Appendix G

Heritage report

Insite Heritage Pty Ltd
PO Box 98
Wangi Wangi NSW 2267
Ph/Fax 02 49755 818
insite@idl.net.au

Aboriginal Archaeological Assessment
Macquarie Generation Proposed Gas Pipeline
East-West Route

Report to:
Parsons Brinckerhoff

October 2008

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Executive Summary

Insite Heritage Pty Ltd have been commissioned by Parsons Brinckerhoff to conduct an Aboriginal archaeological assessment for the east west route of the proposed Liddell gas pipeline to be constructed by Macquarie Generation.

The proposed pipeline route is approximately 25km in length and aims to capture coal seam gases from adjoining mining operations in order to assist in power generation at Liddell Power Station and reduce emissions generated by traditional coal burning methods.

The aboriginal archaeological assessment identified 15 archaeological sites in the vicinity of the proposed pipeline route. The majority of identified sites were of low significance, comprising of low density open artefact scatters or isolated finds. One large site Liddell EW 14 was identified in the pathway of the proposed route. Discussions with the project manager during the survey indicated that it will be possible to avoid the site.

This report does not cover any deviation in the pipeline route outside of the area surveyed. Any additional changes to the route, not covered by the survey would require an additional assessment

The authors of this report are Angela Besant and Elizabeth Wyatt of Insite Heritage Pty Ltd.

In general, the development of the pipeline with the implementation of the management recommendations will have minimal impacts on the archaeological resource of the area.

1.0 Project Overview

1.1 Location

The project is located within land owned by Macquarie Generation in the vicinity of Camberwell and the Bayswater and Liddell power stations, near Muswellbrook in the Hunter Valley, parishes of Savoy, Liddell and Vane, County of Durham. The location of the proposed east west route is outlined in Figure 1 below and is approximately 25km in length.

1.2 Project Details

The proposed pipeline will collect methane gas from adjoining coal mines along the route which will then be transferred to Liddell Power Station to be used in electricity generation. The project is subject to approval under Part 3(a) of the EPA Act 1979 as amended.

The proposed works involve the excavation of a trench for emplacement of the gas pipeline. The trench will be approximately 1.5m deep and 1m wide. The area adjacent to the pipeline will be used for service vehicles etc during the construction of the pipeline. In areas where the pipeline will be under-bored, a pit approximately 2m deep will need to be excavated on either side of the area to be under-bored for the boring rig.

1.3 Description of Route

The westernmost portion of the proposed east west pipeline route commences in Macquarie Generation land adjacent to the BHP Billiton lease area, approximately 500m east of Saddlers Creek. The route then continues eastwards for approximately 5km following a road and coal conveyor. The pipeline in this section will be located in the road easement on the southern side of the road. Approximately 500m west of the coal conveyor junction at the top of the ridge north of Bayswater Dam, the pipeline will be under bored to the northern side of the road where it proceeds to follow the conveyor to the conveyor junction at the north of Bayswater Dam. The route then continues east, south east along a vehicle track way for approximately 600m after which it veers to the north east following a fence line down the ridge line adjacent to a former compound area. At this point the route may follow the southern edge of a small tributary of Tinkers Creek between the northern edge of the compound/ dam spillway and the creek bank, eastwards to the coal conveyor. Due to space restrictions between the dam embankment and the creek line the route may continue

northwards from the edge of the compound area and follow the northern bank of a small tributary of Tinkers Creek eastward to the coal conveyer.

Another variation in the pipeline route may also occur in this area where the pipeline may take a more northerly route from the top of the ridge north of Bayswater Dam down slope to the tributary. Should this option be chosen it would require an additional assessment as it was not covered by this survey.

The pipeline will then cross under the coal conveyer on the western side of Tinkers Creek. The route will then be trenched across Tinkers Creek and continues south eastwards where it will be under bored under the main access road into Bayswater Power Station. The proposed route then runs south eastwards for approximately 400m following the north eastern side of a sealed access road where it then heads south east wards for approximately 1.5km towards the New England Highway. In this section the route may follow the transmission line easement, crossing Chilcotts Gully and a coal conveyor, to then follow a vehicle track way to the highway. The alternative option for the route in this section is to follow the ridgeline down to Chilcotts Gully, under a coal conveyor, and then run within a power line easement adjacent to the highway, crossing a number of small gullies.

Once crossing the highway the route will then head north following a vehicle access way to the southern side of the coal conveyor running to Liddell Power Station. At this location there will be a junction in the pipeline and a section of the pipeline will proceed north, north east following the coal conveyor to the power station. The route also proceeds south eastwards, for approximately 2.5km, following the access road adjacent to the coal conveyor to Pikes Gully Road where it will be under bored. The pipeline will continue to follow the conveyor for approximately 4km and re crosses the New England Highway south of Lemington Road. The pipeline then continues across Bayswater Creek, and continues along the rehabilitated embankment of the former Costaines mine. The pipeline follows an access way along rehabilitated land adjacent to the New England Highway southwards past Ravensworth and into the Ashton Coal Mine. The route then proceeds down slope to the flood plain adjacent to Bowman's Creek. The pipe will under bore Bowman's Creek. The total length of the east – west pipeline route is 25km.

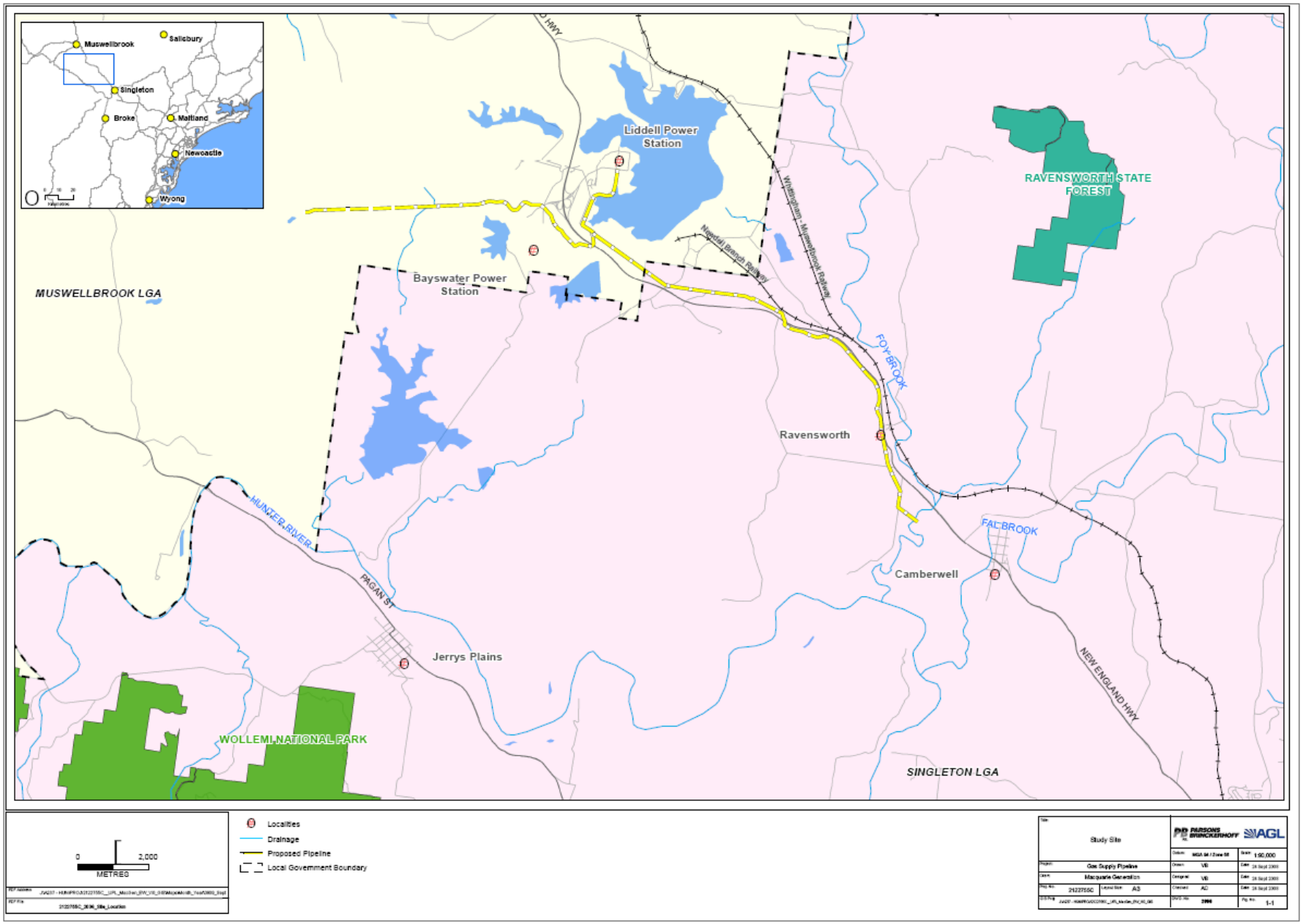


Figure 1 Plan of proposed E-W Liddell pipeline route.

1.4 Community Consultation

Letters of notification of the project and a request for the contact details of Aboriginal stakeholder groups who may have an interest in the project were sent to DECC (Department of Environment & Climate Change), NSW Native Title Services, Office of the Registrar, Muswellbrook Council and Singleton Council.

Letters of invitation to register an interest in the project were sent to:

Wanaruah Local Aboriginal Land Council
Junburra Consultants
Aboriginal Native Title Elders Consultants
Black Creek Aboriginal Corporation
Darrel Mathews Heritage Consultants
Giwiir Consultants
Hunter Valley Aboriginal Corporation
Lower Hunter Wonnarua Council
Lower Wonnaruah Tribal Consultancy Pty Ltd
St Clair Singleton Aboriginal Corporation
Ungooroo Aboriginal Corporation
Wonnaruah Elders Council
Valley Culture
Wanaruah Custodians
Wattaka Wonnaruah Cultural Consultants Services
Wonnarua Culture Heritage
Wonnaruah Tribal Council inc./Wonnaruah Elders Council
Yarrawalk Enterprises

An advertisement of the project inviting registrations of interest from community stakeholder groups with a two week registration period was placed in the Singleton Argus on the 20.07.2007. Due to delays in the commencement of the assessment an additional advertisement inviting registrations of interest, with a two week registration period was placed in the Singleton Argus on the 04.07.2008.

The following groups registered their interest in the project:

Wannaruah Local Aboriginal Land Council
Wattaka Wonnarua Cultural Consultants Services
Hunter Valley Aboriginal Corporation
Giwiir Consultants
Barkuma Neighbourhood Centre Inc.
Aboriginal Native Title Heritage & Cultural Consultants
Mingga Consultants
Wonnarua Culture Heritage
Yarrawalk Enterprises
Upper Hunter Wonnarua Council
Upper Hunter Heritage Consultants
Ungooroo Aboriginal Corporation
Hunter Valley Cultural Survey

Community involvement in the field work was set by Macquarie Generation who requested that the survey be attended by one community group per day. Wanaruah LALC, Wattaka Wonnarua Cultural Consultants and Ungooroo Aboriginal Corporation were invited to participate in a day each of field work. Due to weather and other circumstances on the day, Wanaruah LALC and Wattaka Wonnarua Cultural Consultants were unable to attend the field work. Mr Alan Paget of Ungooroo Aboriginal Corporation assisted in the field work on Wednesday 16th July.

All registered parties will be forwarded a copy of the draft report for their review and comment.

See Appendices A and B for community consultation log and project advertisement.

1.5 Environmental Context

Geology & Soils

The proposed east west pipeline route is predominantly located within the Liddell Soil Landscape. The route also crosses the Brays Hill Soil landscape in its western most section and the Hunter Soil Landscape situated in the land adjacent to Bowman's Creek (Kovac 1991). The underlying geology of the Liddell Soil Landscape comprises of Permian sandstone, shale, mudstone, conglomerate, siltstone and coal seams of the Singleton Coal Measures (Kovac & Lawrie 1991:255). The main soil types are yellow Soloths on slopes with Earthy and Siliceous Sands on mid to lower slopes. Red Soloths, red Solodic Soils and Red Podzolic Soils also occur (Kovac & Lawrie 1991:254).

The geology of the Brays Hill Soil Landscape comprises of Permian calcareous shale and sandstone of the Singleton Coal Measures with some Tertiary Basalt. The main soil types consist of Red Clays on mid to upper slopes, with Black Earths and Grey Clays on mid to lower slopes. The soils of the Hunter Soil Landscape are formed from Quaternary alluvium with the main types consisting of Brown Clays and Black Earths on former channels and tributary flats. Alluvial Soils occur on levees and flats adjacent to the current channel with Red Podzolic Soils and Lateritic Podzolic Soils on former terraces and Non-calcic Brown Soils and yellow Solodic Soils in some drainage lines (Kovac & Lawrie 1991:212).

Landform & Topography

The landform within the Liddell Soil Landscape is characterised by low hills with some undulating hills. Elevations range from 140-220m with slope gradients range from 4-7% with slope lengths from 1200-2000m. Local relief ranges from 60-120m (Kovac & Lawrie 1991:255). Rounded undulating low hills with elevations from 160-330m occur within the Brays Hill Soil Landscape. Slope gradients range from 6-10%, with slope lengths from 800-1200m and local relief from 60-80m (Kovac & Lawrie 1991:113).

The Hunter Soil landscape is located on the level flood plains and river terraces of the Hunter River. Elevations range from 20-60m with slopes from 0-3% and local relief less than 10m (Kovac & Lawrie 1991:213).

Vegetation

Native vegetation within the Liddell Soil Landscape comprises of open-woodland with main tree species of narrow-leaved red ironbark, yellow box, white box, and spotted gum (Kovac & Lawrie 1991:255). Remnant native vegetation within the Brays Hill Soil Landscape consists of Savannah Woodlands with white box, yellow box and kurrajong (Kovac & Lawrie 1991:113).

No native vegetation remains within the Hunter Soil Landscape due to clearing for agriculture (Kovac & Lawrie 1991:213).

Hydrology

The proposed pipeline route commences approximately 500m east of Saddlers Creek. The route crosses Saltwater, Tinkers, Bayswater and Bowman's Creeks and a number other smaller tributaries and drainage channels.

2.0 Archaeological Context

2.1 Regional Indigenous Archaeological Context

Aboriginal occupation within the Central Lowlands of the Lower Hunter Valley occurred over 20,000 years ago. Koettig (1986) recorded a date of 20,200 BP from a hearth at Glennies Creek to the north of Singleton. An Aboriginal site on the Liverpool Plains has been dated to at least 19,000 BP (Gorecki *et al,* 1984). The majority of dated sites within the Hunter Valley are less than 4,000 years old (Brayshaw 1994).

The study area is located within Wonnarua tribal country. European settlement of the Hunter Valley commenced in the early 1800's which in turn had a catastrophic impact on the local Wonnarua peoples and their traditional culture.

2.2 AHIMS Search

A search of the AHIMS (Aboriginal Heritage Information Management System) register was conducted for a minimum of a 1km either side of the proposed route. The search identified 460 sites located in the vicinity of the route, with some sites being located up to 3km away from the proposed route. Figure 2 below displays the location of recorded sites identified by the search in relation to the proposed pipeline route. The route depicted in Figure 2 has altered since the figure was compiled; the section of the route north of Ravensworth on the northern side of the New England Highway is no longer part of the proposal.

Of the nineteen sites which are located in close proximity to the proposed route, the majority of sites types recorded comprise of artefacts scatters ranging in size from two to over 150 artefacts. The dominant raw material types recorded were mudstone and silcrete with some FGS (fine grained siliceous), tuff and igneous with minor quartz, porcellanite and glass. The main artefact types identified at these sites include flakes, broken flakes, flaked pieces and cores with implements, retouched flakes and pebble tools also recorded.

The AHIMS search also lists the Ravensworth Massacre site (37-3-0390). The massacre occurred in 1826 and resulted in the deaths of 18 Aborigines following a raid by the Wonnarua on Lethbridge farm. The site card lists the massacre site as being located at Ravensworth, however further detailed research undertaken by HLA Envirosciences (2005) proposes that the massacre site may be located in the areas

of Merton or the Patrick Plains, situated to the west of Ravensworth and north of Mr. Lethbridge's farm (HLA 2005:59-62).

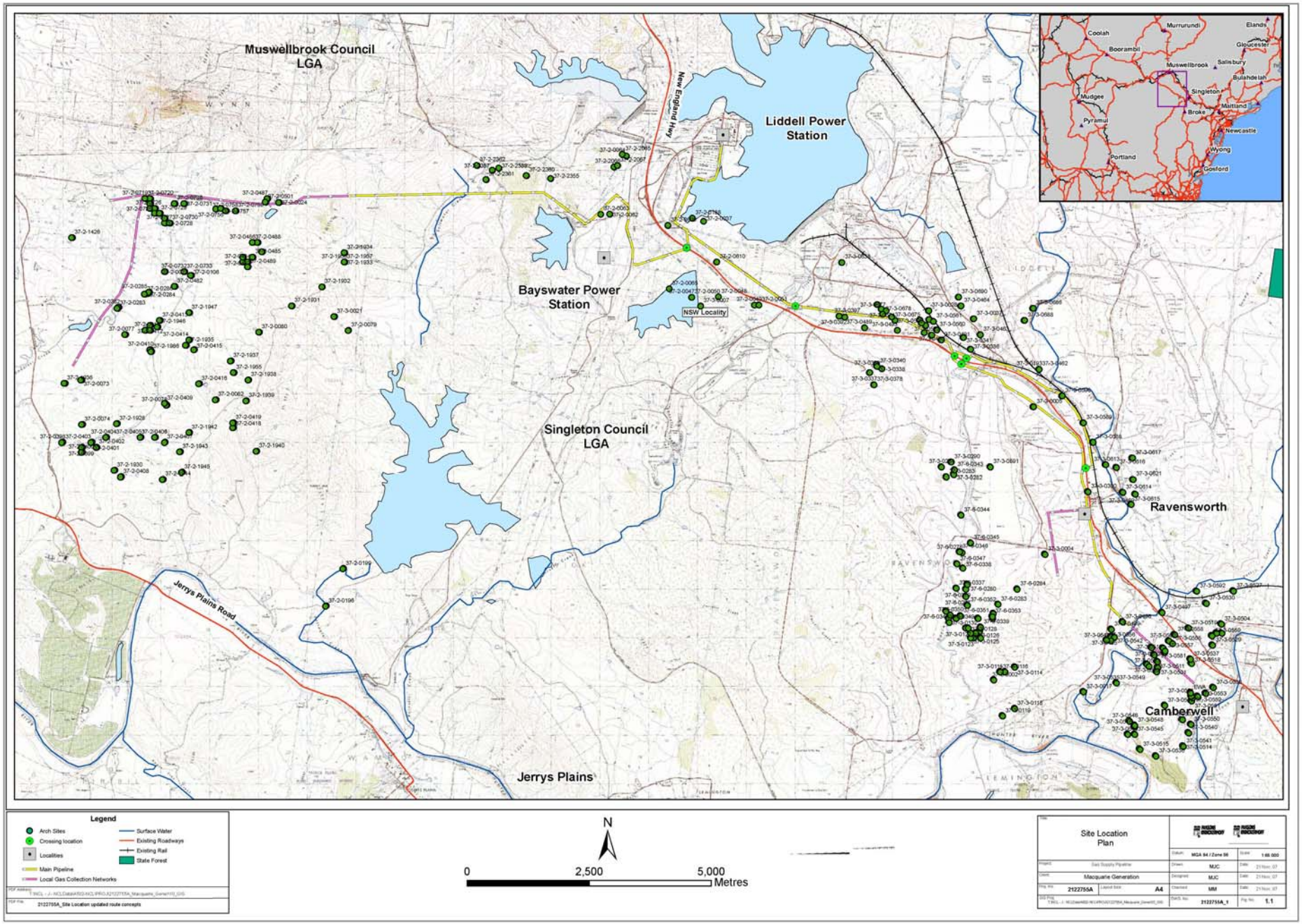


Figure 2 Location of recorded archaeological sites in proximity to the proposed pipeline route.

2.3 Local Indigenous Archaeological Context

A review of previous archaeological assessments was conducted in proximity to the proposed pipeline route in order to place the study area into an archaeological context. A more comprehensive review of previous studies in the area was unable to be undertaken as the report library at AHIMS was closed for upgrading during the compilation of this report.

Austral Archaeology (2005) conducted an archaeological assessment on behalf of Resource Pacific Ltd for a proposed stockpile area. The survey covered approximately 200m x 500m and was located on land north of the New England Highway and the Coal Conveyor and south of the Liddell rail line. The assessment identified three open campsites/artefact scatters and two isolated finds. The dominant raw material was FGS with some silcrete with the main artefact type comprising of flaked pieces and flakes. The sites were all located in a large area of fill with the recommendations that consents to destroy be issued on the sites if required. None of these sites are situated within the proposed pipeline route.

HLA Envirosciences (2005) conducted subsurface investigations for the proposed extension of the Rail Unloader Facility at Newdell Junction, just north of Ravensworth for Macquarie Generation. The previous survey identified three sites (MG#1, 2 &3), all open artefact scatters, located on lower slope and in an open depression. The main artefact types recorded at the sites include flakes, broken flakes, retouched flakes and cores, with raw material types of silcrete, mudstone and fine grained siliceous (FGS). Subsurface testing at sites MG#1 and MG#2 and in designated areas of sensitivity across the site. A total of 197 whole and broken artefacts were recovered from subsurface testing, with the majority (156) were identified as flakes. 24 retouched flakes were also recorded of which 5 were backed artefacts. 5 cores were also identified. 88 of the artefacts were manufactured from Silcrete, and 88 from FGS. Small numbers of chert, volcanic and quarts were also recorded. The majority of artefacts were recovered from areas of testing located on the lower slopes. Only three artefacts were recovered from test pits located on the alluvial flat, but it was considered that artefacts may have been removed from this area due to flooding or buried deeper than 80cm the limit of the excavations.

Umwelt (2002) conducted an archaeological assessment for enlargement of a mine water storage dam for the Nardell Coal Mine. The survey covered an area of approximately 1200 x 300m and was situated on a hill and gently sloping land to the

north of the New England Highway and south of the Macquarie Generation coal conveyor, north of Ravensworth. The survey identified six sites (N1-N5 and the Dam Site) predominantly open artefacts scatters. The closest recorded site to the pipeline route was site N2 (37-3-0492) which was located near the northern boundary of the study area, south of the Macquarie Generation coal conveyor. The site comprises of an open artefact scatter of a silcrete core, a mudstone flaked piece and a mudstone retouched flake. The site covered a 20m² area located on the lower slopes of a hill just above a drainage contour cut into the hill.

The Umwelt (2002) survey also re visited five sites identified by Stuart (1996) located in Nardell Colliery land, north of the Macquarie Generation coal conveyor (Nard 8,9,11,12&13). The dominant raw material types were mudstone and silcrete with some porcellanite and glass with main artefact types recorded as flakes, broken flakes, flaked pieces and cores. The largest site recorded by Stuart and re recorded by Umwelt, Nard 12 (37-3-0523), comprises of 150 artefacts in a 50m x 30m area. Severe sheet erosion and previous disturbances were noted at the site.

Witter (2002) undertook an archaeological assessment for the Ashton Coal Mining Project. The survey was conducted over land previously surveyed by HLA Envirosciences for an EIS (2002), see below. The study area encompassed an area 9km by 10km and is bounded by Bowman's, Glennies and Betty's Creeks and the Hunter River. The southern most section of the East West pipeline route traverses the western portion of the area surveyed by Witter. The assessment revisited previously recorded sites and also identified an additional 18 sites, 31 isolated artefacts and 6 sets of grinding grooves. At three of the recorded sites (Waterhole, Oxbow and Glennies Creek sites) over 200 artefacts were identified. All three sites were located on high ground adjacent to a deep section of a permanent creek. There was also a close similarity in artefact type at the three sites. All three sites were noted as having a low component of micro blade technology, and two sites also had associated grinding grooves.

HLA Envirosciences (2001) carried out an archaeological assessment for White Mining Ltd at Camberwell for the Ashton Coal Project. A portion of the area surveyed by HLA covers the southern most portion of the proposed pipeline route. Vehicle and foot surveys were conducted over the 801ha proposed for impact (HLA 2001:16). The survey identified twenty four archaeological sites. 20 of the recorded sites were identified as artefacts scatters ranging from 2 to approximately 200 artefacts, with the majority containing 4-10 artefacts. Four isolated artefacts were also recorded. The

majority of recorded artefact types were flakes pieces and flakes with some cores and tools, with silcrete and mudstone the dominant raw material with minor quartz and quartzite. The majority of sites were located along drainage channels, and adjacent creek flats and low ridge lines. Two of the recorded sites are located in proximity to the proposed pipeline route.

2.4 Predictive Model of Archaeological Potential

The archaeological record of the Hunter Valley has revealed a distinct site patterning for the region. Previous archaeological investigations have shown that archaeological sites are more prevalent in areas in close proximity to water sources with the number and density of archaeological sites increasing with the permanence of the water resource. Areas surrounding creek confluences have also been shown to be of importance in the region and potentially contain larger and more complex archaeological sites. River terraces have also been noted to have been favoured areas for Aboriginal encampments. The preference for occupation close to water resources may also lead to the re-deposition of artefacts in alluvial sediments and the exposure of subsurface archaeological material as a result of geomorphological processes. Whilst these areas can be favoured for larger camp sites, smaller artifact scatters may occur in all landscapes, resulting from movement between areas and the procuring of resources.

An analysis of previous studies conducted in proximity to the study area has shown that the most likely site types which may occur are: Open Campsites/Artefact Scatters, Isolated Artefacts and areas of PAD (Potential Archaeological Deposit). Axe Grinding Grooves are also likely to be present if suitable rock outcrops occur along watercourses.

3.0 Archaeological Survey

3.1 Survey Objective

The aim of the survey was to identify any Aboriginal sites or areas of potential archaeological deposit which may be impacted by the proposed pipeline. The survey was conducted on 14th, 15th and 16th of July 2008 and was attended by Elizabeth Wyatt of Insite Heritage, Mr Glenn Keevers from Macquarie Generation and Mr Alan Paget, senior field officer from Ungooroo Aboriginal Corporation who attended the survey on the 16.07.08. Wanaruah LALC and Wattaka Wonnarua Cultural Consultants Services were scheduled to attend the survey on the 14th and 15th respectively but were unable to attend on the day. The survey was carried out in conjunction with the flora and fauna survey undertaken by Parsons Brinckerhoff Pty Ltd.

3.2 Survey Details

The survey of the proposed pipeline route (approx. 25km) was conducted using both foot survey and vehicle surveys in areas of high disturbance or no visibility. The survey assumed a 20m impact corridor of for the proposed pipeline although this reduced in size in some places as a result of other constraints such as existing pipelines.

For the purposes of this report the proposed route can be divided up into five survey sections:

Survey Section 1: East of Saddlers Creek to Tinkers Creek.

Survey Section 2: Tinkers Creek – New England Highway

Survey Section 3: New England Highway to Liddell Power Station

Survey Section 4: New England Highway to Bayswater Creek

Survey Section 5: Bayswater Creek to Bowman's Creek

Refer to Section 1.3 above for a detailed description of the proposed route. The details of each of the survey sections are presented below.

Table 1 Survey Details

Survey Section	Location	Landform	Surface Visibility (SV)	Arch. Visibility (AV)[1]	Area (approx.)	Effec. Coverage m²[2]	Sites	Notes
SS 1								
1.1	Cleared former paddock, Westernmost section of pipeline adjoining BHP Billiton E300955, N6415155[3]	Lower slopes	0-10%	0-30%	200m x 50m	150	1 Liddell EW 1	Approx. 500m E of saddlers creek. Paddock heavily grassed. Visibility in paddock generally <10%, some exposure around ants nests and animal tracks. Exposure on northern corner of dam provided higher visibility (SS 20-40%, AV 60%), background gravels, angular, silcrete, FGS mudstone. Pipeline to run between N edge of dam and S of small drainage depression. Site located NW corner of dam.
1.2	South side road reserve to intersection with Saltwater Ck	Undulating low hills	0-10%	0-10%	3.5km x 20m	700		Pipeline to run S side of sealed rd between concrete drainage culvert and fence line. Road reserve area heavily grassed. Approx. 3m wide strip slashed, but still little visibility. Due to low vis., vehicle survey with stops for photos and where small tributaries crossed route. Route crosses a number of small tributaries running south to Saltwater Ck. Banks on either side heavily grassed and generally steep, disturbed by concrete drainage culverts for road etc.
1.3	Saltwater Ck E304214, N6415284	Undulating low hills, creek bed	40%	60%	50m x 100m	1200		E & W banks of creek surveyed in proposed route area, predominantly covered in pasture. Small exposures present on top of E creek bank. Exposure also occurred along E and N edges of dam in creek bed to the south.
1.4	Exposure E of Saltwater Ck E304665 N6415282	Undulating low hills	30-80%	60-80%	50m x 20m	350	1 Liddell EW 2	Located in cleared road easement between fence to S and culvert running parallel to road to the N. Eroded exposure, disturbed. Background gravel angular – sub rounded fragments of sedimentary, silcrete, quartz. Artefacts identified in two main exposures adjoining fence line and adjacent to drainage culvert.
1.5	Eroded exposure and eroded track way to location where pipe will under bores to Nth side of Rd and conveyor. E305217 N6415302 – E305649 - 6415319	Low ridgeline	20-90%	30-60%	500m x 15-20	1856.25	2 Liddell EW 3, Liddell EW 4	Visibility variable. Eroded exposure on edge of road embankment and cleared eroded vehicle track way provided good visibility. Followed track way approx.4m wide E to eroded small drainage lines, continued following fence line and cleared reserve and slashed track way to where the pipe line will under bore the road (near 60km sign). Back ground gravel, grasses and leaf litter hindered visibility in this section. Heavy machinery over area also produced broken gravels.

[1] Archaeological Visibility
[2] Effective Coverage
[3] **Please note all GPS recordings given using GDA94 co-ordinate system.**

Survey Section	Location	Landform	Surface Visibility (SV)	Arch. Visibility (AV)[1]	Area (approx.)	Effec. Coverage m²[2]	Sites	Notes
1.6	Cross over point N side conveyor to conveyor junction, top of ridge. E305661 N6415326 – E306094 N 6415377	Low ridgeline – top of ridge	0-10%	0-10%	300 x 20	60		A foot survey was conducted around the corresponding location of the N side of rd where the pipe will be under bored. The area was heavily grassed, although slashed with no visibility. Due to low vis. and disturbed nature of the area to the coal conveyor the area was not surveyed on foot. Area around coal conveyor junction heavily disturbed, earthworks, fill, rubbish. Large exposure E of junction also inspected.
1.7	Vehicle track way E-SE from conveyor junction. E306150 N6415369 – E306606 N6415180	Top of ridge	60-80%	60%	800m x 20m	6720	1 Liddell EW 5	Best exposure in vehicle track (approx 4m wide) and area immediately adjacent. High proportion of back ground gravel. Following top of ridge line, track way cut into hill in some locations, eroded, disturbed, possible locally derived fill placed in track way. At time of survey route not yet finalised in this section.
1.8	NE along down slope along spur to tributary of Tinkers Ck and adjacent to compound area to E. E306634 N6415163 – E306873 - N6415264	Ridge spur, mid slope, base of slope	20-70%	50-70%	400m x 20m	2160	1 Liddell EW 6	Near a Telstra underground cable marker the survey route diverted away from the track and headed NE down ridge slope and then continued down slope following fence line adjacent to the western edge of a large compound area, down towards tributary which runs east to Tinkers Ck. Away from the fence line area less disturbed. At top of ridge sandstone exposure 10m x 6m SV 80%, AV 80%. AS head down slope more vegetation (open wood land), visibility hindered by leaf litter, some exposure under trees and in eroded patches. Near base of slope survey veered west towards drainage line flowing N into tributary. At time of survey route not yet finalised in this section.
1.9	Tributaries N of compound area W of conveyor on W side of Tinkers Ck E306873 N6415264 – E307178 - 6415335	Base of slope, creek banks	70-0%	60-0%	200 x 120m	2520		In this area immediately N of the compound area and adjoining dam, two small drainage lines converge into a small tributary flowing E into Tinkers Creek. The area around the two smaller drainage lines and both sides of the tributary was surveyed as the pipeline route had not been finalised in this section. Visibility was variable in this section. Adjacent to the dam embankment S of the tributary visibility was good (SV 70%) but decreased N to edge of tributary bank (SV0-20%) due to leaf litter etc. The area adjacent to the embankment was also disturbed from fill and erosion associated with dam construction. Some exposure was also present around a small dam constructed on the W end of tributary. The survey also covered the area proceeding up slope to joining the N end of SS1.9. A patch of casuarinas was noted on the bank above the junction of the two drainage channels. SV was low due to leaf litter, there was some exposures under the casuarinas which were surveyed. Visibility on the N bank of the tributary was largely low (0-20%).
SS 2								

Survey Section	Location	Landform	Surface Visibility (SV)	Arch. Visibility (AV)[1]	Area (approx.)	Effec. Coverage m^2[2]	Sites	Notes
2.1	E of Tinkers Ck to compound area and main access road for Bayswater Power Station	Disturbed Creek Flat	0-20%	0-30%	120m x 20m	36		Pipeline to be trenched across Tinkers Creek. Recorded sites along Tinkers Ck located to the N of where pipeline (approx 500m). Visibility on creek bank low, due to ground cover. No sandstone outcrops noted in creek bed. From creek route proceeds east along former compound area to main access road which will be under bored. Low vis. in former compound area also noted, imported gravel, blue metal, disturbed area.
2.2	SE from main access road following easement to top of hill End point E307692 N 6415041	Mid to top of slope	0-100%	0-100%	500m x 20m	2500		Predominantly grassed road reserve, with no visibility. At top of hill large exposure 40m long with 100%. Pipeline to be contained in reserve between road and fence line running parallel to the NE. NE side of fence also inspected.
2.3	SE to ridge top E307705 N 6415011 – E307853 – N6414776	Mid slope to top of spur	0-15%	30%	200 x 20m	45		Veering from road reserve, south into predominately cleared land with small base at gully, beneath transmission lines. Route then headed SE up slope to top of small ridge.
2.4	Down spur to Chilcotts Gully E307913 N 6414770 – E308063 N6414684	Mid slope – base of slope	20-60%	60%	200 x 20m	960	1 Liddell EW 7	Following spur line to gully, less disturbed. Visibility up to 50% under trees mid slope. Larger exposure at base of slope where two small drainage lines join. Heavily grassed in creek line.
2.5	South of Chilcotts Gully to New England Highway E308063 N6414684 E308838 N6414141	Low undulating hills	30-90%	60-80%	800 x 20m	6160	4 Liddell EW 8-11	From S edge of Chilcotts gully headed SE to cross coal conveyor and continued SE across two smaller gullies then proceeding along a cleared power line easement running parallel to the Highway to an underpass following Jerrys Plains water pipeline. Visibility variable. Open woodland S of Chilcotts Gully and S of coal conveyor.
2.6	Transmission line easement – New England Highway	Undulating hills	60%	0-50%	1.1km x 20m	3300	1 Liddell EW 12	Possible route variation. Follow transmission line easement heading SE from SS 2.3 which intersects vehicle track way and then follows vehicle track under New England Highway. Variation located in cleared dirt track way and disturbed power line easement. Track from highway to easement approx 6m wide, SV 100%, AV 60% erosion, disturbed. Following transmission easement visibility variable from <10%-60%, greatest on gully banks.
SS 3	New England Highway Under pass – Liddell Power Station E308838 N6414141 – E309583 N6416252	Lower slopes	0-100%	0-60%	2km x 20m	6000		From underpass pipeline follow E side of dirt vehicle track to junction with Macquarie Generation Conveyor. Pipeline heads N and NE adjacent to access track south side of conveyor pass former coal storage facility to Power Station. Highly disturbed area, heavily modified.
SS 4								

Survey Section	Location	Landform	Surface Visibility (SV)	Arch. Visibility (AV)[1]	Area (approx.)	Effec. Coverage m^2[2]	Sites	Notes
4.1	Pipeline Junction to Pikes Gully Rd E308820 N6414532 – E311085 N 6412990	Undulating hills	<10%	<10%	2.7km x 20m	135		From junction, pipeline to run S side of access road, E of fence line adjacent to Macquarie Generation coal conveyor SE to intersection with Pikes Gully Rd. Pipe will under bore road. Due to low visibility (heavy grass cover) in the cleared easement adjacent to pipeline vehicle survey conducted with ground inspections every 100-200m or. Reserve/embankment cleared, heavily grassed, small stand of trees near Pikes Gully rd in reserve area, surface disturbed.
4.2	Pikes Gully Rd to Coal Conveyor Intersection E311085 N 6412990 – E314192 N 6412177	Undulating hills – creek flat	10-90%	20-80%	3.5km x 10-5m	700		SE of Pikes Gully Rd, pipeline to continues to follow road reserve/embankment on S side. Due to existing pipelines on S side, route to run in space between existing pipes and road (generally 10-5m). Area between pipelines and road largely disturbed. .A number of exposures along the route in this section were surveyed including adjacent land outside of the route, however given small easement for pipeline and disturbed context, no sites were identified. Approx 500m from S end of section route deviates around substation, this section was also surveyed on foot.
4.3	Conveyor Intersection to New England Highway E314192 N 6412177 – E 314359 N6412006	Creek flat	50-70%	50-70%	120m x 20m	864	1 Liddell EW 13	At S end of this section conveyor intersects road and conveyor heading E W. Pipeline crosses this intersecting conveyor to SE and continues S around substation, along power line easement and across to the Highway. Foot survey conducted in this section and in a vegetated area, outside of the route area to the W before the conveyor intersection. On the S side of conveyor intersection, some disturbance noted from earth works, power line easement and evidence of water moving over surface. Small stand of Casuarinas on E side of power line easement to highway. Area under the power easement provided the best visibility.
SS 5								
5.1	New England High Way – Bayswater Creek E314341 N6411943 – E314524 N 6411794	Road reserve – Creek banks	10-70%	0-90%	250 x 50m	2250		On S side of highway disturbed road reserve, disturbed, gravel fill, leaf litter hindering visibility. Crosses fence to S. From fence route to head to Bayswater Creek at bearing c.110º. Route not yet finalised in this section, so larger area surveyed. Approx. 20m S of fence line on eroded exposure adjacent to creek line large site identified extending approx. 200m SE. Visibility between fence line and eroded bank exposure low due to grass cover. Immediately S of exposure and on the N bank of Bayswater Creek no visibility due to vegetation including dense leaf littler particularly from Casuarina cladodes. Large artificial mound noted at SE section of site.

Survey Section	Location	Landform	Surface Visibility (SV)	Arch. Visibility (AV)[1]	Area (approx.)	Effec. Coverage m^2[2]	Sites	Notes
5.2	Bayswater Creek – Costaines Conveyor Terminal E314524 N 6411794 E314848 - N6411590	Creek bank – Mine Rehabilitation	20-30%	0%	200m x 20m	0		Bayswater Creek to be under bored. No visibility in area required for borer on both sides of creek. From S side of creek route continued up slope of large constructed earthen embankment and down to coal terminal.
5.3	Costaines Conveyor Terminal – Mine Rehabilitated Ashton Coal Mine E314848 - N6411590 E317877 N6407170	Rehabilitated Land	60%	0%	4km x 10-20m	0		Route follows access road in mine rehabilitation area SE-S to Ravensworth and Ashton Coal Mine. As located in constructed/modified/rehabilitated environment, vehicle survey conducted, pipelines also noted running adjacent to route.
5.4	Ashton Coal Mine: – Bowman's Creek (Foy Brook) E317877 N6407170 E318017 N6406425	Ridge top - Flood plain	0-60%	0-80%	800m x 20m	1920	1	To continue SW following cleared, revegetated mound down to Brunkers Lane and then S to Bowmans Creek. Site located in cleared level ridge top area to the E of access road and existing pipelines (approx 50m).Revegetated tree line located to the E of site. From Brunkers Lane to Bowmans Creek 20m transect surveyed to creek edge, though due to heavy pasture 0% visibility to creek edge. Some exposure in eroded terrace banks and along constructed earthen channel, but no artefacts noted. Recorded Isolated Artefact (Brunkers Lane site) could not be relocated due to heavy grass cover.

3.3 Survey Results

The survey identified a total of 15 sites, the majority isolated artefacts or low density artefact scatters. The details of the recorded sites are shown in Table 2 below. The locations of the recorded sites are indicated in Figures 3,4,5 and 6 below.

Table 2 Recorded Sites

Site Name	Site Type	Notes	GPS	Exposure (Approx. m)	Visibility	Artefact Type	Raw Material	Dimensions LxWxT (mm)	Notes
Liddell EW 1	Isolated Artefact	NW corner of dam	E300955 N6415155	10m x 6m	SV 80% AV 80%	Broken Core	Silcrete	37 x 20 x 14	7 neg. scars
Liddell EW 2	Artefact Scatter	Two loci of artefacts, immediately adjacent to fence line and probably continuing in eroded exposure to the south of fence, and in eroded exposure adjacent to culvert approx. 15m north of fence. Glass fragments noted.	E304665,-304653 N 6415282, 6415274 E604685, N6415290	20-30m x 5-4m 15-20m x 2-3m	SV 50-60% AV 80%	Broken Flake/ Blade Blade Broken Flake Flake	Silcrete FGS FGS Silcrete	31 x 17 x 6 22 x 5 x 3 13 x 8 x 3 27 x 12 6	No termination, 5 neg.scars.
Liddell EW 3	Isolated Artefact	Located approx. 3-4m from fence line in eroded vehicle track.	E305315 N6415291	5-4m wide, vehicle track.	SV 90% AV 80%	Broken Flake	Silcrete	50 x 25 x 30	No termination, red/brown silcrete
Liddell EW 4`	Isolated Artefact	Located in eroded exposure on small rise adjacent to road.	E305491 N6415308	15m x 5m	SV 80% AV 60%	Broken Flake	Silcrete	45 x 34 x 20	Broken termination, red-brown silcrete. AV hindered by background gravels.
Liddell EW 5	Artefact Scatter	Located in disturbed vehicle track way, high proportion of back ground gravel.	E306483 N6415297	5-6m wide track	SV 60-80% AV 60%	Core Broken Flake	Quartzite Quartz	60 x 43 x 50 25 x 27 x 3	 Possible small pressure flake
Liddell EW 6	Isolated Artefact	Located in eroded exposure mid slope	E306707 N6415201	15m x 15m	SV 50% AV 70%	Flake	FGS	26 x 17 x 3	
Liddell EW 7	Isolated Artefact	Located mid slope between two small drainage lines on low spur to N of Chilcotts Gully	E307986 N6414767	25m x 25m	SV 60% AV 50%	Broken Flake	Mudstone	34 x 25 x 2	Termination missing
Liddell EW 8	Artefact Scatter	Located in exposure S bank of Chilcotts Gully	E308036 N6414684	8m x 6m	SV 60-70% AV 80%	Broken Flake Broken Flake	Mudstone Mudstone	35 x 20 x 3 35 x 24 x 3	Termination missing Mid section
Liddell EW 9	Isolated Artefact	Open woodland immediately S of conveyor. Due to ground cover possibly more artefacts located in the area.	E308197 N6414538	3m x 2m	SV 30% AV 70%	Flake	FGS	39 x 22 x 16	
Liddell EW 10	Artefact Scatter	Adjacent to small creek line. Highly probable more artefacts present in the area.	E 308310 N6414439	2m x 2m		Broken Flake Flake	Silcrete Silcrete	18 x 11 x 2 10 x 10 x 8	In a 50cm x 50xm square an additional Broken Silcrete Flake and Mudstone Flake also recorded.
Liddell EW 11	Isolated Artefact	Cleared access way underneath power line, 5m	E308792 N6414176	6m wide track	SV 80% AV 50%	Broken Flake	Silcrete	77 x 56 x 40	

Site Name	Site Type	Notes	GPS	Exposure (Approx. m)	Visibility	Artefact Type	Raw Material	Dimensions LxWxT (mm)	Notes
		from fence line easement adjacent to New England Highway							
Liddell EW 12	Isolated Artefact	In exposure under transmission line on eroded gully bank	E 308225 N 6414430	6m x 10m	SV 50% AV 40%	Broken Flake	Mudstone	16 x 8 x 3	
Liddell EW 13	Isolated Artefact	In exposure under trees approx. 50m N of highway.	E314359 N 6412006	15m x 15m	SV 70% AV 80-90%	Flake	Mudstone	25 x 10 x 6	
Liddell EW 14	Artefact Scatter	On eroded exposure adjacent to drainage depression running S to Bayswater Creek.	E314371 N 6411892	200m x 30m	SV 90% AV 70-80%	Flake Core Broken Flake Flake Flake w/ retouch	Mudstone Silcrete Silcrete Silcrete Mudstone	5 x 14 x 1 36 x 40 x 34 19 x 10 x 2 25 x 15 x 6 22 x 4 x 10	Artefacts identified on banks E side of drainage line and eroding on side slopes of drainage line in large erosion scours. W side of drainage line disturbed by coal conveyor. Visibility low immediately adjacent to gully edge due to grass cover, possibility of more artefacts extending NE toward fence line. Due to size of site, a 1m² area was marked out and the artefacts falling within the square were recorded.
Liddell EW 15	Artefact Scatter	On level top of ridge N of Bowman's Creek, in 50m area between existing pipelines and planted tree line. Site continues SE for approx. 50m, should not e affected by pipeline. Due to time constraints artefacts recorded in a 3m x 3m area.	E317877 N6407170	50m x 15m	SV 50-60% AV 80%	Flake Flake Flake Broken Blade (medial) Flake Flake Broken Blade (proximal)	Mudstone Mudstone FGS Mudstone Mudstone Mudstone Mudstone	35 x 26 x 2 20 x 16 x 3 10 x 13 x 4 22 x 21 x 4 21 x 16 x 4 20 x 15 x 2 19 x 24 x 14	Two blade sections may conjoin together.

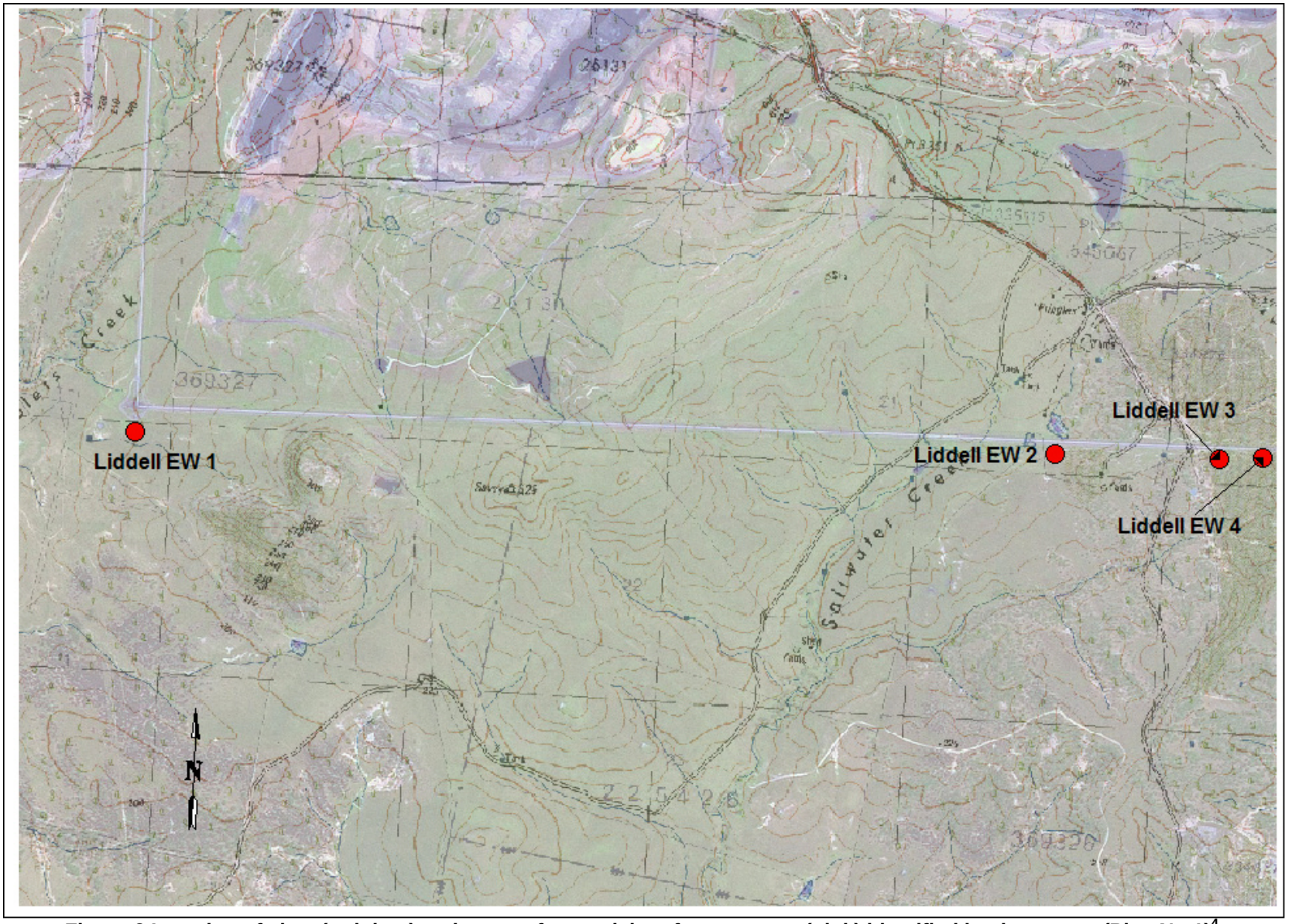


Figure 3 Location of sites (red dots) and areas of potential surface scatters (pink) identified by the survey (Plan No.1)[4].

[4] Liddell EW 1 site should be plotted on NW edge of dam, probable co-ord reading error. All map produced from Aerial photo overlain with 1:25K topographic map. Grid lines are spaced at 1km intervals © Department of Lands 2006.

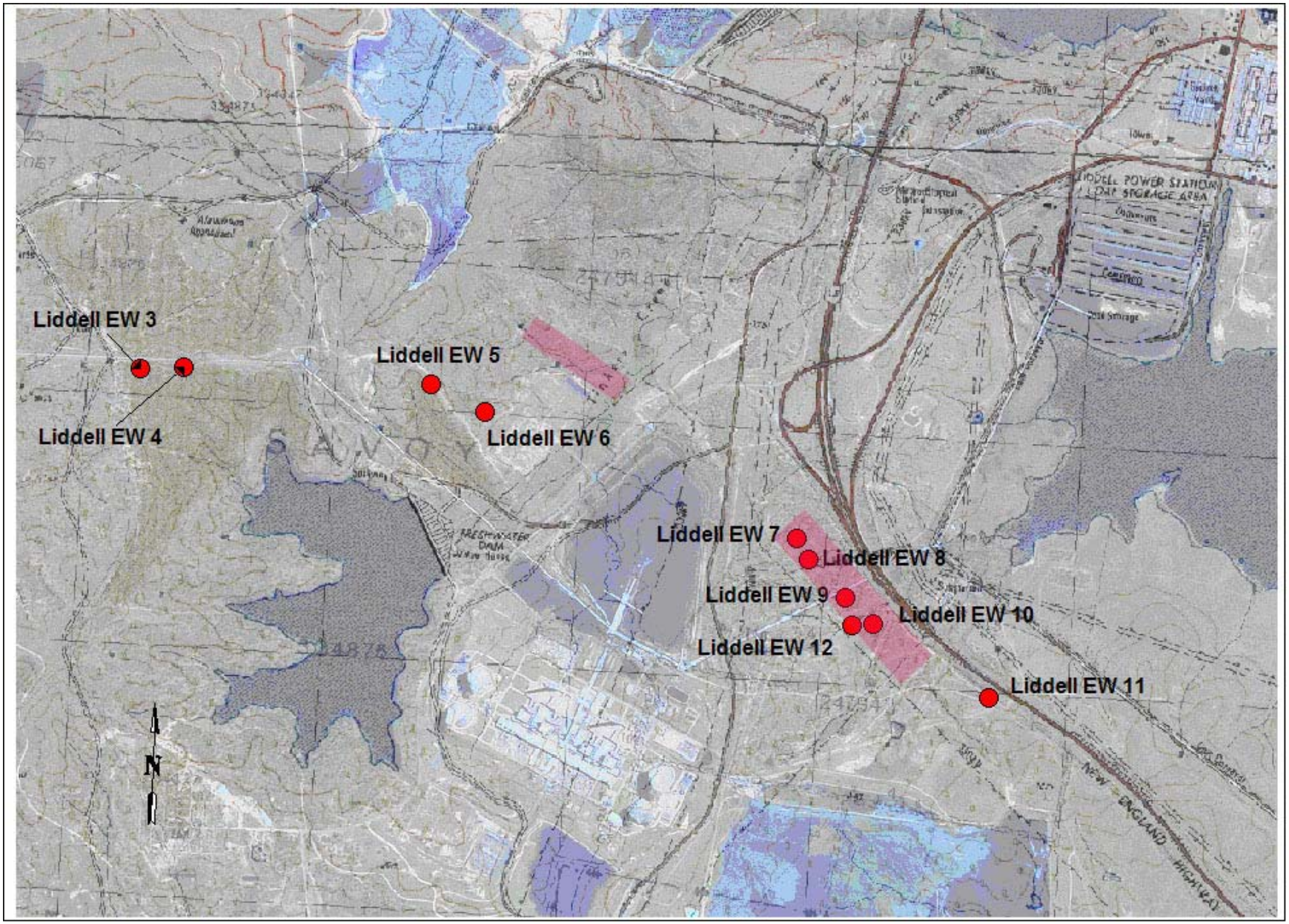


Figure 4 Location of sites identified by the survey (Plan No.2).

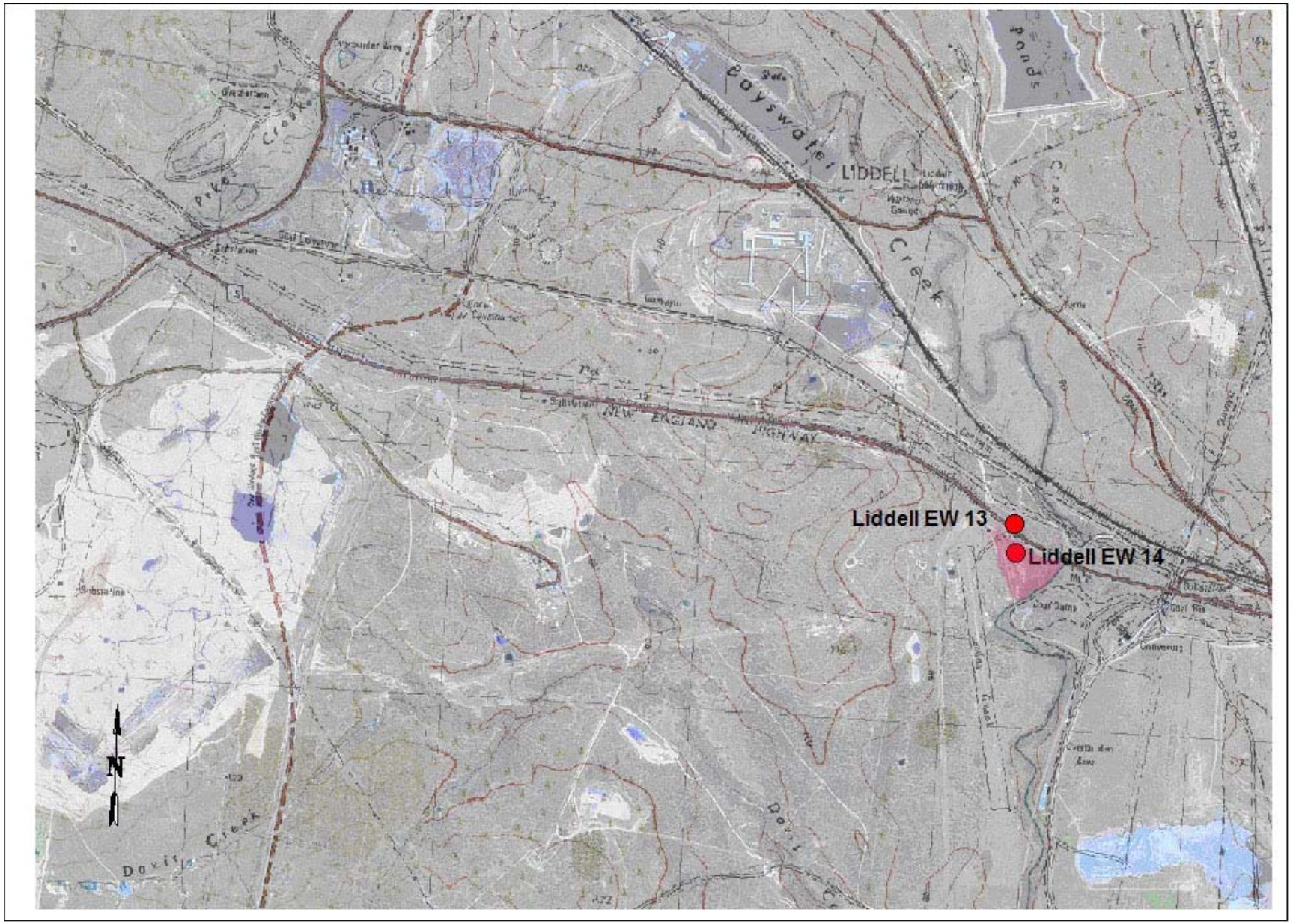


Figure 5 Location of archaeological sites identified by survey (Plan No.3).

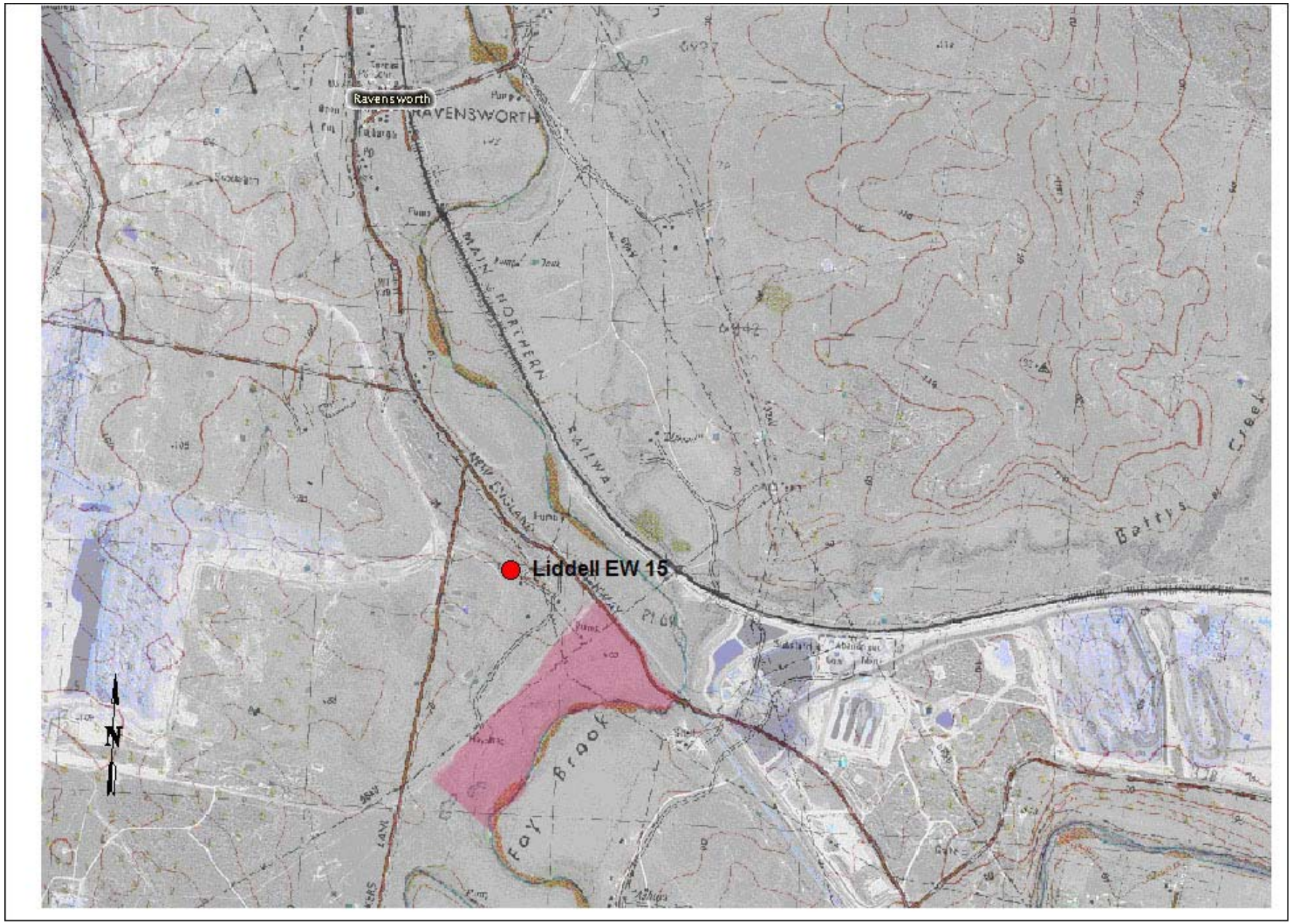


Figure 6 Location of sites identified during survey (Plan No.4).

4.0 Significance of Identified Sites

4.1 Significance Criteria

The basic processes of assessing significance for items of heritage are outlined by *The Australian ICOMOS Charter for the Conservation of Places of Cultural Significance: the Burra Charter* (amended 1999) and its associated *Guidelines*. Sites may be significant according to several criteria, including scientific or archaeological significance, significance to Aboriginal people, aesthetic value, the degree to which a site is representative of archaeological and/or cultural type, and value as an educational resource. In New South Wales the nature of significance relates to historic, aesthetic, social, scientific, cultural or educational criteria and sites are also assessed on the degree to which they exhibit rare or representative characteristics of their type, or whether they exhibit historic or cultural connections.

SCIENTIFIC SIGNIFICANCE

In order to determine scientific significance it is necessary to first place sites within a local and regional context. This process enables the assessment of any individual site in terms of merit against other sites of similar nature within similar contexts.

PUBLIC SIGNIFICANCE

The sites are assessed in terms of their educational value, to enhance community knowledge and appreciation of cultural heritage.

CULTURAL SIGNIFICANCE

Generally, all sites are of significance to the Aboriginal people. It has been recognised however that with the widespread nature of site distribution, sites will eventually be impacted upon by development. It is however necessary to conserve where possible sites which are of high significance to the community.

REPRESENTATIVE SIGNIFICANCE

Site significance is rated low, medium and high. The significance of individual sites is determined by factors such as representativeness, rarity, and the sites potential to add scientific data to what is known about past human occupation of the Australian continent. Conservation outcomes are determined by comparison of a site's qualities with known sites in the region that have been protected.

4.2 Significance Assessment

The following significance assessment is based on the guidelines listed in the preceding section. For the significance assessment regarding the cultural significance of the sites, please refer to community reports in Appendix C.

Table 3 Significance Assessment

Site Name	Site Type	Scientific Significance	Public Significance	Representative Significance
Liddell EW 1	Isolated Artefact	Low	Low	Low
Liddell EW 2	Artefact Scatter	Low	Low	Low
Liddell EW 3	Isolated Artefact	Low	Low	Low
Liddell EW 4`	Isolated Artefact	Low	Low	Low
Liddell EW 5	Artefact Scatter	Low	Low	Low
Liddell EW 6	Isolated Artefact	Low	Low	Low
Liddell EW 7	Isolated Artefact	Low	Low	Low
Liddell EW 8	Artefact Scatter	Low	Low	Low
Liddell EW 9	Isolated Artefact	Low	Low	Low
Liddell EW 10	Artefact Scatter	Low	Low	Low
Liddell EW 11	Isolated Artefact	Low	Low	Low
Liddell EW 12	Isolated Artefact	Low	Low	Low
Liddell EW 13	Isolated Artefact	Low	Low	Low
Liddell EW 14	Artefact Scatter	Moderate-High	Moderate	Moderate-High
Liddell EW 15	Artefact Scatter	Low	Low	Low

5.0 Legislation

THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (1979)

This project is being assessed by the Department of Planning under Part 3(a) of the EP&A Act 1979. This Act over rides other state legislation as the project is considered State significant. The guidelines on the preparation of planning instruments specifically state that Aboriginal heritage should be assessed as an integral part of these studies.

Part IV of the Act determines the way in which consent authorities make decisions regarding development applications. Section 79C (b) states that;

"The impact of development on the natural or built environment should be considered before consent is granted; and"

Part V of the EP&A Act points out that State government agencies which act as determining authorities must also conduct reviews of their own or other agencies activities in terms of impact on the environment. Where these impacts are deemed to be minimal a Review of Environmental Factors is required, although where impacts are greater an EIS would be generated. This part of the Act requires that;

'any impacts on a locality having aesthetic, anthropological, architectural, cultural, historic, scientific, recreational, scenic or social significance or other special value for present or future generations' (DUAP 1995) be accounted for.

THE NATIONAL PARKS AND WILDLIFE ACT 1974

Whilst this Act is not triggered under Part 3A of the EPA Act, it forms the basis on which DECC provide their recommendations to the Department of Planning upon their review of the project. The NPW Act (section 90) provides statutory protection for all material evidence of Aboriginal occupation of NSW. Aboriginal places which are areas of cultural significance to the Aboriginal community, are also protected by the 1974 Act (section 84) that states:

The Minister may declare lands to be 'protected archaeological areas' to preserve Aboriginal places and relics; and

It is an offence to disturb or destroy an Aboriginal place or relic without first obtaining written consent from the Director of National Parks and Wildlife Service NSW.

The National Parks and Wildlife Act 1974 requires the obtaining of a Section 87 Permit if a person wishes to excavate land to disturb or discover an Aboriginal object (relic) or disturb or move an Aboriginal object.

A Section 90 Heritage Impact Permit is required if an activity will or is likely to destroy, damage, desecrate or deface and Aboriginal object or Aboriginal place.

A relic is defined as any deposit, object or material evidence (not being a handicraft made for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains (NPW A s.5(1)).

6.0 Management Recommendations

The following management recommendations are applicable to the route as surveyed at the time. Deviations from the surveyed route would require an additional assessment.

i) The areas marked as having recorded and potential artefact scatters (Figures 3-6) should be monitored by the Aboriginal Community giving the community the opportunity to record and relocate artifacts from the route of the pipeline to adjacent areas.

ii) Isolated finds and small scatters should be avoided by pegging of the site location and appropriate adjustment to the route.

iii) In order to avoid impacting site Liddell EW 2 it is recommended that the route be diverted around the site at this point. The community may wish to participate in monitoring of works at this point and to relocate any artefacts disturbed by the works to the southern portion of the site.

iv) Due to the low visibility and the proximity to Tinkers Creek, the community may wish to monitor earthworks along the two drainage channels which flow E to Tinkers Creek (Survey Section 1.9, Figure 4).

v) Liddell EW 3, 4, 5, 6, 11,12 and 13 are of low scientific and representative significance. If they can not be avoided by the proposed works it is recommended that the community be given the opportunity to collect and replace adjacent to the pipeline.

vi) More artefacts are likely to be located around Liddell EW 7, 8, 9 & 10, but were not able to be located due to visibility constraints. If impact at these sites can not be avoided it is recommended that an archaeologist and the community are commissioned to remove leaf litter in the vicinity of the sites and collect surface artefacts for replacement adjacent to the pipeline. A site card noting the change in location should be lodged with AHIMS.

vii) The preferred route option in the area of Survey Section 2 is to follow the transmission line easement across Chilcotts Gully, across the coal conveyor and along the vehicle track way to the point where the pipe line crosses the New England Highway. If the pipeline proceeds in the cleared eastern edge of the transmission line

easement as proposed during the survey, impact on sites Liddell EW 7,8.9,10 and 11 would be avoided, and mitigation (collection) would only be required for Liddell EW 12. The immediate landscape context indicate an area of potential archaeological sensitivity. The impact on this area can be substantially reduced by placing the pipeline adjacent to the transmission line easement. This portion of the route, as close as feasible to the transmission line, should also be monitored by the Aboriginal community.

viii) Due to its significance it is recommended that the proposed works avoid Liddell EW 14. It is recommended that the route proceed as close as possible along the along the fence line of the New England Highway reserve, to the N-NE of the site. As the route crosses Bayswater Creek at this location, and due to the poor surface visibility and the recording of Lidell EW 14, it is recommended that this section be monitored by an archaeologist and the Aboriginal community.

If this is not feasible then the Lidell EW 14 should be salvaged prior to the pipeline and the pipeline route confined to the eroded tributary margins where the artifacts are visible as lag deposit on the A2 and B soil horizon.

ix) Liddell EW 15 can be easily avoided by the proposed works and therefore no further mitigation is required.

x) The flood plain and terraces adjacent to Bowman's Creek have been previously identified as areas of archaeological sensitivity. It is recommended that under boring of the creek commence 35-40m back from the creek edge to avoid trenching through the creek terraces. Due to the lack of visibility, no sites were identified by the survey in this area, however, it is recommended that the community be allowed to undertake monitoring of earthworks in the area from Brunkers Lane to Bowman's Creek.

xi) Previously recorded sites 37-3-0496 and 37-3-0499 were not re-identified by the survey but are located in the immediate proximity of the proposed pipeline route. It is recommended that the sites be staked prior to the proposed works and that impact on these sites be avoided by diverting the route around them.

xii) The community may wish to undertake monitoring in additional areas not previously mentioned due to the low visibility of a large proportion of the survey route.

In general if these mitigation measures are undertaken the development of the pipeline should have minimal impact on the archaeological resource of the area.

7.0 Plates

Plate 1 Survey Section 1.1

Plate 2 Site Liddell EW 1 in SS 1.1

Plate 3 Typical visibility SS 1.2. Route to follow S side of road E.

Plate 4 FGS flake Liddell EW 2

Plate 5 Liddell EW 3

Plate 6 Liddell EW 4

Plate 7 SS 1.7

Plate 8 Quartzite core, Liddell EW 5

Plate 9 SS 1.8

Plate 10 SS 1.9 Tributaries of Tinkers Creek.

Plate 11 SS 2.4 down low spur to Chilcotts Gully

Plate 12 Location of site Liddell E W 8 S side of Chilcotts Gully

Plate 13 Liddell EW 11 in power line easement.

Plate 14 SS 4.2

Plate 15 Site Liddell EW 13

Plate 16 Location of Liddell EW 14

Plate 17 Sample of artefacts at Liddell EW 14

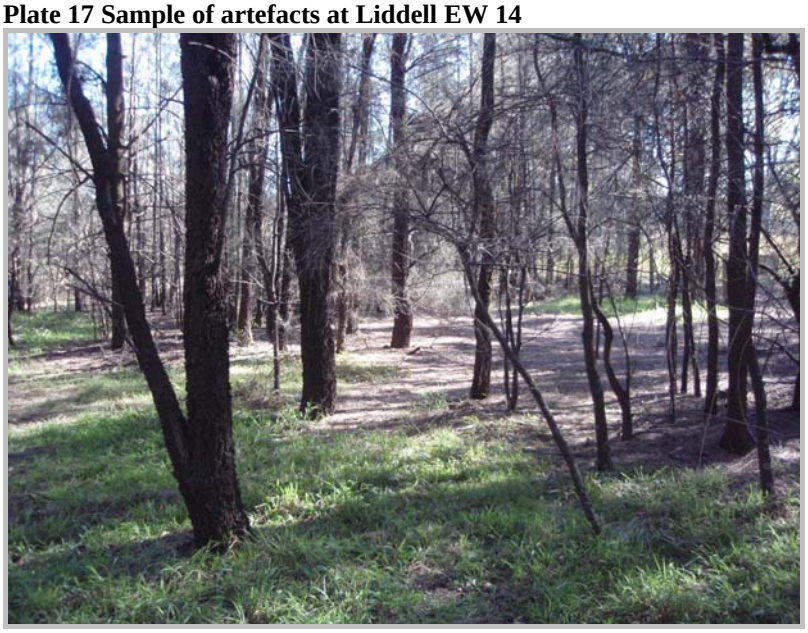


Plate 18 Visibility adjacent to N side of Bayswater Creek

Plate 19 Mine rehabilitation SS 5.3

Plate 20 Liddell EW 15 on ridge to N of Bowman's Creek

Plate 21 Flood plain N side of Bowman's Creek

8.0 References

Austral Archaeology Pty Ltd	2005	*Aboriginal Cultural Heritage Assessment – Coal Stockpile Newpac No.1 Colliery.* Report to Resource Pacific Ltd.
Brayshaw, H	1994	*Proposed Highway Link F3 Freeway to Branxton – Environmental Impact Statement. Working Paper No. 6. Aboriginal Archaeology.* Report to Connell Wagner.
Gorecki, P, Morton, D.R, Stern,N, Wright,R.V.S.	1984	Coexistence of Humans and Megafauna in Australia – Improved Stratified Evidence. *Archaeology in Oceania 19:114-119.*
HLA Envirosciences Pty Ltd	2005	*Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth.* Report to Macquarie Generation.
HLA Envirosciences Pty Ltd	2001	*Archaeological Survey Ashton Mine Camberwell, Hunter Valley, NSW.* Report to White Mining Ltd.
Koettig, M.	1986	*Test excavations at six locations along the proposed pipeline route between Singleton and Glennies Creek Dam, Hunter Valley.* Report to the Dept. of Public Works, NSW
Kovac, M.	1991	*Soil Landscape Series Sheet SI 56-1.* Soil Conservation Service of NSW, Sydney.
Kovac, M. & Lawrie, J.W.	1991	*Soil Landscapes of the Singleton 1:250000 Sheet.* Soil Conservation Service of NSW, Sydney.
Umwelt (Australia) Pty Ltd	2002	*Archaeological Assessment of Proposed Mine Water Storage Dam Enlargement & Adjacent Areas, Nardell Coal Mine, Hunter Valley, NSW.*
Witter, D. C.	2002	*Ashton Coal Mining Project Environmental Impact Assessment: Aboriginal Archaeology.* Report for White Mining Ltd.
		Camberwell 9133-III-S 1:25 000 Topographic Map. Central Mapping Authority of NSW.
		Jerrys Plains 9033-II-S 1:25 000 Topographic Map. First Edition. Central Mapping Authority of NSW.

Appendix A – Community Consultation Log

20.06.2007
Letters of notification of the project and a request for contact details of Aboriginal stakeholder groups who may have an interest in the project were sent to:
Wanaruah LALC
Department of Environment and Climate Change
Office of the Registrar
NSW Native Title Services
Muswellbrook Council
Singleton Council

Letter of invitation to register in the project was sent to Wanaruah LALC

25.06.2007
Wanaruah LALC telephoned to register an interest in the project.

03.07.2007
Response received via email from the Office of the Registrar stating there are no registered Aboriginal owners over the study area.

18.07.2007
Invitations to register an interest in the project were sent to: (close of registration 5pm 02.08.07).
Aboriginal Native Title Elders Consultants 31 Mitchell St Muswellbrook
Barkuma Neighbourhood Centre 76 Lang St Kurri Kurri
Black Creek Aboriginal Corporation PO Box 168 Kurri Kurri
Darrel Mathews Heritage Consultants 33 Adam St Muswellbrook
Giwiir Consultants 8 Fitzgerald Avenue Muswellbrook
Hunter Valley Aboriginal Corporation PO Box 579 Muswellbrook
Lower Hunter Wonnarua Council Inc. 142 Northcote St Kurri Kurri
Lower Wonnaruah Tribal Consultancy P/L 156 The Inlet Rd Bulga
St Clair Singleton Aboriginal Corporation PO Box 710 Singleton
Ungooroo Aboriginal Corporation PO Box 3095 Singleton
Wonnaruah Elders Council PO Box 184 Singleton
Valley Culture 140 Sydney Street Muswellbrook
Wanaruah Custodians PO Box 3066 Singleton
Wattaka Wonnaruah Cultural Consultants Services 4 Kennedy Street Singleton
Wonnarua Culture Heritage 19 O'Donnell Cres Metford
Wonnaruah Tribal Council Inc/Wonnaruah Elders Council PO Box 184 Singleton
Yarrawalk Enterprises PO Box 906 Muswellbrook

20.07.2007
Advertisement placed in the Singleton Argus.

Fax from Wattaka Wonnarua C.C. Services registering in the project.

23.07.2007
Fax from Barkuma Neighbourhood Centre and Giwiir Consultants registering in the project

24.07.2007
Fax from Hunter Valley Aboriginal Corp registering in the project.

25.07.2007
Fax from Aboriginal Native Title Heritage & Cultural Consultants and Mingga Consultants registering in the project.

26.07.2007
Fax from Wonnarua Culture Heritage and Yarrawalk Enterprises registering interest in the project.

30.07.2007
Registration received from Upper Hunter Wonnarua Council via email.

31.07.2007
Telephone from Mellissa Mathews registering an interest in the project (fax received 01.08.07).
Telephone from Ungooroo Aboriginal Corporation registering in the project.

29.10.2007
Fax received from Hunter Valley Cultural Surveying registering in the project.
Letter of invitation also sent to Ms B Foot 35 Acacia Ct Singleton

20.06.2008
Additional advertisement placed in the Singleton Argus. Close of registration period 04.07.08.

10.07.2008
Wanaruah LALC, Ungooroo Aboriginal Corporation and Wattaka Wonnarua C.C Service and invited to participate in a days field work the following week, Barkuma Neighbourhood Centre also invited for possible additional/back up day, via fax and telephone.

14.07.2008
Telephone from Wanaruah LALC will not be sending a field officer out due to the weather.

15.07.2008
Wattaka Wonnarua C.C. Service unable to attend field work.

16.07.2008
Mr Alan Paget Ungooroo Aboriginal Corp participated in field work. Telephoned Barkuma Neighbourhood Centre to advise that field work was complete.

14.07.2008
Fax received from Mr Noel Downs Wanaruah LALC regarding fieldwork and report (See Appendix C).

10.10.2008
Draft copies of the report forwarded to the following groups for their review and comment via email and mail (where email not available). Close of review period 24.10.2008
Wattaka C.C. Services
Hunter Valley Aboriginal Corp.
Upper Hunter Wonnarua Council

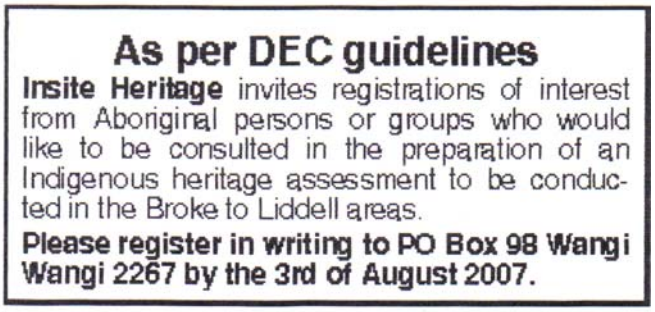
Ungooroo Aboriginal Corporation
Wanaruah LALC
Giwiir Consultants
Gidawaa Walang
Aboriginal Native Title Consultants
Mingga Consultants
Wonnarua Culture Heritage
Upper Hunter Heritage Consultants
Hunter Valley Cultural Surveying.

12.10.2008
Hard copies of the draft report mailed to WLALC (email system had exceeded quota) and Hunter Valley Aboriginal Corp (email address no longer registered with server).

20.10.2008
Returned mail from Upper Hunter Heritage Consultants.

23.10.2008
Response received from Gidawaa Walang via fax.

Appendix B – Project Advertisements



As per DEC guidelines

Insite Heritage invites registrations of interest from Aboriginal persons or groups who would like to be consulted in the preparation of an Indigenous heritage assessment to be conducted in the Broke to Liddell areas.

Please register in writing to PO Box 98 Wangi Wangi 2267 by the 3rd of August 2007.

Adv. Placed in the Singleton Argus 20.07.2007

In Accordance with DECC Interim Community Consultation Guidelines

Insite Heritage have been commissioned to provide an Aboriginal Heritage Assessment of the Broke to Liddell Gas Pipeline project for Macquarie Generation. Any individuals or groups who did not register their interest in response to the August 2007 advertisement are now invited to do so. All those who previously registered are included on the current register of interest.

Please register in writing to: Insite Heritage PO Box 98 Wangi Wangi 2267 or by email to: insite@idl.net.au by the 4th of July 2008.

Adv. Placed in the Singleton Argus 20.06.2008

Appendix C – Community Reports

LOCAL ABORIGINAL LAND COUNCIL
WANARUAH
P.O. BOX 127
19 MAITLAND STREET,
MUSWELLBROOK 2333
ABN 33 251 730 169
PH: (02) 6543 1288
(02) 6543 1962
FAX: (02) 6542 5377
EMAIL: wanarua@bigpond.net.au

Brad Snedden
Parsons Brinkerhoff
P.O. Box 1162
Newcastle 2600

Re: Liddell Pipeline Application S08/00496

Dear Brad,

I thank you for this opportunity to comment on the Aboriginal Heritage Assessment, Liddell Pipeline Application S08/00496.

Aboriginal Cultural Heritage is not limited to the relics and art that have survived the impact of European settlement. It is a living culture and includes landforms, water holes vegetation zones, habitats, and peoples.

Before considering any consents, Wanaruah Local Aboriginal Land Council has a duty to fully explore and compare all the negative impacts that such action will have against the benefits of the development, to the Land, Aboriginal Culture and the Community.

The area in question has great cultural and social significance to Aboriginal peoples of this area as it is within easy walking distance of several VERY significant sites and ceremonial grounds. It is also situated in the proximity of the song line between the Hunter Valley and the Coast. This very important cultural and economic transit way was in use for thousands of years.

In regards to the current cultural assessment we offer the following comments:

1. Wanaruah Local Aboriginal Land Council does not agree to the methodology for the Aboriginal Cultural Survey.
2. Wanaruah Local Aboriginal Land Council does not support the findings of the cultural report.
3. Wanaruah Local Aboriginal Land Council is of the opinion it was not consulted appropriately as required under the NSW Aboriginal Land Rights ACT 1983 No 42, or any other relevant legislation.

Again thank you for this opportunity for input.

Noel Downs
CEO 10/7/2008

cc Keiran Thomas. - Planning NSW
Insite Heritage

14-JUL-2008 09:58 From: To:49755818 P.1/1

Barkuma Neighbourhood Centre Trading as... ABN: 58 290 659 800

Gidawaa Walang

Cultural Heritage Consultancy

..To keep our Culture...

23rd October 2008

Insite Heritage Pty Ltd
PO Box 98
Wangi Wangi, NSW 2267

Dear Liz,

RE: Macquarie Generation Proposed Gas Pipeline East West Route – Archaeological Assessment Draft Report.

In response to the Aboriginal Heritage Impact Assessment document for the above project dated 10th October 2008. Gidawaa Walang supports the recommendations for management of Aboriginal Heritage during future development on page 25, **6.0 Management Recommendations** in the Assessment.

Gidawaa Walang Cultural Heritage Consultancy represents our community members who have culture and heritage affiliations from Awabakal, Wonaruah, Worimi, Biripi, Gamilaroi, Wiradjurri and Eora country who are now residing in the Hunter and New England Region.

As you are aware, maintaining and promoting our Culture and Heritage has always been of major concern and interest to Barkuma and our Community.

Yours Sincerely

Ann Hickey
Gidawaa Project Officer

76 Lang Street
Kurri Kurri
NSW 2327

Phone: 49371094
Fax: 49364449
Mob: 0411196991