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AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED NEW FIRE BREAKS IN THE YAMPI SOUND TRAINING AREA:

Commissioned by Wildman Land Management

Prepared for:

The Department of Defence

By

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1: Introduction

1.1 Introduction.

Yampi Sound Training Area (YSTA) is located approximately 140km north of Derby in the Kimberley Region of Western Australia and covers an area of 5,660 km². YSTA is currently vested with the Department of Defence and comprises the former pastoral leases of Kimbolton and Oobagooma and two areas of Crown Land. The Department of Defence has held the lease of this area for almost 13 years. The property extends from the western seaboard of the Yampi Peninsula to the north western section of the King Leopold Ranges. Wotjulum Aboriginal Land lies to the north of YSTA (See map 1).

1.2 Executive Summary

The following report details the on-ground archaeological survey conducted along the proposed 'fire break' alignments proposed by the Department of Defence and facilitated by Wildman Land Management on Yampi Sound Training Sound Area.

The archaeological survey was focussed on three proposed fire break alignments referred to as the western firebreak alignment, the central western fire break alignment and the eastern fire break alignment (see map 2).

It was proposed by Defence Support Group NT/K to put in new mineral earth fire breaks to protect the YSTA area from late season wild fires. The western fire break alignment essentially followed the Wyndham Ranges in a north/south direction starting roughly at the Kimbolton Road/Keightly River system and ending approximately north/east of Mt Heytesbury (ibid). The central western fire break commenced close to the Townsend River and travelled north to finish approximately 6km SSW of Mount Nellie (ibid). The eastern fire break started from a section of the Kimbolton Road and essentially followed the Tarraji River system in a north eastern direction and finished south east of Mount Disaster (ibid).

A detailed aerial survey of the proposed firebreak alignments was conducted by Wildman Land Management in March 2008 (ibid) and provided a detailed description of the various landforms, vegetation and general topography of the proposed impact areas.

This was followed with a detailed Desktop Analysis by Kimberley Specialists in May 2008 to determine if any heritage sites currently listed on the State Heritage Registers and those held by the Defence Department would be impacted by the proposed infrastructure proposal (ibid).

The subsequent archaeological survey (and the basis of this report) was focussed solely on determining whether the proposed fire break alignments would have any impact on previously recorded heritage sites as well as ensuring that any new heritage sites that might be recorded during the survey would not be impacted.

The methodology adopted during the survey consisted of following the fire break alignments by 4W/D vehicle and using a quad bike and pedestrian methods to survey 100 meters either side of the alignment. When a heritage site was recorded the area of survey was extended to 300 meters. Where an area showed a high probability of containing archaeological sites or an escarpment with obvious over hangs the survey was extended to 500 metres. Previously recorded sites located within 500 meters of the alignment were also surveyed.

The field work was conducted over 11 days in June by s47F [REDACTED].

1.2 Background Information

The results from the desk top analysis of the archaeological, anthropological and other heritage reports concerning previous work undertaken on YSTA were used to prepare the archaeological fieldwork strategy. Prior to the archaeological survey all previously listed and known heritage site coordinates were plotted onto relevant maps in order to identify their topographic relationship to the proposed fire break alignments.

In brief the key findings from the Desk Top Analysis of the archaeological and anthropological literature for YSTA indicated that

- 213 sites of archaeological and cultural heritage significance had been previously documented on YSTA (see map 5)
- only 28 of the total number of sites recorded on YSTA was located within 5 kilometers of the proposed new fire break alignments (see maps 3-4)
- only 9 of the documented sites (and located within one kilometer of the proposed new fire breaks) were determined as relevant to further field investigation during the archaeological survey to assess if there would be any impact from the proposed fire break alignments

1.4 Scope of the Study

The on-ground archaeological survey of the proposed fire break alignments on YSTA was to

1. identify if the proposed fire break alignments would impact on existing recorded and registered heritage sites
2. to identify and record new sites of archaeological significance
3. assess the potential cultural significance of any new sites of archaeological significance recorded during the survey
4. map, photograph and record all new archaeological sites found during the archaeological survey

5. determine where any re-alignment of the proposed fire breaks would need to be established
6. flag and plot the new coordinates of any re-alignment into a GPS
7. Submit a report on the results of the archaeological survey

1.5 Results Summary

Due to the urgency of completing the proposed fire break alignments, and prior to the completion of this archaeological report an electronic Site Summary Map was prepared and submitted to WLM on completion of the archaeological survey (see map 8 and appendix 1). The map was also presented in hard copy. The Site Summary Map provided details of heritage site locations, site descriptions and recommendations as well as grid references for those areas of the proposed YSTA fire breaks that needed to be re-aligned away from a heritage site (ibid).

The archaeological survey located and recorded eighteen new heritage sites (see maps 6-8). Only 5 of the sites were assessed as having the potential to be impacted by the proposed fire break alignments and a re-alignment was recommended (see section 5 of this report). New grid references were provided where new re-alignment of the proposed fire breaks was required. No previously recorded heritage sites were found to be endangered by the proposed firebreak alignments.

2: Previous Research

2.1 Desktop Surveys

The Desktop analysis undertaken by Kimberley Specialists prior to the archaeological survey of the proposed fire break alignments established that quite considerable archaeological, anthropological and ethnographic work has previously been undertaken on YSTA. Significantly a high percentage of the heritage sites registered on YSTA had already been identified by living Aboriginal people and traditional owners for the YSTA (Vachon: 2002; 2003) with the highest density of these ethnographic sites located close to the coastal areas of YSTA and around permanent water holes. Only 28 of the 213 registered sites were found to be located within five kilometres of the proposed fire break alignments, and only 9 of these were located within one kilometre of the fire break alignments.

Relevant details of all registered heritage sites identified during the Desktop survey were plotted onto a map of YSTA (see map 5) and although 9 of these were found to be located within a kilometer of the proposed alignments it was concluded that they were unlikely to be impacted by the proposed fire break alignments. This was confirmed during the archaeological survey (see section 4 of the report).

It was also concluded from the desktop analysis undertaken by the authors prior to the archaeological survey that any unrecorded Aboriginal heritage sites that might be picked up during the archaeological survey were likely to be of archaeological determination

rather than those that would be associated with living people today. This proved to be the case with all 18 of the heritage sites recorded representing isolated retouched artefacts, lithic scatters, one carved Boab Tree and one very early painting site.

The desktop analysis also identified that the Aboriginal consultation previously undertaken on YSTA met with the requirements of the Aboriginal Act of 1972 and that no further consultation was required prior to the proposed archaeological survey of the new fire break alignments. Further consultation with traditional owners would be assessed on the outcomes from the archaeological survey.

2.2 Previously recorded sites on YSTA.

Archaeological sites on YSTA were first recorded as early as the 1930's and 1940's (Elkin: 1930; Lommel: 1940). The Desktop survey of the archaeological and anthropological literature established that YSTA has drawn interest from a wide range of researchers (Crawford:1968; Bindon:1980; Brown & Bindon:1978; Hamilton & Yu: 1975; Wright: 1980; Vachon:2003). The literature review undertaken by Vachon (2002) established a comprehensive list of previously recorded heritage site descriptions and locations on YSTA (ibid). Vachon's 2003 anthropological survey (ibid) added a number of new sites to the register bringing the total number of heritage sites recorded for YSTA at the time of the present archaeological survey to a total of 213. For a detailed summary of previously recorded heritage sites for YSTA see Table 1.

2.3 Summary

The Desktop survey results and detailed list of previously recorded sites was a valuable tool in determining the archaeological survey strategy of the proposed fire break alignments (see Table 1). Previously listed Heritage sites were plotted onto a map of YSTA showing the proposed fire break alignments and indicated those sites that could be impacted by the proposed infrastructure development (see 3 & 4). Descriptions of previously recorded archaeological sites on YSTA (see Table 4) also enabled a rough predictive model of the type of sites the survey would possibly find and the landform features most likely to contain a high probability of archaeological sites.

3: Field Methodology

3.1 Executive summary.

The objective of the archaeological survey of the proposed firebreak alignments on YSTA was to ensure that no previously recorded Heritage sites on YSTA as well as any new sites that might be recorded during the survey would be impacted by the proposed infrastructure development.

A predictive model on those landforms most likely to show evidence of archaeological sites was established prior to the survey and was primarily based on the topographic and vegetation information provided by Wildman Land Management (ibid:2008).

All previously recorded sites located within a kilometre of the proposed fire break alignments were plotted onto a map. Archaeological sites of significance located within 100 meters of the fire break were re-located during the survey. Sites that had been determined as culturally important by the traditional owners and recorded to be within the 500 meter parameter of the fire breaks were located and confirmed to ensure they would not be impacted. This procedure was considered to be important when it became evident that some of the grid references provided for some of the previously recorded sites was not always accurate.

Way Points for each of the proposed fire break alignments were provided by Wildman Land Management prior to the archaeological survey and these were plotted into two hand-held GPS. One GPS was mounted onto the quad bike and the other used for the vehicle and pedestrian components of the survey. The proposed fire break alignments were flagged and where there was a need to re-align any section due to a potential impact on a heritage site this was flagged also and the new alignment plotted with a GPS.

Due to the extreme difficulties of the terrain being surveyed and the lack of any definable track for the large part of the survey a camp was set up each night. This enabled maximum time to be spent in the field and no time wasted heading back to a base camp.

Results of the archaeological survey were recorded in field notebooks and all artefact and other heritage site locations were recorded with a GPS. All heritage finds were photographed and described. GPS readings and photographs were down loaded onto a laptop at the end of each day.

Three proposed fire break alignments were surveyed during this study and a total of almost 200 kilometres was covered during the on-ground survey (see map 2).

- The western alignment commenced on a section of the Kimbolton Road near the Keightly River system and essentially followed the Wyndham Ranges in a north/south direction and ended approximately north/east of Mt Heytesbury
- The central western alignment commenced close to the Townsend River and travelled north to finish approximately 6km SSW of Mount Nellie
- The eastern fire break started from a section of the Kimbolton Road and essentially followed the Tarraji River system in a north eastern direction and finished south east of Mount Disaster

The bulk of the survey was undertaken by 4W/D vehicle, quad bike and on foot. The western and central western firebreaks were surveyed in this manner while the proposed eastern firebreak, due to access difficulties was mainly surveyed from a helicopter.

Access by vehicle or quad bike along the eastern firebreak was difficult due to the steep sided river crossings on the Robinson River. Several attempts had been made by Wildman Land Management to find a suitable crossing without success. Quad bike reconnaissance was restricted to the south west side of the Robinson River and helicopter reconnaissance was the only option for the north eastern section of the proposed firebreak alignment.

Prior to the helicopter reconnaissance a predictive model of those areas showing a high probability of archaeological sites were plotted onto a map. This required the helicopter to land in areas and a 100 metre pedestrian survey was then undertaken on either side of the proposed eastern fire break alignment. When a site was identified the survey was extended another 100 metres.

3.2 Survey procedure

A 4W/D Toyota tray-back was used for the initial fieldwork reconnaissance to follow the established grid referenced fire break alignment and a quad bike then used to undertake reconnaissance 100 meters either side of the proposed fire break. When a previously unrecorded heritage site was recorded the area of survey was extended to 300 meters. This area was then surveyed extensively on foot for 50 metres either side of the determined site to ensure that the parameter of the sites had been recorded accurately. Previously recorded sites located within 500 meters of the alignment were also surveyed, initially to identify the site and also to establish the significance of the site as this was often not clear on the site registration listing.

Vegetation and terrain were important criteria in determining the potential of finding archaeological and other heritage sites. The following were all carefully and extensively surveyed for any evidence of human activity.

- Exposed and burnt areas
- Cattle pads and other animal impacted areas
- Raised sandstone and other rocky outcrops
- Creek lines, river banks and other aquatic systems (dams, billabongs)
- Ridge lines and potential 'rock' overhangs
- Previously formed tracks and road alignments
- Boab Tree's for evidence of any marking or signatures

All creek lines and river banks were surveyed on foot for 500 meters on either side of the proposed firebreak alignments. Other aquatic systems such as dams and billabongs were surveyed along their full length.

3.1 Site recording procedure

The criteria used to identify site types were developed from the previous archaeological and anthropological research undertaken on YSTA and built into the predictive field model prior to the survey (Scott-Virtue:2008).

A site that was considered to be of significant archaeological importance was determined by the following criteria (Reser: 2005:35 after Hiscock 1995). Additional criteria was added as a result of the desk top analysis undertaken prior to the survey (Scott-virtue:2008).

- The presence of more than ten pressure flaked artefacts.
- Evidence of multiple and deliberate stone arrangements.
- Evidence of waste material indicating 'in-situ' manufacture of artefacts.
- Covering at an area of at least two meters.
- A rock art site

The following table is the field recording criteria used when recording any new sites found during the archaeological survey (see Appendix 1)

- Site Identification Number:
- Site Type:
- Description of Site:
- GPS coordinates:
- Size and description of Area:
- Photographic Record:

3.2 Site identification

Based on previous archaeological reports for YSTA and the work done by Vachon (ibid:2002/3) the following site types were anticipated.

- Artefact site. Single pressure flaked tools that may have been accidentally or deliberately discarded.
- Lithic scatter. Those sites that contain concentrated or random flakes such as cores, identifiable stone tools and pressure flaking.
- Stone tool manufacturing sites. Those sites showing evidence of 'in-situ' stone tool manufacture.
- Quarry Sites. Source or location of stone material used for the manufacture of tools.
- Stone arrangement. Sites that may only have one or two deliberately placed stones or much larger complex stone arrangements.
- Rock-shelter. Generally a rock art (pictograph or petroglyphs) and/or living site located in a rock overhang or cave. Generally shows evidence of human occupation with the presence of artefacts, shell, charcoal and other evidence.
- Carved Boab. Carved images of Aboriginal and later historic activity.

- Contact sites. Evidence of continued Aboriginal activity and often showing evidence of interaction with early European settlers.

Lithic and artefact sites were primarily identified by the evidence of human activity.

Stone artefacts were identified as having evidence of pressure flaking and/or evidence of bulbs of percussion or striking platforms.

Quarry sites were identified as showing evidence of striking platforms on areas from which flakes had been removed to make stone tools. These could be represented by the presence of a single quarried boulder or larger quarried rock formation.

Lithic scatters were largely represented by specific and non-specific stone tools, worked cores, waste flakes with evidence of striking platforms and bulbs of percussion.

Stone arrangements largely represented isolated 'human' placed rocks to major culturally 'multiple' placed stone formations.

3.3 Summary

The use of a 4W/D tray-back, while useful in transporting equipment and camping supplies made moving through some of the terrain very difficult. Two quad bikes would have been far more useful. The use of a quad bike for this sort of survey work was efficient and made it considerably easier to re-locate previously recorded heritage sites, particularly those located 500 meters or more from the actual proposed fire break alignments. It also enabled more difficult areas to be accessed and surveyed.

The plotted site coordinates for previously recorded heritage sites, while not always accurate ensured that all sites of concern were located and assessed. The predictive site model established prior to the survey and based on the topographic and vegetation information provided by Wildman Land Management (ibid 2008) assisted in determining those areas or landform systems most likely to show evidence of archaeological sites. This ensured that all areas that had the potential for archaeological sites were comprehensively surveyed.

4: Results

4.1 Executive Summary

A total of 18 archaeologically determined sites were recorded during the survey. 17 of the sites were associated with pre-European contact Aboriginal activity and 1 Historic site, a carved Boab Tree was recorded and associated with European activity (see maps 6-8 & table 4). Without exception all sites were located near or along water courses, near or along a ridge line or in the case of the rock art site, on an escarpment or ridge of rock

containing some form of rock overhang and shelter, confirming the predictive model established prior to the survey.

Of the 18 recorded sites only 5 required a re-alignment of the fire breaks to alleviate any potential impact. Recommendations were made for re-alignment wherever a site was recorded to be located within 100 meters of the proposed fire breaks. No re-alignment recommendation was considered to be necessary for single random artefact finds that were at least 40 metres from the proposed fire break.

It was also determined that of the previously recorded total of 213 heritage sites on YSTA (see table 1) only 28 were located within 5 kilometres of the proposed fire breaks (see table 2) and only 9 of these were felt to be threatened by the proposed infrastructure development. The survey confirmed that none of the previously registered sites would be impacted by the proposed infrastructure development. Where it was feasible recommendations were made to move the alignment further away from a ridge, gorge or creek system (see appendix 1).

The closed Duckhole Billabong site registered as significant and of some concern to the traditional owners for the area was ascertained to be over 500 meters from Way Point 15 on the proposed western fire break alignment (see map 3 & table 2). No recommendations were made to re-align the proposed fire break in this area as it was felt the billabong and general area surrounding the Billabong would not be impacted by the proposed infrastructure development.

4.1.1 Western fire break

A total of 5 sites were recorded during the survey along the proposed western fire break (see map 6). Only 2 of the sites recorded needed a re-alignment of the proposed fire break (see appendix 1 and section 5 of this report). Although the lithic scatter described as site 2 (*ibid*) was sufficiently far enough away from the proposed firebreak alignment the site was located close to a significant natural gorge system and ridge line. On this bases and the fact that the gorge system had a high probability of containing sites of archaeological significance it was proposed that the alignment be moved 40 meters further away.

Only 3 previously recorded heritage sites were considered to have potential impact from the proposed western firebreak alignment. These were re-located during the survey, and all were found to be over 500 meters from the proposed fire break alignments. On this basis no recommendations for re-alignment of the fire break was felt to be necessary.

All 5 sites located during the survey of the proposed western fire break alignment were represented by open sites and described as lithic scatters and as such contained random flakes such as cores, identifiable stone tools and pressure flaking. In only one of the sites was there an identifiable quartzite boulder showing signs of deliberate ‘*insitu*’ quarrying (see appendix 1). None of the sites recorded contained concentrated numbers of stone tools and were fairly discrete and confined to a given area. The archaeological evidence also indicated that all 5 sites recorded were probably the result of ‘one off’ activities by

small groups or individuals. The presence of pressure flaked tools in all 5 sites rated their site listing but none of the sites showed much diversity in either stone material or artefact type, with the recognised stone tools essentially dominated by retouched blades.

Supporting the predictive model established for determining those areas as having a high probability of archaeological material the 5 sites recorded during the survey were located either near ridge lines and creek systems or on raised rocky slopes.

The following is a summary of the sites recorded during the survey of the proposed western firebreak alignment. See section 5 of this report for recommendations.

Site Identification Number	YSTAWFB 001
Site Type	Lithic scatter.
Description of Site	Large pressure flaked blades, 1 core and one placed rock.
GPS Co-ordinates	-16.712500 123.961410
Size and Description of Area	Located 272m west of proposed western fire break alignment and on lower section of ridgeline. Random quartzite pressure flakes covering an area of approximately 5 square meters.
Site Identification Number	YSTAWFB 002
Site Type	Lithic scatter.
Description of Site	Random pressure flaked quartzite artefacts and waste flakes.
GPS Co-ordinates	-16.696560 123.944810
Size and Description of Area	Lower slope of rocky ridge line covering an area of four square meters
Site identification Number	YSTAWFB 003
Site Type	Lithic Scatter
Description of Site	Random quartz and quartzite artefacts with some waste material.
GPS Co-ordinates	-16.712500 123.961410
Size and Description of Area	Exposed rocky slope near ridge line and creek system. Covers an area of approximately 6 square meters.
Site Identification Number	YSTAWFB 004
Site Type	Lithic scatter
Description of Site	Discrete area of random artefacts and waste material. Some evidence of core material. Quartz and chert dominated.

GPS Co-ordinates	-16.645577 123.879119
Size and Description of Area	Exposed Spinifex slope near creek system. Artefacts and waste material covered an area of approximately 11 square meters.
Site Identification Number	YSTAWFB 005
Site Type	Lithic scatter
Description of Site	Random quartz artefacts, waste material, quarrying and core material.
GPS Co-ordinates	-16.642980 123.872980
Size and Description of Area	Open rocky exposed slope with artefacts covering an area of approximately 10 square meters.

4.1.2 Central western fire break

A total of 10 sites were recorded during the survey along the proposed Central western fire break (see map 7). Only 1 of the sites recorded needed a re-alignment of the proposed fire break (see appendix 1 and section 5 on the recommendations for this report). A rock art site located during this survey (see appendix 1) although not under risk of impact from the proposed central western fire break alignment was a significant find. All rock art sites qualify for complete protection under the WA Sites Heritage protection laws, and as such, every effort needs to be made to ensure there is no impact on sites such as these that will hasten their deterioration.

The rock art site located during this survey had been dedicated to the Wandjina style of painting and appeared to be of some considerable age. There was little evidence of re-painting and the size of the tree that had grown up against some of the art indicated the site had not been visited for possibly 150 to 200 years, possibly more. Management strategies for this site are imperative if the remaining paintings are to survive for much longer (see section 5 of this report and appendix 1).

One European historic site depicting the initials of an early European origin was located on a Boab tree. While the location of the Boab tree was only 30 metres from the proposed fire break alignment it was concluded that it was unlikely that there would be any direct impact and no recommendation to re-align the fire break was felt to be necessary.

Only 2 previously recorded heritage sites were considered to have potential impact from the proposed central western firebreak alignment. These were re-located during the survey and it was confirmed that neither of the sites would be impacted by the proposed central western fire break alignment.

The majority of the sites located during the survey were represented by open sites and described as lithic scatters and as such contained random flakes such as cores, identifiable

stone tools and pressure flaking. As with the proposed western fire break the lithic sites were probably the result of 'one off' activities by small groups or individuals.

The exception to this is probably Lithic scatter site 10 (see table 4 & appendix 1) which showed evidence of continuous use and could be described as an 'open living site'. That is an area where people camped and hunted from as well as making stone tools. However, as with all the lithic sites recorded during the survey there was little diversity in either stone material or artefact type with the dominance of tools being of the 'blade' variety.

The following is a summary of the sites recorded during the survey of the proposed Central western firebreak alignment. For recommendations see section 5 of this report and appendix 1).

Site Identification Number	YSTACWFB 001
Site Type	Carved Boab tree.
Description of Site	Boab Tree with initials P.O. carved into side. European origin.
GPS Co-ordinates	-16.669914, 124.020847
Size and Description of Area	Carved Boab tree on the edge of a creek line.
Site Identification Number	YSTACWFB 002
Site Type	Stone arrangement and artefact site
Description of Site	Large cutting flakes and placed rocks in regular pattern around Boab tree. Possibly ceremonial.
GPS Co-ordinates	-16. 699333 124. 008382
Size and Description of Area	Site covers an area of approximately 10 square metre. One side of Boab tree 272m west of fire break.
Site Identification Number	YSTACWFB 003
Site Type	Artefact site
Description of Site	Several large river pebbles that had been worked to shape large 'cutting' 'chopping' tools. Evidence of pressure flaking to obtain a sharp cutting edge.
Site Co-ordinates	-16. 699163 124. 011123
Size and Description of Area	Area of site showing 7 large core artefacts in an area of three meters by three meters on cracked black soil, flood plain. 250 meters west of the fire break alignment.

Site Identification Number	YSTACWFB 004
Site Type	Lithic scatter
Description of Site	Discrete site containing quartzite artefacts and waste flakes.
GPS Co-ordinates	-16.682960, 124.016420
Size and Description of Area	Small Spinifex eroded area on saddle of hill showing artefacts covering an area of approximately 6 square meters in.
Site Identification Number	YSTACFB 005
Site Type	Lithic Scatter
Description of Site	Artefacts appear to be very old. Patina build-up and water rolled 'smoothing' and possible pressure flaked edges. Predominately represented by cores and heavy thick cutting blades.
GPS Co-ordinates	-16.675124, 124.022687
Size and Description of Area	Discrete and contained in an area of around 4 square metres. Located on a saddle close to an ancient creek alignment.
Site Identification Number	YSTACWFB 006
Site Type	Rock Art and occupation site
Description of Site	Very old Wandjina painting site. Early style of Wandjina. Little evidence of re-painting or maintenance of the site indicating the site is well pre-European contact. Pressure flaking indicates post 3 to 3.5 thousand years. Considerably old tree growth against the paintings.
GPS Co-ordinates	-16.650184, 124.034497
Size and Description of Area	Concentrated lithic indicating occupation site. Actual occupation floor approximately 4.8 metres.
Site Identification Number	YSTACWFB 007
Site Type	Lithic Scatter
Description of Site.	Quartzite artefacts with pressure flaking, cores and waste flakes.
GPS Co-ordinates	-16.620264, 124.038517
Size and Description of Area	Discrete area of approximately 3 square metres and probably the results of an individual. Located on a saddle near old creek alignment.

Site Identification Number	YSTACWFB 008
Site Type	Lithic Scatter
Description of Site	Random spread of pressure flaked quartzite tools, cores and waste flakes.
GPS Co-ordinates	-16.613614, 124.033868
Size and Description of Area	Discrete area of artefacts predominantly quartz. On raised area near creek alignment.
Site Identification Number	YSTACFB 009
Site Type	Lithic Scatter
Description of Site	Discrete area of pressure flaked quartz and quartzite artefacts, cores and waste flakes.
GPS Co-ordinates	-16.610986, 124.034078
Size and Description of Area	Located on saddle area of creek alignment. Covered area of approximately 2 square metres.
Site Identification Number	YSTACWFB 010
Site Type	Lithic scatter
Description of Site	Open camping areas with heavy concentrations of lithic material west of current alignment
GPS Co-ordinates	-16.583694, 124.039038
Size and Description of Area	Large eroded area bordering on Spinifex plain. Covers an area of approximately 200 meters by 60 meters.

4.1.3 Eastern fire break

A total of 3 sites were recorded during the survey along the proposed eastern fire break (see map 8). Re-alignment was required for 2 of the sites recorded during the survey (see appendix 1 and section 5 on the recommendations for this report)

The aerial survey indicated a number of substantial granite outcrops and all had a high probability of having some archaeological evidence of human activity. It was suggested that any alignment be kept as far away from the granite outcrops as was practical. The remains of an old track that followed the Tarraji River system were very clear from the air and it was suggested that the alignment follow this where practical, particularly along those sections containing the large isolated granite outcrops. These granite outcrops were particularly evident to the south east of Mount Disaster (see map 8) and it was suggested that any fire break alignment in this area try and avoid these as well as the many creek and other aquatic systems prevalent in this area.

Interestingly the 2 lithic sites that were recorded during the survey held a greater variety and concentration of stone material than the sites recorded for the proposed western and central fire breaks. The concentration of lithic material recorded adjacent to and along a

granite outcrop indicated use of the area over a long period of time rather than the ‘one-off’ situations apparent for the other recorded sites. Several types of fine grained siliceous material had been used in the manufacture of tools, however quartz and chalcedony were the dominant stone type. The site was well represented with retouched cores, pressure flaked blades and spear heads as well as waste material.

The pressure flaked and partially ground basalt axe recorded as artefact site 3, although located well up on the granite outcrop, was almost certainly associated with the lithic site located at the base of the outcrop. The axe appeared to have been deliberately placed in a slight rock hollow approximately 8 meters away from the lithic site at the base of the outcrop.

Four previously recorded sites were determined as possibly being impacted by the proposed fire break alignments. These were essentially located south east of Mount Disaster. However a decision made by Wildman Land Management during the survey to stop the fire break alignment short of the concerned area resolved the need for further archaeological investigation or to make any further recommendations.

4.2 Summary

In point form the following summarises the results of the archaeological survey of the proposed fire break alignments on YSTA.

- A total of 18 sites were recorded during the survey. 17 were archaeological sites associated with Aboriginal activity and 1 to European activity.
- All previously recorded Heritage sites of concern in relation to the proposed fire break alignments were located and location confirmed during the survey.
- The survey confirmed that no previously recorded heritage sites would be impacted by the proposed fire break alignments.
- Of the 18 sites recorded during the survey 5 required a re-alignment of the proposed fire breaks.
- That the majority of sites recorded during the survey represented lithic scatters and appeared to be the result of ‘one-off’ activities by very small groups and/or individuals.
- The Wandjina rock art site, while not in danger of impact from the proposed fire break alignment was a significant find.

5: Recommendations

5.1 Summary

The following is a brief summary of the sites located during a survey of the proposed western fire break alignment on YSTA and the recommendations associated with each site (see appendix 1 for additional detail).

5.1.1 Western fire break

Site Identification Number	YSTAWFB 001
Site Type	Lithic scatter.
Recommendation.	No realignment necessary.
Site Identification Number	YSTAWFB 002
Site Type	Lithic scatter.
Recommendation	Move alignment 40 meters further east away from significant natural eco system.
Site identification Number	YSTAWFB 003
Site Type	Lithic Scatter
Recommendation.	No re-alignment necessary. Site 220 meters away from fire break.
Site Identification Number	YSTAWFB 004
Site Type	Lithic scatter
Recommendation	No re-alignment necessary.
Site Identification Number	YSTAWFB 005
Site Type	Lithic scatter
Recommendation	Recommend move proposed fire break alignment 60 meters further west

5.1.2 Central western fire break

Site Identification Number	YSTACWFB 001
Site Type	Carved Boab tree
Recommendation	No re-alignment necessary.
Site Identification Number	YSTACWFB 002
Site Type	Stone arrangement and artefact site
Recommendation	Will not be affected by Fire Break

Site Identification Number	YSTACWFB 003
Site Type	Artefact site
Recommendation	No re-alignment necessary
Site Identification Number	YSTACWFB 004
Site Type	Lithic Scatter
Recommendation	220 metres from fire break alignment. No re-alignment necessary.
Site Identification Number	YSTACWFB 005
Site Type	Lithic Scatter
Recommendation	Re-align proposed fire break alignment 50 metres west.
Site Identification Number	YSTACWFB 006
Site Type	Rock Art and occupation site
Recommendation	Site needs to be managed. Veg. right up to rock face. A single tree has grown up against a section of the art and will cause extensive damage if fire is allowed to reach the site. Future management required. More extensive archaeological field work needed.
Site Identification Number	YSTACWFB 007
Site Type	Lithic Scatter
Recommendation	No re-alignment necessary. Site 380 meters WSW of alignment.
Site Identification Number	YSTACWFB 008
Site Type	Lithic Scatter
Recommendation	No re-alignment necessary.
Site Identification Number	YSTACWFB 009
Site Type	Lithic Scatter
Recommendation	No re-alignment necessary.
Site Identification Number	YSTACWFB 010
Site Type	Lithic scatter
Recommendation	Designated Way Points 13 and 14 of the proposed fire break alignments will not impact on this area as long as they stay on the current alignment

5.1.3 Eastern fire break

The survey of this proposed fire break alignment was undertaken primarily by helicopter, however a site prediction model based on previously recorded sites for the area and the general topography and vegetation was proposed prior to the survey. The helicopter was landed at 3 designated locations that were thought to have a high probability of archaeological sites. This was confirmed by the following sites listed below.

Site Identification Number	YSTAEFB 001
Site Type	Lithic Scatter
Recommendations	Located 120 metres from eastern alignment. Existing road in general vicinity. No re-alignment necessary.
Site Identification number	YSTAEFB 002
Site Type	Lithic Scatter
Recommendations	Need to move alignment 40m further west to existing old road alignment. At best move alignment away from granite outcrop. .
Site Identification	YSTAEFB 003
Site Type	Artefact site.
Recommendations	Need to move alignment 40m further west to existing old road alignment. At best move alignment away from granite outcrop.

6: Conclusion

This report details the archaeological survey results of the three fire break alignments proposed by the Department of Defence and facilitated by Wildman Land Management. The focus of the archaeological survey was to ensure that the proposed fire break alignments would have no impact on previously registered Heritage sites. All previously recorded heritage listed sites that were determined as at risk by the proposed infrastructure development prior to the survey were located. The re-alignment of the eastern firebreak in the general area south east of Mount Disaster mitigated any potential impact. The survey results concluded that no previously listed Heritage sites would be impacted.

The survey was also directed at determining if the proposed infrastructure development would impact on any new sites of archaeological determination located during the survey. Of the 18 sites recorded, 5 sites required some re-alignment of the fire breaks to mitigate potential impact.

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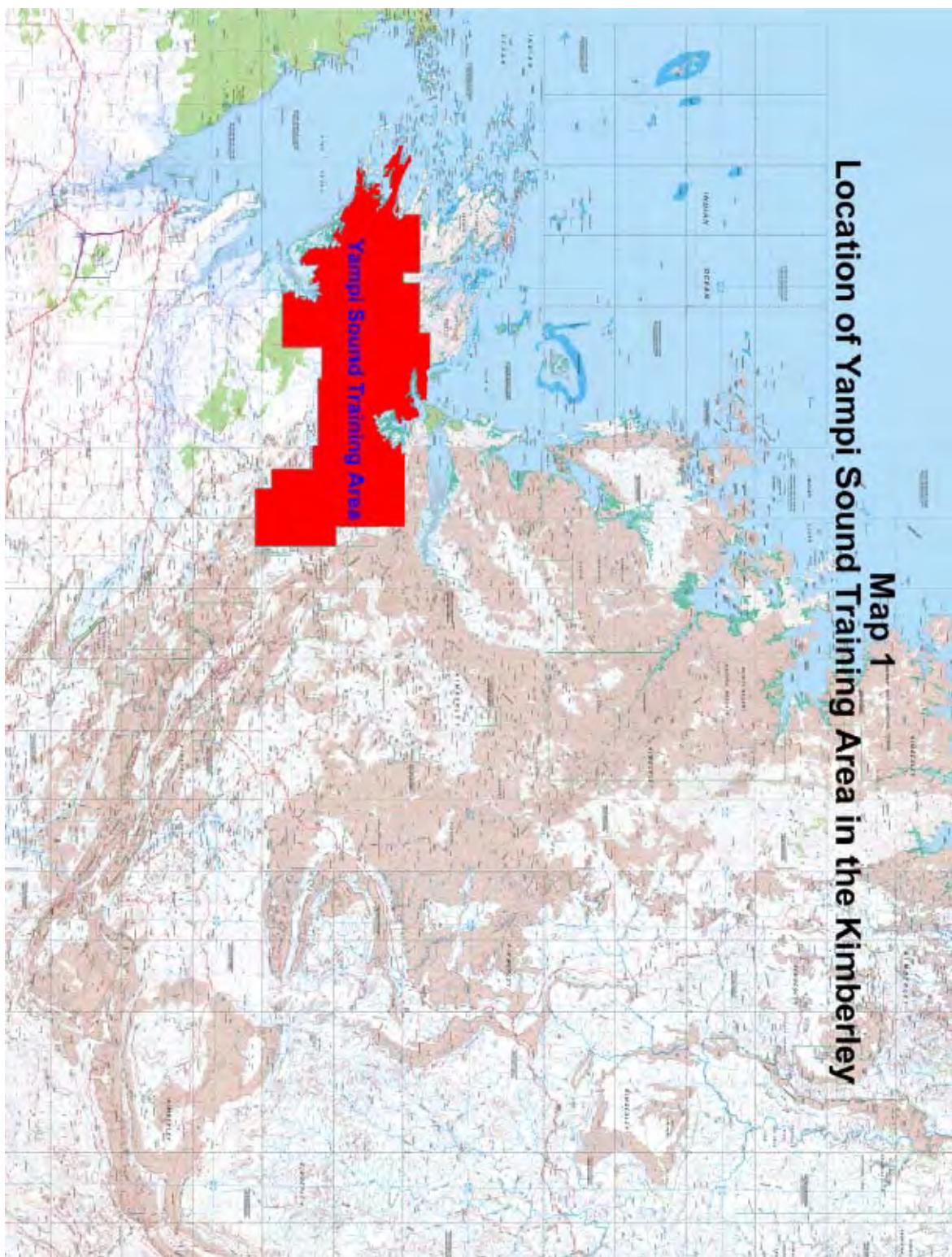
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Vachon, Daniel A. 2003. *Significant Aboriginal Sites in the Yampi Military Training Area*. Prepared for the Kimberley Land Council. Unpublished Report.\

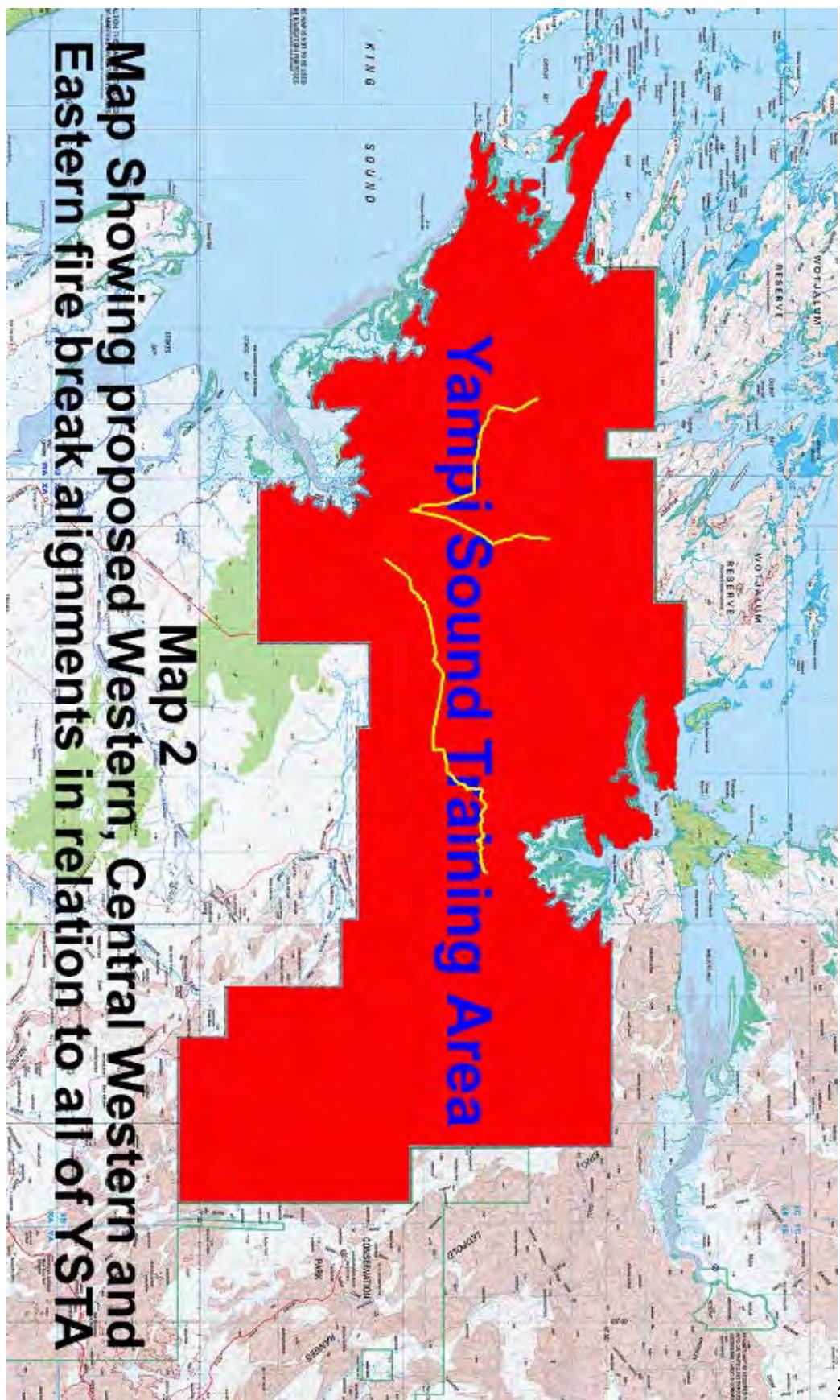
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MAP1

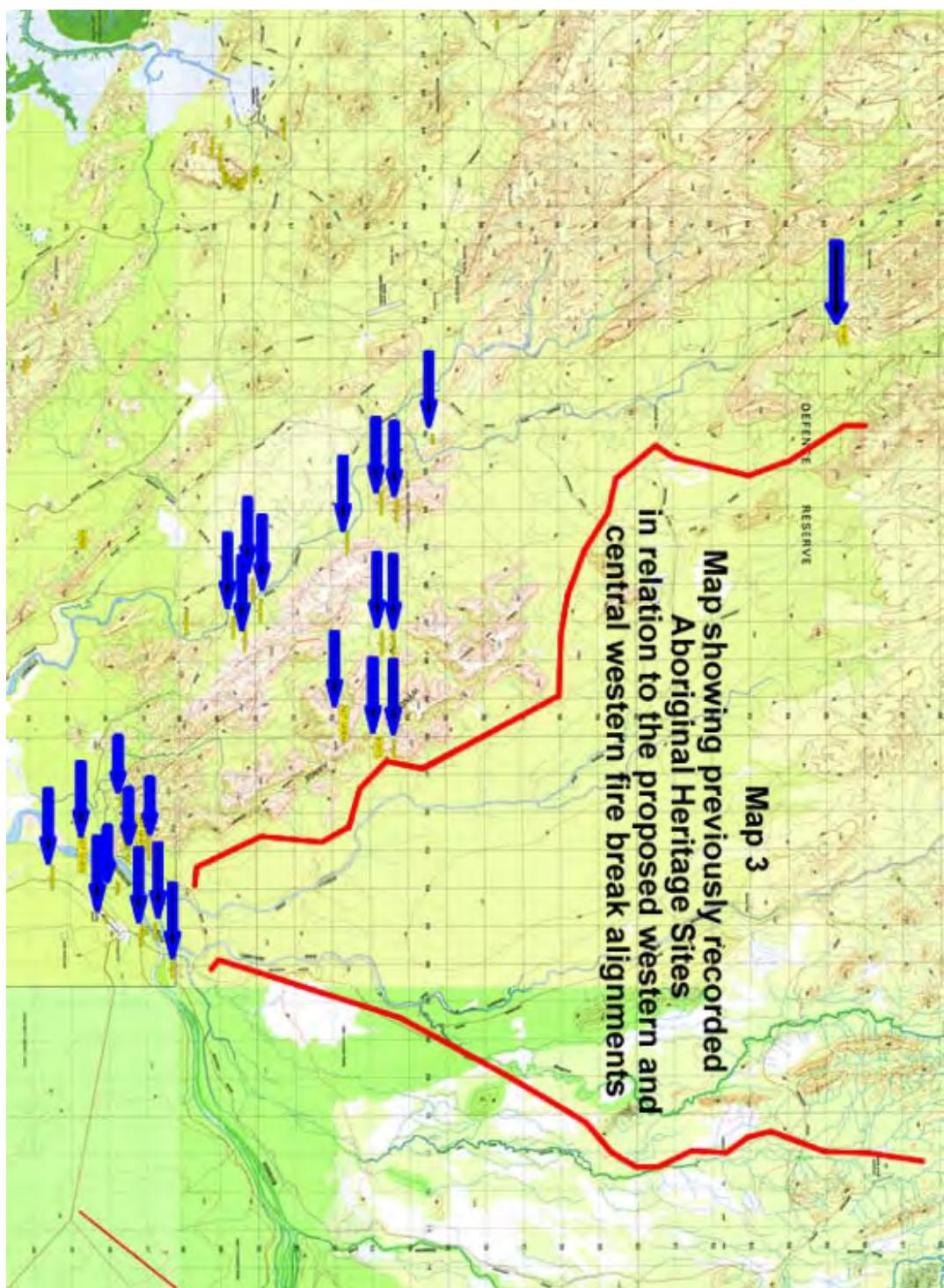
Map 1
Location of Yampi Sound Training Area in the Kimberley



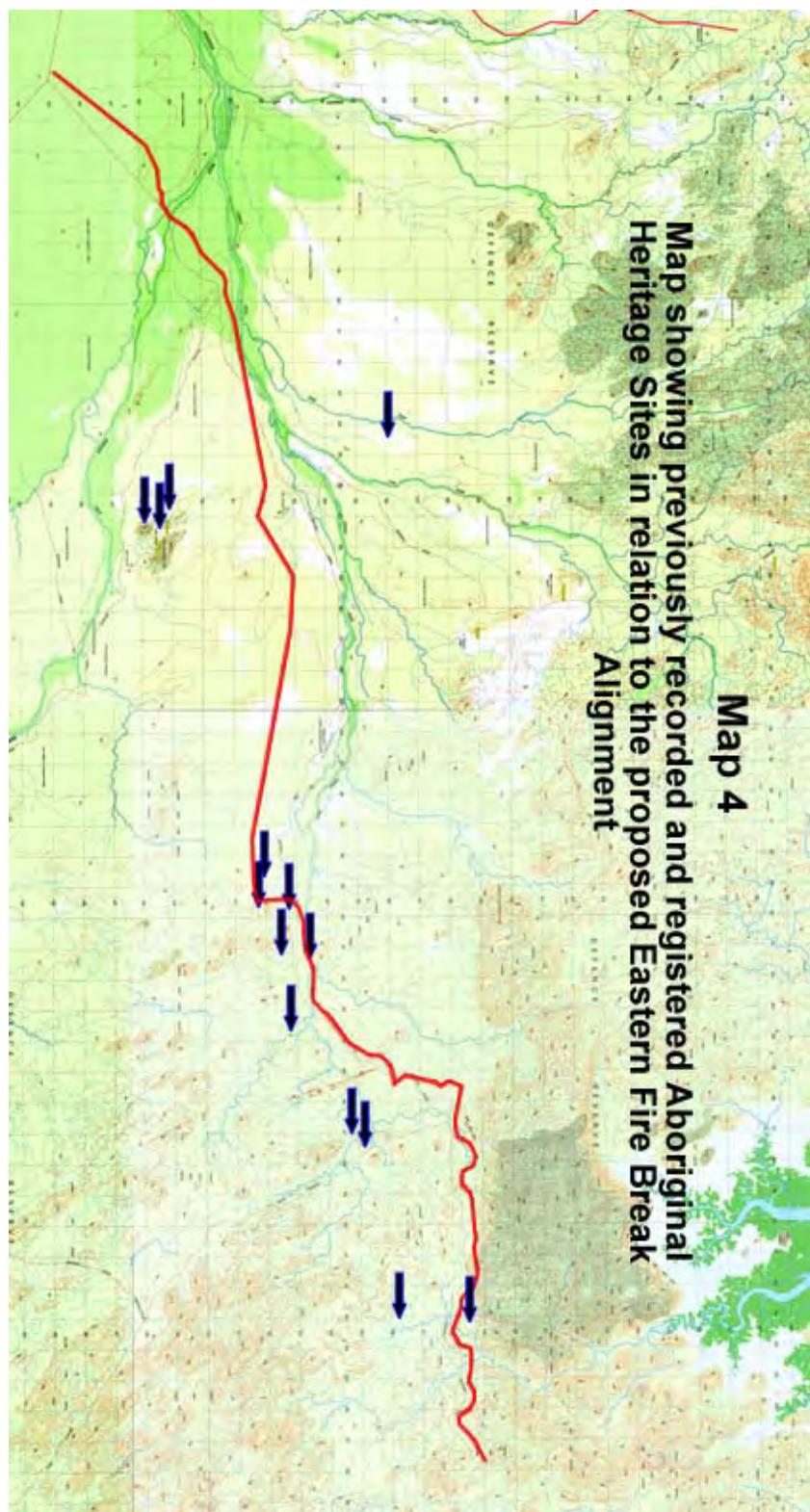
MAP 2



Map 3



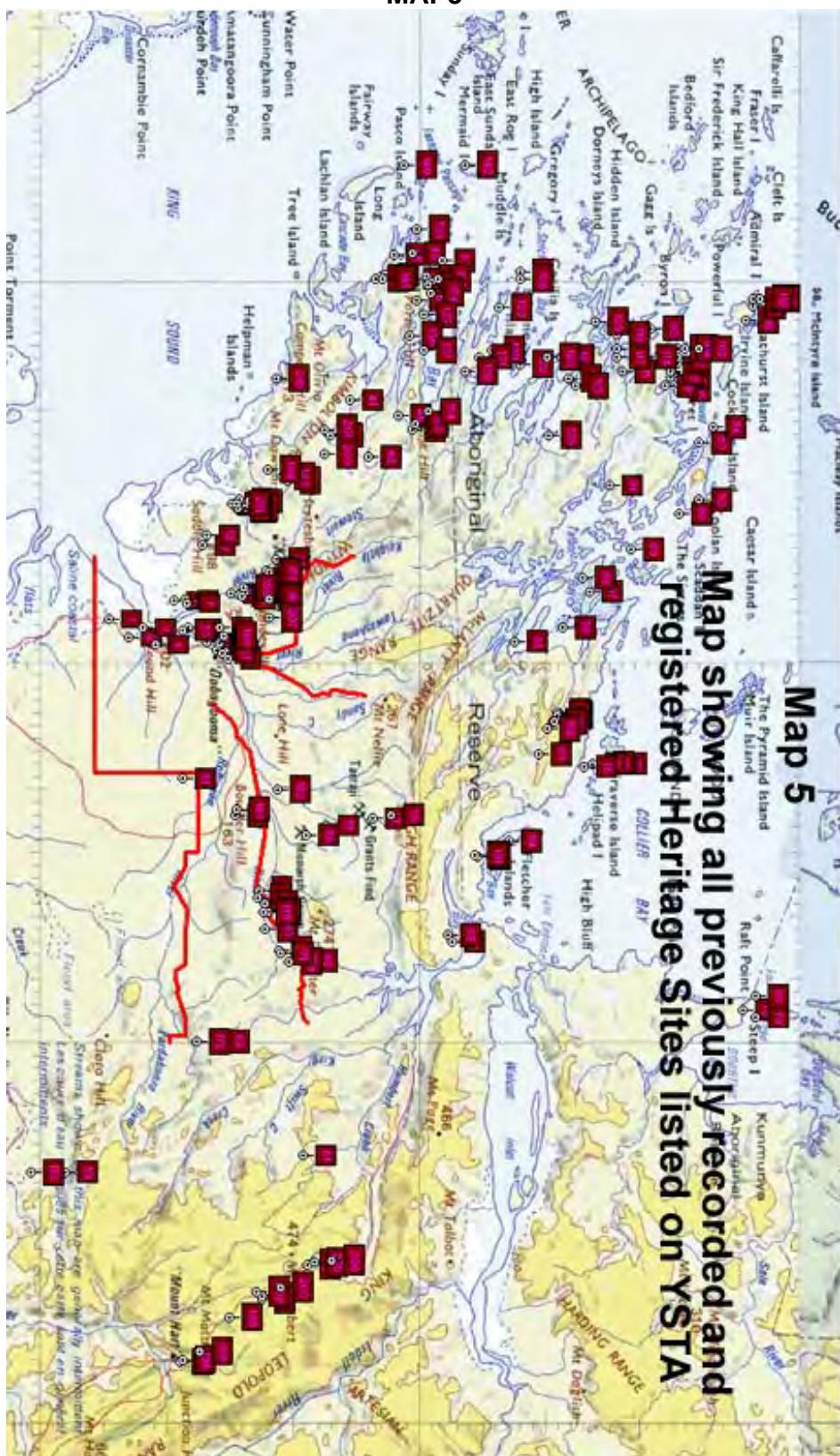
MAP4



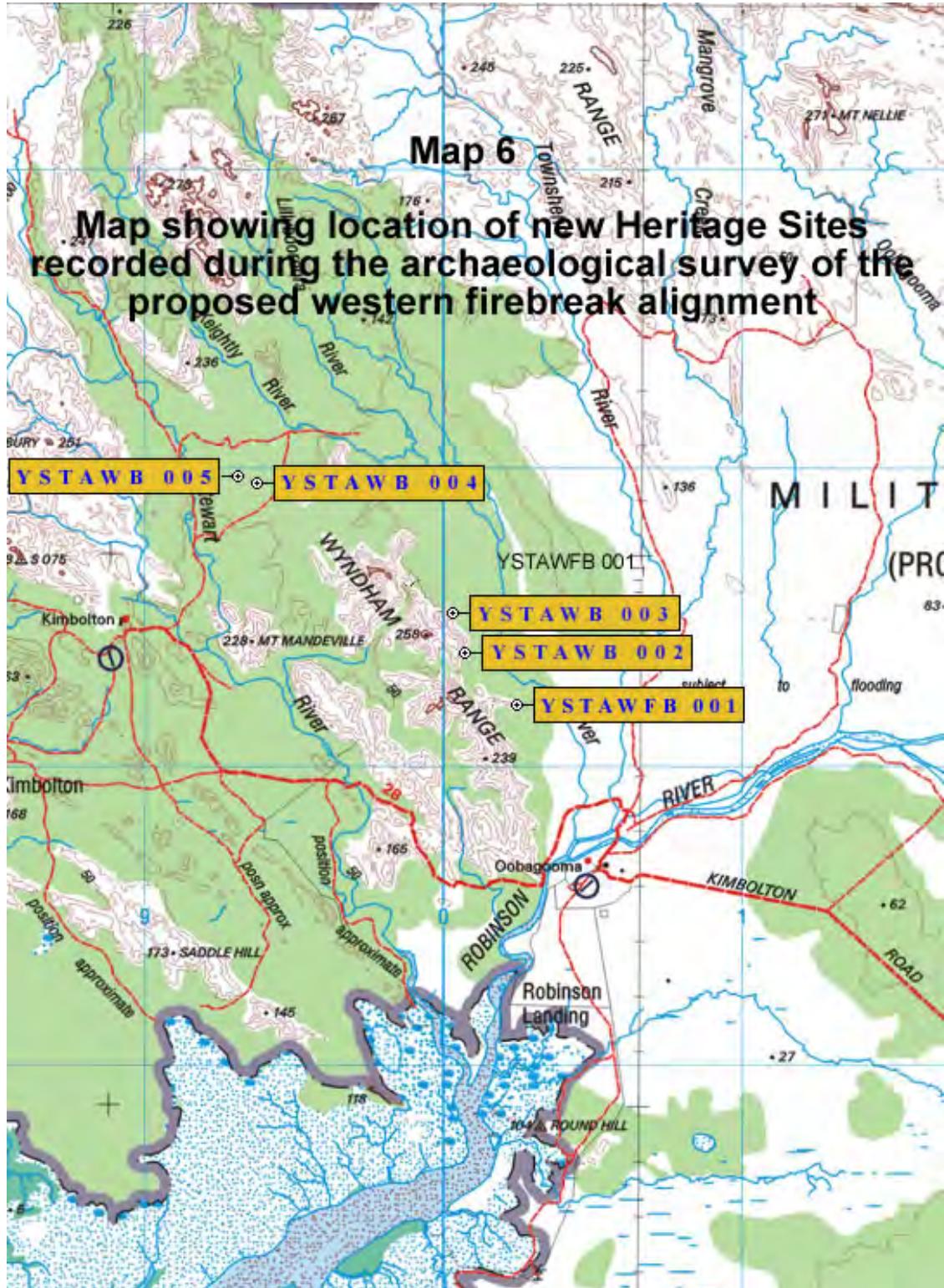
MAP5

Map 5

Map showing all previously recorded and registered Heritage Sites listed on YSTA



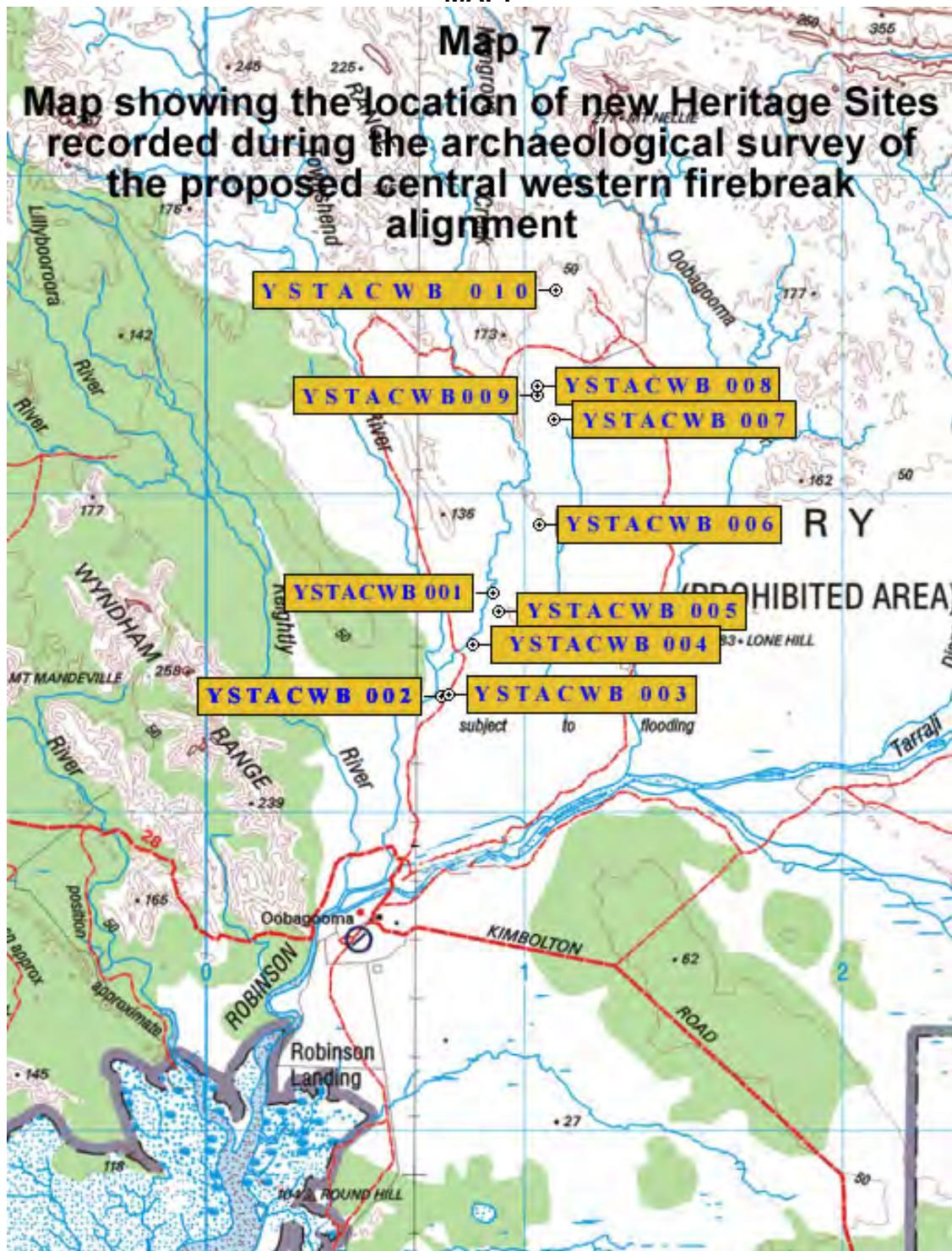
MAP6



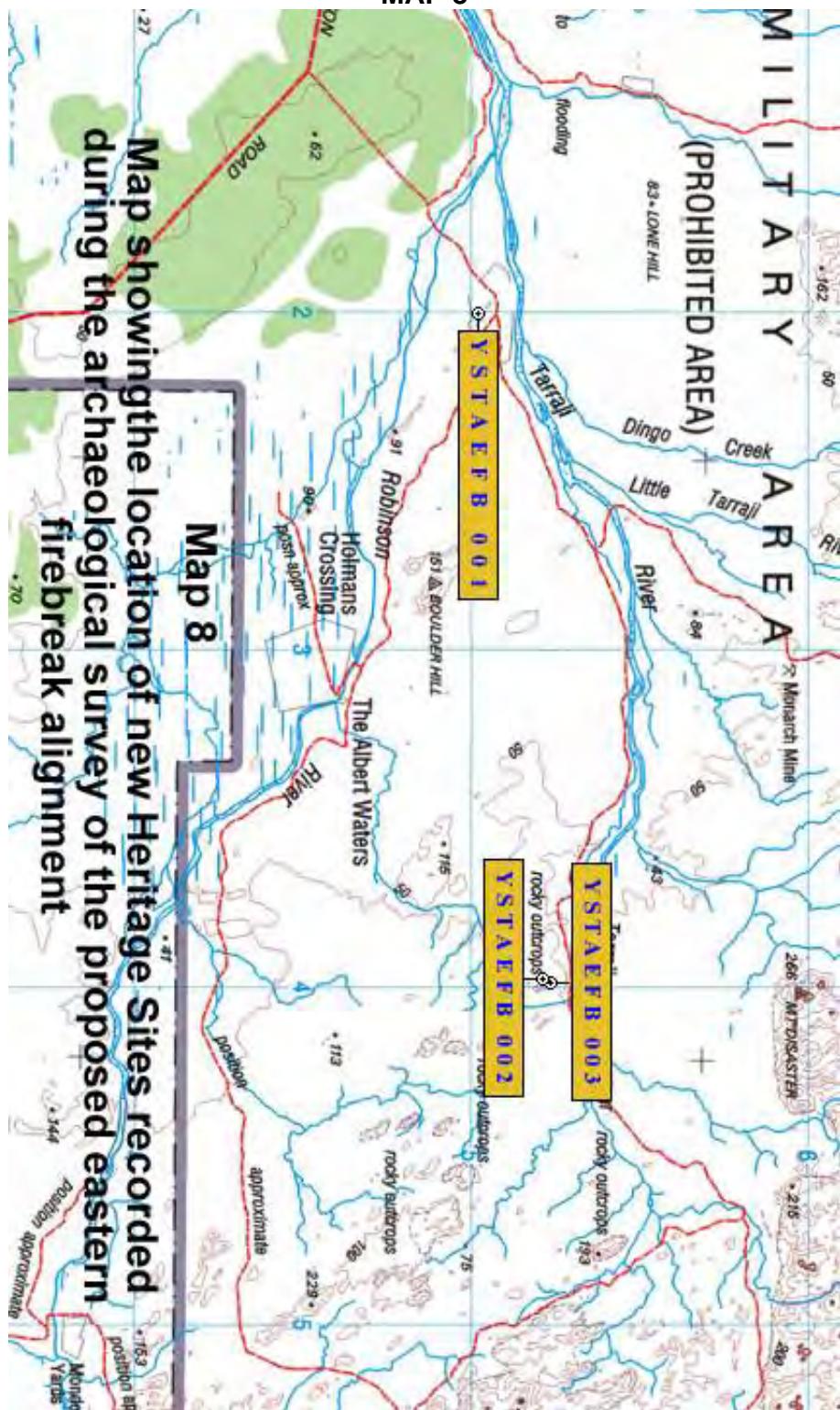
MAP7

Map 7

Map showing the location of new Heritage Sites recorded during the archaeological survey of the proposed central western firebreak alignment



MAP 8



Map showing the location of new Heritage Sites recorded during the archaeological survey of the proposed eastern firebreak alignment

TABLE 1

NO	NAME	TYPE	EASTING	NORTHING	MAP	SOURCE	SITEID	SITENAME
1	Robinsons Landing	Historic	602200	8140500	Kimbolton	EMP, 86		Robinsons Landing
2	Old Customs House	Historic	606200	8147300	Kimbolto	EMP, 86		Old Customs House
3	Wilsons Reward Mine	Historic	629600	8161300	Taraji	EMP, 86		Wilsons Reward Mine
4	Monarch Mine	Historic	630900	8158500	Taraji	EMP, 86		Monarch Mine
5	Grants Find Mine	Historic	628700	8168200	Taraji	EMP, 86		Grants Find Mine
6	Copper Mine Camp	Historic	628200	8170900	Taraji	EMP, 86		Copper Mine Camp
7	Mining battery ruin	Historic	677900	8122900	Matthew	EMP, 86		Mining battery ruin
8	Aboriginal	Historic	648600	8158100	Taraji	EMP, 86		Aboriginal (ceremonial) rock stack
9	Aboriginal (ceremonial) rock stack	Historic	675800	8157800	Matthew	EMP, 86		Aboriginal (ceremonial) rock stack
10	Aboriginal (ceremonial) rock stack	Historic	659800	8145300	Taraji	EMP, 86		Aboriginal (ceremonial) rock stack
11	Japanese Pearlers Graves	Historic	550500	8178700	Sunday Is	EMP, 86		Japanese Pearlers Graves
12	Residential ruin (X and X)	Historic	553800	8176600	Yampi	EMP, 86		Residential ruin(X and X)
13	Aboriginal (ceremonial) rock circle	Historic	555900	8175000	Kimbolton	EMP, 86		Aboriginal (ceremonial) rock circle
14	Old Kimbolton Homestead	Historic	584000	8150400	Kimbolton	EMP, 86		Old Kimbolton Homestead
15	Oobagooma Homestead	Historic	605300	8146500	Kimbolton	EMP, 86		Oobagooma Homestead
16	Oombalai Area (approx 4km2)	Registered Aboriginal area	584760	8148720	diamond shape around hAHC, 98		10165	Oombalai Area (approx 4km2)
17	Boulder Hill West Area	Registered Aboriginal area	628120	8148090	500m*200m rect NW-SE AHC, 98		10166	Boulder Hill West Area
19	Slate Is/Wailalkunya	Occupation	621200	8203500	Collier - in Ab. ReserWAM survey pt1, 80		K0023	Slate Is/Wailalkunya
20	Halls Pt/Langawarru	Myth	621000	8202000	Collier - in Ab. ReserWAM survey pt1, 80		K0024	Halls Pt/Langawarru
21	Halls Pt/Langgi	Pictograph	621000	8201500	Collier - in Ab. ReserWAM survey pt1, 80		K0025	Halls Pt/Langgi
22	Freshwater Cove/Kariadang	Pictograph	621300	8200300	Collier - in Ab. ReserWAM survey pt1, 80		K0026	Freshwater Cove/Kariadang

23	Widjingarra tjilkiya	Myth	621300	8200300	Collier - in Ab. ReserWAM survey pt1, 80	K0026	Widjingarra tjilkiya
24	Montgomery Is/ Ngalangurru Wondang	Pictograph/ Burial	621600	8199000	Collier - in Ab. ReserWAM survey pt1, 80	K0027	Montgomery Is/ Ngalangurru Wondang
25	Munkurin	Myth	621600	8199000	Collier - in Ab. ReserWAM survey pt1, 80	K0027	Munkurin
26	Doubtful Bay/Ngumburi	Pictograph	656000	8222000	Collier - in Ab. ReserWAM survey pt1, 80	K0028	Doubtful Bay/Ngumburi
27	Rocks below Ngumburi	Myth	656000	8222000	Collier - in Ab. ReserWAM survey pt1, 80	K0028	Rocks below Ngumburi
28	Steep Is	Myth	657000	8224000	Collier - in Ab. ReserWAM survey pt1, 80	K0029	Steep Is
29	Raft Pt	Occupation	654000	8224000	Collier - in Ab. ReserWAM survey pt1, 80	K0030	Raft Pt
30	Doubtful Bay Is in Success Straight,	Pictograph	622900	8140500	Tarraj - not in TA WAM survey pt1, 80	K0031	Doubtful Bay, Is in Success Straight
31	Secure Bay/Larinyum	Pictograph	645000	8179000	Collier WAM survey pt1, 80	K0032	Secure Bay/Larinyum
32	Secure Bay/Puddawata	Quarry-Ochre	619800	8192500	Collier - in Ab. ReserWAM survey pt1, 80	K0033	Secure Bay/Puddawata
33	Shoal Bay/Munjaliama Is	Occupation	632000	8188000	Collier - in Ab. ReserWAM survey pt1, 80	K0034	Shoal Bay/Munjaliama Is
34	Talbot Bay/bridge	Myth	604000	8189000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0035	Talbot Bay/bridge
35	Talbot Bay	Occupation	602000	8196000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0036	Talbot Bay
36	Talbot Bay/Ubernaru	Occupation	597000	8200000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0037	Talbot Bay/Ubernaru
37	Talbot Bay/Kutjunmur	Occupation	595000	8199000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0038	Talbot Bay/Kutjunmur
38	Talbot Bay	Occupation	591000	8206000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0039	Talbot Bay
39	Talbot Bay	Occupation	586000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0040	Talbot Bay
40	Talbot Bay/Kaikaluoma	Petroglyph	582000	8203000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0041	Talbot Bay/Kaikaluoma

41	Yalulpa-Kulanu	Pictograph	584000	8216000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0042	Yalulpa-Kulanu
42	Yampi	Occupation	576000	8216000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0043	Yampi
43	Koolan Is	Occupation	574000	8218000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0044	Koolan Is
44	Yampi Peninsula/Kunguluma	Occupation	569000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0045	Yampi Peninsula/ Kunguluma
45	Myridi Bay	Occupation	567000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0046	Myridi Bay
46	Myridi Bay	Occupation	567000	8212000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0047	Myridi Bay
47	Myridi Bay	Occupation	568000	8211000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0048	Myridi Bay
48	Myridi Bay	Occupation	565000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0049	Myridi Bay
49	Myridi Bay	Occupation	566000	8212000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0050	Myridi Bay
50	Myridi Bay	Occupation	565000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0051	Myridi Bay
51	Karalu II	Occupation	564000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0052	Karalu II
52	Karalu III	Occupation	563000	8213000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0053	Karalu III
53	Karalu I	Occupation	563000	8214000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0054	Karalu I
54	Margaret Island	Occupation	563000	8216000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0055	Margaret Island
55	NE Irvine Is	Occupation	559000	8223000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0056	NE Irvine Is
56	Irvine Is	Occupation	557000	8224000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0057	Irvine Is
57	Bathurst Is	Occupation	556000	8225000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0058	Bathurst Is
58	Bathurst Is	Occupation	556000	8226000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0059	Bathurst Is

59	Irvine Is/Winjomerima	Myth	556000	8226000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0059	Irvine Is/Winjomerima
60	Irvine Is	Occupation	556000	8224000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0060	Irvine Is
61	Irvine Is	Myth	556000	8225000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0061	Irvine Is
62	Yampi Peninsula	Occupation	560000	8209000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0062	Yampi Peninsula
63	Coppermine Creek	Occupation	564000	8208000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0063	Coppermine Creek
64	Watjelum	Mission/ reserve	566000	8205000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0064	Watjelum
65	Goose channel	Occupation	563000	8204000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0065	Goose channel
66	Yampi/Cholemma	Occupation	564000	8204000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0066	Yampi/Cholemma
67	Yampi Peninsula	Occupation	561000	8204000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0067	Yampi Peninsula
68	Yampi/Yeediwoodu I, II, III	Occupation	559000	8201000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0068	Yampi/Yeediwoodu I, II, III
69	Yampi Peninsula/Mundalallpa	Occupation	559000	8201000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0068	Yampi Peninsula/Mundalallpa
70	Graveyard	Occupation	564000	8196000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0069	Graveyard
71	Graveyard	Occupation	565000	8190000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0070	Graveyard
72	Aveling Is/Widjalgowarra	Occupation	564000	8194000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0071	Aveling Is/Widjalgowarra
73	Yampi Graveyard	Occupation	567000	8197000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0072	Yampi Graveyard
74	Yampi Graveyard	Occupation	568000	8198000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0073	Yampi Graveyard
75	Yampi Graveyard	Occupation	575000	8194000	Yampi - in Ab. Reserve WAM survey pt1, 80	K0074	Yampi Graveyard
76	Karrakututu/Mary Is	Occupation	552000	8190000	Sunday Island - not in WAM survey pt1, 80	K0075	Karrakututu/Mary Is

77	Mary Island	Occupation	553000	8190000	Sunday Island - not in WAM survey pt1, 80 Yampi - in Ab. Reserve	K0076	Mary Island
78	Strickland Bay/Jallajallapa	Quarry	557000	8187000	WAM survey pt1, 80	K0077	Strickland Bay/Jallajallapa
79	Strickland Bay	Occupation	563000	8186000	Yampi - in Ab. Reserve	K0078	Strickland Bay
80	Strickland Bay	Occupation	564000	8184000	WAM survey pt1, 80	K0079	Strickland Bay
81	Strickland Bay/Euorapa	Occupation	566000	8182000	Yampi - in Ab. Reserve	K0080	Strickland Bay/Euorapa
82	Cone Bay/Tjukunjma	Occupation	553000	8178000	WAM survey pt1, 80	K0081	Cone Bay/Tjukunjma
83	Cone Bay/Malalpa	Occupation	555000	8177000	Sunday Island	K0082	Cone Bay/Malalpa
84	Cone Bay	Occupation	558000	8176000	Yampi	K0083	Cone Bay
85	Cone Bay	Occupation	561000	8174000	WAM survey pt1, 80	K0084	Cone Bay
86	Yampi/Cone Bay	Occupation	563000	8176000	Kimbolton	K0085	Yampi/Cone Bay
87	Faint Point	Occupation	546000	8175000	WAM survey pt1, 80	K0086	Faint Point
88	Cascade Bay	Myth	553000	8169000	Cornambie	K0087	Cascade Bay
89	Cascade Bay	Pictograph	537000	8173000	WAM survey pt1, 80	K0088	Cascade Bay
90	Long Island	Occupation	553000	8170000	Cornambie	K0089	Long Island
91	Mermaid Is	Pictograph	537000	8182000	WAM survey pt1, 80	K0090	Mermaid Is
92	Swan Point	Occupation	503000	8191000	Sunday Island - in Ab. Res	K0091	Swan Point
93	Hunters Ck/Bulgin	Burial	633000	7932000	WAM survey pt1, 80	K0092	Hunters Ck/Bulgin
94	Cape Leveque	Petroglyph	625000	7932000	Meda? - not in TA	K0093	Cape Leveque
					Meda? - not in TA		
					WAM survey pt1, 80		

95	Yampi Peninsula 1	Artefact Scatter	614500	8195600	not in training area WAM survey pt2, 80	K0803	Yampi Peninsula 1
96	Yampi Peninsula 2	Artefact Scatter	613900	8195400	not in training area WAM survey pt2, 80	K0804	Yampi Peninsula 2
97	Yampi Peninsula 3	Pictograph site Artefact Sc	614100	8195300	not in training area WAM survey pt2, 80	K0805	Yampi Peninsula 3
98	Yampi Peninsula 4	Artefact Scatter	614400	8195300	not in training area WAM survey pt2, 80	K0806	Yampi Peninsula 4
99	Yampi Peninsula 5	Pictograph site Artefact Sc	615100	8194600	not in training area WAM survey pt2, 80	K0807	Yampi Peninsula 5
100	Yampi Peninsula 6	Artefact Scatter	615300	8194700	not in training area WAM survey pt2, 80	K0808	Yampi Peninsula 6
101	Yampi Peninsula 7	Pictograph site	616200	8193700	not in training area WAM survey pt2, 80	K0809	Yampi Peninsula 7
102	Cone Bay Axe Site	Ground Edge Axe	573300	8174700	Kimbolton WAM survey pt3, 80	K0918	Cone Bay Axe Site
103	Cone Bay 1	Shell Material	571600	8176600	Yampi WAM survey pt3, 80	K0919	Cone Bay 1
104	Wyndham Range Campsite	Artefact Scatter	597600	8152900	Kimbolton WAM survey pt3, 80	K0920	Wyndham Range Campsite
105	Wyndham Range Campsite	Artefact Scatter	593900	8152900	Kimbolton WAM survey pt3, 80	K0921	Wyndham Range Campsite
106	Wyndham Range Campsite	Artefact Scatter	594100	8153300	Kimbolton WAM survey pt3, 80	K0923	Wyndham Range Campsite
107	Wyndham Range Campsite	Artefact Scatter	597500	8149300	Kimbolton WAM survey pt3, 80	K0924	Wyndham Range Campsite
108	Wyndham Range Campsite	Artefact Scatter	596200	8149500	Kimbolton WAM survey pt3, 80	K0925	Wyndham Range Campsite
109	Wyndham Rge Painted Shelters	Painting, Engraving, Artefac	597800	8153200	Kimbolton WAM survey pt3, 80	K0926	Wyndham Range Painted Shelters
110	West Boulder Hill	Painting, Artefacts, Grindin	627400	8148400	Tarraj WAM survey pt3, 80	K0927	West Boulder Hill
111	Crowley Highway 1	Artefact Scatter	624600	8154300	Tarraj WAM survey pt3, 80	K0928	Crowley Highway 1
112	K0929 Crowley Highway 2	Artefact Scatter	638700	8151500	Tarraj WAM survey pt3, 80	K0929	Crowley Highway 2

113	Crowley Highway 3	Artefact	639800	8151400	Tarraji WAM survey pt3, 80	K0930	Crowley Highway 3
114	Crowley Highway 4	Scatter				K0931	Crowley Highway 4
		Water Source,	640400	8152300	Tarraji WAM survey pt3, 80		
		Artefacts				K0932	Crowley Highway 5
115	Crowley Highway 5	Artefacts,	641600	8152900	Tarraji WAM survey pt3, 80		
		Grinding, Water				K0933	Crowley Highway 6
116	Crowley Highway 6	Grinding	644100	8152300	Tarraji WAM survey pt3, 80		
		Patches				K0934	Crowley Highway 7
117	Crowley Highway 7	Artefact	647100	8154500	Tarraji WAM survey pt3, 80		
118	Crowley Highway 8	Artefact	648700	8155800	Tarraji WAM survey pt3, 80	K0935	Crowley Highway 8
119	Crowley Highway 9	Scatter				K0936	Crowley Highway 9
		Grinding,	641800	8152200	Tarraji WAM survey pt3, 80		
		Artefacts				K0937	Harry Martin Trip 1
120	Harry Martin Trip 1	Artefact	647500	8154600	Tarraji WAM survey pt3, 80		
121	Harry Martin Trip 2	Scatter				K0938	Harry Martin Trip 2
122	Harry Martin Trip 3	Artefact	659700	8142300	Tarraji WAM survey pt3, 80		
		Scatter				K0939	Harry Martin Trip 3
123	Harry Martin Trip 4	Artefact	677900	8118000	Lennard WAM survey pt3, 80		
		Scatter				K0940	Harry Martin Trip 4
		Paintings	683600	8092100	Lennard - not in TA WAM survey pt3, 80		
124	Harry Martin Trip 5	Paintings,	683700	8093100	Lennard - not in TA WAM survey pt3, 80	K0941	Harry Martin Trip 5
		Axe Grooves, Arte					
125	Harry Martin Trip 6	Artefact	682100	8104700	Lennard - not in TA WAM survey pt3, 80	K0942	Harry Martin Trip 6
		Scatter					
126	Harry Martin Trip 7	Artefact	691400	8106400	Lennard - not in TA WAM survey pt3, 80	K0943	Harry Martin Trip 7
		Scatter					
127	Harry Martin Trip 8	Artefact	691100	8065800	Lennard - not in TA WAM survey pt3, 80	K0944	Harry Martin Trip 8
		Scatter					
128	Harry Martin Trip 9	Grinding	690800	8105000	Lennard - not in TA WAM survey pt3, 80	K0945	Harry Martin Trip 9
		Patches					
129	Harry Martin Trip 10	Artefact	689300	8103900	Lennard - not in TA WAM survey pt3, 80	K0946	Harry Martin Trip 10
		Scatter					
130	Harry Martin Trip 11	Artefact	689100	8103700	Lennard - not in WAM survey pt3, 80	K0947	Harry Martin Trip 11
		Scatter					

131	Harry Martin Trip 12	Artefact Scatter	693000	8082800	Lennard - not in TA WAM survey pt3, 80	K0948	Harry Martin Trip 12
132	Oombalai Cave	Painting, Mythological, Engr	585200	8149600	Kimbolton WAM survey pt3, 80	K0949	Oombalai Cave
133	Oombalai 1	Painting, Mythological	585100	8149700	Kimbolton WAM survey pt3 , 80	K0950	Oombalai 1
134	Oombalai 2	Painting, Mythological, Engr	585300	8148900	Kimbolton WAM survey pt3, 80	K0951	Oombalai 2
135	Oombalai 3	Painting, Mythological, Engr	585300	8148800	Kimbolton WAM survey pt3, 80	K0952	Oombalai 3
136	Oombalai 4	Painting, Mythological	585100	8148800	Kimbolton WAM survey pt3 , 80	K0953	Oombalai 4
137	Wyndham Range Grinding	Grinding	603000	8146700	Kimbolton WAM survey pt3 , 80	K0954	Wyndham Range Grinding
138	Secure Bay Stone Arrangement 1	Stone Arrangement	634100	8183500	Collier WAM survey pt3 , 80	K0955	Secure Bay Stone Arrangement 1
139	Secure Bay Stone Arrangement 2	Stone Arrangement	634000	8183000	Collier WAM survey pt3 , 80	K0956	Secure Bay Stone Arrangement 2
140	Secure Bay Arrangement 3	Stone Arrangement	634000	8183000	Collier WAM survey pt3 , 80	K0957	Secure Bay Stone Arrangement 3
141	Kimbolton 1	Artefacts Grinding	581300	8156000	Kimbolton WAM survey pt3, 80	K0958	Kimbolton 1
142	Kimbolton 2	Stone Mound	580700	8155100	Kimbolton WAM survey pt3, 80	K0959	Kimbolton 2
143	Kimbolton 3	Artefact Scatter	579700	8153200	Kimbolton WAM survey pt3, 80	K0960	Kimbolton 3
144	Mt Hart Old Homestead	Artefact Scatter	704500	8139400	Matthew - not in TA WAM survey pt3, 80	K0961	Mt Hart Old Homestead
145	Mt Hart Base Camp	Grinding Bases	704400	8140000	Matthew - not in TA WAM survey pt3, 80	K0962	Mt Hart Base Camp
146	Mt Hart Artefact Site 1	Artefact Scatter	703300	8142300	Matthew - not in TA WAM survey pt3, 80	K0963	Mt Hart Artefact Site 1
147	Mt Hart Artefact Site 2	Artefact Scatter	703300	8142300	Matthew - not in TA WAM survey pt3, 80	K0964	Mt Hart Artefact Site 2
148	Mt Hart Hearths	Cooking Hearths	698400	8146800	Matthew - not in TA WAM survey pt3, 80	K0965	Mt Hart Hearths

149	Mt Hart Quarry	Quarry, Artefacts	696000	8151500	Matthew - not in TA WAM survey pt3, 80	K0966	Mt Hart Quarry
150	Mt Hart Artefact Site 3	Artefact Scatter	695500	8151500	Matthew - not in TA WAM survey pt3, 80	K0967	Mt Hart Artefact Site 3
151	Mt Hart Artefact Site 4	Artefact Scatter	695000	8150800	Matthew - not in TA WAM survey pt3, 80	K0968	Mt Hart Artefact Site 4
152	Humbert Ck Artefact Site 1	Artefact Scatter	694300	8154300	Matthew - not in TA WAM survey pt3, 80	K0969	Humbert Ck Artefact Site 1
153	Humbert Ck Artefact Site 2	Artefact Scatter	691300	8158200	Matthew - not in TA WAM survey pt3, 80	K0970	Humbert Ck Artefact Site 2
154	Humbert Ck Artefact Site 3	Artefact Scatter	690900	8159200	Matthew - not in TA WAM survey pt3, 80	K0971	Humbert Ck Artefact Site 3
155	Humbert Ck Artefact Site 4	Artefact Scatter	690600	8161800	Matthew WAM survey pt3, 80	K0972	Humbert Ck Artefact Site 4
156	Wyndham Range 6	Stone Mound	600400	8153200	Kimbolton WAM survey pt3, 80	K0973	Wyndham Range 6
157	Kimbolton Range 1	Painting	574200	8161400	Kimbolton WAM survey pt3, 80	K0810	Kimbolton Range 1
158	Kimbolton Range 2	Stone Arrangements	577460	8161500	Kimbolton WAM survey pt3, 80	K0811	Kimbolton Range 2
159	Nth of Helpman Is (coast)	Mythological, Initiation site	567000	8154500	Kimbolton WAM survey pt3, 80	K0812	Nth of Helpman Is (coast)
160	Red Hill Old Kimbolton	Painting, Engraving	584500	8148500	Kimbolton WAM survey pt3, 80	K0813	Red Hill Old Kimbolton

Table 2

Datum, Australian Geodetic 1984

NO	EASTING	NORTHING	SITEID
West Boulder Hill			
8	-16.742160,	124.195330	Minirrima
17	-16.653494,	124.394684	
110	-16.745165,	124.203247	10166
111	-16.742403,	124.196472	K0927
112	-16.689230,	124.169884	K0928
113	-16.713745,	124.302277	K0929
114	-16.714584,	124.312599	K0930
115	-16.706415,	124.318169	K0931
116	-16.700920,	124.329384	K0932
117	-16.706190,	124.352867	K0933
118	-16.686123,	124.380859	K0934
119	-16.674273,	124.395775	K0935
120	-16.707233,	124.331306	K0936
8	-16.685194,	124.384598	K0937
17	-16.651828,	124.392608	Aboriginal (ceremonial) rock stack
110	-16.743490,	124.201174	Boulder Hill West Area
111	-16.740728	124.194399	West Boulder Hill
112	-16.687559	124.167811	Crowley Highway 1
113	-16.712073	124.300201	Crowley Highway 2
114	-16.712912	124.310523	Crowley Highway 3
115	-16.704745	124.316094	Crowley Highway 4
116	-16.699250	124.327309	Crowley Highway 5
117	-16.704520	124.350792	Crowley Highway 6
118	-16.684454	124.378783	Crowley Highway 7
119	-16.672605	124.393698	Crowley Highway 8
	-16.705563	124.329231	Crowley Highway 9

NO	EASTING	NORTHING	SITEID
120	-16.683525	124.382522	Harry Martin Trip 1
K0927	-16.740485	124.193257	see 6.7.1; category 2 site
NOT GIVEN	-16.759929	123.961689	KLC Report

Table 3

Datum,Australian Geodetic 1984

NO	EASTING	NORTHING	SITEID
8	-16.651828	124.392608	Aboriginal (ceremonial) rock stack
17	-16.743490	124.201174	Boulder Hill West Area
110	-16.740728	124.194399	West Boulder Hill
111	-16.687559	124.167811	Crowley Highway 1
112	-16.712073	124.300201	Crowley Highway 2
113	-16.712912	124.310523	Crowley Highway 3
114	-16.704745	124.316094	Crowley Highway 4
115	-16.699250	124.327309	Crowley Highway 5
116	-16.704520	124.350792	Crowley Highway 6
117	-16.684454	124.378783	Crowley Highway 7
118	-16.672605	124.393698	Crowley Highway 8
119	-16.705563	124.329231	Crowley Highway 9
120	-16.683525	124.382522	Harry Martin Trip 1
K0927	-16.740485	124.193257	see 6.7.1; category 2 site

TABLE 4

Site Id Number	Site Type	Description of Site	Size and Description of Area	Latitude	Longitude
YSTAWFB 001	Lithic scatter.	Large pressure flaked blades	Located 272m west of proposed western fire break alignment and on lower section of ridgeline. Random quartzite pressure flakes covering an area of approximately 5 square meters.	-16.712500	123.961410
YSTAWFB 002	Lithic scatter.	Random pressure flaked quartzite artefacts and waste flakes.	Lower slope of rocky ridge line covering an area of four square meters.	-16.696560	123.944810
YSTAWFB 003	Lithic Scatter	Random quartz and quartzite artefacts with some waste material.	Exposed rocky slope near ridge line and creek system. Covers an area of 6 square meters.	-16.712500	123.961410
YSTAWFB 004	Lithic scatter	Discrete area of random artefacts and waste material. Some evidence of core material. Quartz and chert dominated.	Exposed Spinifex slope near creek system. Artefacts and waste material covered an area of approximately 11 square meters.	-16.645577	123.879119
YSTAWFB 005	Lithic scatter	Random quartz artefacts, waste material, quarrying and core material.	Open rocky exposed slope with artefacts covering an area of approximately 10 square meters.	-16.642980	123.872980
YSTACWFB 001	Carved Boab tree	Boab Tree with initials P.O carved into side. European origin.	Carved Boab tree near creek system	-16.669914	124.020847
YSTACWFB 002	Stone arrangement and artefact site	Large cutting flakes and placed rocks in regular pattern around Boab tree. ? ceremonial.	Site covers and area of approximately 10 square metre. One side of Boab tree 272m west of fire break.	-16.699333	124.008382

YSTACWFB 003	Artifact site	Several large river pebbles that had been worked to shape large 'cutting' 'chopping' tools. Evidence of pressure flaking to obtain a sharp cutting edge.	Area of site showing 7 large core artefacts in area of three meters by three meters on cracked black soil, flood plain. 250 meters west of the fire break alignment. Small Spinifex eroded area on saddle of hill	-16.699163	124.011123
YSTACWFB 004	Lithic Scatter	Discrete site containing quartzite artefacts and waste flakes.	showing artefacts covering an area of approximately 6 square metres.	-16.682960	124.016420
YSTACWFB 005	Lithic Scatter	Artefacts appear to be very old. Patina build-up and water rolled 'smoothing' and possible pressure flaked edges. Predominately represented by cores and heavy thick cutting blades.	Discrete and contained in an area of around 4 square metres. Located on a saddle close to an ancient creek alignment.	-16.675124	124.022687
YSTACWFB 006	Rock Art and occupation site	Very old Wandjina painting site. Little evidence of re-painting or maintenance of the site indicating the site is well pre-European contact. Pressure flaking indicates post. 3 to 3.5 thousand years. Considerably old tree growth against the paintings.	Concentrated lithic indicating occupation site. Actual occupation floor approximately 4.8 metres.	-16.650184	124.034497
YSTACWFB 007	Lithic Scatter	Quartzite artefacts with pressure flaking, cores and waste flakes.	Discrete area of approximately 3 square metres and probably the results of an individual. Located on a saddle near old creek alignment.	-16.620264	124.038517
YSTACWFB 008	Lithic Scatter	Random spread of pressure flaked quartzite tools, cores and waste flakes.	Discrete area of artefacts predominantly quartz. On raised area near creek alignment.	-16.613614	124.033868

YSTACWFB 009	Lithic Scatter	Discrete area of pressure flaked quartz and quartzite artefacts, cores and waste flakes.	Located on saddle area of creek alignment. -16.610986 Covered area of approximately 2 square metres.	124.034078
YSTACWFB010	Lithic scatter	Open camping areas with heavy concentrations of lithic material west of current alignment	Large eroded area bordering on Spinifex plain. -16.583694 Covers and area of approximately 200 metres by 60 metres.	124.039038
YSTAEFB 001	Lithic Scatter	Discrete lithic site comprising quartz, chert and silcrete pressure flaked tools, waste flakes and 1 core. Located in an open exposed area of Spinifex flats and on a slightly raised area.	Large open area surrounded by rocky outcrops and creek systems. Large permanent water hole located 600 metres from the site.	-16.723910 124.122480
YSTAEFB 002	Lithic Scatter	Open Camping Site. Major occupation site showing concentrated artefacts, waste flakes and core material.	Major lithic site located along the lower section of the granite ridge.	-16.709805 124.310972
YSTAEFB 003	Artefact site.	Basalt stone Axe located on a section of the granite outcrop above site YSTAEFB 002		-16.707565 124.311751

APPENDIX 1

Site Identification Number	YSTAWFB 001
Site Type	Lithic scatter.
Description of Site	Large pressure flaked blades, 1 core and one placed rock.
GPS Co-ordinates	-16.712500 123.961410
Size and Description of Area	Located 272m west of proposed western fire break alignment and on lower section of ridgeline. Random quartzite pressure flakes covering an area of approximately 5 square meters.
Recommendation.	No realignment necessary.
Photographic record	Pressure flaked artefact and placed rock.



Site Identification Number	YSTAWFB 002
Site Type	Lithic scatter.
Description of Site	Random pressure flaked quartzite artefacts and waste flakes.
GPS Co-ordinates	-16.696560 123.944810
Size and Description of Area of four square meters	Lower slope of rocky ridge line covering an area
Recommendation	Move alignment 40 meters further east away from significant natural eco system.
Photographic record	Photo's show some waste flakes and pressure flaked tools of quartzite material



Site identification Number	YSTAWFB 003
Site Type	Lithic Scatter
Description of Site	Random quartz and quartzite artefacts with some waste material.
GPS Co-ordinates	-16.712500 123.961410
Size and Description of Area	Exposed rocky slope near ridge line and creek system. Covers an area of approximately 6 square meters.
Recommendation.	No re-alignment necessary. Site 220 away from fire break.
Photographic record	2 of the 12 quartz artefacts recorded for this site.



Site Identification Number	YSTAWFB 004
Site Type	Lithic scatter
Description of Site	Discrete area of random artefacts and waste material. Some evidence of core material. Quartz and chert dominated.
GPS Co-ordinates	-16.645577 123.879119
Size and Description of Area	Exposed Spinifex slope near creek system. Artefacts and waste material covered an area of approximately 11 square meters.
Recommendation	No need for fire break re-alignment
Photographic record	Small area of the exposed Spinifex slope containing random artefacts.



Site Identification Number	YSTAWFB 005
Site Type	Lithic scatter
Description of Site	Random quartz artefacts, waste material, quarrying and core material.
GPS Co-ordinates	-16.642980 123.872980
Size and Description of Area	Open rocky exposed slope with artefacts covering an area of approximately 10 square meters.
Recommendation	Recommend move proposed fire break alignment 60 meters further west.
Photographic record	Shows quartz artefact, 1 waste flake and quartz boulder that had been quarried.



Site Identification Number	YSTACWFB 001
Site Type	Carved Boab tree
Description of Site	Boab Tree with initials P.O. carved into side. European origin.
GPS Co-ordinates	-16.669914, 124.020847
Size and Description of Area	Carved Boab tree near creek system
Recommendation	Boab will not be affected by firebreak
Photographic Record	Boab tree showing initials P O



Site Identification Number	YSTACWFB 002
Site Type	Stone arrangement and artefact site
Description of Site	Large cutting flakes and placed rocks in regular pattern around Boab tree. ? ceremonial.
GPS Co-ordinates	-16. 699333 124. 008382
Size and Description of Area	Site covers and area of approximately 10 square metre. One side of Boab tree 272m west of fire break.
Recommendation	Will not be affected by Fire Break
Photographic Record	Shows Boab tree. Stone artefacts this side of tree.



Site Identification Number	YSTACWFB 003
Site Type	Artefact site
Description of Site	Several large river pebbles that had been worked to shape large 'cutting' 'chopping' tools. Evidence of pressure flaking to obtain a sharp cutting edge.
Site Co-ordinates	-16.699163 124.011123
Size and Description of Area	Area of site showing 7 large core artefacts in area of three meters by three meters on cracked black soil, flood plain. 250 meters west of the fire break alignment.
Recommendation	No re-alignment of fire break necessary.
Photographic Record	Show 2 examples of the large quartzite river pebbles used as 'cutting' 'chopping' tools.



Site Identification Number	YSTACWFB 004
Site Type	Lithic Scatter
Description of Site	Discrete site containing quartzite artefacts and waste flakes.
GPS Co-ordinates	-16.682960, 124.016420
Size and Description of Area	Small Spinifex eroded area on saddle of hill showing artefacts covering an area of approximately 6 square metres in.
Recommendation	220 metres from fire break alignment. No re-alignment required.
Photographic Record	Photograph showing one artefact with pressure flaking.



Site Identification Number	YSTACFB 005
Site Type	Lithic Scatter
Description of Site	Artefacts appear to be very old. Patina build-up and water rolled 'smoothing' and possible pressure flaked edges. Predominately represented by cores and heavy thick cutting blades.
GPS Co-ordinates	-16.675124, 124.022687
Size and Description of Area	Discrete and contained in an area of around 4 square metres. Located on a saddle close to an ancient creek alignment.
Recommendation	Re-align proposed fire break alignment 50 metres west.
Photographic Record photograph	Camera lost battery and unable to take

Site Identification Number	YSTACWFB 006
Site Type	Rock Art and occupation site
Description of Site	Very old Wandjina painting site. Early style of Wandjina. Little evidence of re-painting or maintenance of the site indicating the site is well pre-European contact. . Pressure flaking indicates post 3 to 3.5 thousand years. Considerably old tree growth against the paintings.
GPS Co-ordinates	-16.650184, 124.034497
Size and Description of Area	Concentrated lithic indicating occupation site. Actual occupation floor approximately 4.8 metres.
Recommendation	Site needs to be managed. Veg. right up to rock face. A single tree has grown up against a section of the art and will cause extensive damage if fire is allowed to reach the site. More extensive archaeological field work needed.
Photographic Record	Show site and examples of the Wandjina paintings.



Site Identification Number	YSTACWFB 007
Site Type	Lithic Scatter
Description of Site.	Quartzite artefacts with pressure flaking, cores and waste flakes.
GPS Co-ordinates	-16.620264, 124.038517
Size and Description of Area	Discrete area of approximately 3 square metres and probably the results of an individual. Located on a saddle near old creek alignment.
Recommendation	No re-alignment necessary. Site 380 metres WSW of alignment.
Photographic Record	Camera out of battery.

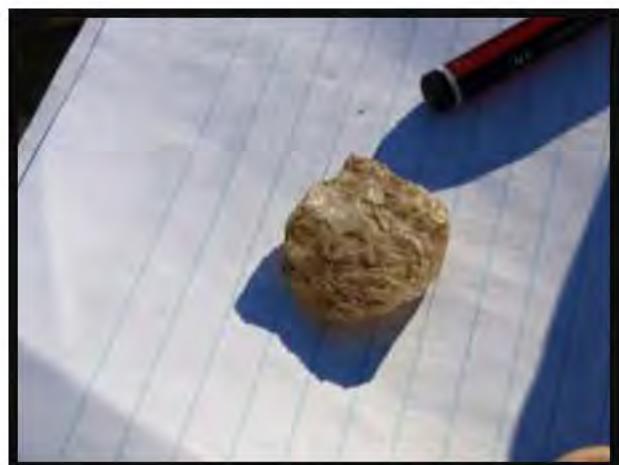
Site Identification Number	YSTACWFB 008
Site Type	Lithic Scatter
Description of Site	Random spread of pressure flaked quartzite tools, cores and waste flakes.
GPS Co-ordinates	-16.613614, 124.033868
Size and Description of Area	Discrete area of artefacts predominantly quartz. On raised area near creek alignment.
Recommendation	No re-alignment required.
Photographic Record	Camera out of battery.

Site Identification Number	YSTACFB 009
Site Type	Lithic Scatter
Description of Site	Discrete area of pressure flaked quartz and quartzite artefacts, cores and waste flakes.
GPS Co-ordinates	-16.610986, 124.034078
Size and Description of Area	Located on saddle area of creek alignment. Covered area of approximately 2 square metres.
Recommendation	No re-alignment required.
Photographic Record	No battery for camera

Site Identification Number	YSTACWFB 010
Site Type	Lithic scatter
Description of Site	Open camping areas with heavy concentrations of lithic material west of current alignment
GPS Co-ordinates	-16.583694, 124.039038
Size and Description of Area	Large eroded area bordering on Spinifex plain. Covers an area of approximately 200 metres by 60 metres.
Recommendation	Designated Way Points 13 and 14 of the proposed fire break alignments will not impact on this area as long as they stay on the current alignment
Photographic Record	Shows example of the extent of the site and some of the artefacts randomly located throughout the area.



Site Identification Number	YSTAEFB 001
Site Type	Lithic Scatter
Description of Site	Discrete lithic site comprising quartz, chert and silcrete pressure flaked tools, waste flakes and 1 core. Located in an open exposed area of Spinifex flats and on a slightly raised area.
GPS Co-ordinates	-16.723910 124.122480
Size and description of area	Large open area surrounded by rocky outcrops and creek systems. Large permanent water hole located 600 metres from the site.
Recommendations	Located 120 metres from eastern alignment. Existing road in general vicinity. No re-alignment required.
Photographic record	Photograph showing exposed area containing artefacts. Two examples of the artefacts recorded.



Site Identification number	YSTAEFB 002
Site Type	Lithic Scatter.
Description of Site	Open Camping Site. Major occupation site showing concentrated artefacts, waste flakes and core material.
GPS Co-ordinates	-16.709805 124.310972
Size and Description of Area	Major lithic site located along the lower section of the granite ridge.
Recommendations	Need to move alignment 40m further west to existing old road alignment. At best move alignment away from granite outcrop. .
Photographic record	Shows example of quartz and chalcedony artefacts.



Site Identification	YSTAEFB 003
Site Type	Artefact site.
Description Of Site	Basalt stone Axe located on a section of the granite outcrop above site YSTAEFB 002
GPS Co-ordinates	-16.707565 124.311751
Recommendations	Need to move alignment 40m further west to existing old road alignment. At best move alignment away from granite outcrop. .
Photographic Record	Photograph showing basalt pressure flaked stone axe.

