

Environmental Impact Statement
Uungula Wind Farm

Appendix K: Aboriginal Cultural Heritage Assessment Addendum Report (Austral Archaeology, 2020)

May 2020



A U S T R A L

A R C H A E O L O G Y

Ungula Wind Farm, Ungula New South Wales: Aboriginal Archaeological Survey Report (Addendum)

FINAL REPORT

CWP Renewables Pty Ltd

11 March 2020

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EXECUTIVE SUMMARY

Austral Archaeology (Austral) has been commissioned to prepare an addendum to the Heritage Impact Assessment (HIA) for the Uungula Wind Farm (the project) for CWP Renewables Pty Ltd (CWPR). This addendum is required to be complimentary to the Aboriginal Cultural Heritage Assessment Report (ACHAR) previously prepared by New South Wales Archaeology titled Uungula Wind Farm Aboriginal Cultural Heritage Assessment Report. Report for Uungula Wind Farm Pty Ltd (Dibden 2018). The Project is a State Significant Development (SSD 6687) and is required to meet the standard as set by Secretary Environmental Assessment Requirements (SEARs) project requirements for the overall project issued on 11 November 2019.

There are three discrete study areas, two adjacent to existing roads, one is situated on Twelve Mile Road from the corner of Goolma Road in the west to the project entry point in the east, there is also a short section of Ilgingery Road. The third study area comprises additions to previously surveyed areas throughout the overall Development Corridor area. The two sections of road were surveyed 20 metres either side of the existing road. If access was restricted by fencing or other hazards, general visual observations were made of the inaccessible locations. The surveys adjacent to the roads is of such a nature that it was possible to survey the entirety of it within a discrete timeframe, without the necessity to create more manageable unit sizes as outlined in the current ACHAR. The additional areas, however, were surveyed concentrating on areas of moderate to high potential as much of the previous survey found little or no artefactual material in areas of low or no potential. This will complement the existing methodology and not detract from or alter the previous methodological statement.

Summary of previous Investigations

Archaeological studies across the wider region have identified numerous archaeological sites, particularly in association with permanent or ephemeral water sources. The sites are almost entirely made up of single lithic artefacts or scatters of lithic artefacts. These have been extensively outlined in the previous report and the reader is referred to that for detailed information. However, Dibden (2018) noted that

- Artefacts densities and site complexities are more likely to be greater near reliable water.
- That visibility and exposure will greatly influence the detection of artefactual material
- There is low potential for artefacts to be present on slopes of moderate to steep gradient.
- The presence of grinding grooves is unlikely in the general region as there is an absence of suitable rock exposures.
- Burials are unlikely to be present, however, the sedimentary deposits near creeks may be an exception.
- Rockshelters are unlikely as the appropriate geological conditions are not present in the overall study area.
- Scar trees are unlikely due to the previous clearing of mature trees

Results of archaeological investigations in the study area

The pedestrian survey undertaken as part of the assessment process identified 115 stone artefacts across 28 new Aboriginal site locations. There were also seven new areas of high and moderate potential archaeological deposits (PADs) recorded in five of the new survey areas

Based on the quantity and location of the newly identified sites and PADs the Development Footprint has high potential to impact on Aboriginal objects.

Summary of results

There were eight moderate sized artefact scatters comprised of three artefacts or more, six artefact scatters of two artefacts and 14 individual finds. The artefacts scatters contained two sites of high significance UWFA11_1 and UWFA11_2, three sites of moderate significance, UWFA11_3, UWFA11_4 and UWFA24_AS1, a further 22 sites of low significance are detailed in Table 6.

The sites of high significance include rare and unusual artefacts, the sites of moderate significance are moderate density artefact scatters, the sites of two artefacts and individual finds are all of low significance. The newly recorded sites are detailed Table 6, along with their significance.

There were seven areas of PAD located during the survey and these were commonly associated with watercourses and artefact scatters. These PADs extend beyond the boundaries of the artefact scatters and will require further investigation if they are to be impacted.

Summary of recommendations

The following recommendations are derived from the survey results and refer to the findings described in Section 5.1 of this assessment. The recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, and the findings of the survey results and the predicted impact of the proposed works on archaeological resources.

It is recommended that if it is not possible to realign or reposition certain infrastructure as detailed in Table 9, Figure 20, Figure 21, Figure 22, Figure 39, Figure 40 and Figure 41 then it will be necessary to undertake subsurface testing in those areas where impact will affect the archaeological resources present. This particularly applies to the following areas

- **Survey Area 11** Which has five artefact scatters and two large PADs, these would be directly impacted by the proposed Development Footprint and are within the Development Corridor.
- **Survey Area 24** Has a single artefact scatter and PAD directly in line with the proposed Development Footprint and are within the Development Corridor.
- **Survey Area 6** Has two small artefact scatters and a PAD which would be impacted by the proposed Development Footprint and are within the Development Corridor.

Where surface artefacts are located either as individual finds or low density, small artefact scatters a surface collection of these materials would be appropriate. The subsurface testing and community collections will need to be undertaken before any construction works are commenced.

Furthermore, the following points should be adhered to before works commence

1. All contractors undertaking earthworks on site should be briefed on the protection of Aboriginal heritage objects under the *National Parks & Wildlife Act 1974* (NPW Act) and the penalties for damage to these items.
2. All contractors undertaking earthworks in the study area should undergo an induction on identifying Aboriginal heritage objects; and
3. A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the project.

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1 INTRODUCTION

Austral Archaeology Pty Ltd (Austral) has been commissioned by CWP Renewables (CWPR), on behalf of Uungula Wind Farm Pty Ltd to undertake an addendum Aboriginal Archaeological Survey Report (AASR) for the Uungula Wind Farm Aboriginal Cultural Heritage Assessment Report 2018 (the previous report). The addendum survey was undertaken from 28 October 2019 through to 1 November 2019 and a secondary follow up survey from 11 December 2019 until 13 December 2019. The study area lies wholly within the Dubbo Regional Council Local Government Area (LGA), and lies 22 kilometres due east of the township of Wellington, NSW. In December 2019, Secretary's Environmental Assessment Requirements (SEARs) were issued and the Department of Planning and Environment (DP&E) Secretary's Environmental Assessment Requirements (SSD 6687) was issued on 21 December 2016, with a revised SEARs issued on 11 November 2019.

The survey was divided into three distinctive sections. The Twelve Mile Road section has been subjected to a high level of disturbance during the construction of the existing bitumen road and associated water dispersal works. The Ilginyer Road section had a moderate level of disturbance associated with the forming of the gravel road with some water dispersal works. The remainder of the survey was divided into smaller individual survey areas. Overall, these had been subjected to a moderate level of disturbance, with some sections containing dams, stockyards and bulldozed fire trails, all areas had informal farm tracks, stock watering points and evidence of previous ploughing. The location of the study areas is shown in Figures 1, 2 and 3 below.

1.1 Project Description

The scope of works as been extensively outlined in the previous report (Dibden 2018) and the reader is referred back to the initial report for further detail. Since that report was prepared further amendments have been made to the proposed Development Footprint and Study Areas. These amendments do not affect previous survey or report and only apply to this new AASR. An up to date map of the Development Footprint was supplied by CWP Renewables on 7 January 2020, with a further update made available on 18 February 2020 and it is from this mapping that all assumptions regarding proposed impacts are taken. The Project has revised down the number of Wind Turbine Generators (WTG) from 109 to 97. This decrease in the number of WTGs will not affect the results or recommendations of this report.

1.2 Assessment Objectives

The scope of this AASR addendum report is based on the legal requirements, guidelines and policies of the Heritage Team of the Department of Premier and Cabinet (DPC), formerly the Office of Environment and Heritage (OEH), and the Department of Environment, Climate Change and Water (DECCW). The guiding documents for this assessment are the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011) [the Guide to Reporting] and the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* (DECCW 2010) [the code of practice].

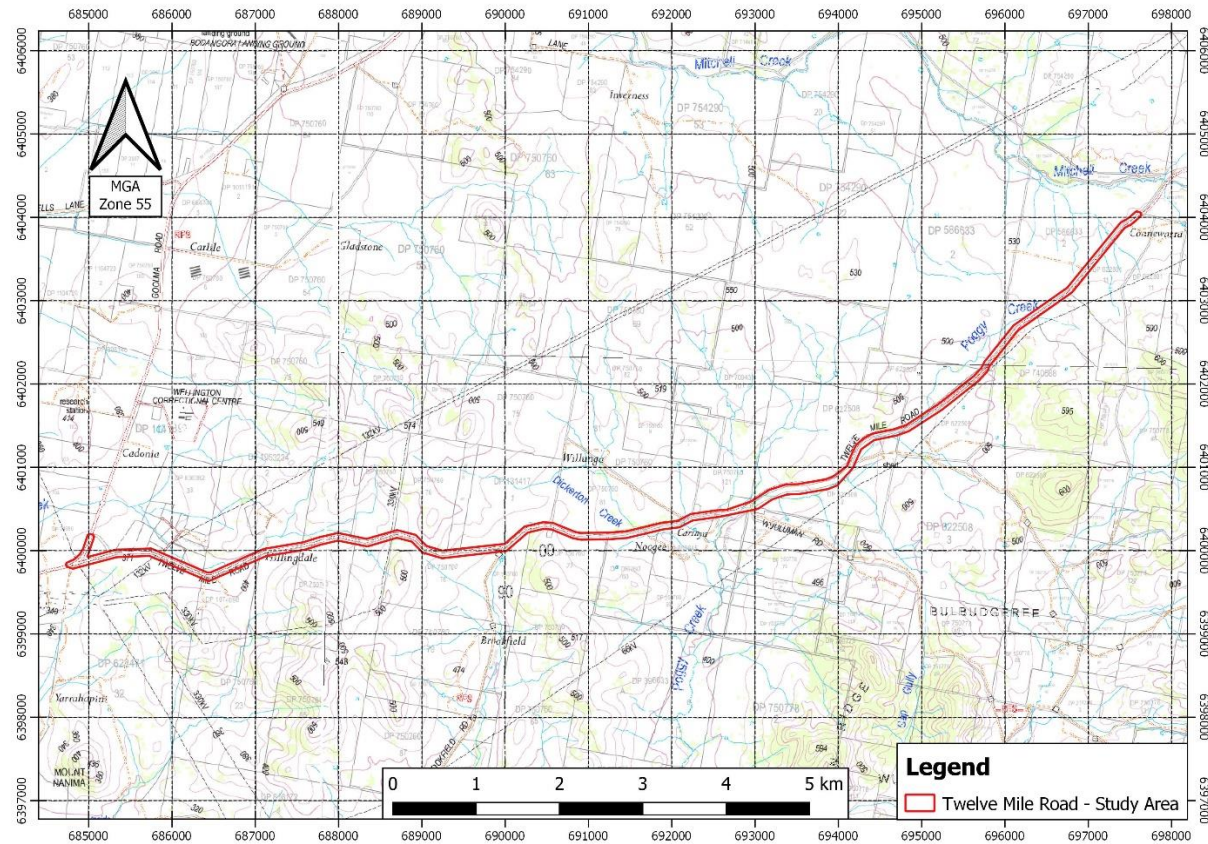
The scope of works includes the following:

- Document the results of archaeological survey undertaken in accordance with the code of practice.

1.3 Federal and State Legislation

Aboriginal archaeological and cultural heritage assessments in New South Wales are carried out under the auspices of a range of State and Federal acts, regulations and guidelines. The acts and regulations allow for the management and protection of Aboriginal places and objects, and the guidelines set out best practice for community consultation in accordance with the requirements of the acts. This legislation has been detailed in the previous report and the reader should refer to this.

Figure 1. Study area for the Twelve Mile Road Section



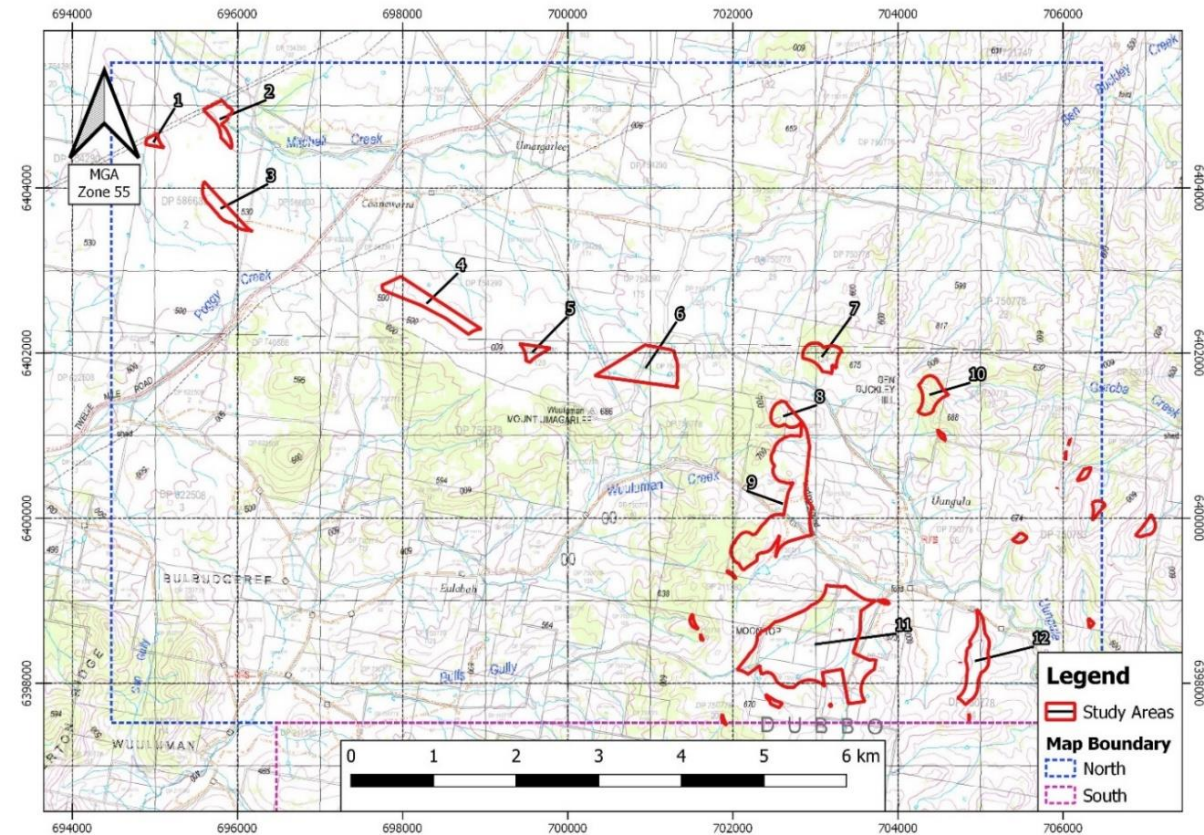
Project: 1961

Operator: William Andrews

Date: 11 March 2020

Source: Nearmap, NSW Spatial Services

Figure 2. Northern Section of the Study Area



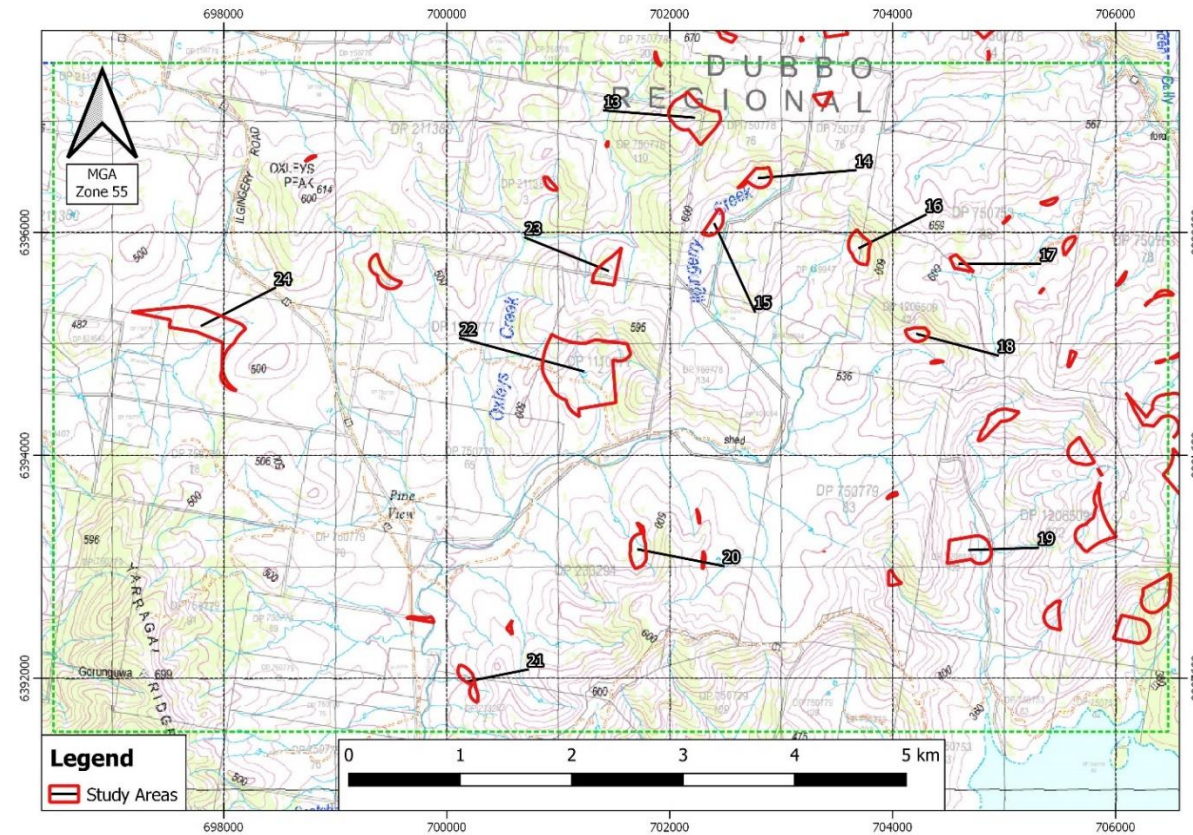
Project: 1961

Operator: William Andrews

Date: 11 March 2020

Source: NSW DFSI Topographic

Figure 3. Southern Section of the study area



Project: 1961
Operator: William Andrews
Date: 11 March 2020
Source: NSW DFSI Topographic

Figure 4. Ilginery Road section of the study area

Project: 1961_Ungula Wind Farm

Operator: William Andrews

Date: 11 March 2020

Source: NSW DFSI Topographic

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1.4 Section Summary

Aboriginal places and objects, both known and unknown, are protected in New South Wales by State and Federal legislation. The present assessment is being conducted under the DPC's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010b) [the Consultation Requirements], the Guide to Reporting, under Section 80 of the NP&W Regulations and under Part 6 of the NP&W Act in respect to the identification of Aboriginal stakeholders. As the work is currently classified as a State Significant Development, the procedures under Part 5 of the EP&A Act do not apply.

Searches of the Australian Heritage Places Inventory (AHPI), the Register of the National Estate (RNE), the National Heritage List and the NSW Heritage Council's State Heritage Register (SHR) websites identified no recorded sites within the study area.

At the State level, the works are to be assessed under the NP&W Act and the EP&A Act. The relevant sections of the NP&W Act are Section 86, Section 87, Section 89A and Section 90.

1.5 Project Team and Qualifications

This AASR was prepared by Neil Fenley (Archaeologist) and Alexander Beben (Director) and project management was provided by Amanda Atkinson (Director). William Andrews (Archaeologist) conducted the GIS mapping. The report was reviewed by Amanda Atkinson (Director) for quality assurance purposes.

Alexander Beben (B.A. (Hons.) Archaeology, Ma. Archaeology)

Alexander Beben is a Director of Austral Archaeology with over 15 years' experience in the completion of historical and Aboriginal heritage projects. Alexander has worked in every state and territory and has completed in excess of 500 consulting projects. Alexander has extensive experience in the completion of surveys, excavations and the authorship of archaeological reports and management plans.

Amanda Atkinson (BA. Arch/Paleo, Grad Dip Archaeology)

Amanda Atkinson is an Aboriginal heritage specialist with over 12 years' experience in Australian archaeology. Amanda has worked predominantly in eastern Australian states and in Western Australia. Amanda has extensive experience in Aboriginal consultation and has worked on some of the state's most complex Aboriginal heritage projects.

Neil Fenley (B. Arch. (Hons.))

Neil is an archaeologist who has 17 years of experience working throughout Australia on a variety of projects. He has led large teams on protracted fieldwork projects in remote areas and specialises in managing large scale fieldwork projects. Neil has also completed numerous Cultural Heritage Management Reports in Victoria and has recently joined the Austral Archaeology team on a full time basis.

William Andrews (B.Eng. (Hons) Surveying)

William Andrews is a Graduate Archaeologist for Austral Archaeology. William is a graduate of a Bachelor of Engineering (Surveying) and has transitioned his career toward Archaeology in 2019. Prior to his career change William had been working as a land surveyor for two years. Which has given him the skills to specialise in spatial and technological documentation techniques that relate strongly to Archaeology. William completed his thesis on these topics and is skilled at photogrammetry, laser scanning, GIS and in-field documentation methods. William has also studied Archaeology prior to his engineering degree, which taught him the foundational knowledge required to apply his engineering abilities to the job.

1.6 Acknowledgements

Austral Archaeology would like to acknowledge the participation of the following people who contributed to the preparation of the report:

- Bradley Bliss Wellington Valley Wiradjuri Aboriginal Corporation
- Helena Stanley Wellington Local Aboriginal Land Council
- Brendan Doherty Gallangabang Aboriginal Corporation
- Fleur Magick Dennis Gallangabang Aboriginal Corporation
- Steven 'George' Flick Murong Gialinga
- James Williams Mudgee Local Aboriginal Land Council

1.7 Abbreviations

The following are common abbreviations that are used within this report:

ACHA	Aboriginal Cultural Heritage Archaeological
AHIMS	Aboriginal Heritage Information Management System
AHPI	Australian Heritage Places Inventory
AASR	Aboriginal Archaeological Survey Report
Austral	Austral Archaeology Pty Ltd
COP	Code of Practice
CWPR	CWP Renewables Pty Ltd
DECCW	EP of Environment, Climate Change, and Water
DPC	Department of Premier and Cabinet
DP&E	Department of Planning and Environment
DPIE	Department of Planning Industry and Environment
EP&A Act	Environmental Planning and Assessment Act 1979
LGA	Local Government Area
NP&W Act	National Parks and Wildlife Act 1974
NPWS	National Park and Wildlife Service
NSW	New South Wales
PAD	Potential Archaeological Deposit
SEARs	Secretary's Environmental Assessment Requirements
RNE	Register of the National Estate
SHR	State Heritage Register

Refer also to the document Heritage Terms and Abbreviations, published by the Heritage Office and available on the website: <http://www.environment.nsw.gov.au/heritage/index.htm>

2 ARCHAEOLOGICAL SURVEY

2.1 Survey Methodology

The specific survey methodology developed for this assessment was guided by the survey requirements as set out in the code of practice. The survey methodology was designed to optimise the investigation of areas where archaeological materials may be present and visible, as well as investigation of the broader archaeological potential of the study area. The field inspection of the study area therefore paid close attention to areas of favourable landform conditions.

The key survey variables of ground visibility, which considers the amount of ground surface which is visible and not covered by any vegetation; and exposure, which defines areas where dispersed surface soils and vegetative matter afford a clear assessment of the ground, were assessed across the study area and within each landform element. Overall survey coverage and calculated survey effectiveness was recorded. Note that the effectiveness of the field survey was largely dependent on the degree of ground surface visibility.

The individual study areas contained landforms which differed from location to location and were subjected to differing forms of disturbance. Therefore, each study area was assessed on an individual basis. The landforms within the Development Corridor were broadly contained to hill crest or hill slope or alluvial flat, although there were areas of upper and lower terrace (see Table 1). All survey areas had undergone some form of disturbance, this varied from high, as with the Twelve Mile Road section to moderate in the majority of the smaller survey areas. Areas of higher surface visibility and inherent archaeological potential were subject to proportionately closer inspection. In areas of low archaeological likelihood due to landform or disturbance levels, transects were walked at intervals of approximately 20 metre distance.

2.2 Survey Results

The archaeological survey of the study area was undertaken 28 October until 1 November 2019 by Alexander Beben and Neil Fenley of Austral Archaeology, and Bradley Bliss of Wellington Valley Wiradjuri Aboriginal Corporation, Helena Stanley of Wellington Local Aboriginal Land Council, Brendan Doherty of Gallangabang Aboriginal Corporation and Fleur Magick Dennis of Gallangabang Aboriginal Corporation. A further survey was undertaken to clarify these results from 11 December through to 13 December 2020 by Neil Fenley and Hayley Hunter of Austral Archaeology, Steven 'George' Flick of Murong Gialinga and Jamie Williams of the Mudgee Local Aboriginal Land Council.

The visibility and exposure varied greatly across the entire study area, the sections which had been heavily grazed had visibility up to 90 % while fenced off areas or areas of heavy leaf litter had zero visibility. The exposure was also highly variable and in some localities was as high as 50 %, generally though where there were areas of exposure it was from five to ten % (see Table 2). Many of the survey areas contained ephemeral creek lines and these areas were where the majority of artefacts were located. Photographs were taken of all survey units and landforms which may provide an indication on the archaeological potential.

The survey comprised of two distinct components, the first being the Twelve Mile Road and Ilgingery Road section, the second was the additional survey areas which were required due to a change in the project scope. The Twelve Mile Road section was 14.23 kilometres in length and was surveyed for 20 metres on either side of the road covering a total area of 569,200 metres squared. The Ilgingery Road section was 1.45 kilometres in length and this was surveyed for 20 metres either side of the road and covered 58,000 metres squared (see Table 1).

The additional survey areas encompassed approximately 4,034,534 square metres, however, some of the survey areas were located on steep slopes and no archaeological potential existed for these areas. A total of 2,975,616 square metres was surveyed and within these areas, archaeological potential varied from no potential on the steeper hill slopes and gullies to high potential along the alluvial flats. The hill slopes and gently undulating hills were the most common landform and accounted for 60.43 % of the surveyed area, although these were considered to be of low archaeological potential. The alluvial flats made up a further 22.43 % of the total survey area and areas of these were of high archaeological potential, therefore, they received the most consideration. Hill crests are an area which is generally considered to have low archaeological potential and they accounted for 13.10 %, the remainder of the surveyed areas were lower terrace (2.85 %) and upper terrace (1.14 %) (see Table 2).

This survey included multiple survey units of varying sizes and landform elements and within these there was differing visibility and exposures percentages. Although these figures differed somewhat, to allow for clarity in assessing the overall survey coverage an average of visibility and exposure per landform was utilised (see Tables 3 and 4).

There were eight moderate sized artefact scatters comprised of over two artefacts, four artefacts scatters of two artefacts and 14 individual finds. The survey also recorded seven areas of Potential Archaeological Deposit (PAD) in four survey areas.

Areas of moderate or high archaeological potential were limited to the alluvial flats and artefact scatters on the surface were indicative that these areas have high potential to contain sub-surface deposits. The other landforms present such as hill slopes were not conducive to or suggestive of areas of moderate archaeological potential. The location of surface artefacts is generally concentrated in the region of higher order creek lines. However, some artefacts were recorded on hill crests and as there was only skeletal soils overlying areas of exposed bedrock no PAD was present. Table 5 outlines the areas of PAD and their location within the survey areas

Survey Area	Flat ground to gently undulating m2
Twelve Mile Road	569,200
Ilgingery Road	58,000
Total	627,200

Table 1. The Twelve Mile Road and Ilgingery Road survey areas in square metres

Survey Area	Upper Terrace m ²	Lower Terrace m ²	Alluvial Flat m ²	Crest m ²	Slope m ²	Total m ²
1	19,886					19,886
2	14,358	61,456				75,814
3				73,463	14,470	87,833
4				133,405	60,148	193,553
5					37,376	37,376
6			139,341		172,350	311691
7				14,182	91,951	106133
8				5,007	72,057	77064
9			88,855	88,855	482,967	178193
10				14,182	91,849	106031
11			404,535		817,465	1222000
11a					3,627	3,627
11b					12,200	12,200
11c					11,300	11,300

Survey Area	Upper Terrace m ²	Lower Terrace m ²	Alluvial Flat m ²	Crest m ²	Slope m ²	Total m ²
22			34,902	21,293	311,599	367,794
24		24,036		39,626	101,459	165,121
Total	34,244	85,492	667,633	390,013	1,798,334	2,975,616

Table 2 The additional survey areas in square metres as an addendum to the original survey

Landform Element	Landform Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (area x vis 5% x exp%)	% of landform effectively surveyed (= area effectively surveyed/ landform x 100)
Flat to gently undulating	627,200	30	20	37,623	6.0%

Table 3 Twelve Mile Road and Ilginy Road survey coverage by landform

Landform Element	Landform Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (area x vis 5% x exp%)	% of landform effectively surveyed (= area effectively surveyed/ landform x 100)
Slopes	1,798,333	50	20	179,833	10.0%
Alluvial Flats	667,633	60	20	80,115	12.0%
Crests	390,013	40	10	15,600	38.46%
Lower Terrace	85,492	80	60	41,036	48.23
Upper Terrace	34,244	20	10	644	1.87
Total area	2,975,616	N/A	N/A	317,228	10.65

Table 4 Additional survey areas coverage by landform

Survey Area	PAD sensitivity	PAD area in m ²
2 Two PADs	High	34,398
6 One PAD	Moderate	2,9389
11 Two PADs	High	365,346
22 One PAD	Moderate	41,933
24 One PAD	High	22,850
Total		493,916

Table 5 The location, sensitivity and area of the recorded PADs

3 INDIVIDUAL SURVEY AREAS

3.1 Twelve Mile Road

This survey was conducted along Twelve Mile Road within the fence line 20 metres either side of the bitumen road. The survey began at the corner of Goolma Road and Twelve Mile Road heading in an easterly direction for 14.5 kilometres. The landform was flat ground slightly rising to the east near the Goolma Road intersection gradually changing to very low rolling hills incised by deep creek lines. Vegetation varied along the course of the survey with tree clearing and heavy stock grazing throughout. Trees present included white box (*Eucalyptus albens*), sheoak (*Allocasuarina* sp.) and kurrajong (*Brachychiton populneus*) with small shrubs and grasses located in areas less heavily grazed. A high level of disturbance was present from the construction of Twelve Mile Road and the associated water run offs. Visibility and exposure along the survey route varied, dependent on clearing and grazing, however, it was determined that overall there was an average of 20 % visibility and 10 % exposure over the survey area.

There were three sites located within this study area, UWFTMR_IF1 a single basalt multi-platform core, UWF1TMR_IF2 a chert flake with clear negative flake scars and UWFTMR_AS1, three flakes in close proximity to each other. The overall archaeological potential for the entirety of the Twelve Mile Road survey area was considered to be low, due mainly to the level of disturbance which has occurred during the construction of the road and ongoing maintenance.



Figure 4. Location of UWF12M_AS1, showing typical vegetation on the survey



Figure 5. Two of the artefacts located at UWF12M_AS1.

3.2 Ilgingery Road

The Ilgingery Road area was surveyed for approximately 1.5 kilometres on 20 metres either side of the bitumen road. This area was in gently undulating hills on a winding road. Mature white box trees were sparsely located with dense immature eucalypts in the northern region, pasture and native grass was present although this was also sparse. A high level of disturbance has taken place from the construction and improvements to Ilgingery Road, this disturbance was noted as far as 20 metres from the road. Visibility in this area averaged 50 % and exposure was 20 %. The area adjacent to the previously identified site SU86/L1 was intensively surveyed to establish whether it encroached into the study area. No cultural material was located near this site and no cultural material was located within this survey unit. The area surveyed was determined to be of low archaeological potential.



Figure 6. Typical vegetation and ground visibility on Ilgingery Road, facing north.

3.3 The Previously Unsurveyed Areas

These survey areas were an addendum to the previous survey undertaken; this was required due to a change in the Development Footprint and Development Corridor. Many of these additional areas were relatively small in size being under 500,000 square metres. Access to these areas was often difficult and in some cases they were not accessible by vehicle, therefore, these areas were accessed by foot. Not all of the survey areas were accessed as some of the landforms, such as the steep slopes and deep gullies had no archaeological potential. However, other landforms with moderate to high archaeological potential were intensively surveyed, such as the alluvial flats adjacent to creek lines. This was discussed with the Aboriginal representatives present on the survey and agreed between both parties.

The vegetation present across the entirety of the survey areas has undergone large scale tree clearing in the past. The ploughing of paddocks for pasture grass, informal tracks and stock have also caused disturbance and it is reasonable to suggest moderate disturbance exists throughout the area. The sowing of pasture grass generally resulted in visibility being reduced to as low as 20 %, however, some of the survey areas had been intensively grazed meaning visibility was as high as 90 %.

The results of this survey are in keeping with the regional predictive model, in that sites are most likely to be located near creek lines with low density small scatters present throughout the landscape.

3.4 Survey Area 1.

This study area was roughly parallelogram in shape and covered 19,886 metres square. The landform was a relatively flat lower terrace with sparse white box and pasture grass. The area had undergone disturbance from fencing, power line installation and informal tracks. The visibility at this location was 60 % with the exposure on the crest 40 % and the slope 30 %. There was no artefactual material recorded for this location and the archaeological sensitivity was low. There are no proposed impacts in this survey area.



Figure 7. Survey Area 1 Showing the typical vegetation and visibility

3.5 Survey Area 2

This irregular shaped polygon measured 75,814 square metres in total and contained two landforms. The upper terrace landform was 14,358 square metres and made up 19 % of the total area, the lower terrace was 61,456 metres square and accounted for the remaining 81 % of the area. The lower terrace area was in parts bordered by the deeply incised Mitchell Creek in the east. The vegetation was limited to mature white box and pasture grass. The dense pasture grass in the upper terrace area limited visibility to 10 % and exposure was confined to the stock pads at five %. However, the lower terrace had 80 % visibility and 60 % exposure. There were four artefacts located in the northern section on the crest of a hill within this survey unit and one just outside the survey boundary. The site UWFA2_AS1 was comprised of three basalt and two crystal quartz artefacts, both the crystal quartz artefacts showed evidence of retouch and are therefore classified as tools. The presence of a site at this location infers there is a high archaeological potential in this location. There is a small area in the south east of the study area which the proposed activity footprint impacts, however this in an area of low archaeological potential.



Figure 8. The deeply incised Mitchell Creek present in the eastern section



Figure 9. One of the backed quartz tools located at UWFSA2_AS1

3.6 Survey Area 3

The survey area is semi-circular in shape and encompasses two distinct landforms over 87,833 square metres and is made up of hill crest measuring 73,463 square metres and hill slope at 14,470 square metres. This survey area had very sparse white box and was essentially cleared for pasture grass. Disturbance was limited to stock pads, informal tracks and fencing. There was no archaeological material recorded in this survey area on either landform and the archaeological potential for this entire survey area was considered to be low. The proposed works footprint runs through the northern section of the study area in an area of low archaeological potential.



Figure 10. The typical landscape in in Survey Area 3

3.7 Survey Area 4

This area was basically rectangular in shape and covered a total of 194,522 metres square, with 144,382 metres being hill crest and the remainder slope. Large granite boulders were present and were the dominant feature of this in this area. Mature white box and immature eucalypts were scattered sparsely throughout with pasture grasses. The disturbances were primarily informal tracks and fencing with some stock related erosion along the stock pads. The visibility was quite high at 40 % and the exposure very high at 60 %. No artefactual material was located during the survey and the area was considered to be of low archaeological potential. The area will be impacted by the development across the entire southern section, although this region is of low archaeological potential.



Figure 11. An example of the large boulders in Survey Area 4

3.8 Survey Area 5

This small triangular shaped area measured 37,376 metres squared and was entirely a gentle sloping landform, with granite boulders eroding out of the soils. There are very sparse white box present, immature eucalypts, native poa species. and pasture grass present across the survey area. There has been little recent disturbance aside from the informal vehicle tracks and stock pads. Visibility was 50 % and the exposure 30 %, although it was variable across the area. There were no artefacts recorded in the is survey area and the archaeological potential was determined to be low. This survey area is bisected by the proposed Development Footprint, however, it is in an area of low archaeological potential.



Figure 12. The typical landscape of Survey Area 5

3.9 Survey Area 6

This irregular shaped polygon is 311,691 square metres in total and is made up of two landforms. The alluvial flat in the western area was 139,341 metres square and the eastern, sloping landform with granite boulders exposed across the area made up the remaining 172,350 metres square. There is a deeply incised first order creek situated on a sloping landform running in a west-east direction through the center of the survey area. The vegetation present includes immature eucalypt species and aloe casuarina with pasture grass present throughout. Visibility varied throughout the landforms, however, the alluvial flat had 80 % and 10 % exposure while the sloping landform was 40 % visibility and had 40 % exposure. This survey area had two sites each with two artefacts located on a gentle slope within 30 metres of creek line. The site, UWFA6_AS1 is the more centrally located within the survey area and contains one quartz and one basalt artefact and UWFA6_AS2, to the east is also comprised of one quartz and one basalt artefact. The archaeological potential for the survey area in general was low, however, UWFA6_PAD1 which encompasses the two sites and extends for the length of the watercourse in an east-west direction has moderate archaeological potential. The proposed works footprint will directly impact the two sites and the PAD.



Figure 13. The typical landscape in the western region of Survey Area 6



Figure 14. The landscape in the region of the two sites in Survey Area 6

3.10 Survey Area 7

Survey area 7 was an irregular shaped polygon of 106,133 square metres with an area of hill crest of 14,182 square metres and the remaining 91,951 square metres being steep slope. The landform leading from the ridgeline which had short spurs running out from the main ridge varied in slope although this was up to 30 degrees in places. Vegetation consisted of small eucalypt sp., kurrajong and sparse sheoak, some small shrubs including grass trees (*Xantharrea* spp.) along with grasses on the minor, cleared spurs. The ridgeline previously had a fire trail constructed along it and the visibility along this was high at 70 %, while elsewhere it was ten %. It was determined an average of 20 % visibility over the survey area was appropriate with exposure at five %, this being restricted to the fire trail. The down slopes were heavily wooded and completely covered in leaf litter. A single isolated artefact UWFA7_1, a complete basalt flake with flaked platform and feather termination was located on the fire trail. The archaeological potential for this area was low. The proposed development footprint will directly impact this artefact.



Figure 15. The artefact UWFA7_1 that was located on the fire trail

3.11 Survey Area 8

This small semi circular shaped polygon is 81,392 metres squared in total and contains two landforms, the lower slope is 72,057 metres squared and the crest of a low hill makes up the remaining 5,007 square metres. The vegetation present in this area included widely dispersed mature white box, immature eucalypts and pasture grasses. The disturbances were confined to informal tracks and stock pads and the visibility and exposure for the entire area were both 40 %. There was no archaeological material recorded in this survey area and the archaeological potential was considered low. The central section of the survey area will be impacted by the Development Footprint, however, the entire survey area is of low archaeological potential.



Figure 16. Survey Area 8 showing typical visibility and exposure

3.12 Survey Area 9.

This large irregular shaped polygon was 648210 metres squared and contained three different landforms. The gently sloping landform was 482.967 square metres in size and was separated by an alluvial flat which was 88,855 metres square, while at the southern end a crest line was 76,385 metres squared. The vegetation in the gently sloping country was sparse, restricted to pasture grass with the occasional eucalypt restricted mostly to the east, there were some mature eucalypts along the drainage line in the alluvial flat and a dense stand of eucalypt on the crest in the southern section. The headwaters of Wuuluman Creek pass through this survey area and the banks of this named waterway were more intensively surveyed. The visibility and exposure across the lower slope and alluvial flat was relatively constant at 40 % for each, however the crest had a visibility of 10 % and an exposure of 5 %. There were two artefacts, a chalcedony retouched flake and a retouched basalt flake. located in the southern section and as they were within 25 metres of each other they were placed together as site UWFA9_AS1, this site was located 70m to the south of Wuuluman Creek. The archaeological potential of the survey area was only considered to be low, generally a named waterway would be indicative of an area of high archaeological potential, however, as this is the headwaters it corresponds more closely with a first order stream. The survey area will be partially impacted over the entire area and the site location will be directly impacted by the proposed works.



Figure 17. Survey Area 9 showing the typical sloping landform

3.13 Survey Area 10

Survey area 10 was a small irregular shaped polygon measuring 97,210 metres squared in heavily wooded steep terrain and access to this area was gained along a rough fire trail along a narrow ridge line. The crest line comprised 14,408 square metres of this survey area with the remaining 82,812 square metres being steep slope of 30 degrees or greater in most locations. Vegetation was predominately eucalypt species, with sparse kurrajong and sheoak present. Some areas of small shrubs were present, however, grasses were not, except at the base of the ridgeline. Disturbance in this area was restricted to the bulldozed fire trail leading up to the ridgeline. Visibility was high along the fire trail, 70 % but due to the high degree of leaf litter and fallen trees less than 5 % elsewhere while exposure was limited to the bulldozed fire trail or bedrock. There was no cultural material present along the survey route and due to the steep terrain, there was no archaeological potential for this area. The proposed development will directly impact the central region of the survey area.



Figure 18. Survey Area 10 showing the fire trail leading up to the ridgeline, facing north.

3.14 Survey Area 11

This large survey area covered 1,222,000 metres squared metres in a roughly trapezoid shape. There were various landforms including ephemeral creek lines with associated alluvial flats (404,535 square metres), leading up to gentle slopes (817,465 square metres) and low rolling hills. The survey initially covered all landforms, however, it was determined that a more productive strategy would be to concentrate on the landforms with a moderate to high sensitivity. Therefore, the areas adjacent the first and second order streams were intensively surveyed. This survey area contained outcrops of quartz or basalt which may have been utilised as a raw material source and these were also more intensively surveyed.

Vegetation varied depending on the landform, on the gentle slopes and low rolling hills sparse white box with pasture grass dominated, whereas along the creek large eucalypts were present. In the western section, Blackberry had overtaken the low ground where a swamp would have once existed, the Blackberries were within a dense scrubby area which had thick leaf litter meaning there was poor visibility. The survey area had also been heavily grazed in some parts and lightly in others. This grazing had created some areas of bulldust which reduced visibility substantially.

The disturbance in Survey Area 11 was moderate across the entire area and consisted of informal tracks, some minor earthworks at creek crossings, construction of dams and stock trampling near gates. The visibility over the area varied from 80 % to zero, however, and overall visibility of 40 % was considered correct. Exposure also varied, the creek banks generally had 30 % exposure from the action of stock, while the gentle slopes were as low as 5 %, overall though there was an exposure of 10 %.

Two large areas of PAD were present along the two water courses, these PADs are on alluvial soils which have the potential to have deep deposits which may have a degree of stratification. A total of four artefact scatters and five sites made up of single artefacts sites were recorded in Survey Area 11.

Artefact Scatter 1 (UWFA11_AS1)

The site is located adjacent to a second order creek bank and is 80 metres long and 20 metres wide. It is a low-density scatter with two concentrations separated by approximately 25 metres. The vegetation associated with this site included the large, mature eucalyptus species on the creek bank and sown pasture grass. Ploughing to sow pasture grass is the main disturbance, however, the erosion of the creek banks by stock trampling and flooding events suggests that a moderate level of disturbance is occurring to the site. The visibility at this location is 30 % and an exposure of 20 % was limited to the eroded creek bank. There was a total of 19 artefacts recorded including two portable sandstone grinding grooves and a partially prepared axe blank, quartz bi polar cores and quartz flakes, basalt flakes, chert flakes and a crystal quartz proximal flake. The axe blank and one of the portable grinding grooves were located halfway between the creek bed and the top of the bank. It was apparent that artefacts are eroding out of the creek bank and dropping towards the creek bed. The archaeological potential for this site is high and there is a UWFA11_PAD1 running the entire length of the creekline. The site is within 20 metres of the proposed development footprint to the south and 40 metres to the east.



Figure 19. A portable grinding groove eroding out of the creek bank at UWFA11_AS1, facing south



Figure 20. Detail of one of the portable grinding grooves located at UWFA11_AS1

Artefact Scatter 2 (UWFS11_AS2).

The site is 175 metres long, parallel to the creek line and extends 50 metres away from the creek. The landform associated with this site is a flat ground on an alluvial flood plain which would be inundated during flood events. Vegetation currently within the site boundary is restricted to sparse mature eucalypt species and pasture grass. There has been a moderate level of disturbance in this area from ploughing and sowing of the pasture grass and minor erosion of the creek bank has occurred. The location of the site is downstream from a swamp area which would have formed part of the headwaters for the eastern stream creating this second order creek, the swamp area is currently overgrown by blackberries. An average visibility over the entire site was 30 % with exposure at ten % which occurred mostly along the eroding creek bank. There are 21 artefacts contained within the site and these include a portable grinding groove, a crystal quartz proximal flake, eight multi-platform cores, two grinding bases, a hammerstone and an anvil. These artefacts are highly indicative of a workshop site. There is high archaeological potential at this site, given the number of cores, presence of a hammerstone and an anvil for subsurface artefacts to be present, a PAD, UWFS11_PAD2, runs along the entirety of this creek line. The proposed development will directly impact this site and the PAD.



Figure 21. The site, UWFS11_AS2 showing typical landform and visibility, facing east



Figure 22. The portable grinding located within the site UWFA11_AS2.

Artefact Scatter 3 (UWFA11_AS3).

This site is roughly a parallelogram measuring 30 metres long by 20 metres wide and is widely dispersed on gently sloping ground 100 metres from the same creekline on which UWFA11_AS3 is located. It is 80 metres downslope from a high quality quartz outcrop and adjacent to a fence line, there is a reasonable probability that the site extends beyond the fence line, however, this area had extensive leaf litter present, visibility was less than 5 %. The only vegetation present at this location is pasture grass with a dense stand of immature eucalypts inside the fence line to the north. A moderate level of disturbance has occurred due to the action of ploughing. The visibility at UWFA11_AS2 varied slightly, however, 40 % was average with 20 % exposure however, on the other side of the fence line which had not been subjected to grazing visibility was ten % or lower with no areas of exposure. There were no artefacts present within ten metres of the fence line. A total of 17 artefacts were recorded at this site, a quartzite anvil with two indentations, five multi-platform cores and two blade cores were present, suggesting this was also a reduction site and there is likely to be some association with the nearby quartz outcrop as well as a basalt outcrop 250 metres to the west. This area is within the high potential PAD, UWFA11_PAD2, that runs along the creek line. This site will be directly impacted by the proposed development.



Figure 23. View of UWFS11_AS3 facing west



Figure 24. The blade core recorded at UWFS11_AS3.

Artefact Scatter 4 (UWFA11_AS4)

This site is oval in shape and measures 45 metres by 15 metres it is located on the same gentle slope as UWFA11_AS3 which is approximately 200 metres to the east. It is situated 100 meters from the same creek line as UWFA11_AS2 and UWFA11_AS3. This site is located on a scour which has left the area with 70 % visibility and 40 % exposure. The visibility outside the scoured area is 20 % and the exposure less than 5 %. The site contained 11 artefacts, of which all were flakes, there was a single backed quartz artefact recorded from this location. This site is located with the high potential PAD, UWFA11_PAD2, which runs along the creek line. The proposed development footprint will directly impact this site.



Figure 25. Site UWFA11_AS4 looking up the gentle rise, facing south



Figure 26. The backed quartz artefact located within site UWFA11_AS4

Artefact Scatter 5 (UWFA11_AS5)

This small site is located in the south of the survey area on a small rise with an outcropping of quartz adjacent to an ephemeral drainage line. The area surrounding these artefacts had pasture grass with sparse mature white box in the general area. The visibility in this region was 50 % and the exposure was 20 %. A quartz medial flake and a quartz bi-polar core were located within close proximity of each other at this site. The area surrounding this site was intensively surveyed and no other artefactual material was present. There is low archaeological potential in the general area where small rises are present. The site is located ten metres south of the Development Footprint but is within the Development Corridor.



Figure 27. The location of site UWFA11_AS5 showing typical visibility and exposure

Survey Area 11 Individual finds

UWFA11_IF1 A chalcedony multi-platform core artefact was located on a gentle slope adjacent to a large dam and eroding from an informal track in the bottom south east corner of the survey area. The area had been cleared of trees and the only vegetation was sown pasture grass and evidence of the ploughing was still visible. The construction of the dam has resulted in a high level of disturbance in the area and therefore there is no archaeological potential in this area.

UWFA11_IF2 A quartz bi-polar core was recorded in the south east corner of the study area. It was located near a quartz outcrop on a gentle slope in an area cleared of trees which had undergone moderate disturbance from ploughing. There is low archaeological potential associated with this isolated find.

UWFA11_IF3 A crystal quartz proximal flake, was located in the eastern corner of the study area near the headwaters of the ephemeral creek associated with UWFA11_AS2, UWFA11_AS3 and UWFA11_AS4. There were mature eucalypts nearby and ploughing for pasture grass had caused moderate disturbance in the area. There is high archaeological potential in this general area due to the proximity of the creek lines.

UWFA11_IF4 A quartz proximal flake was recorded in the far eastern section of the study area, this was located at the headwaters of the creek line mentioned above. This is upstream of a swampy area

with dense blackberry and immature eucalypts reducing visibility in the general area to ten %. There is moderate archaeological potential at this location as it is at the headwaters to the creek.

Survey Area 11 PAD 1

This large PAD extends along the length of the of the southern watercourse, the site UWFA11_AS1 is within the boundaries of this PAD. The PAD is mostly outside the area of the proposed Development Footprint, however, it is within the Development Corridor.

Survey Area 11 PAD 2

This large PAD extends along the length of the of the northern watercourse, the sites UWFA11_AS2, UWFA11_AS3 and UWFA11_AS4 are within the boundaries of this PAD. This PAD will be directly impacted by the proposed Development Footprint in multiple locations.

3.15 Survey Area 11a

This was a small survey area at 3,627 metres squared and was the first of the survey areas undertaken. It was surveyed to allow for an understanding and refining of the survey methodology. The area was located on a gently rising slope approximately 60 metres south of an ephemeral second order stream. Sparsely separated white box trees were present along with pasture grass within the survey area boundaries. The area had been heavily grazed and stock feeders had been placed on an informal track in the area leading to heavy stock trampling which has resulted in a visibility of 20 % with 10 % exposure. Disturbance in this area was low and restricted to informal vehicle tracks and stock pads. Two isolated artefacts UWFA11a_1 and UWFA11a_2 were recorded in the study area, both were quartz flakes located near vehicle tracks. It was determined that these flakes had eroded out of the subsurface deposits. This survey area is outside the footprint of the proposed development.



Figure 28. Typical terrain of Survey Area 11a

3.16 Survey Area 11b

This area was 12,200 metres square in size and irregular in shape. It is located on gently undulating rocky hills with sparse eucalypts with a relatively thick covering of grass. An infrequently used track was present along the fence line and the area had been sown with pasture grass. These were the only disturbances noticed within the survey area. There was a moderate quality quartz outcrop present at the western end of the survey area, although no artefacts were associated with this outcropping. The area is of low archaeological potential as no artefacts were located and there is no area of PAD. There is a small area in the northeast corner of this study area which will be impacted by the proposed Development Footprint.



Figure 29. The quartz outcrop at the western end of Survey Area 11b

3.17 Survey area 11c

This small survey area measuring 11,300 metres square was characterised by low rolling hills. The entire area was sown with pasture grass which required ploughing and there was an informal track running through the centre, no other areas of disturbance were noted. There was a general visibility of 20 % with five % exposure along the track. A single manuport of banded chert was recorded 50 metres south of the survey area, the nearest known source of banded chert is 20 km to the east. The presence of this manuport suggests there is some archaeological potential in this area, although, this is considered low. There would be some impact in the eastern section of the study area from the proposed Development Corridor, however, they will not impact the manuport.



Figure 30. The banded chert manuport located south of survey area 11c.

3.18 Survey Area 12.

This survey area is 90,200 square metres in area and was located on a narrow, steep sided ridge line. Sparse eucalypts in small clusters were present with some pasture grass. This area was characterised by shale outcrops with the occasional low quality quartz outcrop. There was little disturbance in this area confined to an informal track running along the fenceline and animal pads. Visibility was 20 %, however, there was no clear areas of exposure except the animal pads along the fence line. On the crest of the hill three quartz proximal flakes and one piece of quartz debitage were recorded as site UWFA12_AS1. These were located within 30 metres of each other suggesting this high point with extensive views may have been utilised as an observation point in the past. No other artefact were located within the study area and the archaeological potential of this study area is low. This site will be directly impacted by the proposed works.



Figure 31. The typical terrain in the survey area 11 at UWFA12_AS1, facing south



Figure 32. One of the quartz artefacts recorded at UWFS12_AS1

3.19 Survey Area 13, 14, 15, 16, 18 and 23

These survey areas were all located on steep hills with deep gullies with little or no flat ground present. Vegetation varied, however, it was generally sparse eucalypts with with pasture grass and woody weeds such as blackberry present in the gullies. In consultation with Aboriginal Representatives these survey areas were all considered to have no archaeological potential, therefore, it was established that no survey was required.



Figure 33. Survey Area 13 showing the steep gully common for the hills in this area

3.20 Survey Area 19

Survey area 19 was characterised by steep sided gullies which led to three first order ephemeral streams conjoining into a second order stream. The slopes which led to these streams were steep and it was determined that this degree of slope was unlikely to retain cultural material. Therefore, the survey of this area was concentrated along the stream banks over an area ten metres either side of each individual stream bank. The vegetation in this area consisted of white box, sheoak, kurrajong and small to medium shrubs with some native poa spp. and pasture grass present. The area had been intensively grazed and this created excellent surface visibility of up to 90%, there was also 20 % exposure present along stock tracks and areas of erosion. No Aboriginal cultural material was located in this survey area and the archaeological potential of the area was subsequently rated low. It was hypothesised that during flood events a high level of scouring from flash flooding would take place along the creek banks.

There was an excavated shaft, set approximately 15 metres north of the main creek line. This had large stones forming a collar above rounded logs placed in the shaft, due to the danger accurate measurement and photography were not possible. However, it was estimated to be less than ten metres deep with water at the bottom. The purpose of this shaft is unknown, although there were no other shafts noted in this region and for that reason it was presumed to be a well rather than a mine. There are no proposed works being undertaken in this study area, however, it is within the Development Corridor.



Figure 34. The second order stream in survey area 19 showing the visibility, facing east



Figure 35. The shaft located north of the second order creek in Survey Area 19

3.21 Survey Area 22

This survey was a large irregular shaped polygon covering a total of 377,794 square metres and contained three different landforms. The gently sloping ground covered the majority of the area at 311,599 square meters, with alluvial flats being 34,902 metres squared and the hill crest 21,293 metres squared. The vegetation across the large survey area varied from open grassed areas to relatively dense eucalypt woods. However, the area generally had dispersed mature white box and immature eucalypts throughout. This region has informal tracks, fencing and stock pads throughout and the overall disturbance is moderate. The exposure and visibility in the gently sloping and hill crest landforms is 60 % and 40 % respectively, while the alluvial flats had a visibility of 80% and exposure of 60 %. There were three basalt and one crystal quartz artefacts, UWFA22_IF1, UWFA22_IF2, UWFA22_IF3, UWFA22_IF4 and UWFA22_IF5, respectively and these were located on the alluvial flat, however, they were all a significant distance from each other and could not be considered an artefact scatter. There was also a single basalt artefact located on a spur line near a hill crest. The archaeological potential on the gentle slopes and hill crest area was low, however, UWFA22_PAD1 on the alluvial flats had moderate potential. The footprint of the proposed development will directly impact on two of the isolated finds and the PAD.



Figure 36. Typical landscape of Survey Area 22 in the southern section

3.22 Survey Area 24

This irregular shaped polygon is 165,121 metres squared and comprises three landforms, the largest is the gentle slopes at 101,459 metres squared, followed by the hill crest 39,626 metres squared and a small section of river terrace at 24,036 square metres. The hill crest and slope had a visibility of 60 % and exposure of 40 %, while the terrace had 80 % visibility and 60 % visibility. An artefact scatter UWFA24_AS1 was recorded in the far west of this study area adjacent to a second order creek line. The site comprised of 17 artefacts recorded within a 20 metre by ten metre roughly oval shape, of these 15 were basalt flakes, one of which was a tool and two quartz flakes. There was a single backed basalt tool artefact, UWFA24_1, 65 metres to the west of this scatter. There is an area of high potential PAD, UWFA24_PAD1, covering the entire western corner of the survey area and this encompasses UWFA24_AS1. The PAD is adjacent to the watercourse and has the potential to extend beyond the survey area, however, the rest of the survey was of low archaeological potential. There is a corridor of proposed works running east-west through the site and PAD.



Figure 37. The site UWFA24_1 facing north with the second order creek in the background



Figure 38. A quartz proximal flake from site UWFS24_1

3.23 Individual Finds outside of the survey areas

During the course of the survey it was necessary to traverse long distances in an attempt to gain access to the dispersed survey areas, often there would be a necessity to exit the vehicle for safety reasons. In a saddle on a steep sided ridgeline between survey area 22 and 23 two artefacts, UWFOS_IF1 and UWFOS_IF2, were located, these artefacts were a complete silcrete flake and a quartz proximal flake. They were located outside the current survey area, however, when their location data was transferred to the mapping program it revealed they will be directly impacted by the proposed Development Footprint.

3.24 Conclusion

The survey results revealed that there is one site and two isolated artefacts on Twelve Mile Road. There is little information that can be inferred from these artefacts due to the small number in the site and the distance between finds. Therefore, it is representative of a very low-level background scatter. No cultural material was recorded for the Ilgingery Road section and the recorded site UWF SU86/L1 did not extend into the study area.

There were 12 sites, 14 individual finds and seven PADs recorded during the survey. It is probable that the varying geographical locations of the survey areas, have skewed the data and therefore, it is difficult to draw any conclusions as to the overall potential use of the region. However, the newly recorded sites, individual finds and PADs were almost exclusively associated with water courses and this corresponds to the predictive modelling as set out by Dibden (2018). Not every water course had cultural material, for example, Survey Area 19, where the alluvial flats appeared to be affected by flash flooding events which would remove or relocate artefactual material. The proximity of artefactual material to these ephemeral water courses suggests these areas may have been utilised after rain events in the region. The site, UWFS11_AS1, with two portable grinding grooves and a stone axe blank supports this hypothesis as water is crucial in the manufacture of stone axes. Furthermore, the location of the artefact scatter UWFS11_AS3 in Survey Area 11 near outcrops of high quality quartz and basalt suggests that this raw material may have been utilised for stone tool manufacture.

The seven PADs, five high and two of moderate sensitivity, were all located adjacent to water courses and these have the potential to increase the size and significance of the sites already present along the watercourses if further artefactual material is present. There is a difference in the findings from the previous report by Dibden (2018) in regard to the significance of sites and PADs recorded. This can be attributed to Survey Area 11 which is unique in its topography for the entirety of the study area and covered a large flattish area of ground near the confluence of two second order creek lines. It is probable that due to the gentle slope, that these creeks would continue to hold water within the deeper sections for longer periods than those in steeper terrain. Therefore, creating a location where habitation could be sustained for a longer period of time.

4 ASSESSMENT OF HERITAGE SIGNIFICANCE

4.1 Introduction to the Heritage Assessment Process

An assessment of significance seeks to determine and establish the importance or value that a place, site or item may have to the community at large. The concept of cultural significance is intrinsically connected to the physical fabric of the item or place, its location, setting and relationship with other items in its surrounds. The assessment of cultural significance is ideally a holistic approach that draws upon the response these factors evoke from the community. This assessment of significance will generally follow the same methodology as that of the previous report

Archaeological sites require a different approach to significance assessment because the extent of the heritage resource and the degree to which it can contribute to our understanding of the past is not fully known at the outset. For example, it is the significance of the potential of the site to reveal information about the past that needs to be assessed when establishing the cultural significance of archaeological deposits.

Similarly, it is the significance of the type of information that can be revealed by the archaeological deposits, especially where the information is not available through any other source and the contribution it can make to our understanding of a place, which may also be of cultural heritage significance.

4.2 Basis for Assessment of Aboriginal Sites

The Department of Primary Industry and Environment (DPIE) Aboriginal Heritage Unit assessment criteria for archaeological significance have been developed to deal specifically with archaeological resources and covers the following potentials:

- A) Research Potential. This criterion is designed to qualify the significance of potential research which may be carried out at a site. Significance is apportioned according to the amount of new information which might be contained in the deposit, rather than the potential to yield a large number of artefacts. A site may have high significance under this criterion if it has an intact stratigraphic sequence and good integrity, the potential to provide a chronology extending into the past, or if it is connected to other sites within the region. Within this criterion are the subsets of representativeness and rarity. Representativeness is the ability of the site to demonstrate a representative type of site or deposit. This is important to maintain a contingency sample of all site types. Rarity is often described within the framework of representativeness as it relates to the distinctive features of a site which set it apart from similar sites.
- B) Educational Potential. This allows the educational value of a site to be considered as a component of significance. Under this criterion, an archaeologist may assess the potential of a site to educate the general public. The DPIE has acknowledged that this criterion is open to misinterpretation by archaeologists who have the ability to convey the value of a site to other archaeologists. The DPIE recommends that, in cases where significance is determined on educational potential, the onus is on the archaeologist go to the public for an assessment of this value.
- C) Aesthetic Significance. Aesthetic significance is not inherent in a place, but arises from the response that people have to it. It is pertinent to remember that this response can vary dramatically between cultures and social groups; therefore, an assessment of significance based on aesthetic value should incorporate the views of different cultures.

For a full description of assessment procedures refer to the Aboriginal Cultural Heritage: Standards and Guidelines Kit (NPWS 1997). These criteria have been designed to deal specifically with the

archaeological resource; however, they do not provide a framework for the assessment of social significance to the Aboriginal community. For this reason, the criteria for assessment provided in the ICOMOS Burra Charter are sometimes also used to assess significance as they provide a framework for a more holistic assessment of significance.

4.3 Preliminary Assessment of Aboriginal Sites

Only one Aboriginal archaeological site, AHIMS# UWF_SUB6_L, 1 had previously been recorded in close proximity to any of the study areas, this was on Ilgingery Road. However, another 12 sites were located within the broader boundary encompassing all of the individual study areas (see Figures 23 and 24).

Site Number	Features	Survey Unit	Landform	Significance
UWF12M_AS1	3 stone artefacts	Twelve Mile Road	Flat	Low
UWF12M_IF1	Isolated stone artefact	Twelve Mile Road	Flat	Low
UWF12M_AS2	2 stone artefacts	Twelve Mile Road	Flat	Low
UWFA2_AS1	5 stone artefacts	Survey Area 2	Hill crest	Moderate
UWFA6_AS1	2 stone artefacts	Survey Area 5	Hill slope	Low
UWFA6_AS2	2 stone artefacts	Survey Area 5	Hill slope	Low
UWFA7_IF1	Isolated stone artefact	Survey Area 7	Hill crest	Low
UWFA9_AS1	2 stone artefacts	Survey Area 9	Hill slope	Low
UWFA11_AS1	19 stone artefacts	Survey Area11	Alluvial flat	High
UWFA11_AS2	20 stone artefacts	Survey Area11	Alluvial flat	High
UWFA11_AS3	16 stone artefacts	Survey Area11	Alluvial flat	Moderate
UWFA11_AS4	11 stone artefacts	Survey Area11	Alluvial flat	Moderate
UWFA11_AS5	2 stone artefacts	Survey Area11	Alluvial flat	Low
UWFA11_IF 1	Isolated stone artefact	Survey Area11	Hill slope	Low
UWFA11_IF 2	Isolated stone artefact	Survey Area11	Hill slope	Low
UWFA11_IF 3	Isolated stone artefact	Survey Area11	Alluvial flat	Low
UWFA11_IF 4	Isolated stone artefact	Survey Area11	Alluvial flat	Low
UWFA11a_IF 1	Isolated stone artefact	Survey Area11a	Hill slope	Low

Site Number	Features	Survey Unit	Landform	Significance
UWFA11a_IF 2	Isolated stone artefact	Survey Area11a	Hill slope	Low
UWFA12_AS1	4 stone artefacts	Survey Area12	Hill crest	Low
UWFA22_IF 1	Isolated stone artefact	Survey Area22	Alluvial flat	Low
UWFA22_IF 2	Isolated stone artefact	Survey Area22	Alluvial flat	Low
UWFA22_IF 3	Isolated stone artefact	Survey Area22	Alluvial flat	Low
UWFA22_IF 4	Isolated stone artefact	Survey Area22	Alluvial flat	Low
UWFA22_IF 5	Isolated stone artefact	Survey Area22	Hill crest	Low
UWFA24_AS1	17 stone artefacts	Survey Area24	Alluvial flat	Moderate
UWFA24_IF 1	Isolated stone artefact	Survey Area24	Alluvial flat	Low
UWFA1	2 stone artefacts	Outside study area	Hill crest	Low

Table 6 The new sites, their locations and their significance

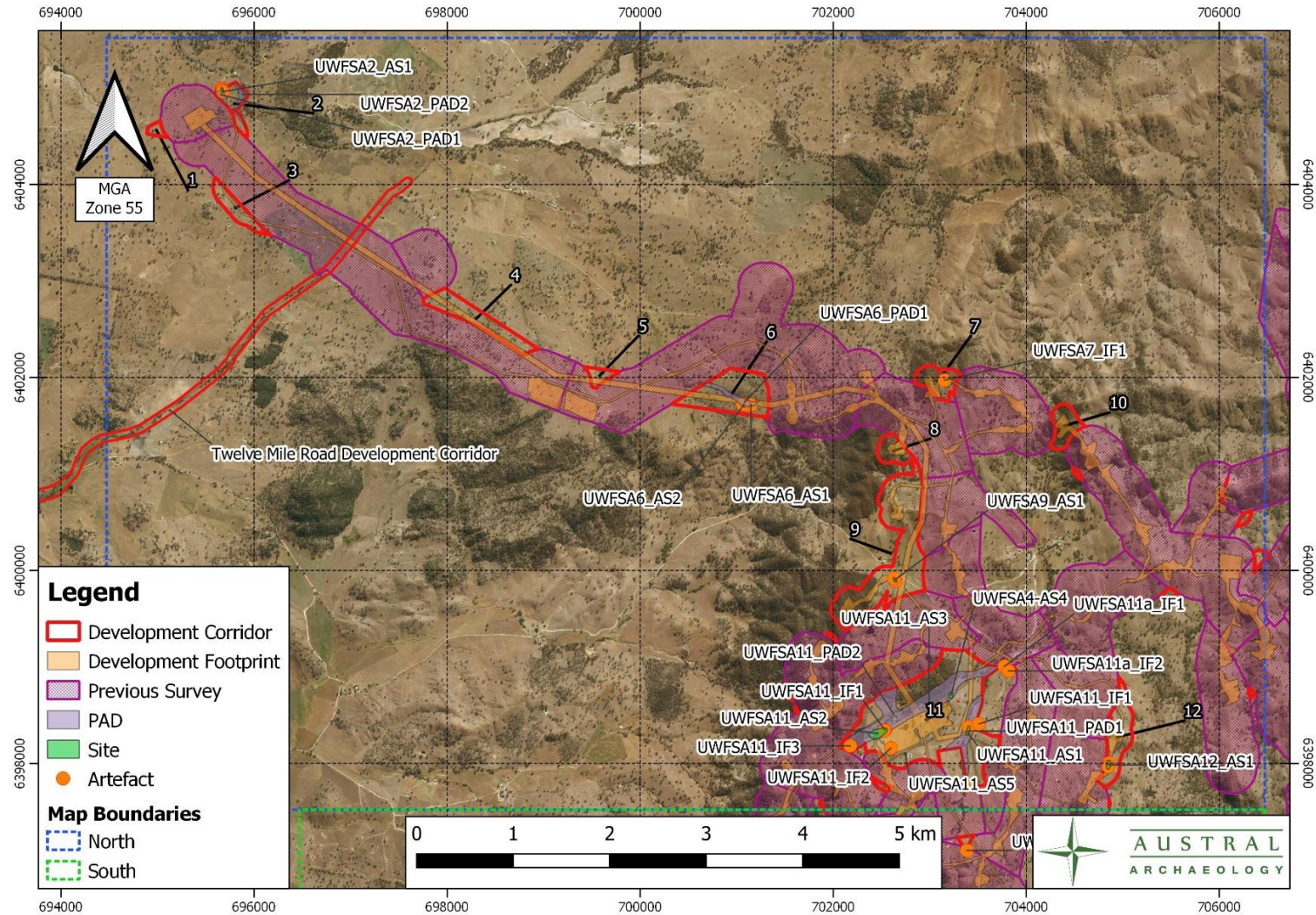


Figure 39. Location of the new sites in relation to the proposed Development Corridor Northern Section (NSW DFSI Aerial)

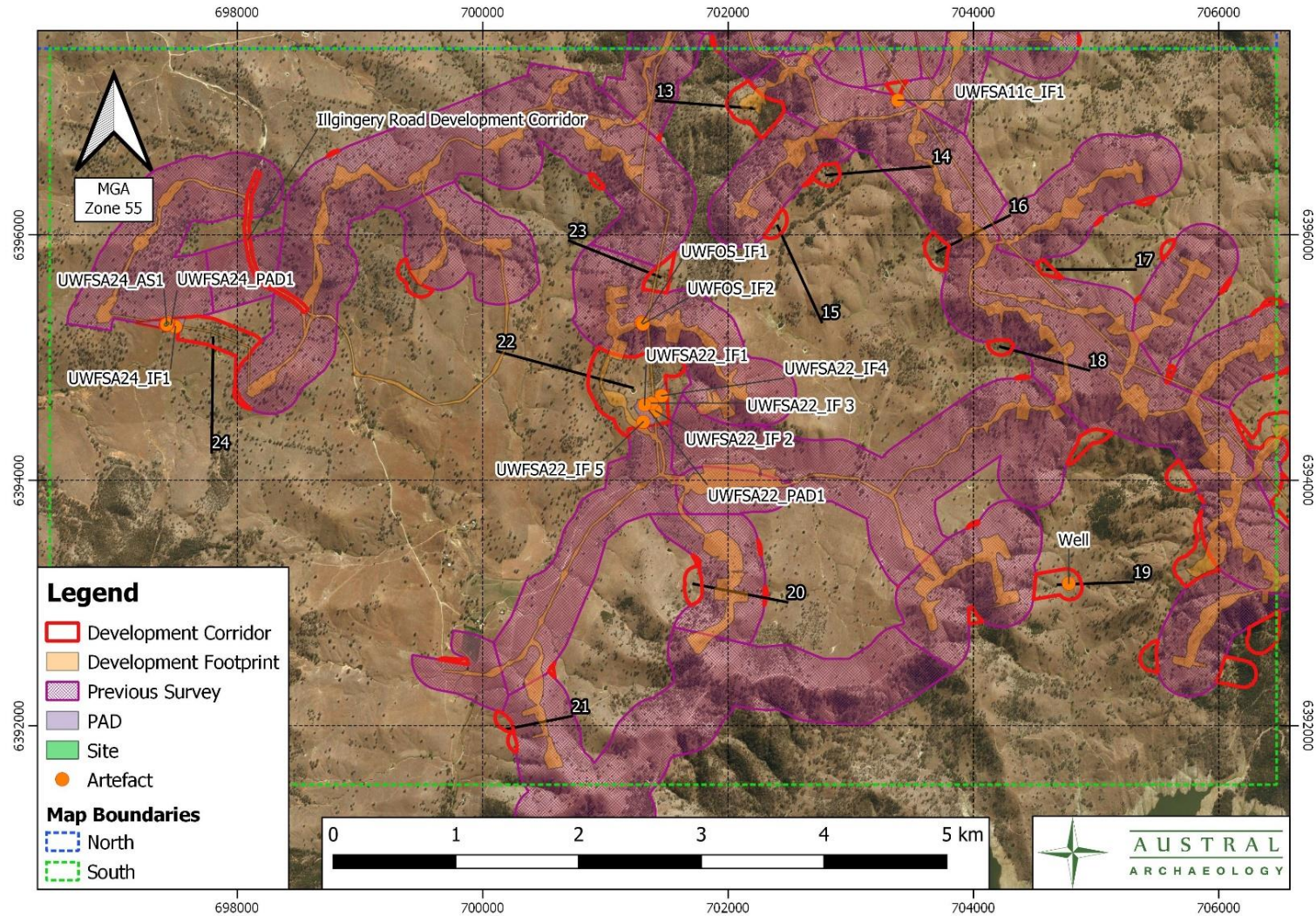


Figure 40. Location of the new sites in relation to the proposed Development Corridor Southern Section (NSW DFSI Aerial)

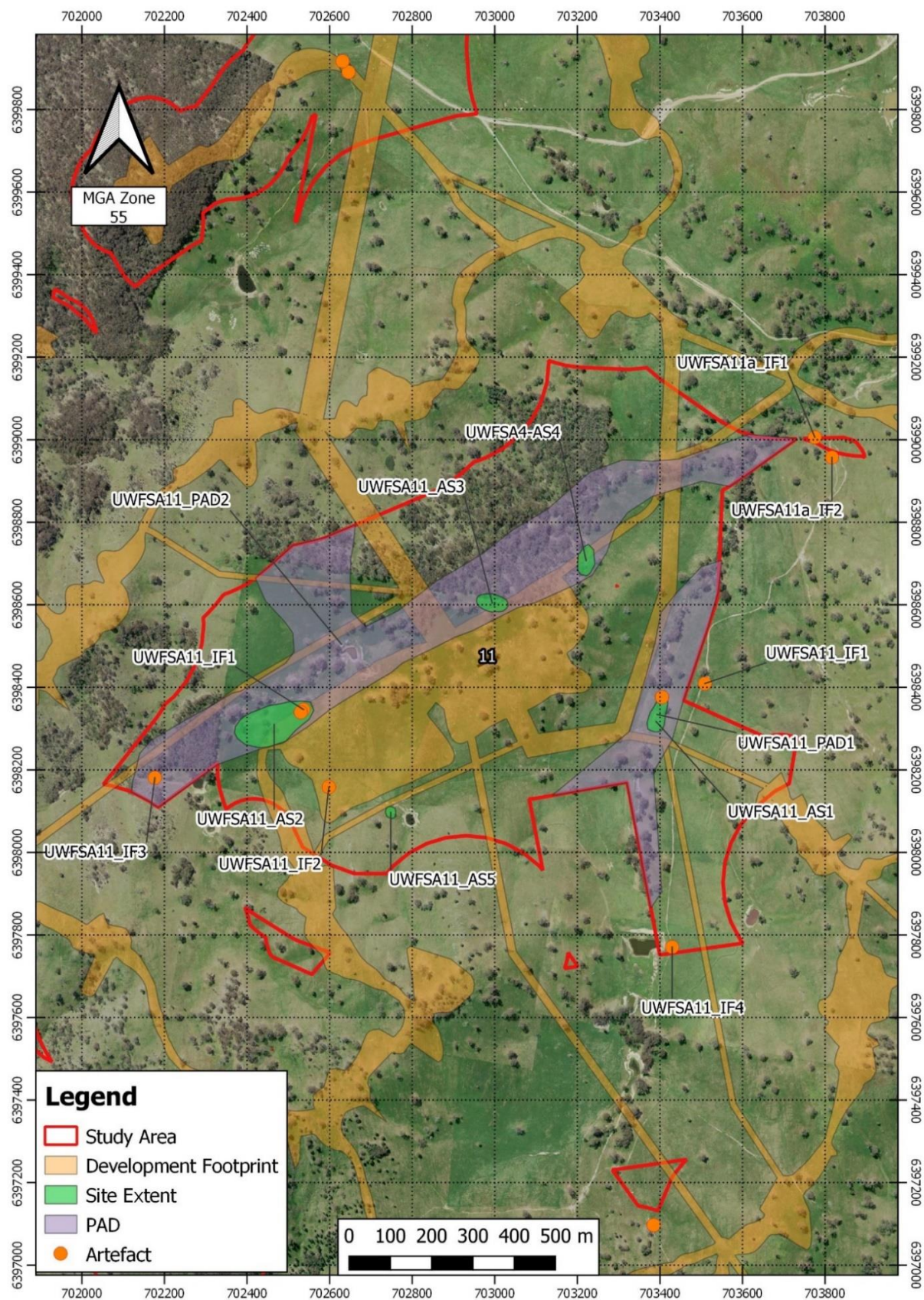


Figure 41. Survey Area 11 in detail, showing the overlap of sites, PADs and the development footprint (NSW DFSI Aerial)

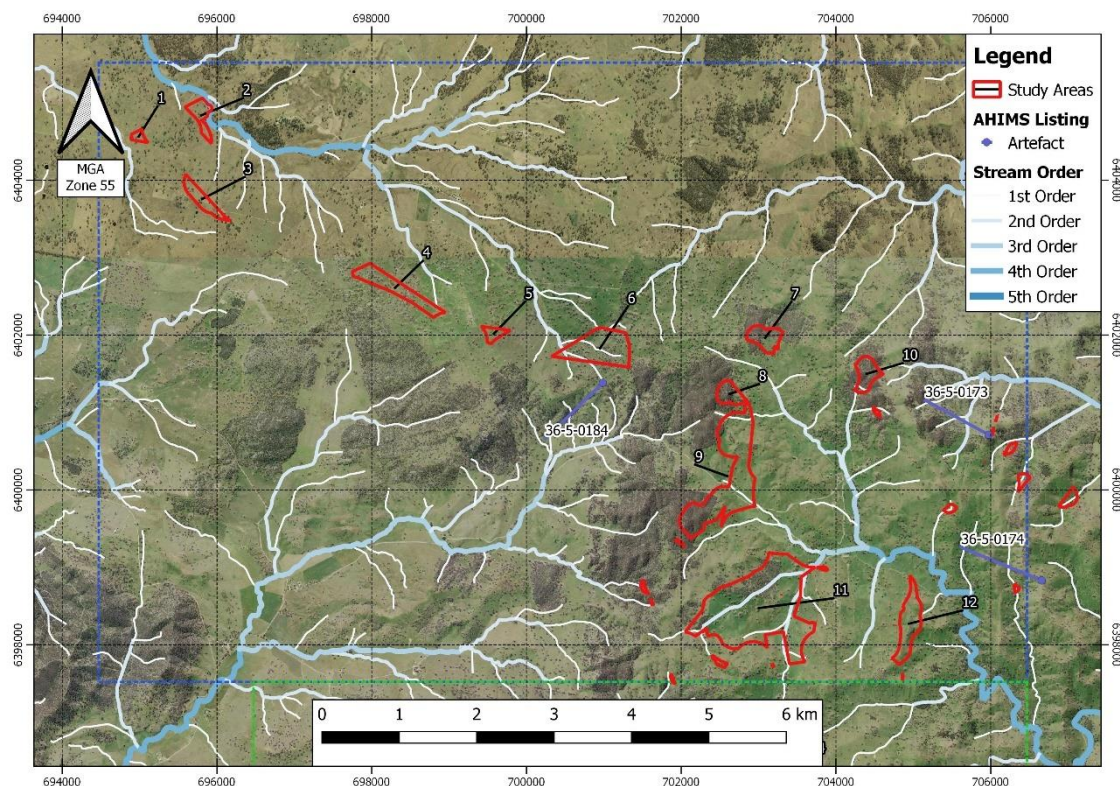


Figure 42. AHIMS sites located within the northern section of the study (NSW DFSI Aerial-& hydrology)

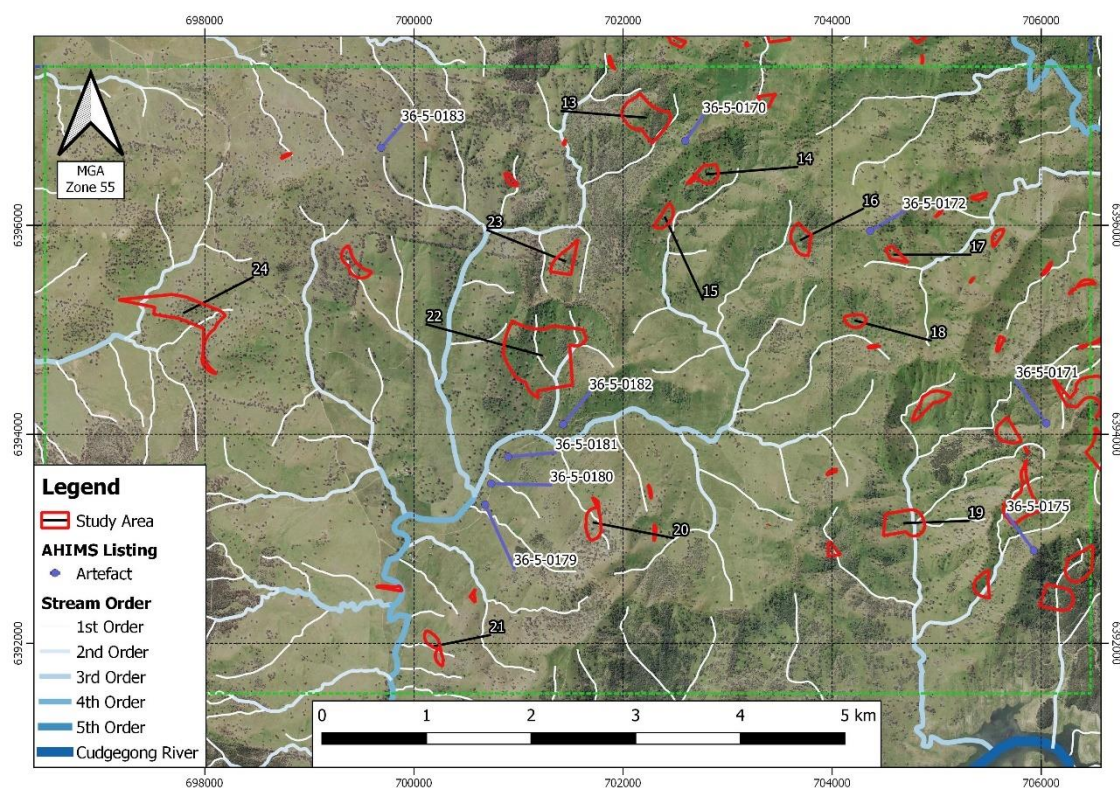


Figure 43. AHIMS sites located within the southern section of the study (NSW DFSI Aerial & hydrology)

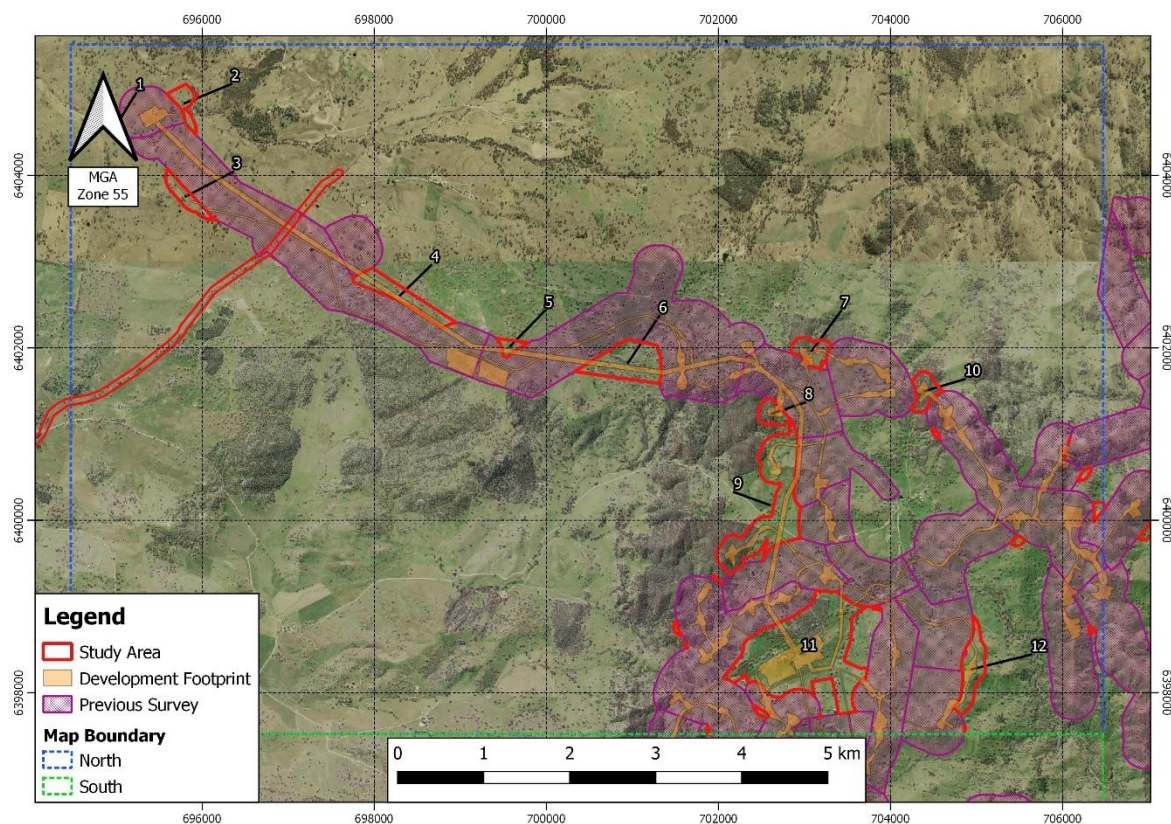


Figure 44. The northern section of the survey area, showing the present survey, previous survey and development footprint (NSW DFSI Aerial)

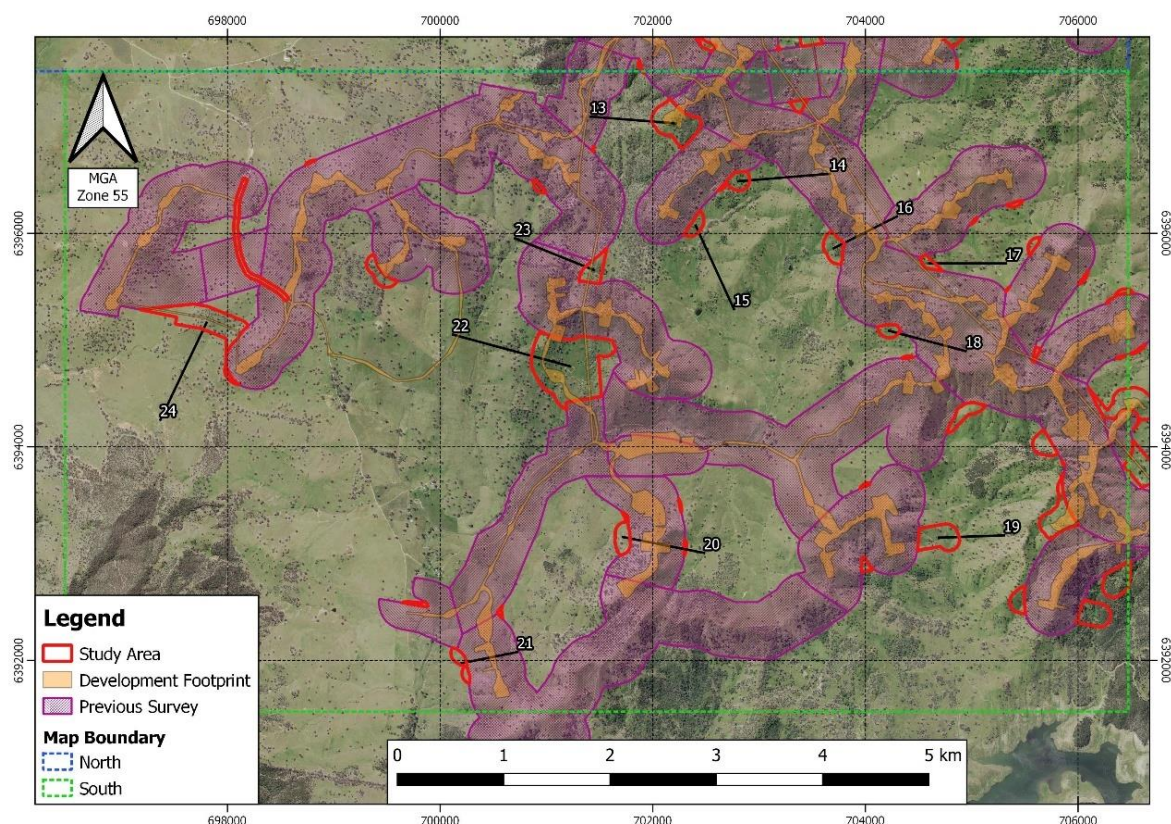


Figure 45. The southern section of the survey area, showing the present survey, previous survey and development footprint (NSW DFSI Aerial)

4.4 Aboriginal Stakeholder Comments

The Aboriginal stakeholders on this project commented on the importance of the two newly recorded sites, UWFA11_AS1 and UWFA11_AS2, and stated that due to the rarity of the portable grinding grooves located at these locations they are of high cultural significance and that these should be protected. That the other sites located during this survey should be protected if possible or if not that sub-surface testing be undertaken where artefact scatters are present and a surface salvage be completed for the individual finds.

They also believed that some of the raw material types had been transported in to the area and stated that the chalcedony artefacts are likely derived from a source near Cudgegong or Mumble and the banded chert was from a separate area 20 to 30 kilometers to the east. Furthermore, it was agreed between the parties on the survey that the survey areas where steep slopes were encountered, such as, survey areas 13, 14, 15, 16, 18 and 23 would have no archaeological potential and therefore these areas would not require an archaeological survey.

In response to the draft survey report, which was sent out to the relevant RAP groups on January 22, responses were received back was from the WFWAC and the GAC on the 12 February 2020. These RAP groups agreed with all recommendations suggested in the survey report.

5 RECOMMENDATIONS

5.1 General

It is recommended that areas which have surface artefacts, sites or PADs present be avoided if possible, this will allow works to be undertaken without further cultural heritage procedures needing to be undertaken. However, if it is not possible to avoid these areas the following procedures are recommended.

- **The individual finds** - A community collection followed by an analysis of the retrieved artefacts.
- **The low significance artefact scatters** - A community collection followed by an analysis of the retrieved artefacts
- **The moderate and high significance artefact scatters** - A program of subsurface testing be undertaken at the sites to establish the site density and boundaries followed by an analysis of the retrieved artefacts
- **The PADs** - A program of subsurface testing to establish the presence or absence of artefactual material within these areas followed by an analysis of the retrieved artefacts

Once the subsurface testing is completed and the results of this analysed it may then be necessary to follow on with salvage excavations of any sites that are present and likely to be impacted by the Development Footprint or Development Corridor.

It is also recommended that if cultural heritage material is located during works that work stop immediately and a suitably qualified person is engaged to ascertain whether the material is of cultural origins and if so, they can then advise how to proceed.

Twelve Mile Road

There were no areas of high potential on this section of the survey, although surface artefacts were recorded in three locations. It is recommended that, if possible, these areas be avoided, however, if disturbance is not avoidable a community collection should take place prior to any works being undertaken

Ilgingery Road

This survey area had no areas of moderate or high potential archaeological and no surface artefacts were located during the survey. It is recommended that works can take place in this location with caution.

Additional survey areas throughout the Development Corridor

The surveys undertaken in these localities covered areas where artefacts scatters, individual artefact locations and areas of moderate and high sensitivity PADs. The works to be undertaken in the areas

which are culturally sensitive involve disturbances to those locations. These works will involve major ground disturbance and the broad term earthworks has been used as an umbrella description.

Site Number	Significance	Type of Harm	Degree of Harm	Consequences of Harm
UWF12M_AS1	Low	Earthworks	High	Destruction
UWF12M_IF1	Low	Earthworks	High	Destruction
UWFS2_AS2	Low	Earthworks	Low	Destruction
UWFS6_AS1	Low	Earthworks	High	Destruction
UWFS6_AS2	Low	Earthworks	High	Destruction
UWFS7_IF1	Low	Earthworks	High	Destruction
UWFS9_AS1	Low	Earthworks	High	Destruction
UWFS11_AS1	High	Earthworks	Low	Destruction
UWFS11_AS2	High	Earthworks	High	Destruction
UWFS11_AS3	Moderate	Earthworks	High	Destruction
UWFS11_AS4	Moderate	Earthworks	High	Destruction
UWFS11_AS5	Moderate	Earthworks	High	Destruction
UWFS11_IF1	Low	Earthworks	High	Destruction
UWFS11_IF2	Low	Earthworks	High	Destruction
UWFS11_IF3	Low	Earthworks	High	Destruction
UWFS11_IF4	Low	Earthworks	High	Destruction
UWFS11a_IF1	Low	Earthworks	Low	Destruction
UWFS11a_IF2	Low	Earthworks	Low	Destruction
UWFS12_AS1	Low	Earthworks	High	Destruction
UWFS22_IF1	Low	Earthworks	High	Destruction
UWFS22_IF2	Low	Earthworks	High	Destruction
UWFS22_IF3	Low	Earthworks	High	Destruction
UWFS22_IF4	Low	Earthworks	High	Destruction
UWFS22_IF5	Low	Earthworks	High	Destruction

Site Number	Significance	Type of Harm	Degree of Harm	Consequences of Harm
UWFA24_AS1	Moderate	Earthworks	High	Destruction
UWFA24_IF1	Low	Earthworks	High	Destruction
UWFA1	Low	Earthworks	Outside study area but within the Development Footprint	Destruction

Table 7. The impacts and consequences of the proposed works on Artefact Scatters and Isolated Finds

Survey Area	Site Numbers	Recommendation 1	Recommendation 2	Results
Twelve Mile Road	UWF12M_AS1 UWF12M_AS2 UWF12M_IF1	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection is undertaken	Work can proceed with caution
Ilgingery Road	N/A	Work can proceed with caution	N/A	Work can proceed with caution
1	N/A	Work can proceed with caution	N/A	Work can proceed with caution
2	UWFA2_AS2	Avoid works in the area of site location	If works cannot be avoided it will be necessary to undertake subsurface testing in order to establish if artefactual material is present	Sub-surface testing will need to be undertaken before works proceed

Survey Area	Site Numbers	Recommendation 1	Recommendation 2	Results
3	N/A	Work can proceed with caution	N/A	Work can proceed with caution
4	N/A	Work can proceed with caution	N/A	Work can proceed with caution
5	N/A	Work can proceed with caution	N/A	Work can proceed with caution
6	UWFS A6_AS1 UWFS A6_AS2	Avoid works in the area of site location	If works cannot be avoided it will be necessary to undertake subsurface testing in order to establish if artefactual material is present	Sub-surface testing will need to be undertaken before works proceed
7	UWFS A7_IF1	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection is undertaken	Work can proceed with caution
8	N/A	Work can proceed with caution	N/A	Work can proceed with caution
9	UWFS A9_AS1	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection is undertaken	Work can proceed with caution
10	N/A	Work can proceed with caution	N/A	Work can proceed with caution
11	UWFS A11_AS1 UWFS A11_AS2 UWFS A11_AS3 UWFS A11_AS4 UWFS A11_AS5	Avoid works in the area of site locations	If works cannot be avoided it will be necessary to undertake subsurface testing in order to establish if artefactual material is present	Sub-surface testing will need to be undertaken before works proceed

Survey Area	Site Numbers	Recommendation 1	Recommendation 2	Results
11	UWFS11_IF1 UWFS11_IF2 UWFS11_IF3 UWFS11_IF4 UWFS11_IF5	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection is undertaken	Work can proceed with caution
11a	UWFS11a_IF1 UWFS11a_IF2	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection is undertaken	Work can proceed with caution
11b	N/A	Work can proceed with caution	N/A	Work can proceed with caution
11c	N/A	Work can proceed with caution	N/A	Work can proceed with caution
12	UWFS12_AS1	Avoid works in the area of site locations	If works at the location of site is unavoidable a community collection is undertaken	Sub-surface testing will not be possible as the artefacts are located on or marginally above bedrock
13	N/A	Work can proceed with caution	N/A	Work can proceed with caution
14	N/A	Work can proceed with caution	N/A	Work can proceed with caution
15	N/A	Work can proceed with caution	N/A	Work can proceed with caution
16	N/A	Work can proceed with caution	N/A	Work can proceed with caution
18	N/A	Work can proceed with caution	N/A	Work can proceed with caution
19	N/A	Work can proceed with caution	N/A	Work can proceed with caution.

Survey Area	Site Numbers	Recommendation 1	Recommendation 2	Results
				NOTE: There is well/mine located in this survey area and may be of historical significance. This will need to be recorded before works proceed.
22	UWFS22_IF1 UWFS22_IF2 UWFS22_IF3 UWFS22_IF4 UWFS22_IF5	Avoid works in the area of site locations	If works at the location of sites or individual finds is unavoidable a community collection will be required to be undertaken	Work can proceed with caution
23	N/A	Work can proceed with caution	N/A	Work can proceed with caution
24	UWFS24_AS1	Avoid works in the area of site locations	If works cannot be avoided it will be necessary to undertake subsurface testing in order to establish if artefactual material is present	Sub-surface testing will need to be undertaken before works proceed

Table 8. The recommendations for the individual survey areas

6 References

Dibden, J. 2018. Uungula Wind Farm Aboriginal Cultural Heritage Assessment Report. Report for Uungula Wind Farm Pty Ltd

6.1 Appendix 1

Survey Location	Site Name	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location(quadrant)	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Comments
Twelve Mile Road	Iso 1	Multi Platform Core	Basalt	0							90.15	65.27	52.64	3		
Twelve Mile Road	Iso 2	Flake Fragment	Chert	0							30.12	22.64	5.03	3		Arris Lines
Twelve Mile Road	Iso 3	Proximal flake	Chert	5	Flaked	9.15	3.27				37.64	10.13	8.24	1		
Twelve Mile Road	Iso 4	Complete Flake	Quartz	0	Flaked	9.62	1.67	Feather			13.97	12.43	2.29			
Survey area11a	Iso 5	Complete Flake	Quartz	0	Crushed			Feather			25.26	23.44	7.65			
Survey area11a	Iso 6	Complete Flake	Quartz	0	Crushed			Feather			25.67	22.14	7.06			
Survey Survey Area 11	Iso 7	Multi Platform Core	Chalcedony	0							45.23	55.68	14.93	3		
Survey Survey Area 11	Artefact Scatter 1	Tool	Sandstone	30							356	254	49			Portable grinding groove for axe sharpening
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Chert	0	Flaked	11.17	3.26				15.62	12.44	4.65			
Survey Survey Area 11	Artefact Scatter 1	Complete Flake	Basalt	0	Flaked	17.34	10.16	Hinge			40.44	25.67	15.21			
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Chert	0	Flaked	13.52	2.27				20.18	17.65	3.41			
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Chert	0	Flaked	12.09	4.66				24.68	13.36	5.17			
Survey Survey Area 11	Artefact Scatter 1	Bipolar Core	Quartz	0							34.67	23.82	9.94			
Survey Survey Area 11	Artefact Scatter 1	Tool	Basalt	0							118	82	54			Axe blank Evidence of grinding and thinning
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Quartz	0	Crushed	14.69	3.24				11.29	14.69	3.24			
Survey Survey Area 11	Artefact Scatter 1	Medial flake	Quartz	0							12.48	13.25	2.61			
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Quartz	0	Crushed						15.83	8.89	5.14			
Survey Survey Area 11	Artefact Scatter 1	Flake split	Quartz	0	Crushed						17.83	15.28	6.12			
Survey Survey Area 11	Artefact Scatter 1	Complete Flake	Quartz	0	Flaked	15.82	12.49				34.73	29.29	21.32			
Survey Survey Area 11	Artefact Scatter 1	Medial flake	Quartz	0							11.51	13.76	3.17			
Survey Survey Area 11	Artefact Scatter 1	Tool	Quartz	0					Backing		17.83	13.29	7.02			Geometric Microlith
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Crystal Quartz	0	Flaked	7.27	4.53				18.18	13.68	7.14			
Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Quartz	0	Flaked	14.2	8.27				24.72	21.84	12.31			
Survey Survey Area 11	Artefact Scatter 1	Bipolar Core	Quartz	0							23.66	17.29	11.38			
Survey Survey Area 11	Artefact Scatter 1	Complete Flake	Quartz	0	Crushed						19.41	14.87	3.29			

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Survey Survey Area 11	Artefact Scatter 1	Proximal flake	Chert	0	Flaked	16.31	7.88		32.57	18.22	7.96	
Survey Survey Area 11	Iso 8	Complete Flake	Basalt	0	Flaked	28.28	11.18	Feather	65.41	43.96	12.28	
Survey Survey Area 11	Iso 9	Proximal flake	Quartz	0	Crushed				22.93	15.55	16.38	
Survey Survey Area 11	Artefact Scatter 2	Proximal flake	Crystal Quartz	0	Flaked				36.87	17.44	8.11	
Survey Survey Area 11	Artefact Scatter 2	Single platform core	Chert	0					62.78	21.31	15.91	4 Blade core
Survey Survey Area 11	Artefact Scatter 2	Proximal flake	Quartz	0	Flaked	14.21	7.86		23.45	21.66	9.22	
Survey Survey Area 11	Artefact Scatter 2	Proximal flake	Quartz	0	Crushed				24.05	18.67	9.41	
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Chert	80					152.36	81.72	43.08	5 Grinding on one side
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Basalt	90					244.61	122.48	58.72	3
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Quartz	0					52.28	41.64	33.71	3
Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Basalt	0	Flaked	26.36	13.11		63.28	42.44	17.94	
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Basalt	20					126.74	86.28	48.31	5
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Basalt	10					172.67	103.52	53.64	6
Survey Survey Area 11	Artefact Scatter 2	Grinding Base	Quartzite	50					115.41	99.67	51.46	
Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Quartz	0	Crushed			Feather	33.38	27.04	8.48	
Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Basalt	0	Flaked	22.64	7.21	Plunge	41.38	22.72	11.25	
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Basalt	0					64.61	53.78	36.24	3
Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Quartz	0	Flaked	15.87	10.08	Feather	55.46	32.49	15.21	
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Quartz	0					46.91	29.34	18.69	3
Survey Survey Area 11	Artefact Scatter 2	Bipolar Core	Quartz	0					45.03	23.75	17.43	
Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Basalt	0	Crushed			Plunge	54.02	38.66	9.76	
Survey Survey Area 11	Artefact Scatter 2	Multi Platform Core	Basalt	0					65.41	36.49	18.75	6
Survey Survey Area 11	Artefact Scatter 2	Grinding Base	Tuff	0					132.05	112.18	76.42	Grinding on both sides
Survey Survey Area 11	Artefact Scatter 2	Hammerstone	Basalt	40					56.86	43.27	39.11	2 Pitting on on end

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Survey Survey Area 11	Artefact Scatter 2	Complete Flake	Basalt	0	Flaked	25.58	10.17	Plunge	48.21	38.79	12.05	
Survey Survey Area 11	Artefact Scatter 2	Anvil	Basalt	90					112.94	69.47	56.62	Two indentations from bi-polar flaking
Survey Survey Area 11	Artefact Scatter 3	Multi Platform Core	Basalt	0					71.16	52.41	33.82	5
Survey Survey Area 11	Artefact Scatter 3	Complete Flake	Quartz	0	Crushed			Feather	27.25	21.46	8.27	
Survey Survey Area 11	Artefact Scatter 3	Proximal flake	Quartz	0	Crushed				14.27	19.14	8.67	
Survey Survey Area 11	Artefact Scatter 3	Medial flake	Quartz	0					23.63	16.7	7.49	
Survey Survey Area 11	Artefact Scatter 3	Proximal flake	Quartz	0	Crushed				36.21	18.1	7.23	
Survey Survey Area 11	Artefact Scatter 3	Proximal flake	Quartz	0	Crushed				26.65	17.96	8.97	
Survey Survey Area 11	Artefact Scatter 3	Proximal flake	Quartz	0	Crushed				23.18	18.44	6.31	
Survey Survey Area 11	Artefact Scatter 3	Multi Platform Core	Quartz	0					38.87	33.35	22.11	3
Survey Survey Area 11	Artefact Scatter 3	Multi Platform Core	Quartz	0					62.23	48.96	21.04	2
Survey Survey Area 11	Artefact Scatter 3	Manuport	Banded Chert	0					95.41	58.33	22.17	Banded chert source is 20-30km toward Mudgee from this location
Survey Survey Area 11	Artefact Scatter 3	Multi Platform Core	Quartz	0					57.11	32.18	28.48	3
Survey Survey Area 11	Artefact Scatter 3	Complete Flake	Quartz	0	Crushed			Feather	15.89	17.34	6.25	
Survey Survey Area 11	Artefact Scatter 3	Multi Platform Core	Quartz	0					57.33	32.57	28.64	3
Survey Survey Area 11	Artefact Scatter 3	Single platform core	Quartz	0					63.22	42.53	30.12	2
Survey Survey Area 11	Artefact Scatter 3	Single platform core	Quartz	0					27.98	20.11	18.44	3 Blade core
Survey Survey Area 11	Artefact Scatter 3	Single platform core	Basalt	0					45.66	28.87	25.63	4 Blade core
Survey Survey Area 11	Artefact Scatter 3	Tool	Quartzite	90					115.28	74.61	59.78	Anvil, 2 indentations
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Crystal Quartz	0	Crushed				20.15	19.88	6.23	
Survey Survey Area 11	Artefact Scatter 4	Medial flake	Basalt	0					52.01	221.59	8.55	3
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Quartz	0	Crushed				28.24	22.56	7.04	
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Quartz	0	Crushed				32.44	18.78	8.61	
Survey Survey Area 11	Artefact Scatter 4	Complete Flake	Basalt	0	Flaked	10.41	2.68	Feather	15.36	11.71	3.86	
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Quartz	0	Crushed				23.94	16.49	7.23	

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Survey Survey Area 11	Artefact Scatter 4	Complete Flake	Quartz	0	Flaked	12.08	4.85	Feather			12.87	14.95	4.42	
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Quartz	0	Crushed						13.04	17.54	3.69	
Survey Survey Area 11	Artefact Scatter 4	Complete Flake	Quartz	0		12.72	2.11	Feather	Backing	Quadrant 2 and 3	24.64	16.28	3.98	Geometric Microlith
Survey Survey Area 11	Artefact Scatter 4	Tool	Quartz	0							18.63	18.21	5.88	
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Quartz	0	Crushed						29.11	19.73	11.08	
Survey Survey Area 11	Artefact Scatter 4	Proximal flake	Chert	0	Flaked	20.45	7.2				53.29	22.65	7.84	
Survey Survey Area 11	Artefact Scatter 5	Proximal flake	Quartz	0	Crushed						24.25	21.92	12.05	
Survey Survey Area 11	Artefact Scatter 5	Bipolar Core	Quartz	0	Crushed						23.71	17.98	11.54	
Survey Survey Area 9	Artefact Scatter 1	Tool	Chalcedony	5	Crushed				Backing	Quadrant 2 and 4	18.24	17.82	8.07	
Survey Survey Area 9	Artefact Scatter 1	Complete Flake	Basalt	0	Flaked	10.24	3.17	Step	Backing	Quadrant 2	35.46	22.17	6.88	
Survey Survey Area 6	Artefact Scatter 2	Split Flake	Quartz	0							28.44	20.71	10.28	
Survey Survey Area 6	Artefact Scatter 2	Complete Flake	Basalt	0	Crushed			Feather			16.46	12.81	2.34	
Survey Survey Area 6	Artefact Scatter 1	Distal Flake	Quartz	0				Feather			16.31	17.91	4.79	
Survey Survey Area 6	Artefact Scatter 1	Tool	Basalt	20	Flaked	10.61	2.48		Retouch	Quadrant 2 and 4	50.91	21.57	6.22	Broken Blade (recently)
Survey Survey Area 2	Artefact Scatter 1	Distal Flake	Basalt								18.61	22.23	2.97	
Survey Survey Area 2	Artefact Scatter 1	Complete Flake	Basalt	20	Flaked	20.38	5.87	Hinge			70.86	48.41	15.49	
Survey Survey Area 2	Artefact Scatter 1	Proximal Flake	Basalt		Flaked	13.55	4.1				20.45	19.68	5.04	
Survey Survey Area 2	Artefact Scatter 1	Tool	Crystal quartz						Backed	Quadrant 3 and 4	8.19	14.27	4.01	Backed tool with possible residue
Survey Survey Area 2	Artefact Scatter 1	Tool	Crystal quartz		Crushed				Retouch	Quadrant 2 and 3	17.11	10.41	4.76	
Survey Survey Area 22	IF5	Complete Flake	Basalt	5	Flaked			Feather			55.47	35.61	10.04	
Survey Survey Area 22	IF2	Complete flake	Basalt			20.04	3.76	Feather			45.74	25.37	10.29	
Survey Survey Area 22	IF4	Tool	Crystal quartz					Feather	Retouch	Quadrant 2 and 3	20.97	25.01	5.63	
Survey Survey Area 22	IF3	Proximal flake	Basalt		Flaked	10.05	4.15		Retouch	Quadrant 4	22.49	22.82	5.91	
Survey Survey Area 22	IF1	Complete flake	Basalt		Flaked	15.74	6.24	Hinge	Retouch	Quadrant 2	45.18	20.17	10.87	
Survey Survey Area 24	IF1	Tool	Basalt	10	-	-		Step	Backed	Quadrant 1	18.22	10.04	5.61	
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	20.47	7.05	Feather			79.68	22.46	10.11	
Survey Survey Area 24	Artefact Scatter 1	Split flake	Qtz		Flaked	15.76	9.78	Feather			45.47	20.02	15.14	
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	10.04	4.56	Step			52.31	15.61	5.84	

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Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	15.95	8.17	Feather		20.07	45.22	10.76
Survey Survey Area 24	Artefact Scatter 1	Tool	Basalt		Flaked	5.02	1.98	Retouch	Quadrant 2 and 3	25.64	12.49	3.38
Survey Survey Area 24	Artefact Scatter 1	Proximal Flake	Basalt		Flaked	10.27	2.55			25.13	15.65	3.21
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt	10	Flaked	12.04	3.36	Hinge		68.79	18.46	5.55
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	8.23	4.17	Step		22.98	11.57	6.98
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	5.61	2.71	Feather		18.94	14.51	3.72
Survey Survey Area 24	Artefact Scatter 1	Proximal fl	Basalt		Flaked	7.01	2.12	Step		23.78	17.63	3.77
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt	20	Flaked	10.85	3.74	Step		47.55	16.79	5.25
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt	30	Flaked	5.77	4.11	Feather		64.19	18.08	6.49
Survey Survey Area 24	Artefact Scatter 1	Distal Flake	Basalt		-	-		Feather		25.7	11.19	3.67
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt		Flaked	8.99	2.04	Feather		25.51	9.87	3.65
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Basalt	20	Flaked	33.45	6.88	Step		65.4	45.22	12
Survey Survey Area 24	Artefact Scatter 1	Complete Flake	Quartz		Flaked	13.89	4.13	Feather		22.46	14	5
Survey Survey Area 24	Artefact Scatter 1	Proximal flake	Basalt	10	Flaked	5.83	4.44			28.66	9	6