

**ARCHAEOLOGICAL SURVEY OF
PROPOSED RED HILL QUARRY DEVELOPMENT AREA**

Prepared for
STRATEGEN

on behalf of
HANSON CONSTRUCTION MATERIALS PTY LTD

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EXECUTIVE SUMMARY

In January 2007, an archaeological site survey was carried out over a portion of Lot 11 Toodyay Road, Red Hill. Hanson Construction Materials Pty Ltd is proposing to continue to develop rock quarrying on this land. The survey was commissioned by Strategen, on behalf of Hanson Construction Materials Pty Ltd.

The archaeological survey was conducted by Joe Mattner on the 20th and 24th January 2007. A local resident, Mr William Macham, assisted with the survey by showing Joe Mattner several purported archaeological and historic places within and in the vicinity of the project area.

The proposed development area comprises two sections; the proposed Red Hill Quarry Pit Development Area which has an area of approximately 73.3 ha and is located north and west of the existing Red Hill Quarry; and the much smaller Stockpile Extension Area which has an area of 5 ha and is situated to the southwest of Red Hill Quarry.

Research established that no registered archaeological sites are within the project area. However, the registered ethnographic site #3433 “Herne Hill Ochre”, which is classified as a mythological site, is within the designated land. This site is associated with an occurrence of white ochreous clay. This site is protected from disturbance. Several other Aboriginal sites are located within or close to Lot 11 Toodyay Road, but these are all outside the 2 designated survey areas.

No definite Aboriginal archaeological sites was identified in the course of the survey. The only sure evidence of past Aboriginal activity in the project area was 2 isolated quartz artefacts. These were found on the crest of the ridge north of the existing Red Hill Quarry.

A feature of uncertain archaeological status was also identified in the project area. This is a rockshelter in the Quarry Pit Development Area that was known to Mr W. Macham. No artefacts were found within the rockshelter but a small basal grindstone is located just outside it. However, the provenance of that artefact is uncertain and no other evidence of an Aboriginal presence was observed in or around the rockshelter.

This feature has previously been examined by a DIA heritage officer who concluded that it did not meet the criteria for registration as an Aboriginal site under section 5 or 39 of the W.A. *Aboriginal Heritage Act 1972* (AHA). This assessment is consistent with current DIA guidelines and is supported by the author who does not believe the feature would meet the AHA criteria for registration.

It is far from clear that the rockshelter is an Aboriginal archaeological site, but it might be one. Nonetheless, on the available evidence this shelter probably does not meet the criteria for registration as a heritage site under Sections 5 or 39 of the W.A. *Aboriginal Heritage Act 1972*.

There are, therefore, no newly discovered Aboriginal archaeological sites in the land designated for the continued quarry development, as currently planned. It is, however, necessary to ensure registered site #3433 “Herne Hill Quarry” is continued to be protected from any disturbance.

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SPATIAL ACCURACY: All coordinates given in the report are GDA94 (MGA) Zone 50. Coordinates recorded in the field were collected with a handheld Garmin GPS; datum WGS84.

1.0 INTRODUCTION

1.1 Objectives

Hanson Construction Materials Pty Ltd is planning to continue to develop rock quarrying at Red Hill, in the Darling Scarp to the east of Perth. The proposed operations are centred on the existing Red Hill Quarry. Prior to any development, Hanson Construction Materials Pty Ltd commissioned Strategen, an environmental consultancy, to coordinate a series of environmental and Aboriginal heritage investigations. Strategen in turn engaged C.J. Mattner to conduct the archaeological work.

The project brief called for an archaeological study of the development area, which is located within the centre of Lot 11 Toodyay Road, Red Hill. The archaeological survey had three objectives:

1. to determine if any Aboriginal archaeological sites were already known to exist in the project area, and to find them if possible;
2. to discover any previously unknown sites in the project area; and
3. to provide recommendations for the management of any heritage sites present.

The work was intended to ensure that any development at Red Hill Quarry complies with the W.A. *Aboriginal Heritage Act* 1972. All work was undertaken in accordance with the heritage guidelines of the Department of Indigenous Affairs (DIA) and Environmental Protection Authority Guidance Statement No. 41 'Assessment of Aboriginal Heritage'.

An ethnographic survey has previously been carried out over all of Lot 11 (McDonald 1990). A previous archaeological survey had covered part of Lot 11 and a small portion of the proposed pit development area (Quartermaine 1990). As part of the proposed development, there has been a short review of Aboriginal heritage issues (Clarke 2006).

1.2 Survey Area

Red Hill is located approximately 7km northeast of Midland, and approximately 24km northeast of Perth CBD. It is situated on the Darling Plateau immediately east of the Darling Scarp in the Shire of Swan. The surrounding area is semi-industrial land and parkland (Figure 1).

The Red Hill Quarry and the former Herne Hill Quarry are both within Lot 11 Toodyay Road. To the south, Lot 11 is abutted by John Forrest National Park and Toodyay Road. The northwestern boundary abuts the Darling Range Regional Park. Susannah Brook flows roughly east-west through the middle of Lot 11, following a circuitous route. For an approximate length of 700m, the northeastern and northern edge of the proposed quarry development area lies close to Susannah Brook.

Within Lot 11 Toodyay Road, 2 areas were designated for archaeological survey (Figure 2). These have a combined area of approximately 80ha.

- 1) Proposed Quarry Pit Development Area: this covers an area of 73.3ha and is located north and west of the existing Red Hill Quarry. It reaches north to near Susannah Brook.
- 2) Proposed Stockpile Extension Area: this covers an area of approximately 5ha. It is located south of Red Hill Quarry and north of Toodyay Road, and directly to the southwest of the existing stockpile area.

1.3 Environment

The climate of the Shire of Swan, within which the survey area is located, is characterised by cool, wet winters and hot, dry summers. It lies within the Dry Mediterranean climatic zone and averages between five and six dry months per year (Beard 1981). Average annual rainfall is 870mm, about 80% of which usually falls between May and September (Australian Bureau of Meteorology 2007). Typically, there is a summer drought of several months duration. This influenced Aboriginal occupation of this region, as discussed in section 2.3.

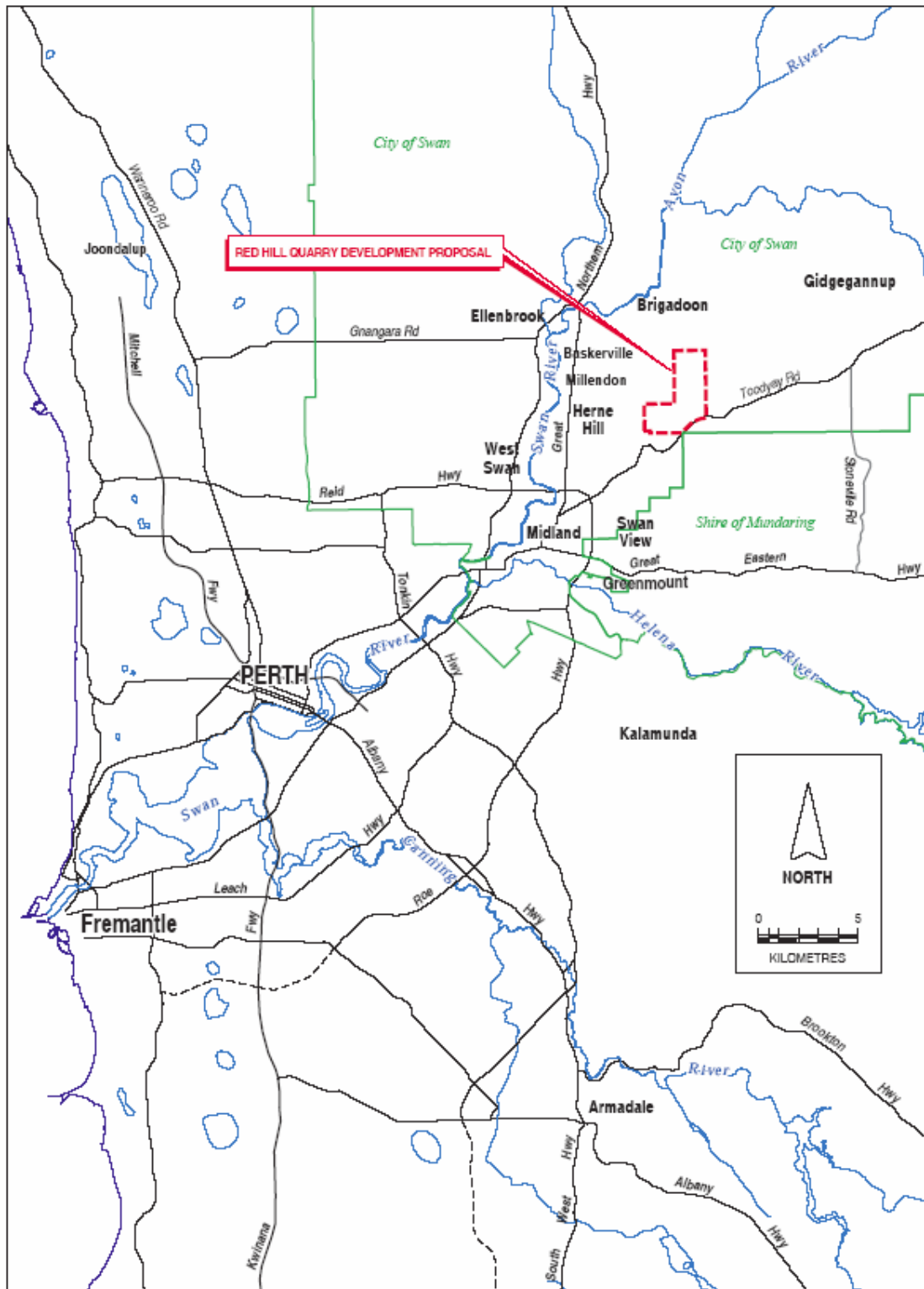
The project area and its surrounds lie adjacent to the eastern margin of the Swan Coastal Plain physiographic unit. The Swan Coastal Plain is bounded by the present coastline to the west, and the Darling Fault to the east. Red Hill is located on the Darling Plateau, immediately to the east of the Darling Scarp and Darling fault line. This is a heavily eroded landscape with exposed laterite and thin soils. Within the project area, the laterite is interspersed with exposures of the underlying fine- to coarse-grained granite. These exposures take the form of large boulder piles and/or large slabs of granite, which typically form steep slopes.

The project area is strongly undulating, with several gullies dissecting the granitic and lateritic hills. The proposed Quarry Pit Development Area covers a high broad ridge extending north of Red Hill Quarry towards Susannah Brook and also high ground extending west towards the former Herne Hill Quarry. Susannah Brook flows around the eastern and northern flanks of this ridge and the slopes are steep and strewn with large boulders and outcrops. West and south of Red Hill Quarry, there is an area of laterite with very little exposure of granite. This ground slopes down to small gullies that drain into Strelley Brook. The proposed Stockpile Extension Area covers an undulating area of strong laterite exposure.

The vegetation of the Red Hill area is included in the Dale Subdistrict of the Darling Botanical System. The proposed Stockpile Extension Area consisted mainly of open woodland of Wandoo with a dense understorey with some areas of open woodland of Jarrah and Marri. The proposed Pit Development Area to the north was dominated by a mosaic of lithic complexes on exposed granites to patches of open to closed heath. In areas of large granite slabs, there was a thin cover of low shrubs and few trees. The proposed Pit Development Area to the west consisted mainly of open forest of Sheoak, Jarrah and Marri over a low understorey. There were patches of young regrowth forest, possibly regeneration from past fires.

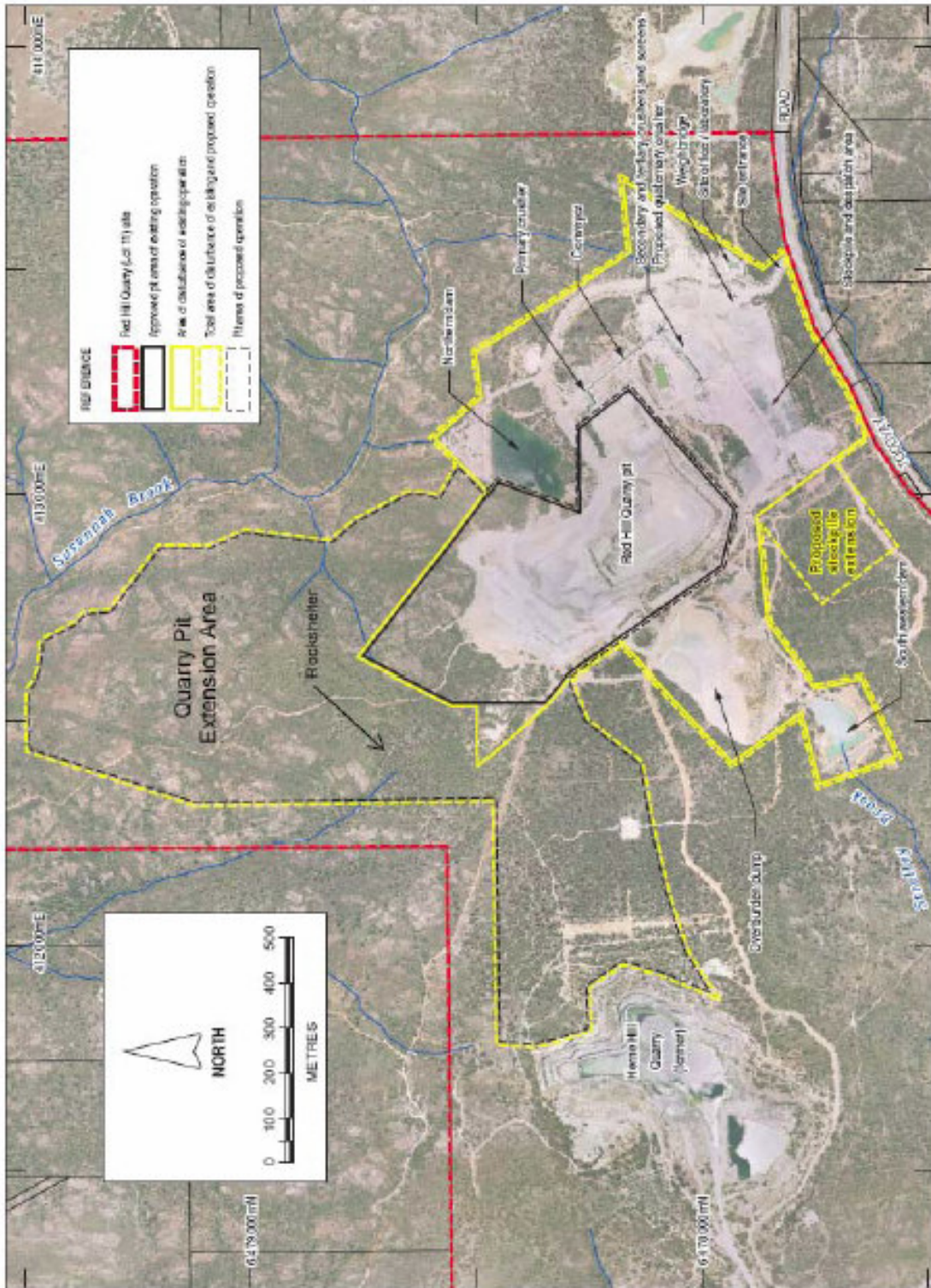
A portion of the project area has been heavily disturbed by tracks, as well as quarrying and associated activities (Figure 2).

In general, conditions for the survey were poor. This is common in forested areas. Ground surface visibility was variable, but much of the designated survey areas had low visibility on account of dense shrubs and leaf litter. Visibility was highest in areas which had been cleared, but this was also the more disturbed ground where there was little likelihood for finding intact archaeological sites. Visibility in the Stockpile Extension Area was generally moderate, as there was less groundcover. On the other hand, there was a high contrast between the granite and laterite and any foreign stone, meaning that artefacts were highly conspicuous.



Hanson Construction Materials Pty Ltd
 RED HILL QUARRY DEVELOPMENT PROPOSAL
 REGIONAL LOCATION OF THE
 RED HILL QUARRY DEVELOPMENT PROPOSAL

Figure
 1



Hanson Construction Materials Pty Ltd
 RED HILL QUARRY DEVELOPMENT PROPOSAL
 EXISTING AND PROPOSED QUARRY OPERATIONS

Figure
 2

2.0 BACKGROUND

2.1 Definitions

The most common archaeological material is discarded stone tools, or the debris from making such tools. These artefacts formed a small but durable part of the Aboriginal tool-kit. Often stone tools were used to manufacture other tools from wood or organic materials. Where numerous artefacts occur in context and in association they constitute an artefact scatter and together comprise the site assemblage.

Artefact scatters generally represent campsites. Large scatters are places that were regularly occupied, sometimes for long periods, and are the accumulation of many overlapping smaller camps. Small scatters are the remains of sites that were briefly occupied, probably on several occasions. Very small scatters may be evidence of an overnight camp, meal-time camp or work area where specific activities were carried out.

A place where stone was obtained for making stone tools is a quarry. Generally quarries contain knapping centres or core reduction areas, which is where stone tools were made. Quarries are found at occurrences of highly siliceous rocks, such as chalcedony, chert, silcrete, quartz, etc. Finished artefacts are not common at quarries and the vast majority of material is waste, called debitage or debris, from making tools or preparing cores for transport off the quarry and later use.

Another common site in the Southwest are culturally marked or scarred trees. Many of these are the scars left by the removal of the outer wood or bark to make implements such as bowls, shields or boomerangs. Other marks include footholds for climbing trees; for example to catch possums or raid nests. Cut marks may indicate where honey was collected from the hives of native bees.

Other site types which are uncommon but have been recorded in the Perth region include art sites and stone arrangements. The art sites are either paintings or engravings and are found in caves where they are protected from weathering. Stone arrangements can consist of hundreds of stones arranged in elaborate lines or in mounds, or can be a single line or small cluster. Solitary placed or standing stones may have served as a sign; for example, as a warning to avoid a ceremonial site or as an indicator of water. Another arrangement type is a lizard trap, which are found on expanses of outcrop. Some circular stone arrangements are the remains of hunting hides or the bases of huts.

Apart from concentrations of artefacts at campsites, there are also solitary artefacts which are distributed at a very sparse density across the landscape. These form a background scatter that probably represents evidence of dispersed hunting and gathering activities.

2.2 What is a site?

For the purposes of this study, an archaeological “site” was defined as a place where “significant traces of human activity are identified” (Renfrew & Bahn 1991: 42). In other words, where there is substantial, in situ evidence of past Aboriginal occupation or activity. This is a scientific definition, not a legal definition.

The decision whether a place might or might not constitute a “site” under Sections 5 and 39 of the W.A. *Aboriginal Heritage Act* 1972 is made by the Aboriginal Cultural Material Committee. Excerpts from the Act are included in Appendices 2 and 3. All types of Aboriginal sites are described in more detail in Appendix 3.

It is important to note that all sites are protected under the Act, whether known or not, or whether reported or not. It is an offence to disturb or conceal a site, or remove artefacts, without appropriate consent.

2.3 Ethnohistory

There is little ethnohistorical information specific to the northeast districts of Perth, but there are many accounts of the Noongar tribes in the Southwest. A number of early settlers described the lifestyle of the Aborigines after the time of initial settlement, when there had been disruption to traditional life (e.g. Grey 1841; Hammond 1933). A more thorough chronicler was Daisy Bates, who travelled and worked extensively in the Southwest of the State in the early part of the twentieth century (Bates 1985).

Past settlement patterns were related to the seasons and the scheduling of resources. The Noongar recognised six seasons, each coinciding with an abundance of particular food resources. Bates (1985: 46) noted that these tribes had an abundance of food and “there was no time of the year which had not its seasonal product for the sustenance of its inhabitants”. Where dependable supplies of food were available, there were opportunities for large social gatherings extending over weeks or longer.

In the Perth district, a considerable part of subsistence activities were focussed on the Swan–Helena river system, including fringing lakes and swamps. Estuaries were also important, but there was little use of the coastal and littoral zones. The wetlands and rivers offered a wide variety of animal and plant foods, while yams were cultivated on the floodplains (Hallam 1986). The Darling Scarp with its steep slopes and thick forest was not used regularly.

The seasonal cycle of movement was in large part between the coastal lowlands and the inland forests (Anderson 1984; Hammond 1933; Yates 2004). The general pattern involved moving inland during the winter months; to the jarrah forest and the zone between the forest and the coastal plain. In the forested hills, people relied more on hunting and were more mobile, travelling in small groups. A wide range of foods were hunted, including kangaroos and possums, and numerous plants were collected, including yams and other root foods.

In summer, people returned to the coastal plains and the wetlands, rivers and estuaries, with their abundance of fish, water fowl and wetland plant foods. There were larger social gatherings and longer periods of residence at campsites. Nonetheless, it seems there was intermittent occupation at estuaries and water sources on the coastal plains throughout the year. No such gatherings seem to have occurred in the hills or forests east of the Swan Coastal Plain.

The Noongar regularly burnt their land, as a means of keeping paths open, as a hunting technique and as a form of ‘fire-stick farming’ to promote certain plant species (e.g. *Macrozamia*) and to create clearings with fresh feed for game (Hallam 1985).

2.4 Site Patterning

Researchers have identified the archaeological signature of the migration between forested plateau and coastal plain reported in the ethnohistorical accounts. Hallam (1986) conducted a systematic study of the Swan Coastal Plain in the 1970s and early 1980s. Using numbers and types of sites within ecological zones as a means of comparison, Hallam describes the pattern and nature of archaeological assemblages from littoral zone, through coastal sand plain to the foothills and Darling Scarp. Hallam concluded that Aboriginal occupation was focused around lakes and swamps of the Bassendean Sands and Pinjarra Plains ecological zones.

Anderson (1984) proposed a land-use model for prehistoric exploitation of the Swan Coastal Plain, and its hinterland, based on regional research into the relative proportions of surface artefact scatters and their associated artefact densities. This model suggests that, due to the variation in resources available in the three different environmental zones investigated, there was more intensive use of the coastal plain than either the adjacent forest or open woodland plateau. The Darling Scarp was a transitional zone, which people occupied briefly often in pursuit of specific resources such as knappable stone.

At the macro level, the factors influencing Aboriginal settlement and occupation of the region included the climate and the distribution and availability of natural resources. At the micro level, the patterning of sites was influenced by factors including topography, hydrology and vegetation. Aspects of comfort and practicality were important factors in the selection of Aboriginal campsites. Campsites were typically situated on level ground or on a slight slope on well-drained soils. They were in locations that took advantage of shade or windbreaks, were close to wood supplies and not too far from water (Lilley 1985; Tindale 1974).

2.5 Site Significance

The heritage significance of a site is determined by several factors. Principal among these will be Aboriginal viewpoints and scientific significance. The public, educational or aesthetic value of a site are also factors to be considered.

Assessments of the archaeological or scientific significance of sites are typically based on two criteria: representativeness and research potential (Bowdler 1981; Coutts 1979; Raab & Klinger 1977). Representativeness refers to the frequency of occurrence of sites or archaeological material. The more commonplace something is the less significant it will be, while unique sites will be of high significance. Research potential refers to the likelihood that study of a site or archaeological material will answer scientific questions. A stratified site that can be dated will have more research potential than a surface site, while a complex assemblage will have more potential than a smaller, less diverse one.

3.0 ARCHIVAL RESEARCH

3.1 Registered Archaeological Sites

The on-line Register of Aboriginal Sites at the DIA was searched to determine if any previously recorded archaeological sites were located within or in the vicinity of the 2 survey areas (see Appendix 1). This search also provided information on the types and frequency of archaeological sites and their distribution in this district.

No registered archaeological sites are located within the proposed Quarry Development Area. There is, however, one registered site within the project area. This is site (DIA id.) #3433 “Herne Hill Ochre”. This site was recorded during an ethnographic survey by McDonald (1990). It is described as a small patch of high quality ochre and was identified as a mythological site. No archaeological component was reported or identified in association with this site. No archaeological material was found near this site during the current survey.

Within approximately 2km of the project area, the Register of Aboriginal Sites contains details of 7 Aboriginal archaeological sites or sites with archaeological components (Table 1).

Table 1: registered archaeological sites within 2km of the project area

DIA site id. no.	Site Name	Site Type	Other	Status	Access
21170	RED/01 – Engraving	Engraving	Mythological	I	O
17696	Red Hill #1	Artefact Scatter		P	O
17697	Red Hill #2	Artefact Scatter		P	O
21077	Gidgegannup Petroglyph	Petroglyph		P	O
21078	Gidgegannup Scarred Tree	Modified Tree		P	O
21079	Gidgegannup Rockshelter	Rockshelter		I	O
21080	Gidgegannup Gnamma Hole & Lizard Trap	Lizard Trap		P	O

KEY: Status: P=Permanent Register, I=Interim Register. Access: O=open.

3.2 Prior Investigations

There have been several archaeological surveys undertaken in the Red Hill district which are relevant to the project area (Quartermaine 1990, Yates 2004, Lantzke 2004). These surveys all cover land either on Lot 11 or immediately adjacent to it. Because of this, they provide particularly pertinent information.

These surveys have located sites that are related to a particular key resource, such as ochre, water, and shelter. The pattern of the sites indicates that Aboriginal activity in this area was directed at the extraction of specific resources, rather than camping and hunting. The site pattern conforms with the expected pattern for an area that was otherwise unsuitable for occupation. There is limited fresh water supply, especially in the summer months, and few areas of flat ground for camping. The more plentiful resources of the Swan – Helena Valleys and nearby coastal plain would have ensured that there was limited occupation of this area.

Investigations on Lot 11 (owned by Hanson)

Quartermaine surveyed a 50ha portion of Lot 11 in the area of the present Red Hill Quarry. No archaeological sites were located as a result of the field survey (Quartermaine 1990). On inspection of the wider lease Quartermaine found an isolated “quartz flake (22 x 12mm) found on the northern mid-slope of a hill to the south of Susannah Brook”. This was likely within the proposed Quarry Pit Development Area.

Investigations adjacent to Lot 11 (land not owned by Hanson)

In 2004, Lantzke surveyed land directly east of Lot 11; specifically, Lots 193, 166 & 137 Toodyay Road. As a result of his survey, Lantzke identified 4 features that he considered to be Aboriginal archaeological sites.

One of Lantzke's sites is an engraving, or petroglyph, on a granite tor amid granite outcrop adjacent to a rockshelter. This "oval or egg shaped motif" is formed by a "distinctive groove" and is well weathered suggesting some antiquity. These 2 features are registered sites #21077 and #21079. Although there were no artefacts found on the floor of the shelter or in the area immediately adjacent, Lantzke argues the shelter's "proximity to the petroglyph would suggest that the cave would have been occupied at times" (Lantzke 2004: 30).

Lantzke also identified and reported 2 other sites. Site #21080 contains 3 features; "what is best described as a sluice-gate structure and ... two instances of what is termed lizard traps" (Lantzke 2004: 30). The sluice-gate structure comprised a "flat slab of granite that had been placed at the mouth of a shallow depression in the granite". It is assumed, but is not at all certain, that this was done by Aboriginals to create a small water reservoir. The two lizard traps consist of small slabs of granite propped on other rocks to create niches for lizards to occupy and where lizards might be expected to be caught by lifting the slab. Site #21078 is a purported scarred tree. The scar is asymmetrical and rotates around the trunk of the tree, so this may be a natural scar.

Yates conducted a survey of Lots 1-7 Toodyay Road, immediately south of Lot 11 and on the southern side of Toodyay Road (Yates 2000). There was one previously recorded Aboriginal site of ethnographic significance in the survey area. This site, #3721, is an ochre quarry and associated waterhole. Two small artefact scatters (#17696 & #17697) were found close to the ochre quarry and numerous isolated artefacts were widely scattered over the land.

Site #17696 had an estimated 22 artefacts. The assemblage contained a small grindstone that has ochre on it, plus another rock with grinding patches. The remainder comprised small quartz flakes and flaked pieces. Site #17697 had more than 150 artefacts in an area of open gravel wash. The assemblage was predominantly composed of quartz flakes and flaked pieces, but included small proportions of chalcedony flakes and dolerite flakes and flaked pieces. Yates attributed both sites to the presence of a water source close by, while the ochre source may have also been a factor.

4.0 ARCHAEOLOGICAL SURVEY

4.1 Archaeological Survey Design

The archaeological survey was undertaken on the 20th and 23rd January 2007. On the morning of the first day, Mr W. Macham assisted with the survey by showing Joe Mattner a number of places with purported Aboriginal and historic material on Lot 11, both within and outside the designated survey areas. In the course of this, searches were made of the northern part of the proposed Quarry Pit Development Area, including a west-east transect over the main ridge and down to Susannah Brook. Access was via the Darling Range Regional Park.

Joe Mattner then continued the survey alone, starting at the proposed Stockpile Extension Area. This was searched on foot, with two north-east and south-west transects through the bush and additional searches along tracks. This area is considerably disturbed by tracks and has been partially cleared in the past.

For the larger proposed Quarry Pit Development Area, the survey strategy involved searches on foot of areas likely to yield intact Aboriginal archaeological material and/or sites. Areas of severe disturbance were not searched (e.g. tracks, existing quarries and associated infrastructure). A search was made through less disturbed pockets of forest on the steep slopes in the area around the former Herne Hill Quarry. This was followed by a search of the ridge crest between the two existing quarries (i.e. the current Red Hill Quarry and former Herne Hill Quarry) and around the former explosive magazine. North of Red Hill Quarry, additional searches were made of the flatter crest of the ridge and the western slopes, including a broad gully. Then the steep eastern slope was searched. The focus of the searches was on open areas with good ground visibility and outcrops and exposures of granite.

Following the archaeological survey on 20th January, a subsequent visit was made on 24th January. This was conducted in the early morning, so that sunlight at an oblique angle improved the chances for discovering any engravings on rock outcrops. Searches were carried out of granite outcrops and boulder piles to the north of Red Hill Quarry and on the eastern side of the ridge. These areas had been searched in the afternoon during the earlier survey under different light conditions.

4.2 Survey Findings

No archaeological sites were discovered in the designated survey areas despite comprehensive searches. No archaeological material was observed in the vicinity of the registered ethnographic site (DIA id. #3433) in the project area.

The only certain evidence of past Aboriginal occupation was 2 isolated artefacts. One quartz core was noted in small clearing below a ridge crest at 412758mE 6478832mN. A quartz flake was found on the crest of the same ridge beside a granite outcrop at 412575mE 6478628mN. These isolated finds are likely associated with hunting and gathering or transient movement along the ridge. The scarcity of isolated finds observed during the survey indicates that there was little Aboriginal activity in the project area.

A rockshelter which was known to Mr W. Macham was visited in the course of the survey. This is in the proposed Quarry Pit Development Area, on the western slope of the ridge north of the existing Red Hill Quarry, at 412433mE 6478693mN. The shelter is formed by a very large granite boulder which rests on other granite boulders to form a rockshelter approximately 1.5m high, 3m deep and 4m wide.

One artefact, a small dolerite slab, was found on the slope immediately outside and below the shelter. This had wear on one surface that indicates it probably was used as a basal grindstone. No artefactual material was found within the shelter and there is little soil accumulation or deposit on its sloping floor.

It is not clear that this rockshelter was occupied by Aborigines. While the presence of the grindstone suggests past Aboriginal usage of the rockshelter, the provenance of the artefact is uncertain. According to Mr Macham, the shelter has been visited on numerous occasions by various people. So the artefact may have been brought to this shelter by non-Aboriginals in recent times. The same applies to several small ochreous rocks shown to me by Mr Macham. These rocks are reasonably common on the slope above the shelter and they may have been introduced by recent visitors to the shelter. Alternatively, their presence in the shelter may have resulted from natural forces.

Mr Macham has previously visited the rockshelter with Robert Reynolds, a senior heritage officer at the DIA, and local Aboriginal people. According to Mr Macham, Mr Reynolds considered that this was not an Aboriginal site and declined to report or register it. Apparently the local Aboriginal people did not know of this shelter. They also did not report it to the DIA. Research showed that the shelter has not been registered or entered on the DIA database.

5.0 CONCLUSION

5.1 Discussion

No archaeological sites were found in the course of a comprehensive survey. No registered archaeological sites exist within or adjacent to the survey area on Lot 11. No archaeological material was found in the vicinity of the registered ethnographic site (#3433) in the project area. The only unambiguous evidence of Aboriginal activity was 2 isolated artefacts. These solitary artefacts probably represent evidence of dispersed hunting and gathering activities.

These results mirror the findings of Quartermaine (1990), who previously surveyed a portion of Lot 11, and who found a single isolated artefact. All of these pieces were found on the prominent ridge north of Red Hill Quarry, which may have been used as a vantage point or pathway.

The results reflect the absence of key resource in the project area, such as water sources, knappable stone, or flat well-drained land that was suitable for camping. In the Perth region, archaeological sites are typically found in association with such features, so the absence of these resources from the study area is a strong indicator that the most common types of sites, artefact scatters and quarries, will also be absent. While there apparently is a deposit of ochre in the project area (site #3433 “Herne Hill Quarry”), it is unlikely that ochre in itself would have attracted occupation. Rather, the ochre source may have been visited briefly by people camping at other more suitable locations outside Lot 11.

Susannah Brook, which runs through Lot 11 but lies at least 100m to the north or east of the survey area boundary, is a significant water source and would have served as a pathway from the coastal plains into the forested hills. However, the very steep slopes flanking the creek at this point would likely have precluded any movement of people from the creek to the project area. The steep slopes also lack any potential camping places, so that it is expected that any Aboriginal camping was restricted to the margins of Susannah Brook or occurred beyond the project area.

While it is considered that there was a very low likelihood for sites in the 2 survey areas, it must be acknowledged that land disturbance and historic quarrying activities have severely disturbed part of the land and reduced the likelihood for finding intact archaeological sites. Poor visibility of the ground due to dense scrub and leaf litter also limited the chances of finding archaeological sites and material. This is a common problem in forested regions.

The rockshelter within the proposed Quarry Pit Development Area known to Mr W. Macham, a local resident, does not appear to meet the criteria for registration as an Aboriginal site under sections 5 or 39 of the W.A. *Aboriginal Heritage Act 1972*.

The presence of a grindstone suggests past Aboriginal occupation, but according to Mr Macham, the shelter has been visited on numerous occasions by various people. So the artefact may have been brought to this shelter by non-Aboriginals in recent times. A senior heritage officer from the DIA, Mr R. Reynolds, has already visited the shelter with Mr Macham. Mr Reynolds considered that it did not meet the criteria for registration as an Aboriginal site.

Subsequent consultation with Mr Reynolds has confirmed that he did inspect the shelter approximately 6 years ago. At that time he noted the presence of the basal grindstone and the ochreous rocks referred to above. He advised that he sought further information about the shelter from Aboriginal informants but did not receive anything and therefore did not proceed with reporting it as a site because there was no conclusive evidence of Aboriginal usage.

The evidence of an Aboriginal presence in the rockshelter is weak and possibly ambiguous. It is the authors' professional opinion that the rockshelter does not meet the criteria for registration as a protected Aboriginal heritage site under Sections 5 or 39 of the W.A. *Aboriginal Heritage Act 1972*. The proposed quarry development could proceed without the requirement for a Section 18 approval under the Act.

5.2 Recommendations

The following recommendations are based on research of registered sites and previous studies and surveys in the vicinity of the project area and on the findings of a comprehensive archaeological survey.

Recommendation 1

There are no known archaeological sites that impede the development and construction of new quarries and associated infrastructure within the surveyed area on Lot 11 Toodyay Road, Red Hill.

Recommendation 2

It is necessary to ensure registered ethnographic site #3433 "Herne Hill Quarry" is continued to be protected from any disturbance.

Recommendation 3

Hanson Construction Materials Pty Ltd are to take adequate measures to inform all personnel and contractors of their responsibilities and obligations to protect Aboriginal heritage sites under the W.A. *Aboriginal Heritage Act 1972*.

Any Aboriginal cultural material which may be uncovered or encountered in the course of their work is to be reported and work is to halt until it is determined if an archaeological site exists.

6.0 REFERENCES

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APPENDICES

Appendix 1: Site Register Search

Appendix 2: Obligations Relating to Sites

Appendix 3: Notes on the Recognition of Aboriginal Sites

APPENDIX 1

SITE REGISTER SEARCH



Department of Indigenous Affairs
Government of Western Australia

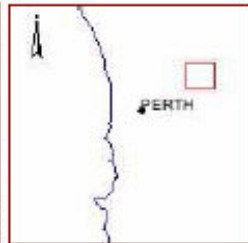
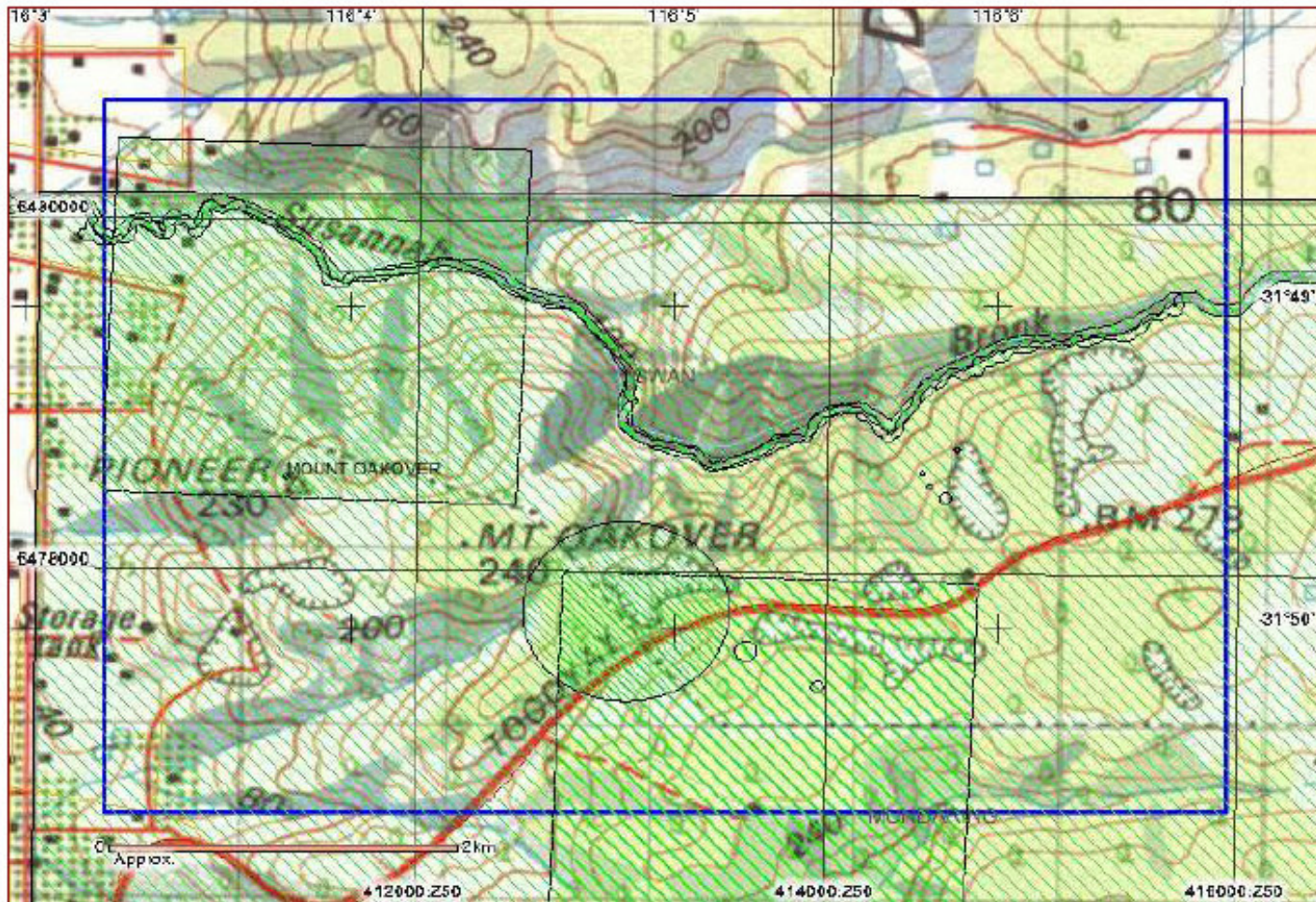
Aboriginal Heritage Inquiry System
Register of Aboriginal Sites



Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
640	P	O	N	Susannah Brook(Whole Extent	Mythological	Water Source, [Other: 30M BUFFER ZONE]		414334mE 647883mN Zone 50 [Reliable]	S02890
3188	S	O	N	Darling Range				415137mE 6475150mN Zone 50 [Unreliable]	S00546
3433	P	O	N	Herne Hill Ochre.	Mythological	Ochre		413019mE 6477779mN Zone 50 [Unreliable]	S02735
3536	P	O	N	Swan River	Mythological		*Registered Informant names available from DIA.	443400mE 6461967mN Zone 50 [Reliable]	S02548
3656	P	C	N	Susannah Brook Waugal.	Mythological	Water Source, [Other: 30M BUFFER ZONE]		Not available for closed sites	S02278
3721	P	C	N	Red Hill.	Mythological, Quarry	Water Source	*Registered Informant names available from DIA.	Not available for closed sites	S02221
17696	P	O	N	Red Hill #1	Artefacts / Scatter		*Registered Informant names available from DIA.	413957mE 6477364mN Zone 50 [Reliable]	
17697	P	O	N	Red Hill #2	Artefacts / Scatter		*Registered Informant names available from DIA.	413806mE 6477569mN Zone 50 [Reliable]	
21076	S	O	N	Gidgegannup Isolated Artefacts		[Other: 2 Isolated Artefacts / Manuport]	*Registered Informant names available from DIA.	414626mE 6478709mN Zone 50 [Reliable]	
21077	P	O	N	Gidgegannup Petroglyph	Engraving		*Registered Informant names available from DIA.	414626mE 6478709mN Zone 50 [Reliable]	
21078	P	O	N	Gidgegannup Scarred Tree	Modified Tree		*Registered Informant names available from DIA.	414496mE 6478499mN Zone 50 [Reliable]	
21079	I	O	N	Gidgegannup Rockshelter		Rockshelter	*Registered Informant names available from DIA.	414626mE 6478709mN Zone 50 [Reliable]	
21080	P	O	N	Gidgegannup Gannam Hole And Lizard Trap		Water Source, [Other: Lizard trap]	*Registered Informant names available from DIA.	414572mE 6478432mN Zone 50 [Unreliable]	
21170	I	O	N	Red/01 - Engraving			*Registered Informant names available from DIA.	414460mE 6478575mN Zone 50 [Reliable]	

Legend

Restriction	Access	Status	Coordinate Accuracy
N No restriction	C Closed	I Interim register	Accuracy is shown as a code in brackets following the site coordinates.
M Male access only	O Open	P Permanent register	[Reliable] The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
F Female access	V Vulnerable	S Stored data	[Unreliable] The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.



Legend

- Highlighted Area
- Town
- Map Area
- Search Area

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For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at <http://www.dia.wa.gov.au/terms.aspx>

APPENDIX 2

OBLIGATIONS RELATING TO SITES UNDER THE W.A. ABORIGINAL HERITAGE ACT 1972

15. Report of findings

Any person who has knowledge of the existence of any thing in the nature of Aboriginal burial grounds, symbols or objects of sacred, ritual or ceremonial significance, cave or rock paintings or engravings, stone structures or arranged stones, carved trees, or of any other place or thing to which this Act applies or to which this Act might reasonably be suspected to apply shall report its existence to the Registrar, or to a police officer, unless he has reasonable cause to believe the existence of the thing or place in question to be already known to the Registrar.

16. Excavation of Aboriginal sites

- (1) Subject to section 18, the right to excavate or to remove any thing from an Aboriginal site is reserved to the Registrar.
- (2) The Registrar, on the advice of the Committee, may authorise the entry upon and excavation of an Aboriginal site and the examination or removal of any thing on or under the site in such manner and subject to such conditions as the Committee may advise.

17. Offences relating to Aboriginal sites

A person who -

- (a) excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or
 - (b) in any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site,
- commits an offence unless he is acting with the authorisation of the Registrar under section 16 or the consent of the Minister under section 18.

18. Consent to certain uses

(1) For the purposes of this section, the owner of any land includes a lessee from the Crown, and the holder of any mining tenement or mining privilege, or of any right or privilege under the Petroleum Act 1967, in relation to the land.

(1a) A person is also included as an owner of land for the purposes of this section if -

(a) the person -

- (i) is the holder of rights conferred under section 34 of the Dampier to Bunbury Pipeline Act 1997 in respect of the land or is the holder's nominee approved under section 34(3) of that Act; or
- (ii) has authority under section 7 of the Petroleum Pipelines Act 1969 to enter upon the land;

or

(b) the person is the holder of a distribution licence under Part 2A of the Energy Coordination Act 1994 as a result of which the person has rights or powers in respect of the land.

(2) Where the owner of any land gives to the Committee notice in writing that he requires to use the land for a purpose which, unless the Minister gives his consent under this section, would be likely to result in a breach of section 17 in respect of any Aboriginal site that might be on the land, the Committee shall, as soon as it is reasonably able, form an opinion as to whether there is any Aboriginal site on the land, evaluate the importance and significance of any such site, and submit the notice to the Minister together with its recommendation in writing as to whether or not the Minister should consent to the use of the land for that purpose, and, where applicable, the extent to which and the conditions upon which his consent should be given.

(3) Where the Committee submits a notice to the Minister under subsection (2) he shall consider its recommendation and having regard to the general interest of the community shall either -

- (a) consent to the use of the land the subject of the notice, or a specified part of the land, for the purpose required, subject to such conditions, if any, as he may specify; or

- (b) wholly decline to consent to the use of the land the subject of the notice for the purpose required, and shall forthwith inform the owner in writing of his decision.
- (4) Where the owner of any land has given to the Committee notice pursuant to subsection (2) and the Committee has not submitted it with its recommendation to the Minister in accordance with that subsection the Minister may require the Committee to do so within a specified time, or may require the Committee to take such other action as the Minister considers necessary in order to expedite the matter, and the Committee shall comply with any such requirement.
- (5) Where the owner of any land is aggrieved by a decision of the Minister made under subsection (3) he may apply to the State Administrative Tribunal for a review of the decision.
- [(6) repealed]
- (7) Where the owner of any land gives notice to the Committee under subsection (2), the Committee may, if it is satisfied that it is practicable to do so, direct the removal of any object to which this Act applies from the land to a place of safe custody.
- (8) Where consent has been given under this section to a person to use any land for a particular purpose nothing done by or on behalf of that person pursuant to, and in accordance with any conditions attached to, the consent constitutes an offence against this Act.

APPENDIX 3

NOTES ON THE RECOGNITION OF ABORIGINAL SITES

Section 4 of the W.A. *Aboriginal Heritage Act* 1972 defines the meaning of "Aboriginal Site" as a place to which this Act applies by the operation of Section 5 (see below). The Act also applies to objects (Section 6).

5. Application to places

This Act applies to -

- (a) any place of importance and significance where persons 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 the Aboriginal people, past or present;
- (b) any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;
- (c) any place which, in the opinion of the Committee, is or was associated with the 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;
- (d) any place where objects to which this Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.

The following information was taken from 'Notes on the Recognition of Aboriginal Sites' published by the W.A. Museum

Habitation Sites (Artefact Scatters)

These are commonly found throughout Western Australia and usually contain evidence of tool-making, seed grinding and other food processing, cooking, painting, engraving or numerous other activities. The archaeological evidence for some of these activities is discussed in details under the appropriate heading below.

Habitation sites are usually found near an existing or former water source such as a gnamma hole, rock pool, spring or soak. They are generally in the open, but they sometimes occur in shallow rock shelters or caves. It is particularly important that none of these sites be disturbed as the stratified deposits which may be found at such sites can yield valuable information about the inhabitants when excavated by archaeologists.

Seed Grinding

Polished or smoothed areas are sometimes noticed on/near horizontal rock surfaces. The smooth areas are usually 25cm wide and 40 or 50cm long. They are the result of seed grinding by the Aboriginal women and indicate aspects of past economy.

Quarries

When outcrops of rock suitable for the manufacture of stone tools were quarried by the Aborigines, evidence of the flaking and chipping of the source material can usually be seen in situ and nearby. Ochre and other mineral pigments used in painting rock surfaces, artefacts and in body decoration are mined from naturally occurring seams, bands and other deposits. This activity can sometimes be recognised by the presence of wooden digging sticks or the marks made by these implements.

Habitation Structures

Aboriginal people sheltered in simple ephemeral structures, generally made of branches and sometimes of grass. These sites are rarely preserved for more than one occupation period. Occasionally rocks were pushed aside or used to stabilise other building materials. When these rock patterns are located they provide evidence for former habitation sites.

Middens

When a localised source of shellfish and other foods has been exploited from a favoured camping place, the accumulated ashes, hearth stones, shells, bones and other refuse can form mounds at times several metres high and many metres in diameter. Occasionally these refuse mounds or middens contain stone, shell or bone tools. These are most common near the coast, but examples on inland lake and river banks are not unknown.

Stone Artefact Factory Sites

Pieces of rock from which artefacts could be made were often carried to camp sites or other places for final production. Such sites are usually easily recognisable because the manufacturing process produces quantities of flakes and waste material which are clearly out of context when compared with the surrounding rocks. All rocks found on the sandy coastal plain, for example, must have been transported by human agencies. These sites are widely distributed throughout the State.

Marked Trees

Occasionally trees are located that have designs in the bark which have been incised by Aborigines. Toeholds, to assist the climber, were sometimes cut into the bark and sapwood of trees in which possums and other arboreal animals sheltered. Some tree trunks bear scars where sections of bark or wood have been removed and which would have been used to make dishes, shield, spear throwers and other wooden artefacts. In some parts of the state wooden platforms were built in trees to accommodate a corpse during complex rituals following death.

Burials

In the north of the state it was formerly the custom to place the bones of the dead on a ledge in a cave after certain rituals were completed. The bones were wrapped in sheets of bark and the skull placed beside this. In other parts of Western Australia the dead were buried, the burial position varying according to the customs of the particular area and time. Natural erosion, or mechanical earthmoving equipment occasionally exposes these burial sites.

Stone Structures

If one or more stones are found partly buried or wedged into a position which is not likely to be the result of natural forces, then it is probable that the place is an Aboriginal site and that possibly there are other important sites nearby. There are several different types of stone arrangements ranging from

simple cairns or piles of stones to more elaborate designs. Low weirs which detain fish when tides fall are found in coastal areas. Some rivers contain similar structures that trap fish against the current. It seems likely that low stone slab structures in the south west jarrah forests were built to provide suitable environments in which to trap some small animals. Low walls or pits were sometimes made to provide a hide or shelter for a hunter.

Elongated rock fragments are occasionally erected as a sign or warning that a special area is being approached. Heaps or alignments of stones may be naturalistic or symbolic representations of animals, people or mythological figures.

Paintings

These usually occur in rockshelters, caves or other sheltered locations which offer a certain degree of protection from the weather. The best known examples in Western Australia occur in the Kimberley region but paintings are also found throughout most of the state. One of several coloured ochres as well as other coloured pigments may have been used at a site. Stencilling was a common painting technique used throughout the state. The negative image of an object was created by spraying pigment over the object which was held against the wall.

Engravings

This term describes designs which have been carved, pecked or pounded into a rock surface. They form the predominant art form of the Pilbara region but are known to occur in the Kimberleys in the north to Toodyay in the south. Most engravings occur in the open but some are situated in rock shelters.

Caches

It was the custom to hide ceremonial objects in niches and other secluded places. The removal of objects from these places, the taking of photographs of the places or objects or any interference with these places is not permitted.

Ceremonial Grounds

At some sites the ground has been modified in some way by the removal of surface pebbles, or the modelling of the soil, or the digging of pits and trenches. In other places there is no noticeable alteration of the ground surface and Aborigines familiar with the site must be consulted concerning its location.

Mythological Sites

Some of the types of sites already described have a place in Aboriginal mythology. In addition there are many Aboriginal sites with no man-made features which enable them to be recognised. They are often natural features in the landscape linked to the Aboriginal account of the formation of the world during the creative "Dreaming" period in the distant past. Many such sites are located at focal points in the creative journeys of mythological spirit beings of the Dreaming. Such sites can only be identified by Aboriginal people who are familiar with the associated traditions.

* * *