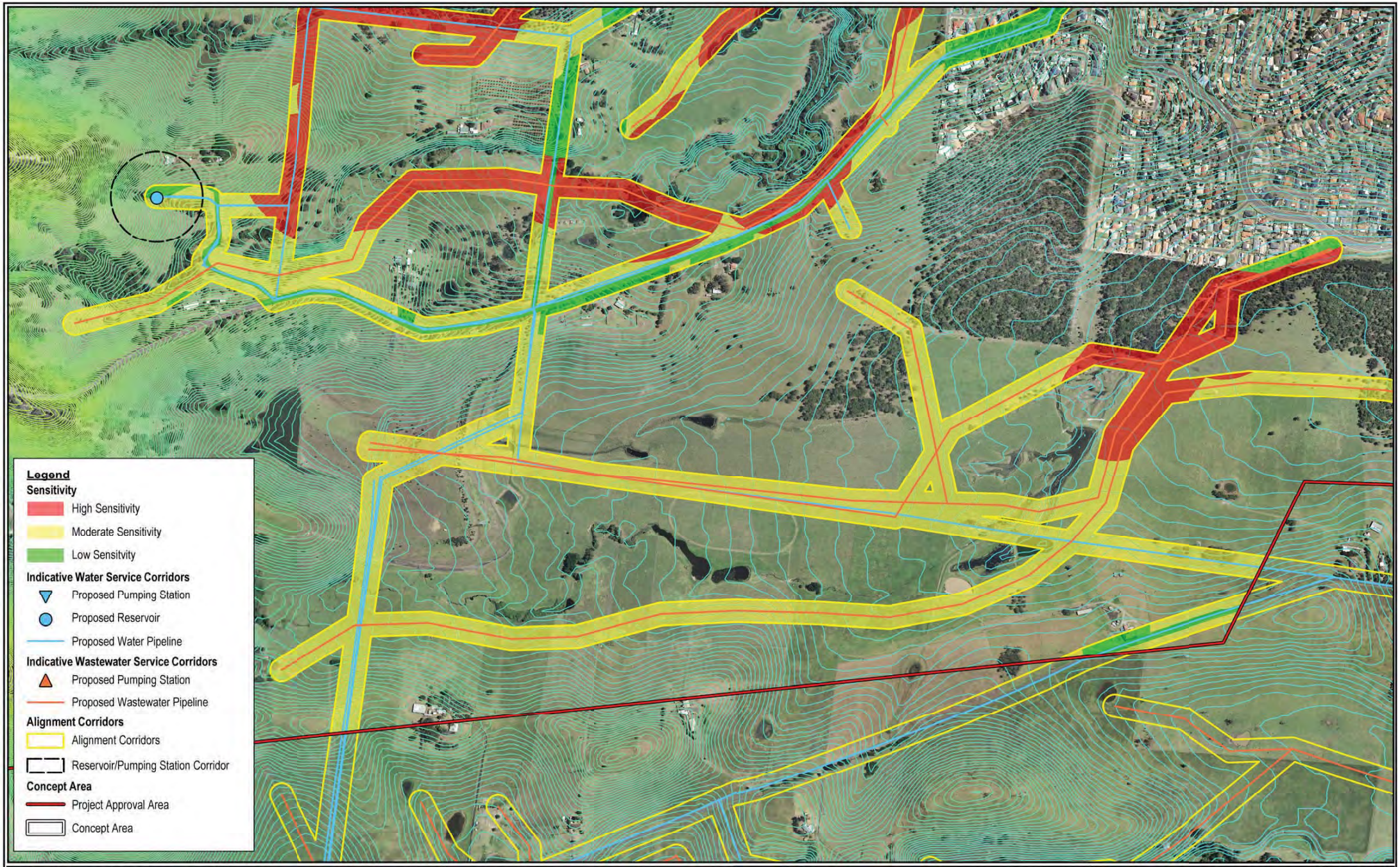

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Figure 27: Areas of archaeological sensitivity within the Project Approval Area.

Date: 23 June 2011	Drawn by: ANP
File number: 11633	Checked by: GLR
Location:-..P:\11600s\11633\Mapping\FINAL_Report Figures April 2011\11633 F27_Detailed Sensitivity.WOR	

Acknowledgements:
Aerial Imagery - Courtesy of Sydney Water

0 75 150 225 300 375
metres

Scale: 1:7,500 at A3
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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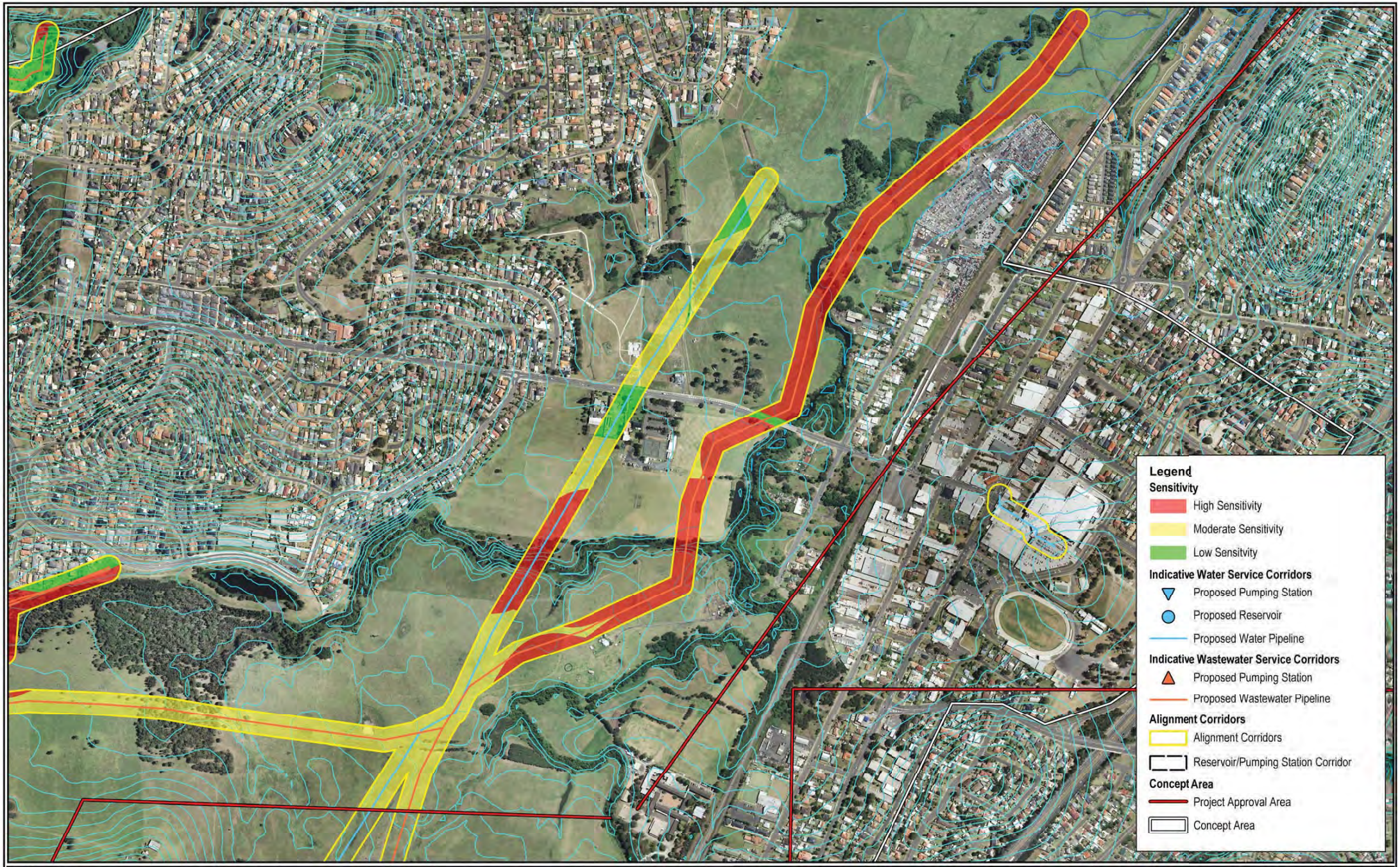

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Figure 28: Areas of archaeological sensitivity within the Project Approval Area.

Date: 23 June 2011	Drawn by: ANP
File number: 11633	Checked by: GLR
Location:-..P:\11600s\11633\Mapping\FINAL_Report Figures April 2011\11633 F28_Detailed Sensitivity.WOR	

Acknowledgements:
Aerial Imagery - Courtesy of Sydney Water
This product incorporates Data which is copyright to the Commonwealth of Australia (c.2003-)

0 75 150 225 300 375
metres

Scale: 1:7,500 at A3
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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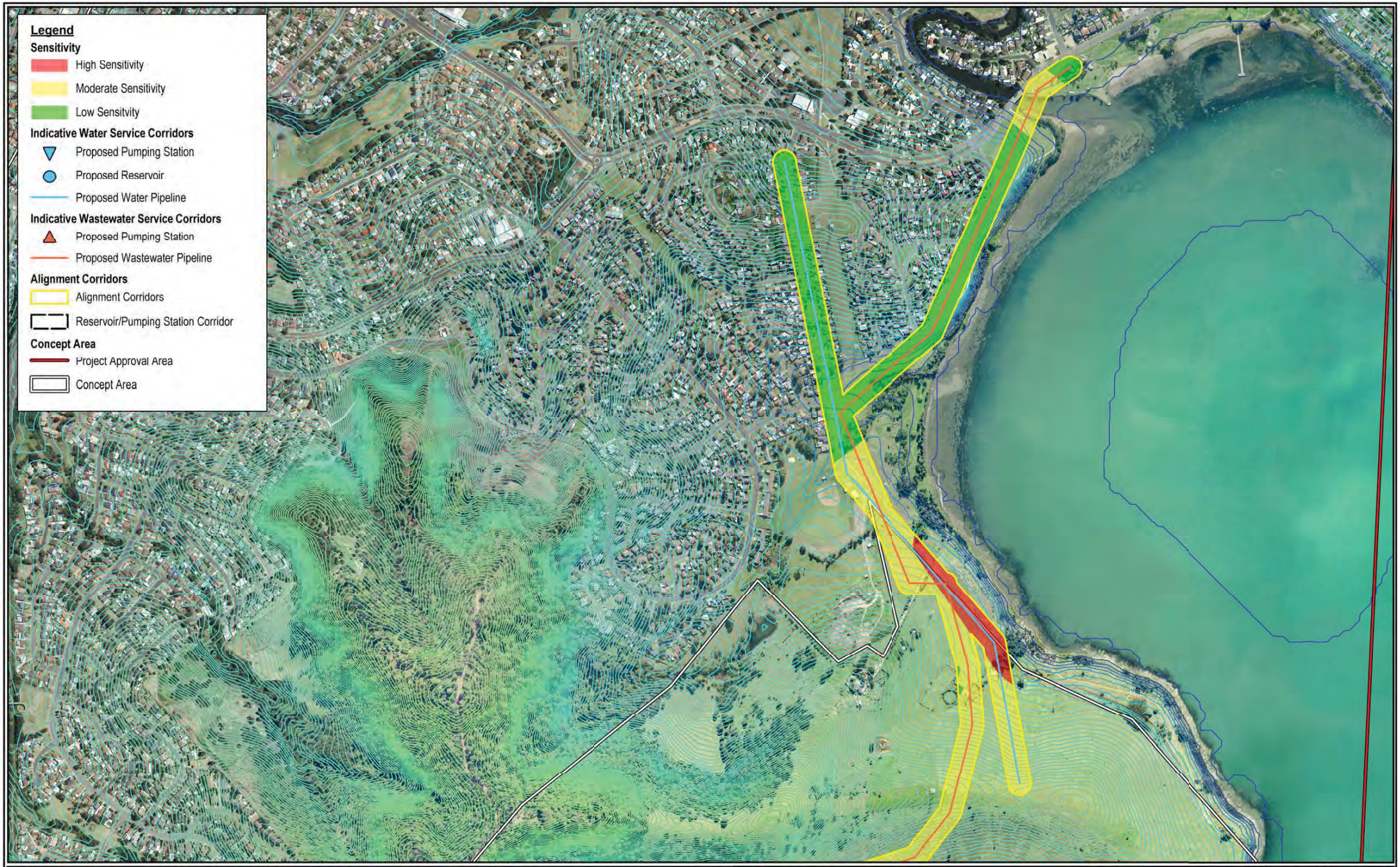

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Figure 29: Areas of archaeological sensitivity within the Project Approval Area.

Date: 23 June 2011	Drawn by: ANP
File number: 11633	Checked by: GLR
Location:-..P:\11600s\11633\Mapping\FINAL_Report Figures April 2011\11633 F29_Detailed Sensitivity.WOR	

Acknowledgements:
Aerial Imagery - Courtesy of Sydney Water

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metres

Scale: 1:7,500 at A3
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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NEW SOUTH WALES 2500

Figure 30: Areas of archaeological sensitivity within the Project Approval Area.

Date: 23 June 2011	Drawn by: ANP
File number: 11633	Checked by: GLR
Location:-..P:\11600s\11633\Mapping\FINAL_Report Figures April 2011\11633 F30_Detailed Sensitivity.WOR	

Acknowledgements:
Aerial Imagery - Courtesy of Sydney Water

0 75 150 225 300 375
metres

Scale: 1:7,500 at A3
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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12.0 PROJECT APPROVAL AREA (WATER ALIGNMENT ONLY)

The additional Project Approval Area (water alignment only), is required as a result of the need for two water reservoirs to service the WDURA. These reservoirs and associated water mains are typically constructed before an area is developed to ensure that mains drinking water will be available for both residential and industrial construction.

Initially, only one reservoir was planned for the early servicing of the rezoned area of WDURA. However, recently an additional reservoir, to be located at Avondale, was included in the early works program. It will ensure mains water would be available for all of the WDURA in a timely manner.

A desktop assessment has been undertaken for the Project Approval Area (water alignment only), using data described in Part 1 – Concept Plan Area. The majority of the area comprises alluvial flats, with soil landscapes being comprised of Albion Park and Shellharbour (erosional), Fairy Meadow (residual) and Wattamolla Road (depositional) (Figure 5).

The predictive model outlined in Section 7 is again applicable to this area. Archaeological sensitivity mapping (Figure 8) indicates that the majority of the area is considered to have moderate archaeological sensitivity, with areas of high sensitivity located along Mullet Creek. No archaeological sites registered with AHIMS area located within the proposed water corridor (Figure 4). Two registered sites are located within the waste water alignments but this is outside of the scope of the current assessment which is confined to analysis of the water alignments for this section of the approval area.

Recommendations specifically relating to this area can be found in Section 17.

13.0 ABORIGINAL ARCHAEOLOGICAL FIELD SURVEY

13.1 Archaeological Survey Constraints / Factors to the survey

With any archaeological survey there are several factors that influence the effectiveness or the likelihood of finding sites. The factors that contribute most to how detectable archaeological sites may be are summarised as *visibility* and *exposure*. A brief discussion of these factors is presented below and they are considered during field surveys.

Ground Surface Visibility

Ground surface visibility (GSV), which is often referred to in archaeological reports as just 'visibility', is the amount of bare ground visible in the context of a survey. The GSV of any given area is usually expressed as a percentage estimate. Generally, vegetation cover is the primary factor that negatively affects GSV. However, modern cultural material can also negatively affect GSV especially in an urban context, (e.g. roadways).

Areas of Exposure

Areas of exposure refer to areas at which previously buried cultural materials may have been exposed as surface expressions by either natural or cultural processes. For instance, sheet erosion is a common cause of exposure as are animal or human activities that have disturbed the ground. Exposure differs from GSV in that it refers to areas in which previously buried cultural material may have been exposed, whereas GSV simply refers to the amount of bare ground visible. For example a previously buried stone artefact might be exposed as a surface expression as the result of sheet wash but obscured from the naked eye by long grass cover.

Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and factors that may allow for the exposure of subsurface archaeological materials. A good example of exposure would be a Creek cutting, where the water movement has eroded away the bank to show the stratigraphy, and associated archaeology, within it (Plate 2).

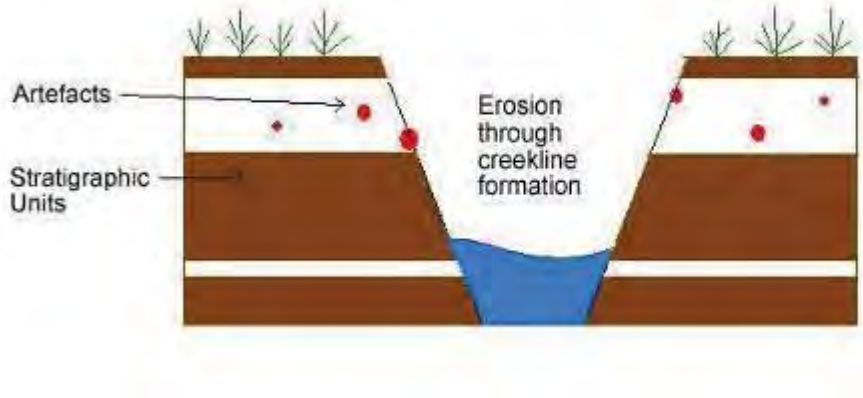

Plate 2: An example showing the concept of exposure, where artefacts can be identified in situ as a result of the erosion caused by the formation of the creek line.

While exposure is also usually expressed as a percentage estimate, it differs to visibility in that it is, in part, a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke and Smith 2004: 79).

Factors that affect archaeological exposure include the natural geomorphic process acting on a landscape (aggrading, stable or eroding) and the level of previous disturbance that will expose or potentially bury archaeological sites.

A number of geomorphic processes were observed within the Project Approval Area, primarily erosional and residual components within the general landscape. Residual landscapes are likely to accumulate archaeological material over long periods but are not particularly likely to reveal buried artefacts. Erosional landscapes within the Project Approval Area may expose artefacts as surface expressions. These processes are most likely to have eroded and exposed Aboriginal archaeological material at the surface.

Exposures occurred most frequently in association with stock pads along creek lines in erosional landscapes. Additional exposure trends were identified within the residual landscapes in areas associated with human activity (unformed tracks, driveways, gardens).

Disturbance

Disturbance in the Project Approval Area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring.

Disturbance associated with recent human action is prevalent in the Project Approval Area and covers large sections of the land surface. The agents include farming practices, such as the initial vegetation clearance for the creation of paddocks, tilling, fencing, stock grazing and tracks, unsealed tracks, construction of golf courses,

housing, farm dams and the construction of roadways. Overall, the Project Approval Area displays moderate levels of disturbance.

13.2 Survey Methodology

The aim of this investigation was to assess Aboriginal archaeological sites situated within the Project Approval Area and determine if the Proposal will impact on known and unknown Aboriginal archaeological sites. The field survey focussed on the following development components:

- areas 100m around the perimeter of proposed reservoirs, pumping stations and other ancillary infrastructure sites
- areas 25m either side of the road edge of the proposed alignment for pipelines (generally water pipes) along specified roads
- service corridors 50m wide, i.e. 25m either side of the proposed alignment, for all other pipelines.

This corridor based assessment approach, as outlined in Section 1.2.1, allows for each infrastructure component to be moved within the assessed corridors if needed. This decreases the likelihood of impact to previously identified Aboriginal archaeological sites, cultural values, and other environmental constraints occurring.

The field survey methods have been designed to locate archaeological sites within the Project Approval Area with reference to the following information:

- the proposed development 'corridors' surrounding each project components, including the pipelines, the pumping stations and reservoirs
- previously recorded sites within the assessed 'corridors'
- areas of archaeological potential, known and unknown, based on the background research predictive model (regional site patterns, overlain on the physical environment of the Project Approval Area).

Within the identified development corridor targeted pedestrian survey methods were employed for the archaeological assessment. Two survey teams (minimum of 6 people at all times) surveyed each corridor area. Based on previous archaeological assessment within the region, particular attention was paid to key sensitive landforms or features (creek banks and remnant vegetation) with a high likelihood for the presence of Aboriginal archaeological sites. All areas with reasonable levels of ground surface visibility and exposure, regardless of archaeological potential, were specifically inspected within the identified 'envelopes'. Where vegetation remained, old growth trees for scarring or other culturally manufactured features or cultural markers relating to burials were closely examined.

Recording during the survey followed the guidelines of the *Code of Practise for Archaeological Investigation of Aboriginal objects* in New South Wales (DECCW 2010) came into effect on 1 October 2010.

Information recorded during the survey included:

- Aboriginal sites
- Landforms elements, as per Speight (1998)
- Ground surface visibility (GSV) and areas of exposure (for definitions see Appendix 2)
- Observable past or present disturbances to the landscape from human or animal activities
- Any resources that may have potentially been exploited by Aboriginal people

Distinguishing landform elements and their association with Aboriginal cultural heritage may help with the identification of site patterning, though with the awareness of the following limitations:

- The degree of GSV and amount of exposed areas can significantly bias the discovery of surface artefacts
- Cultural material exposed on the surface is not necessarily representative of the potential extent of the site (either horizontally or vertically)

Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the Project Approval Area.

Information about GSV and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites for an area.

The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Differential Global Positioning System (DGPS) and the Map Grid of Australia (94) coordinate system. Notable features, landforms and Aboriginal archaeological sites within the Project Approval Area were recorded using a DGPS. A DGPS 'track' was also recorded and stored showing all survey movements within the Project Approval Area, effectively serving as continuous 'survey transects'.

Survey conditions and variables were recorded for the Project Approval Area, whilst the extent of survey was determined after downloading the DGPS data into a GIS. Topographic and aerial maps and a DGPS were used to navigate across the Project Approval Area and to areas of identified archaeological potential. Survey data was recorded on Transect Data Sheets and Site Plans drawn for each gas well envelope, the information from which is summarised in Appendix 2.

13.3 Methodology for assessing archaeological potential within the Project Approval Area

It is possible that stone artefact sites will remain undetected in many parts of the Project Approval Area due to the factors discussed above. The location of these artefact sites are likely to conform to the landscape modelling characteristics described in Section 7 previously. Site preservation and integrity will be subject to the levels of previous disturbances occurring within the Project Approval Area.

To determine the locations of these sites, an assessment of archaeological potential will be developed, based on those definitions applied by other heritage practitioners within the Project Approval Area – principally AMBS 2006. Specifically, the assessment of archaeological potential is based upon previous studies in similar landscapes, known sites within the region, the predictive model outlined in Section 7, knowledge of recent land uses and the results of the field survey. The assessment of archaeological potential and the assessment of scientific significance for recorded Aboriginal sites rely on similar criteria – knowledge of disturbance from land use and site type distribution in the Illawarra Coastal Plain/ West Dapto area.

As previously stated in Section 7.3, defined levels of archaeological *potential* are not a reflection of the presence of Aboriginal archaeological material, rather an indicator of the likelihood of 'intact' archaeological material within the Project Approval Area, usually on a particular landform.

The identified areas of archaeological *potential* will be used as a general guide to identity areas to be conserved and avoided by the proposed works.

An archaeological potential map has been developed and various 'levels' (low, moderate, and high) will be defined and identified on mapping for the proposed water and wastewater corridors with the Project Approval Area following archaeological survey.

13.4 Survey Results

13.4.1 Summary

This section summarises the results of the field survey.

The effectiveness of a survey is determined by a number of factors, including actual area surveyed, visibility and exposure. The effective survey coverage of the Project Approval Area is considered to be low, primarily due to the various disturbances which have occurred within the area and the high percentage of pasture grass cover. Areas of high ground surface visibility were limited to stock tracks/ pads, unsealed tracks, erosion on slopes and creek banks, farm dams and scours (see Appendix 4 for details).

During the site survey the six sites and one area of PAD previously registered as being located within the 20m buffer of the proposed alignments were re-surveyed to confirm their location. Three new Aboriginal archaeological sites (all isolated artefacts) were recorded within the Project Approval Area but outside of the current pipeline corridors. The locations of these sites are shown on Figures 32, 33 and 34.

The majority of sites were located within close proximity to 1st and 2nd order drainage lines. Hills and the surrounding alluvial plain also appear to feature a high proportion of sites. Areas of archaeological potential were identified throughout the Project Approval Area, based on factors that might determine the location and survival of Aboriginal archaeological sites, including landform type, water sources proximity and levels of disturbance from land use activities as outlined in Section 5.8.

Table 13: Aboriginal archaeological sites located within the Project Approval Area corridors.

Site Name	Site Type	Landform Location	Map Reference
Previously Recorded Aboriginal Archaeological Sites			
52-2-1033	Artefact scatter	Alluvial terrace	Figure 39
52-2-3271	Isolated artefact	Spur crest	Figure 36
52-2-3274	Isolated artefact	Alluvial flat	Figure 36
52-2-3279	Artefact scatter	Lower hill slope	Figure 36
52-2-3293	Artefact scatter	Alluvial flat	Figure 39
52-2-3779	Artefact scatter	Alluvial terrace	Figure 40
Previously Recorded Potential Archaeological Deposits (PADs)			
52-2-3778	PAD	Alluvial terrace	Figure 40

13.4.2 Survey Team

The survey was conducted primarily within the weeks starting on 1 November 2010 and 15 November 2010. Additional field work was required on 29 November 2010, 19-20 January, 2011 and 24 January, 2011.

The field surveys were undertaken by the following people/ organisations:

- Georgia Roberts, Melanie Thomson, Jenny Fiddian and Lyn O'Brien (Biosis Research)
- Roy Stewart, Margaret Mongta, Buddy Walker, Richard Campbell (ILALC)
- Ali Maher (National Koorie Site management)
- Paul Charles (Kullila Welfare and Housing Aboriginal Corporation)
- Peter Falk (Peter Falk Consultancy)
- Scott Franks, Danni Franks (Tocomwall)
- Yvonne Simms (La Perouse Botany Bay Aboriginal Corporation)
- Keith Ball, Lesley Ball, Maxine Wakeman (Wulungulu Tribal Elders Corporation)
- Paul Cummins, Kayla Cummins and Mark Cummins (Woronora Gundungara Elders Council)

13.4.3 Existing Conditions

In general, the Project Approval Area comprises the alluvial plain and undulating basal hills of the Illawarra Escarpment. A number of creek lines and minor drainage channels are found within the Project Approval Area, including Duck Creek, Mullet Creek, Reed Creek, Robins Creek, Dapto Creek, Jenkins Creek. The area has been cleared of most Aboriginal vegetation as the result of farming practices initiated in 1817; however there are localised pockets of Illawarra Lowlands Grassy Woodland vegetation that contains some surviving old growth trees. Most of the Project Approval Area is vegetated with seeded pasture grasses.

The nature of the engineering works associated with the proposed pipeline alignments and infrastructure components have resulted in the majority of the water lines being positioned along spur lines and hill slopes, while the wastewater lines are proposed to run through or adjacent to many of the low lying areas, including creek lines. These landforms comprise alluvial and erosional soil landscapes that are subject to:

1) erosion of limited surface soils that exposes and reduces the survival of cultural material, or

2) movement of soils down slope as a result of land use practices destabilising soil profiles.

Disturbances associated with the Project Approval Area include the original land clearance and pastoral use of the alluvial flats (including tilling and grazing), construction of the farm vehicle tracks and dams, natural erosion and scouring processes throughout the Project Approval Area on hill slopes and along drainage features. Exposures in these areas have occurred as a result of these disturbances and account for the exposure and visibility within the Project Approval Area (Plate 3). Elsewhere survey exposure and visibility was low as pasture grasses obscure much of the ground surface (Plate 4). Where natural exposures occurred, more detailed inspection was undertaken. Overall exposure and visibility throughout the Project Approval Area was low-moderate.

Plate 3: Exposure demonstrating good GSV

Plate 4: Dense pasture cover resulting in extremely poor GSV

13.4.4 Effective Survey Coverage

Limitations

The survey was constrained by several factors, including:

- poor ground surface visibility, primarily as the result of several weeks of good rain and warm weather proceeding the survey, leading to extensive pasture growth;
- landform modification reducing archaeological potential, such as that which has occurred as the result of farming practices; and
- severe landform modification obscuring archaeological potential e.g. dams, rubbish tip, and industrial development.

As a result of these factors, targeted surveys were used in areas where ground modification was severe or where there was no GSV. Although these areas may retain Aboriginal archaeological objects or features, the likelihood that they would be detected by means of ground survey is greatly reduced and not an effective use of survey time.

The effectiveness of a survey is based on the:

- Visibility – a percentage of the total visible ground surface with the surveyed area, and
- Exposure – a percentage estimate of the surveyed area that has been exposed through natural or human agencies to potentially reveal (buried) archaeological material

The Effective Survey Coverage (ESC) calculation is defined by NPWS (*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* 2010:19). The details of the percentage of exposure, visibility and exposure type along the proposed pipeline can be found in Appendix 4. Table 14 below summarises this information and shows survey coverage across all landforms with the proposed water and wastewater pipeline corridors within the Project Approval Areas.

Table 14: Effective survey coverage of all landform units within proposed water and wastewater pipeline corridors within the Project Approval Area.

Survey Unit Name	Survey Unit Area (m^2)	Visibility % (average)	Exposure % (average)	Effective Coverage Area (m^2)	Effective Survey Coverage %
Hillslopes	244687.50	5%	7%	856.41	35.0%
Alluvial flats	1541250.00	1%	1%	154.13	1.0%
Drainage line	241875.00	2%	1%	48.38	2.0%
Spur Crest	151875.00	5%	10%	759.38	50.0%
Disturbed terrain	160312.00	0%	0%	0.00	0.0%

Areas of good ground surface visibility occurred primarily along stock tracks, unsealed tracks, erosion on slopes and creek banks, farm dams, and patchy grass cover. Based on this information, the overall effective survey coverage of the Project Approval Area is considered to be low. This can be attributed to pasture grasses and road reserve vegetation. It should be noted however that this growth is a direct result of high seasonal rainfall. At other times of the year, larger areas of ground surface would be visible.

A total of 56ha was surveyed, of which only 0.112ha (2%) was effectively surveyed due to the severely limited level of exposure and GSV. This indicates that the ESC within the assessed Project Approval Area is extremely low overall (see Appendix 2). Despite this, the survey is considered to be adequate for determining the archaeological potential and values within the Project Approval Area. Overall, where ground surface visibility was high, cultural material was present.

13.4.5 Landform Analysis

The field surveys for this proposal involved 100% survey coverage of the proposed alignments for the freshwater and wastewater pipelines and of the pumping stations and reservoir sites located within the Project Approval Area. As a result, the survey took place across a range of landforms (Table 15). A brief landform analysis is presented in the section below.

Table 15: Summary of landform area sampled during the field surveys of the proposed water and wastewater corridors within Project Approval Area

Landform	Landform Area (m^2)	Area effectively surveyed (m^2)	% of landform effectively surveyed	Number of Registered Sites within the surveyed alignments
Hill slopes	244687.50	856.41	35.0%	1
Alluvial Flats	1541250.00	154.13	1.0%	4
Drainage line	241875.00	48.38	2.0%	2
Spur Crest	151875.00	759.38	50.0%	1
Disturbed Terrain	160312.00	0.00	0.0%	0

Hill slopes

A moderate amount of the proposed alignment (10.46%) is located on hill slopes (Plate 5). Evidence for an increasing intensity of Aboriginal occupation/usage is generally more likely to be located on relatively level ground.

In addition, slopes are particularly vulnerable to sheet wash, particularly when clearing has occurred. Cultural heritage material located in an unstable environment or landform is likely to be redeposited down slopes.

The sensitivity of these parts of the Project Approval Area is low.

Landform – Hill Slopes	
Approximate area (m²)	244,687.50m²
Notable disturbances	Vegetation clearance resulting from agriculture.
Disturbance level	Medium – vegetation clearance, erosion.
Average Visibility	5%
Average area of exposure	7%
Effective survey coverage	856.41m²
Aboriginal sites	1
Archaeological Sensitivity	Low
Image	

Plate 5: View north of a typical hill slope landscape within the West Dapto area.

Alluvial Flats

The majority (65.87%) of alignments are located on alluvial flats (Plate 6). These areas are generally considered to be consistent with moderate levels of Aboriginal land use due to their association with permanent waterways. However, this landform is also strongly associated with pastoral activities such as dairying with extensive land clearance. The sensitivity of these parts of the Project Approval Area is moderate.

Landform – Alluvial Flats	
Approximate area (m²)	1,541,250.00m²
Notable disturbances	Vegetation clearance resulting from agriculture; infrastructure; housing.
Disturbance level	Medium – vegetation clearance, erosion, construction.
Average Visibility	1%
Average area of exposure	1%
Effective survey coverage	154.13m²
Aboriginal sites	4
Archaeological Sensitivity	Moderate – increasing with proximity to permanent water sources.
Image	

Plate 6: View west across a typical alluvial flat landform located at the base of the Illawarra Escarpment.

Drainage Lines

Many of the proposed alignments are associated with drainage features (Plate 7). 10.34% are found to be in direct association, either running parallel to, or crossing over, low order creek lines.

The archaeological sensitivity of those parts of the proposed alignments directly associated with drainage lines have been assessed as moderate. In addition, parts of the Project Approval Area that extend across watercourses are likely to have been disturbed by channel flow and sediment deposition.

Landform – Drainage Line	
Approximate area (m²)	241,875.00m²
Notable disturbances	Vegetation clearance resulting from agriculture.
Disturbance level	Low-Medium – vegetation clearance, erosion.
Average Visibility	2%
Average area of exposure	1%
Effective survey coverage	48.38m²
Aboriginal sites	2
Archaeological Sensitivity	Medium-high
Image	

Plate 7: View west of a typical drainage line within the Project Approval Area. The riparian vegetation is generally cleared up to the edges, with small remnant pockets remaining in some cases. Foreign species have, in some cases, been planted along the margins, such as *Salix sp*.

Spur crests

Only 6.49% of the pipeline alignment was located on a spur crest (Plate 8). Aboriginal activities on spur crests are likely to have been transient in nature. Stone artefact scatters on this landform are generally low density background scatters and likely represent tool maintenance or limited artefact manufacture.

The sensitivity of these parts of the Project Approval Area is low.

Landform – Spur Crest	
Approximate area (m²)	151,875.00m²
Notable disturbances	Vegetation clearance resulting from agriculture.
Disturbance level	Medium – vegetation clearance, erosion.
Average Visibility	5%
Average area of exposure	10%
Effective survey coverage	759.38m²
Aboriginal sites	1
Archaeological Sensitivity	Low-medium
Image	

Plate 8: View south of the side of a typical spur crest landform located within the Project Approval Area.

Disturbed terrains

There are parts of the Project Approval Area that have been disturbed by modern cultural activities to the extent that the integrity of potential Aboriginal cultural material is likely to be low (6.85%) (Plate 9).

These activities include the construction the Northern Line and associated infrastructure - including access roads, bridges and tunnels - mining rehabilitation areas, communication towers, graded vehicle tracks, an artificial channel, dams and tree replanting areas.

The sensitivity of these parts of the Project Approval Area are considered low.

Landform – Disturbed Terrain	
Approximate area (m²)	160,312.00m²
Notable disturbances	Installation of infrastructure features, such as roadways, pathways and housing developments.
Disturbance level	High
Average Visibility	0%
Average area of exposure	0%
Effective survey coverage	0.00m²
Aboriginal sites	0
Archaeological Sensitivity	Low
Image	

Plate 9: View north of an example of a disturbed landform, with roadways, housing, pathways and artificial vegetation communities.

Stratification

Stratified sites are likely to retain their spatial and temporal integrity within the soil profile. Due to the high level of farming activity (ploughing, land clearance, cattle and horse activity) which has occurred within the Study Area since initial settlement (1815), it is unlikely that large areas of stratified deposit will remain.

Areas located along creek lines, where riparian vegetation is still *in situ*, is the most likely areas in which stratified deposits might be retained.

Conclusion

The overall archaeological sensitivity of the proposed alignments have been zoned based on a cross consideration of the points discussed above (Figure 35 to Figure 43).

13.4.6 Aboriginal archaeological sites recorded during the survey of the Project Approval Area

Details of previously known sites within the Project Approval Area (Figure 36 to Figure 43) are provided in Appendix 3. Site identified as a result of the field surveys are summarised below, with full site cards located in Appendix 6.

A total of three (3) new Aboriginal archaeological sites were identified within the Project Approval Area, located outside of the proposed pipeline alignments. One site has been registered as an open artefact scatter and the other two consist of isolated artefacts. The following gives a brief description of each site, the extent of material and details of the cultural material and the levels of disturbance.

NRE Wongawilli AFT-1 **Open Artefact Scatter** **(52-2-3813)**

This page of the assessment contains culturally sensitive information. Sydney Water has removed the contents to protect and manage culturally sensitive information out of respect to the Aboriginal community.

Table 16: Summary description of stone artefacts located at NRE Wongawilli AFT-1

MATERIAL	ARTEFACT TYPE	LENGTH (mm)	WIDTH (mm)	BREDTH (mm)
FGS	Flake	14.1	15.3	3.4
FGS	Distal flake	17.1	15.8	4.1
FGS	Flake	34.6	20.2	7.8
FGS	Flake	32.4	15.4	7.9
FGS	Angular fragment	15.1	9.9	10.8
FGS	Proximal flake	17.3	20.7	6.0
FGS	Angular fragment	22.9	14.3	8.6
FGS	Distal flake	11.6	6.9	5.4
FGS	Angular fragment	28.4	15.1	5.4
FGS	Broken flake	13.7	14.0	6.9
FGS	Angular fragment	17.0	18.5	10.5
FGS	Angular fragment	14.2	8.4	6.9
FGS	Angular fragment	19.7	13.0	14.7
FGS	Angular fragment	13.0	16.0	12.3
FGS	Angular fragment	30.0	20.0	13.0

Smiths Lane AFT-2 **Isolated Stone Artefact** **(52-2-3814)**

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Table 17: Description of stone artefacts located at Smiths Lane AFT-2 Aboriginal archaeological site

MATERIAL	ARTEFACT TYPE	LENGTH (mm)	WIDTH (mm)	BREDTH (mm)
Quartz	Distal flake	17.0	11.0	2.0

Riverpark Way AFT-3 **Isolated Artefact** **(52-2-3815)**

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Table 18: Description of stone artefacts located at each newly recorded Aboriginal archaeological site

MATERIAL	ARTEFACT TYPE	LENGTH (mm)	WIDTH (mm)	BREDTH (mm)
Chalcedony	Flake	35	19.1	15.8

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13.4.7 Archaeological potential within the Project Approval Area

During the field surveys, an assessment for Aboriginal archaeology potential was undertaken for all pipeline and infrastructure corridors. The assessment was based on those parameters outlined in Section 7.3.

Areas of high, moderate and low archaeological potential were identified throughout the Project Approval Area water and wastewater pipeline corridors (Figure 35 and Figure 36). These areas are indicated on archaeological potential mapping and outlined specifically in Table 19 below.

Table 19: Areas of Aboriginal archaeological potential within the Project Approval Area 'corridors'.

DEFINED AREA OF ABORIGINAL ARCHAEOLOGICAL SENSITIVITY	*DESCRIPTION OF COMPONENT AREA*
Low likelihood for intact Aboriginal archaeological remains - Areas that have been identified as having specific locations where there has been a high degree of disturbance since the arrival of non-Aboriginal people, where the impact has been to the extent where no intact deposits are believed to be present. Areas may also include moderate and steep slopes or plains away from water sources. Artefacts found in this area are likely to be isolated, representative of 'background scatter', or in a highly disturbed context.	Examples include the Whytes Gully Tip, Horsley Estate and the numerous roadways and house sites within the Project Approval Area.
Moderate likelihood for intact Aboriginal archaeological remains – Areas where minor post contact disturbance has occurred; the area is located along creeks and waterways where short term campsites may have been present. Artefact scatters are likely to vary in density, but are concentrated in small areas.	Examples include the flood plain surrounding Horsley, where ground-truthing excavations have shown small concentrations of artefacts. The lower slopes of the Illawarra Escarpment are also included in this category.
High likelihood for intact Aboriginal archaeological remains – Areas associated with major creek lines, raised flat landforms such as ridges and hills, or where there has been minimal disturbance to the specific area and it is believed that an intact remnant landscape exists. Artefacts remains within these areas are likely to be dense and large in size. The identified areas are considered to be of high potential for intact sub-surface archaeological material.	Examples include the major creeks within the Project Approval Area, including Mullet Creek and Duck Creek.

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13.5 Discussion of Results

Overall, the results of the archaeological survey within the Project Approval Area reflect the predictive modelling for the West Dapto Area; that the most likely site types to occur are isolated artefacts and open artefact scatters. Both new isolated artefact sites (Smiths Lane AFT-2 and Riverpark Way AFT-3) were located within landforms identified by the predictive model as having either a high or a moderate potential for archaeological remains. The new artefact scatter (Wongawilli NRE AFT-1) was located within a highly disturbed context where it is considered that the site has been created by the importation of quarried materials. The location of this site should not affect the predictive model.

No dominant raw material was identified within the study, as both isolated artefacts (Smiths Lane AFT-2 and Riverpark Way AFT-3) were made from differing rock types (chalcedony and fine grained siliceous material). The artefacts located within the imported site of Wongawilli NRE AFT-1 were all derived from fine grained siliceous materials, perhaps suggesting a common origin.

All of the sites are considered to be situated within a disturbed context, with the most disturbed being that of Wongawilli NRE AFT-1. Smiths Lane AFT-2 and Riverpark Way AFT-3 were located within areas which had been disturbed through the impact of human habitation.

The landscape disturbances throughout the Project Approval Area have reduced the likelihood of locating intact archaeological cultural deposits, with no areas of PAD being identified in association with recorded sites. It was deemed that there was adequate ground surface visibility to determine the possibility of further sub-surface cultural material at these sites.

The effective survey coverage (ESC) of the Project Approval Area is considered to be low, primarily due to pasture grass cover. Areas of high ground surface visibility were limited to areas of disturbance. Despite this, the survey is considered to be adequate for determining the archaeological potential and values within the Project Approval Area. Overall, where ground surface visibility was high, cultural material was present.

Areas of low, moderate and high Aboriginal archaeological potential were identified across the Project Approval Area. These were defined based on levels of disturbance, sensitive landforms, survey results and the likelihood for intact archaeological deposits. Overall, a small number of high and moderate areas of potential were identified, mainly on ridge crests, creek spurs and on flat ground near the confluence of creeks (Figure 35 to Figure 43).

The results of the current survey conform to the predictive model developed for the region, with results being very similar to previous studies.

14.0 SIGNIFICANCE ASSESSMENT

Assessing the heritage significance of an archaeological site is undertaken to make decisions about the best way to protect and manage the particular heritage place. The nature and level of cultural significance will also determine if statutory protection is appropriate under State or Federal heritage legislation. The statutory frameworks that govern heritage protection have been discussed previously in Section 4.

The NSW National Parks and Wildlife Service (NPWS) have produced *Guidelines for Archaeological Survey Reporting* [(Working Draft), Cultural Heritage Services Division, (1997)], and '*Guidelines for Aboriginal Heritage Impact Assessment*' (NSW NPWS 1997). These guidelines have been used as the *Code of Practice* (DECCW 2010) for the assessment of significance for Aboriginal archaeological sites.

The 'definitive' international archaeology guidelines, the *ICOMOS Charter for the Protection and Management of Archaeological Heritage* ('ICAHM Charter' 1990) by ICOMOS Committee on Archaeological Heritage Management, enunciates the goal of preserving existing, original physical fabric. However, it provides no prescription of standards for archaeology beyond the requirement that:

> *"The protection of the archaeological heritage must be based upon the fullest possible knowledge of its extent and nature. General survey of archaeological resources is therefore an essential working tool in developing strategies for the protection of the archaeological heritage. Consequently archaeological survey should be a basic obligation in the protection and management of the archaeological heritage."*

The last phase of archaeological research is Phase III-Mitigation. Once a cultural heritage place has been determined to have a level of significance warranting some form of further cultural heritage management, the archaeologist must make recommendations to the site's management how to preserve the data contained in the site. This process must be consistent with Commonwealth, state and local heritage legislation and be commensurate with the level of significance of the site.

The ICOMOS Burra Charter defines cultural significance as the 'aesthetic, historic, scientific or social value for past, present or future generations' of a place. The NSW NPWS (1997 – now part of the OEH) provides further discussion on the assessment of cultural significance for Aboriginal sites, and for artefact scatter sites in particular. Categories of significance relevant to Aboriginal archaeological sites include Aboriginal significance, archaeological/scientific significance, aesthetic significance, tourism potential and educational significance. *The NSW NPWS Guidelines for Archaeological Report Writing* (1997: 25) states:

> *While Aboriginal sites and places may have educational, tourism, and other values to groups in society their principle values are likely to be in terms of their cultural/social significance to Aboriginal people and their scientific significance to archaeologists. It is thus possible to identify two main streams in the overall significance assessment process: the assessment of cultural/social significance to Aboriginal people and the assessment of scientific significance to archaeologists.*

The significance of the sites within this assessment report will be assessed in relation to their cultural and scientific significance. Cultural significance is discussed in Section 14.2. The scientific significance assessment of the sites recorded during the survey for this project and those previously recorded will be discussed and justifications for the significance ranking provided.

14.1 Archaeological (Scientific) Significance

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including Aboriginal communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke and Smith 2004:249, NPWS 1997b). For this reason, the NPWS (part of DECC) summarises the situation as 'while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential' (NPWS 1997b:26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter, and include the following aspects and definitions (NPWS 1997b):

General site considerations, including factors such as:

- ***Site intactness or integrity****:* This includes the state of preservation of archaeological objects, as well as the stratigraphic integrity of the site, the taphonomic processes acting on the site (i.e. the factors that affect a site after its original use), and the impact of past artefact collections made at the site.

- The ***connectedness*** of the site to other sites – when considered as part of a larger assemblage or landscape the site may have greater research potential than if it was simply considered in isolation.

- ***Chronological potential*** refers to the potential of a site to provide a dateable framework extending back into the past. The potential antiquity of a site is also an important consideration, as older sites are relatively less common than younger sites. In many cases stratified, dateable artefact bearing deposits are sufficiently rare to be a very valuable resource.

Representativeness

Representativeness refers to the ability of a site or object to serve as a representative example of sites in the same class. This aspect of value is only meaningful when considered in conjunction with a conservation goal, and must be determined against the archaeological record at various scales of consideration - local, regional and continental for example. It takes into account site and object variability, connectedness and a consideration of what is already, and likely to be, conserved. Burke and Smith (2004: 247) define representativeness as 'an assessment of whether or not a place is a good example of its type, illustrating clearly the attributes of its significance.'

Rarity

Rarity is, of course, closely related to representativeness (if a site is rare, it is likely to have high representative value), and will include a consideration of those issues discussed under general site considerations. In many ways, the determination of rarity is a summation of exceptional research potential, or a representative of a small class of sites or objects. Burke and Smith further describe rarity as 'an assessment of whether the place represents a rare, endangered or unusual aspect of our history or cultural environment that has few parallels elsewhere' (2004: 247).

Research Potential

Research potential is essentially a summation of the above values in the general, representativeness and rarity criteria (DECC NPWS 1997). Pearson and Sullivan note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory' (1995: 149). Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example). It can provide information about certain aspects of Aboriginal life in the past that other sites may not (Burke and Smith 2004: 247-8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The NPWS general advice is that archaeologists should give careful consideration prior to attempting to determine educational and aesthetic values (NPWS 1997: 32). No attempt to determine educational potential of sites under scientific assessment was made, but do consider educational value as a contributing factor may be included in an assessment of social significance by the Aboriginal community.

Aesthetic values

There is a diverse yet accessible literature regarding identifying aesthetic values and determining aesthetic significance (Burke and Smith 2004: 248-9, Kerr 1996: 15-16, Pearson and Sullivan 1999: 134-8). It is generally agreed that aesthetic values are an important part of cultural heritage significance, however they are dependent on an individual's sensory response, which means determining aesthetic value is fraught with difficulty, and should be applied on a case-by-case basis as it is not always a value applicable to archaeological sites (Burke and Smith 2004: 248). However, when dealing with some types of sites, aesthetic values and landscape context are an important consideration. The question 'does the place have a relationship between its parts and the setting which reinforces the quality of both', while originally proposed in an architectural context (Kerr 1996: 15), is relevant also for many sites in a local setting—such as in forests, deserts, coastlines or indeed wetlands—where there is often an important relationship between the cultural site and natural environment, which contribute to the values of a 'sense of place'.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during the field survey. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable, the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the Project Approval Area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

14.1.1 Statement of Archaeological Significance

The evaluation of the assessment of significance follows the Aboriginal significance assessment outlined in *DECC Guidelines for Aboriginal Heritage Impact Assessment* (DECC 2006). The assessments are based on the information detailed in previous archaeological assessment reports and the available OEH AHIMS site cards. An assessment of significance was determined and a rating for each site was given. Based on this information, nomination of the level of value—high, moderate, low, or not applicable – was given.

A numerical approach to the evaluation of archaeological significance has been undertaken for sites located within the Project Approval Area (including those located within the proposed water and wastewater alignment corridors).

Table 20 outlines the basis for numerical values attributed to each criterion, which are as follows:

- Low significance was afforded a score of 1

- Moderate significance was afforded a score of 2
- High significance was afforded a score of 3

Overall significance was scored as is outlined below (minimal score being 12):

- Low significance 12-15
- Low to moderate significance 16-19
- Moderate significance 20-23
- Moderate to high significance 24-27
- High significance 27+

Table 20: Criteria Used in Evaluating Archaeological Significance

	Low (Score of 1)	**Moderate (Score of 2)**	**High (Score of 3)**
Rarity	The location of the site within the landscape, its type, integrity, contents and/or potential for subsurface artefacts, are common within the local and regional context.	The location of the site within the landscape, its type, integrity, contents and/or potential for subsurface artefacts, are common within the regional context but not the local context.	The location of the site within the landscape, its type, integrity, contents and/or potential for subsurface artefacts, are rare within the local and regional context.
Representativeness	The site, when viewed in relation to its type, contents, integrity and location in the landscape, is common within a local and regional context and sites of similar nature (or in better condition) are already set aside for conservation within the region.	The site, when viewed in relation to its type, contents, integrity and location in the landscape, is uncommon within a local context but common in a regional context and sites of similar nature (or in better condition) are already set aside for conservation within the region.	The site, when viewed in relation to its type, contents, integrity and location in the landscape, is uncommon within a local and regional context and sites of similar nature (or in better condition) are not already set aside for conservation within the locality or region.
Integrity	Stratigraphic integrity of the site has clearly been destroyed due to major disturbance/loss of topsoil. The level of disturbance is likely to have removed all spatial and chronological information.	The site appears to have been subject to moderate levels of disturbance, however, there is a moderate possibility that useful spatial information can still be obtained from subsurface investigation of the site, even if it is unlikely that any useful chronological evidence survives.	The site appears relatively undisturbed and there is a high possibility that useful spatial information can still be obtained from subsurface investigation of the site, even if it is still unlikely that any useful chronological evidence survives.

	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
Connectedness and Chronological Potential	There is no evidence to suggest that the site is connected to other sites in the local area or the region through: - their chronology (rarely known); - their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction); - by the use of an unusual raw material, knapping technique/reduction strategy; - similar designs/motifs in the case of art sites and engravings; and/or - information provided by Aboriginal oral history.	There is some evidence to suggest that the site is connected to other sites in the local area or the region through one of the following: - their chronology (rarely known); - their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction); - by the use of an unusual raw material, knapping technique/reduction strategy; - similar designs/motifs in the case of art sites and engravings; or - information provided by Aboriginal oral history.	There is good evidence to support the theory that the site is connected to other sites in the local area or the region through two or more of the following: - their chronology (rarely known); - their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction); - by the use of an unusual raw material, knapping technique/reduction strategy; - similar designs/motifs in the case of art sites and engravings; and/or - information provided by Aboriginal oral history.
Complexity	The site does not exhibit and is not predicted to contain either of the following in a subsurface context: - a complex assemblage of stone artefacts in terms of artefact types and/or raw materials (including use of local and imported raw materials) and/or knapping techniques/reduction strategies; and/or - features such as hearths or heat treatment pits, activity areas.	The site exhibits or can be predicted to contain one of the following in a subsurface context: - a complex assemblage of stone artefacts in terms of artefact types and/or raw materials and/or knapping techniques/reduction strategies and/or use of local and imported raw materials; and/or - features such as hearths or heat treatment pits, activity areas.	The site exhibits or can be predicted to contain both of the following in a subsurface context: - a complex assemblage of stone artefacts in terms of artefact types and/or raw materials and/or knapping techniques/reduction strategies and/or use of local and imported raw materials; and - features such as hearths or heat treatment pits, activity areas.

	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
Potential for Archaeological Deposit	The site does not have or has only a low potential to contain subsurface archaeological material that has stratigraphic integrity or is of a nature that suggests its subsurface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.	The site has a moderate potential to contain subsurface archaeological material that has stratigraphic integrity or is of a nature that its subsurface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.	The site has a high potential to contain subsurface archaeological material that has stratigraphic integrity or is of a nature that its subsurface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.

The numerical significance assessment of the sites located within the Project Approval Area (Table 21), the proposed alignment corridors (Table 24)) and new sites located during the surface survey (Table 23) are presented in the sections below.

Table 21: Significance assessment of previously recorded archaeological sites located within the ***Project Approval Area***, based on information provided in the site card submitted to OEH (Key: High; Moderate-High; Moderate; Low-Moderate; Low).

Site ID	AHIMS	Rarity		Representativeness		Archaeological Integrity		Connectedness and Chronological Potential		Complexity		Potential for Archaeological Deposit		Archaeological Significance	
		Local	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*		
TLPD AFT-7	52-2-0613	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
TLPD AFT-8	52-2-0614	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
TLPD AFT-9	52-2-0615	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
Wongawilli; Camden;	52-2-1032	1	1	1	1	1	1	1	1	2	1	2	1	14	Low
Wongawilli; Camden	52-2-1033	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
Bong Bong 1; West Dapto;	52-2-1542	3	3	3	3	3	3	1	1	1	1	2	2	26	Moderate-high
Bong Bong 3 West Dapto;	52-2-1543	3	3	3	3	3	3	1	1	1	1	2	2	26	Moderate-high
Bong Bong 2; West Dapto;	52-2-1544	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WD1-1;	52-2-1688	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
TEST PITTING AREA 21	52-2-2227	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
test pitting area 22	52-2-2233	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_42	52-2-3270	1	1	1	1	2	2	1	1	2	1	3	3	19	Low-Moderate
WDRA_AX_40	52-2-3271	1	1	1	1	1	1	1	1	1	1	3	21	15	Low
WDRA_AX_41	52-2-3272	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_43	52-2-3273	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_44	52-2-3274	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_45	52-2-3275	1	1	1	1	2	2	1	1	2	2	3	3	20	Moderate
WDRA_AX_46	52-2-3276	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_14	52-2-3279	2	2	2	2	3	2	1	1	3	2	3	2	25	Moderate-high

Site ID	AHIMS	Rarity		Representativeness		Archaeological Integrity		Connectedness and Chronological Potential		Complexity		Potential for Archaeological Deposit		Archaeological Significance	
		Local	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*	*Local*	*Regional*		
WDRA_AX_15	52-2-3280	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_20	52-2-3283	2	1	2	1	2	1	1	1	1	1	2	1	16	Low-Moderate
WDRA_AX_21	52-2-3284	1	1	1	1	2	2	1	1	2	1	3	3	19	Low-Moderate
WDRA_AX_22	52-2-3285	1	1	1	1	1	1	1		1	1	1	1	11	Low
WDRA_AS_04	52-2-3286	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AS_05	52-2-3287	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_01	52-2-3289	1	1	1	1	1	1	1	1	1	1	2	1	13	Low
WDRA_AX_08	52-2-3290	2	1	2	1	2	2	1	1	2	1	2	2	19	Low-Moderate
WDRA_AX_09	52-2-3291	2	1	2	1	2	2	1	1	2	1	2	2	19	Low-Moderate
WDRA_AX_07	52-2-3292	2	1	2	1	2	2	1	1	2	1	2	2	19	Low-Moderate
WDRA_AX_10	52-2-3294	1	1	1	1	1	1	1	1	1	1	3	2	15	Low
WDRA_AX_11	52-2-3295	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WDRA_AX_12	52-2-3298	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
Bong Bong Road IA1	52-2-3659	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
Bong Bong Road IA2	52-2-3660	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
Cleveland Road PAD 3	52-2-3765	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
West Dapto	52-2-3778	1	1	1	1	1	1	1	1	1	1	2	2	14	Low
WDSY1	52-2-3779	1	1	2	1	2	1	1	1	1	1	2	2	16	Low-Moderate
Tallawarra Midden	52-5-0070	3	3	3	2	3	2	2	1	3	2	3	3	30	High
Yallah site 2	52-5-0122	2	1	2	1	2	1	1	1	1	1	2	1	16	Low-Moderate

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Table 22: Significance assessment of previously recorded archaeological sites located within the ***Proposed Project Approval Area corridors***, based on information provided in reports and site cards submitted to OEH. (Key: Moderate-High; Low-Moderate; Low).

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Table 23: Significance assessment of newly recorded archaeological sites located within the ***Proposed Project Approval Area***. (Key: Low).

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14.2 Aboriginal cultural values

OEH recognises that 'Aboriginal community are the primary determinants of the significance of their heritage' (DECCW 2010). Biosis Research recognises that our role in the cultural heritage assessment process is to provide specialist skills, particularly in regard to archaeological and heritage management expertise. These specialist skills can be articulated and enhanced through consultation with the Aboriginal community, with the aim of providing a comprehensive assessment of cultural heritage significance.

The assessment criteria used to identify Cultural Significance include social, historic and aesthetic values, with social and aesthetic values often being closely related. ***Social values*** refer to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day Aboriginal community. ***Aesthetic values*** related to Aboriginal sites and places that may contain particular sensory, scenic, architectural and creative values and meaning to Aboriginal people. ***Historic values*** refer to the associations of a place with a person, event, phase or activity of importance to the history of an Aboriginal community.

These aspects of Cultural Significance can only be determined through consultative processes with one or more Aboriginal communities. In terms of Aboriginal communities, heritage places – including those that are otherwise defined as 'archaeological sites' – generally always attract differing values. These may include custodianship obligations, education, family or ancestral links, identity, and symbolic representation. History and traditions are important: this generation has an obligation to future generations to retain certain things as they are currently seen and understood. This includes retaining alternative understandings to those that come through scientific assessments. Cultural significance is often more complex than is identified through the scientific determination of value. Cultural values can be complex and rich - the past is a vital component of cultural identity. Feelings of belonging and identity are reinforced by knowledge of the existence of a past, and this is further reinforced and maintained in the protection of cultural heritage.

14.3 Aboriginal Cultural Significance

This section of the report presents a summary of statements or comments of cultural significance made by registered Aboriginal stakeholders from the results of previous archaeological assessment, during the sub-surface investigations and following the provision of the draft report.

14.3.1 Aboriginal Cultural Landscape Values and Significance

The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape' (DECC n.d.: 5-6). This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of a wider context of features with cultural value. Hence the site or place may possibly have values derived from its association with other sites and places, and its context within the physical landscape. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places (DECC n.d.: 5).

The assessment of cultural landscape values is firstly approached by considering the value of the assemblage of sites within the Project Approval Area as just that – an assemblage of sites in a wider context of other sites. It is important to note that the value of the cultural landscape as a social phenomenon does not have to rely on robust archaeological interpretation; but rather is a contemporary expression of value to the Aboriginal community, archaeologists, and the community at large. This is consistent with current approaches and policy directions for the OEH (DECC n.d.; Byrne *et. al.* 2001).

14.3.2 Aboriginal stakeholder comments

Comments and rating of significance were sought from the Aboriginal stakeholders. The general comments are that all sites are of high cultural significance and should be avoided. If sites cannot be avoided recommendations for testing, collection and salvage of sites should be followed.

15.0 IMPACT ASSESSMENT

15.1 Proposed Development

As outlined in Section 1, the proposed infrastructure works will involve design, construction and operation (including commissioning and maintenance) of drinking water and wastewater services. Infrastructure components include:

- water and wastewater main pipelines
- water and wastewater pumping stations
- reservoirs (potentially four sites)
- support assets (e.g. wet weather overflow points, vent shafts, odour dosing units).

15.1.1 Water infrastructure

The majority of water pipelines are to be installed in road reserves. Some sections will need to be installed in public reserves and private land. Trenching will be the main construction technique for installing pipelines. Boring or tunnelling will also be used where appropriate to minimise disturbance in locations where there are particular environmental, safety, access or surface feature issues (e.g., creek crossings).

Water pipes are generally between 300mm and 1200mm in diameter. Smaller diameter pipes may also be considered within the context of the Proposal. Trenches for water pipelines will generally be up to about 1.7m wide and 1.5m deep, with a construction footprint width of approximately 6m to 10m. Lay-down and staging areas may also be required. 50m wide corridors have been assessed to minimise potential impacts.

Hydraulic efficiency requires that water reservoirs be constructed at high points in the landscape. Water from the reservoirs is transported through pipelines under gravity. A water reservoir will generally require a site with an area of two to four hectares and construction will utilise most of this space, subject to site constraints.

If required, water pumping station sites will need approximately 160m^2, all of which will be utilised during construction.

Construction of reservoirs and pumping stations will include the following key activities:

- site preparation and excavation
- construction of buildings, mechanical and electrical controls, electrical kiosks, etc.
- ancillary construction works such as roads, fencing, etc.
- commissioning in accordance with standard commissioning procedures
- landscaping and restoration.

Typical construction equipment includes excavators, compactors, rock-breakers, saw cutters, welding equipment, delivery and concrete trucks, powered hand tools, generators, boring, micro-tunnelling or directional drilling rigs, and cranes.

15.1.2 Wastewater infrastructure

Many of the wastewater pipelines will be constructed in low-lying areas and in the vicinity of waterways. Due to the design requirements of gravity wastewater systems, locating wastewater pipelines away from waterways is not always feasible.

Wastewater trunk pipelines are generally between 300mm and 1800mm in diameter. Smaller diameter pipes may also be considered and assessed in the context of the Proposal. Trenches for wastewater pipelines will generally have a similar width and construction footprint to water pipelines (1.7m and 6m to 10m respectively). However, some sections of wastewater pipelines may require deeper installation (5m or more) due to the need to maintain gravity flow in the pipeline. In such instances, the trench width and construction footprint will increase.

The construction of wastewater pumping stations will include the following key activities:

- site preparation and excavation
- construction of buildings, chemical storages, tanks and treatment process units, etc.
- ancillary construction works such as roads, fencing, etc.
- commissioning in accordance with standard commissioning procedures
- landscaping and restoration.

Typical construction equipment will include excavators, compactors, rock breakers, saw cutters, welding equipment, delivery and concrete trucks, powered hand tools, generators, micro-tunnelling or directional drilling rigs, and cranes.

Upgrade of some of the pumping stations within the existing Wollongong and Shellharbour wastewater systems is anticipated. Upgrade works are likely to comprise both underground and above ground works and involve a limited number of the activities and construction equipment listed above.

15.2 Potential Impacts

A number of Aboriginal archaeological sites and areas of Aboriginal archaeological potential have been identified within the current Project Approval Area corridors. These Aboriginal archaeological sites and areas of Aboriginal archaeological potential are considered to constitute areas of constraint and conservation potential within the Project Approval Area.

All areas are considered to have, at the least, low archaeological potential. Comprehensive studies in other locations (for example, Kuskie 2000 at Mount Arthur North in the Hunter Valley) demonstrate that artefacts occur in a widespread distribution across the landscape, with higher artefact densities, representing a greater focus of Aboriginal activity, tending to occur in primary and secondary resource zones than in other contexts. Many major surveys in eastern Australia have identified a virtually continual distribution of artefacts across the landscape, but at varying densities (for example, Kuskie 2000).

It is important to consider, however, that the Aboriginal archaeological assessment has been undertaken within 'corridors' that are wider than the proposed construction activities. The assessment 'corridor' approach therefore involves a wider area to allow for the final infrastructure alignments and sites to be moved subject to the recommended environmental management measures and consultation with the landowner. This cautious approach to the impact assessment was taken to ensure the highest impact activities were assessed within each 'corridor' and therefore, the full extent of these activities is within the assessed parameters, and that the assessment is ultimately conservative in nature.

Sydney Water's preferred option is to avoid impacting any Aboriginal archaeological sites through moving the alignments, where possible.

Table 24 and Figure 44 to 52 identify those Aboriginal archaeological sites and areas of Aboriginal archaeological potential that currently fall within proposed pipeline alignments within the Project Approval Area. Specific Mitigation measures for these sites/ areas are detailed in Section 17.

Table 24: Aboriginal archaeological sites located within the Project Approval Area corridors.

AHIMS	Site Name	Site Type	Archaeological Significance	Map Reference
Previously Recorded Aboriginal Archaeological Sites				
52-2-3279	WDRA_AX_14	Artefact scatter	Moderate-High	Figure 45
52-2-3779	WDSY1	Artefact scatter	Low-Moderate	Figure 49
52-2-1033	Wongawilli; Camden	Artefact scatter	Low	Figure 48
52-2-3293	WDRA_AX_18	Artefact Scatter	Low	Figure 48
52-2-3271	WDRA_AX_40	Isolated artefact	Low	Figure 45
52-2-3274	WDRA_AX_44	Isolated artefact	Low	Figure 45
Previously Recorded Potential Archaeological Deposits (PADs)				
52-2-3778	West Dapto	PAD	Low	Figure 49

Part 3:
Management and Recommendations

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of "*doing as much as necessary, as little as possible*" (Marquis-Kyle and Walker 1994: 13). In cases where avoidance is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable.

Section 16 details general management recommendations to be applied throughout the Concept Area, with specific recommendations provided for sites located within the proposed alignments (Project Approval Area).

16.0 RECOMMENDATIONS

16.1 Conservation through Avoidance

- In the first instance, Sydney Water should minimise or avoid impact to all registered Aboriginal archaeological sites, PADS, and areas of high archaeological and cultural sensitivity at the design stage of the Project.
- In the second instance, Sydney Water should minimise or avoid impact to those registered archaeological sites and PADs considered to be of high archaeological sensitivity and scientific significance by adjusting the Proposed Alignment (Figure 44 to 52).
- To successfully minimise or avoid impact to identified Aboriginal sites, Sydney Water should develop and adopt management and mitigation strategies to ensure that all archaeological sites, PADS and areas of archaeological sensitivity are not inadvertently impacted by future proposed development.

16.2 Direct Impacts to known archaeological sites

- Where registered Aboriginal archaeological sites, PADs and areas of high archaeological sensitivity cannot be avoided, further archaeological investigation will be required, including excavation and recording, to determine the nature and extent of the site and the archaeological and cultural significance prior to ground disturbance. For specific recommendations, refer to Table 26.

- Where artefacts are recovered or require relocation, a Care and Control Agreement should be developed and implemented in consultation with registered Aboriginal stakeholders.

- No further archaeological investigation is recommended within areas of no and low Aboriginal archaeological sensitivity and areas of high disturbance.

- A suggested testing methodology for areas identified as being of high archaeological sensitivity is provided in Section 18.

16.3 Aboriginal Stakeholder Consultation

All aspects of management and mitigation should be developed and implemented in consultation with the registered Aboriginal stakeholders and a qualified archaeological consultant.

The main recommendations from the Aboriginal stakeholders can be summarised as follows:-

- All cultural heritage sites are of high significance to the community and should be avoided.

- If impacts can not be avoided then sub surface testing, collection and salvage of sites should be undertaken.

16.4 Cultural Heritage Awareness Training

It is recommended that Sydney Water should prepare a Cultural Heritage Induction information pack that can be used by the on-site contractors as a reference guide. The information should be provided to the contractors as part of their site induction prior to the commencement of the proposed development works. Registered Aboriginal stakeholders should be provided with the opportunity to provide input into any cultural heritage awareness training.

16.5 Unanticipated Aboriginal Sites

Should unanticipated Aboriginal archaeological material be identified during any works, works should cease in the vicinity (50m radius) of the find and a qualified archaeologist should be consulted in instances where a person discovers or suspects they have discovered Aboriginal cultural heritage, including human skeletal remains. NSW OEH and Aboriginal stakeholders will also require notification.

The qualified archaeologist, in consultation with the Aboriginal stakeholders, will then be engaged to update and/or complete site cards as per s97 of the NPWS Act and advise on possible management strategies.

Where required, the methodology of any salvage excavation must be appropriate to the site type(s) discovered and the nature, extent and significance of the sites.

Registered Aboriginal stakeholders must be consulted concerning all unanticipated Aboriginal archaeological sites.

After completion of the salvage excavations a qualified archaeologist shall undertake analysis of the excavated material and provide a report of the results of the analysis.

16.6 Discovery of human remains

If any suspected human remains are discovered during any activity works, all activity in the vicinity (100m radius) must cease immediately. The remains must be left in place and protected from harm or damage. The following contingency plan describes the actions that must be taken in instances where human remains or suspected human remains are discovered. Any such discovery at the activity area must follow these steps:

1. Discovery:

If suspected human remains are discovered all activity in the vicinity (100m radius) must stop to ensure minimal damage is caused to the remains; and the remains must be left in place, and protected from harm or damage.

2. Notification:

Once suspected human skeletal remains have been found, the Coroners Office and the NSW Police must be notified immediately. Following this, the find will be reported to Sydney Water. If the remains are proven to be in an archaeological context and Aboriginal, then OEH and the Aboriginal stakeholders will be notified.

If the remains are demonstrated to be of non-Aboriginal origin, and greater than 100 years of age, they will fall under the jurisdiction of the NSW Heritage Branch, under the *Heritage Act, 1977*. In this instance, the NSW Heritage Branch should be notified of the remains.

3. Management and Mitigation or Salvage:

An appropriate management and mitigation or salvage strategy will be implemented (this will depend on the circumstances in which the remains were found, the number of burials found and the type of burials, and the outcome of consultation with any Aboriginal person or body). The find will be recorded in accordance with the National Parks and Wildlife Act 1974 (NSW) and the *Code of practice for Archaeological Investigation of Aboriginal Objects in NSW* (2010).

4. Reburial

Any reburial site/s must be fully documented by an experienced and suitably qualified archaeologist, clearly marked, discussed with any Aboriginal person or body and all details provided to OEH; and appropriate management measures must be implemented to ensure that the remains are not disturbed in the future.

5. Consultation:

The above processes should be undertaken in consultation with the registered Aboriginal stakeholders.

17.0 SITE SPECIFIC RECOMMENDATIONS – PROPOSED PIPELINE ALIGNMENTS

Site specific recommendations have been outlined for the 7 Aboriginal archaeological sites identified within the proposed pipeline alignments (Table 25). Recommendations specifically relating to areas of high, moderate and low archaeological sensitivity are provided in Table 26.

Table 25: Aboriginal archaeological sites located within the Proposed Alignment corridors.

AHIMS	Site Name	Cultural Sensitivity	Archaeological Sensitivity	Mitigation Measures
Aboriginal Archaeological Sites				
52-2-3279	WDRA_AX_14	High	Moderate-High	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site.
52-2-3779	WDSY1	High	Low-Moderate	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site.
52-2-1033	Wongawilli; Camden	High	Low	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site. Additional testing of the area surrounding this site is recommended, due to the proximity of the site to a 3rd order stream. Additional artefact sites are located within close proximity to the identified site.
52-2-3293	WDRA_AX_18	High	Low	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site. Additional testing of the area surrounding this site is recommended, due to the proximity of the site to the confluence of 3rd and 4th order streams and old growth scrubland (resulting in low levels of disturbance).
52-2-3271	WDRA_AX_40	High	Low	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site. Additional testing of the area surrounding this site is recommended, due to the proximity of the site to the confluence of 1st, 2nd and 4th order streams and numerous other artefact scatters and sub-surface deposits.
52-2-3274	WDRA_AX_44	High	Low	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site. Additional testing of the area surrounding this site is recommended, due to the proximity

AHIMS	Site Name	Cultural Sensitivity	Archaeological Sensitivity	Mitigation Measures
				of the site to Sheaffes Creek and numerous other artefact scatters and sub-surface deposits.
Potential Archaeological Deposits (PADs)				
52-2-3778	West Dapto	Moderate	Low	If impact to the site can not be avoided, and impact to or destruction of the site is intended, salvage of this site is recommended. These excavations should be designed to determine the nature and extent of the site. Additional testing of the area surrounding this site is recommended, due to the proximity of the site to the confluence of 2nd and 3rd order streams.

Table 26: Recommendations for areas of high, moderate and low archaeological sensitivity within the Project Approval Area.

Areas of High Archaeological Sensitivity				
N/A	N/A	High	High	If the areas of high archaeological sensitivity identified in Figure 45 to 52 can not be avoided by the proposed alignments, additional subsurface testing will be required to determine the nature and extent of known sites, and the location of additional sub-surface deposits within the area. A suggested testing methodology has been outlined in Section 18.
Areas of Moderate Archaeological Sensitivity				
N/A	N/A	High	Moderate	No further archaeological work required
Areas of Low Archaeological Sensitivity				
N/A	N/A	High	Low	No further archaeological work required

18.0 SUGGESTED TESTING METHODOLOGY FOR AREAS IDENTIFIED AS BEING OF HIGH ARCHAEOLOGICAL SENSITIVITY

Best archaeological practice, as outlined by DECCW (2010) indicates that a test excavation sampling strategy should include:

- a framework for sampling all potential archaeological deposits (PAD) that are at risk of harm (within the subject area)
- a description of the differentiation of the PAD/ area of archaeological sensitivity to be test-excavated from the surrounding archaeological landscape (i.e. explain why the PAD is anticipated to be of higher significance than the continuous distribution of archaeological material in which it exists), and
  - test those areas of PAD that have no archaeological exposure or visibility, or
  - test the boundaries of known sites (where appropriate)
- description of how the sampling area relates to the area that is proposed to be impacted by the proposed development.

18.1 Test Excavations

The aim of the test excavation sampling strategy is to build upon the information already gathered through archaeological assessments (surface survey and AMBS 2006) carried out within the Study Area.

Based on these requirements, the following sampling strategy has been devised for the current Project Approval Area, using the DECCW (2010) requirements as a minimum:

1. Test Excavation units must be placed on a systematic grid across the identified Aboriginal sites to determine the extent of these and across various landforms across the Project Approval Area.

2. To test the archaeological significance of sensitive landforms within the Project Approval Area, the Test Units will comprise 50cm x 50cm test pits at a maximum of 5m intervals, or other justifiable and regular spacing. These may be grouped into discrete focus areas. For example, the entire alignment identified as being of moderate to high archaeological significance will not need to be excavated. A strategic sampling approach can be taken as an alternative.

3. Test excavations units must be excavated using hand tools only.

4. Test excavations must be excavated in 50cm x 50cm units.

5. Test excavation units may be combined and excavated as necessary to understand the site characteristics, however, the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3m² - with the maximum surface area of all test excavation units must be no greater than 0.5% of the area – either PAD or site – being investigated.

6. The first excavation unit must be excavated and documented in 5cm spits at each area – either PAD or site – being investigated. Based on the evidence of the first excavation unit, 10cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.

7. All material excavated from the test excavation units must be sieved using a 5mm aperture wire-mesh sieve.

8. Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.

9. Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.

10. Test excavations units must be backfilled as soon as practicable.

11. Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation.

As per the Aboriginal Consultation Requirements, the Sampling Strategy will be provided to registered Aboriginal Stakeholders for comment prior to the finalisation of the methods.

18.2 Notification

Notification will be forwarded to the Department of Planning and Infrastructure 14 days prior to the commencement of any test excavations to inform their progress of the project and knowledge of project status.

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APPENDICES

APPENDIX 1

Glossary of Key Terms

AEOLIAN: A geomorphic process whereby soil forming material is transported and deposited by wind

ALLUVIAL: Alluvial refers to sediment deposition in riverine landscapes.

ALLUVIUM: Alluvium is the sediment deposited from transportation by channelled stream flow or over-bank stream flow.

ASSEMBLAGE: artefacts that are found together and that presumably were used at the same time or for similar or related tasks

CALCAREOUS: Used as a descriptive term in the Australian Soil Classification (Isbell, 1996). It describes a soil that has sufficient calcium carbonate to cause effervescence on the application of a few drops of hydrochloric acid.

CONTEXT: the relationship of artefacts and other cultural remains to each other and the situation in which they are found.

DEBITAGE: the by-products or waste materials left over from the manufacture of stone tools.

DIAGNOSTIC ARTEFACT: an item that is indicative of a particular time period and/or cultural group.

FEATURE: a type of material remain that cannot be removed from a site such as roasting pits, fire hearths, house floors or post molds.

FLUVIAL: A geomorphic process whereby sediments are transported and deposited by flowing river water.

HOLOCENE: The Holocene epoch forms part of the late Quaternary period and extends from about 11,000 years ago to the present day.

IN SITU: in the original place.

LACUSTRINE: A geomorphic process whereby soil forming material is deposited in lakes

LATERITE: Highly weathered material characterised by the formation of clays and mobilisation and concentration of iron and other minerals such as aluminium and manganese.

LITHIC: stone, or made of stone.

METAMORPHOSED: Material (usually sedimentary) that has been altered by heat and/or pressure (e.g. siltstone to schist, limestone to marble.

MORPHOLOGY: Description of landform based on dimensions (i.e. shape and size).

ORDOVICIAN: The Ordovician period extended from about 500-510 million years ago until 420-440 million years ago. During the Ordovician period much of what is now Victoria was part of a deep

marine basin and nearly all of Ordovician rocks in Victoria are of deep water sedimentary origin (sandstones, mudstones and shales).

PARENT MATERIAL: Generally used in soil description to denote the material from which the soil is derived. Lithologically variable, depending on processes that are active at that site. Parent material could be a rock type or in situ weathered material or unconsolidated material transported from elsewhere.

PLEISTOCENE: The Pleistocene is an Epoch within the early Quaternary period, extending from about 1.6 million years ago to about 11 000 years ago. The end of the Pleistocene is marked by the last of the great Ice Ages.

QUATERNARY: Geological time period from 1.6 - 1.8 mya to present. Much of the alluvial deposition is of this age, which in turn can be subdivided into different time periods.

REGOLITH: This is defined as weathered material between the soil and hard rock. Soil surveyors tend to restrict this term to the weathered C horizon of the soil, whereas geologists adhere to the depth of any unconsolidated material to hard rock (e.g. the depth of Tertiary and Quaternary unconsolidated sediments).

SAPROLITE: Decomposed rock that has maintained characteristics that were present as an unweathered rock

SILICEOUS: Material dominated by silica in a free form- predominantly in the form of quartz (SiO_2). This material in its purist form is inert with no nutrient value and therefore limited in its overt use for agriculture.

SOIL TYPE: This is a basic unit for classifying and mapping soils. It groups soils where profiles vary within defined, narrow limits. A soil type develops from a common parent material and following the U.S. definition, has areas as well as depth.

TERTIARY: Geological time period from approximately 66 million years ago to 1.6 - 1.8 million years before present (mybp). A period of major dissection and deposition in Victoria, particularly closer to more recent times, producing large amounts of fan material flanking the uplands.

APPENDIX 2

Consultation Log and Indigenous Community Comment

This appendix has been removed from the assessment as it may contain culturally sensitive information

APPENDIX 4

Data and survey coverage

This appendix has been removed from the assessment as it may contain culturally sensitive information

APPENDIX 5

Significance assessment of previously recorded archaeological sites located within the Project Approval Area, based on information provided in the site card submitted to DECCW.

This appendix has been removed from the assessment as it may contain culturally sensitive information

APPENDIX 6

AHIMS site cards for newly recorded archaeological sites

This appendix has been removed from the assessment as it may contain culturally sensitive information

APPENDIX 7

Relevant legislation

COMMONWEALTH LEGISLATION

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

In January 2004 the Commonwealth *Australian Heritage Commission Act 1975* was repealed and in its place amendments to the EPBC Act were made. The amendments were contained in three new pieces of Commonwealth Heritage Legislation. The three new Acts are the:

1. Environment and Heritage Legislation Amendment Act (No. 1) 2003 which:

   (a) amends the Environment Protection and Biodiversity Conservation Act 1999 to include 'national heritage' as a new matter of National Environmental Significance and protects listed places to the fullest extent under the Constitution

   (b) establishes the National Heritage List

   (c) establishes the Commonwealth Heritage List

2. Australian Heritage Council Act 2003 which establishes a new heritage advisory body to the Minister for the Environment and Heritage, the Australian Heritage Council, and retains the Register of the National Estate.

3. Australian Heritage Council (Consequential and Transitional Provisions) Act 2003 which repeals the Australian Heritage Commission Act, amends various Acts as a consequence of this repeal and allows for the transition to the new heritage system.

Any place that has been nominated and assessed as having cultural heritage significance at a national level can be added to the National Heritage List.

Under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) an action requires approval from the Federal Environment Minister if the action will, or is likely to, have a significant impact on a matter of national environmental significance. Matters of national environmental significance relating to cultural heritage are:

- World Heritage Places, and
- National Heritage Places.

An action includes a project, development, undertaking, activity, or series of activities.

Actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land), and actions taken by the Commonwealth that are likely to have a significant impact on the environment anywhere in the world, may also require approval under the EPBC Act.

NATIVE TITLE ACT 1993

The Commonwealth Native Title Act establishes the principles and mechanisms for the preservation of Native Title for Aboriginal people.

Under Subdivision P of the Act, *Right to negotiate*, native title claimants can negotiate about some proposed developments over land and waters (known as 'Future Acts') if they have the right to negotiate. Claimants gain the right to negotiate if their native title claimant application satisfies the registration test conditions.

The right to negotiate applies over some proposed developments or activities that may affect native title. These are known as future acts under the Native Title Act 1993. Native title claimants only have the right to negotiate over certain types of future acts, such as mining. Activities such as exploration and prospecting on the land do not usually attract the right to negotiate.

The right to negotiate is not a right to stop projects going ahead — it is a right to have a say about how the development takes place. In some situations, the right to negotiate does not apply. In these circumstances, claimants may have the right to be notified, to be consulted, to object and to be heard by an independent umpire.

The right to negotiate is triggered when a government issues a notice to say that it intends to allow certain things to happen on land, such as granting a mining lease. This notice is called a 'section 29 notice.

People who claim to hold native title in the area, but have not yet made a native title claimant application, have three months from the date given in the section 29 notice to file a claim if they want to have a say about the proposed development. To get the right to negotiate, the claim must be registered within a month after that.

If the right to negotiate applies, the government, the developer and the registered native title parties must negotiate 'in good faith' about the effect of the proposed development on the registered native title rights and interests of the claimants.

The parties can ask the National Native Title Tribunal to mediate during the negotiations.

If the negotiations do not result in an agreement the parties can ask the Tribunal (no sooner than six months after the notification date) to decide whether or not the future act should go ahead, or on what conditions it should go ahead.

The National Native Title Tribunal administers the future act processes under the Commonwealth legislation. The Tribunal's role includes mediating between parties, conducting inquiries and making decisions (called 'future act determinations') where parties can't reach agreements.

When the Tribunal receives a future act determination application, it must conduct an inquiry (an arbitration) in order to determine whether the future act can be done and if so whether any conditions should be imposed.

A member of the Tribunal (or a panel of three members) will be appointed to conduct the inquiry, and will initially hold a preliminary conference and set directions for the parties to provide submissions and evidence. Members who have mediated a particular matter are not usually appointed as inquiry members. Inquiry members conduct hearings, receive submissions and evidence from the parties and take into account matters set out in section 39 of the Native Title Act such as:

- the effect of the future act on the enjoyment by the native title party of their registered native title rights and interests; their way of life, culture and traditions; the development of their social, cultural and economic structures; their freedom of access to the land and freedom to conduct ceremonies and other cultural activities; and the effect of the future act on any area or site of particular (special) significance to the native title party;
- the interests, proposals, opinions or wishes of the native title party;
- the economic or other significance of the future act;
- the public interest; and
- the presence of any existing non-native title rights and interests and use of the land by other persons (for instance, pastoralists).

ABORIGINAL AND TORRES STRAIT ISLANDER HERITAGE PROTECTION ACT 1984

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 provides protection for Aboriginal cultural property. Whereas the State Act provides legal protection for all the physical evidence of past Aboriginal occupation, the Commonwealth Act deals with Aboriginal cultural property in a wider sense. Such cultural property includes any places, objects and folklore that ‘are of particular significance to Aboriginals in accordance

with Aboriginal tradition'. There is no cut-off date and the Act may apply to contemporary Aboriginal cultural property as well as ancient sites.

PROTECTION OF MOVABLE CULTURAL HERITAGE ACT 1986

Australia's movable cultural heritage is protected at both Commonwealth and State levels. This web site only provides information on the Commonwealth laws.

In 1970 the United Nations Educational, Scientific and Cultural Organisation (UNESCO) adopted the UNESCO Convention on the Means of Prohibiting the Illicit Import, Export and Transfer of Ownership of Cultural Property. Australia ratified the convention by passing the *Protection of Movable Cultural Heritage Act 1986* (the Act), giving the 1970 Convention force in Australian law.

The Act regulates the export of Australia's significant cultural heritage objects. It is not intended to restrict normal and legitimate trade in cultural property and does not affect an individual's right to own or sell within Australia.

It implements a system of export permits for certain heritage objects defined by the Act as 'Australian protected objects'. Australian protected objects are objects which form part of the movable cultural heritage of Australia and which meet the criteria established under the National Cultural Heritage Control List. The Control List is located in the Regulations to the Act, and divides Australian protected objects into two classes:

- Class A objects which may not be exported
- Class B objects which may be exported if granted a permit under the Act.

A person wishing to export a Class B object is required to apply for a permit in writing. Applications are processed in accordance with the legislative process established under section 10 of the Act.

Certificates of Exemption, granted under section 12 of the Act, allow Australian protected objects that are currently overseas to be imported into Australia and subsequently re-exported. This includes Class A objects.

The Act also includes provisions that allow Australia to respond to an official request by a foreign government to return movable cultural heritage objects that have been illegally exported from their country of origin.

The *Protection of Movable Cultural Heritage Act 1986* is administered by the Minister for the Environment and Heritage. This responsibility was transferred from the Minister for Communication, Information Technology and the Arts in November 2001.

The Movable Cultural Heritage Unit in the Department of the Environment and Heritage provides the Secretariat to the National Cultural Heritage Committee

STATE LEGISLATION

NATIONAL PARKS AND WILDLIFE ACT 1974

The *National Parks and Wildlife Act 1974* provides for the protection of Aboriginal objects (sites, relics and cultural material) and Aboriginal places. Under the Act (S. 5), 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.*

This includes individual artefacts, scatters of stone artefacts, rock art sites, ancient camp sites, human burials, scarred trees, and ruins and archaeological deposits associated with Aboriginal missions or reserves.

Aboriginal places (areas of cultural significance to the Aboriginal Community declared by the Minister) are protected under Section 84 of the Act.

Aboriginal objects (any material evidence of the Aboriginal occupation of NSW) are protected under Sections 86, 87 and 90 of the Act. Section 86 of the Act identifies that a person, other than the Director-General or a person authorised by the Director-General in that behalf, who:

> *(a) disturbs or excavates any land, or causes any land to be disturbed or excavated, for the purpose of discovering an Aboriginal object*

is guilty of an offence under the NPW Act.

The *National Parks and Wildlife Act* requires that a permit from the Director General be obtained before archaeological fieldwork involving disturbance to an Aboriginal site is carried out. Consent is granted under section 87 and 90 of the Act. Queries and applications to excavate or disturb an Aboriginal archaeological site for purposes of archaeological fieldwork, should directed to the relevant Planning and Aboriginal Section Manager at the appropriate Environment Protection and Regulation Branch office. For this study the relevant branch office is at Armidale.

Section 91 of the Act requires the mandatory reporting of the discovery of Aboriginal objects, and establishes a mechanism for interim protection orders that may be used to protect objects. Identified Aboriginal objects and sites are registered with the NSW Department of

Environment and Climate Change (DECC) on the Aboriginal Heritage Information Management System (AHIMS). DEC administers *the National Parks and Wildlife Act 1974*.

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *NSW Environmental Planning and Assessment Act* will have relevance for all development projects because it requires that environmental impacts are considered in land-use planning and decision making. The definition of 'environment impacts' includes impacts on the cultural heritage of the Study Area. The Act has three relevant parts: Part III, which governs the preparation of planning instruments; Part IV, which relates to development where consent is required under an environmental planning instrument (EPI); and Part V, which relates to activity where development consent is not required but some other government approval assessments are needed.

Under the Act, local government authorities and The Department of Infrastructure, Planning and Natural Resources (formerly Planning NSW) prepare local and regional environmental planning instruments (LEPs and REPs) to give statutory force to planning controls. These may incorporate specific provisions for conserving and managing archaeological sites.

Integrated Development Assessment (IDA) was introduced under the *Environmental Planning and Assessment Act* so that all matters affecting a development application would be considered by the consent authority in an integrated way.

Integrated Development is one which requires development consent as well as one or more approvals from different government agencies. Such agencies may include NSW DEC or the NSW Heritage Council. If a development is likely to impact a heritage item, the consent authority must refer it, to NSW DEC (for Indigenous objects) or the NSW Heritage Council (for sites listed on the State Heritage Register) prior to approval determination.

The Local Government Act 1993

Under the State Local Government Act, councils can prepare local approvals policies that set out specific matters for consideration in relation to applications to demolish, build or undertake works. Archaeological sites could be considerations under such policies.

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