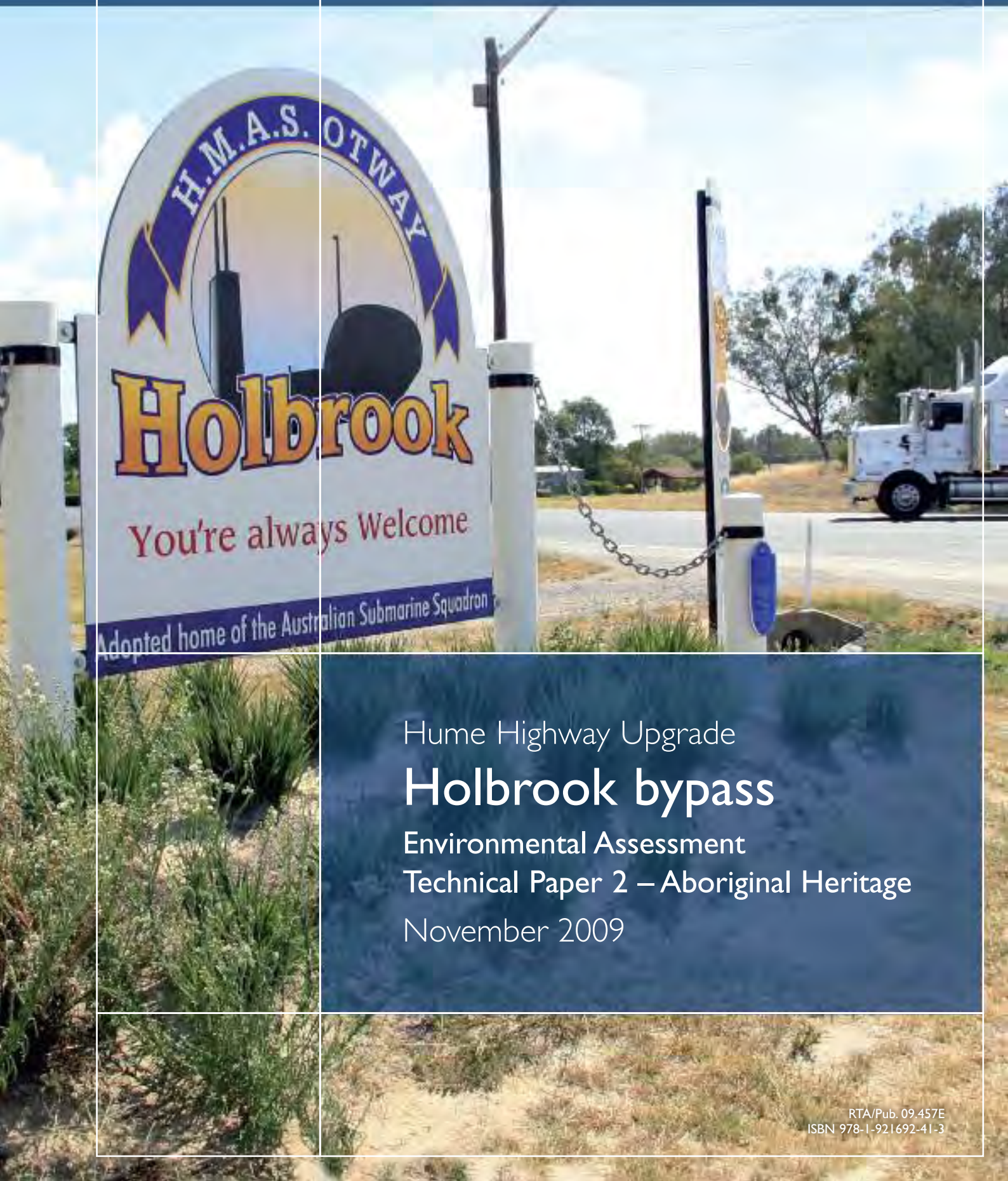

Hume Highway Upgrade

Holbrook bypass

Environmental Assessment
Technical Paper 2 – Aboriginal Heritage

November 2009

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HUME HIGHWAY TOWN BYPASS: HOLBROOK
ABORIGINAL CULTURAL HERITAGE

Cultural Heritage Assessment Report

Prepared for Parsons Brinckerhoff on behalf of
the Roads and Traffic Authority of NSW (RTA)

Final Report
October 2009

Ref. 7008

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Hume Highway Town Bypass: Holbrook
Aboriginal Cultural Heritage: Cultural Heritage Assessment Report
Portions of this document have been censored for reason of confidentiality to protect sensitive cultural information.

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1 Introduction

1.1 Project Description

As part of the Hume Highway upgrade works to provide dual carriageway between Sydney and Melbourne, the Roads and Traffic Authority of New South Wales (RTA) proposes to construct a bypass of the town of Holbrook, NSW. The general location of the study area and proposed Holbrook bypass corridor is shown in Figure 1.

The Holbrook Bypass Project (the Project) would include the following key components:

- Approximately 9.5 kilometres of dual carriageway, including 0.5 kilometres along the existing Hume Highway alignment north of Holbrook, seven kilometres along a new alignment to the west of Holbrook and two kilometres along the existing Hume Highway alignment south of Holbrook.
- A grade-separated northern interchange with Holbrook-Wagga Road.
- A grade-separated crossing over Culcairn Road.
- A bridge over Ten Mile Creek.
- A southern interchange with the existing Hume Highway.
- A cutting at the northern end.

The route would deviate to the west from the existing Hume Highway approximately four kilometres to the north of Holbrook (with a tie in at the southern extent of the Hume Highway duplication works currently under construction to the north of Holbrook).

It would then traverse cleared agricultural land before crossing Holbrook-Wagga Road, which would require a grade-separated interchange, with the Holbrook-Wagga Road going over the bypass.

The route then traverses the former Town Common area passing to the west of a cemetery, sewage treatment works and industrial land, and to the east of the Holbrook tip. The route crosses the non-operational Culcairn Holbrook rail line and the eastern edge of a travelling stock route before crossing Culcairn Road where a grade-separated crossing is also required.

From Culcairn Road, the route passes through the Greater Hume Shire Council depot and crosses Ten Mile Creek before rejoining the existing Hume Highway approximately two kilometres south of Holbrook.

The Project forms an elongated curved alignment and is generally flat, with the exception of a raised area at the northern end where a cutting is required.

The overall corridor width of the alignment would vary between 90 and approximately 100 metres, depending on environmental and design requirements.

Figure 1. Study area location and bypass corridor

1.2 Scope of Environmental Assessment

An Environmental Assessment (EA) is being undertaken for the proposed bypass. Parsons Brinkerhoff (PB) has been appointed by the RTA to manage the EA process. Kelleher Nightingale Consulting Pty Ltd (KNC) has been engaged to undertake an Aboriginal cultural heritage assessment as part of the EA.

The bypass project is being assessed as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). As such, the assessment is being undertaken in accordance with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005) for Part 3A major projects and the RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation (RTA 2008).

As part of this process, a preliminary environmental assessment, including archaeological survey and cultural mapping of the Holbrook bypass corridor was undertaken. A number of cultural places, Aboriginal archaeological sites and areas of potential archaeological deposit (PAD) were identified during inspection of the bypass corridor. The assessment provided an understanding of the Aboriginal archaeological and cultural heritage sites and values of the proposed bypass.

Further detailed assessment of the selected route as part of the EA, including archaeological test excavation and detailed cultural mapping with knowledge holders, was required to provide specific management and mitigation advice regarding Aboriginal cultural heritage. The further detailed assessment is provided to assess the impacts of the proposed bypass, refine the detailed road alignment within the route corridor and identify appropriate mitigation measures.

2 Study Objectives

The objectives of the integrated Aboriginal cultural heritage assessment were in accordance with the RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation.

The processes undertaken for the Preliminary Environmental Investigation and Environmental Assessment phases comply with the requirements of Stages 2, 3 and 4 of the procedure.

The results of the detailed consultation and assessment are integrated into this Cultural Heritage Assessment Report. The report comprises:

- a description of the location and scope of the proposed project, including ancillary works (section 1);
- description and map of the study area (section 1);
- details of Aboriginal stakeholder identification, consultation and participation in the cultural and archaeological assessments (section 3);
- description of the methodologies and results of the cultural and archaeological assessments (sections 4, 5 and 6);
- statement of significance, incorporating assessed cultural and archaeological values (section 7);
- an assessment of the potential impacts of the proposed bypass on identified cultural heritage values (section 8); and
- management and mitigation measures recommended for archaeological sites and cultural values identified through the assessment (section 9).

3 Aboriginal Stakeholder Consultation and Participation

The RTA is committed to effective consultation with Aboriginal communities regarding activities which may impact on Aboriginal cultural heritage. The RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation (RTA 2008) has been developed to provide a consistent means of effective consultation for RTA activities across NSW.

3.1 Stakeholder Identification and Consultation

The RTA has initiated Aboriginal stakeholder identification and consultation for the Holbrook bypass Environmental Assessment. The formal consultation process is being coordinated by PB, on behalf of the RTA, as project managers of the overall EA process.

The RTA advertised for Aboriginal stakeholders following the Department of Environment and Climate Change and Water (DECCW) Interim Community Consultation Requirements for Applicants (DEC 2004) and the RTA Procedure. Registered Aboriginal stakeholders have been consulted as part of the Aboriginal cultural heritage assessment. Registered stakeholders for the Holbrook bypass (based on the list as advised by PB) are listed in the table below.

Table 1. Registered Stakeholders

Group / Individual	Representative / Contact
Waagan Waagan Project Group	Robert Hampton
Albury and District Local Aboriginal Land Council	CEO
Wandoo Aboriginal Corporation	Muriel Hampton
Dean Bell	Individual
Colin Boyle	Individual
Douglas Connors	Individual
Kathy Williams	Individual
Jerrawa Freeman	Individual
Alice Williams	Individual
Lindsay Connolly	Individual
Shawn Williams	Individual
Beverly Herrington	Individual
Kevin Williams	Individual
Arinya Freeman	Individual
Donna Freeman	Individual
Muriel Williams	Individual
Vicky Parsley	Individual
Shirley Tidmarsh	Individual
Ronald Grovenor	Individual
Ramsay Freeman	Individual
Janice Considine	Individual
Margaret Williams	Individual
Neville Williams	Individual
Sharon Williams	Individual
Enid Clarke	Individual
Krystal Ingram	Individual
Norma Freeman	Individual
Keith Freeman	Individual
Margaret Berg	Individual
Calca Freeman	Individual
Enid Freeman	Individual
Jessica Berg	Individual
Shirley Marlowe	Individual
Wayne Williams	Individual

The formal consultation process has included:

- advertising for registered stakeholders in local and Indigenous media (refer Appendix A);
- notification of closing date for registration;
- Aboriginal Focus Group (AFG) meeting held at the Holbrook Community Technology Centre on Wednesday 20th February 2008, at which the results of the preliminary archaeological and Aboriginal cultural heritage assessments and methodology for Aboriginal cultural assessment were presented and discussed;
- provision of the archaeological test excavation methodology (research design) to each of the registered stakeholders for review and comment. Comments received were included in full in the research design;
- AFG meeting held at the Holbrook Community Technology Centre on Wednesday 11th February 2009, at which the results of the survey and methodology for the proposed test excavation program was presented and discussed;
- AFG meeting held at the Holbrook Community Technology Centre on Thursday 24th September 2009, at which the Cultural Heritage Assessment Report (CHAR) was presented and discussed;
- ongoing compilation of registrants list, through continuing to register individuals and groups for consultation on the project; and
- ongoing consultation with the local Aboriginal community.

In addition, registered stakeholders have participated in both the archaeological surface survey of the Holbrook bypass corridor and the subsequent test excavation program. Aboriginal stakeholders were involved in each day of the survey program, which was undertaken on the 13th and 14th of November 2008 with a follow up survey on the 15th and 16th of December 2008, and the archaeological test excavation program, which was conducted between 23rd March and 17th April 2009.

A copy of the draft CHAR was provided to Aboriginal stakeholders for review and comment. Over 21 days was provided to receive comments. No comments were received within the 21 day period.

3.2 Aboriginal Stakeholder Comments

Throughout the Aboriginal stakeholder consultation process and discussions on-site between stakeholders and archaeologists, it has been clearly identified that the study area has cultural heritage value to the local Aboriginal community. Some of the Aboriginal cultural heritage values expressed by stakeholders include:

- strong association with the land;
- responsibility to look after the land, including the heritage sites, plants and animals, creeks and the land itself;
- scarred trees;
- artefact sites and areas of potential;
- landscape features and areas of Aboriginal cultural value identified by knowledge holders around Holbrook;
- creek lines and dry swamps;
- Indigenous plants and animals; and
- general concern for burials, as their locations are not always known and they can be found anywhere.

3.3 Aboriginal Knowledge Holder Identification

As part of the cultural assessment, registered Aboriginal stakeholders were invited to identify individuals they regarded as knowledge holders for the area. Identified knowledge holders would be invited to participate in the cultural assessment process. The methodology and results of the cultural assessment, as considered appropriate for incorporation into the CHAR, are outlined in the following section.

4 Aboriginal Cultural Assessment

4.1 Cultural Assessment Methodology

An assessment of the Aboriginal cultural heritage of the Holbrook bypass potential impact corridor has been undertaken as part of the overall assessment of Aboriginal heritage for the Environmental Assessment and a report has been prepared by Waters Consultancy (2009). The Aboriginal cultural assessment methodology was presented at the AFG in Holbrook on 20th February 2008.

The assessment identified locations of Aboriginal cultural value within the potential impact corridor as provided by the RTA.

The assessment involved consultation with Aboriginal knowledge holders as identified by the registered Aboriginal stakeholders for the Project. Registered Aboriginal stakeholders were contacted directly by Waters Consultancy to discuss the current project, identify those individuals they regarded as knowledge holders for the area and to learn any additional relevant stakeholder concerns or issues. Stakeholders also identified knowledge holders during the Aboriginal Focus Group meeting.

As a result of this process, seven of the identified knowledge holders were spoken with to determine their willingness to participate in the assessment process through field surveys and interviews. Three knowledge holders were willing to be involved in the assessment through both interviews and field surveys. Of the remaining knowledge holders, one chose not to be involved and three were satisfied that the three who had indicated they would participate would provide sufficient information for the assessment.

As a result of the cultural assessment process, a total of 20 places of specific Aboriginal cultural value were identified within the Holbrook Bypass potential impact corridor. [redacted]

4.2 Cultural Landscape

[redacted]

4.3 Identified Cultural Places

[redacted]

[redacted]

5 Archaeological Assessment

The archaeological assessment for the Project was undertaken by KNC and comprised intensive survey and geomorphologic/landform assessment. This section outlines the results of the archaeological assessment. The information presented in this section offers an understanding of the archaeological resource potentially impacted by the Holbrook bypass and enables an informed archaeological impact assessment.

5.1 Archaeological Context

No significant archaeological surveys have been conducted for the Holbrook area prior to the bypass program. A search of the Aboriginal Heritage Information Management System (AHIMS) did not identify any sites within a 5km radius from town. Archaeological surveys and excavations have been undertaken for the Hume Highway Duplication Project north of Holbrook (see RTA 2007), but these assessments generally traverse a different landscape (colluvial hills and hill slopes) than the Holbrook bypass (alluvial floodplain and fans).

5.2 Archaeological Survey

PB commissioned KNC to undertake an archaeological survey of the Holbrook bypass corridor. The survey around Holbrook was carried out on the 13th and 14th of November 2008 with a follow up survey on the 15th and 16th of December 2008. Because little archaeological work has been undertaken around Holbrook, these surveys were critical to an informed assessment.

The methodology of the survey followed a standard approach and was consistent with the survey methodology employed for the Tarcutta and Woomargama bypasses and the Hume Highway Duplication Project. Two teams of archaeologists and Aboriginal community members undertook a pedestrian survey of the bypass corridor. 100% of the bypass corridor was assessed.

Each team consisted of around 4-5 people. Digital and print maps showing the proposal and standard topographic maps were used for reference. Handheld GPS were used to register grid references. Areas of exposed ground such as tracks or eroded surfaces which provided good visibility formed the focus of the pedestrian survey (although all areas were assessed). Generally surface visibility was poor with a resulting low level of effective coverage.

Effective survey coverage along the Holbrook bypass survey area was low averaging c. 3-4%. This is predominately due to relatively high levels of grass or other vegetation covering the survey corridor. Ploughed fields offered good surface visibility, but their disturbed nature hindered artefact identification. Where surface visibility was high it was usually related to erosional or one off disturbance events (e.g. trenching, dam construction). No potential archaeological deposits were identified around Holbrook. All areas of potential exhibited at least minor artefactual signatures.

As a result of the survey, a total of 13 Aboriginal archaeological sites were identified within the proposed bypass EA corridor. (Each site is discussed in section 5.3). The sites include: 11 artefact scatters, one isolated find and one scarred tree.

Table 2. All identified Aboriginal archaeological sites in the Holbrook bypass EA corridor

Site Name	Site Type	AHIMS Number
HB1	Artefact Scatter	TBA
HB2	Artefact Scatter	TBA
HB3	Artefact Scatter	TBA
HB4	Artefact Scatter	TBA
HB5	Artefact Scatter	TBA
HB6	Scarred Tree	TBA
HB7	Artefact Scatter	TBA
HB8	Artefact Scatter	TBA
HB9	Artefact Scatter	TBA
HB10	Artefact Scatter	TBA
HB11	Artefact Scatter	TBA
HB12	Isolated Find	TBA
HB13	Artefact Scatter	TBA

Artefact scatters were generally identified where surface visibility was high; such as where large surfaces have eroded along the margins of slopes or in disturbed areas (e.g. along tracks, drainage lines, agricultural works). The highest density scatter was HB4 where erosion prone soils combined with elevated level ground near a creek and dry swamp to exhibit over 50 artefacts. Quartz was the dominant raw material representing 97% of all artefacts. Quartz was found in all parts of the study area, but preference for flaked pieces was given to „higher quality' minerals which exhibited few internal fractures and a crystalline structure (in other words people were being selective in the precise minerals being chosen for flaking). Consistent with previous studies, around 10%-15% of all artefacts displayed some level of retouching suggesting more selective knapping (and perhaps some curatorial action) was taking place as opposed to the more common „use and discard' often associated with quartz artefacts (Kelleher 2003).

Figures 2, 3 and 4 show the locations of archaeological sites and cultural features within the study area.

Figure deleted from public document.

Figure 2. Aboriginal cultural places and Aboriginal sites (south portion)

Figure deleted from public document.

Figure 3. Aboriginal cultural places and Aboriginal sites (middle portion)

Figure deleted from public document.

Figure 4. Aboriginal cultural places and Aboriginal sites (north portion)

5.3 Archaeological Sites

HB1
Site HB1 was located across a broad, gently sloping/flat terrace landform. The surrounding area was generally flat, with occasional well incised ephemeral drainage lines leading north/northeast towards Ten Mile Creek. The stable terrace landforms across the area are likely to exhibit an increased probability of archaeological deposit integrity, with relatively high survivability of artefacts. Site HB2 was located immediately to the north of HB2. These two sites were intersected by a first order drainage line.

Site HB1 consisted of a scatter of artefacts spread over a large area. The main surface visibility in the area was a tree planting easement along the eastern side of the Hume Highway. The relatively high surface visibility within the easement was a result of telecommunication cable installations and a vehicle access track. Site HB1 covered an area of approximately 1 km north-south and 200 m east-west (c. 200,000m^2). Within this area, a total of 12 artefacts were identified.

Plate 1. Exposure of HB2 with HB1 in the distance

HB2
Site HB2 was located across a broad, gently sloping terrace landform. The surrounding area was generally flat, with occasional well incised ephemeral drainage lines leading north/northeast towards Ten Mile Creek. The stable terrace landforms across the area are likely to exhibit an increased probability of archaeological deposit integrity, with relatively high survivability of artefacts. Site HB1 was located immediately to the south of HB2, whilst site HB3 was located immediately north of HB2. Sites HB1 and HB2 were intersected by a first order drainage line. Sites HB2 and HB3 are separated by a slight elevation change – HB2 was situated on a slightly higher level of the terrace.

Site HB2 consisted of a scatter of artefacts spread over a large area. The main surface visibility in the area was a tree planting easement along the eastern side of the Hume Highway. The relatively high surface visibility within the easement was a result of telecommunication cable installations and a vehicle access track. Site HB1 covered an area of approximately 650 m north-south and 150 m east-west (c.100,000m^2). Within this area, a total of 15 artefacts were identified.

Plate 2. Artefacts from HB2 and general location of HB3 north of the drainage channel

HB3

Site HB3 was located across a broad, gently sloping terrace landform. The surrounding area was generally flat, with occasional well incised ephemeral drainage lines leading north/northeast towards Ten Mile Creek. The stable terrace landforms across the area are likely to exhibit an increased probability of archaeological deposit integrity, with relatively high survivability of artefacts. Site HB3 was located immediately north of HB2, the two sites were separated by a slight elevation change – HB2 was situated on a slightly higher level of the terrace.

Site HB3 consisted of a scatter of artefacts. The main surface visibility in the area was a tree planting easement along the eastern side of the Hume Highway. The relatively high surface visibility within the easement was a result of telecommunication cable installations and a vehicle access track. In the southeastern portion of site HB3 was a large, vegetated area that extended eastward into the surrounding cleared paddock. This vegetated area contained a number of very large, remnant river red gum trees.

Site HB3 covered an area of approximately 400 m north-south and 150 m east-west (c. 60,000m^2). Within this area a total of five artefacts were identified.

HB4

Site HB4 was located across a broad, gently sloping terrace landform. The site was bordered to the north and west by low-lying areas associated with the Ten Mile Creek floodplain. To the west of the site was a low-lying area that was likely to have been a swampy/marsh area (Doodle Coomer Swamp) during wetter periods. Bordering the northern margin of the site was an ephemeral (recently formed) unnamed 3rd order tributary of Ten Mile Creek. The northwestern point of site HB4 overlooked the confluence of the 3rd order tributary and the large low-lying area. Some artificial drainage works in the area appear to direct ephemeral flows from the 3rd order tributary along the eastern margin of the low-lying area for a more direct flow to Ten Mile Creek.

Site HB3 and HB4 is located on the same terrace landform which has been artificially bisected by the Hume Highway. Otherwise these two areas are the same landform (site). The stable terrace landforms across the area are likely to exhibit an increased probability of archaeological deposit integrity, with relatively high survivability of artefacts.

Site HB4 consisted of a scatter of artefacts over a large area. Them main surface visibility was at the break of slope in the northwestern portion of the site bordering the 3rd order tributary. Surface visibility over the remainder of the site was around 30%. The site covered an area of approximately 400m north-south and 200m east-west (c.80,000m^2). Within this area a total of eight artefacts were identified. Subsequent test excavation identified significant quantities of artefacts.

The site is of particular archaeological significance because of the relationship with the swamp. It is a rare opportunity along the Hume to investigate the relationship between Aboriginal occupation and swamp based resources.

Plate 3. HB4 facing south from the drainage channel looking towards the raised landform that is the site

Plate 4. Subsurface cutting north of HB4 showing homogenised alluvial deposit

HB5
Site HB5 was located across a gently sloping floodplain landform bordered to the south by Ten Mile Creek. The margins of the creek, including the southern portion of the site, consisted of moderate to dense vegetation. The site was bordered to the north and east by a works depot with associated impacts from buildings, heavy machinery and mounds of building material/fill.

Site HB5 covered an area of approximately 140m north-south and 80m east-west (c. 11,000m^2). A scatter of artefacts was identified over an exposure in the northeastern corner of the site. The exposure was a heavily disturbed area that appeared to consist of dumped material forming a slightly raised area above the surrounding grass cover. Despite the evident impact to surface of the site the subsurface (alluvial sodosols) of HB5 appeared to be relatively undisturbed, and representative of a prominent position above Ten Mile Creek. A total of six artefacts were identified across the disturbed exposure at site HB5.

Test excavation of this site confirmed the presence of significant archaeological deposit situated in a remarkable undisturbed context.

Plate 5. Exposure located at HB5 (above) and scarred tree HB6 (right)

HB6
Site HB6 was located on a flat floodplain landform approximately 250 m north of Ten Mile Creek. The surrounding area was largely cleared of vegetation, with only isolated or small stands of trees remaining.

Site HB6 was a south facing scar on a Yellow Box tree located approximately 8 m north of [redacted]. The tree was in relatively good condition and approximately 25 m high. The scar was an elongate shape, measuring 1.30 m long, 40 cm wide and 20 cm thick.

HB7
This site is located west of the road leading to the Holbrook tip and just south of the disused railway line opposite [redacted]. Site HB7 comprised two quartz artefacts found at the western edge of Holbrook, 45 to 50m north of a 1st order drainage depression, a tributary of Ten Mile Creek which is 600m further to the south. The artefacts were found 4m apart on an unsealed road verge. Exposure was patchy between grass with visibility up to 50%. The verge had been disturbed by grading and used by travelling stock. HB7 is associated with the springs and mounds of HB8 located to the north.

HB8
This site is located west of the road leading to the Holbrook tip and just south of the disused railway line opposite [redacted]. A collection of artefacts was found on a series of low level mounds in association with a drainage channel/springs flowing into Ten Mile Creek. This landform represents a smaller scale version of the landform associated with HB4. Both HB8 and HB4 offer an opportunity to investigate relatively well watered areas (swamp and springs) which have been little explored by previous archaeological investigations. Subsequent test excavation confirmed a significant but dispersed collection of artefacts associated with the billabong creek/channel. The site is in good condition with an alluvial soil displaying little degradation. The site has high archaeological significance.

Plate 6. HB8 showing the raised surfaces (exposures) separated by drainage channels (dark green)

Plate 7. Billabong as part of the drainage system of HB8

HB9
This site is located west of the Holbrook sewerage treatment tank. Site HB9 comprises a scatter of 10 quartz artefacts found over a 7m x 2m area the south wall of a small dry dam. The dam has been cut into lower hillslope overlooking a drainage basin, possibly a former wetland. Visibility along the south-west edges of the 40m x 20m dam was up to 80%. A cutting on the opposite (eastern) side of the dam exposed the natural soil profile of the slope, a pale grey brown loam over yellow clayey subsoil. Yellow clay from the excavation of the dam has been dumped on the opposite side to create the southern dam wall. This wall has inverted soil profile, with yellow clay over topsoil.

Plate 8. Dry dam associated with HB9. Artefacts eroding from the southern (left) wall

HB10
Site HB10 is located on the crest of a hill at [redacted] north west of Holbrook. Site HB10 comprises an open scatter of 10 quartz artefacts, exposed on a cleared and ploughed hilltop paddock over a c.25 x 10m area. The site encompasses at least 25,000m^2. Four artefacts were in a 3m² area. Visibility on exposure between plough furrows was c.20%, limited by pasture grasses and lucerne over red brown soil. The site is estimated to continue out to the west, south, and north for at least 100m encompassing the level to slightly sloping crest area. This site exhibits high archaeological significance as the soil matrix (on residual hills) is conducive to artefact survivability and the location represents high cultural value.

HB11
This site is a disturbed collection of artefacts [redacted] Site HB11 comprises a small scatter of six quartz artefacts, all exposed on the northern edge of an excavated dam. Five artefacts were within 1m², with another found two metres to the east. Visibility was high (>80%) on exposure which was limited by grass tufts, Patersons curse, and small manganese gravels. Soils were pale brown fine sandy loam podzolic soils. Surrounding visibility was zero due to pasture grass cover. The site covers approximately 10,000m^2. The site is assessed as being derived from colluvial and erosional forces which have been concentrated during the dam construction. Due to the moderate gradient and erosion prone soils the site does not exhibit archaeological potential.

HB12
This site is an isolated quartz artefact [redacted] The location offers extensive views of country to the south. Visibility was high (c.60-70%) on a 6m wide x c.50m exposure around the dam edges. Visibility was

limited by grass tufts. Soils were pale grey brown sandy clay loam over yellow clayey subsoil, with no local rocks noted. Visibility off the exposure was poor due to low pasture grass. The immediate area around the dam has low archaeological potential for further subsurface artefacts, with potential increasing upslope toward the hilltop. In general the area is a colluvial derived background scatter which is not archaeologically significant.

HB13

This artefact scatter is approximately 1.5km north of Holbrook along a westerly flowing drainage channel associated with Billabong Creek. Artefacts were found on the low slopes (fans) and raised mounds associated with the channel. Site HB13 comprises a small scatter of three quartz artefacts on a 3m wide vehicle track (two wheel tracks each 1m wide, and central strip). Length of exposure was c.100m with the overall site covering an area of approximately 20,000m^2. Two artefacts were within 1m², and another artefact two metres further north. This is within 50m of the confluence of two dry ephemeral creek gullies. Exposure off the track was 0-10% due to grass cover. The soils in this area are transferral with gently inclined footslopes and fans which tend to suffer from erosion and have localised waterlogging. Archeologically these soils are unsuited to artefact survivability, but the slightly raised surfaces near the channel indicate marginally better conditions as expressed by the identified artefact scatter. Subsequent test excavation of the site identified a low density scatter of artefacts which have been impacted by colluvial and erosional forces. Based on these findings the significance of the site was determined to be low.

Plate 9. HB13 facing south towards Hillview. Artefacts were recorded along the track bisecting terrace/banks

6 Holbrook Test Excavation Results

The Holbrook test excavation program was designed to be systematic and comparable with previous test excavation programs both local and regional, and especially with the test excavation for the Hume Highway Duplication Project. Excavation was undertaken at four locations as identified through survey (section 5.3) with the aim to test the extent and significance of Aboriginal archaeology within the Holbrook bypass corridor. The excavation methodology was presented at an AFG on 11th February 2009 (KNC 2009). The test program commenced on 23rd March and finishing on 17th April 2009. Each excavation summary shown in this section is outlined in a similar manner detailing: aims, methods, personnel, results and site based summary. A quick reference text box is also provided to allow a quick comparison between sites (from this and other test programs).

6.1 Test Area 18 (TA18) – HB4

Date work commenced: Thurs 2nd April 2009
Date work completed: Fri 17th April 2009

Aims

This test area is located approximately 1km south of Holbrook, on the western side of the Hume Highway. The subject land is a cleared paddock [redacted]. Current land-use is cattle grazing. During a pedestrian survey in 2008, a low density of quartz artefacts was identified exposed along a stock track and named site HB4. Landform is a remnant terrace, elevated above alluvial flats and a former swamp. A fenced paddock encompassing this prominent landform between the highway and the swamp was highlighted as Test Area 18 (TA18). There are views from the study area of Morgans Ridge (formerly Yarra Yarra Wildlife Refuge), a large granite outcrop 7.5km to the east. During the 1960s drainage channels were excavated to convert the swamp to grazing land, and contour banks created along the eastern margins to direct runoff. A westerly running gullied channel cuts across flats to the north of the test area. This directs water from a culvert under the highway, which was raised due to period flooding [redacted] The test area is mostly level, with gentle slopes to the north (to alluvial flats), and moderate slopes to the west (to swamp). The paddock is mostly cleared except for a few old growth River Red Gums in the southern half. There are many large River Red Gums scattered across the swamp to the west. At the time of excavation ground cover was patchy low dry pasture grass.

TA18 *Quick Reference Guide*	
Test Squares / Artefact Density	**Landform / Elevation**
32 squares 10.56 artefacts/m^2	Terrace above former swamp/ 263m AHD
Grid Area/ Sample Size	**Soil**
4050m^2 0.008% (of grid)	Alluvial-Sandy Clay Loam onto yellow clay subsoil.
Artefacts Total/Range	**Distance to Water/Type**
338 total artefacts 1-97 artefact range	880m/Ten Mile Creek, 50m/Former Swamp

The test area is part of the broad Billabong Creek Valley Plains physiographic region, specifically Mountain Creek Alluvials. Landforms in this region comprise broad, gently undulating alluvial plains, with terrace sequences and narrow drainage lines. Soils of the test area are mapped as the Mountain Creek Soil Landscape with the exception of the swamp derived Doodle Comer deposit. Local geology comprises unconsolidated riverine deposits of clay, silt, sand and gravel on floodplains, ancient channel deposits, and alluvial terraces (Doughty 2003:117).

The nearest major watercourse is Ten Mile Creek, c.880m to the north. This is a tributary of the westerly draining Billabong Creek system. Prior to European land modifications, the swamp would have provided seasonal standing water, as well as being a focal point for birds and mammals. The swamp is fed by a 1st order drainage line and runoff. Freshwater mussels have been reported on western margins of the swamp. A 2nd order tributary of Ten Mile Creek also lies east of the highway, draining to the north-west.

Two impact corridors are proposed to run through the 450m long test area. One is the main bypass route through its north-eastern corner, c.60m wide, and the other is a potential off ramp through the western half of the paddock, c.30-60m wide. Testing focussed along this off ramp corridor. The excavations aimed to investigate the likelihood of subsurface archaeological deposits on this landform and if found to assess their nature and intactness.

Plate 10. TA18 (HB4) test area with Doodle Coomer Swamp on the right and highway left

Methodology
Testing was carried out over a period of 10 days between 2nd April and 17th April 2009 (excludes Easter holiday - Friday 10th to Monday 13th April). A baseline transect (480 Easting) was laid using an automatic level, following the proposed off ramp centreline, in a north-south direction. A GPS reading was taken at 0527480E 6045347N (changed to 345N) with elevation at 263m AHD. Test pit locations were flagged at 15m grid intervals. A second transect (465 Easting) was placed to the west of the baseline, with test pits staggered. A total of 32 test squares (1x1m) were hand excavated at TA18, over a 270m x 15m area. All pits were dug in 20cm spit intervals to an average depth of 35cm.

All wet sieving was carried out in the one location, at the top of slope on the western edge of the test area. Sieving was through nested 2.5mm and 5mm sieve screens, utilising a water truck. All stone at the sieves was bagged for further inspection as there were few coarse fragments in the deposit. Section drawings and photographs were completed for all 32 squares. A real height of 263.036m was recorded by registered surveyors on the most elevated part of the site, 3m south of test pit 480E 330N.

Personnel present on site:
Project Archaeologist / Site Manager: Mark Rawson
Archaeological Assistants: Anne-Marie Beavis, Michael Jackson, Kylie McDonald, Tristram Miller.
Aboriginal Representatives: Rupert Clark, Muriel (Denise) Hampton, Michael Ellis, Darrell Maynard, Margaret Berg, Janice Considine (Freeman), Jessica Berg.

Table 3. Summary findings for TA18

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefacts	Scraper	Geometric	Retouched / Usewear	Average Density / m^2
32	338	1	5	1	4	0	3	10.56/m^2

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	330	2	0	0	0	3	3

Summary of Results

Testing confirmed the presence of intact subsurface archaeological deposit at TA18. Artefacts were found in all 32 test pits excavated. A total of 338 artefacts have been identified in the preliminary analysis, resulting in a moderate average density of 10.56 artefacts per/m². This is skewed by one pit which had a localised high density of 97 artefacts (480E 315N). Excluding this pit, the overall density would be only 7.8 artefacts per /m².18 (56%) of the 32 test pits produced less than 10 artefacts each.

Artefacts were predominantly small quartz debitage such as flake fragments, flakes and angular fragments. A few cores and tools were encountered. Only one backed artefact was found.

Spatial distribution shows some patterning, with the six northern most pits, on sloping ground and shallower soils, producing only 2 or less artefacts per/m² (465E 395N, 410N, 425N, and 480E 405N, 420N, & 435N).

The localised high density (480E 315N) is situated on the most elevated part of the landform, approximately 15m north-west of a tall dead river red gum. Artefacts, all of quartz, were from at least two knapping events. The next highest densities were 19 artefacts each in test pits 465E 260N in the south, and 480E 360N in the north. In 465E 260N, 17 artefacts were from the top 20cm of deposit and included small flakes and flake fragments of good quality quartz as well as two bipolar pieces.

Some pits showed evidence of former ploughing in the top 15cm, with wavy boundaries under the uppermost unit. Bioturbation from insect burrows was common throughout the deposit. There were a relatively few tree roots encountered. These penetrated into basal clay (480E 225N), and in 480E 330N a buried and burnt tree base was encountered 15cm below surface, with a taproot channel extending 1m deep into subsoil.

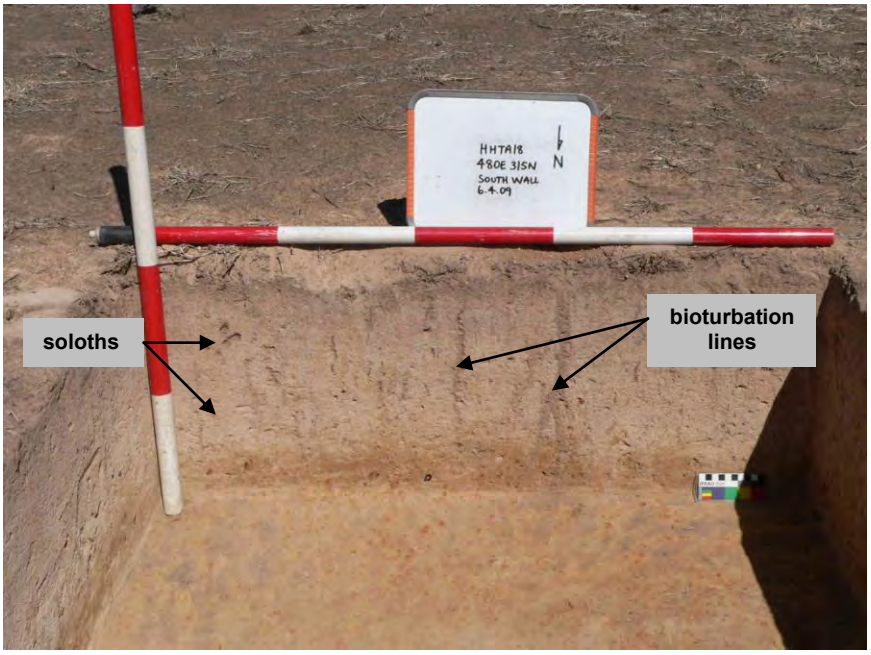

Plate 11. HB4 subsurface with evident soloths indicating a relatively stable alluvium with active bioturbation

Material
Testing revealed a fine sandy clay loam (alluvial) with only minor soil inclusions such as small rounded quartz pebbles (<0.8cm), occasional ironstone (up to 2cm), and manganese nodules (up to 2.2cm). Only one European item was found during the excavations, a fragment of blue glaze "Chinese" porcelain, in Spit 1 (0-20cm) of 480E 210N.

Average soil depth to non-artefact bearing clay was 35cm, ranging from 30cm on northern gentle slopes, to a maximum of 55cm at the southern end of the 480E transect. Basal relief was also more undulating to the south (e.g.480E 210N, 480E 195N, 480E 225N). Soil profiles showed three clear units (soloths) comprising a brown to grey-brown topsoil (A1) grading to a bleached zone with ferro-manganese nodules (A2), onto yellow clayey subsoil (B) also with orange manganese nodules. Ferro-manganese nodules appeared from about 20cm depth and continued into basal clay.

Lithics
The majority of artefacts at TA18 are of quartz (n=330 or 97.6%). A very low proportion of other raw materials were represented (n=8 or 2.4%), which includes 2 quartzite, 3 fine grained siliceous, and 3 igneous. These were all isolated and not associated with knapping events. One of the FGS is a translucent green material (Spit 1 of 480E 255N). This is identical to one artefact found at TA19, next to Ten Mile Creek, 880m to the north. One flake of brown quartzite was found at 14-17cm depth in Spit 1 of 480E 255N. Two speckled grey igneous items, possibly fragments of a ground hatchet head, were found in Spit 1 (0-20cm) of 465E 245N.

Most of the quartz artefacts were of good quality translucent white or grey quartz, with zero cortex, and small in size (<2.5cm) suggesting rationing of raw material. A few larger artefacts were of poorer quality veined quartz.

There was evidence of both freehand and bipolar knapping of quartz at TA18. One relatively larger flake (3.2cm) of fine banded quartz with a unifacially flaked plain platform was found in Spit 1 of 465E 275N. A larger knapping event in 480E 315N included freehand reduced good quality quartz bladelet fragments, angular fragments, and small flakes, some with prepared faceted platforms indicating alternating flaking techniques. One small core of opaque white quartz was found, in Spit 1 of 480E180N. It was well reduced, rotated, and only 2.4cm in size.

Five quartz bipolar cores were also identified, also suggesting raw material conservation. One of these was of fine crystal quartz, in Spit 1 (0-20cm) of 465E 410N. Other bipolar cores were found in Spit 2 of 480E 360N, and one bipolar core in Spit 1 of 480E 240N measured only 2.5cm in length.

Of tool types, only one backed artefact was identified at TA18. This is of fine clear crystal quartz, from Spit 2 (20-40) of 465E 275N, was isolated and not associated with a knapping event. Clear quartz artefacts tend to be more common at sites to the south of Holbrook.

Four other tools, all of quartz, have so far been identified from two test pits towards the southern end of the test area. Two were in 480E 165N (Spit 1), and two in 480E 210N (Spit 2). In 480E 210N, both were of poorer veined and waxy quartz, one a large utilised flake (6cm) provenanced at 24cm depth, and another flake (4.5cm) provenanced at 28cm. At least 3 other retouched quartz items have been identified (465E 365N Spit 2, 465E 320N Spit 2, 480E 270N Spit 1).

In addition to flaked stone, a few unmodified fragments of granite were found at TA18. These might be manuports or possible historical contaminants (465E 380N Bulk 0-30cm, 480E 360N 10-20cm). A large granite intrusion outcrops around 7km to the east of Holbrook.

In general, the initial field analysis of TA18 identified a few moderate density quartz knapping events, one high density event (480E 315N), quartz bipolar cores, one backed artefact, a few isolated larger flake tools of poorer quality quartz, and a few non-quartz artefacts (n=8).

The four isolated flake tools were found towards the southern end of the 480E transect (480E 165N & 480E 210N). These are slightly reminiscent of artefacts and material found in previous excavations to the south of Holbrook near Mullengandra (e.g. site M21). They are of poorer quality veined quartz, would have been handheld, and may be older than the bulk of quartz artefactual material at TA18.

Plate 12. Aboriginal community investigating their cultural past

Table 4. Test squares and artefact densities TA18

Easting	Northing	Total	Easting	Northing	Total	Easting	Northing	Total
465	245	**6**	480	165	**15**	480	360	**19**
465	260	**19**	480	180	**14**	480	375	**1**
465	275	**12**	480	195	**6**	480	390	**11**
465	290	**6**	480	210	**11**	480	405	**2**
465	305	**5**	480	225	**6**	480	420	**1**
465	320	**7**	480	240	**4**	480	435	**1**
465	335	**13**	480	255	**13**			
465	350	**13**	480	270	**4**			
465	365	**10**	480	285	**6**			
465	380	**14**	480	300	**1**			
465	395	**2**	480	315	**97**			
465	410	**2**	480	330	**5**			
465	425	**2**	480	345	**10**			

Summary
Testing and the preliminary field analysis revealed generally intact subsurface archaeological deposit at TA18, with a moderate average density of 10.56 artefacts per/m². 97% are of quartz and most are of good flaking quality. The test intercepted one high density knapping event in square 480E 315N (n=97) which is likely to extend in to adjacent squares. One small quartz core and at least five bipolar quartz cores at TA18 are all suggestive of careful conservation of good quality quartz, all brought some distance from an unknown source to the site. Small parallel sided flakes with careful platform preparation also suggest systematic stone reduction and conservation. One partly backed artefact of crystal quartz was found indicating some on site manufacture. At least four flake tools and three other retouched items indicate on site tool use. Two possible hatchet fragments also add to the range of site activities. At least eight artefacts are of rare non-quartz raw materials which are worthy of further investigation.

Soils within the tested area averaged 35cm depth, with a few pits in the south encountering deeper deposit, and pits on the northern slopes encountering shallower deposit. While there was some evidence of former ploughing in the top 15cm, the artefact bearing portion of the deposit is generally intact. The highest density square was located on level ground on the most elevated part of the terrace landform, in the vicinity of an isolated dead eucalypt. There is good potential for further intact artefacts to be found here. Further work may help to answer research questions related to prehistoric occupation and exploitation of swamps in the region, and occupation in the upper catchment of the Billabong Creek system in general.

6.2 Test Area 19 (TA19) – HB5

Date work commenced: Monday 23rd March 2009
Date work completed: Thursday 2nd April 2009

Aims

This test area is located on the western outskirts of Holbrook, 750m from the Hume Highway, [redacted] adjacent to Ten Mile Creek. The block is accessible via Culcairn Road and through the works depot. A low density scatter of quartz artefacts was located here during a pedestrian survey in late 2008 and named site HB5. Landform is a level terrace overlooking the northern banks of Ten Mile Creek, a major westerly flowing watercourse and tributary of Billabong Creek. The test area is mapped within the Mountain Creek Soil Landscape which comprises broad alluvial plains with old terrace sequences. There is a lower active floodplain below the test area terrace comprising laminated sands (stratic rudosol). The subject land is mostly cleared except for three groves of regrowth Yellow Box and River Red Gum. Ground cover was dry pasture grass in clearings and leaf litter in regrowth. Most vegetation occurs along the creek e.g. Grey Box, River Red Gum, Acacia, and weed species such as Blackberry, Mimosa, and Willow. To the east is a highly disturbed council stockpile area with mounds of concrete, blue metal, and demolition fill. The test area has suffered variable disturbance from compaction by vehicle activity indicated by uneven ground. [redacted] Across the centre of the test area (NE to SW) is an excavated drainage channel, 2m wide x 100m long, and parts of the site has furrows running north-south. At the southern end is a large depression, possibly machine excavated, or a backwash area/former channel. The extent of disturbance to soils across the terrace was difficult to assess however based solely on surface manifestations. Testing was required to investigate the likelihood of subsurface archaeological deposits on this landform, and to assess their nature and intactness.

TA19 *Quick Reference Guide*	
Test Squares / Artefact Density	**Landform / Elevation**
23 squares 5.26 artefacts/m^2	Alluvial Terrace c.250 (<260m) Ahd
Grid Area/ Sample Size	**Soil**
4,500m² 0.005% (of grid)	Alluvial. Sandy clay loam. No coarse frags except ferro-manganese nodules.
Artefacts Total/Range	**Distance to Water/Type**
121 total artefacts/ 0-21 artefact range	0-60m / Ten Mile Creek

Methodology

Test excavations were carried out over a nine day period between 23rd March, and 2nd April 2009. The proposed bypass corridor runs through the paddock from its south-east to north-west corners (c.30-60m wide, by c.125m long). A baseline was laid parallel to an existing north-south fence along the eastern edge of the test area. Pit locations were logged with a hand held GPS and flagged at 15m intervals. Three more parallel transects were placed west of the baseline to encompass the width of the impact corridor and landform. A total of 23 test squares (1 x 1 m²) were hand excavated in 20cm spits. Wet sieving was carried out over the excavated drainage channel using nested 2.5mm and 5mm sieves, and a water truck.

Personnel present on site:
Project Archaeologist / Site Manager: Mark Rawson
Archaeological Assistants: Anne-Marie Beavis, Michael Jackson, Tristram Miller, Kylie McDonald.
Aboriginal Representatives: Rupert Clark, Muriel (Denise) Hampton, Michael Ellis, Darrell Maynard, Margaret Berg, Janice Considine, Jerrawa Freeman

Table 5. Summary of findings TA19

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefacts	Scraper	Geometric	Retouched / Usewear	Average Density / m^2
23	121	0	0	2	0	0	0	5.26/m^2

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	120	0	0	0	0	1	0

Plate 13. View of TA19 (HB5) facing north with the bend in Ten Mile Creek on the right marked by trees

Summary of Results

Testing confirmed the presence of subsurface archaeological material at TA19. Most pits showed some disturbance to the upper 10cm of deposit, but were largely intact below this. A total of 121 artefacts were recovered from 23 test pits. Average artefact density was low at 5.3 artefacts per/m². Highest densities were encountered in test pits 475E 430N (n=21), 490E 440N (n=17), and 490E 485N (n=17). Three pits had zero artefacts (445E 485N, 460E 495N, and 490E 470N).13 pits produced less than 5 artefacts each.

All squares showed some level of disturbance to the upper part of the soil, including removal and or compaction. Pits on the baseline (490E) were more compacted than other transects. Recent grader scrapes were visible on parts of the site. One pit at the southern end (490E 425N) had a profile of compacted cracking yellow clay with no topsoil. At least 15 of the total 23 pits had recent European inclusions such as bottle glass, brick fragments, and occasional metal. This was confined to their top 10-15cm. The most disturbed was one northern pit (460E 510N) which had fill to 25cm depth. Other pits nearer the tree groves had tree root disturbance mostly in the top 10-15cm (445E 450N, 460E 450N, 460E 465N). Large roots were also found within basal clays (475E 505N, 445E 468N).

Soil pH at TA19 was generally acid, ranging from 4.5 to 5.5, and soil colour was typically brown to grey brown (10YR 7/2) grading to a paler bleached grey deposit (10YR 7/1) onto yellow or red basal clay.

Material

There were few natural soil inclusions except for manganese nodules and some small quartz gravels (less than 1cm in diameter). This lack of background stone made artefact identification easier at TA19. No useable local stone was encountered. Deposits comprised fine sands (sandy loam to sandy clay loam) over manganese rich clay subsoils. Soil profiles exposed by gullying in nearby Ten Mile Creek showed deep alluvium (up to 3m) with orange stained and gleyed clays with manganese nodules. More recent deposits occur on the adjacent active floodplain with sections exposing stratic rudosols of interbedded sands and silts.

Soil depths to non-artefact bearing clay ranged from 24cm in the northern half, to up to 84cm in the south, with an average depth of 40cm. Variable topsoil disturbance ranged from 10 to 20cm, although deposit below this was more intact than surface manifestations suggested. Profiles were typically two units comprising an upper mid brown unit (A1- 0 to 10/15cm) grading to a bleached unit with orange-brown ferro-manganese nodules (A2). Deeper deposit with more intact profiles was encountered on the edge of a large depression at the southern end of the tested area (465E 420N & 475E 430N).Test pit 475E 430N reached 60cm depth to clay, and pit 465E 420N had largely intact soils to 84cm depth. There were little or no natural soil inclusions except for ferro-manganese nodules at around 20-25cm depth. There was little or no charcoal found that could be dated.


Plate 14. Test squares at TA19 showing the less disturbed bleached soils above the bend in the creek

Lithics

A total of 121 artefacts were identified in the preliminary analysis, producing an average (low) density of 5.26 artefacts per/m². Most of these (n=85 or 70%) were from the top 20cm of deposit (Spit 1).Quartz makes up the entire assemblage except for one small flake of an unidentified green fine grained siliceous rock, found in Spit 2 (20-40cm) of 465E 420N. Spatially there appears to loci of stone working activities in pits 475E 430N, 490E 440N, and 490E 485N.

Overall, the majority of artefacts were small knapping debitage (<2cm) of good quality translucent white or grey quartz. These included small flakes, flake fragments (a few microblade portions), and angular fragments. Almost all artefacts had zero cortex, suggesting extensive reduction, rationing and/or distant stone source. No cores were identified. The only diagnostic tool types were two partly backed artefacts in Spit 1of 490E 485N**,** as well as 14 debitage pieces of fine translucent quartz. One fragment of a ridge straightening flake was found in Spit 1 of 490E 425N. One bipolar piece was found in Spit 1 of 445E 468N.

In Spit 1 of 490E 440N and 475E 430N were small knapping events of fine quality translucent white quartz. There appears to be a preference for this finer material for production of small elongate flakes (<2cm) probably intended for backing. As there is no background quartz on this landform, all artefactual material must have been brought in from an off site source. Initial results suggest that while different quartz varieties were used, of varying translucence and flaking quality, the majority was good quality translucent white or grey quartz.

A few provenanced artefacts were found. In 490E 440N two artefacts were provenanced at 20cm depth. In 490E 485N, three were provenanced, one at 15cm and two at 19cm.


Plate 15. Processing the deposit and hand excavation at TA19

Table 6. Test squares and artefact densities TA19

Easting	Northing	Total	Easting	Northing	Total	Easting	Northing	Total
445	450	**1**	460	510	**4**	490	398	**1**
445	468	**4**	465	420	**10**	490	425	**2**
445	485	**0**	475	430	**21**	490	440	**17**
445	500	**4**	475	445	**5**	490	455	**8**
460	450	**3**	475	460	**3**	490	470	**0**
460	465	**2**	475	475	**8**	490	485	**17**
460	480	**4**	475	490	**2**	490	515	**3**
460	495	**0**	475	505	**2**			

Summary

The test excavations and interim field analysis at TA19 has revealed a low density of 121 artefacts from 20 of 23 test pits excavated. 99.2% of these were of quartz. Average density is 5.26 artefacts per/m², with localised higher densities of 21 (475E 430N) and 17 artefacts (490E 440N & 490E 485N). Spatial distribution shows that the highest densities were encountered at the southern end of the test area (475E 430N & 490E 440N) closer to Ten Mile Creek (90m north of present channel). Another higher density square was c.45m to the north (490E 485N). The majority of the assemblage was small debitage less than 2cm. A few localised small knapping events were found, all of fine quality translucent quartz. Only two diagnostic tools have been identified, both partly backed flakes probably intended as Bondi points. No cores or other tools have been identified.

Soil profiles (average 40cm deep) indicate variable topsoil disturbance from previous earthmoving and erosion. Recent European material is confined to the upper 20cm of deposit, particularly within the top 10cm. High flood events are also likely to have occurred here. However, soils had intact profiles below this. The likely depth of the main artefact bearing deposit is around 15-25cm. There is potential for more artefacts to be recovered on this landform. Additional archaeological information could be gained about prehistoric use of this terrace landform from further investigations. However there is still moderate to good potential for dateable material to be found. Further work could investigate deeper deposit at the southern end of the test area. This was relatively intact and may have potential for stratification.

6.3 Test Area 20 (TA 20) – HB8

Date work commenced: 24th March 2009
Date work Completed: 3rd April 2009

Aims

HHTA20 *Quick Reference Guide*	
Test Squares/ Artefact Density	**Landform/Elevation**
33 squares 4.2 artefacts/m²	Flood Plain/Wetlands
Grid Area/ Sample Size	**Soil**
7,000m² 0.005% of Grid	Sandy – silty compacted silt and clays
Artefacts Total/Range	**Distance to Water/Type**
137 total artefacts 0-19 artefact range	10m / creek - waterhole

Test Area 20 (TA20) is located on the western boundary of the town of Holbrook, approximately 1.1km from the current Hume Highway. Pedestrian surveys undertaken in 2008 identified a number of quartz artefacts along an exposed track running adjacent to the southern fence line, and on a slight slope in close proximity to one of the main drainage lines bisecting the site. The site is situated on a low lying alluvial plain and incorporates a number of waterholes, or ponds, with associated drainage systems. The area investigated included two separate raised areas, east and west, separated by a drainage line, with two moderate to large ponds forming the northern boundary, east and south delineated by fence lines, with the western boundary delineated by modern farm structures. The paddock has been extensively cleared, although several isolated mature native trees still remain. The current use is for sheep grazing. It is important to note that the ponds are essentially natural formations, although some modifications to the general structure are apparent, such as dredging and widening of the natural form. The aim of the test excavation was to determine the presence of subsurface archaeological material, and to determine the integrity and extent of such deposit.

Methodology

The proposed impact corridor runs approximately north to south across the site, incorporating land to the north and south of the natural ponds. It was determined that the main area of investigation would be the land to the south of the ponds, due to the relatively well delineated landform (low raised areas) and the presence of artefacts located during the survey. The site is bisected by a drainage line running north to the main pond, thus the site was split into eastern and western sections. Four transects were excavated in the western section. Running from the southern fence line to within 20m of the main drainage line and ponds. Two transects were excavated within the eastern section, with pits located within 5m of the drainage system.

Test squares (1m²) were spaced 15m apart along transects running north to south, with test squares and transect staggered across the width of the impact corridor (5m offsets). A total of 33 test squares were excavated to basal clay or to a depth of deposit which was determined to be culturally sterile. All test squares were excavated in spits to determine the vertical distribution of artefacts within the deposit. Spits were predominately dug in 20cm intervals, although two test pits (040E 285N and 040E 300N) were excavated in 10cm spits to provide a higher definition of the vertical distribution of artefacts. The majority of artefacts were located at a depth of between 0-20cm. The depths of the test squares varied across the site, with squares in the eastern section generally shallower (average of 20-30cm), particularly near the fence line, with squares in the western section averaging between 35-40cm with the deepest being approximately 60cm.

All excavated deposit was wet sieved using nested 2.5mm and 5mm mesh screens. Artefactual material and related background material was collected and underwent preliminary analysis on site. All material was recorded and labelled accordingly for further in-depth analysis. Where possible, charcoal samples were collected with detailed provenancing, plans and photographs. All test squares, including all sections and base plans were photographed, with detailed section drawings of selected test squares. Finally, a site plan was completed showing placement of test squares in relation to prominent landform features and contours.

Personnel present on site:

Senior Archaeologist / Site Manager: Brent Levy
Archaeological Assistants: Jaclyn Ward, Wayne Brennan, Brian Armstrong, Amy Wood, Ben Anderson.
Aboriginal Representatives: Ramsey Freeman, Lindsay Connelly, Enid Clarke, Keith Freeman, Darren Williams, Krystal Ingram, Kevin Williams.

Plate 16. TA20 facing northeast towards Holbrook

Table 7: Summary of findings for TA20

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefact	Scraper	Geometric	Retouched / Usewear	Average Density / m²
33	137	7	4	1	1	0	4	4.2 / m²

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	130	1	0	1	4	0	1

Material

Quartz was the predominant raw material recovered during the test excavation, accounting for 94.8% (n=130) of the assemblage. Other material recovered included chert (n=4), silicified tuff (n=1), quartzite and one of unknown material, possibly chalcedony. The quartz recovered ranged from very high quality, milky crystalline artefacts, to moderate to poor milky quartz with either large crystalline structures or with heavy internal fracturing. There was very little other naturally occurring quartz, with most natural gravels being small rounded to sub-angular quartz gravels, generally less than 15mm in size and occurring in very low concentrations (e.g. no naturally occurring gravels above 3mm in test pit 025E 305N). These gravels are consistent with being in a low energy alluvial environment. Similarly, there were few visible quartz gravels apparent on the surface apart from exposed areas along the track where the artefacts were first located during the survey.

The lack of visible local rock outcropping within the immediate area would suggest that the material used was introduced to the area, in particular the chert and tuff artefacts. Fluvial processes may account for some movement of artefacts from other areas, however artefacts recovered from some test pits indicate that working of material was being conducted within at least some of the site area, with only a small amount of movement from their primary positions (such as conjoined artefacts from 040E 285N).

Plate 17. Soloths displaying a high level of stability within the (relatively young) yellow dermosols

Lithics

A total of 137 artefacts were recovered during the test excavation with an average density of 4.2 artefacts per/m^2. Five test squares contained no artefacts, while the remaining 28 squares ranged from 1 to 19, only four test squares had more than 10 artefacts (Table 3). The vertical distribution of artefacts shows that 62.0% of artefacts were recovered from the first 20cm (n=85), 37.3% from between 20 -40cm (n=51), with only 1 artefact recovered below this depth (a chert core from 025E 305N). However a number of squares, such as 040E 285N and 040E 330N, show a higher density of material located at a depth of between 20-40cm.

The use of bipolar techniques is indicated by the presence of four bipolar cores and six identified bipolar flakes, all of quartz. These bipolar artefacts were located in a number of test squares scattered throughout the site. A relatively high percentage of cores, including two chert cores, bipolar and other were also recovered, a total of 8% (n=11) of the entire assemblage. There are three cores of particular note:

1. 025E 305N: High quality chert core located at a depth of 44cm just above the basal clay, green/brown with a red/brown cortex 15%, 5 negative scars, multi-directional.

2. 130E 335N: Medium-poor quality quartz core, large heavily worked core, 78mm maximum length with a minimum of 10 negative scars, uni-facial rotated, found at a depth of 16cm and within 10m of pond.

3. 040E 285N: Medium-poor quality quartz core, broken into 3 pieces (conjoinable), 40mm length with 4 negative flake scars. Located at a depth of between 20-30cm. The breaks are not modern and indicate that there has been little movement within the deposit.

Table 8: Lithic reductions for TA20

	Core	Bipolar Core	Complete Flake	Proximal Fragment	Medial Fragment	Distal Fragment	Angular Fragment
Total	7	4	38	4	8	25	48
Percentage of Total	5.1%	2.9%	27.7%	2.9%	5.8%	18.2%	35.0%

Plate 18. TA20 excavations and sieving area

There were a number of „tools' recovered (n=6), in total 4.4% of the total assemblage. These include one backed artefact (not completely backed) from test square 135E 349N, spit 1(0-20cm) located within 10m of pond, one scraper of very high quality quartz with retouch located on platform and proximal margin, located in test square 115E 300N (spit 1 0-20cm) and four retouched artefacts with potential use-wear evident on a number of them.

Table 9. Squares and artefact density TA20

Easting	Northing	Artefacts	Easting	Northing	Artefacts	Easting	Northing	Artefacts
0995	280	2	040	285	18	115	285	0
010	280	19	040	300	1	115	300	7
010	295	8	040	315	5	115	315	0
010	310	0	040	330	15	115	330	1
010	325	4	040	345	5	130	278	1
025	275	2	055	275	5	130	290	1
025	290	1	055	290	5	130	305	0
022	305	1	055	305	1	130	320	2
025	305	1	055	320	1	130	335	12
025	320	2	055	335	7	135	349	5
040	270	4	115	270	0	145	335	1

Summary

TA20 reveals low density coverage of cultural material, with smaller areas of higher concentrations. The subsurface deposit and low levels of natural gravels within the site indicate that the area was subject to low energy fluvial events, with the sodoths soils heavily bleached and moderately compacted, with only faint traces of stratigraphic differentiation. There is only minimal European disturbance on the site, these mainly evidenced by a top 10-15cm plough-zone and small dips within the landscape, most likely caused by clearing practises. The soil profiles underneath the plough-zone appear to be intact, although some depositional and deflation processes are likely to have occurred.

Despite the low number and density of artefacts and the alluvial nature of the landscape, some areas appear to be relatively intact, as is indicated by conjoinable artefacts retrieved from a number of test squares. Artefacts also occur in close proximity to the ponds. Previous to testing the ponds were considered to have been disturbed from agricultural practices. It is now apparent that cultural material is located within undisturbed deposit immediately adjacent to the drainage lines and ponds. Further investigation may be needed to confirm this, including excavation of deposits on the northern banks of the drainage lines.

TA20 exhibits an exciting array of significant archaeological features. Moreover, in archaeological terms we can learn much about the past by studying TA20. The different raw materials and technologies identified indicate that there were a number of different cultural activities occurring over an undefined period of time with material being transported to the site and worked on site. Flooding event would have impact on much of the western part of Holbrook, but the slightly raised mounds seemed to offer enough relative elevation for archaeology to survive intact. These same raised areas would have provided the ideal landscape for utilising the resources of these areas. Further investigation of the site will provide a greater degree of understanding as to the cultural uses of this landscape.

6.4 Test Area 21 (TA 21) – HB13

Date work commenced: 6th April 2009
Date work Completed: 17th April 2009

Aims

Test Area 21 (TA21) is located approximately 3km north of the town of Holbrook along the Hume Highway. The site is located at the base of a moderate to steep slope north of a dominant ridge overlooking the Holbrook plain. There a three distinct landforms comprising TA21, these include the lower part of the slope running directly into an ephemeral creek (drainage channel), alluvial floodplain and a low lowing alluvial terrace. The eastern border of the site runs parallel to the current Hume Highway. The land has been extensively cleared and is currently used for sheep and cattle grazing, however stands of new growth trees with the occasional mature tree are clustered along the creek and within the low lying alluvial floodplain. Pedestrian surveys undertaken in 2008 located a number of quartz artefacts along a dirt track in close proximity to the creek. The proposed impact corridor runs roughly north-south, parallel with the existing Hume Highway, and encroached into the paddock approximately 100m. Testing aimed to investigate the presence and integrity of any subsurface archaeology, and to ascertain the extent of the site.

/TA14 *Quick Reference Guide*	
Test Squares/ Artefact Density	**Landform/Elevation**
32 squares 2.7 artefacts/m²	Slope / Floodplain / Terrace
Grid Area/ Sample Size	**Soil**
6,000m² 0.005% of Grid	Alluvial soloths
Artefacts Total/Range	**Distance to Water/Type**
85 total artefacts 0-7 artefact range	0m Ephemeral Creek

Methodology

As the proposed impact corridor runs north-south across the creek channel and through three distinct landform types, lower slope, floodplain and terrace, testing was undertaken on all three areas, with emphasis on the lower slope where surface artefacts were located. Constraints due to site boundaries and natural disturbances (trees, creek) limited the amount of test squares excavated on the other two landforms. In total 32 test squares were excavated, 23 on the lower slope, 2 on the floodplain, and 7 on the alluvial terrace. In the lower slope area, three transect were excavated with test squares spaced at 15m intervals, with transects spaced 15m apart and staggered by 5m. One transect was also laid out along the 841E line, and incorporates both the floodplain and the terrace. For the purpose of this excavation, the north-south line was interpreted as the direction of the transects, with an actual compass bearing of 30º.

Initial test squares on the lower slope were excavated in bulk to ascertain whether subsurface archaeology was present, with subsequent test squares excavated in 10cm spits to gain a greater resolution as to the vertical distribution of artefacts. In total six squares were excavated in bulk in this area. All test squares on the floodplain and terrace were excavated in bulk. In total 15 test squares were excavated in bulk, and 17 excavated in spits. Test squares were excavated to the basal clay, with variable depths recorded from the three different landforms. In general, the lower slope area was shallower, with and average depth of approximately 30-35cm, the floodplain and terrace areas averaged a depth of between 45-50cm, with the greatest depth of 60cm recorded in test square 836E 905N on the terrace. The majority of test squares contained very low to moderate densities of natural gravels, with only three containing high concentrations located in the southernmost areas (highest area) of the lower slope. These squares showed characteristic erosional movement of deposit from further up the slope.

All excavated deposit was wet sieved using nested 2.5mm and 5mm mesh screens. Artefactual material and related background material was collected and underwent preliminary analysis on site. All material was recorded and labelled accordingly for further in-depth analysis. Where possible, charcoal samples were collected with detailed provenancing, plans and photographs. All test squares, including all sections and base plans were photographed, with detailed section drawings of selected test squares. Finally, a site plan was completed showing placement of test squares in relation to prominent landform features and contours.

Personnel present on site:

Senior Archaeologist / Site Manager: Brent Levy
Archaeological Assistants: Jaclyn Ward, Wayne Brennan, Brian Armstrong, Amy Wood, Ben Anderson.
Aboriginal Representatives: Ramsey Freeman, Lindsay Connelly, Enid Clarke, Keith Freeman, Darren Williams, Krystal Ingram.

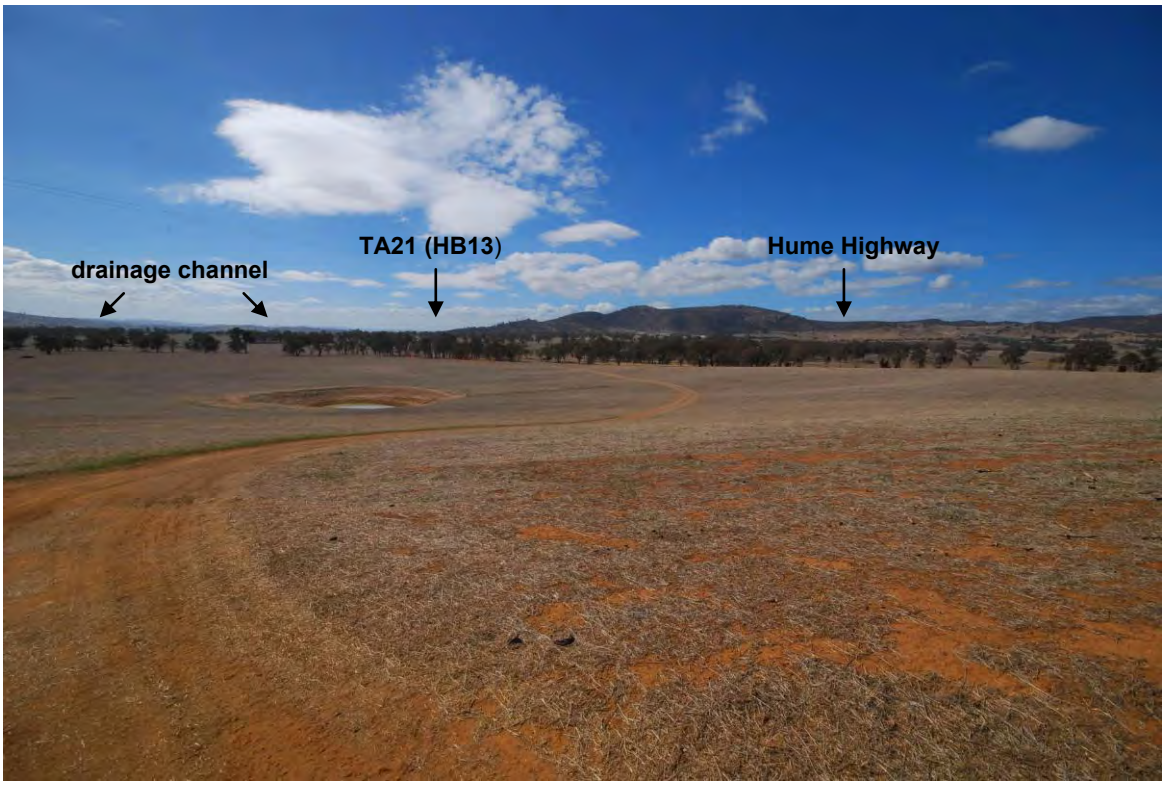

Plate 19. TA21 (HB13) general area

Table 10. Summary of findings TA21

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefact	Scraper	Geometric	Retouched / Usewear	Average Density / m²
32	85	3	0	1	0	0	1	2.7 / m²

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	82	2	0	0	0	0	1

Material

The predominant cultural raw material retrieved from the excavation was quartz (n=82, 96.5%) and two quartzite artefacts (2.5%) of a grey/pink colour. The quartz artefacts recovered were of variable quality, ranging from very good milky crystalline to moderate-poor milky with large crystalline structures and/or with heavy internal fracturing. There was very little natural quartz gravels visible on the surface, with these generally isolated to the exposed dirt track. No natural outcrops of quartz were visible in the immediate vicinity. Subsurface gravels consisted of a mixture of rounded and sub-angular quartz, mostly less the 15-20mm, mixed with small quantities of quartzite, ironstone, and igneous gravels. A number of test squares also contained iron manganese nodules. A number of test squares on the lower slope displayed evidence of erosional deposition. In general the lower slope test squares contained the highest concentration of gravels, with concentrations increasing with depth. The test squares on the floodplain and the terrace contained only low concentrations of small rounded and sub-angular gravels.

Soil deposits on the floodplain were heavily bleached and compacted with very little stratigraphy visible. It is likely that the lower slope and the floodplain have been exposed to moderate to heavy erosion, with only minimal deposition along the floodplain in recent history. The terrace appears to contain a more intact soil profile.

Plate 20. Section from TA21 showing erosional deposit from the terraces above the channel banks

Lithics

A total of 85 artefacts were identified during the test excavation, with an average of only 2.7 artefacts per/m². Of the 32 test squares excavated, 8 contained no artefactual material (25%), 6 contained 6-7 artefacts (18.8%) with the rest containing 5 or less. The highest density of artefacts (n=7) were located in test squares 755E 815N on the lower slope, and 826E 900N on the terrace, both of these squares also contained modified tools. Of the 17 test squares excavated in spits, a total of 46 artefacts were recovered predominantly from Spit 2 (10-20cm) with a total of 47.8% (n=22). Spit 1 (0-10cm) contained 37.0% (n=17) and spit 3 (20-30cm) contained 15.2% (n=7). No artefacts were retrieved from a depth greater than 30cm in squares that were excavated in spits, however 1 small artefact (AF 7mm) was located at a depth of between 50-60cm in test square 826E 905N located on the terrace.

Table 11. Lithic reduction TA21

	Core	Bipolar Core	Complete Flake	Proximal Fragment	Medial Fragment	Distal Fragment	Angular Fragment
Total	3	0	22	4	4	19	33
Percentage of Total	3.5%	0%	25.9%	4.7%	4.7%	22.4%	38.8%

Three cores were identified during the excavation, two moderate to poor quality quartz cores and one quartzite core, two of which (1 quartz and 1 quartzite) were located on the terrace, all were uni-facial (Table 2). The quartzite core located in test square 826E 900N was a complete flake with a large flake removed. The two quartz cores were less than 25mm in size, one with only one negative scar, and the other, located in test pit 841E 895N with 3 negative „blade' scars. All cores were located in pits with a higher density of artefacts: 5, 7 and 7 respectively. No bipolar cores were identified, although the use of bipolar techniques is indicated by the presence of 4 bipolar quartz flakes.

Only two tools were identified. One partially backed blade, of good quality quartz 15mm in size and located on the lower slope in test square 755E 815N (also the location of one core). The other possible tool is a retouched piece of thick dark green glass, possibly the base of a bottle, located in test square 826E 900N on the terrace. There are a number of negative scars placed at regular intervals, creating a sharp serrated edge. The retouch scars do not appear to be random or caused from crushing damage, further analysis is required to confirm this as an artefact.

Plate 21. Excavation of the southern terrace at TA21

Table 12. Square and artefact density TA21

Easting	Northing	Artefacts	Easting	Northing	Artefacts	Easting	Northing	Artefacts
750	884	5	770	765	1	785	820	0
749	889	6	771	780	4	826	900	7
755	770	1	768	795	2	826	915	0
755	785	0	770	810	2	836	905	6
755	800	0	770	825	3	841	820	4
755	815	7	770	840	0	841	850	6
755	830	2	770	855	0	841	895	5
755	845	2	785	760	2	841	910	0
755	860	1	785	775	1	841	925	2
755	875	6	785	790	0	851	910	4
755	884	5	785	805	1			

Summary

TA 21 contains a low density scatter of subsurface cultural artefacts. The three different landform types incorporated within the site show varying levels of erosion and deposition with substantially different subsurface characteristics:

Lower Slope: soil profiles indicate that a number of natural processes are occurring. These include minor colluvial movement of subsurface deposits from higher up the slope, moderate to heavy erosion on the lower slope, and alluvial deposition and erosion in areas immediately adjacent to the creek line. The presence of surface archaeology and low density subsurface archaeology can be explained by incorporating all these factors. Artefacts are likely to have moved down slope onto the site through erosional movement and artefacts are likely to have been dispersed from the terrace onto the slopes flooding. In short, there appears to be no intact archaeological deposit on this landform.

Alluvial Floodplain: Although only 2 test squares were excavated in this area, subsurface deposits indicate that there has been no recent high energy flood events in the area. There are minimal gravels within the soil, and the deposit is heavily bleached and compacted, although relatively deep at an average of 50cm. 10 artefacts were located in the test pits, although most are likely to have been deposited by fluvial processes from localities outside the site area.

Alluvial Terrace: This area appears to be the least disturbed with relatively intact soil profiles and deep deposit. Flooding and alluvial erosion are likely to have had minimal impact in this area compared to other

areas on the site due to it's slightly raised profile and relatively flat nature. This terrace continues to the north of the site boundary rising gradually. Intact subsurface archaeology is likely to occur further from the creek line, although the density will be low.

In sum, the archaeology is significant in this location, but the low densities and erosion prone soils mean that the current test program has been sufficient to mitigate the archaeology of TA21.

Plate 22. Precision excavation of the alluvial deposit at TA21

6.5 Archaeological Summary

Holbrook's archaeological past has remained hidden from modern eyes for some time. We are only now beginning to reveal these long held secrets. Survey and testing has confirmed what many Aboriginal people have always known: Holbrook was an important oasis amongst the plains. Aboriginal peoples came to the Holbrook area enroute to a further destination, much in the same way that travellers today pass through the town; however the archaeological story also shows us that some of those ancient travellers stayed in the Holbrook area for some time.

The archaeological survey around Holbrook identified 13 archaeological sites within the bypass corridor. These sites are found in a range of landforms, which effectively characterise Holbrook's landscape (e.g. creeks, swamps, springs, slopes, hills) and are therefore well placed to offer insights into the array of Aboriginal cultural activities.

Water is the controlling feature of the archaeology of the south west slopes and Holbrook's archaeological picture is no exception. Water features such as Ten Mile Creek, Billabong Creek and related springs and swamps have a direct correlation with archaeology. What is often the case along the Hume Highway corridor however, is that the very water which attracted past Aboriginal activity also washed away most of the archaeological information. Holbrook's story is different. High energy fluvial events (fast moving creeks – HB5) and static water sources (swamps – HB4, springs, and billabongs – HB8) combine to create a story about Aboriginal occupation near these important resources.

For example, sites HB3, HB4, HB5, HB7, HB8, HB13 are all related to water features. The more permanent the feature the greater frequency of artefacts, TA18/HB4, in particular, exhibited artefact densities of almost 100 per/m^2 indicating exceptional levels of occupation associated with Doodle Coomer Swamp.

Excavations at TA18/HB4 yielded a predictable high density of artefacts in association with an important water feature, but they also showed a stable soil profile even after successive ploughing events. Put simply, Aboriginal archaeology is not lost when a field is ploughed. Many forces both natural and artificial act against artefact survivability. TA18/HB4 has been impacted by flooding, erosion, deflation, bioturbation, clearing and ploughing yet a significant archaeological record remains. This surviving archaeology begins to describe a place that facilitated many different types of activities as exhibited by the range of tools and imported raw materials. Further study of this site can only increase our understanding of past Aboriginal people and their material culture as evidenced by the archaeology.

Similar to TA18/HB4 excavations at TA19/HB5 are directly related to a primary water feature, in this case Ten Mile Creek. In fact, it is a rare event for the Hume archaeological program to encounter intact archaeology so close to a high order creek. TA19/HB5 offers a chance to investigate past Aboriginal activities close to the creek and see how they differ from activities elsewhere. Excavations at Tarcutta (TA17) attempted a similar program, but were thwarted by the wide floodplain. In contrast, the relatively high energy movement of Ten Mile Creek allows for archaeology to survive because water is more contained within the main creek channel (rather than spread across a wide and active floodplain as with Tarcutta Creek).

The water based theme is continued for TA20/HB8. This excavation tested a series of flat topped mounds associated with springs located west of Holbrook. The site is in a low lying area prone to water logging but for some slightly raised surfaces which would have offered refuge. A small channel and a few billabongs highlight the mounds and offer more permanent access to water. Excavations revealed an alluvial soil displaying surprising integrity below 15cm. Artefacts displayed an array of cores from localised events. Several small scale events seem to have taken place across the mounds, perhaps over a long period of time. These events are likely one-off actions which are more difficult to locate and study archaeologically due to their individually small signatures. However in the case of TA20/HB8 because of the topography we have been lucky to capture a collection of these one-off events. Differences can be expected when we compare the archaeology of this site with other more permanent locales.

The availability of water and the stability of the soils again combine in the creation/preservation of TA21/HB13. The site is defined by a relatively featureless ephemeral channel which offers little focus for cultural activity, however a very minor raised surface/terrace along the path of the channel is enough differentiation to attract archaeological activity. Typically erosion wipes out the archaeological deposit in featureless settings, and erosion has indeed impacted this site. The terraced area however was just elevated enough to allow artefacts to remain in situ. Identified artefacts are similar to those from TA20/HB8, but whereas with TA20/HB8 we encountered several concentrations spread over the mounds, the artefacts from TA21/HB13 all come from one area and probably represent one primary short term occupation event. The effects of erosion mean that other events, if present, are now lost. A single passage in time is all that remains of TA21/HB13.

Specific to the current assessment, understanding the archaeology of the Holbrook bypass allows for an informed assessment of the proposed impacts caused by the bypass. Important short term implications stemming from the survey and test excavation program make it possible to outline mitigation measures (section 8). Recommendations for further work are dependent on assessed archaeological significance in relation to proposed impacts (section 7). The tables in section 8 outline the requirement for salvage excavation based on the results of the survey and test program.

7 Significance Assessment

7.1 Significance Assessment Criteria

One of the important primary steps in the process of cultural heritage management is the assessment of significance. Not all sites are equally significant and not all are worthy of equal consideration and management (Sullivan and Bowdler 1984, Pearson and Sullivan 1995:7). The determination of significance can be a difficult process as the social and scientific context within which these decisions are made is subject to change (Sullivan and Bowdler 1984). This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time.

Significance assessment can generally be described under three broad headings (Pearson and Sullivan 1995:7):

- value to groups such as Aboriginal communities;
- value to scientists and other information gatherers; and
- value to the general public in the context of regional, state and national heritage.

Professional guidelines for the assessment of significance (NPWS 1997) discuss two types of significance relevant to the assessment of Aboriginal sites: social significance and archaeological significance.

Cultural / Social Significance
This area of assessment concerns the value/s of a place, feature or site to a particular community group, in this case the local Aboriginal community. Aspects of social significance are relevant to sites, objects and landscapes that are important or have become important to the local Aboriginal community. This importance involves both traditional links with specific areas as well as an overall concern by Aboriginal people for sites generally and their continued protection. Aboriginal cultural significance may include social, spiritual, historic and archaeological values.

In this document cultural significance is given a relative ranking of Very High, High, Medium or Low. This ranking has been developed in consultation with key knowledge holders. All listed places hold Aboriginal cultural heritage significance and the relative ranking is designed only to assist future planning.

Scientific / Archaeological Significance
For archaeologists, scientific significance refers to the potential of a site to contribute to current research questions. Alternately, a site may be an in situ repository of demonstrably important information, for example rare artefacts of unusually high antiquity.

Scientific significance is assessed using criteria to evaluate the contents of a site, state of preservation, integrity of deposits, representativeness of the site type, rarity/uniqueness and potential to answer research questions on past human behaviour (NPWS 1997). DECCW guidelines recommended criteria for assessing archaeological significance include:

- Archaeological Research Potential - significance may be based on the potential of a site or landscape to explain past human behaviour and can incorporate the intactness, stratigraphic integrity or state of preservation of a site, the association of the site to other sites in the region (connectivity), or a datable chronology;
- Representativeness - all sites are representative of those in their class (site type/subtype) however the issue here relates to whether particular sites should be conserved to ensure a representative sample of the archaeological record is retained. Representativeness is based on an understanding of the regional archaeological context in terms of site variability in and around the study area, the resources already conserved and the relationship of sites across the landscape; and
- Rarity – which defines how distinctive a site may be, based on an understanding of what is unique in the archaeological record and consideration of key archaeological research questions (i.e. some sites are considered more important due to their ability to provide certain information). It may be assessed at local, regional, state and national levels.

High significance is usually attributed to sites which are so rare or unique that the loss of the site would affect our ability to understand an aspect of past Aboriginal use/occupation of an area. In some cases a site may be considered highly significant because it is now rare due to destruction of the archaeological record through development. Moderate/Medium significance is attributed to sites which provide information on an established research question. Low significance is attributed to sites which cannot contribute new information about past Aboriginal use/occupation of an area. This may be due to site disturbance or the nature of the site's contents.

7.2 Significance of Aboriginal Sites

On the basis of discussions with the knowledge holders, the identified cultural places around Holbrook have been assessed in terms of their cultural significance (Waters Consultancy 2009). All listed places hold Aboriginal cultural heritage significance. However, the cultural significance of the places was ranked through discussions with the relevant knowledge holder/s relative to the current proposal, to assist in future planning.

The identified cultural places range in significance rankings from Very High to Medium. The majority, however, are considered to be of Very High and High Significance.

In addition to the assessment of identified cultural places, on-site discussions with Aboriginal stakeholders has revealed a strong attachment to the area and identified that all archaeological sites, whether an isolated artefact or a larger scatter of artefacts, scarred tree or area of archaeological potential, are highly significant to them. They are evidence of their forebears who lived in this land. They have been entrusted with their protection. Scarred trees appear to have a particular sensitivity. On the basis of this, all the recorded archaeological sites are considered to be of high cultural or social significance.

The scientific significance of the recorded Aboriginal archaeological sites ranges in significance from low to high, with the majority having been assessed as being of moderate to high significance. This assessment is based on a consideration of the research potential, connectivity (association with other sites), representativeness and rarity, in accordance with DECCW guidelines (NPWS 1997). The general level of moderate to high significance is predominantly driven by the fact that all the recorded sites are considered rare in a local and regional context. That is, these sites are rare, not necessarily on the basis of site type, but because there is very little known of the archaeology of the locality and region in which they occur. For a similar reason, they can generally be considered representative. Their research potential differs, as this has been affected by the condition of the site (i.e. the more disturbed a site context is, the less research potential it has).

The integration of the cultural and archaeological information has led to an assessment of the whole bypass area being of high Aboriginal cultural heritage significance.

The proposed bypass project offers an opportunity for a positive conservation outcome for Aboriginal heritage. Early consideration of Aboriginal cultural heritage, especially cultural information, has led to a design which takes into consideration identified cultural places and archaeological sites. Changes to the road design have been made to avoid some cultural sites, especially sensitive cultural areas, and to minimise (where possible) the impacts at other locations. Although it will not be possible to avoid all sites, the remaining features are significant. The value of these features is enhanced by their physical connections which can be interpreted as a landscape microcontinuum (e.g. creek banks – terrace – slopes – hilltops extending over a handful of kilometres). In many ways the area functioned as a „highway' of past peoples connecting people with places along the creek systems. Information obtained through the proposed salvaging of artefacts at key locations along this continuum (highway) will greatly enhance our cultural and archaeological understanding of the area and allow for significant interpretation of past events within this Wiradjuri cultural zone.

8 Impact Assessment and Mitigation Strategies

All identified Aboriginal cultural places and archaeological sites recorded within or near the Holbrook bypass are being considered by the RTA in relation to the proposed road construction and associated activities. Where significant sites or places were identified, where possible the design has been modified to avoid or limit the impact to the identified cultural places and archaeological sites.

For example, early input by knowledge holders greatly assisted route selection to limit the potential impact on significant cultural places (KNC 2008). Detailed design work has been undertaken by the RTA to minimize impact on identified cultural places, in particular on Place 1 and Place 2 which were identified by the knowledge holders as their key areas of concern. Consultation has occurred with the relevant knowledge holders regarding this design work. The impact on Place 1 has been minimized through detailed design work, while all impact on Place 2 has been removed. The confirmed and probable impacts on Place 4 and Places 16-19 have been accepted by the knowledge holders on the basis that the RTA has demonstrated good faith in working to minimize impacts within the corridor, engineering and safety limitations. The knowledge holders have requested a range of mitigation and management measures in relation to the impacts.

In addition a large portion of significant archaeological site HB4 is also being conserved due to a design change. Despite these examples, some level of impact is unfortunately unavoidable for such a large road project. Best practice is to try to limit most impacts and, where appropriate, mitigate impacts.

Although several archaeological sites will be impacted according to the concept design, in most cases the impacts amount to only a relatively small portion of the actual site or place. Overall, it can be argued that this represents a positive outcome for Aboriginal heritage. In this light, the Holbrook bypass is an opportunity for increasing our understanding, strengthening our interpretation and bettering our recognition of Aboriginal culture and heritage within an area where little previous documented information exists.

8.1 Impacts

Twenty cultural places were identified within or immediately adjacent to the Holbrook bypass corridor. Of these, 13 are not impacted and seven are being impacted by the proposed bypass. Impacts will occur to the following identified cultural places:

- one of the identified landscape features (Place 1) is impacted under the current concept design;
- the [redacted] feature and one associated [redacted] (Place 17) is impacted under the current concept design, the other associated [redacted] is likely to be impacted;
- two stand alone [redacted] (Places 4 and 16) are impacted under the current concept design;
- [redacted] (Place 19) is impacted under the current concept design;
- [redacted] (Place 15 and 18) are adjacent to the current concept design and are likely to be impacted.

Of the 13 archaeological sites, 4 will not be impacted and 9 sites will be at least partially impacted by road works as shown in the concept design. All sites (and portions of sites) not impacted will be identified in the construction environmental management plan to ensure the highest level of protection. Specific mitigation strategies for each site are outlined in Table 13.

Table 13 below provides the site reference number, site type, a brief description, significance, impact and mitigation strategies for each identified cultural place and archaeological site identified along the Holbrook bypass. For simplicity, impacts are colour coded according to the key below.

Key

Impact Assessment	Impact Colour Coding
No Impact	**Green**
Will be impacted	**Pink**

Table 13. Impacts and Mitigation for Holbrook Bypass

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Identified Aboriginal Cultural Place					
Place 1	[redacted]	[redacted]	Very High	Impacted	The knowledge holder reluctantly accepts the level of impact as shown in the current design (as presented in this report). The knowledge holder has requested a number of mitigation and management actions on the basis of the cultural significance of the place and the need to limit and monitor the impact. The knowledge holder requests that cultural salvage occurs in relation to all works impacting the Place. The knowledge holder requests that any artefact or other cultural material salvaged be reburied on the Place within the road reserve following analysis and under the direction of the knowledge holder. The knowledge holder requests that barrier fencing be erected on the construction line to ensure that no construction impact extends further into the area of the Place. No signage identifying the area as having Aboriginal cultural significance to be erected, signage stating „Significant Environmental Area – No Entry Permitted' acceptable. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holder.
Place 2	[redacted]	[redacted]	Very High	No impact	The knowledge holders consider that there is no acceptable level of impact on the place due to its very high level of cultural significance. To minimize potential impact temporary fencing of a buffer zone is requested throughout construction to protect that part of the identified place which lies adjacent to the bypass footprint. No signage identifying the area as having Aboriginal cultural significance to be erected, signage stating „Significant Environmental Area – No Entry Permitted' acceptable. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 3	[redacted]	[redacted]	Very High	No impact	The knowledge holder considers that there is no acceptable level of impact on the place due to its very high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holder.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 4	[redacted]	[redacted]	Very High	Impacted	The knowledge holder reluctantly accepts the level of impact as shown in the current design (as presented in this report). The knowledge holder accepts that impact will occur [redacted] and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.
Place 5	[redacted]	[redacted]	High	No impact	The knowledge holders consider that there is no acceptable level of impact on the items due to their high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holder.
Place 6	[redacted]	[redacted]	High	No impact	The knowledge holders consider that due to the items high level of cultural significance no impact was desirable. However, given the poor condition [redacted] they were willing to consider potential impact mitigation if impacts had been necessary in order to prevent impacts on associated cultural places and adjacent [redacted] in better condition. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 7	[redacted]	[redacted]	Medium	No impact	The knowledge holders consider that due to the items medium level of cultural significance no impact was desirable. However, given the poor condition [redacted] they were willing to consider potential impact mitigation if impacts had been necessary in order to prevent impacts on associated cultural places and adjacent [redacted] in better condition. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 8	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) that may impact this place would require further consultation with the knowledge holders.
Place 9	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 10	[redacted]	[redacted]	Very High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its very high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 11	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 12	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 13	[redacted]	[redacted]	Very High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its very high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 14	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 15	[redacted]	[redacted]	Medium	Impacted	The knowledge holders reluctantly accept the level of impact as shown in the current design (as presented in this report). The knowledge holders accept that impact will occur [redacted] and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.
Place 16	[redacted]	[redacted]	High	Impacted	The knowledge holders reluctantly accept the level of impact as shown in the current design (as presented in this report). The knowledge holders accept that impact will occur [redacted] and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 17	[redacted]	[redacted]	High	Impacted	The knowledge holder reluctantly accepts the level of impact as shown in the current design (as presented in this report). The knowledge holder accepts that impact will occur to this place and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.
Place 18	[redacted]	[redacted]	Very High	Impacted	The knowledge holders reluctantly accept the level of impact as shown in the current design (as presented in this report). The knowledge holders accept that impact will occur [redacted] and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 19	[redacted]	[redacted]	Very High	Impacted	The knowledge holders reluctantly accept the level of impact as shown in the current design (as presented in this report). The knowledge holders accept that impact will occur [redacted] and requests that as mitigation for this impact funding be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage and a community report in relation to the cultural values [redacted] on the basis of undertaking: detailed recording of the stories associated with the cultural items; photographic recording of the items; and, interpretative mapping of the cultural landscape. It is requested that the resulting interpretative signage, once approved by the knowledge holders, be displayed by the RTA (NSW) within the Holbrook area subject to agreement by relevant stakeholders, e.g. Greater Hume Shire Council. It is requested that the resulting community report, once approved by the knowledge holders, be distributed to identified Aboriginal stakeholders. It is requested that this work be undertaken as mitigation in relation to the impacts on Place 4, Place 15, Place 16, Place 17, Place 18, and Place 19, and that this work occur as a single project to allow for the recording of meaning and significance of the cultural places in relation to each other and to the wider cultural landscape. It is requested that this occur as soon as possible to allow for the photographic recording of the location prior to any construction impacts.
Place 20	[redacted]	[redacted]	High	No Impact	The knowledge holders consider that there is no acceptable level of impact on the item due to its high level of cultural significance. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Archaeological Sites					
HB1	Artefact Scatter	This site is an artefact scatter located on the eastern side of the highway. HB1 is part of a series of scatters situated on broad gently sloping landforms associated with the Ten Mile Creek catchment. The site's significance is increased by its association with a nearby dry swamp (Doodle Coomer). Artefacts were found dispersed across the landform.	Moderate to High	Will be impacted	Salvage excavation recommended.
HB2	Artefact Scatter	This site is an artefact scatter located on the eastern side of the highway. HB2 is part of a series of scatters situated on broad gently sloping landforms associated with the Ten Mile Creek catchment. The site's significance is increased by its association with a nearby dry swamp (Doodle Coomer). Artefacts were found dispersed across the landform.	Moderate to High	Will be impacted	Salvage excavation recommended.
HB3	Artefact Scatter	This site is an artefact scatter located on the eastern side of the highway. HB3 is part of a series of scatters situated on broad gently sloping landforms associated with the Ten Mile Creek catchment. The site's significance is increased by its association with a nearby dry swamp (Doodle Coomer). Artefacts were found dispersed across the landform.	Moderate to High	Will be impacted	Salvage excavation recommended.
HB4	Artefact Scatter	HB4 is a large artefact scatter located on a raised terrace west of the dry swamp Doodle Coomer. Test excavation of the site revealed a very high density archaeological deposit. This site is archaeologically one of the most significant in the Holbrook area as it offers insight into how rare resources like swamps were utilised in the past.	High	Will be impacted (partial)	Salvage excavation recommended for the (impacted) eastern portion of the site. The western portion of the site, closer to the swamp, should not be impacted. If the western portion is impacted as the result of detailed design a second salvage excavation is recommended.
HB5	Artefact Scatter	This site is located on a northern bend in Ten Mile Creek, [redacted]. Test excavation identified a surprisingly intact subsurface which exhibited a range of artefacts. This site is significant because it allows for a focused assessment of the creek's archaeology. In most instances flood events can be expected to eliminate most of the archaeology directly associated with the creek.	High	Will be impacted	Salvage excavation recommended.
HB6	Scarred Tree	HB6 is a scarred tree located on the northern side of [redacted] approximately 500m west of the bypass corridor. The tree was in relatively good condition and approximately 25 m high. The scar was an elongate shape, measuring 1.30 m long, 40 cm wide and 20 cm thick.	High	No impact	No action required. The location of the tree will be identified in the construction heritage site map to ensure it is not inadvertently affected.
HB7	Artefact Scatter	This site is located along an unsealed road leading to the town tip and just north of a 1st order creek crossing. Opposite another dirt track and property entrance. The site consists of two quartz artefacts resting on raised ground above the tributary. The site is related to HB8. The portion of the site within the road reserve is disturbed.	Moderate to High	No impact	No action required. The location of the site will be identified in the construction heritage site map to ensure it is not inadvertently affected.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
HB8	Artefact Scatter	HB8 is an artefact scatter located [redacted] west of Holbrook [redacted] A series of quartz artefacts were identified on raised surfaces along a billabong creek. Test excavation identified dispersed but significant archaeological deposit associated with multiple small scale occupation events.	Moderate to High	Will be impacted	Salvage excavation recommended for the site.
HB9	Artefact Scatter	HB9 is an artefact scatter located west of the Holbrook sewerage treatment tank. The site consists of 10 quartz artefacts emanating out of a dam cut into a hill slope. The general landform on which the site sits is relatively high in relation to the surrounding (spring feed) area.	High	No impact	No action required. The location of the site will be identified in the construction heritage site map to ensure it is not inadvertently affected.
HB10	Artefact Scatter	This site is located on the crest of a hill [redacted] The artefact scatter is contained to the west side of the road (east side is disturbed). 10 quartz artefacts were recorded on the top of the hill. The hill is a significant landform overlooking Holbrook and has identified cultural significance.	High	No impact (New TSR to be constructed)	No action required. The location of the site will be identified in the construction heritage site map to ensure it is not inadvertently affected. If the site is to be impacted as the result of detailed design a salvage excavation will be required. HB10 will not be impacted by road construction; however a new travelling stock route (TSR) will need to be installed. The TSR includes the installation of a boundary fence set approximately twenty metres from the roadside boundary fence. The installation of the TSR fencing will not significantly impact on the archaeology of HB10.
HB11	Artefact Scatter	HB11 is an artefact scatter [redacted]. Six quartz artefacts were found along the northern edge of a dam. The general area is sloping and with no evidence of focused activity. The artefacts are likely to be artificially concentrated within the dam and the area represents a background collection of artefacts.	Low-Moderate	Will be impacted	Artefacts should be salvaged through surface collection with Aboriginal stakeholders. Site can only be impacted/ salvaged after project approval obtained.
HB12	Isolated Find	HB12 is an isolated quartz artefact on the lower slope of a hill [redacted]. The artefact was found on a large area of dam exposure. The area does not exhibit a focus point within the landscape and the artefact is likely part of a background distribution.	Low	Will be impacted	Artefact should be salvaged through surface collection with Aboriginal stakeholders. Site can only be impacted/ salvaged after project approval obtained.
HB13	Artefact Scatter	HB13 is a small scatter of quartz artefact located on the banks of a 1st order tributary to Billabong Creek. The site is located [redacted] where the tributary crosses the existing Hume Highway. Test excavation of the site identified a low density scatter of artefacts with no significant concentrations. The site was probably only used intermittently and the taphonomic structure of the site suggests a colluvial impact.	Low	Will be impacted	Test excavation undertaken. No further archaeological mitigation required. Site can only be impacted after project approval obtained.

9 Management Outcomes

The following general management outcomes will be implemented in accordance with the management policy for the Project as outlined in section 9.7.

9.1 Conservation of cultural places and archaeological sites not being impacted by road construction or associated activities

The cultural places and archaeological sites in Table 14 would not be impacted by the Project. Their location should be identified in the construction environmental management plan, construction heritage sites map and project inductions to ensure they are not inadvertently damaged as a result of construction works. Cultural places and archaeological sites within the construction site boundary should be fenced off and identified through signage as environmentally sensitive areas prior to the commencement of construction works to ensure that they are not inadvertently affected as a result of construction work. Fencing would be maintained throughout the duration of works.

The cultural places and archaeological sites in Table 14 would not be impacted by the Project. However, if conserved archaeological sites fall within the final road reserve, landscaping activities (e.g. seeding by direct drilling, individual tree planting etc.) would likely take place within these sites. Landscaping is considered a neutral impact (on archaeological sites) as the benefits or reducing the erosion hazard will protect the archaeology in the long term.

Table 14. Aboriginal cultural places and archaeological sites not impacted by road construction

Cultural places and archaeological sites not impacted	
Cultural Places (requiring fencing)	Place 2
Cultural Places (no fencing required)	Place 3, Place 5, Place 6, Place 7, Place 8, Place 9, Place 10, Place 11, Place 12, Place 13, Place 14, Place 20
Archaeological Sites	HB6, HB7, HB9, HB10

9.2 Minimisation of impacts to cultural places impacted by road construction

Seven cultural places will be impacted by road construction. To minimise heritage impacts to six of these places (Table 15) a detailed recording program and interpretative signage is required.

Table 15. Cultural places impacted by road construction requiring detailed recording and signage

Protection of impacted cultural places	
Cultural Place	Place 4, Place 15, Place 16, Place 17, Place 18, Place 19

9.3 Archaeological salvage excavation required to mitigate impacts on highly significant archaeological sites and cultural places

The archaeological sites in Table 16 are of moderate to high Aboriginal heritage significance and require archaeological salvage excavation to mitigate the impacts. Cultural Place 1 has very high cultural significance and requires a cultural salvage excavation. All excavation can only occur after project approval is obtained.

Table 16. Aboriginal archaeological sites requiring salvage excavation

Salvage excavation of archaeological sites	
Archaeological Sites and Cultural Places (Impacted by concept design)	Place 1, HB1, HB2, HB3, HB4, HB5, HB8

9.4 Salvage through the collection of surface artefacts

Salvage would be undertaken at the sites in Table 17 through collection of surface artefacts within the impact area. Surface collection can only occur after project approval is obtained.

Table 17. Aboriginal archaeological sites requiring salvage collection

Salvage collection of archaeological sites	
Archaeological Sites (requiring collection if cannot be avoided)	HB11, HB12

9.5 No further archaeological mitigation required

No further archaeological mitigation is required for the sites in Table 18. Sites can only be impacted after project approval is obtained.

Table 18. No further archaeological mitigation required

No further cultural/ archaeological mitigation required	
Archaeological Sites (requiring no further archaeological mitigation provided no increase in impacts to sites)	HB13

9.6 Proposed Changes to Approved Projects

The RTA recognises that in the course of undertaking the Project, design alterations or other changes to the Approved Project may be required.

Sections 9.7 – 9.10 outline the processes that the Proponent must follow to ensure that any changes to the Approved Project which may impact on Aboriginal cultural heritage are dealt with consistently and with ongoing consultation with Aboriginal stakeholders, DECCW and DoP.

9.7 Management Policy for Aboriginal Heritage

The policy for the management and conservation of Aboriginal heritage in relation to salvage activities and construction activities (or fencing, investigative drilling, minor clearing, establishing site compounds, adjustment to services/utilities etc) is described below:

Responsibility for compliance with Management Policy

1. The Proponent must ensure all of its employees, contractors and subcontractors and agents are made aware of and comply with this management policy.
2. The Proponent must appoint a suitably qualified and experienced environmental manager who is responsible for overseeing the activities related to this management policy.
3. The Proponent must appoint a suitably qualified and experienced Archaeologist who is responsible for overseeing, for and on behalf of the Proponent, the salvage activities relating to the project.

Operational constraints

4. Where salvage activities have been nominated for impacted sites, no construction activities (or fencing, investigative drilling, minor clearing, establishing site compounds, adjustment to services/utilities etc) can occur on the lands to be salvaged until the relevant salvage activities at the nominated site have been completed. This restriction only relates to the specifically identified portion of an archaeological site to be salvaged and not the entire archaeological site (unless specified). Construction activities may proceed on the portion of a site not designated for salvage provided they do not impact or impede the salvage excavation and that the area to be salvaged is fenced in consultation with the Archaeologist prior to the commencement of those construction activities.
5. Prior to the commencement of early works activity (e.g. fencing, minor clearing, establishing site compounds etc) a construction heritage site map identifying conserved sites (excluded from impact) and sites to be salvaged must be prepared. The construction heritage site map should be prepared to the satisfaction of the RTA.
6. Prior to commencing substantial construction activities an Aboriginal heritage management plan must be prepared and approved by the RTA.
7. All employees, contractors, subcontractors and agents carrying out construction activities (e.g. fencing, minor clearing, establishing site compounds etc) must undertake a Project induction (including the distribution of a construction heritage site map) to ensure that they have an understanding and are aware of the Aboriginal heritage issues affecting the activity.
8. Prior to the proposed commencement of activities relating to this management policy the RTA Hume Highway Office must be notified prior to the proposed commencement date of those activities.

Protection and management of sites excluded from impacts

9. All sites listed in section 9.1 are excluded from impact.
10. All excluded archaeological sites in the construction corridor must be fenced in consultation with the Archaeologist prior to the commencement of construction activities (e.g. fencing, minor clearing, establishing site compounds etc). Sites should be identified as environmentally sensitive areas through signage.
11. All excluded cultural places in the construction corridor must be fenced in consultation with the relevant knowledge holder(s) prior to the commencement of construction activities (e.g. fencing, minor clearing, establishing site compounds etc). Sites should be identified as environmentally sensitive areas through signage.
12. All excluded cultural places and archaeological sites located outside of the construction corridor must be identified on construction maps and are not to be impacted. Where possible, cultural places and archaeological sites outside the construction site boundary should be identified as environmentally sensitive areas through signage erected on the construction site boundary fence.

Cultural places, sites and objects to be impacted

13. The cultural place and archaeological sites identified as being impacted by construction activities are listed in sections 9.2, 9.3, 9.4 and 9.5. The impacts authorised by this management policy are those listed in sections 9.2, 9.3, 9.4 and 9.5 unless otherwise agreed in writing by the RTA.

Human Remains

14. This management policy does not authorise any damage of human remains.
15. If potential human remains are disturbed the Proponent must follow the procedures outlined in section 9.8 below.

Salvage Activities

16. The archaeological salvage excavation must be carried out in accordance with the methodology specified in Appendix D of this report.
17. Archaeological testing (as a component of salvage) must be carried out in accordance with the research design methodology used previously to undertake the test excavations (KNC 2009).
18. The surface collection of Aboriginal objects must be carried out in accordance with the methodology described in Appendix D of this report.

Involvement of Aboriginal groups and/or individuals

19. Opportunity must be provided to the approved applicants from the local Aboriginal community to be involved in the following activities:
    a. assist with the salvage excavation as outlined in section 9.3
    b. assist with the surface collection of objects outlined in section 9.4

Salvaged Aboriginal objects

20. Any salvaged Aboriginal objects must be relocated as soon as practicable to a temporary storage location pending discussions with the RTA, Aboriginal stakeholders and the DECCW in relation to a permanent storage location or reburial.
21. In the event that a suitable storage location or reburial area cannot be identified the Proponent must request in writing that DECCW identify a suitable storage location or reburial area.
22. If reburial occurs, pursuant to s.91 of the *National Parks and Wildlife Act 1974* the location of each reburial area must be notified in writing to the DECCW as soon as practicable after reburial occurs.

Reporting requirements

23. A written salvage report about the salvage works must be provided to the RTA. The report must include:
    a. details of the nature and type of Aboriginal objects disturbed or moved at each salvage area;
    b. a detailed description of the methods of excavation and collection used;
    c. a detailed plan of each salvage area;
    d. any proposed ongoing consultation with or involvement of representatives of local Aboriginal groups in relation to the salvage work.
24. The salvage report must be provided to the RTA within six months or otherwise agreed to after the conclusion of all salvage activities.
25. Unless otherwise agreed with the Hume Highway Manager, any culturally sensitive or restricted information identified by representatives of local Aboriginal groups or individuals which is relevant to the salvage report must be detailed in a separate report provided to the RTA. The separate report must describe:
    a. the culturally sensitive or restricted information that is relevant to the project;
    b. any restrictions on access to that information (e.g. for gender related cultural reasons or due to a risk of damage to a particularly significant Aboriginal object or site).
26. Any separate report that is prepared must be provided to the RTA at the same time as the salvage report.
27. Provision of copies of reports to Aboriginal stakeholders and DECCW.
28. Unless otherwise agreed with the Hume Highway Manager, the Proponent must provide a copy of each report provided to the RTA to each registered local Aboriginal group or individual as soon as practicable after each report is provided to the RTA.

Notification and reporting about incidents that breach this management policy

29. Incident reporting requirements in accordance with the Project Approval is to include Aboriginal heritage.
30. Where the Environmental Representative (ER) or the RTA reasonably suspects that an incident has occurred that contravenes the management policy presented here the Proponent must prepare a written report within 5 days detailing that incident. The report must describe
    a. the nature of the incident
    b. the notification of the ER, and specialist where required
    c. the nature and location of relevant Aboriginal sites and/ or PAD, with reference to and provision of maps and photographs where appropriate
    d. the impact of the incident on Aboriginal sites and/ or PAD, with the appropriate specialist input where required
    e. the measures which have been taken or will be taken to prevent a reoccurrence of the incident.

Report about completed work

31. The Alliance must prepare a report relating to Aboriginal cultural heritage activities undertaken for the project. The report must detail:
    a. a short summary of the report for inclusion on AHIMS;
    b. any ongoing consultation with or involvement of local Aboriginal groups in relation to this project;
    c. how any excluded Aboriginal objects or sites were managed during construction;
    d. the effectiveness of salvage activities and mitigation measures that were implemented;
    e. the effectiveness of any management plan which was in place and;
    f. provision of copy of report to DECCW.

9.8 Procedures for Handling Human Remains

- **Note that Project Approvals do not include the destruction of Aboriginal remains**

This section outlines the procedure for handling human remains in accordance with the Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the *Heritage Act 1977* (NSW Heritage Office 1998) and the Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997). In the event that construction activity reveals possible human skeletal material (remains), the following procedure is to be followed: (please note: each step of the procedure will advise if the following step is required to be implemented)

1. as soon as remains are exposed, all work is to halt at that location immediately and the Project Environmental Manager on site is to be immediately notified to allow assessment and management;
2. Project Environmental Manager on site to notify Environmental Representative, RTA Hume Highway Manager and RTA Senior Environmental Officer (South West region)
3. contact police;
4. contact DECCW's Environment line on 131 555 and the Heritage Office on (02) 9873 8500;
5. a physical or forensic anthropologist should inspect the remains in situ, and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic);
    i. if the remains are identified as forensic the area is deemed as crime scene; or
    ii. if the remains are identified as Aboriginal, the site is to be secured and DECCW and all Aboriginal stakeholders are to be notified in writing; or
    iii. if the remains are identified as non-Aboriginal (historical) remains, the site is to be secured and the Heritage Office is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the area and remains is to be determined through one of the following means:

A. If the remains are identified forensic matter liaison with the police; or
B. If the remains are identified as Aboriginal liaison with the RTA, the Department of Planning (DoP), the DECCW and Aboriginal stakeholders; or
C. If the remains are identified as non-Aboriginal (historical) liaison with the RTA, the DoP and the Heritage Office; or
D. If the remains are identified as not being human then work can recommence once the appropriate clearances have been given.

9.9 Procedure for proposed changes to Approved Projects

A proposed change to the Approved Project (such as an alteration of the current alignment, the location of ancillary facilities) within the project corridor may result in a:

- Reduced impact to Aboriginal cultural heritage; or an
- Increased impact to Aboriginal cultural heritage.

Note: the use of the word impact in this section is defined as an impact on the significance of Aboriginal cultural heritage rather than simply an increased physical impact.

To ensure consistency with the Approved Project and this document any change in the overall impact on Aboriginal cultural heritage will need to be considered. The process to determine consistency is outlined in section 9.9.1 below.

Where a proposed change to the Approved Project occurs outside of the project corridor considered for the environmental assessment further heritage assessment will be required to determine if there would be an impact on Aboriginal cultural heritage and whether this represents a modification to the Approved Project (outlined below).

9.9.1 Changes in heritage impact

Where the Proponent seeks to make a change to the design and construction of the Approved Project which changes the assessed impact on Aboriginal cultural heritage, as detailed in sections 9.1-9.5 of this document, the Proponent will need to prepare an assessment of the new impacts of this work in consultation

with the appointed Archaeologist. The continued involvement of the Aboriginal stakeholders in this process is outlined in section 9.10.

The RTA is responsible for determining whether a proposed change is consistent with the Approved Project. The decision as to whether a change is consistent or inconsistent with the Approved Project will be documented. This process is explained below.

- New impacts consistent with previously identified impacts

If a proposed change to the Approved Project is considered to have a neutral or lesser significant impact on Aboriginal cultural heritage than that identified in this document it would be considered a consistent impact.

If the proposed change is considered to be consistent with the Approved Project the RTA may approve the change with no requirements to seek further approval from the Minister for Planning. However, in certain circumstances, further consultation with Aboriginal stakeholders may still be required (see section 9.10 below).

- New impacts inconsistent with previously identified impacts

If a proposed change to the Approved Project is considered to have a more significant impact on Aboriginal cultural heritage than that identified in the environmental assessment it would be considered an inconsistent impact.

If the proposed change is considered inconsistent with the assessed impact on Aboriginal cultural heritage, as detailed in sections 9.1-9.5 of this document, the RTA would require an amendment to the mitigation measures agreed in this report. If this proposed change is considered inconsistent with the Approved Project the RTA would require a modification of the Minister's approval (the Approved Project) from the Minister for Planning. Further consultation with Aboriginal stakeholders will be undertaken (see 9.10 below).

9.10 Process for continued consultation with Aboriginal stakeholders

The extent to which the RTA will continue to consult with Aboriginal stakeholders is dependent upon the level of impact and whether the area was assessed as part of the environmental assessment. The types of potential impacts are identified as reduced impacts, increased impacts or unknown impacts.

a) Neutral or reduced impact
If as a result of alterations to the project design a previously identified impact to an Aboriginal heritage item is reduced or neutral then no further consultation is required.

If as a result of alterations to the project design an impact to a conserved Aboriginal heritage item [section 9.1] is proposed that results in a reduced impact on the overall heritage significance of the study area (i.e. the cumulative impact is reduced), then further consultation with Aboriginal stakeholders will be undertaken. This consultation may entail a phone call and phone log of comments received or the provision of a report for comment (10 working days).

b) Increased Impact
Where as a result of alterations to the project design an impact on Aboriginal heritage is considered to be greater than identified by the Approved Project further consultation will be undertaken. This consultation will either entail a phone call and phone log of comments received or the provision of a report for comment (10 working days).

c) Unknown impacts: Assessment process
Where a proposed change is an area located outside of the project corridor assessed as part of the Approved Project the impact on Aboriginal cultural heritage is considered to be unknown. This area would require preliminary assessment to determine any impacts upon Aboriginal heritage. This assessment should be provided to the RTA Hume Highway Office for review. Should no impacts be identified then no consultation with Aboriginal stakeholders is required. Should potential impacts be identified consultation with Aboriginal stakeholders will be undertaken. This consultation will entail the provision of a report for stakeholder comment (10 working days) detailing the impacts and mitigation strategies proposed.

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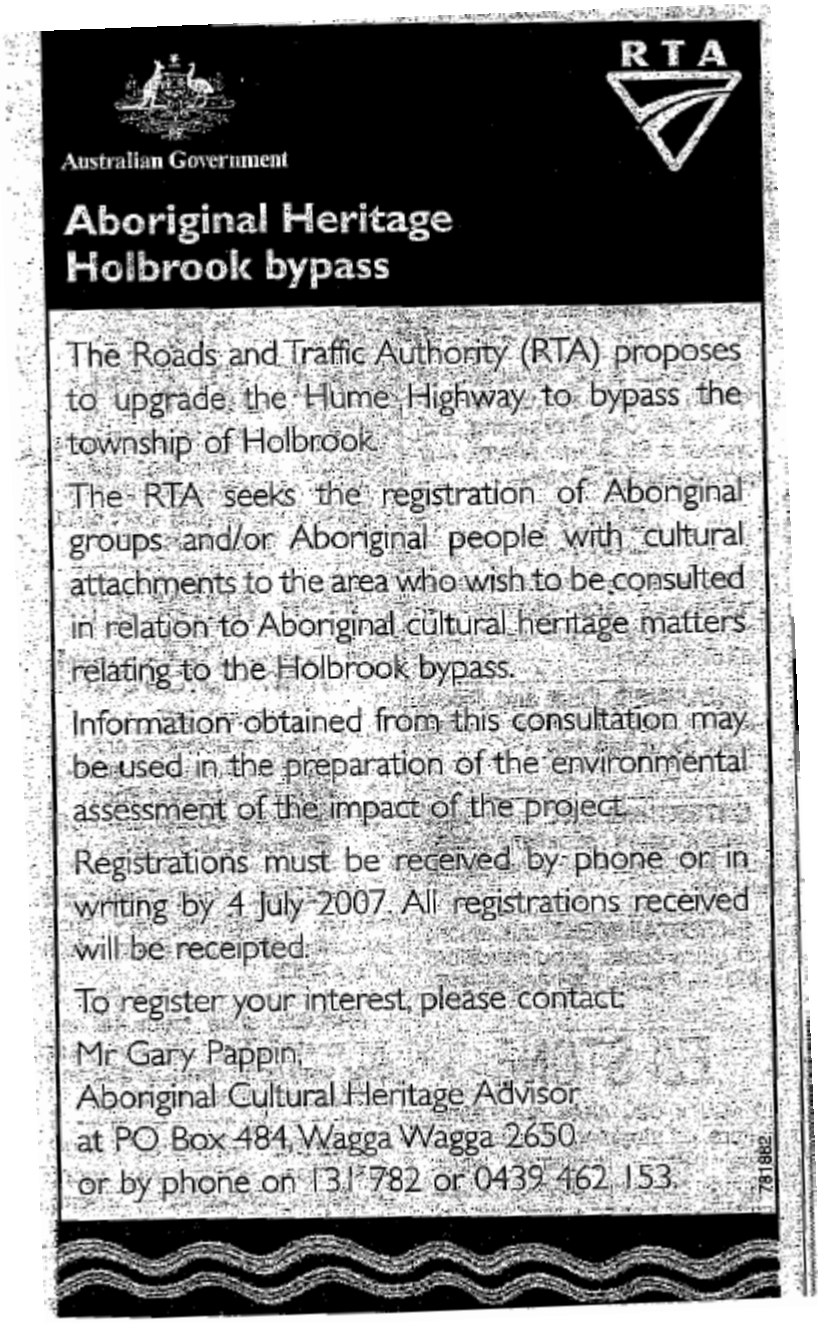
Appendix A Advertisement for Stakeholders

The RTA placed the following advertisements inviting stakeholders to register their interest for the Holbrook town bypass project. Details of where they were advertised and the dates they appeared are provided in the table below.



Australian Government

RTA

Aboriginal Heritage
Holbrook bypass

The Roads and Traffic Authority (RTA) proposes to upgrade the Hume Highway to bypass the township of Holbrook.

The RTA seeks the registration of Aboriginal groups and/or Aboriginal people with cultural attachments to the area who wish to be consulted in relation to Aboriginal cultural heritage matters relating to the Holbrook bypass.

Information obtained from this consultation may be used in the preparation of the environmental assessment of the impact of the project.

Registrations must be received by phone or in writing by 4 July 2007. All registrations received will be receipted.

To register your interest, please contact:

Mr Gary Pappin,
Aboriginal Cultural Heritage Advisor
at PO Box 484 Wagga Wagga 2650
or by phone on 131 782 or 0439 462 153.

781862

Advertisement placed in:

Print Media	Date
The Border Mail (Albury)	23 June 2007
Eastern Riverina Chronicle	20 June 2007
Koori Mail	20 June 2007
National Indigenous Times	28 June 2007
Deadly Vibe	6 July 2007
In Vibe	6 July 2007

Note the closing date in the above advertisement is 4 July. This is more than 10 working days after first appearance of the advertisement in the Koori Mail. The closing date in subsequent advertisements was at least 10 days after publication.

Appendix B Aboriginal Stakeholder Comments

No comments were received from Aboriginal stakeholder during the consultation process.

Appendix C Place Sheets

Appendix deleted from public document.

Appendix D Research Design of Holbrook Bypass

Methodology
Research Aims
The main aims of the proposed salvage excavation program are:

- To salvage representative samples of identified archaeological activity areas, landforms and/or archaeological resources at key locations along the Holbrook bypass prior to development impact.
- Analysis of the salvaged archaeological material to gain and conserve knowledge and understanding of the scientific and cultural information exhibited by the activities associated with the Aboriginal heritage from the Holbrook area.
- Use the excavation results to gain insight into the subsurface archaeology of the adjacent areas not being impacted by the highway construction (i.e. sites outside the construction corridor). This will allow an increase in future educational opportunities and a more informed management of Holbrook's Aboriginal heritage.

The further scientific aim of the salvage excavation program would be to determine the subsurface integrity, extent, spatial distribution and nature of the cultural deposits in varying landscapes and the specific types of associated archaeological/cultural activities.

- Determining the integrity of the deposit involves assessing the degree of disturbance which is present.
- Determining the extent of the sites and/or activity areas involves identifying the boundaries associated with the identified archaeological deposit.
- Assessing the spatial distribution involves identifying the presence/absence of archaeological material across identified land forms (e.g. crest, slope, creek flat).
- The nature of the site refers to the type of activities indicated by the artefactual material (e.g. primary production, domestic knapping, hunting camps). The goal would be to retrieve entire assemblages from specific activities if such activities were present.
- Retrieved assemblages would be compared with the results from other relevant archaeological projects (e.g. Hume Highway duplication) in order to assess significance.

The archaeological program proposed in this research design will salvage the significant archaeology, but equally important is the aim to use this information to bring the Aboriginal story back to the forefront of knowledge. Furthermore as part of the archaeological program, KNC will continue to bolster the recovered archaeological information with geomorphic data designed to offer a glimpse of the physical stage and timeline associated with the cultural story. It is envisioned that this complete archaeological program will be the foundation for the area's future cultural, educational and management opportunities.

Conservation is a primary goal of all Aboriginal heritage management. All archaeological excavation undertaken during the proposed program will be restricted to the actual construction corridor (construction clearing area) associated with the impacted sites. The construction corridor includes the actual roadwork and all associated impacts such as support vehicle tracks or drainage works.

Archaeological Salvage Areas
Salvage excavation will focus on the following areas (outlined in sections 8 and 9):

- HB1
- HB2
- HB3
- HB4
- HB5
- HB8

Site Descriptions
Site descriptions for salvage areas are found in section 5.3.

Place 1 Cultural Salvage (excavation)
Salvage excavation will also be undertaken at Place 1. The mitigation requirement for salvage of Place 1 has been determined by the knowledge holder (see Waters Consultancy 2009). The methodology of the salvage program will be the same as outlined for sites HB1-5 and HB8. However, the outright collection of artefacts will be the principle aim of the excavation program. The knowledge holder has also specifically requested that the recovered artefacts be deposited in the conserved portion of the place/site.

Surface Collection
Construction of the Holbrook bypass will impact several surface artefact scatters. Prior to construction surface artefacts from all known archaeological sites impacted by the project should be collected (see section 9.4). Surface collection of the impacted portions of the following sites would occur:

- HB11
- HB12

Field Methods
The goal of the field excavation program is to recover significant assemblages of artefacts from each salvage area which will characterise the site and offer comparable information with other sites. The field methods reflect this goal and will use a standard (comparable) methodology often used by archaeologists and one which has been previously utilised along the Hume Highway.

Combined Program
In order to achieve the most robust and comparable result, KNC advocates a combination target program and open area excavation program. The initial excavation of each salvage location (i.e. the target program) will be to lay out a series of excavation squares in transects across land formations in order to locate specific activity areas and then open area excavations will be undertaken around these initial squares yielding higher (or otherwise significant) artefact densities. The advantages of this combined program are both statistical and practical. Statistically, the target program will allow for a direct comparison with test data from other excavations undertaken along the highway where salvage excavation was not warranted. This statistically sound information will create a baseline for the region and inform future management and research studies. In addition, the geoarchaeological data covering this same extensive transect will enhance our archaeological assessment by demonstrating the relationship between Aboriginal cultural heritage and the geomorphic process (e.g. climate change). The practical side of the combined program means that we will be 1) finding and 2) salvaging the most relevant archaeological deposits impacted by the road construction. Experience has shown that the most fruitful salvage of open areas involves the need to fully assess the deposit (i.e. subsurface integrity, extent, spatial distribution and nature) in order to demonstrate that the material recovered is truly representative.

Excavation Process
The mechanics of the excavation follow the same standard approach adopted by previous successful excavation methodologies used on Hume Highway Duplication project. Excavation squares measuring 1m x 1m will be hand excavated in bulk or (where possible) stratigraphic units. Squares will be excavated until the basal layer or culturally sterile deposit is reached (past experience indicates that the depth is variable but the cultural deposit is usually contained in the upper 25-35cm). The initial excavation squares at each location will be excavated well into the sterile unit to confirm the absence of artefacts before commencing open area salvage.

Initial excavation will involve around 25-50 squares per salvage area. The precise number of squares would depend on the archaeological deposit and geology. Excavation grids (transects) will be established using AMG coordinates for each square. Squares will be placed at 15m intervals along sampling transects. The squares in adjoining transects will be staggered (at five metre intervals) to achieve maximum sampling coverage. This approach is consistent (and directly comparable) with previous excavations.

Where salvage is required, open area excavation will follow from the results of the initial target program. It is anticipated that around 75-100 additional squares will be excavated per salvage area. Open area excavation will follow a standard cuneiform approach and expand to encompass identified activity areas. On average it is anticipated that two open areas (c. 50m^2 – 150m^2) will be salvaged per location, although where feasible an effort will be made to connect identified activity areas into a single open area.

All of the deposit will be wet sieved on 5.0mm and 2.5mm nested sieves. All artefacts would be collected and bagged. Excavated squares will be backfilled where required (by the Proponent).

The location of each excavated square would be identified on a surveyed plan of the site. Stratigraphic sections detailing the stratigraphy and features within the excavated deposit would be drawn and all squares would be photographed. Soil and carbon samples would also be collected. The stratigraphy of all excavated areas will be fully documented and appropriate records will be archived.

Analysis
Artefacts would be analysed on a comparable level with previous analyses of excavated assemblages (KNC 2008, 2007; AMBS 2006; Jo McDonald Cultural Heritage Management 2003, 2004; Attenbrow 1981). Information derived from this analysis; in particular the identification of specific artefact types, and their distributions and associations; will be used to put together interpretations about how sites were used, where sites were located across the landscape, the age of sites, and to assess cultural heritage values. By comparing different areas it will be possible to determine whether there were differences in the kinds of activities carried out and if different activities were related to different landforms. Sufficient information will be recovered from each excavation in order to assess how people and the land work together to create a social landscape. Differences could be expected if different aspects of settlement organisation varied in relation to the landscape units as defined.

A range of stone artefacts may be present across the salvage areas and the analysis would expand accordingly to account for artefact variability. All information would be recorded in database form (MS Excel). Various types of evidence would be used to determine the kinds of activities that were carried out. A short description of the proposed analysis in outlined below.

- Field analysis would record basic data, such as material type, number, and any significant technological characteristics, such as backing or bipolar techniques; added to this would be any provenance data such as pit ID and spit number. The purpose of the field recording is twofold: 1) establish a basic recording of artefacts retrieved and 2) to allow on-going assessment of the excavation regime (e.g. whether higher stratigraphic resolution is required while digging).
- Detailed (laboratory) analysis would entail recording a larger number of characteristics for each individual artefact. These details would be recorded in matrices suitable for comparative analysis (e.g. multivariate and univariate) of the excavated assemblage on a local and regional basis.
- Lithic characteristics to be recorded cover a range of basic information but are not limited to these categories (see example below). For transparency, terms and category types would in large part be derived from Holdaway and Stern (2004).

Sample Categories		
Record Number	% Cortex	Flake Type
Pit ID	Length	Termination Type
Spit Number	Width	Core Type
Count	Thickness	Number of Scars (Core)
Raw Material	Weight	Scar Type (Core)
Colour	Modification	Shape of Flake
Quality	Reduction Type	Platform Type

- A detailed explanation and glossary would be provided with the final excavation report.
- Minimum Number of Flake (MNF) calculations formulated by Hiscock (2000, 2002) will be undertaken where applicable (although past experience indicates MNF calculations will not be required for this excavation program). The main outcomes of the analysis would be to investigate: the type of activities being carried out across the subject area; stone materials used and quantity; technology; and modification/retouch (type and quantity).

Field Team

KNC directors, Dr Matthew Kelleher and Alison Nightingale, would be responsible for the salvage excavation program. Dr Matthew Kelleher would direct the excavation component of the Aboriginal archaeological assessment. Matthew has extensive experience in managing large scale archaeological excavations and research projects. Alison is the principal contact for the overall Aboriginal archaeological assessment for the Holbrook bypass. She has over 14 years experience managing Aboriginal cultural heritage. Matthew and Alison have both been involved in the highly successful archaeological assessment for the Hume Highway Duplication Project between Mullengandra and the Sturt Highway.