

Appendix M

Aboriginal Heritage Impact Assessment (ACHM 2018)



ACHM

AUSTRALIAN CULTURAL
HERITAGE MANAGEMENT

Cultural Heritage Assessment Report

Final Report for the Aboriginal Heritage Impact Assessment of the City of Gosnells MKSEA Planning Scheme Oct 2018.

Whadjak Noongar Heritage Site
Investigation and Survey.

By: Nigel Tonkin

Date: 27 October 2018

Client Name: City of Gosnells

Client Contact: Clayton Windass

Address: PO Box 662

Gosnells WA

6990

Email: CWindass@gosnells.wa.gov.au

ADELAIDE

BRISBANE

MELBOURNE

PERTH

SYDNEY

1300 724 913

email@achm.com.au

www.achm.com.au

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The professional advice and opinions contained in this document do not constitute legal advice.

Spatial Data

Spatial data captured by Australian Cultural Heritage Management (Victoria) Pty Ltd in this document for any newly recorded sites has been obtained by using hand held or differential GPS units using the GDA94 co-ordinate system.

Abbreviations

Term	Meaning
ACHM	Australian Cultural Heritage Management
ACMC	Aboriginal Cultural Material Committee
AHA	<i>Aboriginal Heritage Act 1972 (WA)</i>
AHIS	Aboriginal Heritage Inquiry System
CCW	Conservation Category Wetland
DPLH	Western Australian Department of Planning, Land and Heritage
GIS	Geographic Information System
GPS	Global Positioning System
MKSEA	Maddington Kenwick Strategic Employment Area
SWALSC	South West Aboriginal Land and Sea Council
TEC	Threatened Ecological Community
WA	Western Australia

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- Alice Warrell (Whadjak Noongar Representative)
- Cindy Nelson (Whadjak Noongar Representative)
- Clayton Windass (City of Gosnells Representative)
- Dianne Wynne (Whadjak Noongar Representative)
- Doreen Nelson (Whadjak Noongar Representative)
- Glenys Yarran (Whadjak Noongar Representative)
- Jessica Landers (Whadjak Noongar Representative)
- Marian Collard (Whadjak Noongar Representative)
- Marlene Warrell (Whadjak Noongar Representative)
- Noel Morich (Whadjak Noongar Representative)
- Patricia Morich (Whadjak Noongar Representative)
- Reg Yarran (Whadjak Noongar Representative)
- Rick Malin (City of Gosnells Representative)
- Sophie Williams (Whadjak Noongar Care Taker)
- Stan Headland Jnr (Whadjak Noongar Representative)
- Stan Headland Snr (Whadjak Noongar Representative)
- Violet Pickett (Whadjak Noongar Representative)
- Wayne van Lieven (City of Gosnells Representative)

Executive Summary

Australian Cultural Heritage Management (Victoria) Pty Ltd (ACHM) have been engaged by the City of Gosnells to undertake the Aboriginal Cultural Heritage Impact Assessment of the City of Gosnells proposed Maddington Kenwick Strategic Employment Area (MKSEA). The Maddington Kenwick Strategic Employment Area (MKSEA) is an area bound by Bickley Road, Roe Highway and Tonkin Highway is currently being investigated for future industrial development (see Map 1-1). The aim of the proposed development is to determine if future industrial development can occur whilst ensuring the protection of key environmental characteristics of the area. The area has been and continues to be subject to various planning studies to determine its suitability of industrial development.

This Report documents the results of the Cultural Heritage Impact Investigation of the 6 designated sites within the proposed MKSEA impact areas, which was conducted 22 - 24 Oct 2018.

The work area lies wholly within the Whadjak Noongar Native Title area in the City of Gosnells MKSEA Precincts.

It should also be noted that prior to the commencement and in some instances during, that all permissions to enter target areas located on privately owned property was sought and obtained by the city of Gosnells prior to any entry. These permissions also informed of the survey target methodology.

As a result of the Cultural Heritage Impact Assessment:

- Taking into consideration the extensive historical development and land use within the proposed MKSEA project footprint, only those places where remnant vegetation i.e. Conservation Category Wetland (CCW) and Threatened Ecological Community (TEC) areas were deemed suitable for investigation and subsequently inspected (notwithstanding access restrictions) (see Map 8-1) due to the higher potential for in-situ cultural material in its original depositional context.
- Lots #110, #107, #195, #142, # 501, # 190, #279, #130, #137, #139, #71 and #78 were visited over the course of the fieldwork.
- 6 sites listed in the scope of works within Maddington Kenwick Strategic Employment Area (MKSEA) were revisited. These sites include (DPLH Place Id); Wattle Grove, Perth (3312) - or part thereof; Boundary Road, Wattle Grove (3624); Brentwood Road NW (4341); Brentwood road Quarry (4342); Brentwood Road Swamp (4343); and Yule Brook Farm 02 02 (24785).
- Of the six (6) visited locations, two (2) sites - Boundary road, Wattle Grove (3624 and Yule Brook Farm 02 02 (24785) could not be inspected in detail and due to access constraints or restrictions and subsequently were viewed from a short distance ~50m or less.
- Of the revisited sites, three (3) were found to be heavily disturbed by historical land use activities and therefore could no longer be recorded and assessed in detail as heritage sites under the AHA 72.
- Czerwinski 2009 Table 6: pg15 reports that all 3 artefacts were previously collected and therefore DPLH Id 3312 may be considered no longer a site under Section 5 of the AHA 72.
- One site - Edward/Grove Streets (4340) was not visited due to time constraints. Furthermore, the survey team were advised by the City of Gosnells representatives that this site was subject to an evaluation/inspection by another heritage consultancy which had been commissioned by the current landowner and no results were available at the time of drafting this report.
- The 3A Precinct and City of Kalamunda Precinct were not visited over the course of the Survey as no Conservation Category Wetland (CCW) and Threatened Ecological Community (TEC) areas are present in these areas furthermore time constraints restricted target location options.

ACHM, in consultation with the Whadjak Noongar Traditional Owners, recommends the following:

- For those locations - Brentwood Road NW (DPLH Id 4341); Brentwood Road, Quarry (DPLH Id 4342); Brentwood Road Swamp (DPLH Id 4343); that have been re-assessed as no longer likely to constitute an archaeological sites under section 5 of the AHA 72, the *Whadjak Noongar* representatives requested that further investigation is undertaken to provide understanding regarding any approval processes may have been undertaken prior to any ground disturbance activities.
- Boundary Road, Wattle Grove (DPLH Id 3624) further investigation is required to determine the condition and intactness of the site.

- If the access is granted by the land owner and the opportunity to visit this location become available that the Yule Brook Farm 02 02 (24785) site is investigated to determine the condition and intactness of the site.
- Should ground disturbing activity be proposed within the immediate vicinity of any previously identified site, *Whadjak Noongar* Traditional Owners are afforded the opportunity to have two representatives monitor earthworks at the following locations; Boundary Road, Wattle Grove (DPLH Id 3624); Brentwood Road NW (4341); Brentwood road Quarry (4342); Brentwood Road Swamp (4343); and Yule Brook Farm 02 02 (24785).
- *Whadjak Noongar* Traditional Owners requested an opportunity to undertake further discussion and consultation with the City of Gosnells regarding the future management and employment opportunities (such as conservation land managers, rangers as well as the establishment of potential tourism ventures) with regards to the area of land listed as the Bush Forever Precinct.
- The *Whadjak Noongar* representatives have requested further opportunity to have a suitably qualified anthropologist to conduct further ethnographic consultation re the Yule Brook Stream, as this water way was presented as a place of importance to past lifeways and daily life. It was considered that two days at accessible locations along the Yule Brook with *Whadjak Noongar* elders would be sufficient.
- Any proposed impacts to the newly recorded archaeological sites, and any other previously recorded sites, may breach section 17 of the AHA. It is recommended that any earthworks should avoid any damage or disturbance to these areas
- In the Rezoning MKSEA precincts that the street names are amended or replaced *Whadjak Noongar* names and places.

In addition to the archaeological recommendations provided in this report, *Whadjak Noongar* may have additional recommendations relating to the management and mitigation of these sites. Further consultation and engagement with *Whadjak Noongar* regarding proposed impacts and mitigation strategies should be conducted.

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1 MKSEA Location and Background

Australian Cultural Heritage Management (Victoria) Pty Ltd (ACHM) have been engaged by the City of Gosnells to undertake the Aboriginal Cultural Heritage Impact Assessment of the City of Gosnells proposed Maddington Kenwick Strategic Employment Area (MKSEA). The Maddington Kenwick Strategic Employment Area (MKSEA) is an area bound by Bickley Road, Roe Highway and Tonkin Highway is currently being investigated for future industrial development (see Map 8-1). The aim of the proposed development is to determine if future industrial development can occur whilst ensuring the protection of key environmental characteristics of the area. The area has been and continues to be subject to various planning studies to determine its suitability of industrial development.

1.1 Project Participation

- Cindy Nelson (Whadjak Noongar Representative 24 Oct)
- Clayton Windass (City of Gosnells Representative 22-24 Oct)
- Dianne Wynne (Whadjak Noongar Representative 23-24 Oct)
- Glenys Yarran (Whadjak Noongar Representative 22 & 24 Oct)
- Jessica Landers (Whadjak Noongar Representative 23-24 Oct)
- Marian Collard (Whadjak Noongar Representative 22-24 Oct)
- Nigel Tonkin (ACHM Archaeologist 22-24 Oct)
- Noel Morich (Whadjak Noongar Representative 22-24 Oct)
- Rick Malin (City of Gosnells Representative 22-24 Oct)
- Stan Headland Snr (Whadjak Noongar Representative 24 Oct)
- Violet Pickett (Whadjak Noongar Representative 22-24 Oct)
- Wayne van Lieven (City of Gosnells Representative 22-24 Oct)
- Doreen Nelson (Whadjak Noongar Representative 22-23 Oct)
- Patricia Morich (Whadjak Noongar Representative 23 Oct)
- Reg Yarran (Whadjak Noongar Representative 22-23 Oct)
- Stan Headland Jnr (Whadjak Noongar Representative 22-23 Oct)
- Marlene Warrell (Whadjak Noongar Representative 22 Oct)
- Sophie Williams (Whadjak Noongar / Cared for Marian Collard 22-23 Oct)

2 Aboriginal heritage Protection Legislation

2.1 Aboriginal Heritage Act 1972 (WA)

The Minister for Aboriginal Affairs is responsible for the administration of the Western Australian Aboriginal Heritage Act 1972 (AHA). Under section 17 of the AHA, it is an offence to disturb any Aboriginal site. If a development is likely to impact a site, the consent of the Minister is required under section 18 of the AHA. The Minister receives a recommendation from the Aboriginal Cultural Material Committee (ACMC) before giving consent. S/he considers its recommendations and the general interests of the community when deciding. The Minister may also impose conditions on her/his approval.

The AHA was enacted to protect and preserve Aboriginal heritage. This includes any places or objects of past or present significance to Aboriginal people. It also provides for fines and jail sentences for breaches.

Section 15 of the AHA outlines the obligations relating to the reporting of an archaeological find.

Section 5 of the AHA provides the following definitions regarding Aboriginal sites:

- a) Any place of importance or significance where people of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of Aboriginal people, past or present;*
- b) Any sacred, ritual or ceremonial site, which is of importance and special significance to people of Aboriginal descent;*
- c) Any place which, in the opinion of the committee, is or was associated with Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State; and*
- d) Any place where objects to which this Act applies are traditionally stored, or to which, under the provisions of the Act, such objects have been taken or removed.*

Any place determined to be a site under section 5, is then evaluated under section 39 of the AHA. Sections 39 (2) & (3) state:

(2) In evaluating the importance of places and objects the committee shall have regard to -

- (a) Any existing use or significance attributed under relevant Aboriginal custom;*
- (b) Any former or reputed use or significance which may be attributed on the basis of tradition, historical association, or Aboriginal sentiment;*
- (c) Any potential anthropological, archaeological or ethnographical interest; and*
- (d) Aesthetic values.*

(3) Associated sacred beliefs, and ritual or ceremonial usage, in so far as such matters can be ascertained, shall be regarded as the primary considerations to be taken into account in the evaluation of any place or object for the purposes of this Act.

2.2 DPLH Heritage Information Submission Form

The DPLH has developed a standard Heritage Information Site Recording Form (HISF), which is intended to capture sufficient relevant information to enable a decision on the applicability of the AHA to an Aboriginal place. The HISF requires information including the location of the place, the type of site with evidence and justification as to why the place is considered an Aboriginal site, a discussion of why and to whom the place is significant and important, and the condition of the site.

3 Methodology

3.1 Searches for Previously Recorded Sites

Prior to the site recording trip commencing, a search of the Aboriginal Heritage Information System and Aboriginal Heritage Sites Register maintained by the DPLH in Perth was conducted to identify any previously recorded Aboriginal sites that intersect with the immediately surrounding area. The DPLH Site Register is a record of previously recorded Aboriginal sites and heritage surveys within WA and is a mechanism whereby a proponent can identify previously reported Aboriginal sites on a parcel of land.

A similar search was also undertaken of the ACHM Corporate Archives.

4 Archaeological Recording Methods

It should also be noted that prior to the commencement and in some instances during, that all permissions to enter investigation/survey target areas located on privately owned property was sought and obtained by the City of Gosnells prior to any entry. These permissions also informed of the survey target methodology

The site recording was conducted between the 22 - 24 October 2018, with a team consisting of one ACHM archaeologists, between six and eight Whadjak Noongar representatives and Three Gosnells City representatives. The Gosnells City representatives provided logistical support and advice. Geographic Information System (GIS) data was uploaded into hand held Garmin GPS Map 64st unit for orientation in the field and to provide previously defined boundaries for the sites. Hard copy maps illustrating the boundaries of sites were also utilised in the field to inform team members of locations to be visited over the course of the trip.

The previously recorded locations were revisited (see Map 8-1) and subjected to detailed inspections to assess the presence of enough cultural material and determine the level of recording which may be required to assess the sites archaeological significance.

Places that may be identified as sites were recorded to a level considered enough to make an informed assessment on the site's potential significance. Where required, GPS units are used to record newly defined polygon boundaries for each site, as well as individual site attributes such as high-density artefact concentrations, individual grindstones, or topographic features.

ACHM archaeologists record the environmental setting for each archaeological site. This included collecting data on landforms, terrain, aspect, slope, orientation of the site and its position on the slope. Vegetation, topography, surface geology (presence/absence of surface rock or roof fall, surface matrix), and soil types (e.g. sand, loam, clay, etc.) are observed. Also noted are site formation processes operating at each site, including natural and artificial taphonomic processes such as evidence of site disturbance, erosion and preservation issues. Ground surface visibility was assessed and is represented as an average percentage of ground surface visibility across the site (0-30% low, 30-70% moderate and 70-100% high).

The site's proximity to ephemeral or permanent water sources, to prominent landscape features and to other Aboriginal sites is also recorded. If potential subsurface archaeological material was suspected, it is recorded as a Potential Archaeological Deposit (PAD). The taphonomic conditions relating to the formation of the potential archaeological deposit was also considered. Excavation of PADs proceeds only if there is a section 16 authorisation or section 18 consent under the AHA.

Digital photography is used to provide additional environmental context for each site; photos are taken across the site and the direction of each image is noted. Site plans are drawn in the field, these will be scanned and digitized and provided to the proponent in the final report.

Pink and black heritage tape is used to demarcate the boundary of each site to alert against possible incursion and to help relocate it for further heritage work.

At each location, discussions were held with the Traditional Owners concerning what future management strategies they requested for each site. This report presents information regarding which sites do/do not require salvaging, and what level of salvage is recommended; detailed information regarding recommendations for each site is included.

- For all Aboriginal sites the following general data is recorded and are presented in this report:
- Site ID
- Site Type
- Easting (GDA94 – Zone 50)
- Northing (GDA94 – Zone 50)
- Site Measurements
- Archaeological significance
- Proposed salvage methodology and future analysis recommendations
- Stone Artefact Assemblages and Knapping Sites

ACHM archaeologists and Whadjak Noongar representatives conducted a visual inspection of each artefact assemblage to establish the distribution of cultural materials. Types of materials at artefact sites that may be identified include stone, bone, shell, ochre, charcoal, wood, glass, metal and ceramic. Artefact raw material types were defined based on rock type, colour, texture, and grain size. Artefacts were considered within a technological reduction system and were classified as being either cores (or core fragments), flakes (or broken flakes), flaked

pieces or retouched flakes. Broad trends of artefact types and raw material use are recorded for the sites. Digital photography is used to record a sample of the artefacts within each site.

The basis of the recording methodology involved two major variable site characteristics: (1) the physical extent and shape of the site and (2) the concentration (density variations) of the assemblage on the ground. Other variables included the terrain and ground visibility.

At those locations where site assessment and recording is to occur the team follow the guidelines as presented in the scope of works, for the stone artefacts, the following attributes are recorded:

- Observed % of Raw material/lithology
- Observed % of Artefact type, such as:
 - Core: is an artefact from which flakes have been detached using a hammer stone. The core will have one or more negative flake scars where flakes have been detached. Core types include single platform, multiplatform, and bipolar forms.
 - Flake: is the detached fragment created by fracturing rock and will have a number of diagnostic features on the ventral and dorsal surface. This includes a striking platform, ring crack, and bulb of percussion on the ventral surface; the dorsal surface will have either cortex, or negative flake scars - depending on the stage of removal from the core.
 - Retouched Flake: is a flake that has been flaked again along one or more of its margins, with the aim of sharpening or serrating the edge.
 - Flake Fragment: Whether the artefact is complete or broken (fragment), and if broken, whether it was a longitudinal or transverse break
- Any observed grinding stones are noted, and their location recorded
- Any observed retouched or formal tools are noted, and their location recorded
- General areas of artefact concentrations and densities are noted as well as the overall spatial distribution of knapped stone.

5 Results of the Survey

5.1 Project Location and Environment

The Heritage Site Investigation and Survey are located within the City of Gosnells local Government precinct which is situated 17kms south east from the Perth CBD and is the 5th largest local government in Western Australia (see Map 8-1).

The project area lies in the Brixton and Yule brook catchment area and the greater portion (~90%+) of the Project area has been subject to land development activities of both an Industrial and Rural nature in the past. As the environmental (Flora, Fauna and Vegetation) of the MKSEA has been reviewed and reported in detail by Cardno BSD Pty Ltd (2005) and Tuass & Weston (2010) for the City of Gosnells previously and therefore will not be reiterated here. However, it should be noted that there are several small and localized areas in the MKSEA project area footprint in which remnant bushland was noted.

6 Previously Reported Sites in the MKSEA

6.1 Archaeological Background

Prior to the site recording trip commencing, a search of the Aboriginal Heritage Information System and Aboriginal Heritage Sites Register maintained by the DPLH in Perth was conducted to identify any previously recorded Aboriginal sites that intersect with the immediately surrounding area. The DPLH Site Register is a record of previously recorded Aboriginal sites and heritage surveys within WA and is a mechanism whereby a proponent can identify previously reported Aboriginal sites on a parcel of land.

A similar search was also undertaken of the ACHM Corporate Archives and the details of these searches are below in Table 6-1.

Table 6-1: Previously Identified Sites in the MKSEA

#	Site Name (DPLH Id)	Site Type	MKSEA Precinct	Central Coordinate Easting mE - Northing mN	Arch / Ethno
1	Wattle Grove, Perth. (3312)	Artefact Scatter	Overlaps 2 & 3A	403639mE - 6456649mN	Archaeological
2	Boundary Road, Wattle Grove (3264)	Artefact Scatter	2	403739mE - 6456299mN	Archaeological
3	Edward/Grove Streets (4340)	Artefact Scatter	3A	403339mE - 6457599mN	Archaeological
4	Brentwood Road, NW (4341)	Artefact Scatter	2	405189mE - 6457599mN	Archaeological
5	Brentwood Road, Quarry (4342)	Artefact Scatter	2	405489mE - 6457199mN	Archaeological
6	Brentwood Road, Swamp (4343)	Artefact Scatter	2	405489mE - 6457199mN	Archaeological
7	Yule Brook Farm 02 (24785)	Artefact Scatter	3A	403053mE - 6457085mN	Archaeological

As can be noted in the above table the predominate site type across the area is artefact scatters with all seven (7) sites containing knapped stone. A review of the above sites suggests that the most likely site type to be encountered is small low-density artefact scatters with limited likelihood of other site types such as culturally modified tree or grinding patch sites. Furthermore, the site review coupled with a landscape analysis also indicates a low likelihood to encounter archaeological sites taking into consideration most of the survey area has been subject to historical disturbance associated with land development and clearing of native / remanent habitat.

A full review of the previous sites identified within the MKSEA survey area is reported by Czwierinski (2009) and has been presented to the City of Gosnells. Therefore, a comprehensive background will not be reiterated here. In the course of the survey, those previously recorded sites where the boundary overlapped the survey area and may be subject to impact by the proposed works were reassessed. The details of any reassessment are presented in the results section below.

6.2 Ethnographic background

No Ethnographic sites have been previously identified in the MKSEA area.

However, as noted in Czwierinski 2009: pg 16-17 in the section titled, *4.1.1 Relevant Reports and Aboriginal Site Implications* recommendations taken from Gifford 2007 were presented regarding the *concerns for the future preservation and the registration of the Yule Brook as a site noting the historical disturbance of the creek itself*.

Furthermore, in the course of the investigation the Whadjak Representatives requested that the City of Gosnells engage additional Anthropological services (preferably a female practitioner) to conduct a more in-depth assessment with Whadjak Noongar Elders in relation to the Yule Brook as well as record the details of a Frog Dreaming story as told to Violet Pickett and her sisters (names not provided) by their father.

7 Heritage Investigation and Site Assessment Results

7.1 Precinct One (1)

Precinct 1 was visited on the 22 Oct 2018.

There are No previously recorded sites within Precinct One (1) and two (2) areas identified as either Conservation Category Wetland (CCW) or Threatened Ecological Community (TEC) -. Following a debriefing period, the team investigated these areas, Lot numbers #110 and #107. A detailed search of the Investigation/survey target areas in remaining remnant bushland in Precinct 1 resulted in NO previously recorded aboriginal heritage sites or new aboriginal heritage sites being identified.

7.2 Precinct Two (2)

Precinct 2 was visited on the 23 & 24 Oct 2018.

There are 5 previously recorded sites within Precinct Two (2) and six (6) areas identified as either Conservation Category Wetland (CCW) or Threatened Ecological Community (TEC). Following debriefing period, the team investigated these areas. A detailed search of the Investigation/survey target areas in remaining remnant bushland in Precinct 2 resulted in the identification of 1 Isolated Artefact (see Figure 7-1) which was collected by Stan Headland Jnr for safe keeping. There were NO new aboriginal heritage sites identified in the target investigation areas.



Figure 7-1: Isolated Artefact - Quartz Flake held by Stan Headland Jnr.

A total 5 previously recorded sites were identified within or overlapping the MKSEA Precinct Two Inspection/Survey areas and all of these were subject to detailed investigation.

7.2.1 Wattle Grove, Perth DPLH Id 3312 - Artefact Scatter

This site is a small artefact Scatter consisting of 3 Quartz Flakes and was initially recorded in 1973 by Hallam (1986). This site has a large Polygon that overlaps a portion of Precinct 2, Precinct 3A & 3B, Bush Forever allotment of land as well as a large area outside the MKSEA footprint. Furthermore, this site boundary covers the Boundary Road, Wattle Grove site (details below). Czerwinski 2009 Table 6: pg15 reports that all 3 artefacts were previously collected and therefore DPLH Id 3312 may be considered no longer a site under Section 5 of the AHA 72.

7.2.2 Boundary Road, Wattle Grove DPLH Id 3624 - Artefact Scatter

This site is a small artefact Scatter consisting of 3 artefacts 1x Quartz Flake, 1 x Dolerite Flake and 1 x Glass was initially recorded in 1970 by Hallam (1986). This site has a small circular boundary that is situated in its entirety in Precinct 2, within the MKSEA footprint. Czerwinski (2009:15) reports that all 3 artefacts represent a contact assemblage and is listed as a registered Aboriginal heritage site. Upon visiting the recorded site location central coordinate, the team found the area to be heavily disturbed by pastoral activities as a number of horses were

observed grazing at the site location. Furthermore, the area had formed a natural wetland in was in a large part underwater. The team were not able to investigate the area in which the site central coordinate was located as winter rains had in undated the site location and it was therefore inaccessible. Further investigation is required to determine the presence of cultural materials, condition and intactness of site. However, given the evident disturbance it is unlikely that any cultural materials present would be in their original depositional context and the site integrity is very poor.



Figure 7-2: Boundary Road, Wattle Grove DPLH Id 3624; located in wetland left half of Image behind trees.

7.23 Brentwood Road, NW DPLH Id 4341

This site is a small artefact Scatter consisting of ~50 artefacts, 49 x Quartz and 1 x Chert which was initially recorded in 1973 by Stranger (no date). This site has a small circular boundary that is situated almost in its entirety (~90%) in Precinct 2, within the MKSEA footprint. Czerwinski 2009 Table 6: pg15 reports from Strawbridge 1988: 56) "**There are also many sites that have been disturbed by development.....these sites cannot be or do not require further assessment**". It is also noted in Czerwinski 2009: 13 that;

Currently (2009) there is insufficient information for the ACMC to determine if this is an Aboriginal site" but there is potential for this to be determined to be an Aboriginal site. More information is required by the ACMC to determine the sites status.

Upon visiting the recorded site location central coordinate, the team found the area to be heavily disturbed by historical clearing activities as building rubble was found at this location. Furthermore, the area to the SW of the central coordinate was built up with significant earthworks in place (see Figure 7-3 and Figure 7-4 below). The remaining site area in which remnant bushland was identified was inspected in detail with no cultural material identified. Given the evident disturbance it is unlikely that any cultural materials present would be in their original depositional context and the site integrity is very poor. Therefore, it is considered that it is unlikely that Brentwood Road, Quarry DPLH Id 4342 would constitute an aboriginal Heritage site under section 5 of the AHA 72.



Figure 7-3: Brentwood Road NW DPLH Id 4341 Central Coordinate Location view NNW



Figure 7-4: Brentwood Road NW DPLH Id 4341 SW portion of site view SE

Brentwood Road, Quarry DPLH Id 4342

This site is a small to moderate sized artefact Scatter/Quarry consisting of ~48 artefacts, 40 x Quartz, 7 x Fossilized Chert, and 1 x Chert which was initially recorded in 1973 by Stranger (no date). This site has a small circular boundary that is situated half in half out (~50%) of Precinct 2, within the MKSEA footprint. It is notable that that approximately half of the site area is situated across the Tonkin Hwy at the location where a culvert drain is located (see Figure 7-5). Czerwinski 2009 Table 6: pg15 reports from Strawbridge (1988: 56) "*There are also a large number of sites that have been disturbed by development.... these sites cannot be or do not require further assessment*".

Upon visiting the recorded site location central coordinate, the team found the area to be heavily disturbed, and within 12m of the Culvert Drainage exit point that runs underneath the Tonkin HWY. General visibility at the site location was poor around the central coordinate at <10%. However further to southern and eastern portions of the site were access was granted by the current land owners' visibility was mildly increased at 10-20%. Nevertheless, given the evident extensive disturbance it is probable that any cultural materials present would not be in their original depositional context and the site integrity is very poor. Therefore, it is considered that it is unlikely that Brentwood Road, Quarry DPLH Id 4342 would constitute an aboriginal Heritage site under section 5 of the AHA 72.



Figure 7-5: Brentwood Road, Quarry DPLH Id 4342 site with Tonkin HWY - View SE.

7.24 Brentwood Road, Swamp DPLH Id 4343

This site is a small to moderate sized artefact Scatter consisting of ~42 artefacts, 32 x Quartz and 10 x Fossilized Chert, which was initially recorded in 1973 by Stranger (no date). This site has a small circular boundary that is situated half in half out (~50%) of Precinct 2, within the MKSEA footprint. It is notable that that approximately half of the site area is situated across the Tonkin Hwy at the location where a culvert drain is located. Czerwinski 2009 Table 6: pg15 reports from Strawbridge (1988: 56) "*Indications of early occupation. This site requires further examination prior to disturbance by development*".

Of note, both this site and Brentwood Road, Quarry DPLH Id 4342 are listed on the DPLH AHIS and site cards at the same location at 405489mE - 6457199mN.

Upon visiting the recorded site location central coordinate, the team found the area to be heavily disturbed, and within 12m of the Culvert Drainage exit point that runs underneath the Tonkin HWY (see Figure 7-6). General visibility at the site location was poor around the central coordinate at <10%. However further to southern and eastern portions of the site were access was granted by the current land owners' visibility was mildly increased at 10-20%. Nevertheless, given the evident extensive disturbance it is unlikely that any cultural materials present would be in their original depositional context and the site integrity is very poor. Therefore, it is considered that it is unlikely that Brentwood Road, Swamp DPLH Id 4343 would constitute an aboriginal Heritage site under section 5 of the AHA 72.



Figure 7-6: Brentwood Road, Swamp DPLH Id 4343 site with Tonkin HWY - View SE

7.3 Precinct Three (3) B

Precinct 3B was visited on the 24 Oct 2018.

There are No previously recorded sites within Precinct 3B and two (2) areas identified as either Conservation Category Wetland (CCW) or Threatened Ecological Community (TEC). Following debriefing period the team investigated these areas including several accessible points along the Yule Brook. A detailed search of the Investigation/survey target areas in remaining remnant bushland in Precinct 3B resulted in NO previously recorded aboriginal heritage sites or new aboriginal heritage sites being identified. Visited Lot#71 and #8 before walking the edge of the Yule Brook which was very densely vegetated resulting in <5% visibility along both banks.



Figure 7-7: Survey Team visiting Yule Brook at rear of Lot#71 - View SW

7.4 Precinct Three (3) A

Precinct 3A was not visited in the course of the Heritage Impact Assessment. However, two (2) previously recorded sites were noted in the Precinct 3A MKSEA footprint.

7.41 Yule Brook Farm 02 DPLH Id 24785

This site is a small artefact Scatter consisting of 24 artefacts all Quartz was initially recorded in 2007 by Hook (2007). This site has a small circular boundary that is situated in its entirety in Precinct 3A, within the MKSEA footprint. Czerwinski 2009 Table 6: pg15 reports (from Hook 2007: 33) that *If the water corporation intend to conduct excavation works in this area that shovel test pitting occurs at YB07-01* This site is listed on the DPLH AHIS as a lodged Aboriginal heritage site.

Access was not granted to visit the property on which the site was recorded and therefore the team were not able to investigate the area in which the site central coordinate was located as winter rains had lush grasses cover the site location and visibility was very low. Further investigation is required to determine the presence of cultural materials, condition and intactness of site. However, given the evident disturbance it is unlikely that any cultural materials present would be in their original depositional context and the site integrity is very poor.



Figure 7-8: Yule Brook Farm 02 DPLH Id 24785 view NE

7.42 Edward/Grove Streets DPLH Id 4340

This site was not visited in the course of the survey due to time constraints and that the land owner had commissioned a heritage investigation through another heritage consultancy. The results of that survey were not available at the time of drafting this report.

8 Summary of Results

Australian Cultural Heritage Management (Victoria) Pty Ltd (ACHM) have been engaged by the City of Gosnells to undertake the Aboriginal Cultural Heritage Impact Assessment of the City of Gosnells proposed Maddington Kenwick Strategic Employment Area (MKSEA). The Maddington Kenwick Strategic Employment Area (MKSEA) is an area bound by Bickley Road, Roe Highway and Tonkin Highway is currently being investigated for future industrial development (see Map 1-1). The aim of the proposed development is to determine if future industrial development can occur whilst ensuring the protection of key environmental characteristics of the area. The area has been and continues to be subject to various planning studies to determine its suitability of industrial development.

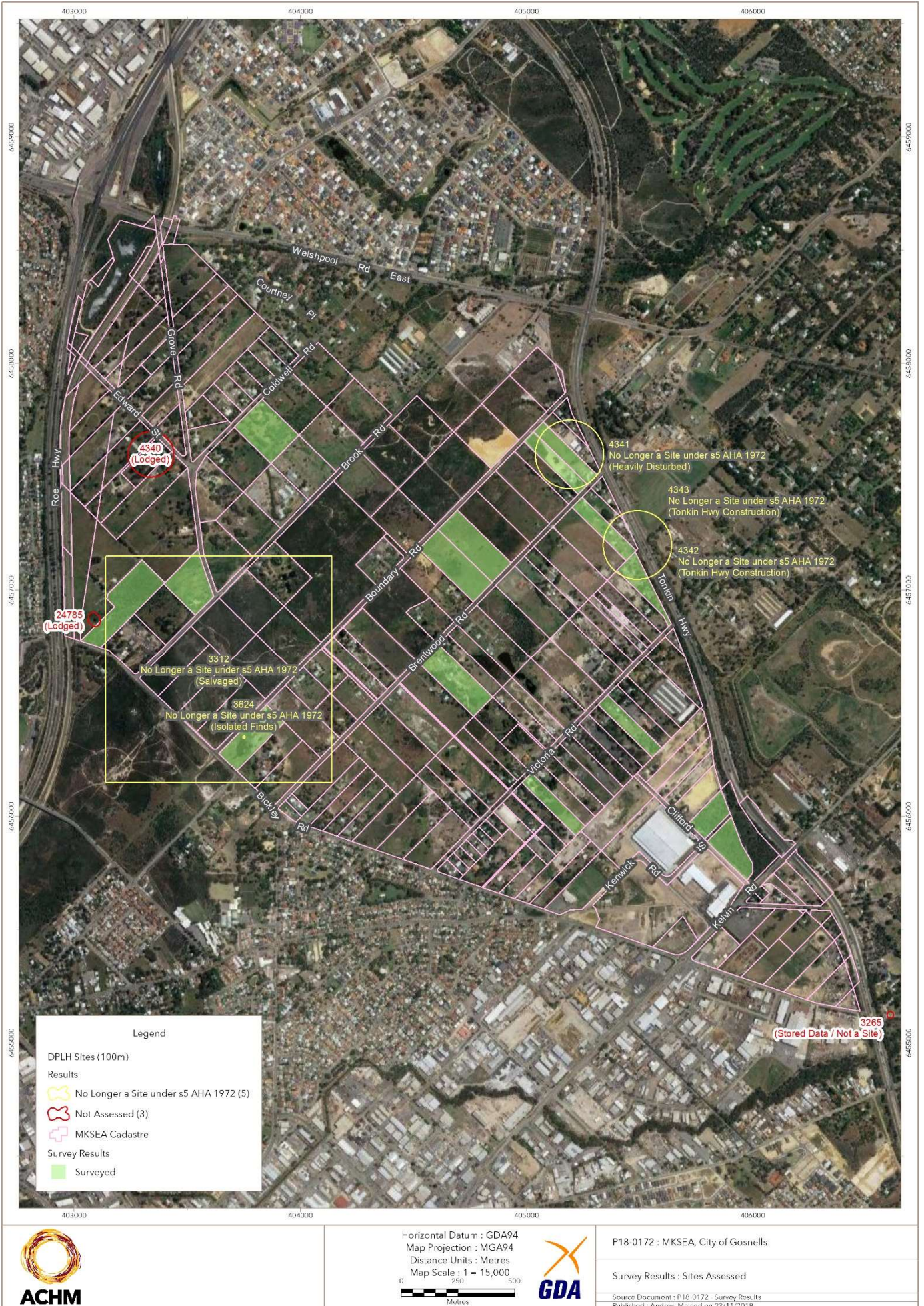
This Report documents the results of the Cultural Heritage Impact Investigation of the 6 designated sites within the proposed MKSEA impact areas, which was conducted 22 - 24 Oct 2018.

The work area lies wholly within the Whadjak Noongar Native Title area in the City of Gosnells planned MKSEA Precincts.

It should also be noted that prior to the commencement and in some instances during, that all permissions to enter target areas located on privately owned property was sought and obtained by the city of Gosnells prior to any entry. These permissions also informed of the survey target methodology.

As a result of the Cultural Heritage Impact Assessment:

- Taking into consideration the extensive historical development and land use within the proposed MKSEA project footprint, only those places where remnant vegetation i.e. Conservation Category Wetland (CCW) and Threatened Ecological Community (TEC) areas were deemed suitable for investigation and subsequently inspected (notwithstanding access restrictions) (see Map 8-1) due to the higher potential for in-situ cultural material in its original depositional context.
- Lots #110, #107, #195, #142, # 501, # 190, #279, #130, #137, #139 (?), #71 and #78 were visited over the course of the fieldwork.
- 6 sites listed in the scope of works within Maddington Kenwick Strategic Employment Area (MKSEA) were revisited. These sites include (DPLH Place Id); Wattle Grove, Perth (3312) - or part thereof; Boundary Road, Wattle Grove (3624); Brentwood Road NW (4341); Brentwood road Quarry (4342); Brentwood Road Swamp (4343); and Yule Brook Farm 02 02 (24785).
- Of the six (6) visited locations, two (2) sites - Boundary road, Wattle Grove (3624 and Yule Brook Farm 02 02 (24785) could not be inspected in detail and due to access constraints or restrictions and subsequently were viewed from a short distance ~50m or less.
- Of the revisited sites, three (3) (see Map 8-1) were found to be heavily disturbed by historical land use activities and therefore could no longer be recorded and assessed in detail as heritage sites under the AHA 72.
- Czerwinski (2009:15) reports that all 3 artefacts were previously collected and therefore DPLH Id 3312 may be considered no longer a site under Section 5 of the AHA 72.
- 1 site - Edward/Grove Streets (4340) was not visited due to time constraints. Furthermore, the survey team were advised by the City of Gosnells representatives that this site was subject to an evaluation/inspection by another Heritage Consultancy which had been commissioned by the current landowner and no results were available at the time of drafting this report.
- The 3A Precinct and City of Kalamunda Precinct were not visited over the course of the Survey as no Conservation Category Wetland (CCW) and Threatened Ecological Community (TEC) areas are present in these areas furthermore time constraints restricted target location options.



Map 8-1: Survey Results.

9 Recommendations

- For those locations - Brentwood Road NW (DPLH Id 4341); Brentwood Road, Quarry (DPLH Id 4342); Brentwood Road Swamp (DPLH Id 4343); that have been re-assessed as no longer likely to constitute an archaeological sites under section 5 of the AHA 72, the Whadjak Noongar representatives requested that further investigation is undertaken to provide understanding regarding any approval processes may have been undertaken prior to any ground disturbance activities.
- Boundary Road, Wattle Grove (DPLH Id 3624) further investigation is required to determine the condition and intactness of the site.
- If the access is granted by the land owner and the opportunity to visit this location become available that the Yule Brook Farm 02 02 (24785) site is investigated to determine the condition and intactness of the site.
- Should ground disturbing activity be proposed within the immediate vicinity of any previously identified site, Whadjak Noongar Traditional Owners are afforded the opportunity to have two representatives monitor earthworks at the following locations; Boundary Road, Wattle Grove (DPLH Id 3624); Brentwood Road NW (4341); Brentwood road Quarry (4342); Brentwood Road Swamp (4343); and Yule Brook Farm 02 02 (24785).
- Whadjak Noongar Traditional Owners requested an opportunity to undertake further discussion and consultation with the City of Gosnells regarding the future management and employment opportunities (such as conservation land managers, rangers as well as the establishment of potential tourism ventures) with regards to the area of land listed as the Bush Forever Precinct.
- The Whadjak Noongar representatives have requested further opportunity to have a suitably qualified anthropologist to conduct further ethnographic consultation re the Yule Brook Stream, as this water way was presented as a place of importance to past lifeways and daily life. It was considered that two days at accessible locations along the Yule Brook with Whadjak Noongar elders would be sufficient.
- Any proposed impacts to the newly recorded archaeological sites, and any other previously recorded sites, may breach section 17 of the AHA. It is recommended that any earthworks should avoid any damage or disturbance to these areas
- In the Rezoning MKSEA precincts that the street names are amended or replaced Whadjak Noongar names and places.

In addition to the archaeological recommendations provided in this report, Whadjak Noongar may have additional recommendations relating to the management and mitigation of these sites. Further consultation and engagement with Whadjak Noongar regarding proposed impacts and mitigation strategies should be conducted.

11 Bibliography

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12 Glossary

Absolute Dating: Is the process of determining a specific date for an archaeological or paleontological site or artefact. Some archaeologists prefer the terms chronometric or calendar dating, as use of the word "absolute" implies a certainty and precision that is rarely possible in archaeology. See also relative dating.

Adze: A stone tool made on flakes with steep flaking along the lateral margins and hafted for use as a wood working tool.

Alluvial Terrace: A terraced embankment of loose material adjacent to the sides of a river valley.

Amorphous: Showing no definite crystalline structure.

Angle Of Applied Force: The angle at which the force of flaking is applied to a core.

Angular fragment: A piece of stone that is blocky or angular.

Anisotropic: Having some physical properties which vary in different directions.

Anvil: A portable stone, used as a base for working stone tools. Anvils most frequently have a small circular depression in the centre which is the impact damage from where cores were held while being struck by a hammer stone. An anvil may be a multi-functional tool also used as a grindstone and hammer stone.

Archaeological Context: The situation or circumstances in which a particular item or group of items is found.

Archaeological site types: The archaeological site types encountered in Australia can be divided into three main groups:

Historical archaeological site: An archaeological site formed since the European settlement containing physical evidence of past human activity (for example a structure, landscape or artefact scatter).

Aboriginal contact site: A site with a historical context such as an Aboriginal mission station or provisioning point, or a site that shows evidence of Aboriginal use of non-traditional Aboriginal materials and technologies (e.g. metal or ceramic artefacts).

Aboriginal prehistoric archaeological site: A site that contains physical evidence of past Aboriginal activity, formed or used by Aboriginal people before European settlement.

These sites may be:

Artefact scatters	Scarred Trees
Isolated artefacts	Mounds
Rock shelters	Rock art
Burial Structures	Hearths
Shell middens	Quarries
Ethnographic Items	Grinding Patches

Archaeology: The study of the past through the systematic recovery and analysis of material culture. Archaeology relies heavily upon science and cognate disciplines to provide interpretations of the past life ways of the peoples under investigation.

Artefact: any movable object that has been utilised modified or manufactured by humans.

Artefact scatter: A surface scatter of cultural material. Aboriginal artefact scatters are often defined as being the occurrence of five or more items of cultural material within an area of about 10m x 10m.

Australian Height Datum: The datum used to determine elevations in Australia. The AHD is based on the mean coastal sea level being zero metres AHD.

Australian Small Tool Tradition: Stone tool assemblages found across Australia, with the exception of Tasmania, dating between 8000 BP to European contact. The tool types include hafted implements (e.g. Bondi points), bifacial and unifacial points, geometric microliths, and blades. The assemblage is named for its distinct lack of larger 'core tools' which characterised earlier assemblages.

Axe: A stone-headed axe or hatchet or the stone head alone, characteristically containing two ground surfaces which meet at a bevel.

Backed Artefact: Backed artefacts are flakes retouched until they have one or more steep and relatively thick surfaces that are covered with negative scars. Since the backing retouch was accomplished with a bipolar and/or anvil-rested knapping technique, these retouched surfaces typically show negative scars originating from two directions, a pattern that is sometimes described as "double backing". Backed pieces are a feature of the 'Australian small tool tradition', dating from about 8000 BP in southern Australia.

Bearing: An angle measured clockwise from a north line of 0° to a given surveyed line.

Bevelled Edge: An edge which has had its angle altered.

Biface: A flaked stone artefact which has flake scars on both ventral and dorsal surfaces.

Bipolar: Technique of knapping where a core is rested on an anvil and force applied to the core at an angle close to 90° in the direction of the core's contact with the anvil.

Blade: A flake at least twice as long as it is wide.

Blaze: A mark carved in a tree trunk at about breast height. This type of mark was traditionally used by explorers or surveyors to indicate a route of passage in a certain direction, or a particular camp location.

Bulb of Percussion: Is a convex protuberance located at the proximal end of the ventral surface of a flake, immediately below the ring crack.

Bulbar Scar: The negative scar on a core that results from the bulb of percussion on the extracted flake.

Burial site: Usually a sub-surface pit containing human remains and sometimes associated artefacts. Human burials can also occur above the ground surface within rock shelters or on tree platform burials.

Burin: A stone implement roughly rectangular in shape with a corner flaked to act as a point for piercing holes.

Cadastral: From the Latin, a cadastre is a comprehensive register of the real property of a country, and commonly includes details of the ownership, the tenure, the precise location (some can include GPS coordinates), the dimensions (and area), the cultivations if rural and the value of individual parcels of land.

Chert: Is a fine-grained silica-rich microcrystalline, cryptocrystalline or microfibrillar sedimentary rock that may contain small fossils. It varies greatly in colour (from white to black), but most often manifests as gray, brown, greyish brown and light green to rusty red. Its colour is an expression of trace elements present in the rock, and both red and green are most often related to traces of iron (in its oxidized and reduced forms respectively).

Cleavage Plane: A plane of weakness or preferred fracture in a rock.

Composite: An artefact made up of two or more parts joined together.

Conchoidal Fracture: describes the way that brittle materials break when they do not follow any natural planes of separation. Materials that break in this way include flint and other fine-grained minerals, as well as most amorphous solids, such as obsidian and other types of glass. Conchoidal fractures often result in a curved breakage surface that resembles the rippling, gradual curves of a mussel shell; the word "conchoid" is derived from the word for this animal. A swelling appears at the point of impact called the bulb of percussion. Shock waves emanating outwards from this point leave their mark on the stone as ripples. Other conchoidal features include small fissures emanating from the bulb of percussion.

Conjoin: A physical link between artefacts broken in antiquity. A conjoin set refers to a number of artefacts which can be been refitted together.

Contours: Lines joining points of equal height on a topographic map. Contour lines that are relatively close together depict an area of steep terrain on the earth's surface; whereas lines depicted a distance apart represent flat areas on the earth's surface.

Core: An artefact from which flakes have been detached using a hammer stone. Core types include single platform, multi-platform, and bipolar forms.

Cortex: Weathered outer surface of rock, usually chemically altered.

Crazing: Production of visible surface cracks by uncontrolled heating of rock.

Crown land: Technically belonging to the reigning sovereign, is a class of public land, provided for the enjoyment and benefit of the people.

Crushing: Abrasion, small fracturing and the formation of ring cracks, usually along an artefacts edge.

Cryptocrystalline: Rock in which the crystal structure is too fine for clear resolution with an optical microscope.

Cultural significance: Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (Australia ICOMOS Burra Charter Article 1.2).

Cultural Materials: The products of human behaviour, such as stone artefacts or food debris.

Datum: In surveying and geodesy, a datum is a reference point or surface against which position measurements are made, and an associated model of the shape of the earth for computing positions. Horizontal datum's are used for describing a point on the earth's surface, in latitude and longitude or another coordinate system. Vertical datum's are used to measure elevations or underwater depths. The previous datum used in Australia was known as the Australian Geodetic Datum (AGD). However, this was restricted because it was defined to best fit the shape of the earth in the Australian region only. The change in datum's had a major consequence to all coordinates. Both latitudes/longitudes and eastings/northings were shifted by approximately 200 metres in a north-easterly direction.

Debitage: The term debitage refers to the totality of waste material produced during lithic reduction and the production of chipped stone tools. This assemblage includes, but is not limited to, different kinds of lithic flakes, shatter, and production errors and rejects.

Decortication: Removal of cortex from a stone artefact.

Dendrochronology: Is the method of scientific dating based on the analysis of tree-ring growth patterns.

Denticulated: Describes a stone tool which has one edge worked into a series of notches giving a toothed or serrated cutting edge.

Discard: The movement of an object from its systemic context to an archaeological context.

Distal: The end of a flake opposite the bulb; the area of a flake containing its termination.

Direct Freehand Knapping: A method of holding the material to be flaked in the unsupported hand and directing the hammer stone with the other hand.

Dorsal Surface: The face of a flake which was the core surface prior to flake removal and may therefore retain negative flake scars or cortex.

Edge ground implement: A tool, such as an axe or adze which has been flaked to a rough shape and then ground against another stone to produce a sharp edge.

Edge modification: Irregular small flake scarring along one or more margins of a flake, flaked piece or core, which is the result of utilisation/retouch or natural edge damage. Edge damage refers to the removal of small flakes from the edge of an artefact.

Elevation: The height above mean sea level.

Eraillure Flake: A flake formed between the bulb of force and the bulbar scar. Sometimes the eraillure flake adheres to the core in the bulbar scar. The eraillure flake leaves no scar on the core, but always leaves a scar on the ventral surface of the flake. The eraillure flake is convex / concave (like a meniscus lens), has no distinct features on the "dorsal face", but may contain compression rings on the bulbar face.

Ethno-archaeology: The study of human behaviour and of the material culture of living societies in order to learn how items enter the archaeological record, thus allowing the formation of hypotheses as to how items of material culture entered the archaeological record in pre-history.

Ethnographic Site: Often overlooked in cultural heritage management, an ethnographic site is one which has particular spiritual or ritual significance to a particular group of people. They are more commonly referred to as 'dreaming sites' in Australia, and most appropriately recorded by someone with anthropological qualifications.

Excavation: The systematic recovery of archaeological data through the exposure of buried sites and artefacts. Excavation is a destructive process, and hence it is accompanied by comprehensive recording of every aspect.

Excavation Report: Once an excavation has finished, a report outlining the reasons, aims, methods used and findings from the excavation as well as some conclusions drawn from interpreting the artefacts.

Faceted Platform: A platform which is created by the removal of a number of flake scars.

Feather Termination: A termination of the fracture plane that occurs gradually (i.e. there are no sharp bends in the plane), producing a thin, low angled distal margin.

Feature: In excavations, a feature is something that a human made in the past that has not been or cannot be moved. Examples of this would be a house floor or a hearth (fire pit). When archaeologists are excavating, they often come across features.

Flake: A piece of stone removed from a core during the process of knapping by the application of external force, which characteristically shows traces of the processes of removal: concentric fracture ripples and a bulb of percussion. Flakes with a length: breadth ratio of 2:1 or more are usually referred to as blades. In some cases flakes are the result of shaping a block of stone into a tool of some kind. When removed from a prepared core, however, they were usually used as blanks for making tools. Primary flakes (also called decortication flakes) are large, thick flakes struck off a core when removing the cortex and preparing it for working. Secondary flakes (also called reduction flakes) are large flakes struck off a piece to reduce its size or thickness. Tertiary flakes are small flakes struck off when shaping the detail of a piece to make a specific tool. Retouching flakes are tiny, extremely thin flakes pinched or pushed off a piece to finish it, to fine-shape part of the surface, sharpen it, or resharpen it. Notching flakes are produced when putting hafting notches in stone tools.

Force: The quantity of energy exerted by a moving body; power exerted; energy exerted to move another body from a state of inertia.

Formal tool: an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces, adzes and axes.

Fracture: Irregular surface produced by breaking a mineral across rather than along cleavage planes.

GDA94: Geocentric Datum of Australia. A spatial reference system which is universally implemented across Australia. The Geocentric Datum of Australia (GDA) is a coordinate reference system that best fits the shape of the earth as a whole. It has an origin that coincides with the centre of mass of the earth, hence the term 'geocentric'

Geodesy: The science and mathematical calculations of the shape and size of the Earth.

Geographic coordinates: a geographic coordinate system enables every location on the earth to be specified, using mainly a spherical coordinate system. There are three coordinates: latitude, longitude and geodesic height.

Geographic Information Systems: Is any system for capturing, storing, analysing, managing and presenting data and associated attributes which are spatially referenced to Earth. GIS is a system or tool or computer based methodology to collect, store, manipulate, retrieve and analyse spatially (georeferenced) data.

Geometric microlith: A small tool that has been fashioned from breaking apart a microblade. The piece is then retouched or backed and a small tool formed.

Gilgai soils: Soils with an undulating surface, presenting as a pattern of mounds and depressions. Gilgai soils contain swelling clays, which shrink and swell with alternate drying and wetting cycles. They display strong cracks when dry. Elements of the soil circulate and move during the shrink-swell process.

Global Positioning System: GPS is a satellite based navigation system originally developed by the United State's Department of Defence. A GPS receiver calculates a position by measuring distances to four or more satellites of a possible 24. These always orbit the Earth .

Grain: A description of the size of particles or crystals in rocks or sand. Coarse grained rocks have particles or crystals which are large (1mm or more), and fine grained rocks have particles which are small (0.1mm or less).

Greywacke: Hard fine-grained rock of variable composition containing some quartz and feldspar but mostly very fine particles of rock fragments.

Graticule: A network of crossing lines on a map representing parallels of latitude and meridians of longitude as defined by the projection.

Grid: The division of an archaeological site into small squares that denote different areas of excavation, making it easier to measure and document the site.

Grid coordinates: A point on a map given as an easting and northing reading. The values are given in metres.

Grindstone: The abrasive stone used to abrade another artefact or to processes food. Upper and lower grind stones used to grind plants for food and medicine and/or ochre for painting. A hammer stone sometimes doubles as a hammer stone and/or anvil.

Hammer stone: a piece of stone, often a creek/river pebble/cobble, which has been used to detach flakes from a core by percussion. During flaking, the edges of the hammer stone become 'bruised' or crushed by impact with the core. Hammer stones may also be used in the manufacture of petroglyphs.

Hand-Held: Description of the method used to immobilize the rock during knapping, it which it is held in one hand and struck by a hammer stone held in the other hand.

Hardness: Resistance of material to permanent deformation.

Hearth: Usually a sub-surface feature found eroding from a river or creek bank or a sand dune – it indicates a place where Aboriginal people cooked food. The remains of hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved with a hearth.

Heat treatment: The thermal alteration of stone (including silcrete) by stone workers to improve its flaking qualities.

Heritage: The word 'heritage' is commonly used to refer to our cultural inheritance from the past that is the evidence of human activity from Aboriginal peoples through successive periods of later migration, up to the present day. Heritage can be used to cover natural environment as well, for example the Natural Heritage Charter. Cultural heritage can be defined as those things and places associated with human activity. The definition is very broad, and includes Indigenous and historic values, places and objects, and associated values, traditions, knowledge and cultures.

Heritage Place: A place that has aesthetic, historic, scientific or social values for past, present or future generations – 'this definition encompasses all cultural places with any potential present or future value as defined above'. Heritage place can be subdivided into Aboriginal place and historical place, for the purposes of this document.

Hinge Termination: A fracture plane that turns sharply toward the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is rounded and should not be confused with a step termination.

Historic place: A place that has some significance or noted association in history.

Homogeneous: Uniform structure and property throughout the material.

Hunter-gatherer: A member of a society who gains their subsistence in the wild on food obtained by hunting and foraging.

Hydrology: Is the study of the movement, distribution, and quality of water throughout the Earth.

ICOMOS (International Council on Monuments and Sites): ICOMOS is a nongovernment professional organisation closely linked to UNESCO, with national committees in some 100 countries with the headquarters in France. ICOMOS promotes expertise in the conservation of cultural heritage. It was formed in 1965, and has a responsibility to advise UNESCO in the assessment of sites proposed for the World Heritage List. Australia ICOMOS was formed in 1976. Its fifteen member executive committee is responsible for carrying out national programmes and participating in decisions of ICOMOS.

Incipient Crack: A crack or line of weakness in the rock.

Inclusion: An impurity or foreign body in the stone that reduces the homogeneity of the rock.

Indirect Percussion: Punch technique.

Interpretation: The process of explaining the meaning or use of an artefact.

Inward Force: Force applied to the platform, and directed into the body of the core.

Isolated artefact: The occurrence of less than five items of cultural material within an area of about 100 sq. metres. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

Knapper: A person who creates stone artefacts by striking rocks and causing them to fracture.

Knapping Floor: The debris left on one spot and resulting from the reduction of one block of raw material. A knapping location is a site comprised of one or more knapping floors.

Koori: Koori is an Aboriginal term used to describe Indigenous people from Victoria and southern New South Wales.

Lateral Margins: The margins of a flake either side of the percussion axis.

Latitude: The angular distance along a meridian measured from the Equator, either north or south.

Layer: The layer is the level in which archaeologists dig. All excavation sites have different numbers of layers. Archaeologists try to work out when they are moving to a new layer by cultural or man-made clues like floors, but sometimes they will go by changes in soil colour or soil type.

Longitude: The angular distance measured from a reference meridian, Greenwich, either east or west.

Longitudinal Cross Section: The cross-section of a flake along its percussion axis.

Magnetic north: The direction from a point on the earth's surface to the north magnetic pole. The difference between magnetic north and true north is referred to as magnetic declination.

Maintenance: The process of keeping an artefact in a particular state or condition. An edge which is being used is maintained by flaking off blunted portions. A core is maintained by keeping its characteristics within the limits required for certain types of flaking.

Manufacture: The process of making an artefact.

Manuport: Foreign fragment, chunk or lump of stone that shows no clear signs of flaking but is out of geological context and must have been transported to the site by people.

Map scale: The relationship between a distance on a map and the corresponding distance on the earth's surface.

Margin: Edge between the ventral and dorsal surfaces of a flake.

Material culture: A term that refers to the physical objects created by a culture. This could include the buildings, tools and other artefacts created by the members of a society.

Mercator projection: A conformal cylindrical projection tangential to the Equator. Rhumb lines on this projection are represented as straight lines.

Meridian: A straight line connecting the North and South Poles and traversing points of equal longitude.

MGA94: The Universal Transverse Mercator coordinates of eastings, northings, and zones generated from GDA94 are called Map Grid of Australia 1994 coordinates.

Microblade: A very small narrow blade.

Microcrystalline: Rocks in which the crystals are very small but visible in an optical microscope.

Microwear: Microscopic use-wear.

Moiety: A moiety is a half. Tribes were composed of two moieties (halves) and each clan belonged to one of the moieties.

Mound: These sites, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow buildup of debris resulting from earth-oven cooking: although some may have been formed by the collapse of sod or turf structures. It has also been suggested some were deliberately constructed as hut foundations.

Morphology: The topographical characteristics of the exterior of an artefact.

Mosaic: A number of continuous aerial photographs overlapped and joined together by way of 'best fit' to form a single non-rectified image.

Negative Bulb of Force: The concave surface left after a flake has been removed. See Bulbar Scar.

Notched: Serration or series of alternating noses and concavities.

Obtrusiveness: How visible a site is within a particular landscape. Some site types are more conspicuous than others. A surface stone artefact scatter is generally not obtrusive, but a scarred tree will be.

Overhang: The lip on a core or retouched flake, caused by the platform being undercut by the bulb on the flake removed.

Overhang Removal: The act of brushing or tapping the platform edge in order to remove the overhang in a series of small flakes.

Overlays: The Victorian Planning Provisions establish a number of different Overlays to show the type of use and development allowed in a municipality. Heritage Overlays will list places of defensible cultural heritage significance.

Patina: An alteration of rock surfaces by molecular or chemical change (but not by attrition, hence not to be confused with sand blasting).

Pebble/cobble: Natural stone fragments of any shape. Pebbles are 2-60 mm in size and cobbles are 60-200 mm in size.

Percussion: The act of hitting a core with a hammer stone to strike off flakes.

Percussion Flaking: The process of detaching flakes by striking with a percussor.

Percussion Length: The distance along the ventral surface from the ring crack to the flake termination.

Place: Place means a site, area, land, landscape, building or other works, group of buildings or other works, and may include components, contents, spaces and views. (Australia ICOMOS Burra Charter Article 1.1)

Plane of Fracture: The fracture path which produces the ventral surface of a flake.

Planning scheme: The legal instrument that sets out the provisions for land use, development, and protection in Victoria. Every municipality in Victoria has a planning scheme.

Platform: Any surface to which a fabricator is applied when knapping.

Platform Angle: 1. The angle between the platform and core face on a core. 2. The angle between the platform and dorsal surface on a flake. 3. The angle between the platform and flaked surface on a retouched flake.

Platform Preparation: Alteration of the portion of the platform which receives the fabricator by grinding, polishing or flaking. Removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering.

Platform removal flake: A flake which contains a platform on the dorsal surface.

Point of force application: The area of the platform in contact with the indenter during knapping. Also known as point of contact.

Positive Bulb of Force: Bulb of force.

Post-depositional processes: The natural or cultural processes which may differentially impact upon archaeological sediments after they deposited.

Potlids: A concave-convex or plano-convex fragment of stone. Potlids never have a ringcrack or any other feature relating to the input of external force. They often have a central protuberance which indicates an internal initiation to the fracture. Potlids are the result of differential expansion of heated rock.

Pre-contact: Before contact with non-Aboriginal people.

Post-contact: After contact with non-Aboriginal people.

Pressure Flaking: The process of detaching flakes by a pressing force. Also Static Loading.

Primary decortication: The first removal of cortex from a core, creating a primary decortication flake. The flake will have a dorsal surface covered entirely by cortex.

Procurement: Obtaining raw materials.

Provenance: The location of an artefact or feature both vertically and horizontally in the site. Archaeologists record the provenance of artefacts and features in their field books and on the artefact bag. Provenance is important because it gives archaeologists the history and context of an object, i.e., exactly where it was found on the site.

Punch: An object which is placed on a core or retouched flake and receives the blow from the percussor.

Quarry: A place where humans obtained stone or ochre for artefact manufacture. A place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Quartz: A form of silica.

Quartzite: Sandstone in which the quartz sand grains are completely cemented together by secondary quartz deposited from solution.

Radiocarbon Dating: Also called carbon dating and C-14 dating. It is used to work out the approximate age of an artefact by measuring the amount of carbon 14 it contains. This dating technique is not perfect. It can only be used on organic remains (typically wood or charcoal). Also radiocarbon is only accurate to ± 50 years, and cannot accurately date objects more than 50,000 years old.

Redirecting Flake: A flake which uses an old platform as a dorsal ridge to direct the fracture plane.

Redirection: Rotation of a core and initiation of flaking from a new platform situated at right angles to a previous platform. It produces a redirecting flake.

Reduction: Process of breaking down stone by either flaking or grinding.

Reduction Sequence: A description of the order in which reduction occurs within one block of stone.

Rejuvenate: The process of flaking in such a way that further reduction is possible or is easier. This usually involves removing unwanted features, such as step terminations, or making unsuitable characteristics more favourable, for example changing the platform angle. A Rejuvenation flake is a flake that has been knapped from a core solely for the purpose of preparing a new platform and making it easier to get flakes off a core, as it reduces that angle between platform and core surface.

Relative Dating: A general method of dating objects, which uses their relation to other objects. For example, artefacts found in lower layer are typically older than artefacts in higher layer.

Relic: Deposit, object or material evidence of human past.

Replica: A copy of a prehistoric artefact made by a modern investigator for research purposes.

Replicative Systems Analysis: A method of analysing prehistoric artefacts by creating exact replicas of all the manufacturing debris.

Reserves: The word 'reserve' derives from the land being reserved for a particular public use. Crown land retained in public ownership, but not reserved is termed unreserved Crown land.

Resharpening: The process of making a blunt edge sharper by grinding or flaking.

Retouched Flake: A flake that has subsequently been re-flaked. A flake, flaked piece or core with intentional secondary flaking along one or more edges.

Retouching: The act of knapping a flake into a retouched flake.

Ridge: The intersection of two surfaces, often at the junction of two negative scars.

Ring Crack: A circular pattern of micro-fissures penetrating into the artefact around the Point of Force Application and initiating the fracture. It appears on the ventral surface usually as a semi-circular protuberance on the edge of the platform.

Rock art: Paintings, engravings and shallow relief work on natural rock surfaces. Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface.

Run: A large area of land in which squatters could pasture their stock without a lot of fencing necessary. Employed shepherds looked after various areas of the runs. Runs became consolidated pastoral holdings. Many of the runs were about 25 sq miles in area and later became parishes.

Sand: Quartz grains with only a small content of other materials. Grain size 2.00 mm to 0.05 mm.

Sandstone: A sedimentary rock composed of sand, and with only a small amount of other material, which has been consolidated by argillaceous or calcareous bonding of grains.

Sahul: This is the name given to the continent when Australia and New Guinea were a single landmass during the Pleistocene era. During this period, sea levels were approximately 150 metres lower than present levels.

Scar: The feature left on an artefact by the removal of a flake. Includes negative bulb, negative ring crack and negative termination.

Scarred tree: Scars on trees may be the result of removal of strips of bark by Aborigines e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors' marks.

Scraper: A flake, flaked piece or core with systematic retouch on one or more margins.

Screen: A screen is used by an archaeologist to sift excavated soil in search of small artefacts like nails, ceramic fragments, and organic material like seeds, shell, and bone. Can be either manual (hand held) or mechanical.

Secondary Decortication: The removal of cortex from a core after the primary decortication flake. A secondary decortication flake is one that has both cortex and flake scars on the dorsal surface.

Selection: Runs were subdivided into selections for farming, agriculture and grazing homesteads. After a period of yearly rental payments, the selector could often obtain freehold ownership.

Shell midden: A surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These site types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

Sieve: See Screen.

Significance: Significance is a term used to describe an item's heritage value. Values might include natural, Indigenous, aesthetic, historic, scientific or social importance.

Silica: Silicon dioxide.

Silcrete: A silicified sediment.

Siliceous: Having high silica content.

Site: An area designated for archaeological exploration by excavation and/or survey usually due to the presence of a concentration of cultural material.

Step Termination: A fracture plane that turns sharply towards the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is sharp, often a right angle.

Stratification: Over time, debris and soil accumulate in layers (strata). Colour, texture, and contents may change with each layer. Archaeologists try to explain how each layer was added--if it occurred naturally, deliberately (garbage), or from the collapse of structures--and they record it in detailed drawings so others can follow. Stratigraphy refers to the interpretation of the layers in archaeological deposits. Usually, the artefacts found on top are the youngest (most recent), while those on the bottom are the oldest.

Structures (Aboriginal): Can refer to a number of different site types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fish traps, dams and cairns, or of earth, such as mounds or some fish traps.

Surface Site: A site where artefacts are found on the ground surface.

Taphonomy: The study of the depositional and preservation processes which produce archaeological or paleontological material.

Termination: The point at which the fracture plain reaches the surface of a core and detaches a flake.

Tertiary Flake: A flake without cortex.

Theodolite: Instrument used by a surveyor for measuring horizontal and vertical angles.

Thermal Treatment: Alteration of siliceous materials by controlled exposure to heat.

Thickness: Measurement of the distance between the dorsal and ventral surfaces of a flake.

Thumbnail scraper: A convex edged scraper that is small, generally the size of a thumbnail.

Tool: Any object that is used.

Topographic map: A detailed representation of cultural, hydrographic relief and vegetation features. These are depicted on a map on a designated projection and at a designated scale.

Transverse Cross Section: The cross section of a flake at 90° to the length.

Transverse Mercator projection: A projection similar to the Mercator projection, but has the cylinder tangent at a particular meridian rather than at the equator.

True north: The direction to the Earth's geographic North Pole.

Tula: A flake with a prominent bulb, large platform and platform/ventral surface angle of about 130°, which is retouched at the distal end. Not to be confused with a Tula Adze.

Tula Adze: A composite tool observed ethnographically, consisting of a stone artefact (often a Tula), a wooden handle and resin.

Unidirectional Core: Core from which flakes were removed from one platform surface and in only one direction.

Unifacial: Artefact flaked on only one side.

Unit: Archaeologists lay out a grid over a site to divide it into units, which may vary in size, and then figure out which units will be dug. Archaeologists dig one unit at a time. Keeping track of specific measurements between artefacts and features gives archaeologists the ability to draw an overall map looking down on the site (called a floor plan), to get the bigger picture of the site.

Use-wear: Damage to the edges or working surfaces of tools sustained in use.

Ventral Surface: The surface of a flake created when it is removed and identified mainly by the presence of a ring crack.

Visibility: The degree to which the surface of the ground can be seen. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices, such as ploughing or grading. Visibility is generally expressed in terms of the percentage of the ground surface visible for a project area.