7. THE RESULTS

Two isolated artefacts were recorded during the investigation. They were recorded as follows:

Site : **"GL ISO1"**

Site type: Isolated artefact.

Location: Map: Hillgrove 9236-1-N, 1: 25,000 scale Topographic map
Map ref: (GPS) 56J 0383235 6618414 (corrected to Topo ref. 383200 6618520)

Material: Silcrete

Description: Flake scraper
62 x 52 x 24 mm
Broad platform 15 x 11
Overhang removal
Core rotation
Cortex nil

Average archaeological visibility within 1 m radius: 60%

Background: Small, fragmentary and angular meta-sedimentary rubble on coarse-grained weathered meta-sedimentary deposits.

Context: The artefact was found in an erosion feature in open dry eucalypt woodland of predominantly regrowth eucalypts with some casuarina. The woodland has been logged/thinned by saw and dozer and the felled timber heaped into unburnt piles. There is likely to be significant displacement of surface material, but the artefact depositional location was probably within 20 m radius of the find-spot. The location is on a saddle between two hills and was probably a route between Gara River and Commissioners Waters. It is unlikely that this was a camp site, and the artefact was probably dropped or left behind accidentally as it is still in usable condition as a scraper.

Site : **"GL ISO2"**

Site type: Isolated artefact.

Location: Map: Hillgrove 9236-1-N, 1: 25,000 scale Topographic map

Map ref: (GPS) 56J 0383143 6619426 (corrected to Topo ref. 383150 6619420)

Material: Silcrete

Description: Flake

31 x 46 x 15 mm

Broad platform 27 x 16 (cortex)

Possible retouch to both margins – but could also be partly or solely from stock treadage

Feather termination

Strike plane 75º

Cortex 10% (platform)

Average archaeological visibility within 1 m radius: 95%

Background: Coarse-grained weathered meta-sedimentary deposits with very few stone pieces.

Context: The artefact was found in the southern eroded face of the creek bank in cleared pasture. The location is approximately 350 m from a small camp site previously recorded on the summit of a small hillock overlooking the creek – see **Figure 7** on page 20, the 'earlier' site is at the base of the twin power-poles at the right of centre in the distance. Because the creek bank deposits are likely to be both alluvial and colluvial in origin, and the area has both been cleared of vegetation and subjected to stock grazing for many years, it is not possible to say where the artefact was originally deposited, but if we assume that it has not travelled far then there is a potential for other artefacts to exist along the creek banks to either side.

8. DISCUSSION

While it is difficult to be confident that there are no other Aboriginal sites of cultural significance in the survey area, primarily as a consequence of clearing, and general disturbance, it is reasonable to assume that if there is any artefactual material present that it is likely to occur along the banks of the main creek, and consist of isolated artefacts and/or low density artefact scatters, neither of which would be visible. Because of the likelihood that

any artefacts would be so sparsely distributed it would not be practical to undertake subsurface investigation, merely to recover one or two more artefacts, however it is reasonable to suppose that monitoring of earthworks along the creek banks in the vicinity of the artefact find-spot might yield additional artefactual material.

Generally, campsites would have been on elevated well-drained land, overlooking or adjacent to reliable water resources. The survey area occurs on the lower slopes and valley floor in an area of open dry eucalypt woodland, in which there were few natural resources – such as water, stone suitable for knapping, shelter, or food resources not available elsewhere. It is unlikely that the area would have been suitable as a camp-site, and so any artefacts found in the survey area were probably accidentally dropped or discarded during transit, perhaps while travelling along the valley, or between the Gara River and Commissioners Waters.

This particular valley of what was only an ephemeral creek was generally unsuitable for campsites and it is probable that it was only ever used for opportunistic activities, such as catching, killing and butchering animals, or for tool maintenance, or as a transit corridor. None of these activities would have left much in the way of archaeological evidence other than the occasional dropped or discarded flake, or trimming flakes of less than 5 mm length discarded during the maintenance of tools.

In summary, although the survey areas occur in a region in which there are known to be places of Aboriginal association, there is very little potential for the survey area to contain any significant archaeological material. Primarily as a consequence of the extent to which the survey area has been significantly altered, there are few undisturbed contexts in which archaeological material could occur. If however archaeological material is present, it is likely to consist of small isolated artefacts or low density open scatters only, none of which will be observed other than by chance.

In its report of the field survey Anaiwan Aboriginal Traditional Owners recommended that their representative should be present during any turf stripping, or clearing of the piled timber, or removal of existing vegetation in the wooded areas of the survey area. At the time ASR also recommended that a representative of Anaiwan Aboriginal Traditional Owners should

monitor any earthworks within 25 metres to either side of the main creek line in the road corridor.

Given that the road corridor is 60 m wide it would be possible to avoid the site at "GL ISO2" which is only 7 m from the fenceline, thus avoiding the necessity of obtaining Section 90 Consent for Salvage for the site. However, the creek banks both upstream and downstream of the site are of potential archaeological sensitivity and ASR recommended that any earthworks that require excavation of the banks should be monitored.

Subsequently, the decision by Council to apply for Part 3A Approval changed the options available to the Aboriginal Community with regard to monitoring. The effect of Part 3A Legislation was to negate any pre-existing legislation that might otherwise have been a constraint to development, thus Section 90 Consent to Salvage and Destroy was not required to develop the site. Consequently the only recourse Aboriginal stakeholders had was to either request the developer to avoid impacting upon sites wherever practical, and if not practical to avoid the sites, to salvage the artefactual material. The stakeholders elected to request that the two artefact locations should be avoided and that the artefacts should remain in situ.

In this instance Council agreed to avoid impacting upon the two site locations, and to ensure that accidental damage did not occur to the site in the access road corridor a circle of vertical posts would be placed around site "GL ISO2" at a radius of 10m from the artefact. Given that Part 3A does not require a developer to make such a concession Council is to be applauded for its sensitivity.

Council is advised that Site Recording Forms for the two artefact locations were lodged with DECC to ensure that they were listed as Aboriginal sites on the AHIMS Site Register.

9. SIGNIFICANCE ASSESSMENT

9.1 Cultural significance

The DEC policy to safeguard all sites, Aboriginal places, and archaeological material of significance wherever possible requires that some means of assessing the significance of the sites is necessary. This is not only for the purpose of determining whether the proposed development can proceed as proposed, but also to provide Cultural Resource Managers with the information for future management of the area.

Following the investigation Rhonda Kitchener, Chairperson, Anaiwan Aboriginal Traditional Owners Natural Resource and Cultural Heritage Management Association Incorporated, discussed the results with Armidale Aboriginal Community Elders. Subsequently Rhonda forwarded a report of their recommendations to Appleton, a copy of which is included as **Appendix i**.

When Appleton received the report he contacted Rhonda to obtain a clearer understanding of the recommendations and implications of the report. Rhonda advised Appleton that the Elders had expressed concern that other artefacts might be present beneath the piles of felled timber or in the grass-covered surface deposits in the wooded areas in the saddle at the southern end of the landfill site. As a consequence they recommended that a representative of the Anaiwan Aboriginal Traditional Owners should be present during any turf stripping, or clearing of the piled timber, or removal of existing vegetation in the wooded areas.

As discussed above the decision to proceed with an application for Part 3A Approval for the project introduced a different set of rules to those that would otherwise have applied for a non-Part 3A Project, and once Part 3A Approval has been given the developer is not required to engage Aboriginal people to monitor earthworks.

9.2 Research potential

Although two isolated artefacts were recorded and one of the sites occurred in a context in which others might exist beneath the surface ("GL ISO2"), ASR assessed the research potential of both sites to be low.

The artefact at "GL ISO1" was on a degraded surface in a highly disturbed context, and it was therefore unlikely that the artefact was in its depositional location. There was therefore no indication of where the artefact might have been deposited.

The artefact recorded at "GL ISO2" was on a degraded surface and it is possible others might exist further back from the creek line, and it could be argued that the intact bank upslope of the degraded area was therefore an area of potential archaeological interest. But typically many sites on the Northern Tablelands are of only isolated artefacts.

The issue was should the site be declared a PAD (see Glossary) or could the road be realigned to avoid the site?

Appleton (ASR) discussed the options with the client's representative, who advised Appleton that the road could be realigned to avoid the site, and that the artefact location (at "GL ISO2") could be contained within a buffer zone. Thus it became unnecessary to investigate the site any further.

When considering whether or not a site is likely to be of research potential, it is necessary to consider who would be undertaking the research. At the present time the cost of undertaking research in the field is such that unless there is a very strong potential for further information to be recovered from a site, that the researcher will use what funds they have on far more promising sites than this. By protecting the site within a buffer zone the site remains intact until such time as more funds are available for research, or a project is undertaken in which the site is just one of many being investigated.

Having undertaken over 480 archaeological projects across the state over a period of nineteen years Appleton has assessed both sites to be of very low potential research value.

10. RECOMMENDATIONS

Council is advised that both of the two artefact locations were registered as Aboriginal sites on the AHIMS Site Register although the listing will not be a constraint to Part 3A Approval.

While Part 3A Approval would render any constraints that might otherwise have applied under the National Parks and Wildlife Act 1974 (as amended) ineffective, ASR recommends that in the interests of the Armidale Aboriginal Community Council should instruct their employees, sub-contractors, machine operators and representatives, whether working on the project Site or elsewhere, that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work should cease immediately in the area of the find.

In the event that any bone cannot be clearly identified by a qualified archaeologist as being of animal remains the police are to be informed of its discovery, and officials and/or their representatives of Armidale LALC, Nyakka Aboriginal Culture Heritage Corporation Archaeological & Cultural Heritage Consultants, and the Manager, Planning & Aboriginal Heritage, DECC, Coffs Harbour, advised that the bone is subject to police investigation.

Work should not recommence in the area of the find, until both the police (if bone has been found) and those officials or representatives have given their permission to do so. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the National Parks and Wildlife Act 1974, as amended.

GENERAL GLOSSARY: The definitions that follow are for terms used in this and other reports written by the author, and do not necessarily apply to their use in different contexts.

ADZE : A modified flake with at least one steeply-retouched working edge. While all adzes are generally considered to be wood-working tools it is probable that some also served as cores and others as scrapers. Adzes with a uniform butt were frequently hafted to make a chisel-like tool, but the intended use of the adze determined the size of the adze and whether it was hafted (Flenniken and White, 1985).

ARCHAEOLOGICAL DEPOSIT :
Sediments which contain evidence of past Aboriginal use of the place, such as artefacts, hearths, burials etc.

ARTEFACT : Any object that has attributes as a consequence of human activity (Dunnell, 1971). In this report 'artefacts' has been used generally to describe pieces of stone that have been modified to produce flakes, flaked pieces, cores, hammerstones, or axes.

BACKED BLADE :
A stone tool manufactured from a flake on which one margin has been modified by the removal of small flakes to blunt the edge or margin opposite the cutting edge.

BORA GROUND :
A ceremonial site comprising of one or two connected circles composed of compacted or mounded earth, or defined by an arrangement of stones, of 2 to 30m diameter, generally used in male initiation rites.

CAMPSITE : A place at which the density of artefacts and the variety of material indicates that people 'frequently' used the place as a stopping or resting place. Such places are also likely to contain or be close to water resources, food resources, or stone material resources. In this report a campsite is used to describe artefact scatters that are associated with hearths or fireplaces, as distinct from scatters that are not associated with hearths or fireplaces, which are described as Open Scatters.

CHALCEDONY :
A form of silica (partially translucent), which occurs as linings in cavities in rocks. When banded it is known as AGATE (Department of Mines, 1973). Chalcedony is uniformly coloured and agate has curved bands or zones of varying colour (Cook & Kirk, 1991).

CHERT : Another name for sedimentary chalcedony. It occurs most frequently in limestones, or in marine sedimentary rock, or as pebbles in sedimentary rock. In its depositional context it is often concentrated in bedding planes. Chert found in deep-water limestones is formed from radiolaria and diatoms (siliceous planktonic micro-organisms) (Cook & Kirk, 1991).
Chert is a form of amorphous or extremely fine-grained silica, partially hydrous, found in concertions and beds. It is classified as a chemical sedimentary rock although it may be precipitated both organically and inorganically (Department of Mineral Resources, n.d.).

CONGLOMERATE :
Naturally cemented gravel. Conglomerate is a coarse-grained clastic sedimentary rock composed of generally rounded fragments of other rock types larger than 2 mm in diameter, set in a fine-grained matrix of sand, silt, or any of the common natural cementing materials (Department of Mineral Resources, n.d.).

CORE : A piece of stone from which flakes have been removed, that cannot otherwise be described as a retouched or modified artefact.

CORTEX : The naturally altered surface of stone – eg. the water-worn surface of river pebbles.

DEBITAGE : The small waste material observed in knapping floors. Generally, waste material is described as all those fragments having a maximum dimension of less than 10mm

FLAKE : A fragment of stone exhibiting features indicating that it has been deliberately removed from a core piece. These features are evident as:

i) Platform: Plane or point at which a blow was delivered to remove the flake.
ii) Bulb of Percussion: Convex surface that occurs on the face or ventral surface of a flake, radiating from the point of impact, produced as a consequence of the force pattern.
iii) Eraillure: see below.

Other terms:

i) Dorsal: The back or outer face of a flake as it would have been prior to removal from a core. Frequently either ridged or exhibiting negative flake scars when removed in secondary flaking, with a natural weathered cortex when removed in primary flaking.
ii) Ventral: The 'chest' or inner face of a flake as it would have been prior to removal from the core. The surface upon which the Bulb of Percussion occurs.
iii) Platform Preparation: The removal of flakes from a surface to produce a level platform. May be evidenced by retouch scars to the platform.
iv) Retouch: The removal of small flakes from an edge or margin of an artefact to modify its shape or resharpen its edge.
v) Proximal: The end of a flake closest to the striking platform.
vi) Distal: The end of a flake furthest from the striking platform.
vii) Margin: The edge of an artefact.
viii) Eraillure: A small circular to elliptical negative flake scar occurring on the surface of the bulb of percussion on flakes of very fine-grained or highly silicified material. It occurs 'naturally' as a consequence of internal forces generated at the time of flake removal.
ix) Split Cone: Occurs when the flake splits down its axis frequently removing part of the striking platform. Generally believed to be produced by faulty knapping technique, but is also probably a consequence of flawed material.
x) Transverse Snap: Occurs when a flake snaps across its axis. Generally believed to be caused by post-depositional impacts such as human or stock treadage, or vehicular traffic.

FLAKED PIECE :

A fragment of stone exhibiting flake scars indicating that it is an artefact, but not displaying diagnostic features, such as a Bulb of Percussion, Striking Platform, or an Eraillure.

GREYWACKE :

A type of sandstone, grey or greenish-grey in colour, tough and well indurated and typically poorly sorted (Clark & Cook, 1986).
A generally poorly sorted, dark sandstone containing feldspar and sand-sized rock fragments of metamorphic or volcanic rocks (Department of Mineral Resources, n.d.).
Usually a dark and coarse-grained rock compared to mudstones and siltstones that are much finer-grained and better sorted.

HOLOCENE PERIOD :

The period from 10,000 years ago to the present.

IGNEOUS ROCK :

Rock formed by the cooling and solidification of magma on or below the earth's surface (Geography Dictionary, 1985).

In situ : In its original place – as deposited.

ISOLATED ARTEFACT :

A solitary stone artefact, at least 50m from its nearest neighbour. This is based on NPWS policy that two artefacts within 50m of each other constitute a site.

KNAPPING FLOOR:

A discrete scatter of artefacts in which at least two artefacts are recognisably of the same material, and derive from the same piece of stone. Also described as a stone tool manufacturing site or floor.

LOCATION : The place at which an artefact is found, or a place identified as having either archaeological or Aboriginal significance.

MEASUREMENT :

I) Flake:
   i) Length: Measured along the percussion axis at right angles to the platform.
   ii) Width: The greatest width measured at right angles to the percussion axis.
   iii) Thickness: The greatest thickness measured at right angles to the percussion axis.

II) Flaked piece:
   i) Length: The longest dimension
   ii) Width: The greatest width measured perpendicular to the length.
   iii) Thickness: The greatest thickness measured perpendicular to the length.

III) Core:
   i) Length: The longest dimension.
   ii) Width: The greatest width measured perpendicular to the length.
   iii) Thickness: The greatest thickness measured perpendicular to the length.

MIDDEN : A refuse heap or stratum of food remains, such as mollusc shells, and other occupational debris (Dortch, 1984 – see also Meehan, 1982).

MUDSTONE : A fine-grained detrital rock, usually quite massive and well consolidated. May be black through grey to off-white, browns, reds and dark blues/greens. Frequently found in association with sandstones (Cook & Kirk, 1991).
Identification is often aided by colour variations in layering. A source for stone material tool manufacturing material found as river pebbles in creek beds, and artefacts often display a water-worn cortex.

NEGATIVE FLAKE SCAR :
A concave surface resulting from the removal of a flake, occurring on the surface of the rock from which a flake has been removed.

PLEISTOCENE PERIOD :
The period from about 10,000 years ago to 2 million years ago.

POTENTIAL ARCHAEOLOGICAL DEPOSIT (PAD) :
Synonymous with Potentially Archaeologically Sensitive : Having the potential to contain archaeological material although none is visible.

QUARTZITE :
Quartzites are formed by the regional or contact metamorphism of quartz arenites, siltstones, and flints (cherts). They are composed essentially of quartz, and usually have a fine-grained granoblastic (grains are roughly the same size) texture. Generally massive, but may sometimes show sedimentary structures (Cook & Kirk, 1991).

ROTATION :
The removal of flakes from a core by blows directed at different angles, to different platforms. May be evident on the dorsal surface of a flake as negative flake scars, which do not follow the same direction as the percussion axis of the flake. This may be confused with scars produced during core preparation.

SCAT : The solid waste material produced by an animal – dung, droppings, manure (Triggs, 1985).

SCATTER : Two or more artefacts occurring within 50 metres. Scatter may also be used in the context of 'background scatter', meaning the general distribution of artefacts across the landscape that cannot be recognised as discrete concentrations.

SILCRETE : A near surface or surface siliceous induration (Desen & Peterson, 1992).
A conglomerate consisting of surficial sand and gravel cemented into a hard mass by silica.
A siliceous duricrust (Bates & Jackson, 1980).

Crusts may form as a result of low, infrequent rainfall, on reasonably flat surfaces. These are known as duricrusts – those cemented by silica are known as silcretes (Clark & Cook, 1986), sometimes referred to locally as 'billy' (Gentilli, 1968), or 'grey billy'.
Silcrete on the northern tablelands of NSW forms at the surface contact between sediments of the Sandon Beds and the Armidale Beds with overlying basalt, where groundwater (more rich in silica than surficial water) interacts with surficial water and precipitates new quartz as the matrix to the sediments (N.D.J. Cook, Dept. of Geophysics, UNE, pers. Comm.).
In softer formations of quartz sands, groundwater has apparently been responsible for the formation of concretionary layers of silcrete. Under altered climatic conditions, the less competent beds erode away leaving concretions. Since they are often the size of old-fashioned woolsacks and are greyish and white, they are popularly known as gray billy (slang for billy goat) (Fairbridge, 1968).

SITE : A discrete area or concentration of artefactual material, place of past Aboriginal activity, or place of significance to Aboriginal people.

SOIL SCIENCE TERMS (taken from Banks, 1995, and others as referenced).

BEDROCK : Outcrop of *in situ* rock material below the soil profile.

BENCH : A strip of relatively level earth or rock breaking the continuity of a slope.

BLOWOUT : A closed depression formed in the land surface by wind eroding sands and depositing them on adjacent land.

CLAYPAN : A depression caused by the aeolian deflation of sediments, or by the presence of a prior lake.

DUNE : A ridge built up by wind action composed of sands, silts, or sand-sized aggregates of clay.

FLOODPLAIN : A large flat area, adjacent to a watercourse, characterised by frequent active erosion and aggradation by channelled and overbank stream flow.

GIBBER : A level surface covered by a thick deposit of gravel or broken siliceous pebbles, occurring in the more arid parts of the continent, thought to have been formed from the break-up of a siliceous (silcrete) surface crust, and termed gibber plains (Whittow, 1984) – see also silcrete.

GILGAI : Surface microrelief associated with soils containing shrink-swell clays. Gilgai consists of mounds and depressions, or irregularly distributed small mounds and subcircular depressions varying in size and spacing. Vertical interval usually <0.3m; horizontal interval usually 3-10m, and surface almost level.
Sometimes called 'crab-hole' soils.

GULLY : An open incised channel in the landscape generally greater than 30cm deep and characterised by moderately to very gently inclined floors and steep walls.

HUMMOCK : A small raised feature above the general ground surface.

LANDFORM ELEMENTS :
Crest : Landform element standing above all points in the adjacent terrain.
Flat : Neither a crest or a depression <3% slope.
Upper slope : Adjacent to and below a crest or flat but not a depression.
Midslope : Not adjacent to a crest, a flat or a depression.
Lower slope :Adjacent to and above a flat or a depression but not a crest.

LITHOSOLS : Shallow soils showing minimal profile development and dominated by the presence of weathering rock and rock fragments.

RILL : A small channel cut by concentrated runoff through which water flows during and immediately after rain.

RUNOFF : That portion of precipitation not immediately absorbed into or detained upon the soil and which thus becomes surface flow.

SCARP/CLIFF : A steep slope terminating a plateau or any level upland surface.

SCRUB : vegetation structure consisting of shrubs 2-8m tall.

SHEET EROSION : The removal of the upper layers of soil by raindrop splash and/or runoff.

SOIL PROFILE :
"A HORIZON" : The top layer of mineral soil. This may consist of two parts:
A_1 HORIZON: Surface soil and generally referred to as the topsoil.
A_2 HORIZON: similar in texture, but paler in colour, poorer in structure, and less fertile.

" B HORIZON" : The layer below the A Horizon. This consists of 2 parts:

B_1 HORIZON: A transitional horizon dominated by properties characteristic of the underlying B_2 horizon.
B_2 HORIZON: typically contains concentrations of silicate clay and/or iron, and/or aluminium and/or translocated organic material.

"C HORIZON" : The parent rock. Recognised by its lack of pedological development, and by the presence of remnants of geologic organization.

"R HORIZON" : Hard rock that is continuous (Charman & Murphy, 1993; 350-1).

SPUR : A ridge which projects downwards from the crest of a mountain as a water-parting (Whittow, 1984).

SUBSOIL : Sub-surface material comprising the B and C Horizons of soil with distinct profiles; often having brighter colours and higher clay contrasts.

SURFACE CONDITION :
Gravelly : Over 60% of the surface consists of gravel (2-69mm).
Hardsetting : Soil is compact and hard.
Loose : Soil that is not cohesive.
Friable : Easily crumbled or cultivated.
Self-mulching : A loose surface mulch of very small peds forms when the soil dries out.

SWALE : A linear level-floored open depression excavated by wind or formed by the build-up of two adjacent ridges.

SWAMP : Watertable at or above the ground surface for most of the year.

TERRACE : A flat or gently inclined surface bounded by a steeper ascending slope on its inner margin and a steeper descending slope on its outer margin (Whittow, 1984).

TOPSOIL : A part of the soil profile, typically the A_1 horizon, containing material that is usually darker, more fertile and better structured than the underlying layers.

UNDERSTOREY : A layer of vegetation below the main canopy layer.

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