Proposed Minemakers Phosphate Mine (MLA 27244) Archaeological Survey Arruwurra Block- Barkly Highway NT.

Prepared for Central Land Council, ALICE SPRINGS

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Tim Hill (BA Hons. Archaeology.)

25 Clarke St ALICE SPRINGS NT 0870 timinya3@bigpond.com 0422 309 822

Executive Summary and Recommendations

The area covered by this archaeological assessment is the proposed Mine Makers phosphate mine (ML 27244) at the Arruwurra block on the Barkly HIghway, Northern Territory. The assessment was commissioned by Central Land Council and is structured following the Office of Environment and Heritage Scope of Works for archaeological assessment.

A total of 12 km was surveyed with a ground visibility being greater than 50% across the entire area. A series of knapping/discard sites were recorded at each of the silcrete outcrops included within the survey. The sites are all similar in composition-being consistently low density knapping debris with very low densities of primary flakes. All artefacts are located in close proximity of the outcropping silcrete. It is highly likely that additional knapping sites exist on all of the silcrete outcrops within the proposed mining lease.

The AW 1 site is determined as being of moderate conservation significance as it is located within a sacred site restricted area and the remaining sites (AW 2, AW 3, AW 4, AW 5, AW 6) are determined to be of low significance. Management recommendations for Arruwurra sites are;

• Apply for consent under the Heritage Conservation Act 1991 for all ground disturbing works within 30 metres of all silcrete outcrops.

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1. Introduction

The area covered by this archaeological assessment is the proposed Minemakers Australia Pty Ltd phosphate mine at the Arruwurra block on the Barkly Highway, Northern Territory. The assessment was commissioned by Central Land Council and is structured following the Office of Environment and Heritage Scope of Works for archaeological assessment.

A total of 12 km was surveyed with a ground visibility being greater than 50% across the entire area. A series of knapping/discard sites were recorded at each of the silcrete outcrops included within the survey. The sites are all similar in composition-being consistently low density knapping debris with very low densities of primary flakes. All artefacts are located in close proximity of the outcropping silcrete. It is highly likely that additional knapping sites exist on all of the silcrete outcrops within the proposed mining lease.

The field survey and report preparation was undertaken by Tim Hill (Tim Hill Heritage Management and Planning) in May 2009.

2. Physical environment

The proposed works are located within the Arruwurra Block situated on the Barkly Highway- approximately 70km east of The Barkly Homestead. The study area is located within the Davenport-Murchison Ranges bioregion. The Davenport-Murchison Ranges bioregion comprises low but rugged rocky hills, formed from folded volcanics and sandstone, siltstone and conglomerates, which contrast starkly with the generally flat sandplain surrounds of the Tanami bioregion and Mitchell Grass Downs to the east. Soils are generally shallow lithosols, but deep fine-grained alluvial soils occur in the valleys and surrounding plains. Vegetation includes hummock grasslands and low open woodlands dominated by eucalypt and *Acacia* species. The climate is arid tropical with summer rain.

Two land-units were defined within the study area based on the classification system proposed by Peter Latz for Central Australia (Latz 1995).

- 1. Spinifex Communities on sandplains and dune fields. The majority of the lease is low lying sand plain dominated by hard spinifex and acacia shrubs and small trees.
- 2. Spinifex communities on hills. The hill areas within the lease are dominated by coarse outcropping silcrete with a very low (less than 10 metres) relief. Soils in these areas appear to be relatively thin with low nutrient levels. The hills are characterised by an absence of a tree or shrub storey.

Drainage within the immediate area of the study appeared to be extremely ephemeral and would provide useable water for only a short period after rainfall events. No major drainage lines or minor creeks were observed and water appeared to be available only at soakages (previously recorded but not sited during the survey)

3. Cultural Setting

3.1. Aboriginal land-use

Detailed historical and anthropological records of traditional and semi-traditional Aboriginal landuse of the Alyawarra language group to the immediate south of the study area have been undertaken by O'Connell and Hawkes (1984). This work was undertaken to test ecological based models of resource use derived from theories of human behavioural ecology. O'Çonnell and Hawkes generally concluded that Alyawara men focused their hunting efforts within mulga and open woodlands in preference over floodplains. The results of the studies for women were less conclusive due to the presence of commercially manufactured flour in the diet which significantly skewed womens foraging patterns away from seed collection and processing towards specific plant resources and smaller animals. The study also noted the value of resources- specifically kangaroo-which allowed men to demonstrate skill and participate within complex kinship/exchange systems.

Anthropological work undertaken to the south of the study area within the Agharringa language area (affiliated with Alyawarra) identify the importance of specific sites along dreaming lines to define land ownership and rights to utilise and manage country (Moyle 1986 in Sutton 1995). Moyle identified that Agharringa men sing entire verses of stories well outside Agharringa country but do not claim ownership of those sites- or necessarily know the location of the sites.

A regional scale archaeological survey undertaken for the Katherine to Camooweal Optical Fibre Cable project (Lance 1990) identified a pattern of sites associated to major rivers and sources of suitable stone material. At these locations sites were spatially extensive and had high artefact densities.

A major excavation at Lake Woods recorded archaeological sites dating potentially to the pleistocene period (Smith 1986). While the archaeological materials were in-situ within ancient lake sands the typology of the stone artefacts was consistent with sites of not older than 6000 years. These include bifacial points, adzes, seed grinding implements, retouched flakes and a few small cores.

Ken Mulvaney (1997) undertook research at the Kurutiti sandstone quarry (Helen Creek) to understand trade and exchange patterns within the region. In addition to the sandstone quarry the site also has a large rock engraving complex and a number of living areas. Mulvaney proposes that Kurutiti was a regionally significant site and that sandstone was traded across the Barkly Tablelands and that the grindstones- and more importantly seed grinding- were an important part of ceremonies and cultural exchange in the region.

3.2. Archaeological Predictive Model

- 1. Spinifex Communities on sandplains and dune fields Low archaeological sensitivity.
- 2. Spinifex communities on hills Moderate to high archaeological sensitivity. High likelihood of silcrete quarries.

4. Previous Archaeological research

A search of the Heritage Database identified no sites in the immediate or surrounding area.

5. Methodology

The field survey aimed to sample the identified land units across the proposed development. The survey utilised meandering pedestrian transects to focus survey effectiveness in areas with greater visibility (Table 1). Sites were marked using GPS waypoints. Archaeological materials were identified by definable characteristics (notably prominent bulb of percussion, point of force application, distinct and/or retouched margins). A total of 7.7km was surveyed in the *Spinifex Communities on sandplains and dune fields* and 5.8km surveyed in the *Spinifex communities on hills*. The survey was supported by traditional owners and a CLC staff member.

6. Results.

A complex of low density silcrete knapping/discard areas was recorded across the proposed mine area. Knapping areas were immediately associated to outcropping silcrete and the individual knapping areas had the greatest densities within the immediate area of the source material. Artefacts densities ranged from 0.2-1 artefact m². All artefacts were simple and primary flakes with no signs of retouch- although several had signs of edge damage. Few artefacts showed signs of platform preparation.

Trans	Land unit	Dist.	Vis.	Sites
AW1	Spinifex Communities on sandplains and dune fields	6518	50	AW 1
AW 2	Spinifex Communities on sandplains and dune fields	2408	70	
AW3	Spinifex Communities on sandplains and dune fields	2976	70	
AW 4	Spinifex communities on hills	180	60	AW 2
AW5	Spinifex communities on hills	65	80	AW 3
AW 6	Spinifex communities on hills		70	AW 4
AW 7	Spinifex communities on hills	34	70	AW 5
AW 8	Spinifex communities on hills	10	80	AW 6
	TOTAL	12386		6

Table 1. Summar	y of survey	v transects
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7. Discussion.

7.1. Assessment of predictive model

- 1. Spinifex communities on sandplains and dune fields. The prediction of low archaeological sensitivity across the sandplains was supported with only one site- AW 1- being located across this land unit in close proximity to a soakage. A likely factor contributing to this is the apparent lack of any form of drainage which would collect water after rains. Significant vegetation growth following high rainfall in 2008 likely also impacted on the effectiveness of the survey and as such it was impossible to record the exact location of the soakage. Of note is that AW 1 is similar to the other sites occurring on a very small outcrop of silcrete within the sand plain.
- 2. Spinifex communities on hills. The prediction of moderate to high archaeological sensitivity was supported with a series of knapping areas at each of the silcrete outcrops surveyed. Of note are that the sites are directly associated to available stone material and showed little evidence of efficient use of the available material. This indicates that use of the area was fairly task specific with groups of people moving through each area quickly and utilizing only so much of the silcrete as required for immediate or imminent tasks. There is little to suggest that the silcrete was systematically knapped for trade or for the production of complicated tools. There is a high confidence that all of the outcropping silcrete across the proposed mine would have consistent archaeological evidence.

7.2. Potential cultural significance.

The Arruwurra archaeological sites have potential cultural significance to Alyawarra and Wakaya people as a tangible link to past geographies and use of the area. It is noted that the archaeological sites were not recorded during the original sacred sites survey with senior traditional owners. During the survey the significance of archaeological sites to traditional owners ranged from quite important during the initial part of the survey to of low importance by the end of the survey.

7.3. Potential scientific significance.

The follow factors contribute to the scientific significance of the Arruwurra site

- Overall it has very low artefact densities.
- A series of sacred sites (soakages) have been recorded in the area with one site- AW 1- being located within the area of a soakage.
- Knowledge of the location of sacred sites is known in the area providing opportunities to understand the cultural context of stone knapping and site use.
- The Arruwurra sites appear to have not been significantly impacted by previous land use or disturbance.

7.4. Statements of significance

The Arruwurra site 1 (AW 1) is determined to be of moderate significance due to its capacity to inform the wider community from a cultural and scientific perspective. Its significance primarily relates to its association to the recorded soakage.

The remaining Arruwurra sites (AW 2, AW 3, AW 4, AW 5, AW 6) are determined to be of low significance. This is primarily due to the high likelihood that all silcrete outcrops in the area were utilised as a stone source and that the use appears to be expedient.

8. Summary and Recommendations.

8.1. Summary.

A total of 12 km was surveyed with a ground visibility being greater than 50% across the entire area. A series of knapping/discard sites were recorded at each of the silcrete outcrops included within the survey. The sites are all similar in composition-being consistently low density knapping debris with very low densities of primary flakes. All artefacts are located in close proximity of the outcropping silcrete. It is highly likely that additional knapping sites exist on all of the silcrete outcrops within the proposed mining lease.

The Arruwurra 1 site complex is determined as being of moderate conservation significance.

The remaining Arruwurra sites (AW 2, AW 3, AW 4, AW 5, AW 6) are determined to be of low significance.

One of the recorded sites (AW 1) is located within close proximity to a restricted area and another (AW 2) is located within an area not identified for development. There are likely several outcrops within either the three restricted areas or areas not identified for mining. As such a proportion of the total archaeological complex will either be protected or not immediately damaged.

8.2. Recommendations

• Apply for consent under the Heritage Conservation Act 1991 for all ground disturbing works within at least 30 metres of silcrete outcrops across the area of the proposed mining lease.

9. References.

Lance, A. 1990. A preliminary archaeological study of the Katherine to Camooweel optical fibre cable route. Unpublished report to National Heritage Studies, Adelaide.

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O'Connell, J.F and Hawkes, K. 1984. Food choice and foraging sites among the Alyawarra. *Journal of Anthropological Research 40:504-435.*

Smith, M.A. 1986. An investigation of possible pleistocene occupation at Lake Woods, Northern Territory. *Australian Archaeology* No. 22:60-74.

Sutton, P. 1995. Country. Aboriginal Boundaries and land Ownership in Australia. *Aboriginal History Monograph 3.* Australian National University, Canberra.

Veth, P., M. Smith and P. Hiscock. 2005. *Desert Peoples. Archaeological Perspectives.* Blackwell Publishing, Carlton.

Map 1. Location of recorded archaeological sites

(This map contains confidential information and as such cannot be put on public display; however, all pertinent information from this map is included in the EIS).

Site Name	Coordinate (GDA 94-Zone 52K)	Location	Site type	Disturbance
AW 1	642567n7777851	West of the access track. No defined track access to archaeological site	Silcrete quarry/ discard site	Nil
AW 2	652208n7780669	Low silcrete outcrop on main access road to the southwestern drilling area and campsite 3.	Silcrete quarry/ discard site	The access track traverses the northern corner of the outcrop.
AW 3	652138n7783157	Low silcrete outcrop on main access road to the southwestern drilling area and campsite 3.	Silcrete quarry/ discard site	Nil
AW 4	652205n7788168	Low silcrete outcrop on main access road south of the current mine camp.	Silcrete quarry/ discard site	Nil
AW 5	657023n7790239	Low silcrete outcrop within the eastern drilling area south of proposed camp 2	Silcrete quarry/ discard site	Some minor disturbance from drilling
AW 6	657001n7791184	Low silcrete outcrop within the eastern drilling area south of proposed camp 2	Silcrete quarry/ discard site	Some minor disturbance from drilling