Mallaty Creeks). These sites have variously been recorded by the Sydney Prehistory Group (SPG 1983) and also by Carol Sefton (DEC site cards).

Since the original assessment four new sites in the area have been entered on AHIMS including the PAD identified in this report (52-2-3289), a scarred tree (52-2-3579) and two grinding groove sites (52-2-3580 and 52-2-3581).

5.5 Site Location Parameters and Predictive Statements

In 2002 Navin Officer completed an Aboriginal heritage study of the Campbelltown local Government area. At the time of this study there were 120 Aboriginal sites recorded in the Campbelltown LGA. Based on this information site prediction models were developed for the Woronora Ramp, the Cumberland Plain and the transitional zone (Navin Officer 2002b:29-31).

At the time of the Campbelltown heritage study there had been little analysis of Aboriginal site type and location patterns relative to the landform variables particular to the transitional zone. Some more recent archaeological investigations remain un-released. The heritage study presented a predictive model for the transitional zone based on an assumption that site types and their location are likely to be consistent with the trends established for the Cumberland Plain and the Woronora Ramp – both of which are present within the transitional zone (Navin Officer 2002b). The model states that, rock shelter and grinding groove sites would be expected to occur in the valley slopes and gullies where the Hawkesbury sandstone has been exposed and weathered. On landforms derived from the overlying shales, open artefact scatters and isolated finds are likely to predominate, with potential archaeological deposits most likely within valley floor alluvium (Navin Officer 2002b:31).

An archaeological assessment of the proposed "Wilton Park" residential development was undertaken in 2002 (Navin Officer 2002c). This project area is located seven kilometres southwest of Leaf's Gully and displays typical transitional zone landforms including steep sided tributary gullies in sandstone, and adjacent, elevated remnant plateau landsurfaces on shale. The Wilton Park study further refined the predictive model for transitional zone landforms. The sensitivity of high gradient sandstone slopes and associated riparian corridors was confirmed with the recording of rock shelter sites including art and archaeological deposits. On the elevated and shale-based terrain, it was found



that higher artefact densities were associated with drainage lines, either in their upper reaches where they have less developed channels, or up-slope of the break-of-slope marking the edge of tributary gullies and gorges.

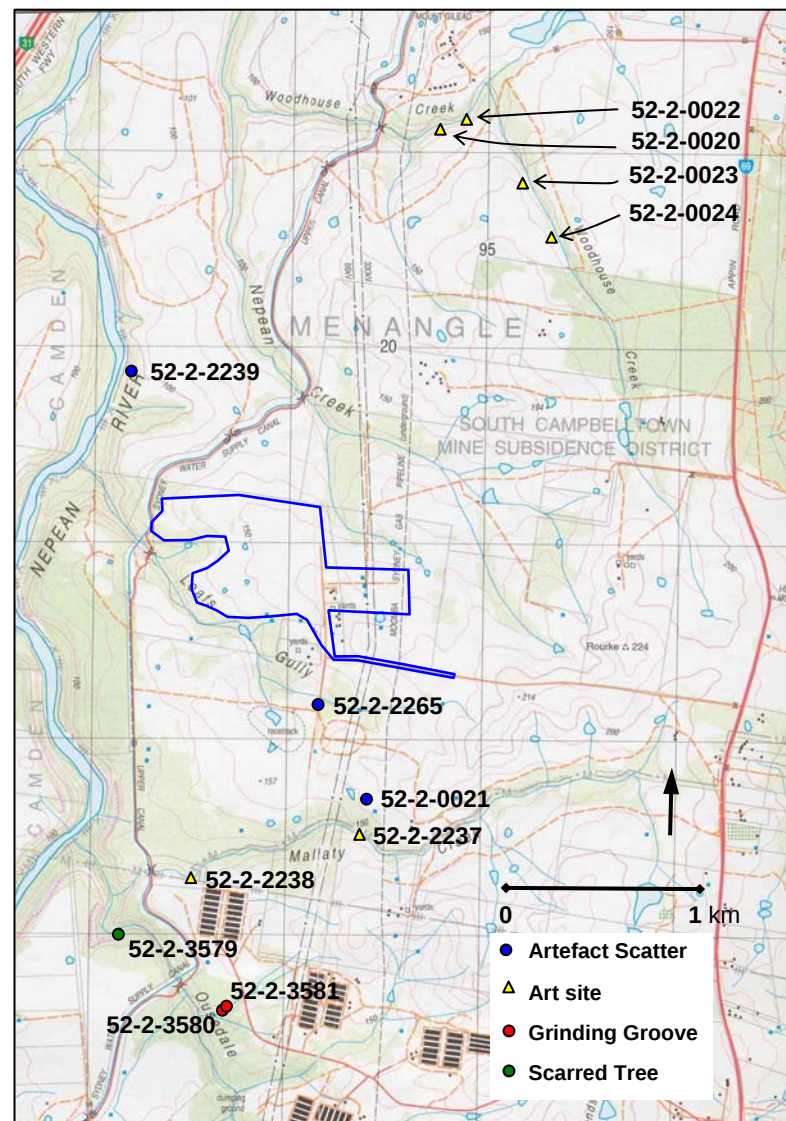


Figure 5.1 Aboriginal sites located within two kilometres of the Leaf's Gully study area (red boundary) (base map: Appin 9029-1S 1:25 000 topo 3rd Ed, LIC 2000).

These site location patterns remain consistent with preferences identified for the Cumberland Plain. Here, artefact discard is mostly associated with locally elevated, well drained and roughly level ground in relative proximity to a substantial freshwater source. In contrast to the mostly gentle gradients of the Cumberland Plain, where such micro-topographic contexts are typically close to tributary streams, the steep gullies of the transitional zone mean that the desirable camp sites are situated adjacent to the break-of-slope, and above the incised gullies.

There is inadequate data from subsurface investigations to predict the extent to which such sites may extend upslope of the break-of-slope. It is known from the lower gradient topographies of the Cumberland Plain that artefact occurrences rarely occur in high densities more than 100 m from riparian zones. A consequence of this is that the crests of spurs or ridgelines tend not to be a focus for occupation, except for specialised sites such as stone quarries (Navin Officer 2002b). By way of contrast, where terrain is characterised by higher gradients and more elevated watersheds, the low gradients afforded by crests and basal slopes are more likely to contain sites and in higher artefact densities. This pattern relates both to the proximity to water sources and the use of crests as access routes. This pattern has been established from investigations on the Woronora Ramp (Navin Officer 1997, 2002b).



Within the study area, it can be hypothesised that spurline crests and tributary gullies were utilised in combination for through and cross-country access (Figure 5.2). The lower gradients of the crests and upper slopes, together with their more open vegetation structures probably aided pedestrian travel. In contrast, the continuous sandstone escarpments along lower tributary valleys and the adjoining Nepean River Gorge would have constrained access. In order to access the Nepean River, the gullies of side tributaries would need to have been traversed. In a few cases, spurlines also afforded negotiable and moderate grades to the river. One such spurline is situated 2 km north of the study area where a side spur provides access to the east bank of the river. This spur branches from the main watershed spurline which passes through the study area (Figure 5.2).

A review of the study area topography in the light of these contrasting models reveals that aspects of both models are likely to be relevant – a finding which is consistent with the transitional nature of the region's geomorphology.

The Leaf's Gully study area consists of a broad spurline crest and upper slopes situated adjacent to the steeply graded, southwest facing slopes of Leaf's Gully. The boundary between the lesser slopes of the spurline and the steeper slopes and Leaf's Gully forms a relatively continuous break-of-slope. This contour defines the approximate extent of the incised gully. Upstream of the break-of-slope the tributary valley is open, and its banks are characterised by low gradient slopes. The combination of level ground adjacent to a tributary water source provides a basis for identifying the ground extending upslope of the break-of-slope as an area likely to contain sites. This topographic context is the same as for site locations recorded at Wilton Park. It is not known to what extent this potential extends upslope and away from the break-of-slope.

The spurline on which the study area is situated forms the watershed between Leaf's Gully and Nepean Creek and as such provides a potential pedestrian route to the Nepean River. It is not known if the minor crest features, which form the interfluvies on either side of the main watershed, were a focus for Aboriginal occupation. Similarly, it is not known if artefact occurrences occur on the slopes to either side of the crests. Given the low gradients involved, these upper slopes may have also served as camp sites. The occupation of these micro-topographic features may have been associated with patterns of cross country movement or related to camping close to water sources. If the latter, any distribution of artefacts may potentially be continuous with occurrences adjacent to the break-of-slope.

The two previously recorded open artefact scatters located within two kilometres of the study area are both located in relative proximity to drainage lines but display contrasting microtopographic contexts (refer Figure 5.1). Site 52-2-2265 is situated close to a first order tributary and occurs within a low gradient upper catchment context. Site 52-2-0021 is situated adjacent to a second order stream (Mallaty Creek) which flows through a distinct gully. The site is positioned on the closest low gradient ground to the stream, just upslope of the gully break-of-slope. Both sites display a preference for level well drained ground where the distance to water is minimised.

Based on the predictive models for the Cumberland Plain and Woronora Ramps, and the results of other archaeological surveys within the transitional zone topographies of the Appin region, the following predictions can be drafted regarding archaeological potential within the Leaf's Gully study area:

- Sites are likely to occur on well drained, relatively level ground adjacent to the Leaf's Gully break-of-slope, and for an undetermined distance upslope;
- In low gradient upper catchment contexts (upstream of gullies associated with a distinct break-of-slope) artefact occurrences are likely to be relatively low in artefact incidence and be situated in close proximity (within 100 m) of drainage lines;
- Sites may occur on well drained, relatively level ground on the crests of both major and minor spurlines. Such sites may be more or less continuous with the break-of-slope zone and display a direct relationship between artefact density and proximity to a water source;
- Sites may occur on the low gradient, upper spurline slopes associated with crests, especially where continuous with the break-of-slope, or a substantial crestline;



- The number and density of artefacts at any site may be, in part, related to the distance to a water source, and the degree of permanence of that source. Sites with a higher incidence of artefacts per area are likely to be situated in relative proximity to substantial water sources (such as second order or greater drainage lines);
- The archaeological sensitivity of spurline crests and adjacent slopes is likely to diminish with distance from substantial water sources. It is hypothesised that sites with greater than background densities of artefacts are most likely to occur on crests that are within 500 m of second order or greater drainage lines

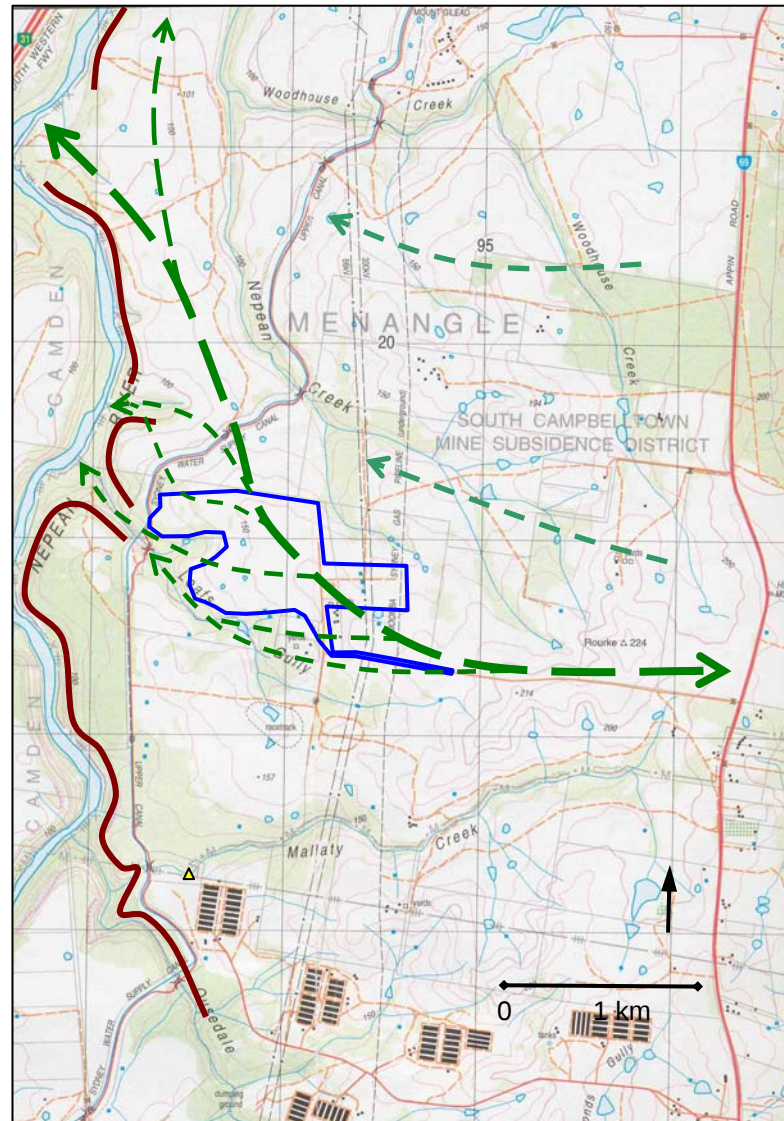


Figure 5.2 The study area relative to hypothesised Aboriginal access routes (green) and constraining escarpments (red) (base map: Appin 9029-1S 1:25 000 topo 3rd Ed, LIC 2000)



6. HISTORIC OVERVIEW

6.1 Historical Overview

In July 1788, two bulls and four cows brought from the Cape of Good Hope with the First Fleet strayed from the rest of the herd. The cattle had wandered southwest from Sydney and had found grazing land around present day Menangle-Camden. In 1795, the first Europeans in the vicinity of Campbelltown were an exploratory party that noted a stray herd of cattle by the Nepean River at a time when there was very little livestock in the colony. This discovery generated another expedition led by Governor Hunter later that year. The number of cattle had increased and the area became known as the 'Cowpastures'. When Hunter again visited the area in 1796 he was impressed with the quality of the soil, timber and water.

Francis Barallier investigated the district in 1802, and botanist George Caley mapped the area in 1804. Despite the objections of the Governor, John Macarthur was granted 5,000 acres on the banks of the Nepean in 1805. When Governor Macquarie visited the area in 1810, he chose the site of Liverpool and named the district around present-day Campbelltown 'Airds' after the family estate of his wife Elizabeth (an estate situated in the village of Appin in Scotland where Elizabeth was born).

By 1811, there were 107 settlers in the district. Continuing expansion and development suggested the need for centralised services and for a staging post to accommodate through-traffic. Campbelltown became the central thoroughfare for those headed on to the south-west grazing plains and south along the road that went through Appin to the Illawarra.

On 1 December 1820, Macquarie laid the foundations for the township of Campbelltown. The name Campbell-town is in honour of his wife's maiden name, Elizabeth Campbell. It is likely that government surveyor James Meehan had reserved the town site in 1815 when he surveyed the road from Liverpool to Appin. This is indicated by the layout of the land grants east of the road. Macquarie marked out the township, indicating sites for a chapel, school house and burial ground in the central part of Airds. From 1820 to 1827 land within Campbelltown was surveyed and in 1826 Robert Hoddle prepared the first town layout plans. In 1827, land grants were allocated but the grants were not occupied until 1831 because Governor Darling wanted the colonial towns to be systematic in their planning (classification of towns and determination of lot sizes/dimensions).

During the 1830s the merits of Campbelltown's location and character were debated, particularly in regard to the street alignments and town allotments, which were not properly defined or identified, and the streetscape. By 1840, it was realised that Hoddle's Plan could no longer be implemented because grants, streets, fences and gardens had been built with no regard to the town plan. Campbelltown did not have the symmetry of other colonial towns but had the only official building outside Sydney – the courthouse.

In October 1811, Macquarie proposed the construction of a road from Sydney to Liverpool. By 1814, this road had been constructed and soon extended to Appin. It was little more than a dirt track but was to become an important communication corridor to the area. The roads from Campbelltown were extended to the south coast and southern highlands as better routes were established by explorers. Campbelltown became a cross roads for movements to Sydney, Appin, Illawarra, Picton, Narellan, Camden, Penrith and Nattai. The roads and bridges were built and maintained by convict road gangs from 1826 to 1858.

The southern expansion of Sydney was confirmed with the construction of the main southern railway line from Sydney to Goulburn. The first section from Redfern to Parramatta was completed towards the end of 1855 and was extended to Campbelltown by May 1858. The railway reached Goulburn in 1869 with some substantial bridge constructions along the way but from 1858-1869 Campbelltown was the effective terminus. There were no established towns on the line. When the estates between Campbelltown and Liverpool were subdivided in the 1870s and 1880s platforms were provided for the villages that established at Glenfield, Ingleburn and Minto. The line to Campbelltown was electrified in 1968. The line continues to be an important link for the development of the area for country and urban movements.



The small land grants in the Districts surrounding Campbelltown engaged mainly in mixed farming, growing crops and grazing animals. Many struggled to survive. The large land grants (holdings) engaged in the grazing of sheep and cattle. The growing of fruit and grapes for wine were activities that also characterized the area, though many of the vineyards were destroyed in the 1890s. Agriculture from Campbelltown supplied the Sydney markets though the activity suffered from disease, market fluctuations, competition and lack of water.

From the 1840s to 1880s Campbelltown prospered from the production and milling of wheat. Until the 1860s, grain was grown on many of these leased farms and on the small grants closer to the rivers. The late 1850s and early 1860s brought a series of disasters when floods ravaged land near the rivers and then stem rust broke out in the wheat during the wet season. By the 1860s, grain growing had been largely wiped out in the County of Cumberland and Camden. That industry virtually ceased by the end of the 1880s. A network of mills had been built to serve the grain growers, grinding the wheat, which was the best grain for growing with the largest and most assured market. The end of grain growing in the area meant the closure of many of the mills, some to decay, some to be converted to other uses. Few survive with the notable exception of the Mount Gilead mill (Kass 2005).

6.2 The Upper Canal

In 1877, construction began on the Nepean Water Supply Scheme for Sydney. It was a major engineering work involving the construction of weirs, dams and a canal system. Tunnels and open channels were built through Campbelltown to feed water via gravity to Prospect Reservoir. (Plate 6.1). From there, water was piped to Sydney. From 1888, water was supplied to Campbelltown from the scheme (Campbelltown City Council 1998:14).

The Upper Canal of the Nepean Water Supply Scheme, a small portion of which occurs within the Leaf's Gully study area, was built of a variety of materials and section profiles depending upon the nature of the country through which it was passing. Where the ground was soft, the Canal was 'V'-shaped and the sides were pitched with shale or sandstone slabs. In other sections, a 'U'-shape was utilised and the sides were walled with sandstone masonry, or, if cut into solid rock left unlined. Where the canal crossed creeks or large depressions, such as Woodhouse and Nepean's Creeks, the water was carried across in wrought iron inverted syphons resting on stone piers. As well as bridges constructed over major roads, 'occupation bridges' were erected to allow property owners with land severed by the canal access between parts of their holdings. By 1888, the Upper Nepean Scheme was completed and in operation.

Care and maintenance of the Upper Canal in particular, was in the hands of Inspectors and maintenance men. They were housed along the Canal in cottages, owned and maintained by the Sydney Water Board. Initially, the men walked or used horses to patrol the length of the Canal assigned to them. By the late 1890s, a gradual process of adding roadways along the Canals was under way. During the cooler months when demand for water was lower and requirements could be supplied from water impounded at Prospect, repairs and maintenance were carried out on the Upper Canal. The sides were regularly cleaned, and, by the 1900s, some lengths were being relined (Higginbotham et al. 1992:10-41).

A more complete description and chronology of the works for the Upper Canal may be found in Aird 1961:15-17, 263-268, and the heritage study of the Upper Canal, Prospect Reservoir and Lower Canal (Upper Nepean Scheme) by Higginbotham et al. in 1992.

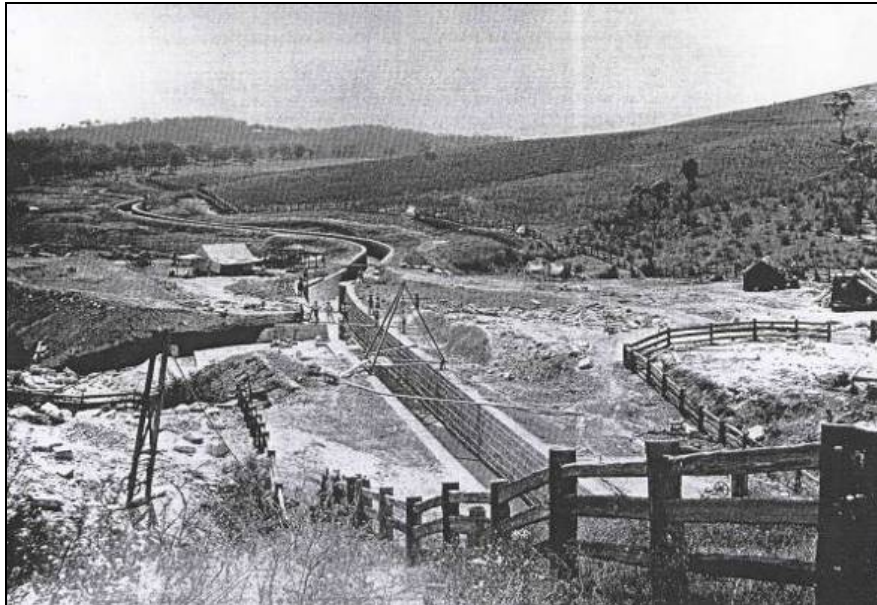


Plate 6.4 View of the Upper Canal under construction c.1886 near Sugar Loaf, note also the primitive huts and humpies erected by workmen as shelter (from Higginbotham et al 1992:13).

6.3 The Study Area

The 1870 to 1904 parish maps (Figures 6.1 - 6.3) show that George Crossley owned the land which comprises the Leaf's Gully study area. George Crossley was an English lawyer who in February 1796 was charged with forging a will but the prosecution, relying on the evidence of an alleged accomplice, failed. However, shortly afterwards he was called upon to answer charges of professional malpractice. His answers resulted in his being charged with perjury and convicted. He was ultimately transported for seven years, arriving in Port Jackson in 1799. In 1803, despite his past and his debts, he began to practice as a lawyer in Sydney where he was one of only two or three with any legal training. He was again convicted of perjury in 1821 and he died in 1823 still under pressure from his creditors.

Crossley was married to Anna Maria, sister of Nicholas Divine, Principal Superintendent of Convicts, and listed as the owner of the property adjacent to Crossley's. Crossley left a will leaving his personal estate, including his property at 'Airds' between John Connell, Mary Arkell and her daughter, Mary, Elizabeth Graham and Sarah Graham. Elizabeth and Sarah were in his service (Allars 1958:298).

It appears from the parish maps the land at Leaf's Gully (Airds) was owned and/or purchased by the executors of Crossley's will and was still under the name of Crossley in the 1904 map (Figure 6.3).

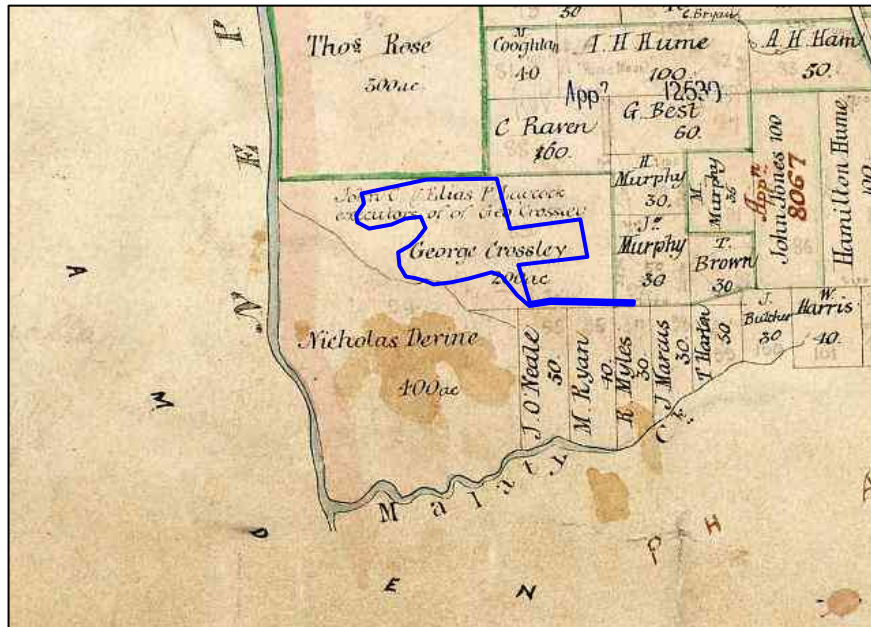


Figure 6.1 Extract from Parish Map of Menangle, County of Cumberland (c.1870) showing approximate location of study area (Department of Lands map ref. 14061101)

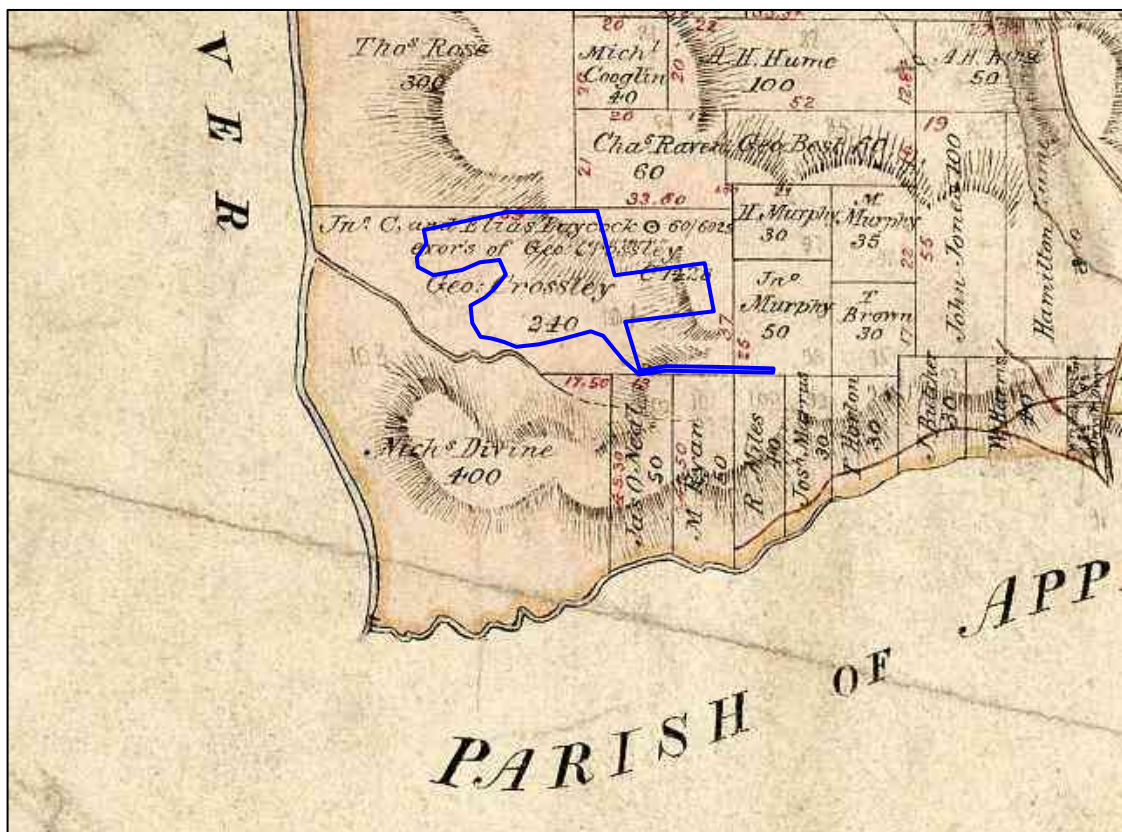


Figure 6.2 Extract from Parish Map of Menangle, County of Cumberland (c. 1880) showing approximate location of study area (Department of Lands map ref. 140668)

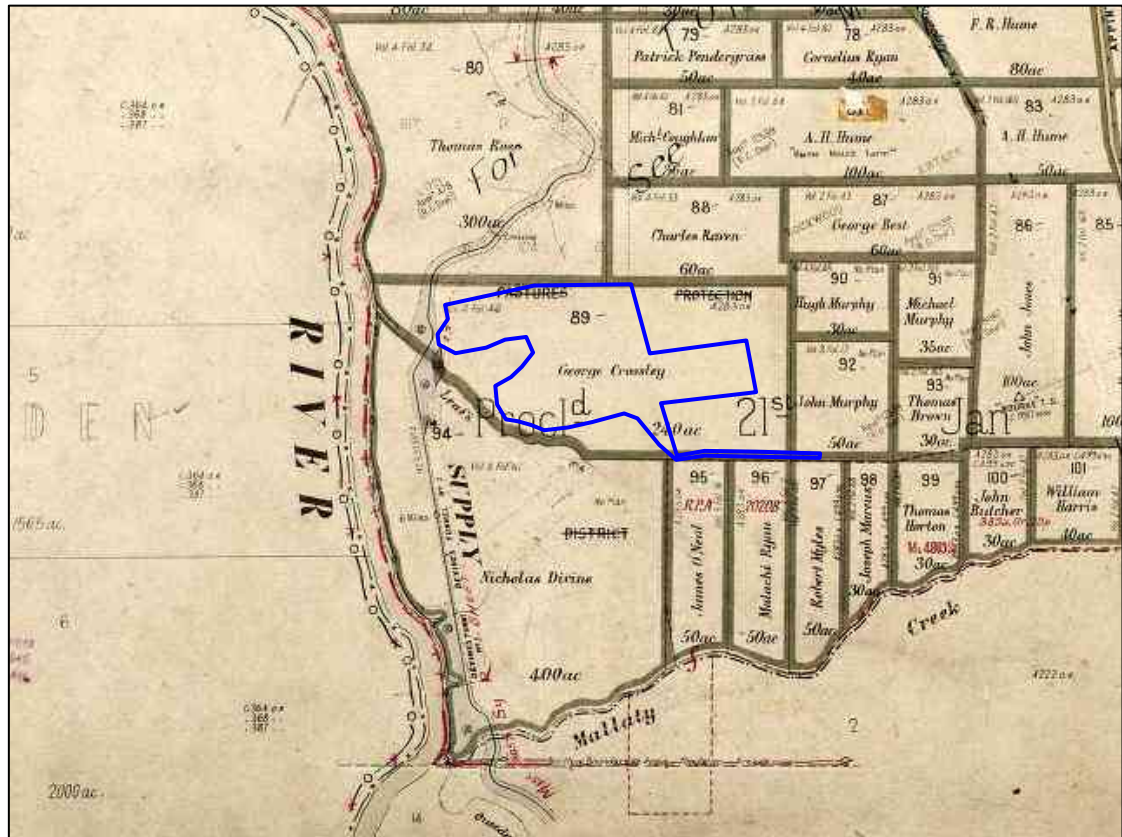


Figure 6.3 Extract from Parish Map of Menangle, County of Cumberland, 2 December 1904 showing approximate location of study area (Department of Lands map ref. 14092002)

Today the property currently operates as a trotting horse breeding and training enterprise. The majority of the land is cleared and used for grazing and horse yards. Main improvements include three substantial residences used by the owner and the owner's family and farm buildings.

Three dwellings including associated sheds have been constructed relatively recently within the study area, all of these dwellings will be affected by the project. None of these structures have any heritage significance (Plates 6.1 to 6.3).



Plate 6.1 First dwelling within study area



Plate 6.2 Second dwelling within study area



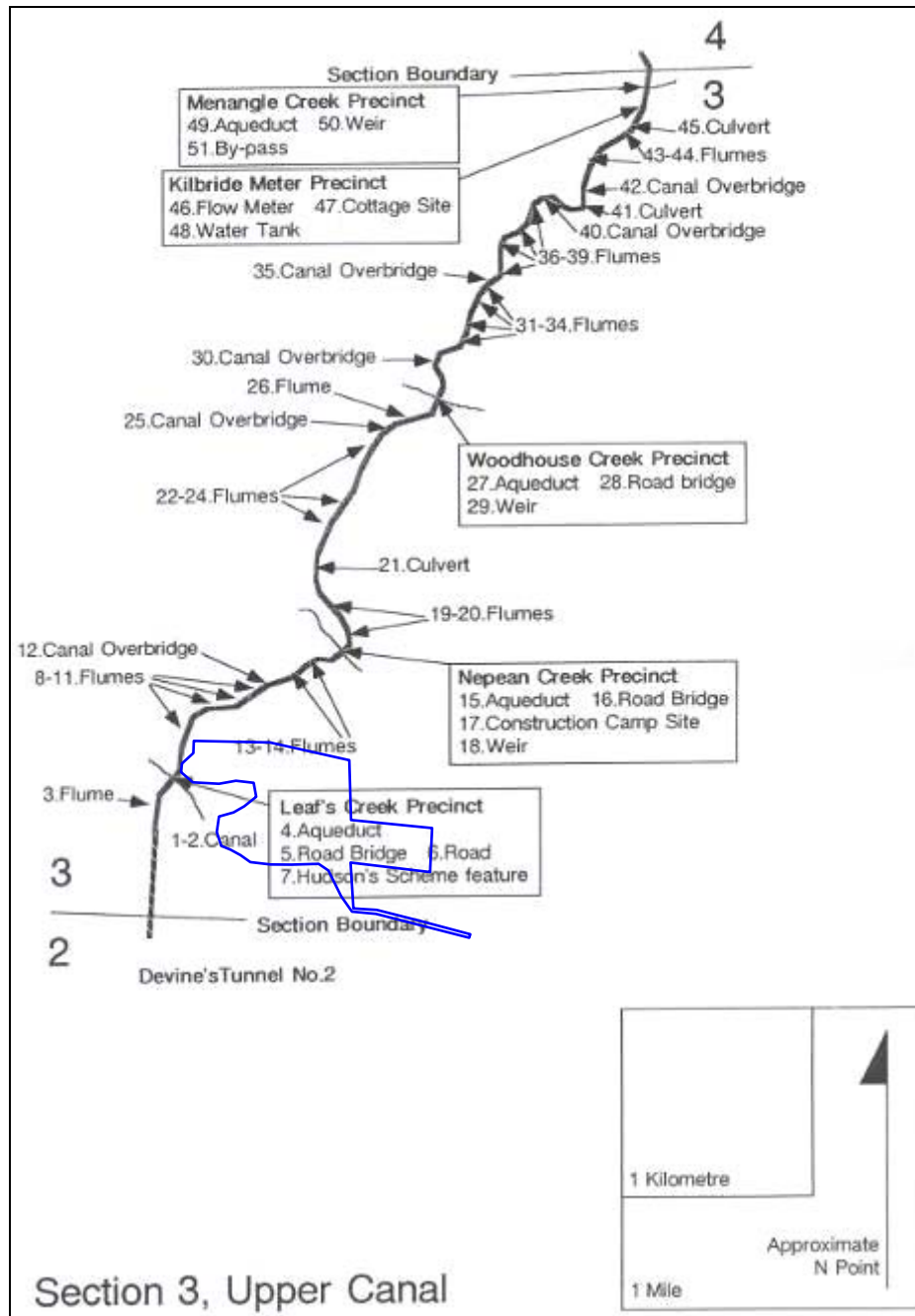
Plate 6.3 Third dwelling within study area

6.4 Previous European Heritage Studies

In 1992, Edward Higginbotham et al. undertook a heritage study of the Upper Canal, Prospect Reservoir & Lower Canal (Upper Nepean Scheme). The authors provided a report of their study in three parts: Volume 1 – Historical and Archaeological Assessment; Volume 2- Inventory (Prospect Reservoir, Lower Canal and Pipehead); and Volume 3 – Conservation Policy.

The Leafs Gully study area is situated adjacent to a portion of the canal identified as the Leafs Gully precinct within Section 3. Figure 6.4 provides an extract from Higginbotham's 1992 report, showing the location of the study area relative to historical places and features he identified within Section 3 of the Upper Canal. Apart from a small portion of the canal itself, there are no previously identified canal related sites or features within the study area.

In 2002, Edward Higginbotham et al. developed a Conservation Management for the Upper Canal, Pheasant's Nest to Prospect Reservoir, NSW. The Plan was endorsed by the Heritage Council of NSW on 27 June 2003.



Gas Turbine Power Station, Leafs Gully, NSW – Cultural Heritage Assessment
Navin Officer Heritage Consultants November 2008



6.5 European Heritage Listings

6.5.1 Heritage Listed Sites within the Leaf's Gully Study Area

One place within the Leaf's Gully study area has been previously recorded as a heritage place. This is the *Sydney Water Supply Upper Canal System*.

The canal system is listed on the following registers:

- NSW State Heritage Register;
- Campbelltown Local Environmental Plan – District 8 (Central Hills Lands) – Schedule 1 – as an item of environmental heritage, and described as 'generally following western boundary of local government area of the City of Campbelltown and south, in so far as it traverses land under this plan';
- Sydney Catchment Authority's Heritage and Conservation (Section 170) Register; and
- Register of the National Trust of Australia (NSW).

No other places or sites within the study area are listed on heritage lists or registers (refer section 3.1 for instruments searched).

The Sydney Water Supply Upper Canal System does not appear on the NSW Heritage Inventory for the Campbelltown Local Government Area (LGA), however it does appear on that Inventory for the Liverpool LGA. A copy of that listing, which contains relevant information on the canal system as it applies to the study area, is provided in Appendix 2.

6.5.2 Heritage Listed Sites outside of the Leaf's Gully Study Area

Three other heritage items are within close proximity to the study area 'Mount Gilead', 'Meadow Vale' and 'Beulah House'. A June 2008 letter from the Heritage Council of NSW identified 'Meadow Vale' and 'Beulah House' as being in the vicinity of the proposal's site and may be affected by construction works.

Subsequent to the initial assessment undertaken in 2006 it was considered that the project may impact the heritage significance of 'Mount Gilead' and 'Meadow Vale', therefore a separate historic heritage assessment was undertaken of these places (Navin Officer 2008). There was not considered to be any impact to 'Beulah House'.

The 'Mount Gilead' historic site is located approximately 2.9 km northeast of the location of the proposed gas turbine power station at Leaf's Gully. It is considered that the proposed development will have no impact on the site's heritage significance. Refer to Navin Officer, *Gas Turbine Power Station Leaf's Gully, NSW Historical Heritage Assessment: Desktop Review*, May 2007 for further information.

'Meadow Vale' is an historic house located approximately 1.25 km west of Appin Road, on Lot 1 DP602888, and approximately 1.4 km northeast of the location of the proposed gas turbine power station at Leaf's Gully (Campbelltown City Library 2007). 'Meadow Vale' is under consideration for State Heritage Register listing.

This site will not be directly affected by the project. With respect to its landscape context, and in particular the distant views from the homestead, it is considered that the proposed development will have little or no effect on that aspect of the homestead's significance. Refer to Navin Officer, *Gas Turbine Power Station Leaf's Gully, NSW Historical Heritage Assessment: Desktop Review*, May 2007 for further information.

Beulah House, Outbuilding, Timber Bridge and Gazebo is listed on the NSW State Heritage Register (item # 368). It is located another 700 m north of 'Meadow Vale' on the Appin Road. on lot 78 DP752042.



This site will not be directly affected by the project and its landscape setting will also not be affected as there are two gullies and a large spur line between it and the project. These landscape features will block any views from Beulah to the project area. Therefore the project will not have any direct or indirect, visual, impacts on the heritage significance of the site.

6.6 Predictive Historical Archaeology Statement

The types of places or items that may form part of the historical archaeology context include:

- Below ground evidence, including building foundations, occupation deposits, features and artefacts; and above ground evidence, including buildings, works, industrial structures and relics that are intact or ruined; and
- Areas of land that display evidence of human activity or occupation.

Based on the largely agricultural historical context of the study area, unrecorded historic sites and features of heritage significance that may potentially occur within the study area include the following:

- Structures of historic interest and heritage significance may be standing, ruined, buried, abandoned or still in use;
- Nineteenth century structures such as farm dwellings, outbuildings, may survive as standing buildings, ruins or archaeological deposits and are most likely to survive on less developed rural properties, on early portion numbers, and in or near established farm building complexes;
- Archaeological sites such as the occupation remains of former dwellings including homesteads, houses and huts, will be distributed in close association with land settlement patterns, and correlated with favourable agricultural lands, trading nodes and transport corridors; and
- Old fence lines (such as post and rail fencing) may occur along road easement boundaries and farmlands, Other indications of field systems such as drainage channels and ridge and furrow ploughlands are likely to survive in low lying agricultural ground, especially in areas which are now used for grazing, rather than cropping.
- Sites associated with the Sydney Water Supply Upper Canal System.



7. RESULTS

7.1 Aboriginal Heritage

No Aboriginal sites or objects were identified within the Leaf's Gully study area.

A relatively large area of subsurface archaeological potential was identified in the study area. This has been recorded as a potential Aboriginal archaeological deposit (or PAD) and identified as LG PAD 1 (see Figure 7.1). The identification of the PAD area is based on the analysis and predictive statements outlined in Section 5.5.

Leaf's Gully PAD 1 (LG PAD 1)

Description:

GDA: 293510.6218720 to 294350.6218730 to 293330.6219230 to 294140.6219180

This recording is an area of predicted subsurface archaeological potential, and occurs on the low gradient, upper slopes and crests of a spurline complex which dominates the study area and descends to the west and north towards Leaf's Gully and the Nepean River respectively. The downslope boundary of the PAD is defined by the break-of-slope above the steep gradients around second order (or greater) drainage lines, and elsewhere by the approximate edge of the crest, extending up to 500 m away from second order drainage lines.

That portion of the PAD within the study area has approximate dimensions of 1000 m by 750 m (refer Figure 7.1). The soils in the area display an upper level of gravelly sand.

The proportion of ground surface exposures providing visibility across the surveyed section of the PAD varied from around 30% on the lower slopes, to less than 5% on the upper slopes and crests. The level of visibility within these exposures was good to very good, ranging from 50 % on the upper slopes, to 60% to 80% on the lower slopes.

There has been disturbance across the site as a result of ploughing, dam construction and erosion from stock animal treadage. This disturbance is unlikely to have removed potentially occurring, subsurface artefacts but could have effected the integrity of their position. .

Justification:

The topography and landscape context of this PAD complies with the predictive statements outlined in Section 5.5. The PAD is made up of the following sensitive landforms:

- low gradient and well drained ground immediately adjacent to and upslope from the Leaf's Gully break-of-slope;
- spurline crests extending upslope of the break-of-slope, up to 500 m away from second order (or greater) drainage lines;
- low gradient upper slopes situated between the break-of-slope and the crests

The sandy soil evident across the surface of the PAD provides an easy medium for stone artefacts to move down the soil profile, via bioturbation, and thus to remain undetected during surface survey. The presence of sandy soils also provides the potential for relatively deep slope wash deposits which may preserve archaeological material.

The assessed archaeological potential varies across the PAD from moderate on the lower slopes (Plate 7.1), to low-moderate on the higher slopes (Plate 7.2, Figure 7.1). Refer to section 3.4.3 for an explanation of how these categories are defined. The boundary between these two areas has been provisionally set at approximately 300 m from a second order (or greater) drainage line, and includes some give and take to include higher potential landforms, such as crests, and to exclude lower potential areas such as higher gradient slopes. This interval is based on previous surface survey



results together with a precautionary and qualitative appreciation of the study area. A more refined distance interval cannot be determined until data from excavated contexts can be obtained. .



Plate 7.1 Lower half of PAD looking west



Plate 7.2 Upper half of PAD looking east

7.2 European Heritage

One European historic site was located within the study area. This is a small portion of the *Sydney Water Supply Upper Canal System*, situated at the far western end of the study area (Figure 7.1)

Sydney Water Supply Upper Canal System

The portion of the Upper Canal within the study area consists approximately of a fifty metre interval which incorporates a bend to the north encompassing approximately 130 degrees. The form of this section of the canal has been classified by Higginbotham et al. (1992) as belonging to a type two.

Type two sections consist of an open, square sided canal, with a U-shaped cross section formed partly by rock cut and partly by sandstone block masonry on each side. In some areas type two canal sections have been lined with concrete. Higginbotham notes that some simple dry-stone retaining walls exist above the canal immediately north of the Leafs Gully aqueduct which is located 100 m upstream of the study area.



Plate 6.6 A typical portion of type two open canal from section 3 of the Sydney Water Supply Upper Canal, showing square sided masonry walls.

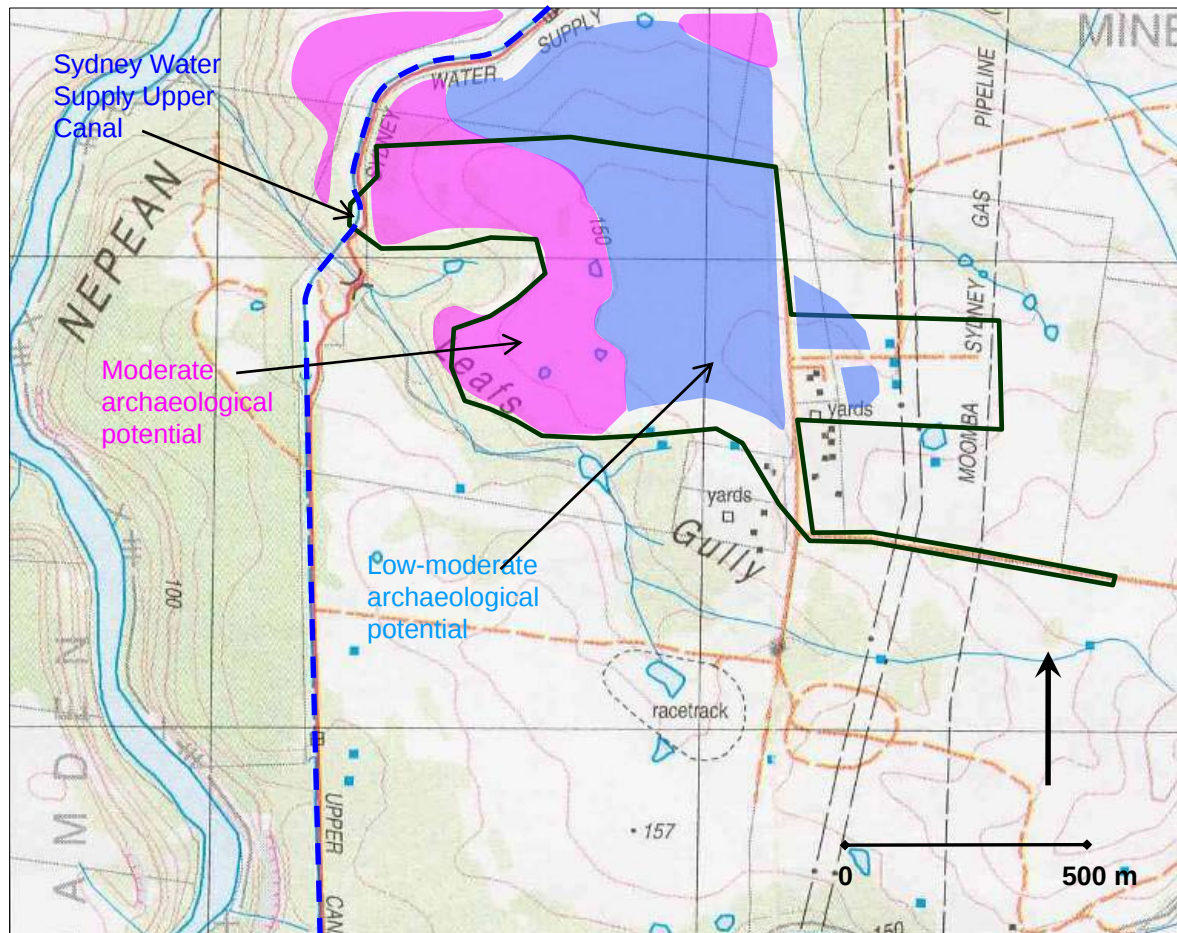


Figure 7.1 The location of historic sites and areas of potential Aboriginal archaeological deposit within and around the study area (study area boundary in dark green). The areas of archaeological potential within the study area boundary are identified as LGPAD 1 (base map: Appin 9029-1S 1:25,000 topo 3rd Ed).

7.3 Survey Coverage and Visibility Variables

The effectiveness of archaeological field survey is to a large degree related to the obtrusiveness of the sites being looked for and the incidence and quality of ground surface visibility. Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility, the frequency of exposure encountered by the surveyor and the quality of visibility within those exposures. The predominant factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels.

The obtrusiveness of different site types is also an important factor in assessing the impact of visibility levels. For example, artefacts made from locally occurring rock such as quartz may be more difficult to detect under usual field survey conditions than rock types that are foreign to the area. The impact of natural gravels on artefact detection was taken into account in the visibility variables estimates outlined above.

The natural incidence of sandstone platforms suitable for grinding grooves or engraving, together with the incidence of old growth trees, are important considerations in identifying both survey effectiveness and site location patterns outside of environmentally determined factors.

The incidence and quality of ground surface exposures was not consistent across the study area. There was a high incidence of exposures (around 30% of the inspected ground) on lower slopes in



the western paddock of the study area. To the east of this area the incidence of exposures reduced to less than 5%. The better visibility appeared to be a consequence of past ploughing and low grass cover. Elsewhere exposures were limited to vehicle, foot and animal tracks; discrete devegetated areas under trees; along fence lines; and erosion scalds and scarps around dams. The level of visibility within the surveyed exposures was good to very good, ranging from 50 % on the upper slopes, to 60% to 80% on the lower slopes.

The area in which survey was conducted is shown in Figure 7.2.

Taking into account survey coverage, archaeologically useable exposures, and visibility variables, the effective survey coverage (ESC) was 3.9% of the total survey area (6.2ha x 0.8sample x 0.3 exp.inc. x 0.7 visibility = 1.04ha; + 24.8ha x 0.5sample x 0.03 exp.inc. x 0.5 visibility = 0.19ha; / 31ha x 100 = 3.9%)

The ESC attempts to provide an estimate of the proportion of the total study area that provided a net 100% level of ground surface visibility to archaeological surveyors. The ESC calculation is defined and required by the DEC and stated to be of use in assessing and cross comparing the adequacy of archaeological surface surveys. The actual utility of the ESC calculation however is challenged by many archaeologists. The limitations of the ESC calculation are emphasised by differences in the subjective assessment of exposure and visibility levels, variations in how survey units are defined and measured, and differences in how and which variables are estimated and combined. In reality, ESC results tend only to be meaningful when compared across surveys conducted by the same surveyors and ESC measurers.

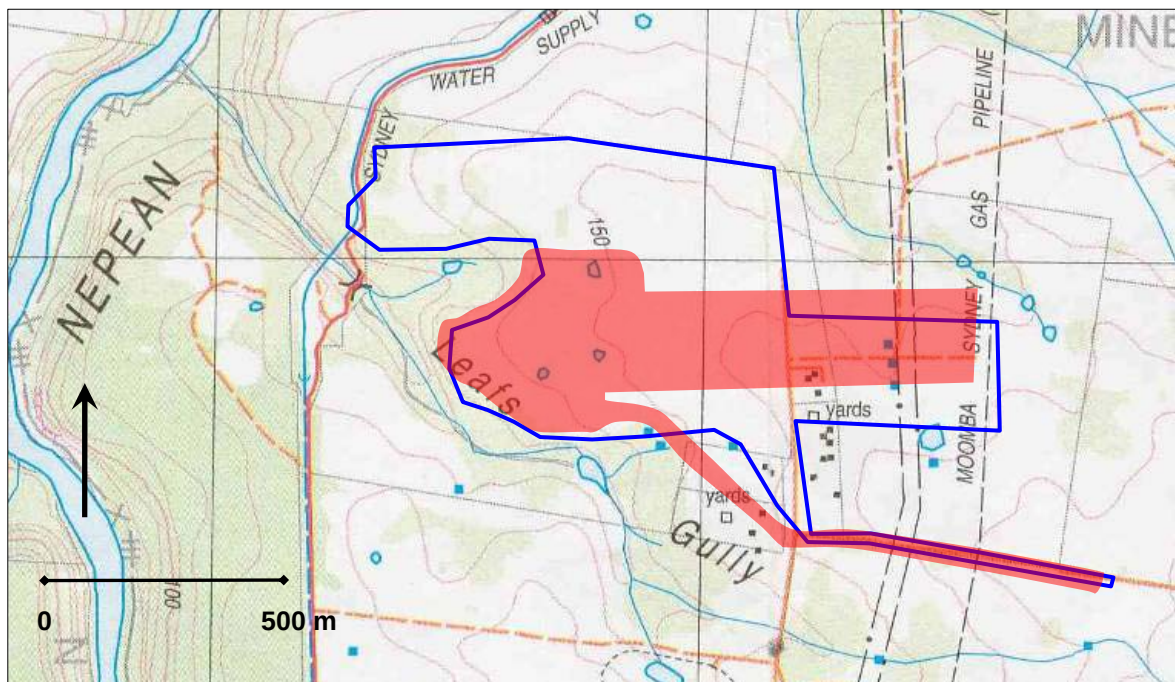
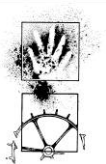


Figure 7.2 Location of area subject to archaeological survey relative to current study area (base Appin 9029-1S 1:25 000 topo 3rd Ed)



8. STATUTORY OBLIGATIONS¹

8.1 The National Parks and Wildlife Act 1974

The following summary is based on:

- The provisions of the current National Parks and Wildlife Act 1974 (NP&W Act) as amended. It should be noted that amendments to this Act were passed by both houses of the NSW State Government in 2001 (no.130, assented 19/12/2001). Some of these amendments are yet to be proclaimed.
- Department of Environment and Conservation policy as presented in the 1997 Standards and Guidelines Kit for Aboriginal Cultural Heritage provided by the (then) NSW NPWS, and as communicated orally to the consultants on a periodic basis. The 1997 Standards and Guidelines Kit is currently under review and subject to change in the near future.

The guideline documents presented in the 1997 Standards and Guidelines Kit were stated to be working drafts and subject to an 18 months performance review. The Standards Manual was defined not to be a draft and subject to periodic supplements.

With the exception of projects subject to the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act), the National Parks and Wildlife Act 1974 (as amended) provides the primary basis for the legal protection and management of Aboriginal sites within NSW. The implementation of the Aboriginal heritage provisions of the Act is the responsibility of the Department of Environment and Conservation (DEC).

The rationale behind the Act is the prevention of unnecessary or unwarranted destruction of relics, and the active protection and conservation of relics that are of high cultural significance.

With the exception of some artefacts in collections, or those specifically made for sale, the Act generally defines all Aboriginal artefacts to be 'Aboriginal objects' and to be the property of the Crown. An Aboriginal object has a broad definition and is inclusive of most archaeological evidence. The Act then provides various controls for the protection, management and disturbance of Aboriginal objects.

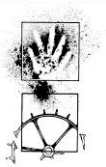
An Aboriginal object is defined as:

'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.' [Section 5(1)].

In practice, archaeologists use a methodology that groups 'Aboriginal objects' into various site classifications according to the nature, occurrence and exposure of archaeological material evidence. The archaeological definition of a site may vary according to survey objectives, however a site is not recognised or defined as a legal entity in the Act. It should be noted that even single and isolated artefacts are protected as Aboriginal objects under the Act.

The investigation, use or destruction of Aboriginal objects is managed through a system of Permits and Consents under the provisions of Sections 87 and 90 of the Act. Section 87 relates to actions which do not involve direct damage to Aboriginal objects, and Section 90 relates to damage or defacement of Aboriginal objects.

¹ The following information is provided as a guide only and is accurate to the best knowledge of Navin Officer Heritage Consultants. Readers are advised that this information is subject to confirmation from qualified legal opinion.



Under Section 87 of the Act, it is an offence to do any of the following without a Permit from the Director-General of the Department of Environment and Conservation: disturb or excavate any land for the purpose of discovering an Aboriginal object; disturbing or moving an Aboriginal object; take possession of or removing an Aboriginal object from certain lands; and erecting a building or structure to store Aboriginal objects on certain land (Section 86). The maximum penalty is \$11,000 for individuals and \$22,000 for corporations.

Under section 90 of the Act, a person who, without first obtaining the consent of the Director-General knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal Place is guilty of an offence against the Act.

Where salvage actions (such as collection or re-positioning) are proposed in conjunction with an application to destroy Aboriginal objects, then an application for a section 87 permit must accompany the section 90 application. This is because a consent issued solely under section 90 of the Act is not considered to permit actions other than those which destroy, deface or damage Aboriginal objects.

In January of 2005, the DEC introduced Interim guidelines for Aboriginal Community Consultation with regard to the preparation of applications for a consent or permit under Part 6 (section 87 and 90) of the NP&W Act. The DEC anticipate that the guidelines will be replaced with a more detailed policy following consultation with the Aboriginal community and other stakeholders. The Interim guidelines include a required process of notification of intended applications in the local media, an invitation for stakeholder groups to register interest, and various time periods providing an opportunity for registered stakeholders to comment and review proposed methodologies and assessments. A transition phase has been specified for the application of the Interim guidelines. Any project where a Planning Focus Meeting was held before the 1st of January 2005, or where the proponent can demonstrate that cultural heritage assessment work commenced prior to this date, may continue to prepare Part 6 applications according to the former processes. Alternatively a proponent may choose to comply with the new guidelines.

It should be noted that section 75U of the EP&A Act 1979 (as amended) establishes an exception to the application of sections 87 and 90 of the NP&W Act. It states that a Permit under section 87 or a Consent under section 90 of the NP&W Act 1974 is not required for an approved project subject to the provisions of Part 3A of the EP&A Act.

Section 175B of the NP&W Act outlines circumstances where corporation directors may be taken to have contravened these provisions, based on the acts or omissions of that Corporation.

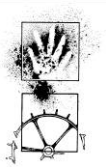
The processing and assessment of Permit and Consent applications is dependent upon adequate archaeological review and assessment, together with an appropriate level of Aboriginal community liaison and involvement (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).

The Minister may declare any place which, in his or her opinion, is or was of special Aboriginal significance with respect to Aboriginal culture, to be an Aboriginal place (Section 84). The Director-General has responsibility for the preservation and protection of the Aboriginal place (Section 85). An area declared to be an Aboriginal place may remain in private ownership, or be acquired by the Crown by agreement or by a compulsory process (Section 145).

The Director General may make an interim protection order and order that an action cease where that action is, or is likely to, significantly affect an Aboriginal object or Aboriginal place. Such an order is current for 40 days (Section 91AA, Schedule 3[10]). Such an order does not apply to certain actions, such as where they are in accordance with development consents or emergency procedures.

8.1.1 General Management Constraints and Requirements

Except where a project is subject to the provisions of Part 3A of the EP&A Act, the NP&W Act, together with the policies of the Department of Environment and Conservation provide the following constraints and requirements on land owners and managers:



- It is an offence to knowingly disturb an Aboriginal object (or site) without an appropriate permit or consent (Sections 87 and 90);
- Prior to instigating any action which may conceivably disturb an Aboriginal object (this generally means land surface disturbance or felling of mature trees), archaeological survey and assessment is required (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).
- When the archaeological resource of an area is known or can be reliably predicted, appropriate landuse practices should be adopted which will minimise the necessity for the destruction of sites/Aboriginal objects, and prevent destruction to sites/Aboriginal objects which warrant conservation (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).
- Documented and appropriate consultation with relevant Aboriginal Community representatives is required by the Department of Environment and Conservation as part of the prerequisite information necessary for endorsement of consultant recommendations or the provision of Consents and Permits by the DEC (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).

8.1.2 Statutory Constraints Arising from Artefacts which Constitute Background Scatter

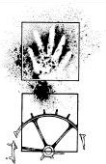
Background scatter is a term used generally by archaeologists to refer to artefacts that cannot be usefully related to a place or focus of past activity. There is no single concept for background 'scatter' or discard, and therefore no agreed definition. The recognition of background material within a particular study area is dependent on an appreciation of local contextual and taphonomic factors. Artefacts within a 'background' scatter can be found in most landscape types and may vary considerably in density.

Standard archaeological methodologies cannot effectively predict the location of individual artefacts within background scatters. Surface survey may detect background material either as individual artefacts ('isolated finds'), or even as small, low-density 'sites'. Subsurface testing may sample, and through analysis, characterise background material. However, beyond the scope of archaeological sampling, the potential to encounter background artefacts within the context of development related ground disturbance will always remain.

Most previous cultural resource management archaeological methodologies have acknowledged that there is little scientific justification for the conduct of archaeological salvage or ground disturbance monitoring to effect the recovery of background artefacts. The intrinsic scientific value of any recovered artefacts does not, in general, outweigh the expense of conducting the monitoring. However, low density distributions of artefacts are a current subject of interest by some heritage practitioners and DEC policy regarding this issue may change in the future. The monitoring of construction related ground works by Aboriginal groups is now increasingly practiced. The recovery of background scatter artefacts is often a probable outcome of such monitoring exercises.

Given the nature of statutory and DEC policy requirements in NSW, the detection of background artefacts during monitoring can be problematic. Except where a project is subject to the provisions of Part 3A of the EP&A Act, or where an Aboriginal object is covered by a current Consent or Permit (or Heritage Impact Permit (HIP)), from DEC, all further impact to an Aboriginal object detected during development works, and to the ground in its immediate vicinity, must cease until an appropriate Permit or Consent is gained. It may take up to eight weeks for this to occur. In the past, however, DEC has not as a general rule granted Consents to cover artefacts within background scatters which remain undescribed and undetected. This is because DEC sought to provide Consents where the significance and location of the Aboriginal objects to be impacted could be reliably defined. By their very nature, this may not be possible for artefacts that constitute a background scatter.

The present application of policy by the DEC does not provide for a consistent or proactive means of dealing with the statutory constraints posed by the detection of background scatter artefacts during development works. In those cases where the provisions of Part 3A of the EP&A Act do not apply, an option is the provision by the DEC of a section 87 Permit or section 90 Consent which includes all



Aboriginal objects situated within the defined development site rather than specific sites or finds within it. This approach has been adopted by some DEC branch jurisdictions where an assessment has been provided which suitably investigates the known and predicted incidence of Aboriginal objects potentially subject to disturbance. Other DEC jurisdictions do not accept this approach and only provide Permits and Consents for known and defined Aboriginal object occurrences.

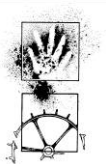
It should therefore be noted, that in the event that an Aboriginal artefact ('Aboriginal object') is detected during ground disturbance within a development study area, and that area or Aboriginal object is not covered by a Permit or Consent to Destroy (or Heritage Impact Permit), there may be considerable delays to development works while an application for a Consent to Destroy is processed.

8.2 The National Parks and Wildlife Amendment Bill 2001

Although this Act was passed by both houses of the NSW parliament in 2001, a number of its provisions with regard to Aboriginal cultural heritage have yet to be gazetted and are not yet law. These include the following provisions:

- The requirement for a section 90 'Consent to Destroy' from the Director General will be replaced by a 'heritage impact permit' (Schedule 3[1], 3[3-8]).
- The offence under section 90 of the Principal Act of 'knowingly' destroying, defacing or damaging Aboriginal objects and Aboriginal Places without Consent will be changed so that the element of knowledge will be removed (Schedule 3 [2]). The amended section 90, subsection 1 will read:

'A person must not destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place.'
- Section 90 subsection 1 will not apply when an Aboriginal object or Aboriginal place is dealt with in accordance with a heritage impact permit issued by the Director-General (Schedule 3[3], Section 90(1B) in amended Act).
- It will be a defence to a prosecution for an offence against subsection 1 if the defendant shows that:
 - (a) 'he or she took reasonable precautions and exercised due diligence to determine whether the action constituting the alleged offence would, or would be likely to, impact on the Aboriginal object of Aboriginal place concerned, and
 - (b) the person reasonably believed that the action would not destroy, deface, damage or desecrate the Aboriginal object or Aboriginal place.' (Schedule 3[3], Section 90(1C) in amended Act)
- A court will be able to direct a person to mitigate damage to or restore an Aboriginal object or an Aboriginal place in appropriate circumstances when finding the person guilty of an offence referred to in section 90 of the Principal Act (Schedule 3[9]).
- Schedule 4[8] of the Bill provides for the Director-General to withhold in the public interest specified documents in the possession of the DEC which relate to the location of Aboriginal objects, or the cultural values of an Aboriginal place or Aboriginal object.



8.3 The NSW Heritage Act (1977)

Overview

The purpose of the NSW Heritage Act 1977 is to ensure that the heritage of New South Wales is adequately identified and conserved. In practice the NSW Heritage Act has focussed on items and places of non-indigenous heritage to avoid overlap with the NP&W Act, 1974 which has primary responsibilities for nature conservation and the protection of Aboriginal relics and places in NSW.

The *Heritage Amendment Act 1998* came into effect in April 1999. This Act instigated changes to the NSW heritage system, which were the result of a substantial review begun in 1992. A central feature of the amendments was the clarification and strengthening of shared responsibility for heritage management between local government authorities, responsible for items of local significance, and the NSW Heritage Council. The Council retained its consent powers for alterations to heritage items of state significance.

The Heritage Act is concerned with all aspects of conservation ranging from the most basic protection against damage and demolition, to restoration and enhancement. It recognises two levels of heritage significance, State significance and Local significance across a broad range of values. Some key provisions of the Act are:

- the establishment and functions of the Heritage Council (Part 2),
- interim heritage orders (Part 3), the State Heritage Register (Part 3A),
- Heritage Agreements (Part 3B),
- environmental planning instruments (Part 5),
- the protection of archaeological deposits and relics (Part 6), and
- the establishment of Heritage and Conservation Registers for state government owned and managed items (Part 7).

Generally this Act provides protection to items that have been identified, assessed and listed on various registers including State government section 170 registers, local government LEPs and the State Heritage Register. The Interim Heritage Order provisions allow the minister or his delegates (local government may have delegated authority) to provide emergency protection to threatened places which have not been previously identified. The only 'blanket' protection provisions in the Act relate to the protection of archaeological deposits and relics greater than 50 years old.

Protection of Archaeological Relics and Deposits

Section 139 of the Act specifically provides protection for any item classed as a relic. A relic is defined as "...any deposit object or material evidence -

- (a) which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; and
- (b) which is 50 or more years old."

(Heritage Act 1977, Part 1, Section 4)

Section 139 of the Act disallows disturbance of a relic unless in accordance with an 'excavation permit' from the Heritage Council. This section also allows the Heritage Council to create exceptions to the requirement for an excavation permit with respect to certain types of relic, contexts, or types of disturbance (refer below).

Section 146 of the Act requires that the discovery of a previously unknown relic be reported to the Heritage Council within a reasonable time of its discovery.

Permits and Approval Requirements

The Act includes two key approval requirements;



- A permit must be obtained for works which have the potential to interfere with a heritage item or place which is either listed on the State Heritage Register or the subject of an interim heritage order (Section 57); and
- A permit must be obtained to disturb or excavate land where it is known (or there is reasonable cause to suspect) that such action will or is likely to uncover or affect a relic (Section 139). This permit is known as an excavation permit and can be applied for under section 140 of the Act. Current interpretation of the Act by the Heritage Office indicates that excavation permits are only applicable to relics which are situated below the ground surface.

It should be noted that section 75U of the EP&A Act 1979 (as amended) establishes an exception to the requirement for an excavation permit. It states that an approval under Part 4 (including section 57), or an excavation permit under section 139 of the Heritage Act 1977 is not required for an approved project subject to the provisions of Part 3A of the EP&A Act.

Exemptions from Permit Requirements

Certain activities are exempted from the Section 57 and 139 permit approval requirements. Exemptions from Section 57 requirements may be granted by the Minister, and the NSW Heritage Council may provide exemptions from Section 139 requirements.

A schedule of section 57 exemptions has been formulated which includes activities such as certain types of maintenance and repair, minor excavations, changes of use, some temporary structures and 'anything which in the opinion of the Director is of a minor nature and will not adversely affect the heritage significance of the item'. In many cases notification of such proposed activities must be made by the applicant to the Director, and written notification from the Director received regarding his satisfaction that the exemption criteria have been met.

Standard Exemption 7 of the *Heritage Act 1977* entitled: Minor Activities with no Adverse Impact on Heritage Significance states that:

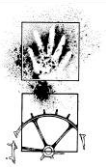
1. Anything which in the opinion of the Director is of a minor nature and will not adversely affect the heritage significance of the item does not require approval under s. 57(1) of the Act.
2. A person proposing to do anything of the kind described in paragraph 1 must write to the Director and describe the proposed activity. If the Director is satisfied that the proposed activity meets the criteria set out in paragraph 1, the Director shall notify the applicant.

A series of exemptions have also been established for Section 139 Permit approval requirements. This includes demolition and maintenance of bridges not listed on the State Heritage Register, some forms of excavation and maintenance of underground services, conservation and repair of monuments and grave markers, and the exposing of survey marks in the course of survey operations.

On the 5th March of 2003, the following section 139 exemptions were notified:

Excavation or disturbance of the following land does not require an excavation permit under Section 139, provided that the Director is satisfied that the criteria in (a), (b) or (c) have been met and the person to undertake the excavation or disturbance has received a notice advising that the Director is satisfied:

- (a) where an archaeological assessment has been prepared in accordance with Guidelines published by the Heritage Council of NSW which indicates that there is little likelihood of there being any relics in the land or that any relics in the land are unlikely to have State or local heritage significance;
- (b) where the excavation or disturbance of land will have a minor impact on the archaeological resource;



- (c) where the excavation or disturbance of land involves only the removal of fill which has been deposited on the land.

A person proposing to excavate or disturb land according to the above criteria must write to the Director and describe the proposed excavation or disturbance and set out why it satisfies the criteria. The Director shall notify the applicant if he or she is satisfied that one or more of the criteria have been met.

The Heritage Council of NSW

The role of the Heritage Council is to provide the Minister with advice on a broad range of matters relating to the conservation of the heritage of NSW. It also has a role in promoting heritage conservation through research, seminars and publications. The membership of the Heritage Council is designed to reflect a broad range of interests and areas of expertise.

Interim Heritage Orders

Under the provisions of Part 3 of the Act, the Minister can make an interim heritage order (IHO). A recommendation with respect to an order can come from the Heritage Council, either based on a request for the Minister, or the Council's own considerations. The Minister can also authorise Local Councils to make IHOs within their area. An interim conservation order may remain in force for up to 12 months, until such time as it is revoked or the item is listed on the State Heritage Register. A heritage order may control activities such as demolition of structures, damage to relics, places or land, development and alteration of buildings, works or relics.

The State Heritage Register

Changes to the Heritage Act in the 1998 amendments established the State Heritage Register which includes all places previously protected by permanent conservation orders (PCOs) and items identified as being of state significance in heritage and conservation registers prepared by State Government instrumentalities. Sites or places which are found to have a state level of heritage significance should be formally identified to the Heritage Council and considered for inclusion on the State Heritage Register.

Heritage Agreements

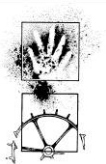
Under Section 39 of the Act, the Minister can enter into an Agreement with the owner of a heritage item listed on the State Heritage Register to ensure its conservation. Such an Agreement can cover a range of responsibilities including financial or specialist assistance and can be attached to the title of the land.

Environmental Planning Instruments

Part 5 of the Act gives the Heritage Council the authority to request that an environmental planning instrument be prepared covering certain lands. It also directs that the Heritage Council shall be consulted by others when preparing a draft planning instrument affecting land to which an interim heritage order applies or which includes an item listed on the State Heritage Register. In addition it gives the Heritage Council the authority to produce guidelines for the preparation of such planning instruments.

Heritage and Conservation Registers

Section 170 of the Act requires all state government instrumentalities to establish and maintain a Heritage and Conservation Register that lists items of environmental heritage. The register is to include items which are, or could potentially be, the subject of a conservation instrument, and which are owned, occupied or otherwise under the control of that instrumentality.



8.4 Environmental Planning & Assessment Act (1979)

The Environmental Planning & Assessment Act 1979 (EP&A Act) and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and decision making. Environmental impacts include cultural heritage assessment. The Act was recently reformed by the passage of the Environmental Planning and Assessment Amendment (Infrastructure and other Planning Reform) Act in June 2005.

There are four main areas of protection under the Act:

- Planning instruments allow particular uses for land and specify constraints. Part 3 governs the preparation of planning instruments. Both Aboriginal and Historic (Non-Indigenous) cultural heritage values should be assessed when determining land use.
- A separate streamlined and integrated development assessment and approvals regime for major infrastructure and other projects of significance to the State is defined by Part 3A.
- Section 90 lists impacts which must be considered before development approval is granted. Part 4 relates to the development assessment process for local government authorities. Impact to both Aboriginal and Historic (Non-Indigenous) cultural heritage values are included.
- State Government agencies which act as the determining authority on the environmental impacts of proposed activities must consider a variety of community and cultural factors in their decisions, including Aboriginal and Historic (Non-Indigenous) cultural heritage values. Part 5 relates to activities which do not require consent but still require an environmental evaluation, such as proposals by government authorities.

Under the *Environmental Planning & Assessment Act (1979)* the Minister for Planning may make various planning instruments such as regional environmental plans (section 51) and local environment plans (section 70). The Minister may direct a public authority such as a Local Council, to exercise certain actions within a specified time, including the preparation of draft Local Environmental Plans and appropriate provisions to achieve the principles and aims of the Act (section 117).

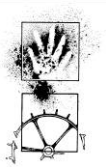
These planning instruments may identify places and features of cultural heritage significance and define various statutory requirements regarding the potential development, modification and conservation of these items. In general, places of identified significance, or places requiring further assessment, are listed in various heritage schedules that may form part of a Local Environmental Plan (LEP) or a Regional Environmental Plan (REP). Listed heritage items are then protected from certain defined activities, normally including demolition, renovation, excavation, subdivision, and other forms or damage, unless consent has been gained from an identified consent authority. The consent authority under a LEP is normally the local Shire or City Council.

In addition to the development of these environmental planning instruments, the Director of the Department of Planning (DoP) or a local Council may prepare a Development Control Plan (DCP), where it is considered that more detailed provisions or guidelines are required over any part of land covered by an REP, LEP or their Drafts (sections 51A and 72).

Recent amendments to the Act require a single LEP to be prepared according to a standard template, for each local government area within the next five years

In determining a development application (DA), a consent authority, such as a local Council, must take into consideration any of the following which are relevant to the subject application (section 79C(1) Potential Matters for Consideration):

- the provisions of any environmental planning instrument, or draft environmental planning instrument (which has been placed on public exhibition); any development control plan; and the regulations;
- the likely impacts of that development on the natural and built environments, and the social and economic impacts on the locality;



- the suitability of the site for the development;
- any submissions made in accordance with the Act or the regulations; and
- the public interest.

Best Practice Guidelines have been issued by DoP on the use of section 79C(1) and include an assessment of how the proposed development will affect the heritage significance of the property, or adjacent properties, in terms of the historic, scientific, cultural, spiritual and archaeological of Aboriginal, non-Aboriginal and natural heritage.

If a development consent is required from council under the provisions of a LEP and a permit or license is also required from a State Government Agency an integrated development must be submitted to the consent authority. A development is an 'integrated development' if it requires an approval under section 90 of the *NSW National Parks & Wildlife Act, 1974* or if the Director General of DEC is of the opinion that consultation with an Aboriginal group or organisation should be consulted prior to a determination being made. Any development approval issued for an integrated development of this kind must be consistent with the general terms of approval or requirements provided by the relevant State Government Agency.

The *Environmental Planning & Assessment Act, 1979*, as amended, provides for the listing of heritage items and conservation areas and for the protection of these items or areas through environmental planning instruments (like LEPs and REPs) at the local government and State planning levels. These statutory planning instruments usually contain provisions for the conservation of these items and areas as well as an assessment process to reduce the impacts of new development on the heritage significance of a place, building or conservation area.

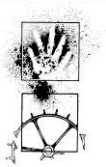
Part 3A of the Act is a recent amendment and establishes a separate streamlined and integrated development assessment and approvals regime for major State government infrastructure projects, development that was previously classified as State Significant development, and other projects, plans or programs declared by the Minister for Planning.

Part 3A removes the stop-the-clock provisions and the need for single-issue approvals under eight other Acts, including the National Parks and Wildlife Act 1974 and the Heritage Act 1977. Environmental planning instruments such as the heritage provisions within LEP and REPs, (other than State environmental planning policies) do not apply to projects approved under Part 3A.

Where warranted the Minister may declare any project subject to Part 3A to be a critical infrastructure project. These projects only require a concept approval in contrast to other Part 3A projects which require project approval. In most circumstances, a concept approval will be obtained to establish the environmental performance requirements and consultation requirements for the implementation of the subsequent stages of the project.

Under the provisions of Part 3A, proponents of major and infrastructure projects must make a project application seeking approval of the Minister. The application is to include a preliminary assessment of the project. Application may be for concept plan approval or full approval. Following input from relevant agencies and council(s), DoP will issue the proponent with requirements for the preparation of an Environmental Assessment and a Statement of Commitments. The Statement of Commitments will include how the project will be managed in an environmentally sustainable manner, and consultation requirements.

Following submission of an Environmental Assessment and draft Statement of Commitments to DoP, these documents are variously evaluated, reviewed, circulated and exhibited. The proponent may modify the proposal to minimise impacts in response to submissions received during this process. The proponent then provides a Statement of Commitments and, following any project changes, a Preferred Project Report. An assessment report is then drafted by the Director-General and following consultation with relevant agencies, a final report with recommendations for approval conditions or application refusal is submitted to the Minister. The Minister may refuse the project, or approve it with any conditions considered appropriate.



9. SIGNIFICANCE ASSESSMENT

9.1 Aboriginal Heritage

9.1.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' (Aust. ICOMOS 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- Significance to contemporary Aboriginal people;
- Scientific or archaeological significance;
- Aesthetic value;
- Representativeness; and
- Value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Aboriginal significance can be defined as the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the result of several factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site. It should be noted that Aboriginal cultural significance can only be determined by the Aboriginal community.

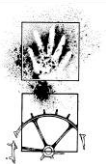
Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information which is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a larger significant structure such as a site complex.
2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique



features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.

The cultural significance of a place can be usefully classified according to a comparative scale which combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.

9.1.2 The Study Area

The heritage significance of the identified potential archaeological deposit (LGPAD1) within the study can only be determined following consideration of the results of a subsurface archaeological testing program. Data from a representative sample of the deposit is required in order to characterise the nature and extent of any potentially occurring archaeological material.

9.2 European Heritage

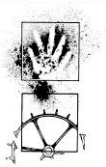
9.2.1 Assessment Criteria

The NSW Heritage Office has defined a methodology and set of criteria for the assessment of cultural heritage significance for items and places, where these do not include Aboriginal heritage from the pre-contact period (NSW Heritage Office & DUAP 1996, NSW Heritage Office 2000). The assessments provided in this report follow the Heritage Office methodology.

The following heritage assessment criteria are those set out for Listing on the State Heritage Register. In many cases items will be significant under only one or two criteria. The State Heritage Register was established under Part 3A of the Heritage Act (as amended in 1999) for listing of items of environmental heritage that are of state heritage significance. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, Heritage Act 1977).

An item will be considered to be of State (or local) heritage significance if, in the opinion of the Heritage Council of NSW, it meets one or more of the following criteria:

- Criterion (a)** An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (b)** An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (c)** An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- Criterion (d)** An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
- Criterion (e)** An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (f)** An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (g)** An item is important in demonstrating the principal characteristics of a class of NSW's
- Cultural or natural places; or
 - Cultural or natural environments.
- (or a class of the local area's
- Cultural or natural places; or
 - Cultural or natural environments.)



An item is not to be excluded from the Register on the ground that items with similar characteristics have already been listed on the Register. Only particularly complex items or places will be significant under all criteria.

In using these criteria it is important to assess the values first, then the local or State context in which they may be significant.

9.2.2 The Study Area

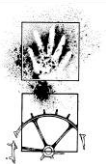
The Sydney Water Supply Upper Canal

The Upper Canal as part of the Nepean Scheme is listed on the NSW State Heritage Register as a State significant item. It is listed as such because:

- In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system;
- It has functioned as a unique part of the main water supply system for Sydney for over 100 years, and has changed little in its basic principles since the day it was completed;
- It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it the city by means of major canals and pipelines;
- It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early utilisation of concrete for many engineering purposes in the system;
- The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms;
- Many of the structural elements are unique to the Upper Nepean Scheme.

The listing includes its infrastructure elements, such as flumes, stone piers, concrete bridges, and aqueducts.

Refer to Appendix 2 for further heritage listing information relating to the Upper Canal.



10. MANAGEMENT CONSIDERATIONS

10.1 Aboriginal Heritage

The proposed construction of the Leaf's Gully Gas Turbine Power Station will necessitate the substantial disturbance or removal of the current ground surface and associated upper soil profile within the footprint of the Power Station works. This level of impact could destroy, damage or move any archaeological material potentially present within the effected sediments.

This investigation has found that the proposed footprint of the development occurs in areas with predicted subsurface archaeological potential. In order to determine if Aboriginal objects would be impacted by such works, and to evaluate their significance, a program of archaeological subsurface testing would need to be conducted across a representative sample of the deposits effected.

It should be noted that a majority of the study area has been previously disturbed by agricultural activities including clearance of native vegetation, ploughing, and the construction of power and gas easements. Despite this, and the likelihood that such activities are likely to have reduced the significance of any potentially remaining Aboriginal objects, there remains a statutory requirement to determine if Aboriginal objects are likely to be impacted and to ensure that appropriate strategies for impact mitigation are conducted. The likely means of managing any detected archaeological deposits subject to impact will depend on their level of assessed significance.

It is recommended that an appropriate level of archaeological subsurface testing be conducted across LGPAD1 to determine the nature and significance of any archaeological material. If this testing program is conducted prior to project approval under Part 3A of the EP&A Act then a section 87 permit from the DEC would be required to conduct the program. Based on the results of this program, a management strategy may be required to mitigate any anticipated development impacts on heritage values. These strategies should form part of a Statement of Commitments under any Part 3A approval.

10.2 European Heritage

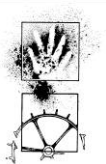
The only historic site with potential to be impacted by the proposed development is a small section of the Sydney Water Supply Upper Canal. The development proposal includes an option for the construction of a pump station and a pipeline connecting the Leaf's Gully Power Station to the canal. If constructed this pipeline connection, would be expected to involve only minor impact to the canal fabric and would be in accordance with the requirements of the Sydney Catchment Authority.

The Upper Canal is listed as an item of heritage significance on the NSW Heritage Register. Part 4 of the *Heritage Act 1977* specifies that no disturbance can occur to items listed on the State Heritage Register without approval from the Heritage Council of NSW. Such approval may be obtained by an application made to the Heritage Office under Section 60 of the *Heritage Act 1977*. However, since the introduction of Part 3A of the Environmental Protection and Assessment Act 1979, section 75U of the amended Act excludes approved projects from the requirements of Part 4 of the Heritage Act.

In the absence of the Part 4 statutory provisions, the Heritage Office would be unlikely to advise approval of the application to the Department of Planning except where it could be demonstrated that impact to the canal would be minor and/or there was an appropriate commitment by the proponent to effectively mitigate any potential impacts to heritage values.

If the option to construct a pipeline connection with the canal is developed further, it is recommended that:

- The design of the connection should minimise direct and indirect impacts to the fabric and context of the canal;
- All works and impacts on the upper canal should be consistent with the provisions of the existing Conservation Management Plan for the Upper Canal (Higginbotham and Associates 2002).



- Any heritage impact mitigation actions as required by Conservation Management Plan (such as the conduct archival recording) should be included in a Statement of Commitments as part of any Part 3A project approval.

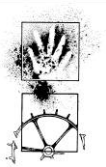
11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Aboriginal Heritage

1. No Aboriginal objects or sites were located during the field survey of the Leafs Gully study area.
2. A substantial area of potential archaeological deposit LGPAD 1 was identified in the study area. The area includes areas of moderate and low-moderate archaeological potential. This potential archaeological deposit would be subject to development impact.
3. *It is recommended that a program of archaeological subsurface testing be conducted across a representative sample of the LGPAD1 deposits with the aim of determining the nature and significance of any Aboriginal objects present. If necessary, appropriate management strategies should be formulated with the aim of mitigating any development impacts to identified heritage values. If this testing program is to be conducted prior to project approval under Part 3A of the EP&A Act then a Preliminary Research Permit must be applied for and received from the DEC under section 87 of the National Parks and Wildlife Act 1974.*
4. No development related disturbance to Aboriginal objects can occur until this program has been completed and any necessary mitigation actions included within a Statement of Commitments. under any Part 3A approval.
5. The conduct of an archaeological subsurface testing program would include the following components:
 - If the program is to be conducted prior to Part 3A approval, then a section 87 permit would be required from the DEC. In this event, as part of the permit application process the DEC Interim Guidelines for Aboriginal Community Consultation would need to be followed if a planning focus meeting for this project was not held before 1st January 2005. These guidelines define a process of public notification and consultation for the application of section 87 and 90 permits and consents. The process requires a preparatory time of at least seven weeks prior to commencement of fieldwork.
 - Processing of a complete application for a section 87 permit will generally be processed by the DEC in a 'turn-around' time of 8 weeks, as specified by the current policy of the DEC.
 - If Part 3A approval is gained prior to the conduct of the archaeological testing program, then it is probable that a testing program and any consequential heritage management requirements would form part of an approved Statement of Commitments. This would depend on advice provided by the DEC.
 - Conduct of the subsurface testing field program would take approximately 1 to 2 weeks.

This investigation would involve excavating a series of test pits within the area of the PAD. Mechanical excavation with a backhoe, excavator or similar, combined with wet sieving of the recovered spoil is the preferred method. The investigation would concentrate on areas to be impacted by the project but may also test areas outside of the development footprint to assess the potential for surviving undisturbed resource.

- Preparation of a report documenting the results of the test program and outlining any recommended management strategies. This may take approximately two weeks, and potentially longer depending on the number of artefacts recovered.



- If Aboriginal objects are encountered within proposed development areas, then management strategies for impact mitigation to heritage values would be included in a Statement of Commitments as part of any Part 3A approval.

11.2 European Heritage

6. A small section of the Sydney Water Supply Upper Canal System may potentially be impacted by the proposed Leafs Gully Power Station development. This would result if an option for a water pipeline connection with the canal was constructed. The expected impact of the connection would be minor in nature.
7. *If the option to construct a pipeline connection with the canal is developed further, it is recommended that:*
 - *The design of the connection should minimise direct and indirect impacts to the fabric and context of the canal;*
 - *All works and impacts on the canal should be consistent with the provisions of the existing Conservation Management Plan for the Upper Canal (Higginbotham and Associates 2002).*
 - *Any heritage impact mitigation actions as required by Conservation Management Plan (such as the conduct archival recording) should be included in a Statement of Commitments as part of any Part 3A project approval.*

11.3 General

8. *Three copies of this report should be forwarded to the NSW NPWS at the following address:*

Cultural Heritage Officer
Conservation Planning Unit
Metro EPRD
NSW Department of Environment and Conservation
PO Box 1967
HURSTVILLE NSW 2220

6. *One copy of this report should be forwarded to each of the following Aboriginal groups:*

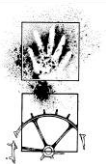
Lance Syme
Tharawal Local Aboriginal Land Council
PO Box 20
Buxton NSW 2571

Glenda Chalker
Cubbitch Barta Native Title Claimants Aboriginal Corporation
55 Nightingale Road
Pheasants Nest NSW 2574

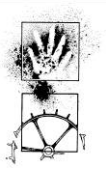


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APPENDIX 1

RECORD OF ABORIGINAL PARTICIPATION



Record of Aboriginal Representative Participation*

Project Name: Appin/Leafs Gully Gas Power Station
Aboriginal Organisation: Native Title Claimants Aboriginal Corporation
Client Name & Address: (Please send invoice to this address) Ms Corp level 3, 116 Miller St, North Sydney 2060
Archaeologist(s): name & address: Navin Officer Heritage Consultants Pty Ltd, 4/71 Leichhardt Street, KINGSTON, ACT 2604 (Tel: 02 8282 9415, Fax: 8282 9416)

Name of Representative	Date	Type of Participation	Start time	Finish time
Glenda Chalker	8th May	Survey	10.00	17.00

Issues raised: I believe the assessment should have been the whole property, not just targeted
A proper plan of management will not be complete without the whole of property
assessment. Secondary impacts also have to be considered

Signed (archaeologist): [Signature] Date: 8-5-06
(Aboriginal representative): [Signature] Date: 8-5-06
(Aboriginal representative): [Signature] Date: 8-5-06
(Aboriginal representative): [Signature] Date: 8-5-06

* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.



Record of Aboriginal Representative Participation*

Project Name: *Appin/Leafs Gully Gas Power Station*
Aboriginal Organisation: *Tharawal UALC*
Client Name & Address: *(Please send invoice to this address) St. Nicole Brower, VRS Corp, 116 Miller St, North Sydney, 2060*
Archaeologist(s): name & address: Navin Officer Heritage Consultants Pty Ltd, 4/71 Leichhardt Street, KINGSTON, ACT 2604 (Tel: 02 6282 9415, Fax: 6282 9416)

Name of Representative	Date	Type of Participation	Start time	Finish time
<i>Kim Prophet</i>	<i>8/5/06</i>	<i>Survey</i>	<i>10 am</i>	<i>5pm</i>

Issues raised: *No comments*

Signed (archaeologist): *N. Hayes*

(Aboriginal representative):

Date: *8/5/06*

(Aboriginal representative):

Date:

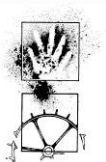
(Aboriginal representative):

Date:

(Aboriginal representative):

Date:

* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.



Advertisement placed in Campbelltown Advertiser 22 October 2008

ABORIGINAL HERITAGE ASSESSMENT

Navin Officer Heritage Consultants Pty Ltd has been commissioned by UES to undertake a subsurface archaeological investigation of various Aboriginal sites and areas of predicted archaeological potential within the Appin area.

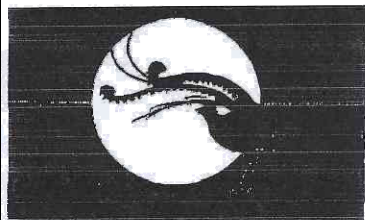
As required by the Department of Environment and Conservation's *Interim Guidelines for Aboriginal Community Consultation*, we are inviting registration from interested Aboriginal groups and individuals in relation to this assessment.

Please forward expressions of interest to:

The secretary

Navin Officer Heritage Consultants Pty Ltd
4/71 Leithardt Street
Kingston ACT 2604

The closing date for this registration of interest
is Monday 3rd November.



THARAWAL LOCAL ABORIGINAL LAND COUNCIL

Navin Officer
102 Jervois Street,
DEAKIN ACT 2600

31st of October 2008

Att: Nicola Hayes

Dear Nicola,

Tharawal Local Aboriginal Land Council wishes to be involved as an interested group in the work to be done in the Appin area. Thankyou for your invitation on this survey.

Yours in Indigenous Unity,

per. Dorey.

Donna Whillock
Cultural Heritage Representative
Tharawal Local Aboriginal Land Council

**P.O. BOX 20, BUXTON NSW 2571
220 WEST PARADE COURIDJAH NSW 2571
TELEPHONE: (02) 4681 0059 • (02) 4681 0799 • FAX: (02) 4683 1375
tharawal@ideal.net.au**

N.I.A.C. ABN 80475697297

Northern Illawarra Aboriginal Collective Inc.
representing Wulungulu, Gundungara, Wadi-Wadi and Korewal traditional owner groups

2/3 Birch Crescent, East Corrimal, NSW 2518. ph/fax (02) 42833009

To the Secretary
Navin Officer Heritage Consultants
Via fax 6282 9416

Subject:
Aboriginal Cultural Heritage Assessment subsurface investigation Appin Area

Dear Secretary,

NIAC would like to register three separate expressions of interest, in the above project, on behalf of three of our Traditional Owner member groups who have connection to the above Country. These are:- * Woronora Plateau Gundangara Elders Council descendants of John Henry Simms also Jane Timbery also Lavinia and Harriet Shephard, * the Korewal/Eora descendants of Queen Emma of La Perouse, * the Wadi Wadi descendants of Queen Rosy of the traditional Lake Illawarra Tribe.

Their fees are \$800 each per day totalling \$2,400 per day (no GST payable as NIAC is a registered charity), and they are covered by NIAC's public liability insurance. Invoicing shall be through NIAC. A volunteer technical assistant is provided at no cost by NIAC to co-ordinate and provided any needed reports or comments which can be included as an appendix to the archaeologists' report.

This expression of interest has also been sent by email.

Yours sincerely

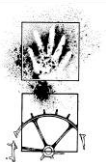
Daniela Reverberi

Daniela Reverberi (NIAC technical officer)



APPENDIX 2

HERITAGE LISTINGS FOR THE UPPER CANAL



NSW Heritage Register Listing

Upper Canal System (Prospect Reservoir)

Name of Item: Upper Canal System (Prospect Reservoir)

Other Name/s: includes the Southern Railway Aqueduct

Type of Item: Area/Complex/Group

Group/Collection: Utilities - Water

Category: Water Supply Canal

Primary Address: Prospect, NSW 2148

Local Govt. Area: Blacktown

Property Description:

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
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Boundary: The Upper Canal forms a major component of the Upper Nepean Scheme, which also includes the Prospect Reservoir and the Lower Canal. The Upper Nepean Scheme supplies water from the Cataract River at Broughtons Pass to the Crown Street reservoir, a distance of 63.25 miles. The Upper Canal commences by tunnel from Pheasant's Nest Weir on the Nepean River and extends through the Local Government areas of Wollondilly, Liverpool, Holroyd, Fairfield, Campbelltown and Camden.

All Addresses

Street Address	Suburb/Town	LGA	Parish	County	Type
	Prospect	Blacktown			Primary
	Leppington	Camden			Alternate
	Horsley Park	Fairfield			Alternate
	Catherine Field	Camden			Alternate
	Mount Annan	Camden			Alternate
	Currans Hill	Camden			Alternate
	Cecil Park	Liverpool			Alternate
	West Hoxton	Liverpool			Alternate
	Appin	Wollondilly			Alternate
	Denham Court	Campbelltown			Alternate
	Gilead	Campbelltown			Alternate



Owner/s

Organisation Name	Owner Category	Date Ownership Updated
Sydney Catchment Authority	State Government	

Statement of Significance

The Upper Nepean Scheme is significant because:

- * In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system.
- * It has functioned as a unique part of the main water supply system for Sydney for over 100 years, and has changed little in its basic principles since the day it was completed.
- * It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it the city by means of major canals and pipelines.
- * It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early utilisation of concrete for many engineering purposes in the system.
- * The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms.
- * Many of the structural elements are unique to the Upper Nepean Scheme.

Reference: Edward Higginbotham & Associates, SCA Heritage and Conservation Register

Date: 18 December 2000

Date Significance Updated: 17 Sep 03

Note: There are incomplete details for a number of items listed on the State Heritage Register. The Heritage Office intends to develop or upgrade statements of significance for these items as resources become available.

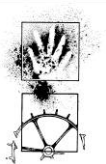
Description

Assessment Criteria

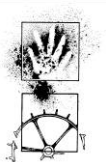
Items are assessed against the State Heritage Register (SHR) Criteria to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Procedures /Exemptions

Section of Act	Description	Title	Comments	Action Date
57(2)	Exemption to allow work	Standard Exemptions	I, the Minister for Planning, pursuant to section 57(2) of the Heritage Act 1977 on recommendation of the Heritage Council of New South Wales grant standard exemptions from section 57(1) of the Heritage Act, 1977 described in the schedule gazetted on 7 March 2003, Gaz No. 59 pages 4066-4070. (As amended on 18 June 2004 and July 2005 and incorporating guidelines as adopted in April 2004)	Mar 7 2003



57(2)	Exemption to allow work	Trash rack safety upgrade for 19 access bridges	Exemption granted under Heritage Council exemption No. 7	Mar 20 2003
21(1)(b)	Conservation Plan submitted for endorsement	Upper Canal CMP, Pheasant's Nest to Prospect Reservoir, Vols 1-3 (Aug 2002)		Jun 27 2003
57(2)	Exemption to allow work	geotechnical investigation drilling program to assess feasibility of emergency and long term stabilisation options		Oct 20 2003
57(2)	Exemption to allow work	Installation of steel pipe guard rail and steel deck joint plates on timber bridges on upper canal system		Feb 18 2004
57(2)	Exemption to allow work	Minor excavation of floor of Southern Railway Aqueduct, Upper Canal System, downstream of aqueduct, to allow for minor change to approved construction programme (2003/S60/147)		Feb 20 2004
57(2)	Exemption to allow work	Application for prevention works on the Cataract Tunnel, Upper Canal (Brooks Point) to mitigate the effects of subsidence from Longwall Coal Mining		Jun 18 2004
57(2)	Exemption to allow work	Drilling of two boreholes adjacent to the Upper Canal		Dec 23 2004
57(2)	Exemption to allow work	Underbore the Sydney Water Supply Canal (Upper Canal System) to install a 110mm pipe for a length of 200m		Jul 21 2005
57(2)	Exemption to allow work	Cecil Hills Water Tunnel and reservoir		Nov 17 2005
57(2)	Exemption to allow work	Westons Tunnel - Installation of a borehole for vibration monitoring during road construction. Installation of fill and construction of widened road over Westons Tunnel.		Feb 20 2006



Listings

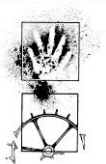
Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
<i>Heritage Act - State Heritage Register</i>		01373	18 Nov 99		
<i>Heritage Act - s.170 NSW State agency heritage register</i>					
<i>Local Environmental Plan</i>	Wollondilly				
<i>National Trust of Australia register</i>					

Study Details

Title	Year	Number	Author	Inspected by	Guidelines Used
Sydney Water Section 170 Register	1996		Graham Brooks and Associates		No

References, Internet links & Images

Type	Author	Year	Title	Internet Links
Written	Caitlin Allen, Conservation Archaeologist, NSW Government Architect's Office	2003	Southern Railway Aqueduct on the Upper Canal at Mount Annan Refurbishment and Repair Heritage Impact Assessment	
Written	Edward Higginbotham et. al.	2002	Conservation management plan for the Upper Canal, Pheasant's Nest to Prospect Reservoir, NSW [Endorsed by the Heritage Council of NSW on 27/6/2003]	
Written	Edward Higginbotham, Terry Kass, Vince Murphy, John Collocott, Toby Fiander, Siobhan Lavelle	1992	Heritage Study of the Upper Canal, Prospect Reservoir & Lower Canal (Upper Nepean Scheme): Volume 1 - Historical & Archaeological Assessment	
Written	Edward Higginbotham, Terry Kass, Vince Murphy, John Collocott, Toby Fiander, Siobhan Lavelle	1992	Heritage Study of the Upper Canal, Prospect Reservoir & Lower Canal (Upper Nepean Scheme): Volume 2 - Inventory. Part 4. Prospect Reservoir, Lower Canal & Pipehead	



Written	Edward Higginbotham, Terry Kass, Vince Murphy, John Collocott, Toby Fiander, Siobhan Lavelle	1992	Heritage Study of the Upper Canal, Prospect Reservoir & Lower Canal (Upper Nepean Scheme): Volume 3 - Conservation Policy	
Written	Kim Ketelby	2005	Westons Tunnel: Assessment of Cultural Significance & Heritage Impact	
Written	RTA Operations	2003	Statement of Heritage Impact	

Source of information for this entry

Name: NSW Heritage Office

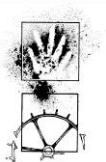
Email: watters@heritage.nsw.gov.au

Web Page: www.heritage.nsw.gov.au

Administration

Database Number: 5051481

File Number: H00/00238



NSW Heritage Inventory Listing (as it applies to the Liverpool LGA)

Sydney Water Supply Upper Canal

Item

Name of Item: Sydney Water Supply Upper Canal

Type of Item: Built

Group/Collection: Utilities - Water

Category: Water Supply Canal

Primary Address: Off Elizabeth Drive (opposite the intersection with Wallgrove Road), Cecil Hills, NSW 2171

Local Govt. Area: Liverpool

Property Description:

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
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All Addresses

Street Address	Suburb/Town	LGA	Parish	County	Type
Off Elizabeth Drive (opposite the intersection with Wallgrove Road)	Cecil Hills	Liverpool			Primary

Statement of Significance

Sydney Water Supply Upper Canal as an essential part of Sydney's fourth water supply, the Upper Nepean, demonstrates the history of the first major civic engineering project of the late 19th century in the wider Sydney area. It also demonstrates the rapid growth of settlement in the environs of Sydney and the need to supply a growing urban population with a water system. The site indicates a level of technical achievement being an example of a late 19th century hydraulic design and construction engineering project. It is now a rare site type in the LGA and State. There is the potential to gain more information on the site from further architectural, archaeological and documentary research.

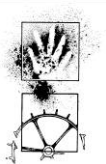
Date Significance Updated: 09 Nov 04

Note: There are incomplete details for a number of items listed on the State Heritage Register. The Heritage Office intends to develop or upgrade statements of significance for these items as resources become available.

Description

Construction Years: 1880 - 1888

Physical The Sydney Water Supply Canal runs c. N-S through the Liverpool LGA area.

**Description:**

It enters Liverpool LGA south of the Elizabeth Drive and Wallgrove Road intersection at Cecil Hills and exits the LGA at the intersection between Bringelly Road and Cowpasture Road, West Hoxton.

The Upper Canal is the conduit which carries water stored in the Upper Nepean Catchment dams (Cataract, Cordeaux, Avon and Nepean) to Prospect Reservoir, the major service reservoir for much of the Sydney Metropolis. The "Upper Canal" comprises approximately 58kms of tunnels, aqueducts and open channels of various cross-section which diverts the flow of the Nepean River below its junctions with the Avon and Cordeaux Rivers at Pheasant's Pass where the flow of the four rivers is diverted to Prospect Reservoir.

The construction of the canal is variable and depends on the type of country through which it passes. The canal includes unlined tunnels through stable sandstone, brick lined tunnels through shale formation, open lengths of the canal in stable sandstone are unlined, in earth areas the canal has battered walls of locally quarried rubble masonry and in poor ground walls has concrete or rubble set in cement mortar. Section 8, 9 & 10 of the Canal cross the Liverpool City CGA.

Section 8 commences near Denham Court Road (27 miles from Pheasant's Nest Weir) and comprises a concrete flume (canal) usually with a trapezoidal section up to nearly 6ms wide at the top and a water depth of just 2ms.

Section 9 also comprises an open canal (commencing approx. 30 miles from Pheasants Nest and continuing to the 33 mile point).

Section 10 comprises of an open canal which has an inlet to the Liverpool Off-take Reservoir locate at Cecil Hills and thence continues as the Cecil Hills Tunnel to the 27 mile point.

Along the route of the canal are situated various ancillary structures such as wrought iron flume (pipe) sections supported on stone piers in order to cross steep gullies, concrete bridges giving access across the canal, other drainage structures to prevent pollution of the canal such as brick and stone culverts, aqueducts, control and gauging installations, an original gateway and gate at the canals intersection with 18th Ave and stone markers along the entire length of the structure.

**Physical Condition
and/or
Archaeological
Potential:**

Excellent **Date Condition Updated:** 09 Nov 04

Current Use:

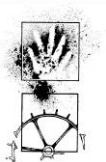
Water Supply Canal

Former Use:

Water Supply Canal

History**Historical Notes:**

The Upper Canal was constructed between 1880 and 1888 as an essential part of the Upper Nepean Scheme which was Sydney's fourth water supply source. Following completion in 1888 the Upper Nepean Scheme was further developed by the construction of major storage dams on the four source rivers Cataract (1907), Cordeaux (1926), Avon (1927) and Nepean (1935) dams. Since the construction of Sydney's fifth water supply source, Warragamba Dam, the Upper Canal is now limited to supplying the



Campbelltown and Camden areas from Cataract and Nepean Dams whilst Cordeaux and Avon Dams supply Wollongong area through the Shoalhaven Scheme.

Historic Themes

Australian Theme (abbrev)	New South Wales Theme	Local Theme
3. Economy - Developing local, regional and national economies	Technology - Activities and processes associated with the knowledge or use of mechanical arts and applied sciences	Water Supply System -
4. Settlement - Building settlements, towns and cities	Utilities - Activities associated with the provision of services, especially on a communal basis	Providing a water supply -

Assessment of Significance

SHR Criteria a)
[Historical Significance] The Upper Canal as an essential part of Sydney's fourth water supply, the Upper Nepean, demonstrates the history of the first major civic engineering project of the late 19th century in the wider Sydney area. It also demonstrates the rapid growth of settlement in the environs of Sydney and the need to supply a growing urban population with a water system.

SHR Criteria c)
[Aesthetic Significance] The site indicates a level of technical achievement being an example of a late 19th century hydraulic design and construction engineering project. The canal maintains the highest possible elevation (with grades as flat as 1 in 3000) in order that most of the supply to the city was controlled by gravity. It is still in use as a water supply system for the south-western suburbs of Sydney.

SHR Criteria e)
[Research Potential] There is the potential to gain more information on the site from further architectural, archaeological and documentary research.

SHR Criteria f)
[Rarity] The site is rare within the Liverpool LGA and the State.

Integrity/Intactness: Intact

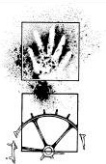
Assessment Criteria Items are assessed against the State Heritage (SHR) Criteria to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommendations

Management Category	Description	Date Updated
Recommended Management	No Action, follow existing management controls	05 Mar 05

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page



(Liverpool) Local Environmental Plan		0252	03 Feb 95	011	678
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Study Details

Title	Year	Number	Author	Inspected by	Guidelines Used
Liverpool Heritage Study	1992	LP008	Neustein & Associates		No
Liverpool Heritage Study Review	2004	1970096	FORM architects aust pty ltd	Helen Davies & Fred Ramos	Yes

References, Internet links & Images

Type	Author	Year	Title	Internet Links
Written	J M Collocott	1985	National Trust Classification Report- Sydney Water Supply Upper Canal	
Written	W V Aird	1961	"The Water Supply Sewerage and Drainage of Sydney"	

Note: Internet links may be to web pages, documents or images.



Source of information for this entry

Name: Local Government

Email: Contact Local Council

Administration