APPENDIX 8

Aboriginal Cultural Heritage Impact Assessment

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Inspired people | Dedicated team
Quality outcomes

lightsource bp

GUNDARY SOLAR FARM

Aboriginal Cultural Heritage Assessment

FINAL

July 2024

GUNDARY SOLAR FARM

Aboriginal Cultural Heritage Assessment

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Lightsource Bp

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Report No. 22223/R07
Date: July 2024

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This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	Ryan Desic	26/07/2024	Malinda Facey	26/07/2024

Executive Summary

Lightsource Development Services Australia Pty Ltd (Lightsource bp) proposes to develop a large scale solar photovoltaic (PV) generation facility (the Project) at 961 Windellama Road, Gundary, approximately 10 km south of Goulburn, NSW within the Goulburn Mulwaree Local Government Area (LGA) (the Project Area).

The Project will be assessed as a State Significant Development (SSD) under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Accordingly, an Environmental Impact Statement (EIS) for the Project is required. Secretary's Environmental Assessment Requirements (SEARs) were issued on 10 November 2022. Lightsource bp has engaged Umwelt Australia Pty Ltd (Umwelt) to prepare the Aboriginal Cultural Heritage Assessment (ACHA) to support of the EIS.

Archaeological investigations have included a survey and a test excavation program of the Project Area, both done in consultation with Registered Aboriginal Parties (RAPs). As a result of the archaeological survey, 11 Open Artefact Sites and four Potential Archaeological Deposits (PADs) were identified. The results of the survey informed the test excavation methodology.

The archaeological test excavation program recovered 295 stone artefacts. Approximately half of the objects were very fine-grained silcrete. Other common materials included quartz and Indurated Mudstone/Tuff (IMT). Rarer raw material types included Fine Grained Siliceous (FGS), quartzite, chert, volcanic and silicified wood. Two sites (namely GSF-UMW-6 and GSF-UMW-9) contained a relatively large number of artefacts and have moderate scientific significance.

As a result of the test excavation, the final number of Aboriginal sites across the Project Area is nineteen (19). All these sites comprise of surface or subsurface stone artefacts. The Project would avoid three identified sites (i.e. GSF-UMW-3, GSF-UMW-4 and GSF-UMW-5), partially impact seven sites (i.e. GSF-UMW-1, GSF-UMW-2, GSF-UMW-8, GSF-UMW-12, GSF-UMW-13, GSF-UMW-14 and GSF-UMW-15), and completely impact nine sites (i.e. GSF-UMW-6, GSF-UMW-7, GSF-UMW-9, GSF-UMW-10, GSF-UMW-11, GSF-UMW-16, GSF-UMW-17, GSF-UMW-18 and GSF-UMW-19). Consultation with RAPs indicate that further archaeological excavation (post-development consent) should be taken to mitigate impacts of the Project. The RAPs identified that, should this mitigation measure be undertaken, they would be supportive of the Project proceeding (in terms of Aboriginal cultural heritage).

Aboriginal cultural heritage will be managed under an Aboriginal Cultural Heritage Management Plan which will be developed post-approval. Salvage excavation of two sites (i.e., GSF-UMW-6 and GSF-UMW-9) would mitigate impacts caused by the Project, by gathering a representative sample of the local archaeological record for analysis, interpretation and to benefit the local Aboriginal community with opportunities to use the sample as a cultural values educational tool. The Aboriginal Cultural Heritage Management Plan will detail the staged salvage excavation methodology (Phase 1 and Phase 2 excavations) and reporting, Aboriginal consultation protocols, community collection, on-site inductions, interpretation, and protocols for unexpected finds and human remains.

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1.0 Introduction

1.1 Background

Lightsource Development Services Australia Pty Ltd (Lightsource bp) proposes to develop the Gundary Solar Farm (the Project) in the Southern Tablelands of New South Wales (NSW), approximately 10 km south of Goulburn within the Goulburn Mulwaree Local Government Area (LGA).

The Project will be assessed as a State Significant Development (SSD) under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Accordingly, an Environmental Impact Statement (EIS) for the Project is required. Secretary's Environmental Assessment Requirements (SEARs) were issued on 10 November 2022. Lightsource bp has engaged Umwelt to prepare the Aboriginal Cultural Heritage Assessment (ACHA) in support of the EIS.

Umwelt has been engaged by Lightsource bp to work with the Registered Aboriginal Parties (RAPs) to prepare an Aboriginal Cultural Heritage Assessment (ACHA) which will form part of the Environmental Impact Statement (EIS) for the Project. This ACHA has been prepared in accordance with the requirements of the National Parks and Wildlife Regulation 2019 (NPW Regulation), the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), with all consultation undertaken in accordance with Clause 60 of NPW Regulation and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a) (the Consultation Requirements). The ACHA incorporates required archaeological technical information in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code of Practice).

1.2 The Project Area

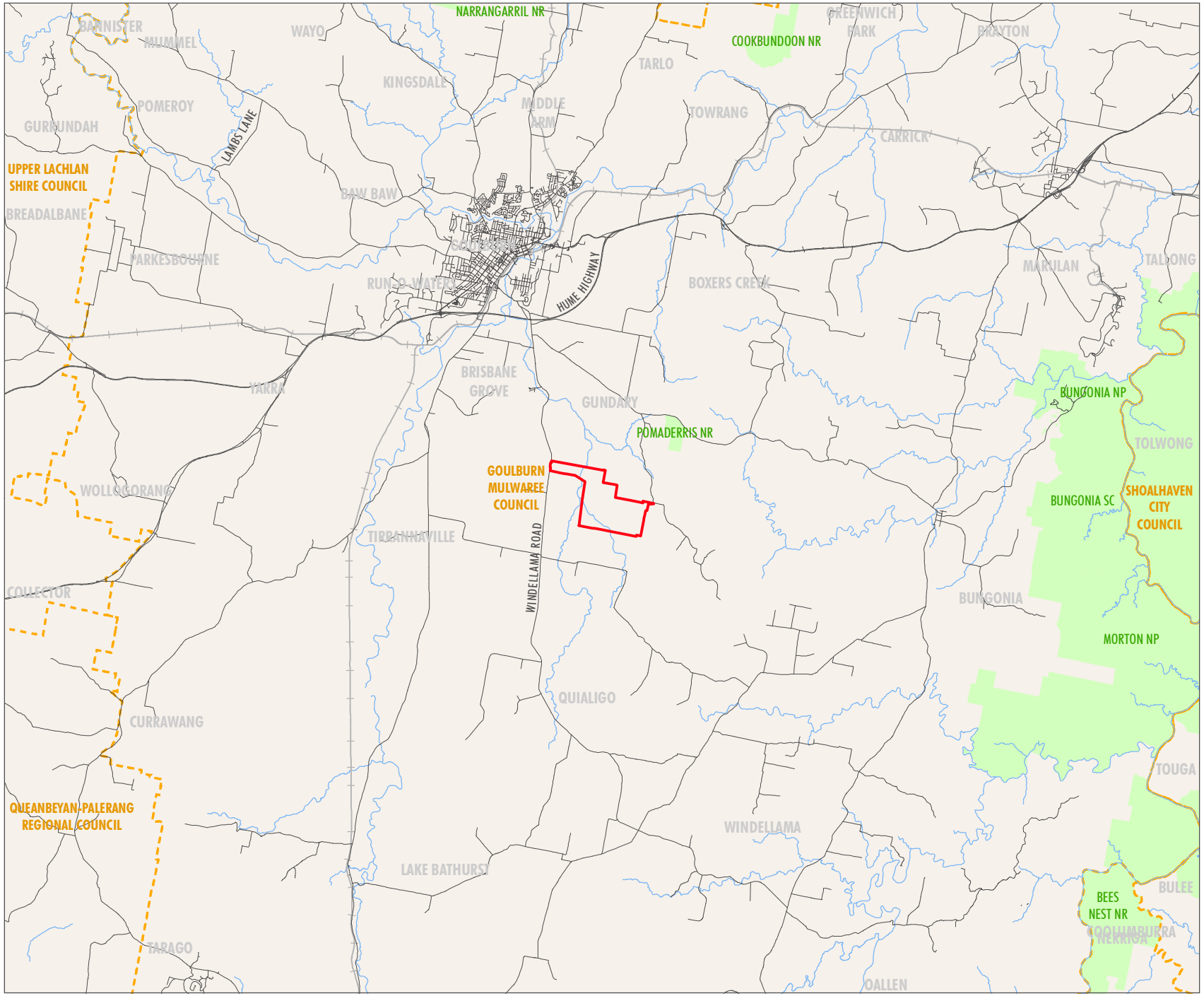
The Project Area is located at 961 Windellama Road, Gundary approximately 10 km south of Goulburn, NSW. The Project Area covers approximately 702 ha, and comprises of Lot 1 DP870101, Lot 2 DP1187724, Lot 80 DP750018, part of Lot 3 DP1238437 and Lot 12 DP1016332. The Project infrastructure will cover approximately 512 ha (the development footprint). The Project Area also includes a small section of Windellama Road and its road reserve for the proposed intersection works at the Project's primary access (**Figure 1.1**). The Project Area is situated within Pejar Local Aboriginal Land Council (LALC) boundaries.

1.3 Overview of the Project

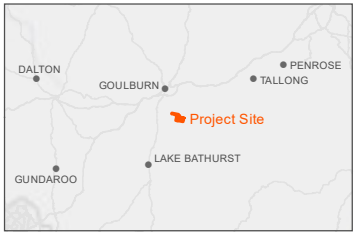
The Project will involve the construction, operation, maintenance and decommissioning of a 400 Megawatt peak (MWp) solar farm with a Battery Energy Storage System (BESS) and associated infrastructure to connect the Project to the national electricity grid. The Project will be accessed from Windellama Road off the Hume Highway. Intersection works on Windellama Road are proposed as part of the Project to upgrade the Project access to accommodate heavy vehicles. The Project's conceptual layout is included in **Figure 1.2**. It is noted that subsequent to the review of the draft ACHA, the conceptual layout for the Project has been refined in order to reduce noise and visual impacts to proximal neighbours. However, the extent of the development footprint in relation to the location of the sites identified and assessed in the draft ACHA remains unchanged.

FIGURE 1.1

Locality and Regional Context



- Roads
- Railway
- Watercourses
- Local Government
- Project Area
- NPWS Estate
- State Forest



0 5 10

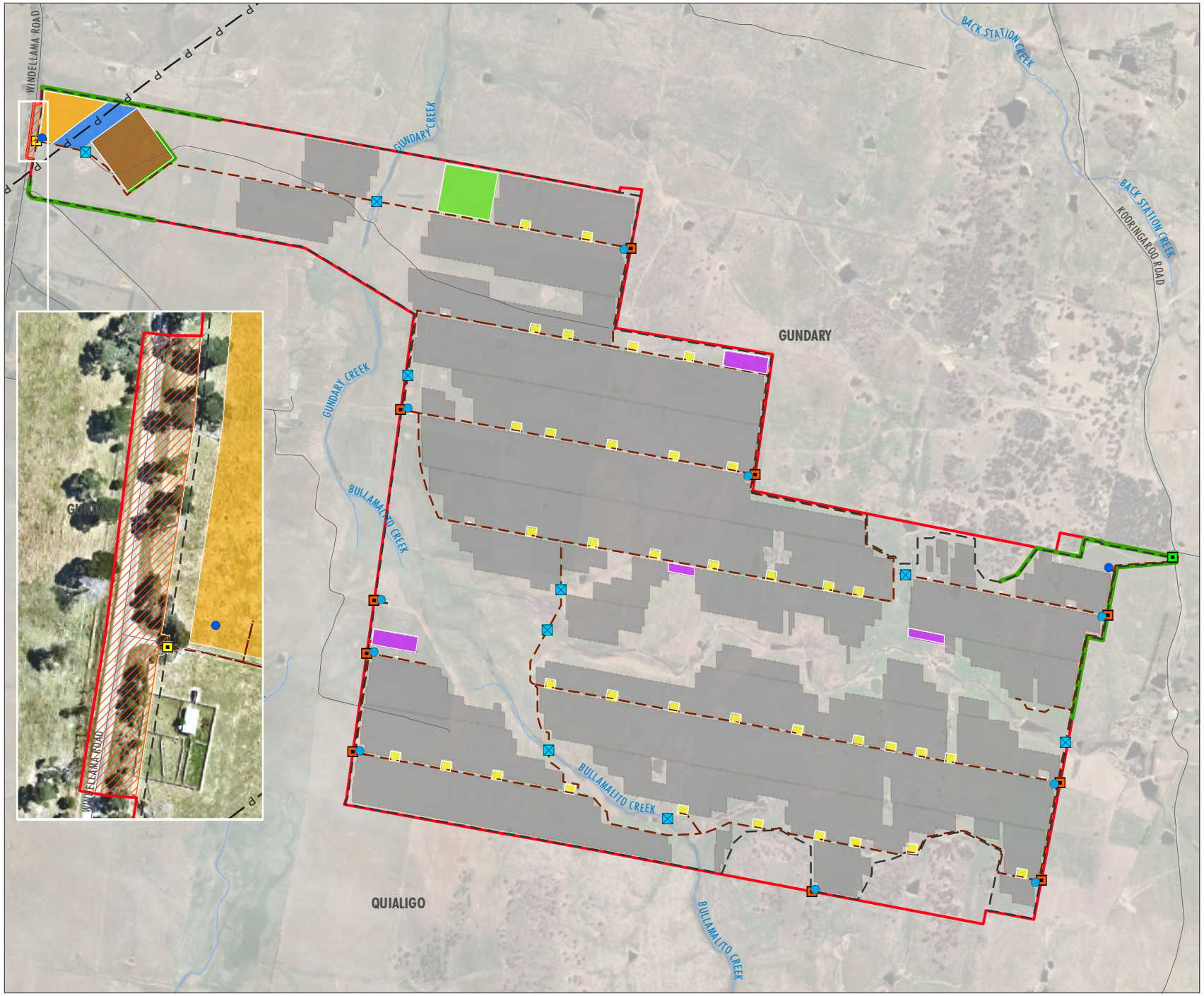
Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

FIGURE 3.1

Project Conceptual Layout



- Access Roads
- Security Fence
- P Existing Transmission Line
- Roads
- Watercourses
- Watercourse / Bed Level Crossing
- Water Tank (40,000L)
- Water Tank (10,000L)
- Primary Access
- Emergency Access
- Emergency Gate
- Project Area
- Proposed Road Upgrade
- Solar Panels
- Landscaping Buffer (5m)
- Transgrid Line Works
- Centralised AC
- Substation and O&M Facility Area
- Construction Compound Area
- Decentralised DC BESS

0 500 1,000

Metres

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

The Project will supply electricity to the National Electricity Market (NEM), via a new onsite connection to the existing 330 kV overhead transmission line traversing through the north-west corner of the Project Area. The Project will generate enough clean energy for about 133,000 homes and reduce carbon emissions by 670,000 tonnes.

The Project would be located on land zoned RU1 – Primary Production. The area surrounding the Project is characterised predominantly by agricultural lands associated with rural residential properties, small settlements, conservation areas and rural tourism. Land within and adjacent to the Project has been subject to extensive cultivation associated with historic and more recent agricultural land uses.

The Project is expected to generate up to 400 Full Time Equivalent (FTE) jobs over the 18-to-24-month construction period with between two and four FTE jobs during operation.

1.4 Objectives and Assessment Requirements

1.4.1 Objectives

The key objectives of this ACHA report are to:

- Outline the Project Area and the proposed activity (the Project) (**Section 1.0** and **Section 7.0**).
- Document the Aboriginal Community Consultation process undertaken for the Project (**Section 2.0** and **Appendix A**).
- Document relevant background information which has been used to inform the current assessment (**Section 3.0** and **Section 4.0**).
- Document the archaeological investigations (both survey and test excavation) that were undertaken for this assessment (**Section 5.0**).
- Provide an assessment of cultural heritage values (**Section 6.0**).
- Provide an impact assessment, including consideration of avoiding and/or mitigating harm (**Section 7.0**).
- Provide management recommendations (**Section 8.0**).

Aboriginal people are the primary determinants of the cultural significance of their heritage. This ACHA is prepared to ensure that the information provided by RAPs is documented and presented in a manner that informs decision making on the management of Aboriginal cultural heritage within the Project Area, whilst ensuring that the required archaeological information is also appropriately documented.

1.4.2 Assessment Requirements and Legislation

The assessment was prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs) issued on 10 November 2022, as outlined in **Table 1.1**.

This report follows the SEARs relating to Aboriginal heritage by being prepared in accordance with the following NSW government best practice guidelines for Aboriginal cultural heritage assessment and management:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (the Consultation Requirements) (DECCW 2010a).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b).

Table 1.1 lists the matters relating to 'heritage' relevant to this assessment and where they are addressed in this report. This report only includes matters relating to Aboriginal cultural heritage and not historical heritage, which is addressed in a separate Historical Heritage Impact Assessment.

Table 1.1 SEARs requirements for Aboriginal cultural heritage

Requirement	Section addressed
An assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (*DECCW, 2010), including results of archaeological test excavations (if required);	Whole report, with a focus on **Section 7.0**.
Evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	**Section 2.0**

1.4.3 Legislative Context

There are several Commonwealth and State Acts (and associated regulations) that protect and manage Aboriginal cultural heritage in Australia. This legislation and its relevance to the Project is summarised in **Table 1.2**.

Table 1.2 Legislative Context

Legislation Overview	Relevant to the Project?	Details
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 Recognises sites with universal value on the World Heritage List (WHL). Protects Indigenous heritage places with outstanding heritage value to the nation on the National Heritage List (NHL), and significant heritage value on the Commonwealth Heritage List (CHL).	No	There are no Indigenous heritage places within the Project Area that are listed on the WHL, NHL, or the CHL.
Native Title Act 1993 The *Native Title Act 1993* (NT Act) recognises that Aboriginal people have rights and interests to land and waters which derive from their traditional laws and customs. Native Title may be recognised in places where Indigenous people continue to follow their traditional laws and customs and have maintained a link with their traditional country. It can be negotiated through a Native Title Claim, Indigenous Land Use Agreement (ILUA) or future act agreements.	No	A search of the Native Title Tribunal Claims Register on 31/05/2023 identified no claims have been made in the Project Area.
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 Preserves and protects areas and objects of particular significance to Aboriginal people that are under threat from injury or desecration.	No	There are no areas or objects within the Project Area subject to a Declaration under the Act.
State		
Environmental Planning and Assessment Act 1979 The EP&A Act regulates development activity in NSW and requires environmental impacts, including to Aboriginal heritage, to be considered in land use planning. Provides for the development of environmental planning instruments, including State Environmental Planning Policies and Local Environmental Plans.	Yes	The Project is being assessed as an SSD project under Part 4, Division 4.7, of this Act, and is subject to project-specific environmental assessment and reporting requirements. These requirements (SEARs) stipulate that an Aboriginal heritage assessment of the likely Aboriginal heritage (cultural and archaeological) impacts of the development, including adequate consultation with the local Aboriginal community impact assessment is required (in accordance with standard Heritage NSW procedures and guidelines).

Legislation Overview	Relevant to the Project?	Details
National Parks and Wildlife Act 1974 Heritage NSW is primarily responsible for regulating the management of Aboriginal cultural heritage in NSW under the *National Parks and Wildlife Act 1974* (NPW Act). It provides protection and management mechanisms for Aboriginal objects and declared Aboriginal places. The NPW Act is accompanied by the National Parks and Wildlife Regulation 2019 (the Regulation) and a range of codes and guides including the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), the Consultation Requirements (DECCW 2010a) and the Code of Practice (DECCW 2010b).	Yes	The NPW Act would generally remain in force for the Project in relation to the discovery, impact notification and care of Aboriginal objects in NSW. However, as the Project is classed as SSD, an Aboriginal heritage impact permit (AHIP) is therefore not required to permit harm to Aboriginal objects associated with an approved project or investigations during the EIS. Instead, an approved management plan would manage relevant Aboriginal cultural heritage values.
Aboriginal Land Rights Act 1983 Establishes Local Aboriginal Land Councils (LALCs). Allows transfer of ownership of vacant crown land to a Local Aboriginal Land Council. The Office of the Registrar, Aboriginal Land Rights Act 1983 (ORALRA), registers Aboriginal land claims and maintains the Register of Aboriginal Owners. Often used in NSW to identify relevant stakeholders for consultation.	No	A request to search the Register of Aboriginal Owners was made to the ORALRA; no relevant land rights claims were relevant to the Project Area.
Heritage Act 1977 The *Heritage Act 1977* provides protection for heritage within NSW. The Act provides protection of historical places, structures, relics, moveable objects and landscapes of significance. The Act also affords protection to Aboriginal places of State heritage significance included on the State Heritage Register (SHR) or subject to an Interim Heritage Order.	No	As no Aboriginal places of State heritage significance apply to the Project Area. The Heritage Act is not relevant to the ACHA.

1.5 Limitations

This Aboriginal Cultural Heritage Assessment report has assessed Aboriginal cultural heritage only. Impacts to historical (non-Aboriginal) heritage are managed under standalone legislation and must be managed accordingly.

This report is based on existing and publicly available environmental and archaeological information (including AHIMS data) and reports about the Project Area. The background research did not include any independent verification of the results and interpretations of externally sourced existing reports (except where the ground-truthing was undertaken).

1.6 Authorship and Acknowledgements

This report was prepared by Umwelt Senior Archaeologist Lara Donohoe (née Tooby), with assistance from Umwelt Archaeologist Sarah Mané. Graphics were prepared by Umwelt Senior GIS Consultant Travis Williamson. Umwelt Principal Archaeologist Ryan Desic undertook technical review of the report, Umwelt Senior Environmental Scientist Marion O'Neil was the overarching Project Manager, and Umwelt Executive Manager Malinda Facey was overarching Project Director and Registered Environmental Assessment Practitioner (REAP) on the Project. Umwelt archaeologists Lara Donohoe (Excavation Director), Sarah Mane, Alison Fenwick, Elise Nuridin and Andrew Crisp participated in the test excavation program for the Project. Taylar Reid (then-Umwelt Senior Archaeologist) and Alison undertook the survey which informed the assessments.

Umwelt would like to thank RAPs for their involvement in ongoing consultation, knowledge sharing and fieldwork assistance. This includes site officers (listed alphabetically) Belinda Little, Brad Maybury, Chris McAllister, Dean Bell, Dean Delponte, Jessica Plumb, Jikayia Little, Marinda Little, Merekai Bell, Pamela Young, Phillip Carroll and Robert Young (**Photo 1.1** and **Photo 1.2**).

Photo 1.1 Week 1 Fieldwork Team

Photograph taken by Lara Donohoe.
Source: Umwelt 2023.

Photo 1.2 Week 2 Fieldwork Team

Photograph taken by Lara Donohoe.
Source: Umwelt 2023.

2.0 Aboriginal Consultation

2.1 Overview

Consultation with Aboriginal parties is an integral part of identifying and assessing the significance of Aboriginal objects and/or places and determining and carrying out appropriate strategies to mitigate impacts upon Aboriginal heritage.

Aboriginal consultation for the Project has been undertaken in accordance with procedures set out in the Consultation Requirements (DECCW, 2010a). These guidelines identify a four-stage process which involves notification and registration of Aboriginal parties, presentation of the Project and assessment information, gathering information about cultural significance, and provision of a draft ACHA for Aboriginal party review.

A summary of the consultation process and its outcomes are provided in the sections below, and full documentation of the consultation process is provided in **Appendix A**.

2.2 Stage 1 – Notification and Registration of Aboriginal Parties

In accordance with Stage 1, Umwelt issued a letter to government agencies on 12 May 2022 requesting advice on which Aboriginal parties to invite for consultation. The agencies contacted included Heritage NSW, Pejar Local Aboriginal Land Council (Pejar LALC), Goulburn Mulwaree Council, South-East Local Land Services (former catchment management authority), National Native Title Tribunal, The Office of the Registrar of Aboriginal Owners and Native Title Services.

Based on information collected from government agencies, expressions of interest were sent to the knowledge holders inviting them to become a RAPs for the Project.

In addition, a notification was placed in a local newspaper detailing the Project name, proponent, location, description and a request for Aboriginal knowledge holders to register interest in the Project.
The advertisement was placed in the *Goulburn Post* on 1 June 2022.

As a result of the expressions of interest and public notices, sixteen Aboriginal parties registered their interest in being consulted for the Project and are listed in **Table 2.1**.

Table 2.1 List of Registered Aboriginal Parties (RAPs) for the Project

Organisation	Contact
Pejar Local Aboriginal Land Council (Pejar LALC)	Delise Freeman
Buru Ngunawal Aboriginal Corporation	Wally Bell
Yurwang Gundana Consultancy Cultural Heritage Services (GCCHS)	Merekai Bell
Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson
Murrabidgee Mullangari Aboriginal Corporation (MMAC)	Darleen Johnson
Merrigarn Indigenous Corporation	Shaun Carroll
Didge Ngunawal Clan	Paul Boyd/Lilly Carroll
Ginninderra Aboriginal Corporation	Krystal Carroll-Elliot
Muragadi Heritage Indigenous Corporation	Jesse Johnson

Organisation	Contact
Mulwaree Aboriginal Community Inc	Jennie Gordon
Konanggo Aboriginal Cultural Heritage Services (KACHS)	Robert Young
Mundawari Heritage Consultants (MHC)	Dean Delponte
Kamilaroi Yankuntjatjara Working Group	Phil Khan
Guntawang Aboriginal Resources Incorporated (GARI)	Wendy Morgan
Timothy Stubbs	Timothy Stubbs
Thunderstone	Tyrone Bell
Mura Cultural Services[1]	Phil Caroll
Murrindyarr Aboriginal Corporation[2]	Teena Riley

2.3 Stages 2 and 3 – Presentation of Information and Gathering Cultural Information

In accordance with Stage 2 and 3 of the consultation guidelines, details of the Project and Assessment Methodology were sent out to RAPs and opportunities for feedback provided (**Table 2.2**).

Two sets of letters were sent out. The first was dated 16 September 2022. The letter included an overview of the Project, the proposed assessment methods (including upcoming site survey) and the consultation process, as well as the results of a preliminary desktop assessment and details about gathering cultural information. The second letter was sent out 30 March 2023, and detailed the test excavation methodology.

Both letters detailed an application process for paid engagement in the site survey and test excavation as Aboriginal Site Officers. As commercial engagement of Aboriginal Site Officers is a process which occurs separately to the Consultation Guideline process, correspondence regarding engagement (excluding that relevant to cultural values and connection to the Project Area) is not included in **Appendix A** nor incorporated into **Table 2.2**.

Table 2.2 Responses to assessment methodologies and the Project information from RAPs, and responses (where relevant) from Umwelt

RAP	Comment	Umwelt Response
Corroboree Aboriginal Corporation— Marylin Caroll-Johnson	Email 16/09/2022— Agrees with the methodology, mentions cultural connection to the land, with her ancestors travelling across different Country, including the locality of the Project.	Noted.
GARI—Wendy Morgan	Email 20/09/2022— Agrees with the Project methodology. Advised preference for artefacts to be reburied in a safe place and protected from the construction. Wendy identified grandfather and great grandfather being connected to the Project Area, which was part of their song lines and marriage lines.	Noted, and the reburial recommendation is incorporated into the management recommendations of this report.

[1] Phillip Carrol previously attended site during survey representative of Thunderstone. Just prior to test excavation (April 2023), he registered for the project under his own organisation.

[2] Teena was originally registered under Mulwaree Aboriginal Community Inc. Murrindyarr Aboriginal Corporation registered as a separate organisation in June 2024. An additional site inspection was undertaken with Murrindyarr Aboriginal Corporation on 17 July 2024, during and following which, comments on the ACHA (prior final EIS submission) were received.

RAP	Comment	Umwelt Response
KAHS—Robert Young	Email 23/9/2023—Noted there no reference to Ancestral remains if found, and wished to understand the process of this, and where any cultural objects would be stored if identified.	Management of Ancestral remains and Aboriginal objects considered within this ACHA report.
MMAC— Ryan Johnson	Email 19/9/2023—Endorsed the methodology.	Noted.
YGCCHS — Merekai Bell	Email 25/9/2023—Agrees with the methodology.	Noted.

2.3.1 Consultation During Fieldwork

Several RAPs were engaged as Site Officers for the archaeological survey and test excavation.

As part of the test excavation program, detailed discussion with site officers was undertaken to understand and document cultural values relevant to the Project Area. Site officers were Brad Maybury (GARI), Pamela Young (KAHS), Robert Young (KAHS), Dean Delponte (MHC), Phillip Carroll (Mura Cultural Services)[3], Belinda Little (MMAC), Jikayia Little (MMAC), Marinda Little (MMAC), Chris McAllister (Pejar LALC), Jessica Plumb (Pejar LALC), Merekai Bell (YGCCHS), and Dean Bell (YGCCHS).

Feedback provided from Site Officers is documented below in **Table 2.3.** As per the wishes of Site Officers, Umwelt has removed the names of individuals, and has kept the comments broad and general. As documented in **Photo 2.1**, many discussions on cultural reconnection to each other and the landscape were undertaken whilst working around the sieve station. Cultural comments about sites are described under the test excavation section, and other cultural comments are incorporated into the entirety of the report.

Table 2.3 Feedback received during fieldwork, with detailed verbal conversations undertaken on Friday 26 May 2023 between Lara Donohoe (Umwelt) and Site Officers

Comment	Umwelt Response
All Site Officers had a positive reaction to undertaking the fieldwork and the significance of participating in fieldwork. Individuals variously describes fieldwork as • '…connections to Ancestors, and connections to each-other' • '…about healing, coming back to Country' • '….reconnection' • '…learning from Country and from each other' • '…. a cultural awakening	The cultural values communicated to Umwelt during fieldwork will be considered and incorporated into the cultural values assessment of the Project and has influenced the management and mitigation strategies recommended in this report.
All Site Officers recommended that salvage excavation occur onsite, with salvage excavation focussing on areas where a relatively large number of artefacts were recovered during test excavation (including sites GSF-UMW-6 and GSF-UMW-9, as outlined in **Section 5.2**). Certain RAPs mentioned the desire to understand what was occurring at each of these locations where artefacts were identified.	The Aboriginal community recommendation for salvage excavation aligns with the archaeological recommendations, and has been applied to sites GSF-UMW-6 and GSF-UMW-9, where impacts will occur.

[3] Phillip Carrol previously attended site during survey representative of Thunderstone. He has subsequently started his own organisation and was later registered under this organisation.

Photo 2.1 Photo of fieldwork and discussions being undertaken around the sieve

Source: Umwelt 2023.

2.3.2 Distribution of Draft Report

A draft version of this report, which included all background information, results, draft significance assessments and draft management recommendations was issued to all RAPs for review and comment on 30 June 2023. Feedback provided from Site Officers is documented below in **Table 2.4**.

Table 2.4 Feedback on Draft ACHA Report

RAP	Comment	Umwelt Response
MHC— Dean Delponte	Phone call 10:53am 10/07/2023 with Lara Donohoe (Umwelt) Feedback on report as follows: -Happy with the report and the recommendations in the report. -Asked us to check his group is included in Section 5. -Happy to add his family's personal connection to the Gundary area (relative married someone from Gundary).	Comments noted (confirming support of Project and proposed archaeological mitigation measures). **Section 5.0** updated to ensure Mundawari Heritage Consultants is included, and the family's personal connection mentioned within **Section 4.2.**

RAP	Comment	Umwelt Response
KACHS—Robert Young	Email 17/07/2023 '*In regard to the ACHA report found it very informative and descriptive. We support the recommendation of the salvage to be adopted for future works. Addressing the measurables and indicators within the landscape. You acknowledged the RAP responses, which are very important. Overall, a very good report.* '	Comments noted (confirming support of Project, and proposed archaeological mitigation measures).
GARI—Wendy Morgan	Email 25/07/2023 '*I would like to congratulate you on an excellent report, well written.* *Guntawang Aboriginal Resources agrees with the recommendations and the draft methodology.* *We hope we can be involved in the salvage or any other field work*.'	Comments noted (confirming support of Project and proposed archaeological mitigation measures).
Kamilaroi Yankuntjatjara Working Group—Phil Kahn	Email 1/08/2023 '*Thank you for your Draft GSF Cultural Heritage Assessment ACHA re Gundary Solar Farm, we would like to agree and support your management and mitigation strategy. Regarding long-term management of the artefacts, I recommend reburia*l.'	Comments noted (confirming support of Project and proposed archaeological mitigation measures).
Mulwaree Aboriginal Community Inc—Jennie Gordon	Email 20/08/2023 Mulwaree responded with an email noting disappointment that some historical information had not been included in the report, including: • Aboriginal groups known to be present within the Goulburn Area. • Mentioning Old King Cry at Tirrannaville. • Scar trees near Project Area. • Traditional burial grounds in Goulburn. The first two points had been raised by Mulwaree Aboriginal Community Inc at public meetings for the Social Impact Assessment (SIA) for the Project.	Ensured that the historical sources provided are considered in the report, with **Section 4.2** being updated to reflect this.
YGCCHS—Merekai Bell	Email 31/08/2023 '*After reading the report, everyone here at Yurwang Gundana agrees with it for the most part, but we can't stress enough that if the Project gets the green light, there needs to be more fieldwork as we believe it has a lot of Aboriginal Heritage Potential and that all the artifacts found when the time to find a new home needs to be a decision that we all agree too*.'	Comments noted (agreement with the recommendation for more fieldwork, which has informed the management recommendations in this report, **Section 8.0**).
Murrindyarr Aboriginal Corporation	Email and phone call 22/07/2024, prior to submission of EIS. Note separate inspection of the Project Area was undertaken with Murindyarr Aboriginal Corporation on 17/07/2024, after identifying themselves as an Aboriginal knowledge holder who lives near the area, and their desire to provide cultural input on the project. Murindyarr Aboriginal Corporation notes that providing mitigation measures (archaeological excavation, as outlined in the ACHA, and artefact reburial occur), they are supportive of the Project proceeding (in terms of Aboriginal cultural heritage). They noted that *'they would welcome the opportunity to be involved in any further*	Comments noted (confirming support of Project and proposed archaeological mitigation measures). Ensured that the historical sources provided are considered in the report, with **Section 4.2** being updated to reflect this. In addition, the social/cultural significance section (**Section 6.2**) has been updated to include

RAP	Comment	Umwelt Response
	assessment on the subject site, and requests to be involved in ensuring the artefacts are treated appropriately. Based on what is known of the development to date, returning the artefacts to Country involving Gundungurra people would seem appropriate.' They provided further historical information on Gundungurra people to be included in the report and in addition, made comments on the cultural significance of some of the artefacts recovered during test excavations (details of which are culturally sensitive and not detailed within the report, but were relayed in confidence to Lara Donohoe on the phone on 22 July 2024. Murindyarr Aboriginal Corporation noted that they were happy to discuss these values with Heritage NSW on request). Murindyarr Aboriginal Corporation also provided ethnohistorical evidence that the Gundary Plains was likely managed ('farmed') by Aboriginal people in the past. Based on this evidence, they state that: *'The site proposed for the Gundary Solar Farm would likely have been utilised as an important hunting ground and location for sourcing a variety of food. Fresh Nadg-yung (water) was also plentiful. During fieldwork, despite significant grazing by sheep and cattle, burra (kangaroo) remained on site and there were numerous goolung (wombat) burrows. Multiple budgang (bird) species were present, including the nulla-bunya-gang (wood duck). Birdlife was particularly prominent in small areas set aside for native vegetation. The subject site appears representative of the Mulwaree or Goulburn plains that presented as very well managed (or 'farmed') by local Aboriginal people prior to colonisation. There is a network of perennial creeks and streams, including Gundary and Bullamalito Creeks, which provided wetlands ideal for fresh water and native flora and fauna, many of which were ideal food sources. The area is almost completely devoid of trees.'* To manage this significance, Murindyarr Aboriginal Corporation requested the reburial of artefacts should be undertaken in consultation with their organisation, and that they would be open to further consultation and discussion of this significance if further archaeological investigation is undertaken.	direct comments (mentioned in the previous column) from the organisation, and comments on the cultural significance of artefacts. Formal submission from Murindyarr Aboriginal Corporation is available for Heritage NSW on request.

3.0 Environmental Context

The decisions that past Aboriginal people made regarding such things as where they lived, the range of resources they used, and other aspects of daily life may be influenced by the environment in which they live. Landscape features were an important factor for the choice of camping and transitory and ceremonial areas used by Aboriginal people. The preservation and visibility of sites is also affected by environmental factors such as vegetation cover, past land-use and disturbance. A review of the environmental context of the assessment is therefore integral to considerations of site visibility, preservation and occurrence within the Project Area.

3.1 Landscape Description

3.1.1 Overview

The Project Area is situated within a landscape of undulating plains, with elevations ranging from 660 m to 700 m above sea level (DPIE 2020). This is an alluvial-colluvial landscape, with soils formed in situ and derived from parent rock (Hird 1991, 41–43). It is prone to localized flooding and has high erodibility of topsoil. Erosion acts to expose deposits that were formerly sub-surface and impacts on the potential for deposits to retain archaeological integrity.

3.1.2 Hydrology

Access to freshwater was a critical requirement for long-term Aboriginal habitation of an area. Known freshwater sources within the Project Area include 5th order streams Gundary Creek and Bullamalito Creek (**Figure 3.1**). These are perennial waterways, and except for periods of drought, should therefore have been a reliable water resource for Aboriginal people in the past. In addition, many first to fourth order streamlines intersect the Project Area. The abundance of water resources in the current Project Area, thanks to numerous streams would likely have made the area suitable for long-term habitation by Aboriginal people in the past.

3.1.3 Geology and soils

The underlying geology of the area around Gundary Creek is Quaternary alluvial silt, sand and clay (**Figure 3.2**). A large portion of the Project Area in the east is underlain by Black Station Ignimbrite (Mount Fairy Group) which consists of blue-grey crystal rich welded dacitic ignimbrite composed of crystals and fragments of plagioclase, quartz, hornblende, clinopyroxene and orthopyroxene, with accessory opaque minerals, K-feldspar, apatite and zircon, set in a cryptocrystalline matrix. The area between these is Quaternary residual deposits, interspersed with Bullamita Conglomerate, which consists of cream to grey matrix. The western portion of the Project Area, near Windellama Road, is underlain by Bindook Group, Four Winds Ignimbrite Member, consisting of green-grey lithic crystal rich dacitic welded ignimbrite and dacitic volcanic breccia, while the sides slopes near Gundary Creek are underlain by Bindook Group, Newacres Ignimbrite, which is cream to grey quartz-feldpsar-phyric crystal-rich welded rhyolitic ignimbrite (Thomas et al. 2002). In terms of raw materials for Aboriginal people in the past, the geological landscapes suggest that the Ingimbrite contexts may contain quartz (commonly used by Aboriginal people in the past) and other silica rich raw materials.

The Project Area is located across three soil landscapes – Gundary, Collectors Creek and Bullamalita, as shown in **Figure 3.1**. The Gundary soil landscape is generally found on the Gundary Plains south of Goulburn. Pockets of Collectors Creek are often associated with this soil landscape, and in this instance, occurs within the area surrounding Gundary Creek in the central portion of the Project Area. The western portion of the Project Area is underlain by Gundary soils, which are expected to comprise of moderately deep, red, orange or yellow duplex soils. The A1 horizon is a dark brown friable sandy loam to loam, underlain by a pale-yellow sandy loam to sandy clay loam in the A2 horizon, and a red mottled clay in the B horizon (Hird 1991, 102–4). Depth to bedrock is generally 100 cm, and alluvium is also noted adjacent creek lines.

The central portion of the Project Area, around Gundary Creek and Bullamalito Creek is classified within the Collectors Creek soil landscape, which generally is found within the drainage depressions of narrow floodplains within the region. These soils are moderately deep, having formed on colluvial and alluvial deposits of Quaternary and Cainozoic clay, silt and sand. The depth to bedrock is >300 cm, although the water table depth is ~80 cm. Soils. The depth to bedrock is >300 cm, although the water table depth is ~80 cm. Soils generally consist of brown sandy loam to clay loam in the A1 horizon, underlain by pale fine sandy clay loam in the A2 horizon, underlain by yellow- grey mottled clay in the B horizon (Hird 1991, 61–63).

The western portion of the Project Area is located within the Bullamalita soil landscape, which consists of sandy loam in the A1 horizon, overlying stony bleached hard setting silty clay loam in the A2 horizon, and mottled yellow clay in the B horizon (DPIE 2020). The depth to bedrock in this soil landscape can be as deep as 200cm (Thomas et al. 2002, 41–43).

3.1.4 Flora and Fauna

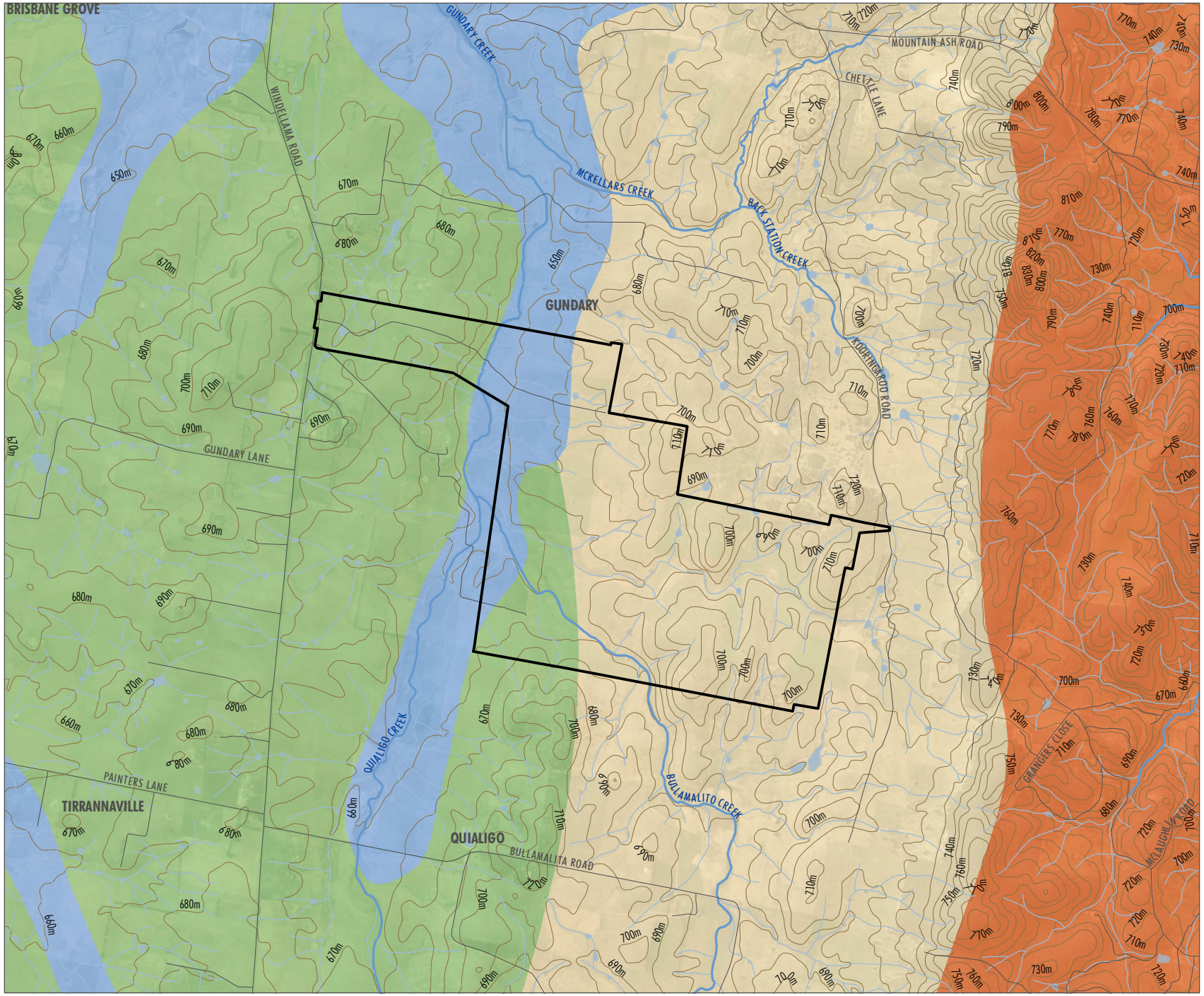
The Project Area is expected to have once been covered by vegetation similar to the Southern Tableland Grassy Woodlands vegetation class. This vegetation class comprises of open eucalypt woodland 15-30 m tall (canopy height), with a sparse non-sclerophyll shrub stratum and continuous groundcover of grasses and herbs. Trees common in this vegetation type include Blakeleys red gum, apple box, red stringybark, yellow box, bundy, broad leaved peppermint and candlebark. Shrubs include silver wattle, blackthorn, native cherry and peach heath, while common forbs include blue flax lily, kidney weed, small St John's wort, variable plantain, swamp dock, speargrass, spiny headed mat-rush, common bog rush and kangaroo grass (Keith 2004).

This vegetation community would have provided a variety of foods and raw materials for Aboriginal occupation in the area. The fruits of the native cherry and blue flax lily are edible as well as the seeds of wattle, spiny-headed mat-rush, and kangaroo grass. The wood and bark from eucalypts could be used to make tools, vessels, shelters and rope, and the leaves and bark of many plant varieties could be used to make string or woven into bags and baskets (Nash 2004).

The woodland would provide the habitat for kangaroos, wallabies, emus, possums, gliders, bats, emu, echidna, birds, snakes, and lizards. These faunae could have provided a source of food and their hides could have been used as a resource to make clothing. The Gundary and Bullamalito Rivers were also likely to have been an important source of eels, fish, and mussels and other food sources such as birds and bird eggs. The Mulwaree area was particularly known for its black swans. The plentiful flora and fauna that occurred within the Project Area and surrounds would have made it a favourable location for collecting resources during the Holocene.

FIGURE 3.1

Landscape Context

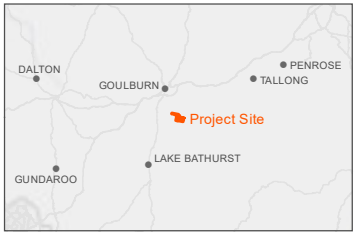


Legend

- Road
- Contours (10m)
- Watercourse (Perrenial)
- Watercourse (Non-perrenial)
- Project Area
- Waterbody

Soil Landscapes

- Bullamalita
- Collector Creek
- Gundary
- Midgee



0 1 2

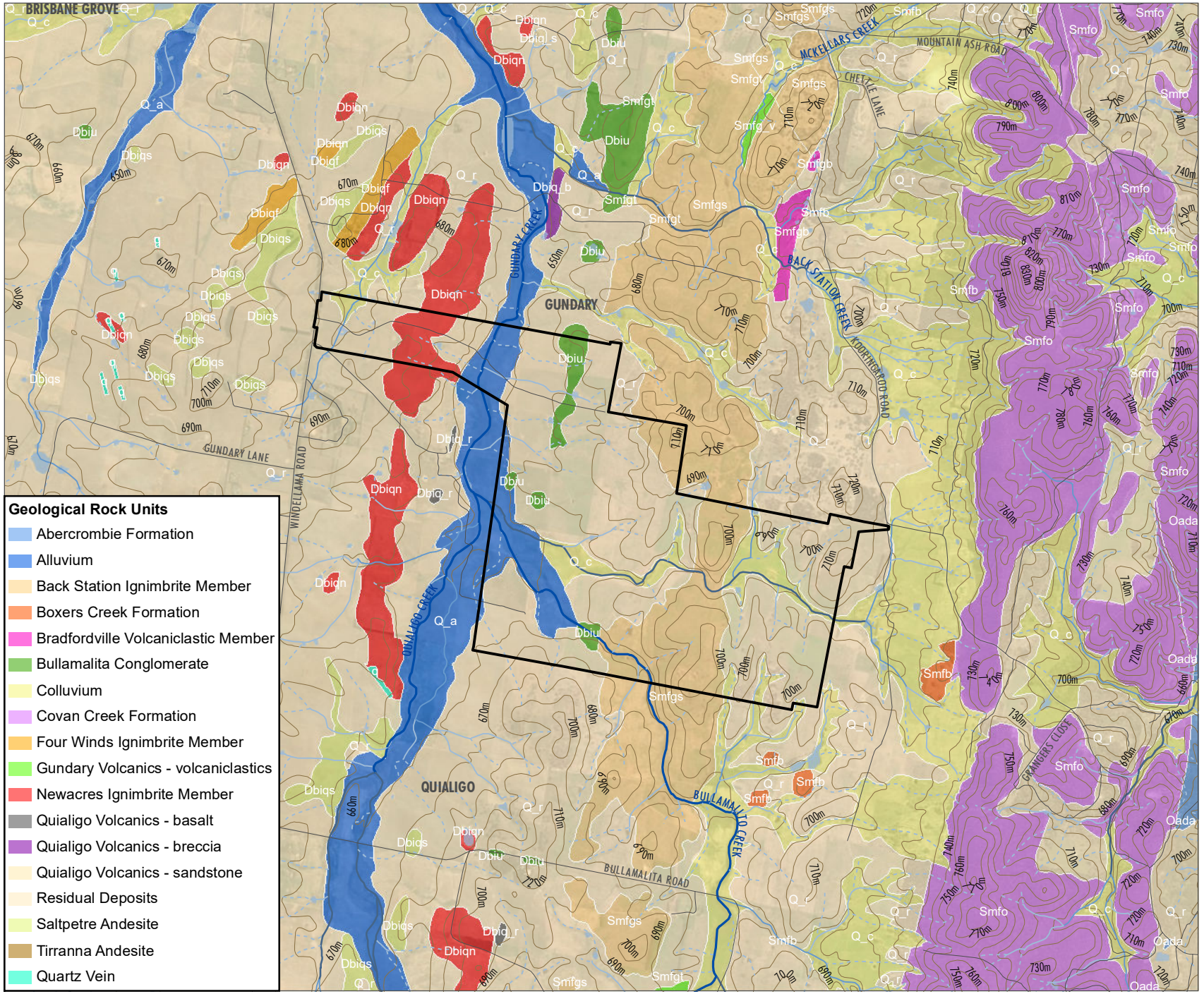
Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

FIGURE 3.2

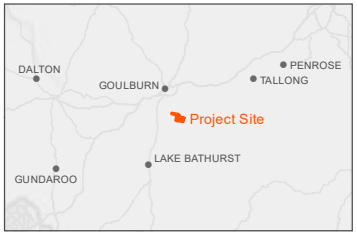
Geological Context



Road
Contours (10m)
Project Area
Waterbody

Strahler Stream Order

1st Order Stream
2nd Order Stream
3rd Order Stream
4th Order Stream
5th Order Stream or Higher



0 1 2

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

3.2 Land Use History

The Project Area, located to the south of the Goulburn township, is located within land grants made to Thomas and William Bradley in 1831 and 1834 (Heritage NSW 2006) (**Figure 3.3**). A newspaper article from 1894 describes the subdivision of the William Bradley's Gundary estate, "suitably divided into 185 dairy, agricultural and pastoral farms, ranging from 5a. to 1000a. each" (Freeman's Journal 1894).

The Project Area passed through several hands before being purchased by a syndicate who attempted to subdivide the land by 1882. In 1902, Mr A.R Maple Brown purchased a large but irregular portion of property, and within several years negotiated for some adjoining blocks to create 'Gundary Plains' a property of slightly more than 10,000 acres. Modifications to the land included substantial plantings of trees (including pines), shrubs and orchards. The Gundary Plains property was successful in the breeding of merino sheep (The Australasian 1930).

Historical aerial imagery from 1974 (**Figure 3.4**) shows the Project Area as almost completely devoid of trees, and divided into agricultural lots, which has been used for sheep and cattle grazing. This is in sharp contrast to land further to the east seen in the photograph that still contains remnant intact vegetation.

Based on the provided information, it is considered that the entire Project Area has been impacted by tree clearance, cropping and ungulate grazing. Sheep and cattle would have traversed the Project Area for approximately 200 years. From this, it is expected at least the top 10 cm of soils are disturbed; and thus, artefacts may have been displaced, but not removed, from the Project Area. Furthermore, the level of displacement would be more intense around re-worn animal tracks and dams. Although it is not clear in the historical background, it is assumed there would have been some cropping in parts of the site, as well as planting of shrubs and orchards, which would also have caused disturbance to the upper layers of soils. Despite this disturbance, research has shown that shallow open sites (<50 cm of artefact bearing deposits) subjected to land use such as grazing, still may retain chronologically meaningful vertical distributions, based on temporal phases of artefact accumulation (White 2018).

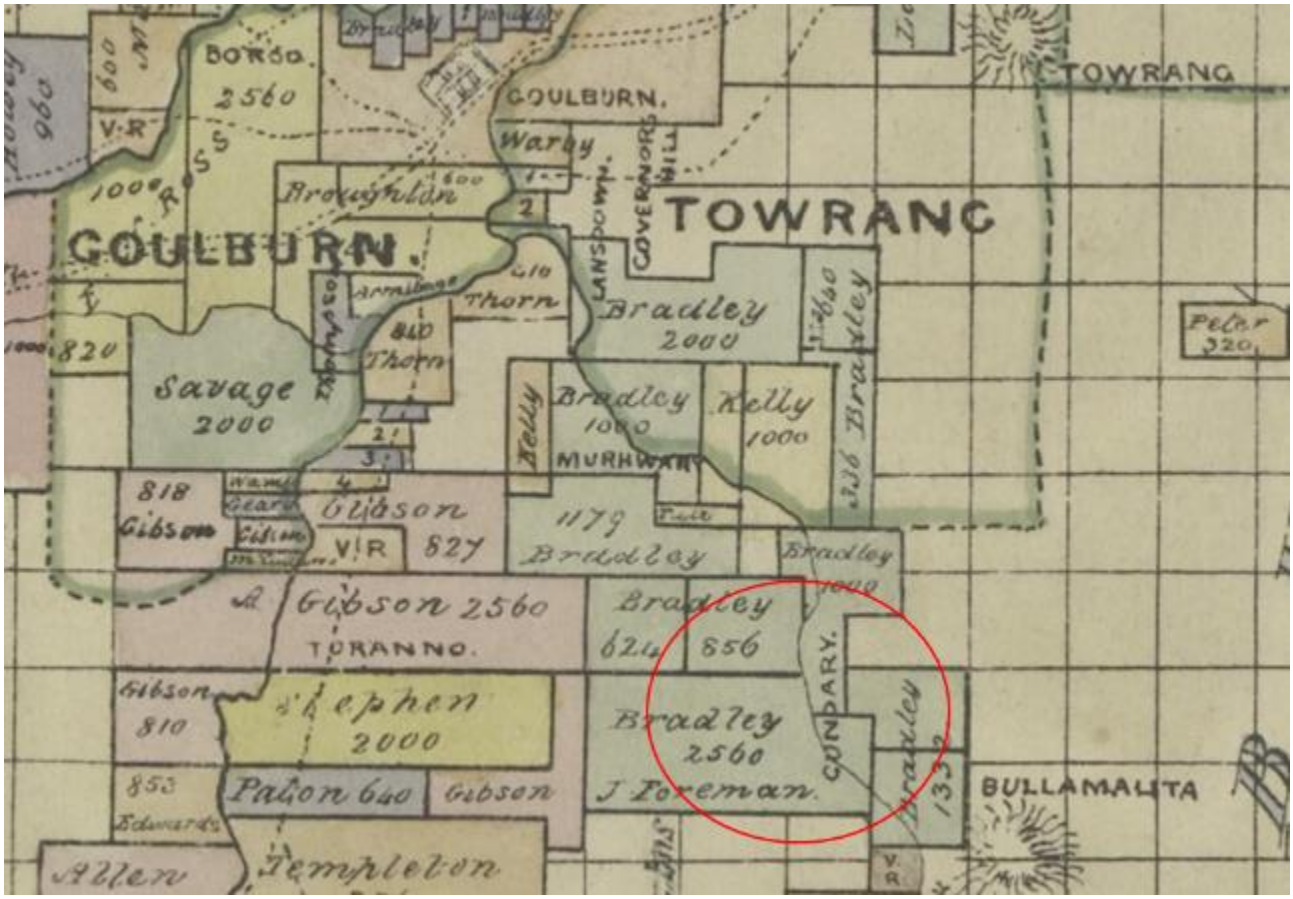


Figure 3.3 Excerpt from the 1843–1846 Bakers Map of the County of Argyle, showing early land grants in the region (the Project Area is circled in red)

Source: State Library of NSW.

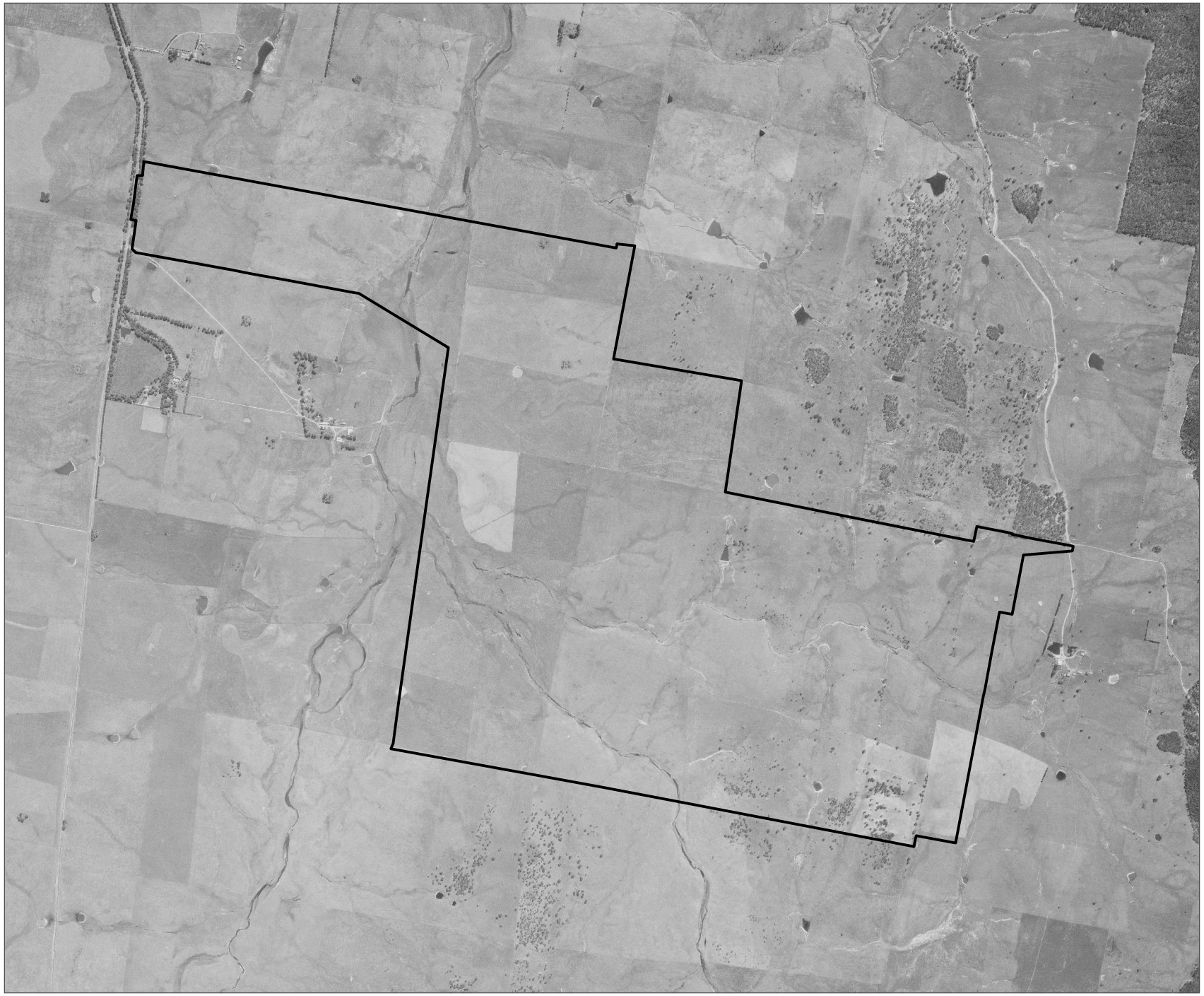
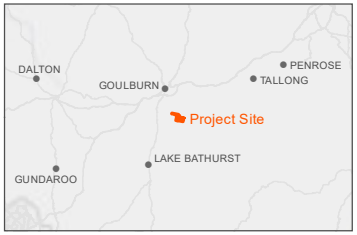


FIGURE 3.4

Historical Aerial - 1974

Legend

Project Area



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Kilometers

Scale: 1:0 at A4

GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

4.0 Aboriginal Cultural Context

4.1 Premise

To adequately understand and assess the Aboriginal cultural heritage values of an area, it is necessary to also understand the cultural context of the area. The term cultural context encompasses both ethnographic information regarding how Aboriginal people lived in the region during the period of non-European settlement and the archaeological context relating to physical evidence.

4.2 Historical Records

Historical records, such as official records and personal observations recorded in diaries or publications, can provide information on the Aboriginal history of a region since European contact. Although a valuable source of information, the limitations of these documents must be recognised as colonial observers generally tended to record unusual rather than everyday events, religious and social life rather than economic activity, and men's behaviour rather than that of women and children. As such, ethnohistorical records are neither unbiased nor complete, and they cannot provide a complete understanding of Aboriginal beliefs and practices at the time of contact.

4.2.1 Traditional Country

Early historical records indicate the cultural groups (often referred to as 'tribes') in which Aboriginal people lived. From these sources and linguistic evidence, researchers have interpreted the existence of 'Nation' groups, where a common language was shared among the smaller groups within the area.

Early historical evidence indicates that the Goulburn region (also referred to in the historical texts as 'Argyle County') was the territory (or 'hunting grounds') of several groups ('tribes'):

- Burra Burra (alternative spelling Burrah Burrah) (Goulburn Evening Penny Post 1937; McAlister 1949; 1907).
- Mulwaree (alternative spelling Mulwarie) (McAlister 1949; 1907).
- Cookmai (alternative Spelling Cookbundoon; sometimes also linked to Mulwaree group) (Evening News 1902).
- Tarlo (McAlister 1949; 1907).
- Woollondilly (McAlister 1949; 1907).
- Linguistic evidence compiled by Tindale (1974) indicates that all of these groups were likely Gundungurra-speaking (alternative spellings Gundungara, Gandangara, Gandangarra), explaining that Gundungurra Country ran from Goulburn and Berrima, down the Hawkesbury River (Wollondilly), to about Camden. He also referred to the area 'east to beyond Goulburn' as being Ngunnawal (alternative spelling Ngunawal) Country (Tindale 1974). Linguists who have worked on Gundungurra and Ngunnawal recognise there is a close relationship between the two (Wafer and Lissarrague 2008, 105).

Ann Jackson-Nakano (2001) and Jim Smith (1992), using historical sources and Tindale (Tindale 1974), identified that the Gundary area was located near the intersection of two Gundungurra speaking sub-tribes or bands, being the Mulwaree (Mulwarie or Cookmai) and Parramarragoo. Jackson-Nakano suggests neighbouring groups to the south and west of the Mulwaree and Parramarragoo were the Pajong (Gundungurra speaking), Moolinggoolah (Ngarigo speaking), Kamberri (Walgalu speaking) and Wallabalooa (Ngunawal speaking) (Jackson-Nakano 2008). Smith indicated that the country of the Parramarragoo stretched as far as Bungonia and Marulan and may have included country from the Wollondilly River to the Shoalhaven. The blanket distribution lists for the Parramarragoo suggest that this group gathered for their blankets at Lumley, Inverary Park and Reevesdale up until 1843, when the blanket distribution was centralised at Goulburn (Jackson-Nakano 2001, 11).

There is evidence that the Gundungurra groups had interactions with Ngunnawal Groups. John Lhotsky, reporting travels from 1834, indicate that Groups around Lake George, known Ngunnawal Country, travelled as far as Goulburn and Yass Plains (Lhotsky 1979, 104–5). Ngunnawal connections to Gundary can be linked to the present RAP groups who were involved in fieldwork. The Caroll family (representing MHC, KACHS, MCS) noted that their Great-Great Aunty, Janett Brown from Binalong (born in 1874) is a Ngunnawal descendent who married John Frederick Kearns from Goulburn, who was born in Gundary.[4]

Overall, Aboriginal community consultation has indicated that both Gundungurra and Ngunnawal people today identify Gundary as being within their traditional lands.

4.3 Historical Information

Early colonial records from the 1830s describe the hunting techniques, food sources, clothing and ornamentation, manufacture and use of tools, weapons, implements and shelters, of the Goulburn Mulwaree region, as well as describing the initiation ceremonies, burials, leisure activities, relationships with surrounding groups and interactions between Aboriginal people and Europeans. It was likely that the Ngunnawal and Gundungurra travelled south to the Bogong Mountains to attend large seasonal gatherings up until the 1850s where feasts and corroborees were held in moth hunting season (Flood 1980, 71).

After the Government introduced the distribution of blankets to Aboriginal people in 1814, blanket distribution lists became important records for determining the number of Aboriginal people in an area. One local history asserts that blankets and rations were distributed by William Bradley at Lansdowne, where Aboriginal people camped on the hill near his homestead in the 1840s and 1850s (Wyatt 1972 in; AMBS 2012, 22).

The ethnohistorical record provides an indication of the rich cultural material of Aboriginal people in the past. Most of this evidence, having organic properties (possum skin cloaks, wooden implements, fine jewellery, ochre) does not preserve within archaeological deposits except under extraordinary circumstances.

[4] As confirmed in a Marriage Transcription from NSW Registry of Births, Deaths and Marriages.

European people witnessed traditional funerary customs, and burial methods changed over time (Byrne 2007). One of these people was William Romaine Govett, who published a series of articles in *The Saturday Magazine* describing the Aboriginal people of the County of Argyle (including Goulburn), and their customs. Govett reported witnessing three women sitting at the graveside of an unknown individual near Mount Wayo (approximately 34 km north-west of the current Project Area). In a public demonstration of grief, they reportedly made small cuts on the back of their heads with axes and wept until they were exhausted (Govett 1977, 44–45). Govett reported this type of earthen mound burial at Wayo was not common and there are only a few descriptions of this type in the Goulburn Mulwaree region. Govett described it as a dome shaped mound approximately 3 feet high (90 cm), surrounded by a flat gutter or channel that had an outside edge of clay. Trees around the grave had been incised with stripes, zigzags and other designs (Govett 1977, 44) (**Figure 4.1**). Other types of burial included burials deep within caves (such as at Bungonia Caves) (AMBS 2012, 21). Generally, the historical records suggest that burial sites (as well as ceremonial sites) are likely found on hilltops (Lance and Koettig 1986, 25). For instance, near Goulburn and Kugolong, Aboriginal people ae known to have been buried in raised graves on the hill to the east of 'Lansdowne House', with some of these graves still seen in the 1860s (Barker Ryan Stewart and Sue Rosen and Associate 2018, 16).

Tools and weapons of the Ngunnawal and Gundungurra people included spears, woomerahs (which doubled as paddles when fishing in canoes), hatchets, shields, clubs and boomerangs. An illustration by Govett in 1836 shows the weapons used by Aboriginal men (**Figure 4.2**), while the tools and implements of Aboriginal women were described as nets (made from Kurrajong fibre) and digging sticks (AMBS 2012, 17).

The bark of stringybark and box trees (*Eucalyptus sp*.) was used for making gunyas (shelters). Fire was used to mould the bark, which was then fixed to the ground as a windbreak, and a fire made at the open front of the shelter (AMBS 2012, 2019).

A surgeon, George Bennet, provided an account of the adornment of Aboriginal groups gathered at Goulburn on Christmas day in 1832. People wore a mix of traditional dress and European style clothing. Women decorated their hair with grease and red ochre and adorned themselves with kangaroo incisors, possum tails and the extremities of other animals. Some wore fillets (head bands) bound around their foreheads and daubed with pipe clay. Pipe clay was also used to decorate the upper body, including the face, breasts and arms. Men wore red ochre and fillets, and some hung feathers from the Sulphur crested cockatoo from their beards (Bennett 1967, 1:323–26) (Bennet 1967 [1834]:323-326).

There are numerous references to what has become known as 'bunyips' and other large creatures across Gundungurra Country including recordings as close to the Project Area as Mulwaree River (Goulburn Post 1993). In 1818 exploration of southeastern NSW, Hamilton Hume (travelling with Charles Throsby and James Meehan) claimed to have found the bones of a strange, aquatic creature, describing them as resembling a hippopotamus (later interpreted as potentially being the fossilised remains of a diprotodon) (Lamb 2019, 9–10)). Jennifer Lamb's (2019) reading of Meahan's 1818 journal indicates Hume found the bones of that large creature on the Mulwaree River nearby to present day Springfield. Gundungurra legend that a 'bunyip' lived in a swimming hole in Eastgrove (Goulburn) known as "The Deep" (Goulburn Post 1993).

Describing the Country between Windenmella and up the Mulwaree River (land which is in around the vicinity of Gundary Plains), Meehan states *they met a very extensive plain to the northward and eastward without trees... the landscape is beautiful being surrounded by a chain of grassy forest hills. To a person in the habit of seeing nothing but forest or brush land such an extent of clear land must be very novel and delightful'* (Lamb 2019, 10). The explorers further travelled away from the Mulwaree River (described as a chain of ponds) and travelled east-north-east to what was a '*large plain- good pasture*', presumably around Gundary Creek and Goulbourn Airport (Lamb 2019, 10).

Lamb (2019) has interpreted that the '*good pasture*' in Gundary and the plain surrounding was because Aboriginal people were using fire to shape the vegetation, noting that Joseph Wild (travelling Lake George region in 1820), noted that '*the grass had been burnt in the neighbourhood of the lake by the natives and it was springing into nice feed*' (Lamb 2019, 13). This is supported by evidence of deliberate cultural burning from other parts of Australia (Gammage 2012; Pascoe 2014).

Beyond likely association of Gundary with the 'grassy forest hills' and 'clear land' observed by early historical records, no further historical records have been identified relate directly to the Project Area noting there are many important sites within the surrounding cultural landscape. Mulwaree Aboriginal Community Inc [5]identified several important artefacts and sites in the area, including the breast plate of King John Cry found in Tirrannaville to the west of the Project Area. Similarly, they spoke of scar trees located East of the Project boundary (exact location culturally sensitive, but outside the Project Area).

Figure 4.1 Three women mourning at a grave near Mount Wayo

Source; Govett 1977 [1836–7]:44.

[5] Aboriginal Heritage Community Consultation email, dated August 2023.

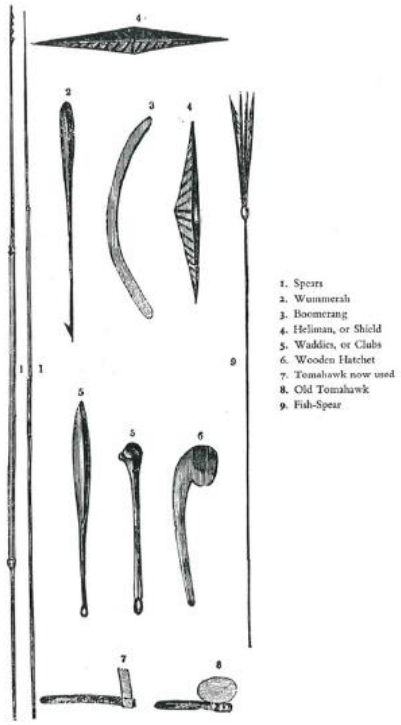


Figure 4.2 Aboriginal weapons drawn by Govett in 1836-1837

Source: (Govett 1977 [1836–7], 12).

4.3.1 Ethnohistorical Implications for the Archaeological Record

Historical records indicate that organic materials like wood, bark and other plant fibres, shell, bone and animal skins were integral to subsistence. However, these are not likely to have survived to form part of the archaeological record. Although stone tools are rarely mentioned in historical accounts, many of these were made when modern materials, such as iron and glass, would have been preferred over stone. Overall, stone, iron, and glass Aboriginal objects would be the materials most likely to have survived in the archaeological record.

Aboriginal burials were often marked by carved trees and mounds and are known to have occurred in the wider region. Burials also may have been in hollow trees or caves. Such carved trees or tree hollows may remain in uncleared areas. Trees were also scarred by bark removal for huts, toeholds for tree climbing and marking for ceremonies. These may remain in uncleared areas. The sizes of individual camps are often difficult to define archaeologically, as many sites are the accumulation of repeated camp occupation and not singular camping events.

4.4 Archaeological Context

The earliest archaeological evidence of occupation from the Goulburn region is the Birrigai rock shelter in the northern foothills of the Australian Alps, approximately 80 km south-east of the Project Area. Radiocarbon dates obtained from charcoal deposits at the site have established that Aboriginal people have lived in this region for at least 21,000 years (Flood 1996). A Late Pleistocene occupation site has also been identified approximately 50 km east of the current Project Area in what is now Morton National Park, at Bulee Brook 2, with dates of approximately 18,810 years before present (BP) (Boot 1996, 288).

Previously recorded sites within the Goulburn Mulwaree region generally occur in the vicinity of watercourses, in elevated areas, and in areas with suitable geology or mature vegetation (AMBS 2012). Most details of known Aboriginal archaeology in the region are contained in the Aboriginal Heritage Information Management System (AHIMS), which is discussed below.

4.4.1 Aboriginal Heritage Information Management System (AHIMS)

A search of the AHIMS was undertaken on 21 November 2022 covering GDA Zone 55, Eastings 740000 to 770000, Northings 6129000 to 6145000 which encompassed the Project Area with a buffer of 5–20 km (as shown in **Figure 4.3**). The search produced a result of 65 valid sites. An updated AHIMS search was undertaken on 28 May 2023, with 66 valid sites found (**Appendix B**). One restricted site was identified in the Project Area. Subsequent consultation with Heritage NSW identified that this site is not within the Project Area. On 9 April 2024, before the lodgement of the EIS, another AHIMS Search was undertaken in Eastings 740000 to 770000, Northings 6129000 to 6145000. This confirmed that the 19 sites recorded as part of archaeological investigations for the Project in 2023 had been successfully registered on the AHIMS. Additionally, two other sites had been registered since 28 May search: TL5_171_IA (51-6-0981), a new artefact site registered in Tirrannaville (site approximately near 7 km west of the Project Area); and Ardmore OS-2 (51-6-0985) a new artefact site located in Bungonia (approximately 15 km southeast of the Project Area. This new search is also saved within **Appendix B**.

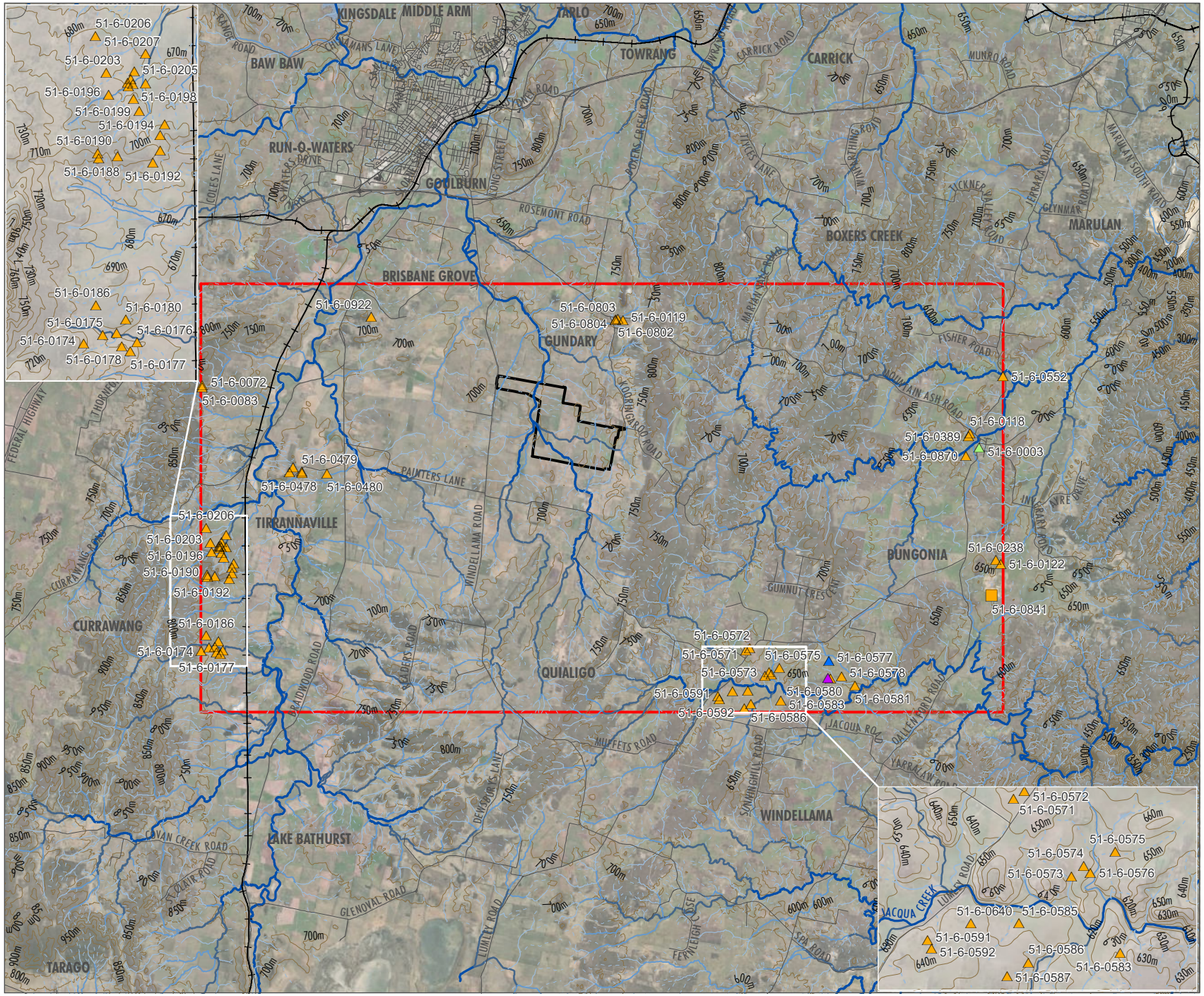
As seen by **Table 4.1**, based on results from the 28 May 2023 AHIMS search, the most common site type in the region is Open Artefact Sites. Stone artefacts dominate the archaeological record as they have a much higher preservation rate than other archaeological materials. The clustering of sites is indicative of stone artefact sites being located during test excavations and surveys, therefore are mostly indicative of areas where development work was proposed and the area subsequently subject to archaeological investigation, as opposed to reflecting the movement of Aboriginal people in the past. A number of these investigations are detailed in the next section.

Table 4.1 AHIMS search results (based on 28 May 2023 AHIMS Search)

Site Types	Count (n)	Percentage of Total
Open Artefact Site	62	93.94%
Culturally Modified Tree	1	1.52%
Grinding Groove	1	1.52%
Quarry and Artefact Site	1	1.52%
Restricted Site	1	1.52%
Total	**66**	**100%**

FIGURE 4.3

AHIMS Search Results (based on 21 November 2022 Search)



Legend

- Road
- Railway
- Contours (50m)
- AHIMS Search Extent
- Project Area
- Waterbody

AHIMS

Partially Destroyed

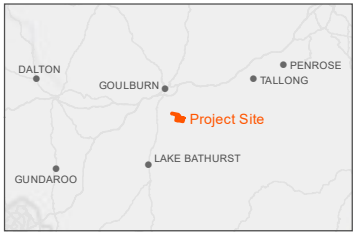
- Open Artefact Site (1)

Valid

- Culturally Modified Tree (1)
- Grinding Groove (1)
- Open Artefact Site (61)
- Quarry and Artefact Site (1)

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher



0 2.5 5

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

4.4.2 Regional Context

The earliest archaeological evidence of occupation from the Goulburn region is the Birrigai rock shelter in the northern foothills of the Australian Alps, approximately 80 km south-east of the Project Area. Radiocarbon dates obtained from charcoal deposits at the site have established that Aboriginal people have lived in this region for at least 21,000 years (Flood 1996). A Late Pleistocene occupation site has also been identified approximately 50 km east of the current Project Area in what is now Morton National Park, at Bulee Brook 2, with dates of approximately 18,810 years BP (Boot 1996, 288).

Arguably the largest archaeological investigations have occurred in the region since the mid 2000s and have been in response to quarrying/mining in the Southern Tablelands. The archaeological investigations for these developments have been completed in similar open rural agricultural settings to that of the current Project Area. The report summaries below provide insight into key regional studies.

Umwelt, 2005–2015, Archaeological Investigation (and Salvage) Lynwood Quarry Marulan

For 10 years, Umwelt worked on Aboriginal Heritage for the Holcim Lynwood Quarry, located approximately 25 km northeast of the Project Area. Holcim received Development Consent to establish the Lynwood Quarry west of Marulan, NSW, in 2005. This was followed by a long history of assessments and investigations.

In 2013, a salvage report was released for the project, which reported on the results of all previous stages of the Project. In terms of site presence, the survey, monitoring, surface collection and subsurface testing results indicate that within the project impact footprint, spur crests, spur crests and adjoining low gradient slopes and very gentle slopes in the riparian corridor were the predominant landforms with evidence of Aboriginal occupation both surface and subsurface. A total of 5,217 artefacts were recovered from the testing and salvage program within the project impact footprint (526 artefacts from the surface assemblage and 4691 artefacts from the subsurface assemblage). Quartz and silcrete were the dominant archaeological material identified. Other raw materials included quartzite, chert, chalcedony, dolerite, basalt, petrified wood, hornfels, ignimbrite, aplite and possibly glass. It was found that landform and gradient were better predictors of site location, while resource availability (food and water) and cultural context (specifically for the Lynwood Quarry project area activities related to ceremony) were better predictors of site size and site content (Umwelt 2013).

The density model for the site found that regional archaeological context indicates that artefact densities of approximately 20 per square metre is considered of moderate to high artefact density.

ERM (2006–2013), EMM (2021) Archaeological Investigation (including Salvage) and Archaeological Management Plan – Peppertree Quarry

In 2006, ERM undertook a survey of the Boral Peppertree Quarry, located approximately 25 km northeast of the Project Area. A series of open sites containing one or more Aboriginal flaked stone artefacts.
In general, the archaeological evidence suggested a low density of stone artefacts spread widely across the landscape, with an overall low scientific value. The exception to this was the area around Tangarang Creek; multiple were identified with moderate scientific significance for the density and frequency of artefacts (including raw materials and artefact types) across the different landforms, and were associated with Potential Archaeological Deposits (PADs) with the potential to contribute to archaeological research in the region (ERM 2011, 3).

In 2010, additional geotechnical works occurred, and an additional ten new Aboriginal sites were identified (the majority of these sites were salvaged). The resulting management plan, which was intended to be updated throughout the quarry's lifespan (to be decommissioned in 2038) recommended a management strategy to offset the impacts through a combination of Aboriginal community involvement and archaeological excavations.

Salvage excavation commenced in between 2011 and 2013. The first phase involved laying out transects within the landscape in and around Tangarang Creek for test pitting to determine the areas for open excavation. The transect locations were determined through knowledge gathered during earlier archaeological assessments and Aboriginal community consultation. Following the definition of the extent of the Aboriginal archaeological deposit, the open area location(s) were determined. A total of ten open area trenches were initially expanded beyond the 50 cm x 50 cm test pit size. Of these, eight trenches were expanded beyond 1 m by 1 m. A total of 22,610 pieces of artefactual stone were identified. Of the objects salvaged, the vast majority of artefacts were stone flakes, the resulting by-product of stone tool manufacture, indicating a strong Aboriginal occupation over the study area. Other objects/features were a stone arrangement, believed to be a burial located adjacent to Dam 1, three stone ovens, a number of possible hearths and a possible post hole potentially relating to a Gunyah.

In addition to these excavations, extensive topsoil monitoring was undertaken throughout the construction of the quarry; as of 2021. EMM updated the management plan for the site in 2021, documenting that over the past 8 years topsoil monitoring had occurred over 50 ha of archaeologically sensitive landscape features. The monitoring involved triggers to undertake salvage excavation of 1 m x 1 m squares where high densities of artefacts were observed during the monitoring process, and this salvage process has resulted in approximately 90 000 artefacts being collected as part of the Peppertree Quarry archaeological management to date (EMM 2021, 39).

The use of a density of 50 artefacts per 1 m square was identified as a benchmark for the expansion of excavation areas, based on the archaeological character of the region, such as at Lynwood Quarry, mentioned above, approximately 7 km northwest. Although the Lynwood Quarry indicated that artefact densities of approximately 20 per m squared is considered of moderate to high artefact density. Comparable landforms from the quarry excavations at Tangarang Creek (1 km north) featured artefact densities of between 70 and 100 artefacts per square m, with some areas displaying very high artefact density of between 100 and 200 artefacts per square m, and in one instance, a 1 m x 1 m pit contained 1722 artefacts (EMM 2021, 50).

Marulan South Limestone Mine: ERM 2006, RPS 2009, EMM 2019, Marulan South NSW

Directly adjacent to Peppertree Quarry, Boral's Marulan South Limestone mine has been the subject of several Aboriginal cultural heritage assessments. The landscape featured a gently undulating limestone plateau at the edge of Bungonia Gorge. Initial assessments by (ERM 2006), identified an open artefact site adjacent to Bungonia Creek. Subsequent investigations by RPS identified (2008) identified further open stone artefact sites in association with drainage lines.

A larger scale investigation was conducted by EMM in 2015 over a proposed expanded mine footprint and dam area to the north at Marulan Creek. The archaeological survey identified 57 surface stone artefact sites, and the test excavation identified subsurface material at 17 of these sites.

The archaeological results indicated that Aboriginal occupation extended across the entire geographic extent of the project site but is better evidenced by surface material in the main project site than through archaeological excavation (possibly due to factors such as poorer eroded soils and also less favourable landforms for occupation). In contrast, the results of the archaeological survey around Marulan Creek are an example where surface artefacts were only revealed by stream bank erosion and nearby subsurface deposits on a broad spur (MSL 046, MSL 057, and MSL 047) were covered in thick grass. The test excavation results indicate that Marulan Creek is likely to have experienced more intensive Aboriginal occupation on prominent landforms, possibly similar to that bordering Tangarang Creek and its tributaries as evidenced by investigations at Peppertree Quarry.

Additionally, a Women's Cultural site was identified at Marulan Creek which was assessed to have high cultural significance (not mentioned in detail due to its sensitive nature). The Project was redesigned to prevent all direct construction impacts on this site.

EMM 2016 Gunlake Quarry Extension Project, Brayton 7 km north-west of Marulan NSW

In 2015-2016, EMM Consulting completed an ACHA for the Gunlake Quarry Extension project which is 7 km north-west of Marulan NSW. The archaeological survey component of the ACHA sampled hill spurs, hill slopes, foot slopes and stream channels. The survey team identified 15 Aboriginal sites. All of the Aboriginal sites were comprised of stone artefacts, made up of 12 open stone artefact sites and three isolated finds. The highest artefact frequencies were identified on a hill spur crest in the proposed quarry embankment area and comprised a site where 281 artefacts were counted on the ground surface. The remaining sites contained less than 20 artefacts each and were found on hill spur crest, foot slope and stream bank landform elements. The archaeological test excavation program aimed to characterise the subsurface archaeological deposit of known surface sites and surrounding landforms in the extension area that had limited ground surface visibility. The excavation comprised eight test pit transects made up of 1 m x 1 m test pits. In total, 42 m squared was excavated. Eighty-nine artefacts were recovered from the 42 test pits which equates to an average frequency of 2.12 artefacts per m squared. One third of test pits contained one or more artefacts and the majority of artefacts (92%) were recovered from the top 20 cm of soil. Artefact frequencies per 1 m x 1 m square ranged from zero to 35. The paucity of subsurface artefact frequencies in all tested areas was attributed to the poor integrity of the soil deposit, which was severely truncated by erosion. It was concluded that the surface artefact distributions offered a better representation of the local archaeological record.

4.4.3 Local Context

Koettig, 1983, Survey for Aboriginal/Historical Archaeological sites, Goulburn

This report (Koettig 1983) outlines the survey of the proposed Goulburn Bypass, commissioned by the Department of Main Roads. The survey area consisted of a 200 m wide easement extending 11 km, located approximately 8 km north of the current Project Area.

The study area was surveyed on foot. The survey resulted in the identification of 22 Aboriginal Heritage sites, 17 isolated finds and two historical sites. Ten of the Aboriginal sites were located beyond the impact zone and 12 were within the impact zone. One of those within the impact zone was considered relatively "rich" in density of artefacts and so it was deemed necessary to undertake test excavations.

This area was located on a different landform to the rest of the study area, being a ridge or terrace directly beside the Mulwaree River. Although the excavation showed that the top 10 cm of soil had been disturbed by ploughing, artefacts were found to a maximum of 70 cm below the surface (Koettig 1983).

All sites were within 200 m of a watercourse, with 68% within 100 m. Raw materials included predominantly silcrete and quartz with a minor component of quartzite, fine grain siliceous, fine grain igneous and mudstone. Artefact types included flakes, retouched flakes, cores, as well as 2 hammerstones and an axe of fine-grained igneous material. It was noted that much of the study area had been cleared and overgrazed leading to massive movement of deposit down the hillslope and onto the flats, suggesting that the depositional contexts of these sites was severely disturbed.

Recommendations were for the protection of sites beyond the impact zone and consent to destroy for the sites within the impact zone.

Lance and Koettig 1986 Aboriginal Resources Planning Study for the City of Goulburn

Lance and Koettig (1986) used archaeological, ethnographic and environmental data and a sample survey to develop an Aboriginal site location model for Goulburn. The overall aim of the study was to identify the location of known sites in the Goulburn and to determine the nature, distribution and significance of other Aboriginal sites which may be in the Goulburn. The study was primarily concerned with the Goulburn CBD area and did not cover the current Project Area.

Based on relevant archaeological, ethnographic and environmental information for the Goulburn area and wider Southern Tablelands region, four environmental zones (major watercourses, undulating hills and plains, hill tops and built-up areas) were categorised, each with an archaeological sensitivity and site significance rating. An analysis on site distribution indicated that over 74% of stone artefact scatters in the Goulburn region were within 100 m of water, and of these, more 65% of these were nearer than 50 m to a water source (Lance and Koettig 1986, 27). In addition, the most favourable landscape setting for campsites (and therefore where most stone artefact scatters occur) was gentle, well-drained lower slopes, followed by ridgetops and creek flats.

Koettig, 1987, Test Excavations, Goulburn

Test excavations were undertaken of Lot 2 DP702730, at the junction of Garoorigang Road and the Hume Highway south of Goulburn, after a number of isolated finds and an open artefacts scatter were located during a survey (Koettig 1987). Located on a broad, low ridge with a small knoll, approximately 10 km north-west of the current Project Area, the study area contained a tributary of the Mulwaree River.

A total of 72 TUs in nine transects were excavated. Artefacts were recovered from 20 excavation squares, with two concentrations on the crest of the ridgeline, both on low knolls. The number of artefacts in these TUs varied from 1 to 14, mostly silcrete and quartz. Artefacts included flakes, broken flakes, flaked pieces and three cores. The presence of a backed blade placed the site as middle to late Holocene. It was noted in the report that the excavation showed that the surface distribution of artefacts did not necessarily represent the subsurface distribution (Koettig 1987, 15).

Further excavation was recommended to enable further artefact analysis and intra-site patterning.

Fuller, 1989, Archaeological Investigation, Goulburn

This report details results of archaeological studies in the Goulburn City area, following preliminary predictive studies by Lance and Koettig 1986.

Fieldwork was undertaken over a month, and involved determining the existence, scale and significance of Aboriginal archaeological sites within the Goulburn city area, focusing on environmental zones deemed to be of potential high sensitivity. These zones were defined as major watercourses, undulating hills and slopes, mid slopes and built-up areas.

All sites located during the field investigations were scatters of stone artefacts. Seventeen archaeological sites and five isolated finds were located, with occupation centred around the exploitation of resources of the Mulwaree and Wollondilly Rivers. The results of the study corroborate the model devised by Lance and Koettig (1986) with some refinements. Alluvial flats and lower slopes adjacent to major watercourses are categorised as having high potential archaeological sensitivity, while hills and built-up areas have moderate to low archaeological sensitivity (Fuller 1989, 31).

4.5 Synthesis and Predictive Model

This section aims to summarise the background information presented in **Section 3.0** and **Section 4.0** and discuss its implications for the Project Area based on landscape analysis. This section of the report provides a preamble to the predictive model that follows. The predictive model provides more succinct predictive statements for site types identified within the Project Area.

The most common site type in the Goulburn region is Open Artefact Sites, identified through test excavation programs and surveys responding to development. Artefact assemblages in Goulburn include, silcrete, quartz, quartzite, fine grain siliceous, ‘chert’ and ‘mudstone’ (both of which can sometimes be identified as Indurated-Mudstone-Tuff (IMT); reference should be made to the lithic analysists recording system) and fine-grained volcanic rocks. Other site types in the region include modified trees (carved and scarred), burial sites, grinding grooves, quarry sites, and ceremonial sites.

Based on the information presented in this report, archaeological predictions for the Project Area are provided in **Table 4.2**.

Table 4.2 Predicted Archaeological Potential by Site Type

Site Type	Assessment	Potential for occurrence
Art	The topography of the Project Area, does not contain any outcrops or rock overhangs that contain potential for rock art.	Nil-Low
Artefact Scatters/ Isolated artefacts	Stone artefact scatters/isolated artefacts are likely to be present. It is anticipated that level to gently inclined landforms associated with perennial water courses may have higher artefact densities because of more prolonged and/or frequent occupation.	Moderate-High
Bora / Ceremonial	Such sites are especially susceptible to ground disturbance. Ground disturbance across the Project Area is likely to have significantly reduced the potential for bora / ceremonial sites to be retained.	Low
Burial	Given the nature of soils within the Project Area (being relatively shallow and highly erodible), and lack of ethnohistorical reports of extant burials, it is unlikely that buried human remains would remain extant.	Low
Contact site	The Project Area is on the boundaries of early European settlement within the area. However, there are no key features (such as historical homesteads, villages or former missions) within the Project Area where it would be expected that contact between Aboriginal and non-Aboriginal people may have occurred.	Low
Grinding Grooves	The Project Area does not contain the sandstone geology and outcropping that would typically be conducive for grinding grooves.	Low
Midden	The Project Area does not contain the type of tributary/watercourses that would have allowed for sustained resource gathering required for the creation of middens.	Low
Modified Trees	Scarred trees may occur within the Project Area where trees of suitable maturity and species (such as box, river red gum etc) occur. The impacts of land clearance and ongoing agricultural activities dictate that scarred trees are most likely within road reserves and on elevated/rocky areas not subject to extensive clearance.	Low
PADs	Subsurface potential will vary depending on past land use, levels of existing native vegetation, levels of disturbance and past major flood events. As noted by the predictive model developed by Lance and Koettig and refined by Fuller, it is considered highly likely there will be PADs with artefact sites adjacent watercourses, moderate potential for PADs with artefact sites in low hill areas, and low for the remaining landforms. This is further explored in the sensitivity model outlined below.	Low-High
Shelters	The topography of the Project Area, does not contain any outcrops or rock overhangs that contain potential for rock art.	Nil-Low
Quarries (stone or ochre)	Quarries are rarely located within the Goulburn region. Nevertheless, the geological formations underlying the Project Area (**Section 3.1.3**) suggest there remains potential for quartz outcrops, and any alluvium deposits in the area have at least some potential to contain silcrete and IMT pebbles.	Low

A predictive model has been developed for the region by Lance and Koettig (1986), which has subsequently refined by Fuller (1989). This model was summarised in the most recent Aboriginal Heritage Study for the region (quoted throughout this report) (AMBS 2012). Models developed as part of extensive archaeological investigations around Marulan have indicated that subsurface archaeological deposits in the Goulburn region are most likely to occur on the broad, low hill crests or spurs adjacent to watercourses (within 200 m) with good outlook over the landscape (see EMM 2021). Lance and Koettig (1986), and Fuller's (1989) categories do not accommodate this type of low crest or spur, as their categorisation appear mostly based on elevations of slope as opposed to morphology; hence the utilisation of a new category: low crests, (shown in **Table 4.3** and **Figure 4.4**). The category of 'slopes' has also been divided into those within (or not within) 100 m of perennial or non-perennial streamlines.

These predictions are shown in **Table 4.3**, in relation to the landform categories designated for this Project as illustrated in **Figure 4.4**. The archaeological investigations (survey and test-excavation) completed for this ACHA aimed to sample each of the designated landform categories, to confirm or refine this regional predictive model of stone artefact density.

Additionally, studies from Marulan (20–25 km northeast as presented in **Section 4.4.2**), which is the borderland between Gundungurra and Ngunnawal Country[6], provide some indication of archaeological subsurface potential in open rural landscapes of low rolling hills. Notably they provide indications of what is considered 'high artefact density' as opposed to 'low artefact density'; applicable to interpreting the scientific significance of any excavated deposits. Following EMM (2021), a very general way to categorise artefact deposits and guide further investigation in the region is: low artefact density is considered under 10 artefacts in a 1 m^2 area, moderate density is considered between 10 and 50 artefacts, and high density is considered over 50 artefacts. Areas over 50 artefacts per 1 m^2 warrant stronger focus of an archaeological investigations, as they may be indicative of more extensive nearby deposits. Excavations indicated that broad, low hill crests or spurs adjacent to watercourses (within 200 m) with good outlook over the landscape are known to have the highest sensitivity for subsurface archaeological deposits.

Notwithstanding, stone artefact densities alone do not dictate a site's cultural or archaeological significance or research potential, as the assemblage makeup, nature and integrity of deposit and their chronological makeup also play a large role in this matter. Instead, artefact densities have only been discussed as an indicator to guide archaeologists to landscape features that are likely to provide good samples for further research and analysis.

Table 4.3 Predictive Model for Archaeological Sensitivity for Landforms in Goulburn

AMBS Landform Category		Umwelt 2023 Landform Category	Umwelt 2023 Potential	Koettig and Lance 1986 Potential	Fuller 1989 Potential
Alluvial flats adjacent to major watercourses		Alluvial flats adjacent perennial watercourses	Low*	High	High
Undulating Hills and Plains	Lower slopes adjacent to watercourses	Slopes* adjacent (<100 m of) perennial watercourses	High	High	High
		Slopes adjacent (<100 m of) non-perennial watercourses	Moderate		

[6] As per consultation with onsite RAPs during fieldwork.

AMBS Landform Category		Umwelt 2023 Landform Category	Umwelt 2023 Potential	Koettig and Lance 1986 Potential	Fuller 1989 Potential
	Gently undulating land, or plains	Mid to upper slopes, not adjacent (>100 m of) watercourses	Low	Not assessed	Low
		Crests and ridges**	High	Not assessed	Not assessed
	Hills – low (<700 m ASL)	*Not assessed (not Project Area)*	*Not assessed (not in our Project Area)*	Low	Medium
	Hills – moderate (700–750 m ASL)				Low
	Hills – High (>700 m ASL)				Low
Hill tops**		*Not assessed (not in our Project Area)*	*Not assessed (not in our Project Area)*	Low	Low
Built-up areas		*Not assessed (not in our Project Area)*	*Not assessed (not in our Project Area)*	Moderate	Moderate

**Whereas it is predicted there is a high degree of sensitivity for raised, dry alluvial flats in the Goulburn region, the identified alluvial flats within the Project Area are generally water-logged floodplain, and it is considered these areas would not have been preferred for long-term habitation by Aboriginal people and are therefore given the low likelihood prediction.*

***Hilltops within the original Koetig and Lance 1986 Potential and Fuller 1989 Potential are assumed to be outside of undulating hills and plains on top of the very high hills present around the Goulburn Area. In contrast, the crests and ridges in the Project Area are part of the gently undulating plains.*

Source: (AMBS 2012, 25).

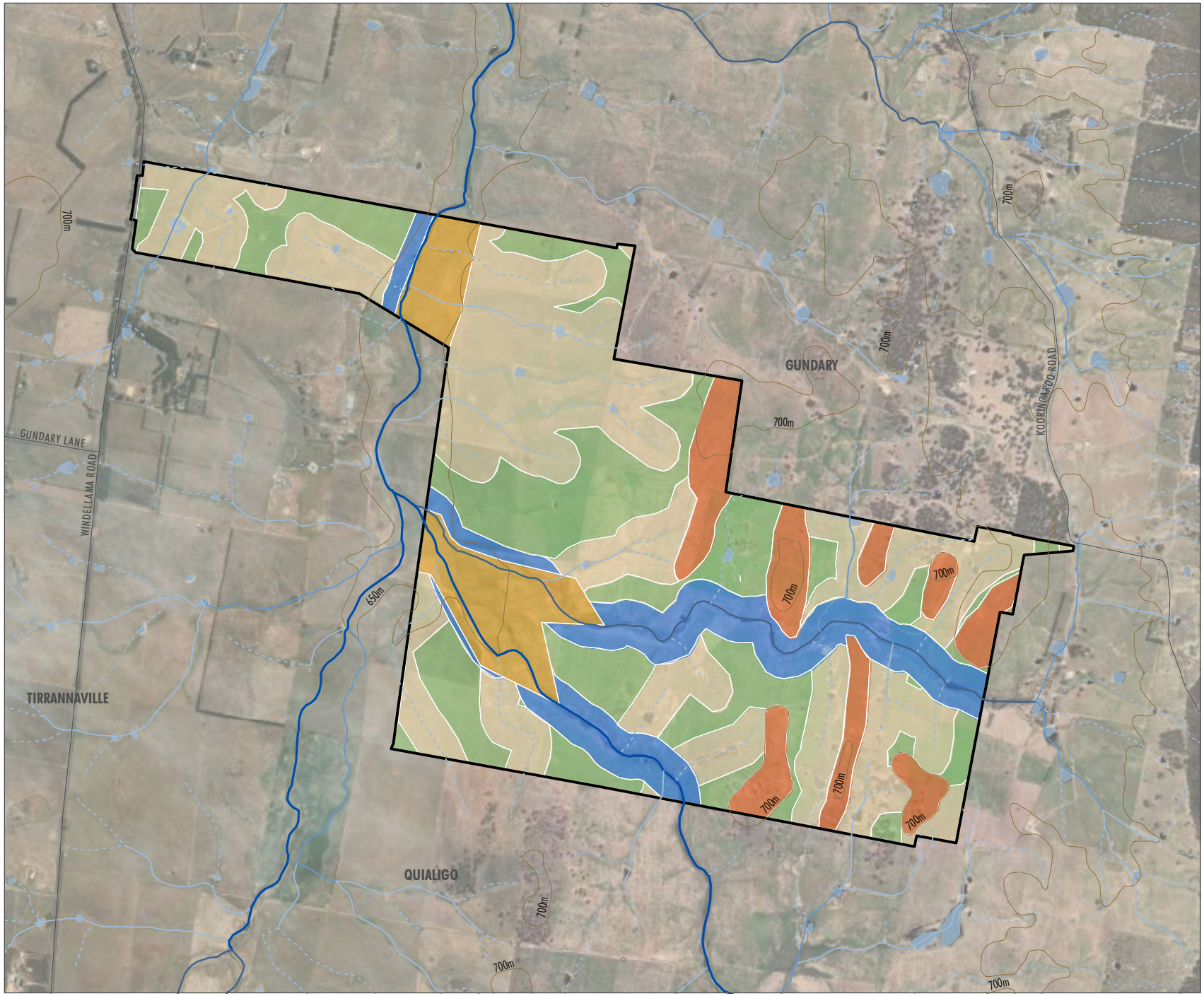


FIGURE 4.4

Designated Landform Units Across the Project Area

Legend

- Road
- Contours (50m)
- Project Area
- Waterbody

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher

Designated Landform Units

- Alluvial Flats Adjacent Perennial Watercourses
- Slopes Adjacent (<100m of) Perennial Watercourses
- Slopes Adjacent (<100m of) Non-perennial Watercourses
- Mid to Upper Slopes, Not Adjacent (>100m of) Watercourses
- Crests and Ridges

0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

5.0 Archaeological Investigations

5.1 Archaeological Survey

Umwelt conducted an archaeological field survey of the Project Area between 7 and 9 December 2022. The survey team comprised Taylar Reid (then-Umwelt Senior Archaeologist) and Alison Fenwick (Umwelt Archaeologist), and RAP representatives from Thunderstone, MHC, GARI, KAHS, MMAC, Pejar LALC and YGCCHS.

The primary aim of the survey was to identify Aboriginal archaeological sites and/or Aboriginal places with the assistance of Aboriginal knowledge holders and identify sites or areas that would require further investigation.

5.1.1 Methods and Coverage

The survey strategy was developed based on the predictive model for Aboriginal site location (refer **Section 4.5**). The overarching aims of the survey strategy were to focus on the landforms most likely to feature Aboriginal sites (areas of high archaeological sensitivity) while also gathering a representative sample of landforms less likely to feature Aboriginal sites to confirm predictions of low archaeological sensitivity.

The Project Area was categorised into landform units. The survey area was categorised into classes of landforms based on being compared to the predictive model for the Goulburn region whilst also being refined for the Project Area (refer to **Table 4.3**). Landform units and their proportions of the Project Area are listed in **Table 5.1**. and illustrated in **Figure 4.4**.

The extent of sampling within each landform class was proportionate to its level of archaeological sensitivity as presented in the predictive model.

Table 5.1 Landform Unit Size Proportions

Designated Landform Unit	Area (ha)	Area (%)
Alluvial flats adjacent perennial watercourses	57	8%
Crests and ridges	38	5%
Mid to upper slopes, not adjacent (>100 m of) watercourses	200	28%
Slopes adjacent (<100 m of) non-perennial watercourses	322	45%
Slopes adjacent (<100 m of) perennial watercourses	91	13%
Grand Total	**709**	**100%**

Site recording was completed in accordance with the Code (DECCW 2010a). Site locations and their details were recorded with digital tablets using site recording forms created by Umwelt on the Survey123 application for ArcGIS (Esri© software). The Survey123 forms allowed for a site's location, details and representative photographs to be linked together, which avoided potential post-fieldwork issues around data integrity. Aboriginal site definitions and Umwelt's approach to defining PADs and assessing archaeological potential are detailed in **Appendix C**.

5.1.2 Survey Results

Survey participants remained spaced apart at 5–10 m throughout the course of the survey, allowing for increased coverage of the varied landforms present within the Project Area. The survey route is shown in **Figure 5.1,** and calculated on the 10 m survey transect, the proportion of each survey unit covered in shown in **Table 5.2** and overall survey coverage shown in **Table 5.3**. As reflected in the survey tracks, some paddocks needed to be avoided due to the presence of cows and sheep (in particular, a paddock of young bulls was avoided).

The survey identified 11 sites and four PADs (**Table 5.4**). Over 70 stone artefacts were identified on the ground surface during survey.

Overall, vegetation clearance had taken place across most of the Project Area, directly related to the historical and contemporary agricultural use of the land. During the survey, the Site Officers expressed that the levels of ground surface visibility were low to poor, and it was discussed that although ground surface visibility was limited, additional artefact scatters or isolated finds were likely present across the landscape, albeit unable to be identified at the time of survey due to the conditions, and therefore test excavation was required to detect these sites. Umwelt's archaeologist agreed with this statement. Each survey unit is described below.

Table 5.2 Proportion of Each Landform Class Surveyed

Survey Unit	Surveyed landform class	Area (ha)	Area (ha) Surveyed	Area (%)	Area (%) Surveyed	Sites /PADS Identified
1	Alluvial flats adjacent perennial watercourses	58	8	8	13	0
2	Slopes adjacent (<100 m of) perennial watercourses	90	14	13	4	10
3	Slopes adjacent (<100 m of) non-perennial watercourses	309	25	44	8	2
4	Mid to upper slopes, not adjacent (>100 m of) watercourses	179	10	25	6	1
5	Crests and ridges	71	8	10	11	2
	Grand Total	**706**	**64**	**100**	**9%**	**15**

Table 5.3 Survey coverage calculations, as per the Code of Practice 2010, p.19

Survey Unit	Landform	Surveyed* Survey Unit Area (m2)	Visibility	Exposure	Effective coverage area (m2)	Effective coverage %
1	Alluvial flats adjacent perennial watercourses	8,000	20%	10%	160	2
2	Slopes adjacent (<100 m of) perennial watercourses	14,000	30%	20%	840	6
3	Slopes adjacent (<100 m of) non-perennial watercourses	25,000	30%	20%	1500	6
4	Mid to upper slopes, not adjacent (>100 m of) watercourses	10,000	20%	10%	200	2
5	Crests and ridges	8,000	30%	20%	480	6

As per 10 m spacing across the survey transect shown in **Figure 5.1.*

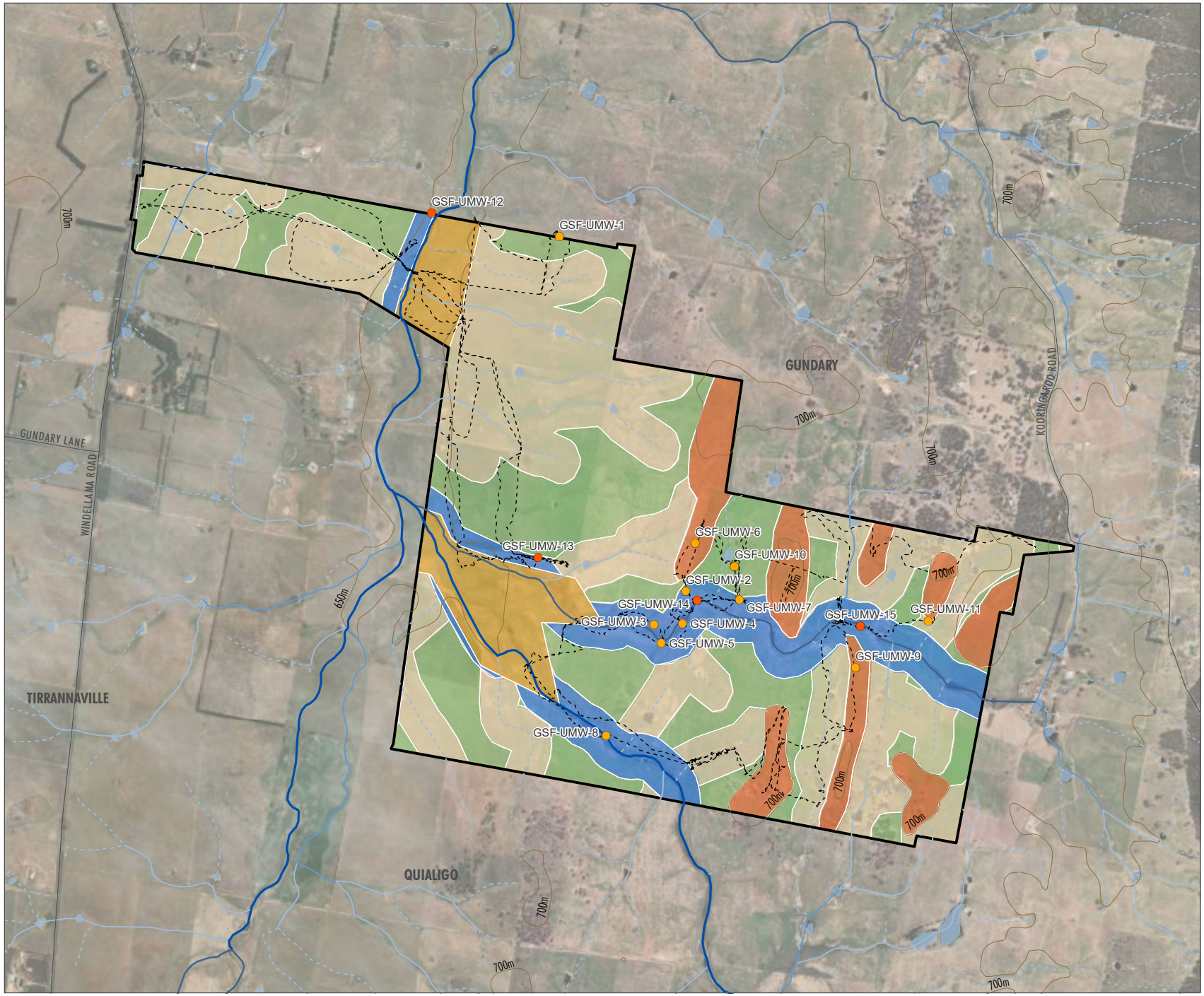


FIGURE 5.1

Survey Results

Legend

- Survey Tracks
- Road
- Contours (50m)
- Project Area
- Waterbody

Survey Sites

- Potential Archaeological Deposit (PAD)
- Open Artefact Site

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th order Stream or Higher

Designated Landform Units

- Alluvial Flats Adjacent Perennial Watercourses
- Slopes Adjacent (<100m of) Perennial Watercourses
- Slopes Adjacent (<100m of) Non-perennial Watercourses
- Mid to Upper Slopes, Not Adjacent (>100m of) Watercourses
- Crests and Ridges

0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Table 5.4 Details of sites identified during survey

Name	Site Description	Number of Artefacts	Survey Unit	Photos examples
GSF-UMW-1	One silcrete artefact, one quartzite artefact, and one broken basalt hammerstone were found eroding from a track on the hillslope and around the gate.	3	4	**Photo 5.9**
GSF-UMW-2	One broken silcrete artefact located on a disturbed cattle track scale on a hillslope.	1	2	
GSF-UMW-3	Four silcrete and two quartz artefacts found in an exposure.	6	2	
GSF-UMW-4	One black chert artefact flake located on an erosion scar.	1	2	
GSF-UMW-5	Three quartz artefacts, three silcrete artefact and two chert artefacts located along highly eroded creek bank. The creek bank had a high density of potential raw material (non-artefactual). Creekbank highly disturbed by cattle movement.	8	2	**Photo 5.3**
GSF-UMW-6	Three blue-grey, fine-grained silcrete artefacts within an exposure at the base of a tree on a hillcrest.	3	5	
GSF-UMW-7	At least 20 grey fine-grained silcrete artefacts extended an access track (disturbed by vehicle movement and cattle) on a hillslope. Disturbance related to cattle movement area vehicle access.	20+	2	
GSF-UMW-8	Two chert and one quartz artefact located across an area of eroded creek line (Bullamlito creek). The context was highly disturbed with evidence of cattle movement and degradation of creek line.	3	2	**Photo 5.4**
GSF-UMW-9	One Fine Grained Silicious (FGS) and one silcrete artefact located on an exposure scar on a low gentle ridgeline, at the base of a dead tree.	2	5	
GSF-UMW-10	One quartz artefact and one potential basalt axe blank, located on foot slope by dam. Area extensively disturbed by cattle movement.	2	3	
GSF-UMW-11	Four fine-grained silcrete flakes within an exposure along a slope.	4	3	**Photo 5.7**
GSF-UMW-12	Area of elevation above Gundary creek, low inclination slope. Assessed as a PAD, due to being a dry elevated position overlooking a perennial creek in a relatively undisturbed context.	0	2	

Name	Site Description	Number of Artefacts	Survey Unit	Photos examples
GSF-UMW-13	Artefacts located in exposures within rise overlooking creek line. Three FGS artefacts, three quartz, one silcrete and one quartzite artefacts were identified. RAPs considered the area to have cultural sensitivity, and therefore it has been assessed as a PAD.	8	2	**Photo 5.5**
GSF-UMW-14	Two silcrete artefacts, two FGS artefacts, and one quartz core located along eroded creek bank. The terrace on either side of the creek line, and the adjacent gentle slope on the northern side, was assessed as a PAD, due to being a dry elevated position overlooking a perennial creek and associated with artefacts.	5	2	
GSF-UMW-15	Over 10 artefacts (chert, silcrete and FGS artefacts) artefacts adjacent a fourth order stream. High quantity of raw material along creek line. Designated PAD area along the whole bank and terrace on south side of the creek whereas the north side appeared swampy (not a PAD).	10+	2	

5.1.2.1 Survey Unit 1 – Alluvial Flats Adjacent Perennial Watercourses

- Survey Unit one comprised of the alluvial flats adjacent Gundary and Bullamalito Creek (**Photo 5.1**). These low-lying areas were flood prone and waterlogged, as evident by the changing marshy vegetation communities. Visibility and exposure were very low (10–20%) due to this thick vegetation.
- No Aboriginal objects were identified in Survey Unit 1. Additionally, in contrast to the predictive model (**Section 4.5**), this area was considered by RAPs to not have potential for large artefact deposits, as the waterlogged nature of the soils likely dissuaded any long-term habitation of the areas. This does not suggest all alluvial flats do not have archaeological potential; but the alluvial flats must be elevated and dry most (unlike the current Project Area) of the year to contain high sensitivity.

Photo 5.1 Survey Unit 1 – view north within alluvial flats (dry at time of recording)

Source: Umwelt 2022.

5.1.2.2 Survey Unit 2 – Slopes Adjacent (<100 m of) Perennial Watercourses

Survey Unit 2 comprised of slopes adjacent (<100 m of) perennial watercourses, including Gundary and Bullamalito Creek (**Photo 5.2**). Visibility and exposure were low-moderate (20-30%), with higher visibility along the creekbanks from erosion. Erosion appeared to be worsened by the movement of cattle and sheep in the area. Grass for grazing animals hindered visibility across the remainder of the survey unit.

Six stone artefact sites (GSF-UMW-2, GSF-UMW-3, GSF-UMW-4, GSF-UMW-5, GSF-UMW-7, GSF-UMW-8) (**Photo 5.3** and **Photo 5.4**) and four PADs (GSF-UMW-12, GSF-UMW-13, GSF-UMW-14 GSF-UMW-15) (**Photo 5.5**) were identified, as described in **Table 5.4**. This survey unit landform was defined by RAPs and archaeologists as likely to have high-density artefact sites due to containing dry, elevated areas overlooking creekbanks, and this is reflected in the high number of sites and PADs identified. The artefact sites comprised of artefacts of chert, silcrete, quartzite and quartz. These artefacts were generally located within highly disturbed contexts, either eroding from creek banks or along exposures caused by cattle and sheep. The four PADs identified in the area, three of which were associated with artefacts, were areas that were less disturbed, and due to flat or gently sloping elevated areas in close proximity to the waterways, were considered ideal places for habitation. It was considered likely these areas would contain subsurface archaeological material at a higher density than the remainder of the Project Area and landforms.

Photo 5.2 Phillip Caroll and Merekai Bell in Survey Unit 2 – view northeast across Bullamalito Creek

Source: Umwelt 2022.

Photo 5.3 Location of a silcrete artefact at GSF-UMW-5

Source: Umwelt 2022.

Photo 5.4 Quartz artefact located at GSF-UMW-8

Source: Umwelt 2022.

Photo 5.5 View south across GSF-UMW-13, showing slight rise above alluvial floodplain. Survey Unit 2

Source: Umwelt 2022.

5.1.2.3 Survey Unit 3 – Slopes Adjacent (<100 m of) Non-Perennial Watercourses

Survey Unit 3 comprised of slopes adjacent (<100 m of) non-perennial watercourses; generally, first or second order tributaries of Gundary and Bullamalito Creek. Visibility and exposure were low to moderate (20-30%); however, like Survey Unit 1, the areas along the non-perennial creek lines were often heavily eroded by cattle and sheep movement (**Photo 5.6**).

Two stone artefact sites (GSF-UMW-10, GSF-UMW-11) (**Photo 5.7**) were identified, comprising of stone artefacts of basalt, quartz and silcrete. These sites are described in **Table 5.4**.

Photo 5.6 View south showing exposures present in association with non-perennial waterway. Survey Unit 3.

Source: Umwelt 2022.

Photo 5.7 Artefacts as UMW-GSF-11

Source: Umwelt 2022.

5.1.2.4 Survey Unit 4 – Mid to Upper Slopes, Not Adjacent (>100 m of) Watercourses

Survey Unit 4 comprised of mid to upper slopes, not adjacent (>100 m of) watercourses. The area was characterised by grassy, gently inclined slopes, with localised exposures caused by cattle and sheep movement (**Photo 5.8**). As with survey unit 4, soil exposures were prevalent at gate access points, where there was a concentration of cattle and sheep movement. Visibility and exposure were low across the area as a whole (10-20%).

One stone artefact site (GSF-UMW-1) (**Photo 5.9**), was identified, comprising of one silcrete artefact, one quartzite artefact, and one broken basalt hammerstone were found eroding from a track on the hillslope and around the gate (**Table 5.4**).

Photo 5.8 View east across mid-slope survey unit along the northern edge of Project Area. Survey Unit 4

Source: Umwelt 2022.

Photo 5.9 Broken basalt hammerstone, part of UMW-GSF-1. Survey Unit 4.

Source: Umwelt 2022.

5.1.2.5 Survey Unit 5 – Crests and Ridges

Survey Unit 5 comprised of crests and ridges across the Project Area (**Photo 5.10**). These ridges were 690–710 m elevation. The area had varied distance to waterways. The area was characterised by grassland, with localised cattle and sheep disturbance, causing an overall disturbance of low-moderate (20–30%). As with Survey Unit 4, soil exposures were prevalent at gate access points where there was a concentration of cattle and sheep movement.

Two stone artefact sites (GSF-UMW-6, GSF-UMW-9) (**Photo 5.9**), were identified, comprising of silcrete and FGS artefacts (**Table 5.4**).

Photo 5.10 View east across ridgetop in the north-eastern portion of the Project Area. Survey Unit 5.

Source: Umwelt 2022.

5.1.3 Discussion

The survey verified that the whole landscape had been subject to disturbance by historical and contemporary agricultural use of the land, specifically vegetation clearance, cropping and cattle and sheep grazing. There was high disturbance along fences, tracks and creek lines from ungulate and vehicle movement. Extensive erosion was noted along both Gundary and Bullamalito Creek, further worsened by the movement of cattle and sheep in the area.

In total, 11 sites and four PADs were identified during the survey. All PADs were associated with non-perennial streamlines and consisted of stone artefacts. Although mature trees were inspected for signs of cultural scarring, none were identified.

The results of the survey fed directly into the test excavation methodology, outlined below.

5.2 Test Excavation

The primary aim of excavations completed under the *Code of Practice* is to provide a characterisation of the Aboriginal objects present without having a significant impact on the archaeological value of a Project Area (DECCW 2010b, 27). Two weeks were allocated for the excavation to achieve this aim, with the idea that any additional excavation required would be undertaken post-approval, to ensure that the Project is approved, prior to funds being spent on more intensive Aboriginal excavation works, and to avoid unnecessarily disturbing subsurface artefacts in the event the Project does not proceed. A copy of the methodology was sent to Heritage NSW on 30 March 2023.

The test excavation program was undertaken with a team of RAP representatives and archaeologists (**Table 5.5**). The program was divided into two stages: The first week being 17 –21 April 2023, and the second week being 1–5 May 2023.

Table 5.5 Personnel involved in test excavations.

Name	Organisation	Role *	Mon 17/4	Tue 18/4	Wed 19/4	Thu 20/4	Fri 21/5	Mon 1/5	Tue 2/5	Wed 3/5	Thu 4/5	Fri 5/5
Lara Donohoe	Umwelt	ED	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sarah Mané	Umwelt	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alison Fenwick	Umwelt	A	✓	✓	✓	✓	✓					
Elise Nuridin	Umwelt	A						✓	✓	✓	✓	✓
Andrew Crisp	Umwelt	A						✓	✓			
Brad Maybury	GARI	ASO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pamela Young	KAHS	ASO	✓	✓		✓	✓					
Robert Young	KAHS	ASO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dean Delponte	MHC	ASO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Phillip Carroll	Mura Cultural Services	ASO		✓	✓	✓	✓	✓	✓		✓	✓
Belinda Little	MMAC	ASO	✓		✓		✓	✓		✓	✓	✓
Jikayia Little	MMAC	ASO		✓					✓			
Marinda Little	MMAC	ASO				✓				✓		
Chris McAllister	Pejar LALC	ASO	✓	✓	✓		✓		✓	✓	✓	✓
Jessica Plumb	Pejar LALC	ASO				✓					✓	
Merekai Bell	YGCCHS	ASO	✓	✓	✓	✓	✓	✓	✓	✓		
Dean Bell	YGCCHS	ASO									✓	✓

**ED = Excavation Director, A = Archaeologist, ASO = Aboriginal Site Officer.*

5.2.1 Methods and Coverage

Test excavation occurred along transects running perpendicular to PADs and sites adjacent to perennial waterways, to test for these areas of sensitivity as well as investigating changes in artefact density based on increasing distance from water and the transition across different landform**.** These transects are shown in **Figure 5.2**. Due to the Project not impacting within 20 m of major creek lines (see **Section 7.0**), and because of some sensitive ecological communities alongside the creek lines, most transects commenced more than 50 m from the perennial streamline, regardless of whether this missed the area of high sensitivity designated as part of the PAD.

An excavation methodology was developed as part of the Aboriginal Community Consultation process, as presented below:

The test excavation was undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) and focussed on the areas identified as requiring further investigation during the archaeological field survey within the Project's development footprint.

The test excavation methodology adopted a sampling strategy that aimed to retrieve a representative sample of PADs and landforms across the Project Area. Transects were placed perpendicular to the creek line from PADs, to investigate changes in artefact density based on increasing distance from water and the transition across different landform types in some instances**.** There was flexibility to redistribute excavation efforts to certain landform groups as initial predictions are refined and revised as results came to hand during the fieldwork program.

Manual excavation of 0.25 m² (50 cm by 50 cm) test excavation units in transects across areas of archaeological interest was undertaken with 10–20 m spacing.

- All excavation used hand tools. Excavation of the first unit at each area was done in 5 cm levels of excavation (known as spits), with subsequent excavation allowed in 10 cm spits. Manual excavation would continue to the base of the cultural deposits, usually at B Horizon clay.
- 0.25 m² test excavation units were expanded into larger trenches of up to 3 m² to further explore subsurface conditions such as artefact concentrations.
- Excavated material was dry sieved through a 5 mm sieve.
- Soil profiles were recorded in accordance with the Code of Practice, including scaled drawings, photographs, and written descriptions.
- Soil and carbon samples were collected for potential sedimentological and chronological analysis where such analysis is considered likely to contribute significant information.

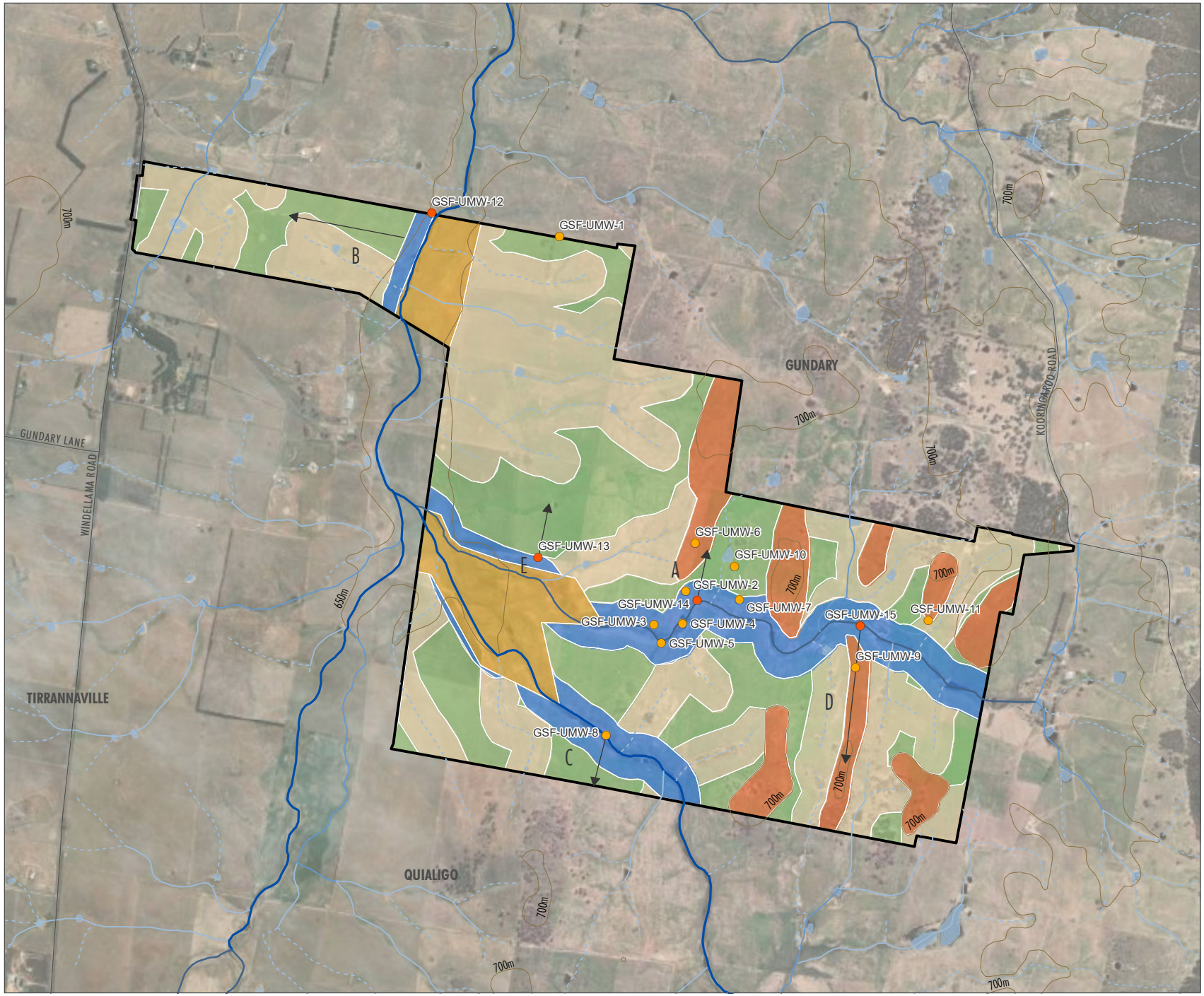


FIGURE 5.2

Proposed Test Excavation Locations

Legend

- Road
- Contours (50m)
- Indicative Site Unit Transect
- Project Area
- Waterbody

Survey Sites

- Potential Archaeological Deposit (PAD)
- Open Artefact Site

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher

Designated Landform Units

- Alluvial Flats Adjacent Perennial
- Slopes Adjacent (<100m of) Perennial Watercourses
- Slopes Adjacent (<100m of) Non-perennial Watercourses
- Mid to Upper Slopes, Not Adjacent (>100m of) Watercourses
- Crests and Ridges

0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

5.2.2 Test Excavation Results

Five areas of investigation were excavated, named areas A, B, C, D and E, as shown in **Figure 5.3**. At least one artefact was identified in each area. The number of test units excavated in each area varied depending on the landform units that were able to be covered during the transect. The spacing between each original test unit was 20 m. Further infill test excavation units were excavated to the north and south (and sometimes east and west) of a select number of test units, if these test units had a relatively high number of artefacts identified. A total of 101 test units were excavated, including two test units which were selected for expansion (test unit 10 and 35W), resulting in a total of 26.75 m^2 being excavated. The average depth of the test units was 0.34 m, and test units were generally terminated when B horizon clay was reached.

A total of 295 artefacts were retrieved from the test excavation program, and the overall artefact frequency was 8.6 artefacts per m^2. A Test Unit register is contained in **Appendix D.**

Table 5.6 Test excavation unit (TU) dimensions and artefact frequency

Area	TU #	Square Metres (m^2)	Depth (m)*	Volume of Soil Excavated (m^3)	Artefacts	Artefact / m^2
A	1	0.25	0.49	0.03	0	0
A	2	0.25	0.5	0.03	3	12
A	2N	0.25	0.1	0.01	2	8
A	2S	0.25	0.43	0.03	2	8
A	2E	0.25	0.7	0.04	0	0
A	2W	0.25	0.5	0.03	0	0
A	3	0.25	0.12	0.01	0	0
A	4	0.25	0.18	0.01	0	0
A	5	0.25	0.4	0.03	2	8
A	5N	0.25	0.2	0.01	0	0
A	5S	0.25	0.5	0.03	0	0
A	6	0.25	0.1	0.01	0	0
A	7	0.25	0.25	0.02	1	4
A	8	0.25	0.36	0.02	0	0
A	9	0.25	0.45	0.03	2	8
A	10	1.25	0.5	0.16	29	23.2
A	10N	0.25	0.3	0.94	9	36
A	10S	0.25	0.4	0.03	4	16
A	10E	0.25	0.4	0.03	0	0
A	10W	0.25	0.29	0.02	9	36
B	11	0.25	0.5	0.03	0	0
B	12	0.25	0.45	0.03	0	0
B	13	0.25	0.4	0.03	13	52
B	13N	0.25	0.48	0.03	3	12
B	13S	0.25	0.5	0.03	0	0
B	13E	0.25	0.5	0.03	0	0
B	13W	0.25	0.64	0.04	2	8
B	14	0.25	0.6	0.04	0	0
B	15	0.25	0.6	0.04	2	8
B	16	0.25	0.5	0.03	2	8
B	17	0.25	0.32	0.02	0	0
B	18	0.25	0.3	0.02	0	0
B	19	0.25	0.2	0.01	0	0
C	20	0.25	0.4	0.03	0	0
C	21	0.25	0.4	0.03	1	4
C	22	0.25	0.3	0.02	0	0

Area	TU #	Square Metres (m^2)	Depth (m)*	Volume of Soil Excavated (m^3)	Artefacts	Artefact / m^2
C	23	0.25	0.35	0.02	1	4
C	24	0.25	0.4	0.03	1	4
C	25	0.25	0.4	0.03	0	0
C	26	0.25	0.4	0.03	0	0
C	27	0.25	0.35	0.02	0	0
C	28	0.25	0.43	0.03	0	0
D	29	0.25	0.32	0.02	1	4
D	30	0.25	0.2	0.01	5	20
D	30N	0.25	0.18	0.01	1	4
D	30S	0.25	0.2	0.01	0	0
D	31	0.25	0.2	0.01	0	0
D	32	0.25	0.2	0.01	0	0
D	33	0.25	0.2	0.01	1	4
D	34	0.25	0.38	0.02	0	0
D	35	0.25	0.23	0.01	5	20
D	35N	0.25	0.17	0.01	1	4
D	35S	0.25	0.28	0.02	5	20
D	35E	0.25	0.19	0.01	6	24
D	35W	0.75	0.3	0.06	83	110.7
D	36	0.25	0.3	0.02	0	0
D	37	0.25	0.34	0.02	7	28
D	37N	0.25	0.25	0.02	17	68
D	37S	0.25	0.3	0.02	13	52
D	38	0.25	0.26	0.02	4	16
D	39	0.25	0.2	0.01	5	20
D	40	0.25	0.2	0.01	0	0
D	41	0.25	0.3	0.02	14	56
D	41N	0.25	0.3	0.02	0	0
D	41S	0.25	0.3	0.02	0	0
D	42	0.25	0.34	0.02	15	60
D	43	0.25	0.38	0.02	1	4
D	44	0.25	0.26	0.02	0	0
D	45	0.25	0.3	0.02	0	0
D	46	0.25	0.24	0.02	1	4
D	47	0.25	0.25	0.02	0	0
E	48	0.25	0.5	0.03	0	0
E	49	0.25	0.58	0.04	0	0
E	50	0.25	0.6	0.04	0	0
E	51	0.25	0.57	0.04	1	4
E	52	0.25	0.51	0.03	0	0
E	53	0.25	0.61	0.04	0	0
D	54	0.25	0.2	0.01	5	20
D	55	0.25	0.22	0.01	5	20
D	55N	0.25	0.3	0.02	0	0
D	55S	0.25	0.3	0.02	0	0
D	56	0.25	0.25	0.02	0	0
D	57	0.25	0.3	0.02	0	0
D	58	0.25	0.3	0.02	1	4
D	59	0.25	0.22	0.01	5	20
D	60	0.25	0.3	0.02	3	12
D	61	0.25	0.25	0.02	0	0
D	62	0.25	0.26	0.02	0	0
D	63	0.25	0.25	0.02	0	0
D	64	0.25	0.28	0.02	0	0
D	65	0.25	0.3	0.02	0	0
D	66	0.25	0.35	0.02	0	0

Area	TU #	Square Metres (m^2)	Depth (m)*	Volume of Soil Excavated (m^3)	Artefacts	Artefact / m^2
D	67	0.25	0.29	0.02	0	0
D	68	0.25	0.28	0.02	0	0
D	69	0.25	0.4	0.03	1	4
D	70	0.25	0.4	0.03	0	0
D	71	0.25	0.36	0.02	0	0
D	72	0.25	0.4	0.03	1	4
D	73	0.25	0.33	0.02	0	0
D	74	0.25	0.35	0.02	0	0
D	75	0.25	0.2	0.01	0	0
Totals	**Total number of Test Units = 101**	**Total Area Excavated = 26.75 m^2**	**Average depth of Test Units = 0.34**	**Total volume of excavated soil = 3.24 m^3**	**Total artefact retrieved = 295**	**Average artefact frequency per m^2 = 8.6****

**Based on the deeper of the northeast or northwest corner shown in the section drawing.*

*** Based on calculating the total number of artefacts divided by the total volume of soil excavated, as opposed the average of the "Total Artefact /m^2" column.*

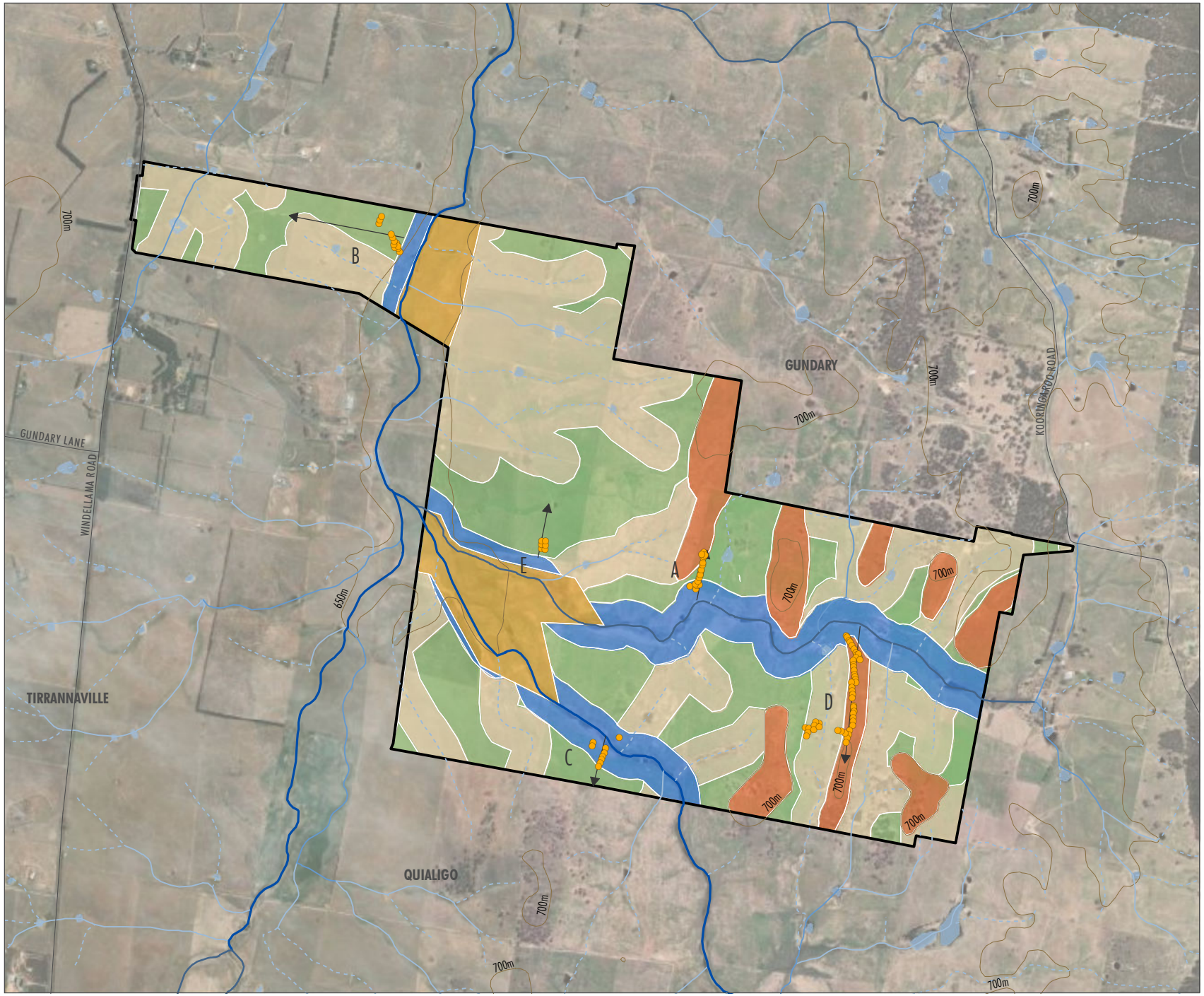


FIGURE 5.3

An Overview of Test Unit Locations

Legend

- Final Test Excavation Locations
- Road
- Contours (50m)
- Indicative Site Unit Transect
- Project Area
- Waterbody

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher

Designated Landform Units

- Alluvial Flats Adjacent Perennial Watercourses
- Slopes Adjacent (<100m of) Perennial Watercourses
- Slopes Adjacent (<100m of) Non-perennial Watercourses
- Mid to Upper Slopes, Not Adjacent (>100m of) Watercourses
- Crests and Ridges

0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

5.2.2.1 Area A

Area A was excavated between 17 and 19 April 2023. A total of 20 test excavation units were excavated, and 63 artefacts were identified (**Figure 5.4**). The transect crossed four landscape units: slopes adjacent (<100 m of) perennial watercourses, slopes adjacent (<100 m of) non-perennial watercourses, mid to upper slopes not adjacent (>100 m of) watercourses, and a crest and ridge landform.

There was variable topsoil depth across Area A, ranging from 0.1 to 0.7 m in depth before B horizon was reached. This soil profile variation was interpreted as being from localised disturbance varying across the landscape. The general soil profile comprised of 0.05–0.2 m of A1 very dark brown silty loam A1 horizon, overlying 0.1–0.35 m of brown clayey-silt A2 horizon, overlying orange silty clay B Horizon (example in **Photo 5.11**).

After six artefacts, including an unusual volcanic artefact, were identified in test unit 10 (a higher number of artefacts than any test unit thus far), the unit was expanded (as per **Photo 5.12**), and an additional 23 artefacts were recovered. A selection of these artefacts is shown in **Photo 5.13.** An unusual, elongated backed artefact comprising of silicified wood was identified in test unit 10W, Spit 2 (ID 43) (**Photo 5.14**)**.** It was not associated with other like-material, and potentially was used as a tool (it is recommended as part of management strategies that this be verified through residue/usewear analysis studies).

Photo 5.11 Example of soil profile in Area A (North Section of 10E)

Source: Umwelt 2023.

FIGURE 5.4

Area A Test Excavation Location and Artefact Density

Legend

- Contours (10m)
- Project Area

Number of Artefacts

- 0 (10)
- 1 - 2 (5)
- 3 - 5 (2)
- 6 - 10 (2)
- >10 (1)

Strahler Stream Order

- 1st Order Stream
- 4th Order Stream

0 50 100

Meters

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Photo 5.12 Test Unit 10, showing unexcavated north, south, east, west extensions

Source: Umwelt 2023.

Photo 5.13 Artefacts from test unit 10 (including northern and southern expansion, not including eastern and western expansion

Source: Umwelt 2023.

Photo 5.14 Elongated backed artefact of silicified wood found in test unit 10W, Spit 2

Source: Umwelt 2023.

5.2.2.2 Area B

Area B was excavated between 19 and 20 of April 2023. A total of 23 test units were excavated and 31 artefacts were identified (**Figure 5.5**)**.** The transect crossed two landscape units: slopes adjacent (<100 m of) perennial watercourses, and mid to upper slopes not adjacent (>100 m of) watercourses.

Soil depth across this area was generally consistent across the site, between 0.4-0.64 on the lower slopes, and shallower (0.2–0.32) at higher elevations. The general soil profile comprised of 0.05–0.2 m of A1 dark brown silty-sandy loam A1 horizon, overlying 0.2–0.6 m of brown clayey-silt A2 horizon, overlying orange silty clay B Horizon.

Artefacts were concentrated around test unit 13 (**Photo 5.15**) and therefore four infills were excavated within 10 m of the test unit (13N, 13S, 13E and 13W) to try and determine the extent of the artefact area. Test excavation units 11-12, 14, 13S and 13E appeared to have been highly disturbed, potentially by burrowing, and exhibited a sandier composition of soils without any artefacts.

FIGURE 5.5

Area B Test Excavation Location and Artefact Density

Legend

- Contours (10m)
- Project Area

Number of Artefacts

- 0 (8)
- 1 - 2 (3)
- 3 - 5 (1)
- >10 (1)

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 5th Order Stream or Higher

0 50 100

Meters

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Photo 5.15 Artefacts from test unit 13

Source: Umwelt 2023.

5.2.2.3 Area C

Area C was excavated on 21 April 2023. This area was selected to ensure the slopes either side of Bullamalito Creek were sampled; despite the transect not originating from a PAD, the excavation transect instead was located close to artefact site GSF-UMW-8. A total of nine test units were excavated and three artefacts were identified (**Figure 5.6**) The transect crossed two landscape units: slopes adjacent (<100 m of) perennial watercourses, and mid to upper slopes not adjacent (>100 m of) watercourses.

Topsoil depth in this area was generally consistent across the site, between 0.3–0.43 m. The general soil profile comprised of approximately 0.1 m of A1 dark brown silty-sandy loam, overlying approximately 0.2–0.3 m of brown clayey-silt A2 horizon, overlying orange silty clay B Horizon.

Only three artefacts were identified, but two of these were quite unusual. A piece of clear quartz was identified in test unit 21, Spit 1 (ID 86) (**Photo 5.16**). Technically a potential cultural object, as opposed to a worked lithic, this object could just be a natural stone. However, clear quartz is known in some places in Australia to be associated with healing practices (Clarke 2019), and the crystal was immediately noticed for its aesthetic qualities by the RAPs. Additionally, a complete IMT flake, with evidence of usewear along its edges, was identified in, found from test unit 23, Spit 1 (ID 87) (**Photo 5.17**). It is recommended that both of these objects are subject to residue/usewear analysis, to see if more understanding can be garnered regarding their use in the past.

Photo 5.16 Quartz from test unit 21, Spit 1 (ID 86)

Source: Umwelt 2023.

Photo 5.17 IMT artefact with signs of usewear along edges, found from test unit 23, Spit 1 (ID 87)

Source: Umwelt 2023.

FIGURE 5.6

Area C Test Excavation Location and Artefact Density

Legend

- Contours (10m)
- Project Area

Number of Artefacts

- 0 (6)
- 1 - 2 (3)

Strahler Stream Order

- 1st Order Stream
- 5th Order Stream or Higher

0 50 100

Meters

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

5.2.2.4 Area D

Area D was excavated between 1 and 5 May 2023 (excluding 3 May 2023, when high winds resulted in the team moving to Area E, where it was low-lying and better protected). A total of 53 test excavation units were excavated and 206 artefacts were identified. As seen by **Figure 5.7**, most of the deposit is occurring within 200 m of the perennial creekline, which is a commonly established parameter for archaeological sensitivity (e.g. DECCW 2010c, 12). The transect crossed two landscape units: slopes adjacent (<100 m of) non-perennial watercourses, mid to upper slopes not adjacent (>100 m of) watercourses, and crests and ridges.

Typical topsoils identified in the area included a shallow (approximately 0.1 m) A1 horizon of brown silty loam, overlying a shallow to moderate (0.10-0.3) brown sandy clay loam A2 horizon, overlying an orange B horizon clay.

Test unit 35W was expanded to the north and south, due to the identification of 36 artefacts in the initial 0.5 x 0.5 test unit (**Photo 5.18**). The expansion led to an additional 47 artefacts being identified. This was the highest concentration of artefacts identified across the site. Artefacts from this area showcased the very fine silcrete artefacts common across the entire Project Area. A selection of these silcrete artefacts is shown in **Photo 5.19**.

Photo 5.18 Test unit 35W, including north and south expansions

Source: Umwelt 2023.

FIGURE 5.7

Area D Test Excavation Location and Artefact Density

Legend

- Contours (10m)
- Project Area

Number of Artefacts

- 0 (28)
- 1 - 2 (9)
- 3 - 5 (9)
- 6 - 10 (2)
- >10 (5)

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream

0 50 100

Meters

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Photo 5.19 A selection of silcrete artefacts from test unit 35W

Source: Umwelt 2023.

5.2.2.5 Area E

On 3 May 2023, during a day of very high-winds, six test units from Area E were excavated. The transect was set behind GSF-UMW-13; as close to the PAD as possible whilst remaining in the development footprint. A total of nine test units were excavated and three artefacts were identified (**Figure 5.8**). The transect was only located in one landform unit: Mid-to upper slopes, not adjacent (>100 m of) watercourses.

The general soil profile comprised of approximately 0.1 m of A1 dark brown silty-sandy loam, overlying approximately 0.5 m of brown sandy clay loam, overlying sandy clay. Only one artefact (indeterminate quartz flake) was identified. It was clear that the area had been heavily ploughed/cropped, and this disturbance may have resulted in the lack of artefacts present.

FIGURE 5.8

Area E Test Excavation Location and Artefact Density

Legend

- Contours (10m)
- Project Area

Number of Artefacts

- 0 (5)
- 1 - 2 (1)

Strahler Stream Order

- 2nd Order Stream

0 50 100

Meters

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

5.2.3 Additional Artefact Site

Whilst opening a gate for fieldwork cars to leave site, a previously unidentified surface artefact was identified and recorded. It was a IMT proximal broken flake (width 31 mm; length 29 mm; and thickness 9.7 mm) (**Photo 5.20**). This artefact site has named as GSF-UMW-16 and is mapped in the below section.

Photo 5.20 Artefact from site GSF-UMW-11

Source: Umwelt 2023.

5.3 Summary of Identified Sites

As shown in **Figure 5.9,** and outlined in **Table 5.7**, as a result of archaeological investigations (survey and test excavation) a total of 19 Aboriginal archaeological sites have been identified in the Project Area. The boundaries of surface artefact sites were extended (or refined) around areas where artefacts were identified through subsurface investigations. Three additional artefact sites (GSF-UMW-17, GSF-UMW-18 and GSF-UMW-19) have been categorised based on where subsurface artefacts were identified through test excavation away from surface artefact sites.

None of these sites had been recorded from previous studies. All these sites have been registered on the AHIMS.

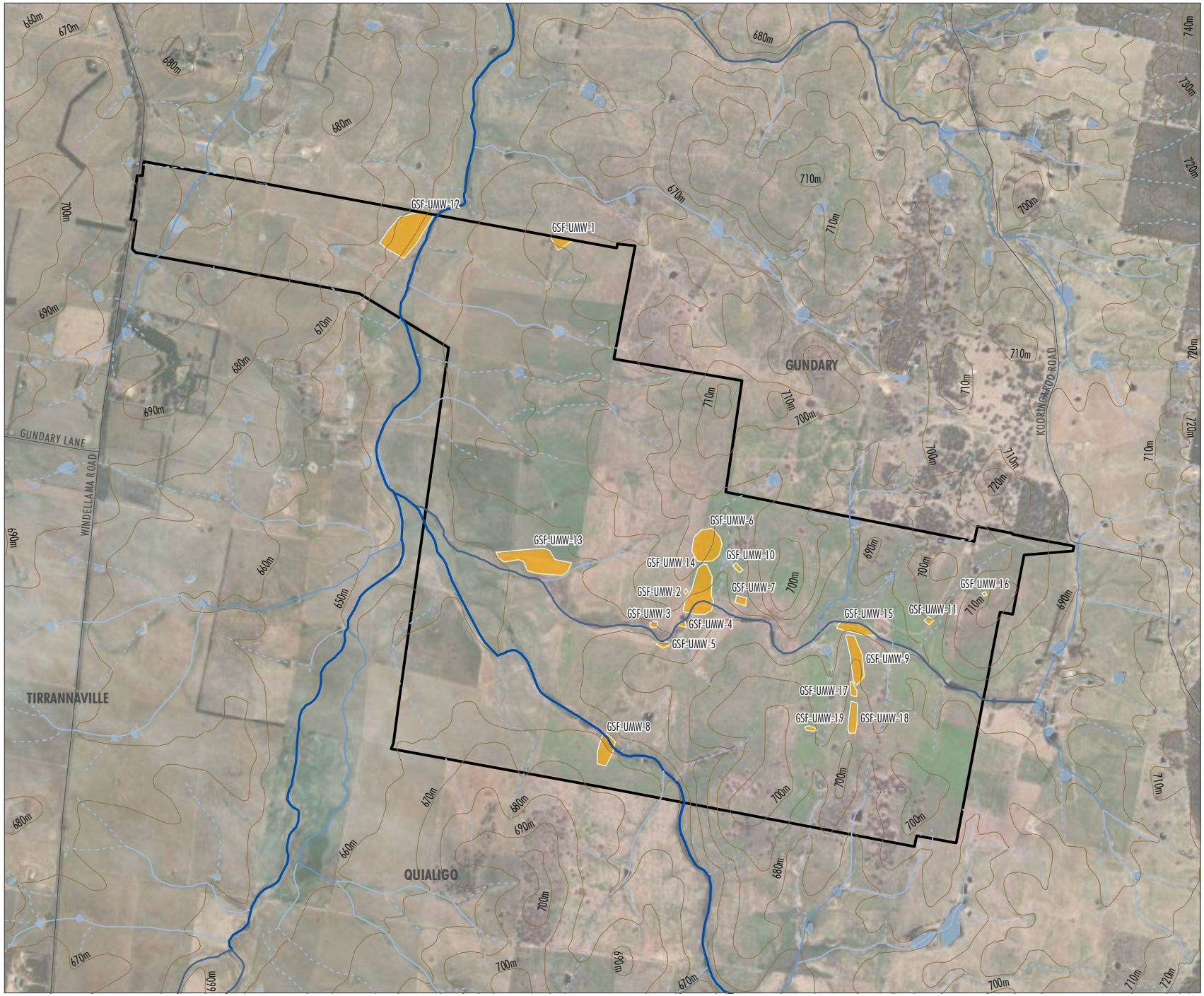


FIGURE 5.9

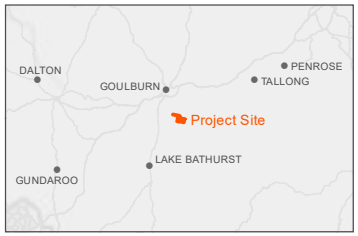
All Archaeological Sites in the Project Area

Legend

- Road
- Contours (10m)
- Project Area
- Waterbody
- All Archaeological Sites in Project Area

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher



0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Table 5.7 Details of PADs and Sites Identified During Survey

Name	AHIMS Site ID	Site Type*	Identified during survey, excavation, or both?	Artefact #	Test unit area (if applicable)
GSF-UMW-1	51-6-0952	Open artefact site	Survey	3	NA
GSF-UMW-2	51-6-0953	Open artefact site	Survey	1	NA
GSF-UMW-3	51-6-0954	Open artefact site	Survey	6	NA
GSF-UMW-4	51-6-0955	Open artefact site	Survey	1	NA
GSF-UMW-5	51-6-0956	Open artefact site	Survey	8	NA
GSF-UMW-6	51-6-0957	Open artefact site with deposit and PAD	Both	3 (survey) 53 (excavation)	Includes an area covering test unit 9 and 10, 10N, 10S, 10E and 10W.
GSF-UMW-7	51-6-0958	Open artefact site	Survey	20+	NA
GSF-UMW-8	51-6-0959	Open artefact site with deposit and PAD	Both	3 (survey) 3 (excavation)	Includes an area covering test unit 20–24
GSF-UMW-9	51-6-0967	Open artefact site with deposit and PAD	Both	2 (survey) 183 (excavation)	Test units 29–42
GSF-UMW-10	51-6-0968	Open artefact site	Survey	2	NA
GSF-UMW-11	51-6-0969	Open artefact site	Survey	4	NA
GSF-UMW-12	51-6-0970	Open artefact site with deposit and PAD	Both	0 (survey) 22 (excavation)	Includes an area covering test units 11–16.
GSF-UMW-13	51-6-0960	Open artefact site with deposit and PAD	Both	8 (survey) 1 (excavation)	Includes an area covering test unit 48 and 51.
GSF-UMW-14	51-6-0961	Open artefact site with deposit and PAD	Both	5 (survey) 10 (excavation)	Included an area covering test unit 1–8
GSF-UMW-15	51-6-0966	Open artefact site with PAD	Survey	10+ (survey)	NA (note: area was not test excavated because it is outside the development footprint)
GSF-UMW-16	51-6-0962	Open artefact site	Test excavation**	1	NA
GSF-UMW-17	51-6-0965	Open artefact site with deposit and PAD	Test excavation	2	Test units 43–46
GSF-UMW-18	51-6-0963	Open artefact site with deposit and PAD	Test excavation	19	Test units 54–60
GSF-UMW-19	51-6-0964	Open artefact site with deposit and PAD	Test excavation	2	Test units 69, 70, and 72

**Some areas where archaeological deposits were identified during test excavation and have been classified (or reclassified) as PADs with artefacts (as likely contain further archaeological deposits).*

** *(but identified on the surface during movements across site).*

5.4 Characterisation of Aboriginal objects in the Project Area

All lithic items recovered during test excavation were inspected by Lara Donohoe under a low-magnification lens and attributes were recorded in accordance with the stone artefact classification methodology outlined in **Appendix E**. A full artefact catalogue for artefacts identified during test excavation is provided in **Appendix F.** The stone artefacts uncovered through excavations are the focus of the below analysis, as they were recorded in a control setting, and have higher spatial integrity than those recorded during surface surveys.

Excavations resulted in the accumulation of 295 Aboriginal objects. Almost half of the objects were an extremely fine-grained silcrete (**Table 5.8**). Other common materials include quartz and IMT. Rarer raw material types included FGS, quartzite, chert, volcanic and silicified wood. Of note was two artefacts of solid black chert found in Area A and Area B. The distinctiveness of this material may warrant further investigations to identify the source (quarry) where the material was found. The lack of cortex on the artefacts (<5%, n=13) and the relatively small size of the artefacts, indicates that the raw material was brought to site in small, already reduced 'portions' from its source (quarry). Additional evidence of this is the abundant fine-grained, grey silcrete occurring in the assemblage typically is found in the central portion of larger cobbles, where it isn't tinted by ferrous minerals.

Quartz was the second most abundant artefactual material. Quartz from the Goulburn area was known to have been modified by both hand-held percussion and by bipolar techniques, where the core was rested on an anvil and struck (Lance and Koettig 1986, 22). Often the diagnostic characteristics of the quartz items recovered through test excavation is difficult to identify; the pieces of quartz naturally formed in the area were very 'sheet-like'; making it difficult to confirm whether caused by natural breakage, knapping or bipolar flaking. A large proportion of 'indeterminate' quartz artefacts were included within the archive, when they were found in the same spit as other clearly worked artefacts, or had a 'glossy' surface, which is characteristic of flaked quartz. Further, detailed artefactual analysis is to be undertaken in the next stage of works, as outlined in **Section 7.0** of the report.

Table 5.8 Artefact Material Identified During Test Excavation Works

Artefact Material	Count	Percentage
Silcrete	149	46.02%
Quartz	91	32.88%
IMT	31	12.26%
FGS	11	5.34%
Quartzite	8	3.00%
Chert	2	0.32%
Volcanic	2	0.09%
Silicified Wood	1	0.10%
Grand Total	**295**	**100.00%**

5.5 Feedback from Aboriginal Site Officers

The Aboriginal site officers all proposed that further archaeological excavation (post- development consent), should be taken, recommending salvage excavation of at least one of the three identified artefact concentrations (e.g., around test unit 10, 13 and 35W) to mitigate impacts of the Project to the area.

5.6 Areas of Archaeological Sensitivity

The sites with the highest artefact density are GSF-UMW6 and GSF-UMW-9, both of which contain an artefact density of over 20 artefacts / m^2 and are situated on gentle spurs/ridges (**Table 5.9**). This indicates that focused Aboriginal camping activities were likely to occur on elevated, relatively gentle or flat land with good outlook over reliable water and the broader valley. The test excavation results at GSF-UMW-9 and the northernmost test units excavated of GSF-UMW-6 (above 680 m AHD contour) demonstrate this evaluation and are predicted to be good representative samples of these most sensitive landform characteristics in the Project Area.

The distribution and frequency of subsurface artefacts results of test excavation, support with regional modelling (EMM 2021) which indicate that subsurface archaeological deposits in the Goulburn region are most likely to occur on the broad, low hill crests or spurs adjacent to watercourses (within 200 m) with good outlook over the landscape.

This then acknowledges that there are further areas of this archaeological sensitivity within the Project Area, predominately along similar broad spurs within 200 m of the perennial tributary to Bullamalito Creek. These observations of sensitivity have been used in considering impacts and mitigation measures for the Project.

Table 5.9 Density calculations of archaeological sites which were subject to test excavation

Name	Number of artefacts identified in excavations	m^2 excavated within boundary of site	Artefact density per m^2 excavated (within boundary of site)
GSF-UMW-6	53	2.5	21
GSF-UMW-8	3	1.25	2.4
GSF-UMW-9	183	6.5	28.1
GSF-UMW-12	22	2.5	8.8
GSF-UMW-13	1	0.5	2
GSF-UMW-14	10	3.25	3.1
GSF-UMW-17	2	1	2
GSF-UMW-18	19	2.25	8.4
GSF-UMW-19	2	0.75	2.7

6.0 Significance Assessment and Aboriginal Cultural Values

6.1 Principles of Assessment

Assessing cultural heritage significance is an essential component for the development of management strategies for the current assessment. There are four recognised classes of value under the Burra Charter (ICOMOS (Australia) 2013): Aesthetic, Historic, Scientific and Social (cultural) as outlined in **Table 6.1**.

In New South Wales, Aboriginal cultural heritage values are typically assessed according to *scientific value(s)* and *social (and/or cultural) value(s)* by Aboriginal people. Significance is then further assessed against the archaeological criteria outlined in the *Code of Practice for Archaeological Investigations of Aboriginal Objects in New South Wales* (DECCW 2010b).

Within this significance assessment, Aboriginal cultural values are captured within social, historical and aesthetic values. The archaeological values are contained within scientific values.

Table 6.1 Values relevant to determining cultural significance, as per the *Burra Charter*

Value	Definition
Aesthetic	"Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use" (ICOMOS 1999: 12).
Historic	"Historic value encompasses the history of aesthetics, science and society...[a] place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may have historic value as the site of an important event" (ICOMOS 1999: 12).
Scientific	"The scientific or research value of a place will depend on the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information" (ICOMOS 1999:12).
Social (cultural)	"Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group" (ICOMOS 1999: 12).

6.2 Social/Cultural Value

Social value refers to the spiritual, traditional, historical or contemporary associations that Aboriginal people have for place. There is not always consensus about the cultural value of a place as people experience places and events differently, and in some instances cultural values may be in direct conflict. Cultural significance can only be determined by Aboriginal people and is identified through Aboriginal community consultation.

RAPs were invited to provide information regarding the cultural value of the Project Area, the associated landscape features, archaeological sites and areas of archaeological potential as part of the consultation process.

All Site Officers recommended that salvage excavation occur onsite, with salvage excavation focussing on areas where a relatively large number of artefacts were recovered during test excavation, particularly sites GSF-UMW-6 and GSF-UMW-9 (**Figure 6.1**). These sites were considered to have high cultural value based on their potential to provide further archaeological evidence which will allow for a meaningful interpretation of how their ancestors were living on Country.

In addition, in review of the ACHA report Murrindyarr Aboriginal Corporation identified that some of the artefacts recovered during test excavations (details of which are culturally sensitive and not detailed within the report but were relayed in confidence to Lara Donohoe on the phone on 22 July 2024. The organisation is happy to discuss these values with Heritage NSW on request). They note:

> *'Artefacts located during the fieldwork demonstrate inhabitation of the site by Gundungurra people, including the Parramarragoo sub-tribe. The tools are precious and specific, and need to be treated with the respect they deserve throughout the development and their return to Country in consultation with Gundungurra people.'*[7]

In addition, they note:

'The site proposed for the Gundary Solar Farm would likely have been utilised as an important hunting ground and location for sourcing a variety of food. Fresh Nadg-yung (water) was also plentiful. During fieldwork, despite significant grazing by sheep and cattle, burra (kangaroo) remained on site and there were numerous goolung (wombat) burrows. Multiple budgang (bird) species were present, including the nulla-bunya-gang (wood duck). Birdlife was particularly prominent in small areas set aside for native vegetation. The subject site appears representative of the Mulwaree or Goulburn plains that presented as very well managed (or 'farmed') by local Aboriginal people prior to colonisation. There is a network of perennial creeks and streams, including Gundary and Bullamalito Creeks, which provided wetlands ideal for fresh water and native flora and fauna, many of which were ideal food sources. The area is almost completely devoid of trees.'[8]

Overall, Murindyarr Aboriginal Corporation requested the reburial of artefacts should be undertaken in consultation with their organisation, and that they would be open to further consultation and discussion of this significance if further archaeological investigation is undertaken.

6.3 Scientific Values and Significance Assessment

Archaeological significance is determined by assessing Aboriginal sites/places/objects against a number of archaeological criteria as set out in the *Code of Practice*. The assessment of Aboriginal archaeological significance is used to develop a series of cultural heritage management and impact mitigation strategies. The scientific criteria are based on representatives, rarity, research potential and educational potential.

[7] Murindyarr Aboriginal Corporation submission to ACHA report, dated to 22 July 2023, and available to Heritage NSW on request.
[8] Murindyarr Aboriginal Corporation submission to ACHA report, dated to 22 July 2023, and available to Heritage NSW on request.

6.3.1 Sites of Moderate Scientific Significance

Sites GSF-UMW-6 and GSF-UMW-9 contained several raw materials (e.g., silicified wood, black chert) which, based on primary artefactual analysis, appear uncommon in regional artefact assemblages. These sites have moderate representativeness, being richer than other sites in the Project Area. Residue analysis on artefacts, and radiocarbon dating on deposits, could be utilised to provide a more substantial interpretation of the cultural material. Both sites have the highest density of artefacts in the Project Area, and on a regional level[9] are considered to have moderate artefact density. The sites have moderate educational and research value for demonstrating Aboriginal occupation of the area. Overall, these two sites have moderate significance on a local scale and moderate on a regional scale, and it is recommended they be subject to salvage excavation.

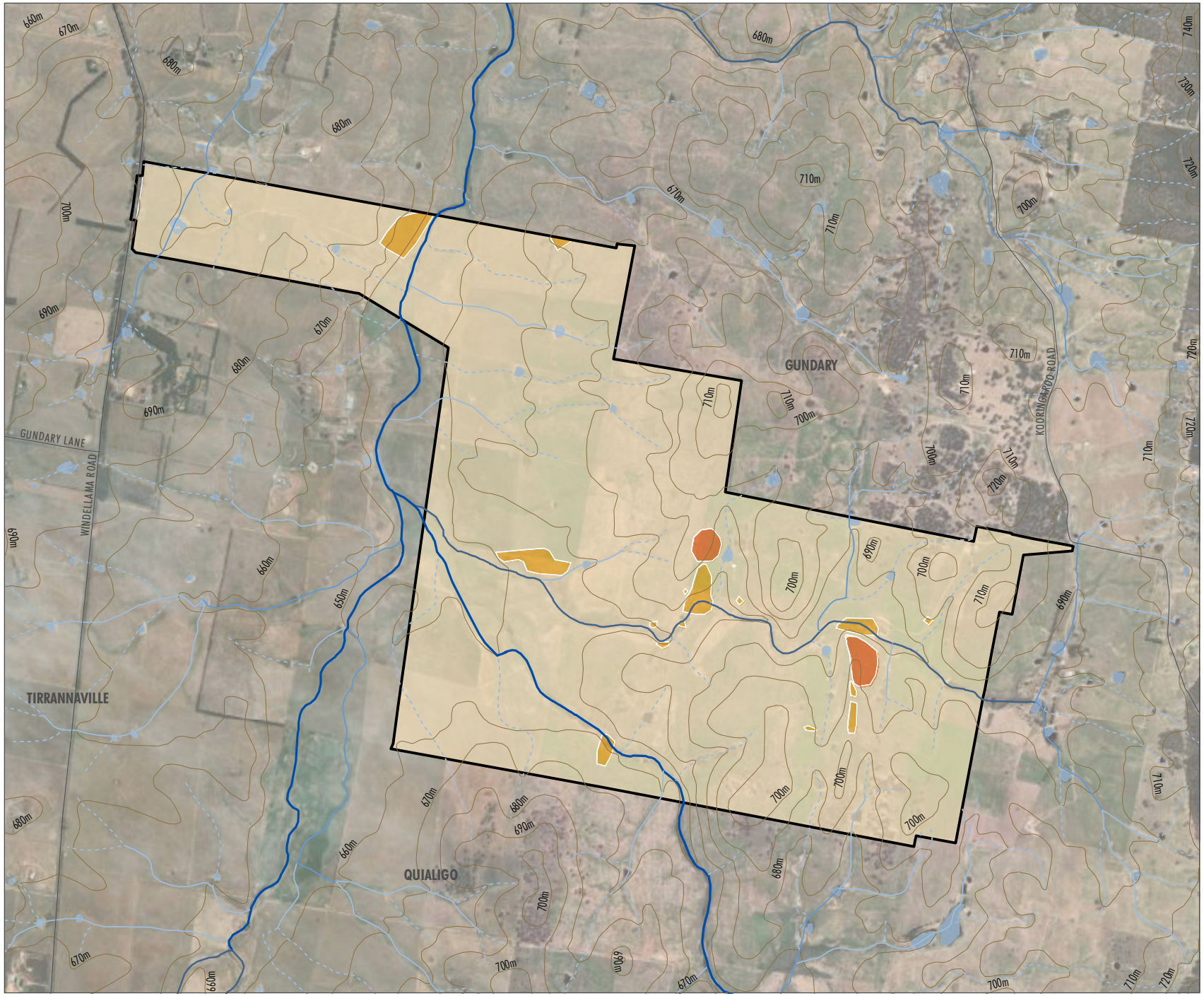
6.3.2 Sites of Low Scientific Significance

Overall, the artefacts at sites GSF-UMW-2, GSF-UMW-3, GSF-UMW-4, GSF-UMW-5, GSF-UMW-7, GSF-UMW-8, GSF-UMW-10, GSF-UMW-11, GSF-UMW-16, GSF-UMW-17, GSF-UMW-18, GSF-UMW-12, GSF-UMW-13, GSF-UMW-14, GSF-UMW-15 are not particularly rare (in terms of type and cultural material) and there are other examples of them in the local area. Although the broken basalt hammerstone at GSF-UMW-1 is relatively uncommon, it was found out of situ, and the reducing its research potential. The sites have low representativeness, as there are other richer and more representative sites in the locality. These sites have low research value as there was no datable material identified and (compared with regional assemblages) a relatively low density of artefacts was recovered at those sites subjected to test excavation (GSF-UMW-8, GSF-UMW-12, GSF-UMW-13, GSF-UMW-14, GSF-UMW-17, GSF-UMW-18, and GSF-UMW-19). These sites have moderate educational value for demonstrating Aboriginal occupation of the area. Overall, the sites have low significance on a local scale and low regional significance.

[9] Following EMM (2021), a very general way to categorise artefact deposits in the region is: low artefact density is considered under 10 artefacts in a 1 m^2 area, moderate density is considered between 10 and 50 artefacts, and high density is considered over 50 artefacts.

FIGURE 6.1

Aboriginal Cultural Heritage Values



Legend

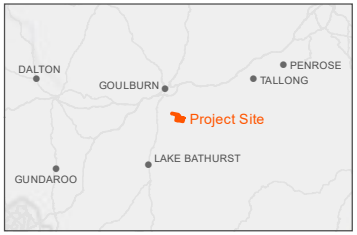
- Road
- Contours (10m)
- Project Area
- Waterbody

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher

Cultural Landscape

- Very High Cultural Values
- High Cultural Values
- Moderate-High Cultural Values



0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

7.0 Impact Assessment

7.1 Overview

The development footprint overlain on the sites identified through archaeological investigations (**Figure 7.1**) indicates the Project will avoid three identified sites, partially impact seven sites and completely impact nine sites (**Table 7.1**). For the sites which cannot be avoided by the Project, the mitigation measures outlined in the following section are to be implemented.

Table 7.1 Overview of sites being impacted by the Project

Sites avoided by Project	Sites partially impacted by Project	Sites totally impacted by Project
GSF-UMW-3	GSF-UMW-1	GSF-UMW-6
GSF-UMW-4	GSF-UMW-2	GSF-UMW-7
GSF-UMW-5	GSF-UMW-8	GSF-UMW-9
	GSF-UMW-12	GSF-UMW-10
	GSF-UMW-13	GSF-UMW-11
	GSF-UMW-14	GSF-UMW-16
	GSF-UMW-15	GSF-UMW-17
		GSF-UMW-18
		GSF-UMW-19

7.2 Measures to Minimise Harm and Alternatives

The most notable consideration from an Aboriginal cultural heritage perspective is the location and design of the development footprint within the broader Project Area, which aims to avoid and minimise disturbance of sites and archaeologically sensitive landforms.

During the Project's early planning phase, desktop constraints analysis and archaeological surveys were undertaken to identify the most archaeologically sensitive areas so that the development footprint could be designed to minimise substantial impacts to Aboriginal sites. As a result, the Project's layout incorporates a minimum 20 m setback around 2nd order and higher streams including some farm dams within the Project Area, which is considered to have very high sensitivity of landform for surface artefact concentrations and where a majority of surface artefact material was identified.

7.3 Impacts to Unknown Aboriginal Objects

As discussed in **Section 5.6,** it is highly likely that further subsurface archaeological material occurs within the Project Area, particularly on elevated, broad mid-to-upper slopes and crests of spurs within 200 m of perennial water. As such this ACHA acknowledges that the Project is likely to impact Aboriginal objects in addition to those sites that have been recorded and mapped. It is likely that such deposits would be lesser than or equal in significance to the primary subsurface artefact concentrations found at GSF-UMW-9 and GSF-UMW-6, and therefore are likely to range from low to moderate significance. Based on archaeological and community consultation considerations, a way to mitigate the loss of known and unknown Aboriginal objects within the Project Area is to salvage a representative sample of artefacts present in surface and subsurface contexts. These are outlined in **Section 8.0**.

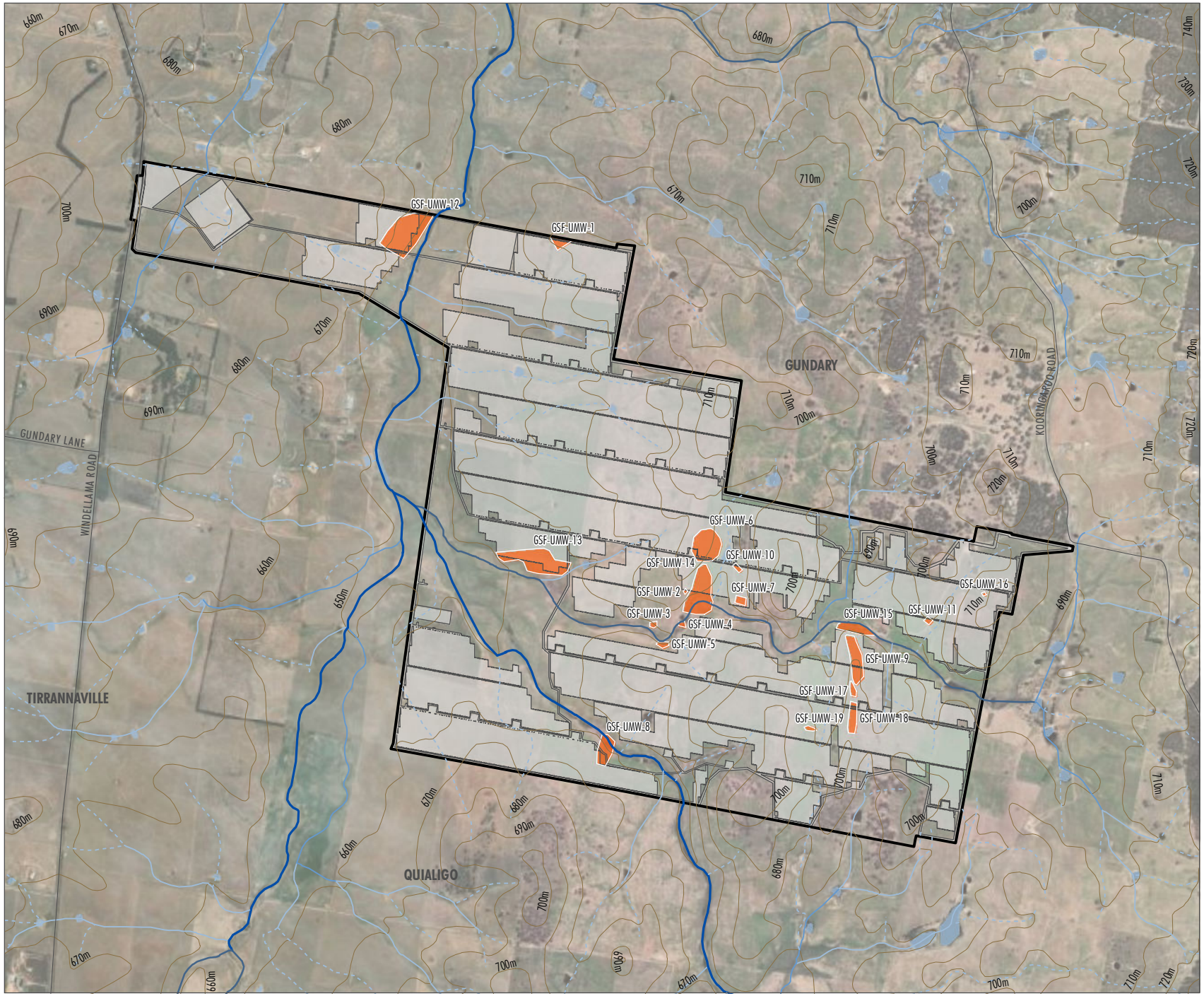


FIGURE 7.1

Development Footprint and Known Archaeological Sites

Legend

- Road
- Contours (10m)
- Project Area
- Waterbody
- All Archaeological Sites in Project Area
- Development Footprint

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher

0 0.5 1

Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

7.4 Cumulative Impacts and Intergenerational Loss/Equity

7.4.1 Rationale

The aim of assessing cumulative impacts is to identify how much of the local and regional archaeological resource has been impacted already, how much of it remains, and the effects the Project will have on the archaeological resource considering what is already lost from other developments. In this case, it is important to recognise that the land surrounding the Project Area contains a substantial archaeological resource because it is largely pastoral properties.

7.4.2 Existing Impacts to the Region

The surrounding region is characterised by established open farmland with remnant native forests contained in highlands commencing 1 km to the east. Low-level urban and industrial development is focused around the township of Goulburn.

The most widespread impact in the region is from the historical clearing and ploughing involved in establishing and maintaining the open farmland. These activities are likely to have removed modified trees and reduced the archaeological integrity of many open artefact sites, particularly on shallow soils where ploughing has disturbed the entire soil profile. Nevertheless (as shown in the current excavation program), many sites still are retained in agricultural areas, despite impacts from farming.

7.4.3 Intergenerational Loss/Equity

Aboriginal heritage management is based on the principle of *intergenerational equity* which has the intention to ensure present generations consider future generations when making management decisions. This principle is possibly the most relevant part of the notion of *ecologically sustainable development* (ESD) when considering Aboriginal heritage management.

A substantial local archaeological resource will remain in the Project Area, considering that three known Aboriginal sites will be completely un-impacted by the development, and seven sites will only be partially impacted.

While it is acknowledged that the Project will cause impacts to Aboriginal heritage, the proposed management measures presented in **Section 8.0** are anticipated to provide detailed information about Aboriginal heritage in the Project Area to mitigate against the loss. This will help to achieve intergenerational equity by allowing retention of cultural materials for the enjoyment and education of future generations.

8.0 Management

8.1 Management and Mitigation Strategy

8.1.1 Strategy Options Considered

There are a range of management strategies that are available in relation to the Project that include varying levels of mitigation of identified or potential harm. The selection of management strategies is guided by the information included in the preceding sections of this ACHA.

The management strategies proposed in response to the impacts and significance levels comprise the following:

- avoidance of Aboriginal sites that are within the Project Area that will not be impacted by current plans
- surface collection of Aboriginal sites in the development footprint area
- staged salvage excavation of two sites
- procedures that specify actions to be taken in the event of discovery of human skeletal remains, discovery of Aboriginal sites, and for the ongoing care of salvaged Aboriginal objects.

8.1.1.1 Avoidance

A total of three sites (GSF-UMW-3, GSF-UMW-4, GSF-UMW-5) in the Project Area will be actively avoided. These sites are to be fenced off prior to construction commencing, to ensure any potential inadvertent impacts are avoided.

8.1.1.2 Collection

All sites with surface stone artefacts within the development footprint of the Project will be collected from the ground surface (including sites that will be subject to salvage excavation). This will involve collecting the entire visible contents of six sites (GSF-UMW-6, GSF-UMW-7, GSF-UMW-9, GSF-UMW-10, GSF-UMW-11, GSF-UMW-16) and partially collecting artefacts from seven sites (GSF-UMW-1, GSF-UMW-2, GSF-UMW-8 GSF-UMW-12, GSF-UMW-13, GSF-UMW-14, GSF-UMW-15).

The collection will be undertaken by qualified archaeologists and RAP representatives. The collection method will be as follows:

- Site coordinates and area polygons for each site will be entered into a GPS device to re-locate and confirm the location.
- The general vicinity of each site location will be inspected by the field team. Stone artefacts will be flagged on the ground and a photo taken of the flagged site. Each flagged artefact will be marked as a waypoint in the GPS.
- All artefacts will be collected into snap lock plastic bags marked with the Project name, site name, collection date and waypoint number.

- All artefacts will be sorted and recorded post-fieldwork with respect to technological type, implement type, raw material, maximum block length and weight.
- The collected artefacts will be incorporated into the overall salvage report detailing the results of the fieldwork, the artefacts recovered at each site and GIS figures showing the artefact locations.
- Results of the artefact analysis will be integrated into the overall salvage report and contribute to the overall interpretation of the area.

8.1.1.3 Staged Archaeological Excavation

It is recommended that a salvage excavation occurs for two sites: GSF-UMW-6 and GSF-UMW-9 (**Figure 8.1)**. All salvage excavation will be limited to the approved the Project development footprint. GSF-UMW-6 will be subject to an investigative phase involving further test pitting along the broad spur crest portion of the site so that the most appropriate salvage area can be targeted (to account for the potential for higher artefact concentrations to be identified and targeted rather than those found in Area A test pits 10, 10W, 10N, and 10S. The test pitting for this site may extend beyond the mapped site boundary in **Figure 8.1** but will be within the development footprint.

GSF-UMW-9 has already been subject to detailed investigation as part of the test excavation program and will proceed straight to Phase 2 of excavation.

Phase 1 Excavation – Investigative Phase (GSF-UMW-6 Only)

- Phase 1 excavations will be undertaken in units of 50 cm by 50 cm.
- The location and distribution of Phase 1 excavation units will be determined in field to avoid areas of localised disturbance and to focus the excavations on areas most likely to contain intact archaeological deposit. Where possible Phase 1 excavation units will be distributed across linear transects with 20 m intervals.
- Each Phase 1 excavation unit will be excavated in 10 cm spits or stratigraphically (where possible), ensuring that the soil profile is adequately described.
- Excavations will cease where one or more of the following criteria are established:
    - B horizon deposits are encountered.
    - It is deemed unsafe to continue to excavate because of risk of collapse or water ingress.
    - If it is agreed by the archaeologist and Aboriginal party representatives present on site that the excavation has continued past the depth of deposits containing cultural material.
    - Where the depth of anticipated Project impacts has been reached.
- Excavated materials (except for sediments from features such as hearths or heat treatment pits) will be sieved using 5 mm wire mesh sieves. Where necessary, wet sieving may be undertaken.
- The final area targeted for open area salvage will be determined based on the results of additional test pitting in comparison to the existing results for GSF-UMW-6 (i.e., the areas with highest frequencies will be targeted).

- Excavation procedures and protocols may be modified at the discretion of the Excavation Director, in consultation with the RAPs as the conditions in the field and nature of the excavations develop. This includes the movement/discontinuance of test pits to avoid existing obstacles, buried services and disturbances.

Phase 2 Excavation – Salvage

GSF-UMW-6 and GSF-UMW-9 will be subject to Phase 2 of excavation. The aim of the salvage excavation will be to provide a representative sample of stone artefacts, raw materials and implements used in the local area.

The test units from which the highest artefact density was identified in the archaeological test excavation program (or Phase 1 of excavation) will be selected for location for salvage. Thus, for GSF-UMW-6, the area around Test Unit 10, or an area identified through additional testing, will be expanded, and for GSF-UMW-9, the area around Test Unit 35W will be subject to expansion. Once the subject test excavation unit is expanded to 1 m x 1 m, the excavation can expand from this trench and dug in 1 m x 1 m squares to increase the efficiency of the salvage. The final scope of salvage will be determined during the preparation of the ACHMP, but it is envisaged that salvage is to continue to up to 25 m^2 in each area (5 m by 5 m open area), unless there is a significant drop-off in artefact density.

Post Excavation Analysis and Reporting

An Aboriginal Cultural Heritage Excavation Report will be prepared following the completion of the Test Excavation and Salvage Program. The report will:

- Be provided to the Planning Secretary, Heritage NSW – ACH and RAPs within 18 months of the completion of the Aboriginal archaeological collections and excavations (both test and salvage).
- Document the results of the archaeological test excavations and any subsequent salvage excavations (with artefact analysis and identification of a final repository for finds).
- Be provided to RAPs with a minimum of 28 days to consider the report and provide comments before the report is finalised.

The post-excavation analysis (incorporating data from the excavations) would be designed to address the research objectives and aims, along with other relevant questions that may arise based on the results of the excavation. These could include, but not be necessarily limited to:

- Stone artefact analysis, including descriptive and functional recording of the assemblage, as well as interpretation of past activities, post-depositional change and comparison with other nearby data. Artefact conjoining may also be attempted where sufficient cultural materials have been recovered.
- Geochronology, including the processing and analysis of samples to inform the absolute age of the soil profile and/or cultural assemblage recovered. This would include Optically Stimulated Luminescence (OSL) ages, as well as radiocarbon samples, where recovered. While large number of these samples are likely to be collected, given the prohibitive cost of processing, it is probable that a small number of ages would be obtained in a small number of master-sequences to inform the broader archaeological program.

- Palaeo-environmental analysis, including palynology, phytolith analysis and/or charcoal analysis to explore the past vegetation and fire regimes that may have been influenced and/or modified by past human activity. These would utilise the same samples collected for geochemistry and/or sampling and sent to a range of university specialists in these fields to process and interpret the results.

Reporting that would provide information on the field investigations, compilation and synthesis of the post excavation analyses, and interpretation of the results to inform the past activity and use of the region.

8.1.1.4 Unmitigated Impacts (artefacts retained ex-situ)

Unmitigated impacts will apply to three sites in Project Area: GSF-UMW-17, GSF-UMW-18, GSF-UMW-19 Unmitigated impacts to these sites apply because they relate to subsurface sites of low or moderate significance which do not warrant further investigation or salvage, although artefacts recovered during excavations will be retained ex situ.

8.1.2 Aboriginal Cultural Heritage Management Plan

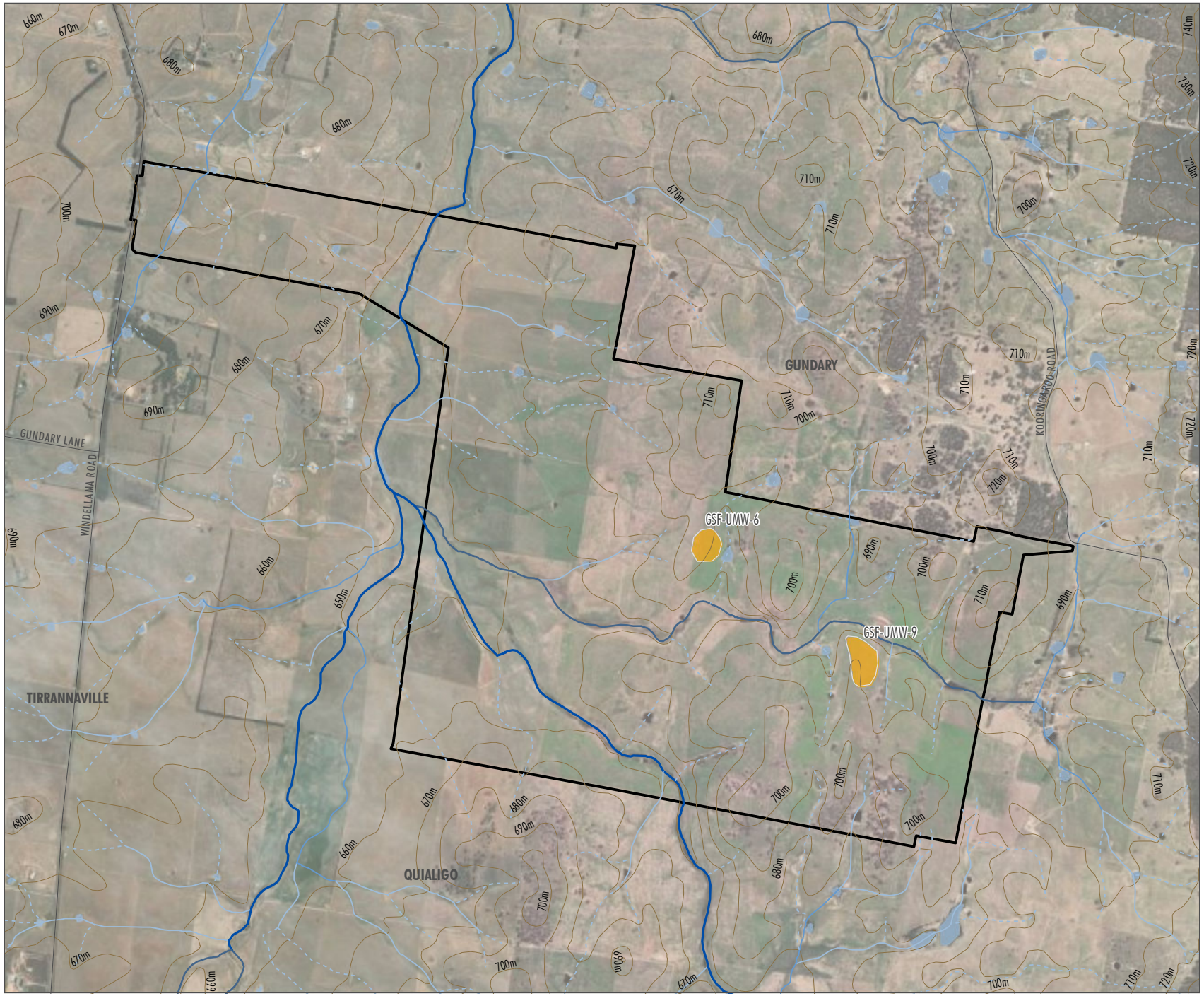
An Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed in consultation with Heritage NSW and RAPs. It will provide details of:

- all Aboriginal sites identified during the archaeological investigation for the Project
- management measures
- measures to ensure ongoing consultation and involvement of RAPs
- RAP access arrangements for a selection of significant sites for educational purposes
- protocols for newly identified sites
- protocols for educating staff and contractors of their obligations relating to Aboriginal cultural heritage values through a site induction process
- protocols for suspected human skeletal materials
- protocols for the ongoing care of salvaged Aboriginal objects.
- provisions for review and updates of the AHMP.

The ACHMP will be prepared after project approval, and in addition to the points above, will address all relevant conditions of approval. The ACHMP will provide the details of the management measures outlined in the sections below.

FIGURE 8.1

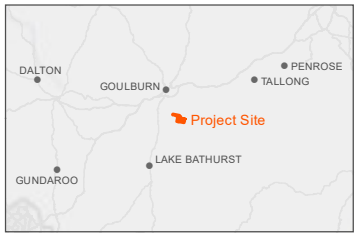
Archaeological Management Zones



- Road
- Contours (10m)
- Project Area
- Waterbody
- Salvage Excavation

Strahler Stream Order

- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream or Higher



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Kilometers

Scale: 1:0 at A4
GDA2020 MGA Zone 55

Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

8.1.3 Aboriginal Keeping Place / Artefact Reburial

A keeping place is a designated long term secure area for the purpose of storing and curating Aboriginal cultural materials and their associated documentation.

The recovered Aboriginal objects will be temporarily stored at a designated location during cataloguing and analysis (Umwelt Offices). At the completion of cataloguing and analysis, the recovered objects will be transferred to a long-term facility. This would involve applying for a care agreement with Heritage NSW.

The long-term storage location for the recovered objects will be determined during the development of the ACHMP in consultation with the RAPs. It is currently recommended that the artefacts should be reburied within the Project Area boundary, however this is to be further discussed with the RAPs as part of the ACHMP. All associated reports and records will be stored in close proximity to the artefacts and kept in both hard copy and digital forms. The procedures to be adopted for access to the objects will be detailed in the ACHMP.

8.1.4 Discovery of New Aboriginal Sites

In the event of discovery of new Aboriginal sites in the Project Area, all work in the potentially affected area (within 20 m of the site) will halt and an archaeologist and designated RAP representatives will be contacted to determine the significance of the object(s).

Any new sites will also be registered in the AHIMS database. Objects will be managed in a manner consistent with the management measures outlined above and finalised in the ACHMP, including appropriate forms of salvage collection.

8.1.5 Aboriginal Ancestral Remains

It is important that all personnel working on the Project during construction be briefed on the possibility and the appropriate protocols to follow if human remains are found, as well as, what to do if other Aboriginal cultural material is encountered.

If known or suspected human remains are encountered during the Project's construction, the following procedure will be followed as soon as the suspected remains are discovered:

- all work in the immediate vicinity will cease and the find will be reported to the work supervisor who will advise the site supervisor or other nominated senior staff member
- the site supervisor or other nominated senior staff member will promptly notify the police and the State coroner (as required for all human remains discoveries)
- the site supervisor or other nominated senior staff member will contact Heritage NSW for advice on identification and management of Aboriginal skeletal material
- if it is determined that the skeletal material is of Aboriginal ancestry, the RAPs will be contacted and consultative arrangements will be made to discuss ongoing care or reinterment of the remains.

8.2 Management Summary

Table 8.1 provides a summary of all Aboriginal sites, significance types and management recommendations presented as part of this report.

Table 8.1 Site Significance, Impact and Management Summary

Name	Site Type	Significance Rating	Level of Impact	Management Strategy
GSF-UMW-1	Open artefact site	Low	Partial Disturbance	Collection
GSF-UMW-2	Open artefact site	Low	Partial Disturbance	Collection
GSF-UMW-3	Open artefact site	Low	None	Avoidance
GSF-UMW-4	Open artefact site	Low	None	Avoidance
GSF-UMW-5	Open artefact site	Low	None	Avoidance
GSF-UMW-6	Open artefact site with deposit and PAD	Moderate	Total Disturbance	Collection and Staged Salvage
GSF-UMW-7	Open artefact site	Low	Total Disturbance	Collection
GSF-UMW-8	Open artefact site with deposit and PAD	Low	Partial Disturbance	Collection
GSF-UMW-9	Open artefact site with deposit and PAD	Moderate	Total Disturbance	Collection and Staged Salvage
GSF-UMW-10	Open artefact site	Low	Total Disturbance	Collection
GSF-UMW-11	Open artefact site	Low	Total Disturbance	Collection
GSF-UMW-12	Open artefact site with deposit and PAD	Low	Partial Disturbance	Collection
GSF-UMW-13	Open artefact site with deposit and PAD	Low	Partial Disturbance	Collection
GSF-UMW-14	Open artefact site with deposit and PAD	Low	Partial Disturbance	Collection
GSF-UMW-15	Open artefact site with PAD	Low	Partial Disturbance	Collection
GSF-UMW-16	Open artefact site	Low	Total Disturbance	Collection
GSF-UMW-17	Open artefact site with deposit and PAD	Low	Total Disturbance	Unmitigated Impacts (artefacts recovered through excavation retained ex-situ)
GSF-UMW-18	Open artefact site with deposit and PAD	Low	Total Disturbance	Unmitigated Impacts (artefacts recovered through excavation retained ex-situ)
GSF-UMW-19	Open artefact site with deposit and PAD	Low	Total Disturbance	Unmitigated Impacts (artefacts recovered through excavation retained ex-situ)

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White, B. 2018. “Time Matters on Shallow Open Sites: An Example from Western Sydney, Australia.” PhD, University of Sydney.

Wyatt, Ransome T. 1972. *The History of Goulburn, N.S.W*. Lansdowne Press (NSW).

10.0 Abbreviations

Term	Definition
AHD	Australian Height Datum
ACHA/ACHAR	Aboriginal cultural heritage assessment report
AHIMS	Aboriginal Heritage Information Management System
ACHMP	Aboriginal Cultural Heritage Management Plan
AMBS	Australian Museum Business Services
BP	Years before present
c.	circa
cm	centimetres
DEC	Department of Environment and Conservation, now Heritage NSW
DECCW	Department of Environment Climate Change and Water, now Heritage NSW
DPC	Department of Premier and Cabinet
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979* NSW
ESD	Ecologically sustainable development
FGS	Fine grained siliceous
g	grams
GIS	geographical information system
GPS	global positioning system
ha	hectare
ICOMOS	International Council on Monuments and Sites
IMT	Indurated mudstone/tuff
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
m^2	square metres
mm	millimetres
n	Number
NSW	New South Wales
NPW Act	*National Parks and Wildlife Act 1974* NSW
OEH	Office of Environment and Heritage, now Heritage NSW
PAD	Potential archaeological deposit
RAP	Registered Aboriginal Party
SEARs	Secretary's Environmental Assessment Requirements
t	Tonne
TU	Test excavation unit

APPENDIX A

Community Consultation Records

Redacted version suitable for public display (does not include RAP contact details or confidential information). This information can be made available for the purposes of development application review by statutory bodies, on request.

Contact	Contacted By	Method	Date	Comments
ABORIGINAL CONSULTATION RECORD				
Project Name: Gundary Solar Farm				**Project #: 22223**
Stage 1 – Notification of project proposal and registration of interest				
Agency Letter Sent				
Heritage NSW	Umwelt (Andrew Crisp)	Email	25/05/2022	
The Office of the Registrar, Aboriginal Land Rights Act 1983	Umwelt (Andrew Crisp)	Email	25/05/2022	
National Native Title Tribunal	Umwelt (Andrew Crisp)	Email	25/05/2022	
Native Title Services Corporation (NTSCORP)	Umwelt (Andrew Crisp)	Email	25/05/2022	
Pejar Local Aboriginal Land Council	Umwelt (Andrew Crisp)	Email	25/05/2022	
South-East Local Land Services	Umwelt (Andrew Crisp)	Email	25/05/2022	
Goulburn Mulwaree Council	Umwelt (Andrew Crisp)	Email	25/05/2022	
Agency Letter Responses				
Umwelt (Andrew Crips)	Heritage NSW	Email	8/06/2023	Attached letter with potential Aboriginal stakeholders list
Umwelt (Andrew Crips)	National Native Title Tribunal	Email	12/05/2022	Confirmed there was no overlap with any National Native Title entries (applications or determinations)
Umwelt (Andrew Crips)	South-East Local Land Services	Email	17/05/2022	Replied with a response that the LLS does not currently does not coordinate or administer any Aboriginal reference group for the region
Umwelt (Andrew Crips)	Goulburn Mulwaree Council	Email	17/05/2022	Attached reference to the latest Goulbourn Aboriginal Heritage Study
Newspaper Public Notice				
Goulbourn Post	*1-Jun-22*			
Expression of Interest Letter Sent				
Yurrandaali	Umwelt (Andrew Crisp)	Email		
Barraby Cultural Services	Umwelt (Andrew Crisp)	Email		
Ngunnawal Elders Corporation	Umwelt (Andrew Crisp)	Email		
Pejar Local Aboriginal Land Council	Umwelt (Andrew Crisp)	Email		
Buru Ngunawal Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Ngunnawal Elder	Umwelt (Andrew Crisp)	Email and post		
Gundungurra Aboriginal Heritage Association Inc.	Umwelt (Andrew Crisp)	Email and post		
Ngunawal Heritage Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Konanggo Aboriginal Cultural Heritage Services	Umwelt (Andrew Crisp)	Email		
Yurwang Gundana Consultancy Cultural Heritage Services.	Umwelt (Andrew Crisp)	Email		
King Brown Tribal Group	Umwelt (Andrew Crisp)	Email		
Gunjeewong Cultural Heritage Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Yukkumbruk	Umwelt (Andrew Crisp)	Email and post		
Corroboree Aboriginal Corporation	Umwelt (Andrew Crisp)	Email and post		
Murrabidgee Mullangari Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Nundagurri Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Walbunja	Umwelt (Andrew Crisp)	Email		
Goobah Development Pty Ltd.	Umwelt (Andrew Crisp)	Email		
Gunyuu	Umwelt (Andrew Crisp)	Email		
Wullung	Umwelt (Andrew Crisp)	Email		
Badu	Umwelt (Andrew Crisp)	Email		
Yerramurra	Umwelt (Andrew Crisp)	Email		
Jerringong	Umwelt (Andrew Crisp)	Email		
Merrigarn Indigenous Corporation	Umwelt (Andrew Crisp)	Email		
Wingikara	Umwelt (Andrew Crisp)	Email		
Bilinga	Umwelt (Andrew Crisp)	Email		
Munyunga	Umwelt (Andrew Crisp)	Email		

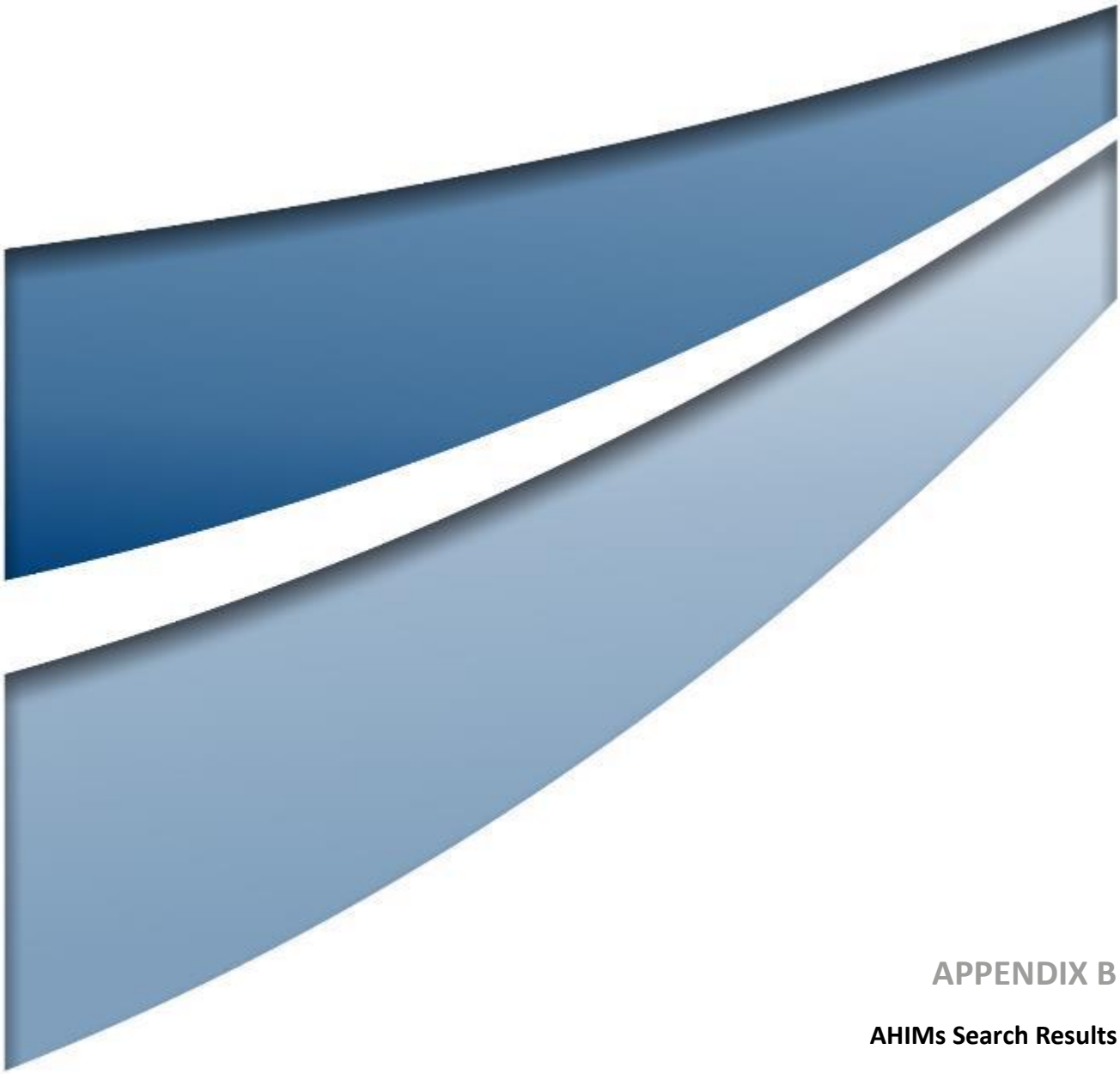
Contact	Contacted By	Method	Date	Comments
Pemulwuy	Umwelt (Andrew Crisp)	Email		
Karrial	Umwelt (Andrew Crisp)	Email		
Didge Ngunawal Clan	Umwelt (Andrew Crisp)	Email		
Ginninderra Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Muragadi Heritage Indigenous Corporation	Umwelt (Andrew Crisp)	Email		
Gundungurra Tribal Council Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Gundungurra Aboriginal Heritage Association Inc.	Umwelt (Andrew Crisp)	Email		
THAUAIRA	Umwelt (Andrew Crisp)	Email		
WALGALU	Umwelt (Andrew Crisp)	Email		
Gadhu Dreaming	Umwelt (Andrew Crisp)	Email		
Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation	Umwelt (Andrew Crisp)	Email		
Duncan Falk Consultancy	Umwelt (Andrew Crisp)	Email		
Thoorga Nura	Umwelt (Andrew Crisp)	Email		
Janine Thompson	Umwelt (Andrew Crisp)	Email		
Ngurambang	Umwelt (Andrew Crisp)	Email		
Clorine Lyons	Umwelt (Andrew Crisp)	Email and post		
Ngunawal Consultancy	Umwelt (Andrew Crisp)	Email		
Oak Hill Enterprises	Umwelt (Andrew Crisp)	Email		
Gilay Consultants	Umwelt (Andrew Crisp)	Email		
Mulwaree Aboriginal Community Inc	Umwelt (Andrew Crisp)	Email		
Konanggo Aboriginal Cultural Heritage Services	Umwelt (Andrew Crisp)	Email		
Mundawari Heritage Consultants	Umwelt (Andrew Crisp)	Email		
Kamilaroi Yankuntjatjara Working Group	Umwelt (Andrew Crisp)	Email		
Guntawang Aboriginal Resources Incorporated	Umwelt (Andrew Crisp)	Email		
Maria Williams	Umwelt (Andrew Crisp)	Email		
Jason Davison	Umwelt (Andrew Crisp)	Email		
Timothy Stubbs	Umwelt (Andrew Crisp)	Email		
Clive Freeman	Umwelt (Andrew Crisp)	Email		
Expression of Interest Responses				
Umwelt (Andrew Crisp)	Pejar Local Aboriginal Land Council (Pejar LALC)	Verbal	2/12/2023	Automatic registration and verbal confirmation of involvement in Project on 2 December 2023
Umwelt (Andrew Crisp)	Buru Ngunawal Aboriginal Corporation	Email	12/06/2022	Registration
Umwelt (Andrew Crisp)	Yurwang Gundana Consultancy Cultural Heritage Services (GCCHS)	Email	15/06/2022	Registration
Umwelt (Andrew Crisp)	Corroboree Aboriginal Corporation	Email	9/06/2022	Registration
Umwelt (Andrew Crisp)	Murrabidgee Mullangari Aboriginal Corporation (MMAC)	Email	13/06/2023	Registration
Umwelt (Andrew Crisp)	Merrigarn Indigenous Corporation	Email	13/06/2023	Registration
Umwelt (Andrew Crisp)	Didge Ngunawal Clan	Email	9/06/2023	Registration
Umwelt (Andrew Crisp)	Ginninderra Aboriginal Corporation	Email	9/06/2023	Registration
Umwelt (Andrew Crisp)	Muragadi Heritage Indigenous Corporation	Email	9/06/2022	Registration
Umwelt (Andrew Crisp)	Mulwaree Aboriginal Community Inc	Email	12/06/2022	Registration
Umwelt (Andrew Crisp)	Konanggo Aboriginal Cultural Heritage Services (KACHS)	Email	10/06/2022	Registration

Contact	Contacted By	Method	Date	Comments
Umwelt (Andrew Crisp)	Mundawari Heritage Consultants (MHC)	Email	9/06/2022	Registration
Umwelt (Andrew Crisp)	Kamilaroi Yankuntjatjara Working Group	Email	9/06/2022	Registration
Umwelt (Andrew Crisp)	Guntawang Aboriginal Resources Incorporated (GARI)	Email	17/06/2022	Registration
Umwelt (Andrew Crisp)	Timothy Stubbs	Email	10/06/2022	Registration
Umwelt (Andrew Crisp)	Thunderstone	Phone/Email	9/09/2023	Registered (late) through fieldwork engagement; enaged on behalf of Mulwaree Aboriginal Community Inc in fieldwork process as per correspondence on
Stage 2 – (Presentation of information about the proposed project) and 3 (Gathering information about cultural significance)				
Methodology / Project Information Sent P1 (Survey				
Pejar Local Aboriginal Land Council (Pejar LALC)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Buru Ngunawal Aboriginal Corporation	Umwelt (Andrew Crisp)	Email	16/09/2022	
Yurwang Gundana Consultancy Cultural Heritage Services (GCCHS)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Corroboree Aboriginal Corporation	Umwelt (Andrew Crisp)	Email	16/09/2022	
Murrabidgee Mullangari Aboriginal Corporation (MMAC)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Merrigarn Indigenous Corporation	Umwelt (Andrew Crisp)	Email	16/09/2022	
Didge Ngunawal Clan	Umwelt (Andrew Crisp)	Email	16/09/2022	
Ginninderra Aboriginal Corporation	Umwelt (Andrew Crisp)	Email	16/09/2022	
Muragadi Heritage Indigenous Corporation	Umwelt (Andrew Crisp)	Email	16/09/2022	
Mulwaree Aboriginal Community Inc	Umwelt (Andrew Crisp)	Email	16/09/2022	
Konanggo Aboriginal Cultural Heritage Services (KACHS)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Mundawari Heritage Consultants (MHC)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Kamilaroi Yankuntjatjara Working Group	Umwelt (Andrew Crisp)	Email	16/09/2022	
Guntawang Aboriginal Resources Incorporated (GARI)	Umwelt (Andrew Crisp)	Email	16/09/2022	
Timothy Stubbs	Umwelt (Andrew Crisp)	Email	16/09/2022	
Thunderstone	Umwelt (Andrew Crisp)	Email	16/09/2022	
Methodology / Project Information Responses P1 (survey)				
Umwelt (Andrew Crisp)	Murrabidgee Mullangari Aboriginal Corporation	Email	19/09/2023	Endorsed methodology, sent through EOI
Umwelt (Andrew Crisp)	Corroboree Aboriginal Corporation	Email	16/09/2022	Agreed with methodology, sent through EOI for fieldwork
Umwelt (Andrew Crisp)	Mulwaree Aboriginal Community Inc	Phone/Email	29/09/2022	Recommended engaing Thunderstone for fieldwork.
Umwelt (Andrew Crisp)	Konanggo Aboriginal Cultural Heritage Services	Email (and Phone)	23/09/2022	Agreed with methodology, wanted further clarification on the process of Ancestor remains if found, where cultural objects are stored. Discussion on phone with Taylor Reid (Umwelt) on 1 December 2022. Sent through EOI
Umwelt (Andrew Crisp)	Mundawari Heritage Consultants	Email	19/09/2022	Supports methodology, sent through EOI
Umwelt (Andrew Crisp)	Guntawang Aboriginal Resources Inc	Email	16/09/2022	Agreed with methodology, requested that any artefacts are found that they are reburied in a safe place and protected from the construction. Sent through EOI for fieldwork
Umwelt (Andrew Crisp)	Yurwang Gundana Consultancy Cultural Heritage Services	Email	25/09/2023	Agrees with methodology, sent through EOI
Umwelt (Andrew Crisp)	Pejar Local Aboriginal Land Council	Email/Phone	2/12/2022	Confirmation of fieldwork attendnace.
Umwelt (Andrew Crisp)	Thunderstone	Email/Phone	29/09/2022	Sent through EOI for fieldwork after being endorsed by Mulwaree Aboriginal Community Inc

Contact	Contacted By	Method	Date	Comments
Methodology / Project Information Sent P2 (Test Excavation)				
Pejar Local Aboriginal Land Council (Pejar LALC)	Umwelt (Lara Tooby)	Email	23/03/2023	
Buru Ngunawal Aboriginal Corporation	Umwelt (Lara Tooby)	Email	23/03/2023	
Yurwang Gundana Consultancy Cultural Heritage Services (GCCHS)	Umwelt (Lara Tooby)	Email	23/03/2023	
Corroboree Aboriginal Corporation	Umwelt (Lara Tooby)	Email	23/03/2023	
Murrabidgee Mullangari Aboriginal Corporation (MMAC)	Umwelt (Lara Tooby)	Email	23/03/2023	
Merrigarn Indigenous Corporation	Umwelt (Lara Tooby)	Email	23/03/2023	
Didge Ngunawal Clan	Umwelt (Lara Tooby)	Email	23/03/2023	
Ginninderra Aboriginal Corporation	Umwelt (Lara Tooby)	Email	23/03/2023	
Muragadi Heritage Indigenous Corporation	Umwelt (Lara Tooby)	Email	23/03/2023	
Mulwaree Aboriginal Community Inc	Umwelt (Lara Tooby)	Email	23/03/2023	
Konanggo Aboriginal Cultural Heritage Services (KACHS)	Umwelt (Lara Tooby)	Email	23/03/2023	
Mundawari Heritage Consultants (MHC)	Umwelt (Lara Tooby)	Email	23/03/2023	
Kamilaroi Yankuntjatjara Working Group	Umwelt (Lara Tooby)	Email	23/03/2023	
Guntawang Aboriginal Resources Incorporated (GARI)	Umwelt (Lara Tooby)	Email	23/03/2023	
Timothy Stubbs	Umwelt (Lara Tooby)	Email	23/03/2023	
Thunderstone	Umwelt (Lara Tooby)	Email	23/03/2023	
Methodology / Project Information Responses				
All responses concerned with engagement in the Aboriginal test excavation.				
Stage 4 – Review of draft cultural heritage assessment report				
Draft Report Sent				
Pejar Local Aboriginal Land Council (Pejar LALC)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2023	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Buru Ngunawal Aboriginal Corporation	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2024	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Yurwang Gundana Consultancy Cultural Heritage Services (GCCHS)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2025	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Corroboree Aboriginal Corporation	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2026	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Murrabidgee Mullangari Aboriginal Corporation (MMAC)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2027	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Merrigarn Indigenous Corporation	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2028	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Didge Ngunawal Clan	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2029	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Ginninderra Aboriginal Corporation	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2030	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Muragadi Heritage Indigenous Corporation	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2031	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Mulwaree Aboriginal Community Inc	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2032	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Konanggo Aboriginal Cultural Heritage Services (KACHS)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2033	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Mundawari Heritage Consultants (MHC)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2034	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Kamilaroi Yankuntjatjara Working Group	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2035	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Guntawang Aboriginal Resources Incorporated (GARI)	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2036	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Timothy Stubbs	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2037	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Thunderstone	Umwelt (Lara Tooby)	Email	30/6/2023 and 3/7/2038	Initital email sent with report attached, followed up on 3 July 2023 by We Transfer Link to report
Draft Report Responses				

Contact	Contacted By	Method	Date	Comments
Mundawari Heritage Consultants (MHC)	Umwelt (Lara Tooby)	Phone	10/07/2023	Happy with the report and the recommendations in the report -Asked us to check his group is included in Section 5 -Happy to add his family's personal connection to the Gundary area (relative married someone from Gundary
Konanggo Aboriginal Cultural Heritage Services (KACHS)	Umwelt (Lara Tooby)	Email	17/07/2023	In regard to the ACHA report found it very informative and descriptive. We support the recommendation of the salvage to be adopted for future works. Addressing the measurables and indicators within the landscape. You acknowledged the RAP responses, which are very important. Overall, a very good report
Kamilaroi Yankuntjatjara Working Group	Umwelt (Lara Tooby)	Email	1/08/2023	'Thank you for your Draft GSF Cultural Heritage Assessment ACHA re Gundary Solar Farm , we would like to agree and support your management and mitigation strategy. Regarding long-term management of the artefacts, I recommend reburial.'
Guntawang Aboriginal Resources Incorporated (GARI)	Umwelt (Lara Tooby)	Email	2/08/2023	'I would like to congratulate you on an excellent report, well written. Guntawang Aboriginal Resources agrees with the recommendations and the draft methodology. We hope we can be involved in the salvage or any other field work.'
Murrindyarr Aboriginal Corporation	Umwelt (Lara Donohoe)	Email / Phone	22/07/2024	Murindyarr Aboriginal Corporation notes that providing mitigation measures (archaeological excavation, as outlined in the ACHA, and artefact reburial occur), they are supportive of the Project proceeding (in terms of Aboriginal cultural heritage). They noted that 'they would welcome the opportunity to be involved in any further assessment on the subject site, and requests to be involved in ensuring the artefacts are treated appropriately. Based on what is known of the development to date, returning the artefacts to Country involving Gundungurra people would seem appropriate.' They provided further historical information on Gundungurra people to be included in the report and in addition, made comments on the cultural significance of some of the artefacts recovered during test excavations (details of which are culturally sensitive and not detailed within the report, but were relayed in confidence to Lara Donohoe on the phone on 22 July 2024. Murindyarr Aboriginal Corporation noted that the were happy to discuss these values with Heritage NSW on request). Murindyarr Aboriginal Corporation also provided ethnohistorical evidence that the Gundary Plains was likely managed ('farmed') by Aboriginal people in the past. Based on this evidence, they state that: 'The site proposed for the Gundary Solar Farm would likely have been utilised as an important hunting ground and location for sourcing a variety of food. Fresh Nadg-yung (water) was also plentiful. During fieldwork, despite significant grazing by sheep and cattle, burra (kangaroo) remained on site and there were numerous goolung (wombat) burrows. Multiple budgang (bird) species were present, including the nulla-bunya-gang (wood duck). Birdlife was particularly prominent in small areas set aside for native vegetation. The subject site appears representative of the Mulwaree or Goulburn plains that presented as very well managed (or 'farmed') by local Aboriginal people prior to colonisation. There is a network of perennial creeks and streams, including Gundary and Bullamalito Creeks, which provided wetlands ideal for fresh water and native flora and fauna, many of which were ideal food sources. The area is almost completely devoid of trees.' To manage this significance, Murindyarr Aboriginal Corporation requested the reburial of artefacts should be undertaken in consultation with their organisation, and that they would be open to further consultation and discussion of this significance if further archaeological investigation is undertaken.
Other Consultaton / Notes				

Contact	Contacted By	Method	Date	Comments
Mura Cultural Services (primary contact: Phillip Carrol) - Late Registration				Phillip Carrol previously attended site during survey representative of Thunderstone. Just prior to test excavation (April 2023), he registered for the project under his own organisation.
Mulwaree Aboriginal Community Inc (primary contact: Teena Riley) Late Registration				Teena was originally registered under Mulwaree Aboriginal Community Inc. A separate inspection of the Project Area was undertaken with Murindyarr Aboriginal Corporation on 17/07/2024, after identifying themselves as an Aboriginal knowledge holder who lives near the area, and their desire to provide cultural input on the project.



APPENDIX B

AHIMs Search Results

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22223

Client Service ID : 678541

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-6-0118	Bungonia 2	GDA	55	768772	6139399	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Dean Freeman,OzArk Environmental and Heritage Management - Dubbo,Mr.Ber					**Permits**		
51-6-0119	Bungonia Rd 1	AGD	55	755671	6143467	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Dean Freeman					**Permits**		
51-6-0003	Bungonia	AGD	55	769000	6138700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Carved Tree	
	Contact	**Recorders**	David Bell					**Permits**		
51-6-0072	S2.	AGD	55	739940	6141030	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Rex Silcox					**Permits**		
51-6-0083	S1.	AGD	55	739930	6140950	Open site	Valid	Artefact : -	Open Camp Site	3631
	Contact	**Recorders**	Rex Silcox					**Permits**		
51-6-0238	ARD1	AGD	55	769627	6134490	Open site	Valid	Artefact : 2		99385,103049
	Contact Searle	**Recorders**	Robert Paton					**Permits**		
51-6-0122	A2/VW1	AGD	55	769810	6134350	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	South East Archaeology					**Permits**		
51-6-0174	Springfield 3 a	AGD	55	739906	6131088	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0175	Springfield 4 a	AGD	55	740192	6131215	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0176	Springfield 5	AGD	55	740710	6131109	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0177	Springfield 6	AGD	55	740607	6130976	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0178	Springfield 7	AGD	55	740476	6131048	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0179	Springfield 8	AGD	55	740405	6131248	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0180	Springfield 9	AGD	55	740541	6131447	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Mr.Mark Dibben					**Permits**		
51-6-0186	Springfield 15	AGD	55	740090	6131666	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0188	Springfield 17	AGD	55	740128	6133862	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0190	Springfield 19	AGD	55	740115	6133938	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0191	Springfield 20	AGD	55	740413	6133885	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 28/04/2022 for Nicola Roche for the following area at Datum :GDA, Zone : 55, Eastings : 740000.0 - 770000.0, Northings : 6129000.0 - 6145000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 65

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22223

Client Service ID : 678541

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0192	Springfield 21	AGD	55	740944	6133791	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0193	Springfield 22	AGD	55	741051	6133984	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0194	Springfield 23	AGD	55	741050	6134207	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0195	Springfield 24	AGD	55	741123	6134368	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Mr.Mark Dibben					**Permits**		
51-6-0196	Springfield 25	AGD	55	740283	6134808	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0197	Springfield 26	AGD	55	740644	6134975	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0198	Springfield 27	AGD	55	740834	6134977	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0199	Springfield 28	AGD	55	740738	6134574	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0200	Springfield 29	AGD	55	740655	6134758	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0201	Springfield 30	AGD	55	740578	6134936	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0202	Springfield 31	AGD	55	740564	6134991	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0203	Springfield 32	AGD	55	740246	6135143	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0204	Springfield 33	AGD	55	740609	6135047	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0205	Springfield 34	AGD	55	740668	6135163	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0206	Springfield 35	AGD	55	740081	6135698	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0207	Springfield 36	AGD	55	740835	6135424	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Doctor.Julie Dibden					**Permits**		
51-6-0389	Bungonia 1	AGD	55	768602	6139122	Open site	Valid	Artefact : 5		
	Contact Searle	**Recorders**	Ms.Delise Freeman					**Permits**		
51-6-0476	Kelburn 5	GDA	55	743441	6138140	Open site	Valid	Artefact : 8		

Report generated by AHIMS Web Service on 28/04/2022 for Nicola Roche for the following area at Datum :GDA, Zone : 55, Eastings : 740000.0 - 770000.0, Northings : 6129000.0 - 6145000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 65

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22223

Client Service ID : 678541

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Justin Boney					**Permits**		
51-6-0477	Kelburn 4	GDA	55	743311	6137949	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Justin Boney					**Permits**		
51-6-0478	Kelburn 3	GDA	55	743795	6137928	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Justin Boney					**Permits**		
51-6-0479	Kelburn 2	GDA	55	743762	6137983	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Justin Boney					**Permits**		
51-6-0480	Kelburn 1	GDA	55	744716	6137916	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Justin Boney					**Permits**		
51-6-0552	BC 16	GDA	55	770000	6141548	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0576	LR6	GDA	55	761333	6130398	Open site	Valid	Artefact : 3		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0577	LR7	GDA	55	763487	6130909	Open site	Valid	Stone Quarry : 1, Artefact : 500		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0578	LR8	GDA	55	763965	6130333	Open site	Valid	Artefact : 100		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0579	LR9	GDA	55	763550	6130253	Open site	Valid	Artefact : 100		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0580	LR10	GDA	55	763452	6130266	Open site	Valid	Grinding Groove : 6		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0581	LR11	GDA	55	764463	6129994	Open site	Valid	Artefact : 11		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0583	LR13	GDA	55	761698	6129421	Open site	Valid	Artefact : 100		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0585	LR15	GDA	55	760465	6129784	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0586	LR16	GDA	55	760579	6129304	Open site	Valid	Artefact : 50		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0587	LR17	GDA	55	760318	6129140	Open site	Valid	Artefact : 3		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0591	LR22	GDA	55	759349	6129580	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0592	LR23	GDA	55	759399	6129476	Open site	Valid	Artefact : 11		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0571	LR 1	GDA	55	760396	6131301	Open site	Valid	Artefact : 8		

Report generated by AHIMS Web Service on 28/04/2022 for Nicola Roche for the following area at Datum :GDA, Zone : 55, Eastings : 740000.0 - 770000.0, Northings : 6129000.0 - 6145000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 65

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22223

Client Service ID : 678541

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0572	LR2	GDA	55	760531	6131387	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0573	LR3	GDA	55	761105	6130351	Open site	Valid	Artefact : 6		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0574	LR4	GDA	55	761253	6130478	Open site	Valid	Artefact : 100		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0575	LR5	GDA	55	761637	6130652	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0640	LR21 (Kooringaroo)	GDA	55	759880	6129776	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Heritage Surveys					**Permits**		
51-6-0802	Souths TSR 2	GDA	55	755597	6143679	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Roy Barker,DPIE - Armidale					**Permits**		
51-6-0803	Souths TSR 1	GDA	55	755521	6143666	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Roy Barker,DPIE - Armidale					**Permits**		
51-6-0804	Souths TSR 3	GDA	55	755507	6143654	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Roy Barker,DPIE - Armidale					**Permits**		
51-6-0841	Ardmore OS1	GDA	55	769574	6133342	Open site	Partially Destroyed	Artefact : -		103961
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					**Permits**		
51-6-0870	Bungonia 4	GDA	55	768615	6138578	Open site	Valid	Artefact : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					**Permits**		
51-6-0912	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact Mungabareena Aboriginal Cor	**Recorders**	Goulburn Mulwaree Council					**Permits**		

**** Site Status**

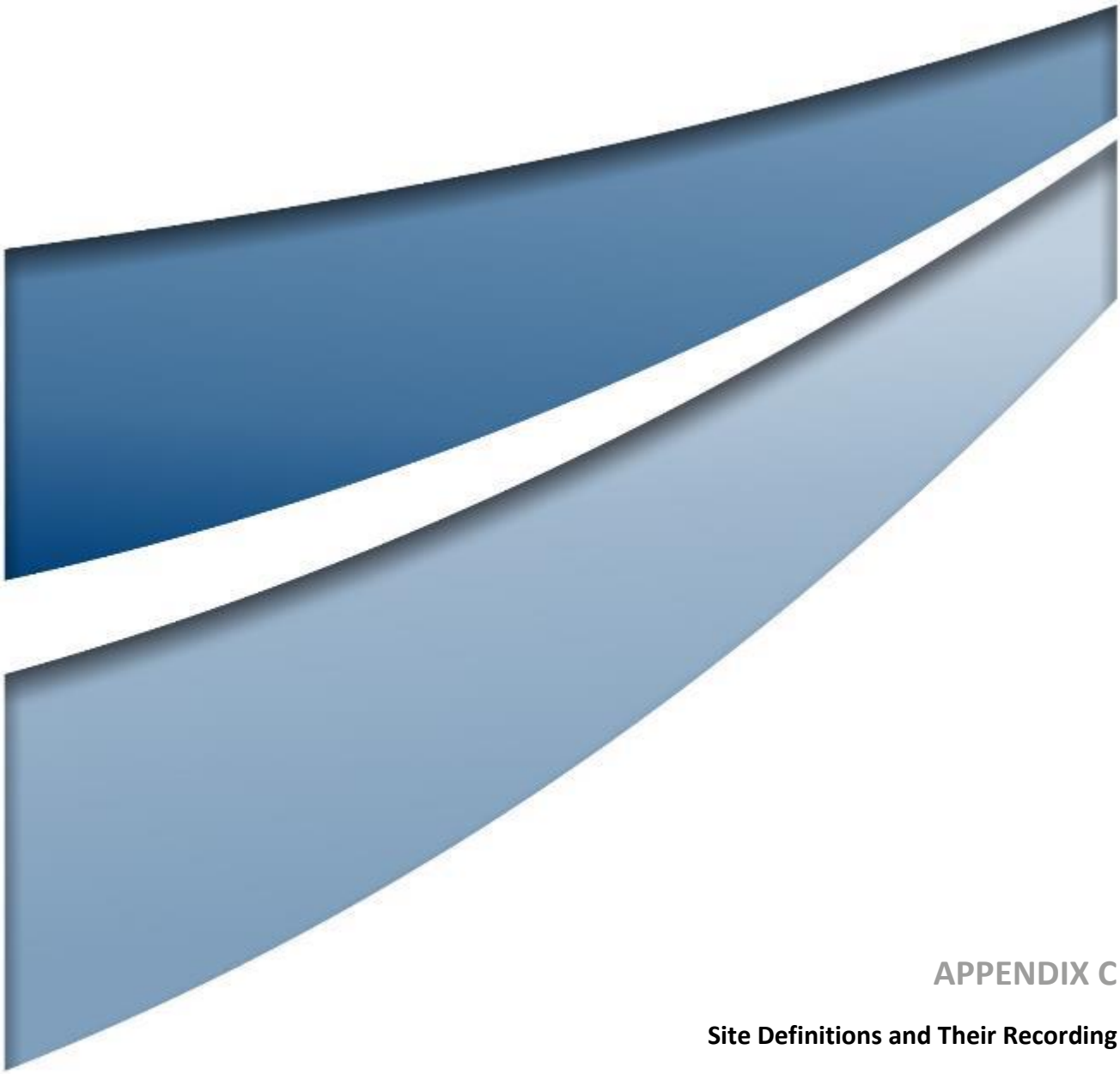
Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 28/04/2022 for Nicola Roche for the following area at Datum :GDA, Zone : 55, Eastings : 740000.0 - 770000.0, Northings : 6129000.0 - 6145000.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 65



APPENDIX C

Site Definitions and Their Recording

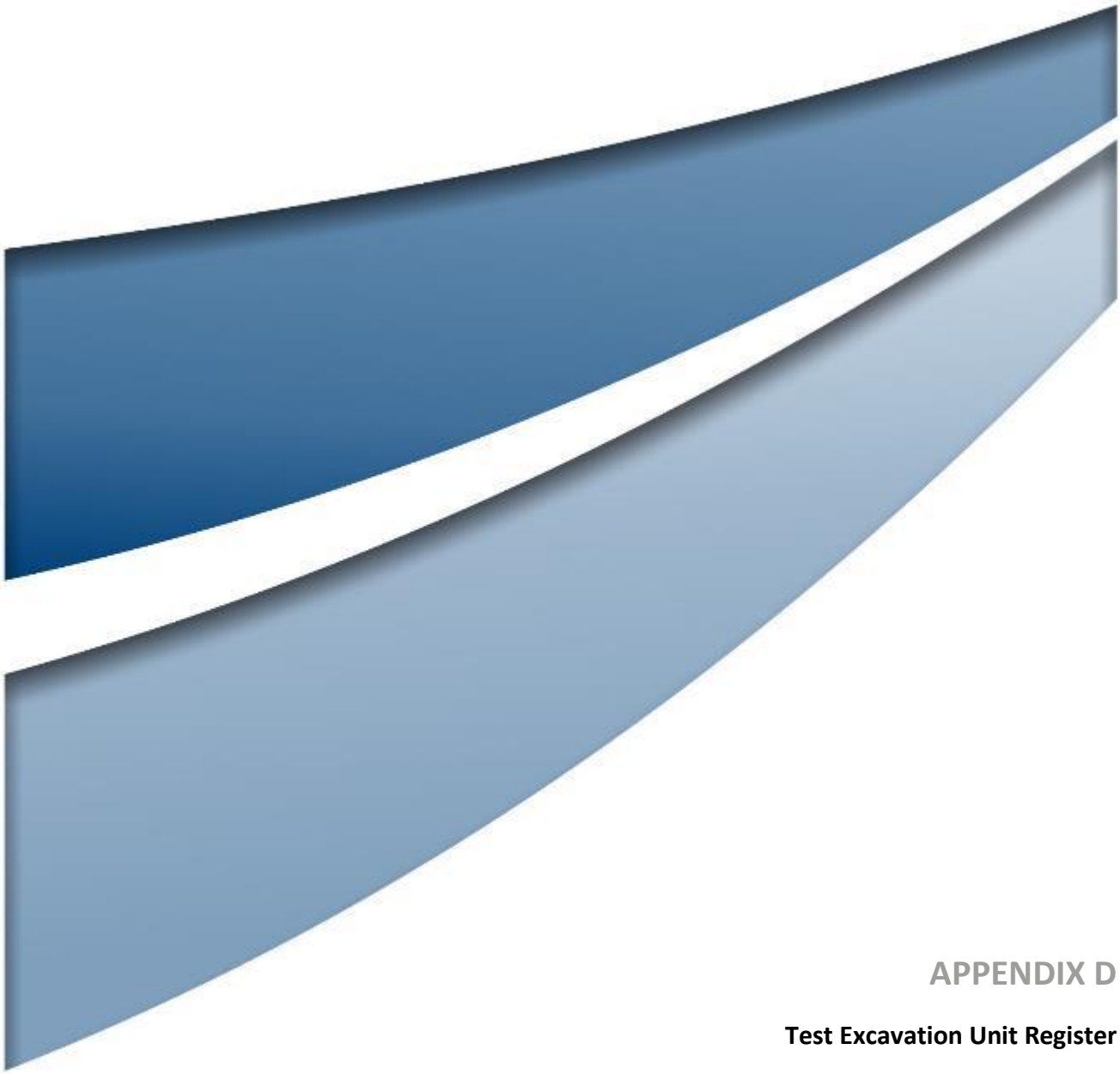
Site Definitions and Recording Methods Used For This Assessment

A description of terms used to describe different site features that occur throughout NSW is provided in the below table, based from definitions guided by Heritage NSW and those adopted by Umwelt in the field to maintain consistency in recording standards.

Site Feature	Definition and Recording Methods
Aboriginal ceremony and Dreaming	Previously referred to as mythological sites these are spiritual/story places where no physical evidence of previous use of the place may occur; e.g., natural unmodified landscape features, ceremonial or spiritual areas, men's/women's sites, dreaming (creation) tracks, marriage places etc.
Artefact site (open stone artefact site)	Objects such as stone tools, and associated flaked material, spears, manuports, grindstones, discarded stone flakes, modified glass or shell demonstrating evidence of use of the area by Aboriginal people. Open stone artefact sites were defined by the presence of one (isolated find) or more (artefact scatter) stone artefacts visible on the ground surface. The boundaries of a site are limited to the spatial extent of the visible stone artefacts. The mapped site points and/or 'site areas' do not represent the areas of potential archaeological deposit (PAD) that also apply to some sites (refer to the term 'PAD' below). Open stone artefact sites were recorded by marking each artefact location or each cluster of artefacts within a 5 m radius as a separate waypoint in the GPS. Site boundaries were allocated by drawing a line around the cluster waypoints for each site using ArcGIS software. Stone artefacts more than 50 m apart were recorded as separate sites. Umwelt acknowledges that the 50 m rule applied here is an arbitrary distinction for site boundaries and is used mainly for efficiencies in site management and to establish consistency in site recording methods
Burials	A traditional or contemporary (post-contact) burial of an Aboriginal person, which may occur outside designated cemeteries and may not be marked; e.g., in caves, marked by stone cairns, in sand areas, along creek banks etc.
Fish trap	A modified area on watercourses where fish were trapped for short-term storage and gathering.
Grinding grooves	Grinding grooves were defined as an area of outcropping bedrock containing evidence of one or more grinding grooves where ground-stone hatchets (axes) or other grinding practices (ie seed grinding) were implemented.
Habitation structure	Structures constructed by Aboriginal people for short- or long-term shelter. More temporary structures are commonly preserved away from the NSW coastline, may include historic camps of contemporary significance. Smaller structures may make use of natural materials such as branches, logs and bark sheets or manufactured materials such as corrugated iron to form shelters. Archaeological remains of a former structure such as chimney/fireplace, raised earth building platform, excavated pits, rubble mounds etc.

Site Feature	Definition and Recording Methods
Modified tree (carved or scarred)	Trees which show the marks of modification as a result of cutting of bark from the trunk for use in the production of shields, canoes, boomerangs, burials shrouds, for medicinal purposes, foot holds etc., or alternately intentional carving of the heartwood of the tree to form a permanent marker to indicate ceremonial use/significance of a nearby area, again these carvings may also act as territorial or burial markers. Modified trees (either carved or scarred) can be difficult to identify. Scars commonly occur on trees through natural processes such a branch tears, insect damage, storm and fire damage and faunal damage. Scars can also occur from mechanical damage from vehicles or farming equipment. The attributes of potential scarred trees were discussed during the survey amongst archaeologists and RAPs before it was decided if a scar would be recorded or not. A precautionary approach was adopted, whereby some of the more ambiguous examples were recorded anyway. The assessment of scar trees was made from the experience of the survey team and the guideline *Aboriginal scarred trees in New South Wales: a field manual* (DEC 2005). In some of the more ambiguous examples, it cannot be verified whether some scars recorded during the survey are of natural or Aboriginal origin. In such instances, an expert evaluation by a scar tree expert (aborist or other) would be required to determine the status of certain trees.
Potential archaeological deposit (PAD) and Assessment of Subsurface Archaeological Potential	Umwelt has defined PADs as the predicted extent of concentrated subsurface Aboriginal objects in a particular area. PADs are not technically Aboriginal sites until, and if, subsurface Aboriginal objects are identified, which is typically established through archaeological test excavation. PAD areas have been assigned to landforms that are distinguishable from the surrounding landscape (eg elevated areas with good outlook overlooking watercourses) as being likely to retain higher artefact densities than the assumed 'background scatter' of archaeological material in the broader landscape.

Site Feature	Definition and Recording Methods
Restricted	Site information contained in the Aboriginal Heritage Information Management System is available only to certain authorised groups of people, as requested by the Aboriginal community. Detailed information may not be available in search reports.
Shell	An accumulation or deposit of shellfish from beach, estuarine, lacustrine or riverine species resulting from Aboriginal gathering or consumption. Usually found in deposits previously referred to as shell middens. Must be found in association with other objects like stone tools, fish bones, charcoal, fireplaces/hearths, and burials. Will vary greatly in size and composition.
Stone quarry	Usually a source of good quality stone which is quarried and used for the production of stone tools. Stone quarries represent where Aboriginal people gathered raw stone materials for stone tools and/or manufactured stone tools from the adjacent source material. Quarry sites are found at rock outcrops where the material was of suitable quality to have been used to manufacture stone tools. Stone quarries were defined by the presence of outcropping stone material with nearby evidence of the same material type used in the stone tool manufacture process. This was most commonly indicated by large stone cores or stone flakes distributed amongst the same naturally outcropping material. Umwelt acknowledges that the 'open stone artefact' site type shares some of the same characteristics as 'stone quarries', such as the presence of stone artefacts. However, they have been distinguished from each other because quarries can not only represent open camping activities, but also a fixed location where Aboriginal people needed to visit to extract a resource. In contrast, the location of typical open camp sites were not fixed, but chosen by Aboriginal people for their favourable conditions.



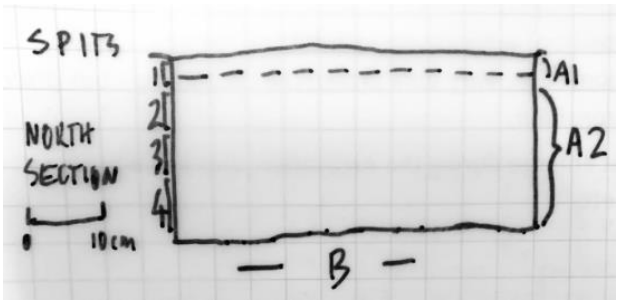
APPENDIX D

Test Excavation Unit Register

Appendix D Gundary Test Excavation Test Unit Register

TU ID	1	Easting	753957	Northing	6139374
Date Recorded	17/04/2023				
Field Recorder	Lara T and Merekai B				
Max. Depth (cm)	49				
Termination	B horizon				
Artefacts	0				

Description and Photos



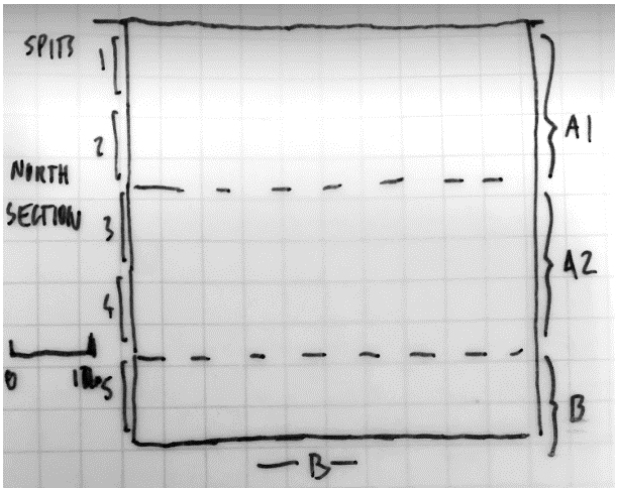
A1 Dark brown, silty loam with small pebble inclusions (10%) and root inclusions, Gradual transition to A2 Brown, silty loam, with small pebble inclusions. Gradual transition to B Light brown silty clay *(5cm spits)*

Backfilled TU, facing south.

North section

TU ID	2	Easting	753963	Northing	6139391
Date Recorded	17/04/23				
Field Recorder	Alison F				
Max. Depth (cm)	50				
Termination	B Horizon				
Artefacts	3				

Description and Photos



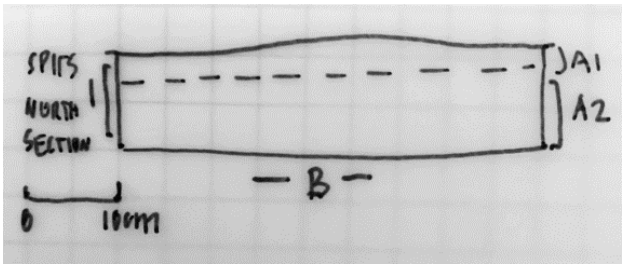
A1 Fine grained loamy sand, medium brown, very few inclusions. Clear transition to A2 Medium/brown silty clay loam. Minimal inclusions. Some charcoal mottling in and quartz in Spit 4 Clear transition to B Light brown, yellow fine grained sandy clay with pebble inclusions

Pre-ex photo, facing north

North section

TU ID	2N	Easting	753968	Northing	6139402
Date Recorded	17/04/23				
Field Recorder	Sarah M and Merekai B				
Max. Depth (cm)	10				
Termination	B Horizon				
Artefacts	2				

Description and Photos

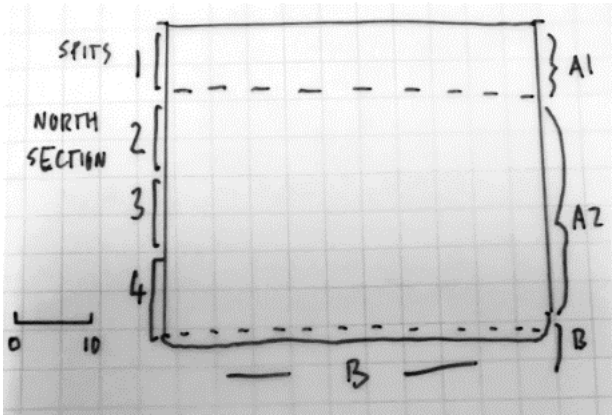


A1 Dark brown silty clay loam. Small pebble inclusions and root inclusions. Clear transition to A2 Brown silty clay loam. Small pebble inclusions. Clear transition to B Light brown silty clay with increasing pebbles.

End of excavation, north towards top of page

North section

TU ID	2S	Easting	753926	Northing	6139384
Date Recorded	17/04/23				
Field Recorder	Lara T				
Max. Depth (cm)	43				
Termination	B Horizon				
Artefacts	2				
Description and Photos					

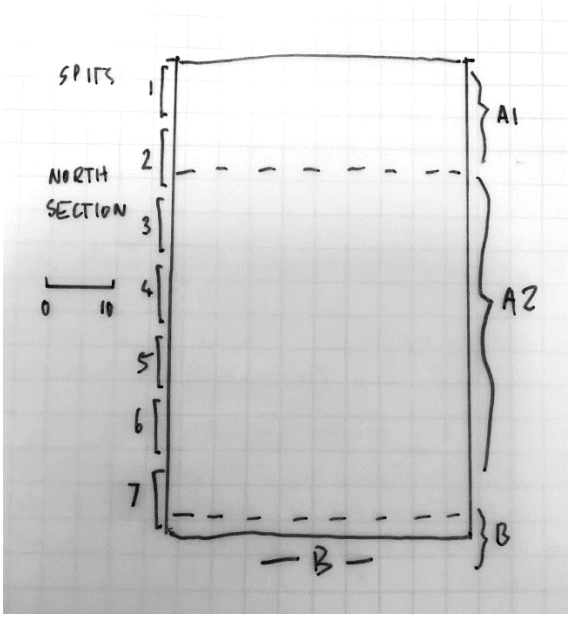


A1 Very dark brown silty loam with grass roots. Clear transition to A2 Brown clayey silt with ironstone and charcoal inclusions. Occasional roots. Increasing clay content with gradual transition to B Orange silty clay. Some mottling

Post-excavation landscape shot, facing southwest.

South section

TU ID	2E	Easting	753974	Northing	6139394
Date Recorded	18/4/2023				
Field Recorder	Alison F				
Max. Depth (cm)	70				
Termination	B Horizon (transition section, no artefacts)				
Artefacts	0				
Description and Photos					

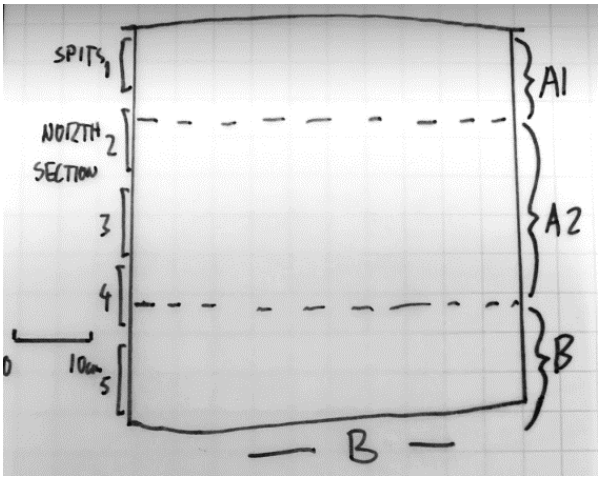


A1 Brown loamy sand, fine grained with 10-15% pebble inclusions (3-6mm). Clear transition to A2 Red-brown loam, medium grained, damp, some pebble inclusions throughout (30%, 3-6mm). Some raw quartz fragments visible. <10% charcoal flecks. Diffuse transition to B (transition) Red-brown clay loam.

End of excavation facing north

Pre excavation view south

TU ID	2W	Easting	753955	Northing	6139396
Date Recorded	18/04/23				
Field Recorder	Merekai B and Sarah M				
Max. Depth (cm)	50				
Termination	B Horizon				
Artefacts	0				
Description and Photos					

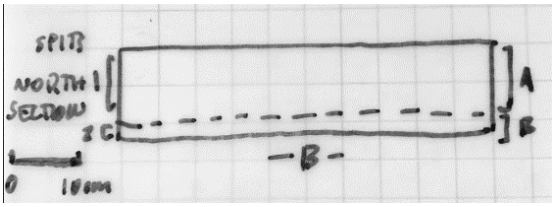


A1 Dark brown silty loam with 5-8% pebble inclusions. Roots throughout. Poorly sorted. Clear transition to A2 Brown silty loam, with the rest as above. Gradual transition to B Light brown silty clay. 10-15% pebble inclusions, and some larger rock inclusions.

End of excavation, facing north

North section

TU ID	3	Easting	753968	Northing	6139411
Date Recorded	14/04/23				
Field Recorder	Alison F				
Max. Depth (cm)	40				
Termination	B Horizon				
Artefacts	0				
Description and Photos					



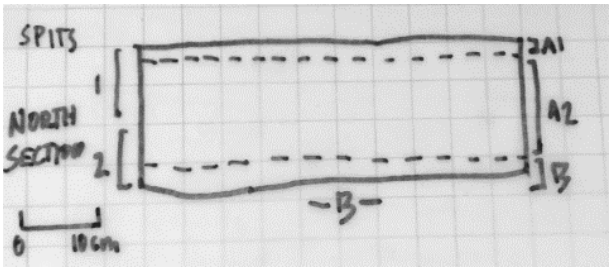
A1/A2 Brown loamy sand, fine grained, very few inclusions (occasional raw quartz). Clear transition to B Brown silty clay.

End of excavation, facing north

North section

TU ID	4	Easting	753974	Northing	6139429
Date Recorded	17/04/23				
Field Recorder	Lara T				
Max. Depth (cm)	18cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos

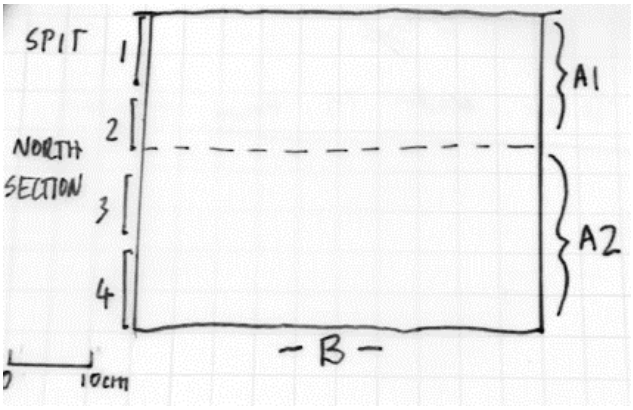


A1 Dark brown silty loam, with 20% root inclusions; bioturbation, fine grained. Clear transition to A2 Brown sandy silty loam. Increasing clay modules. Ironstone flecks in transition to B horizon. Clear transition to B Light orange silty clay, moderately compact.

Landscape context, facing north-east

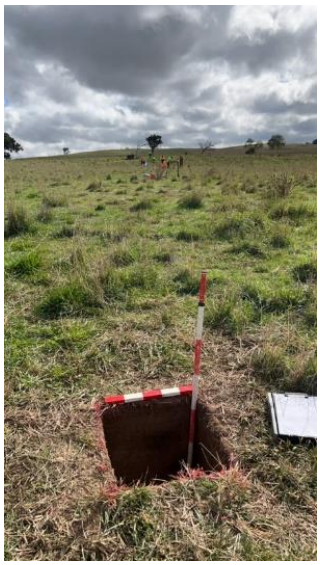
North section

TU ID	5	Easting	753980	Northing	6139449
Date Recorded	17/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	2				
Description and Photos					



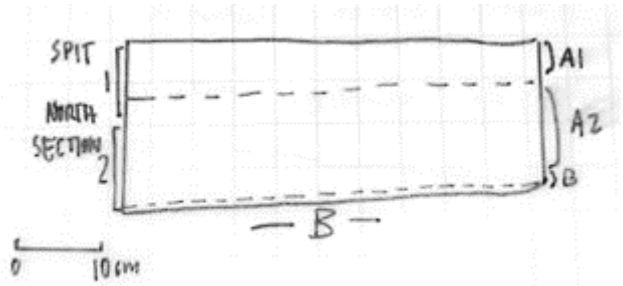
A1 Medium brown fine grained and dry loamy sand, very few inclusions (pebbles). Gradual transition to A2 Light brown fine grained sandy clay loam with increased inclusions (pebbles) and dry clearly defined but gradual transition. Larger pebbles and increased inclusions in Spit 4 (30-40% pebbles). Gradual transition to B Light orange silty clay, moderately compact

North section



Landscape context, facing north

TU ID	5N	Easting	753983	Northing	6139465
Date Recorded	18/04/2023				
Field Recorder	Alison F & Lara T				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					

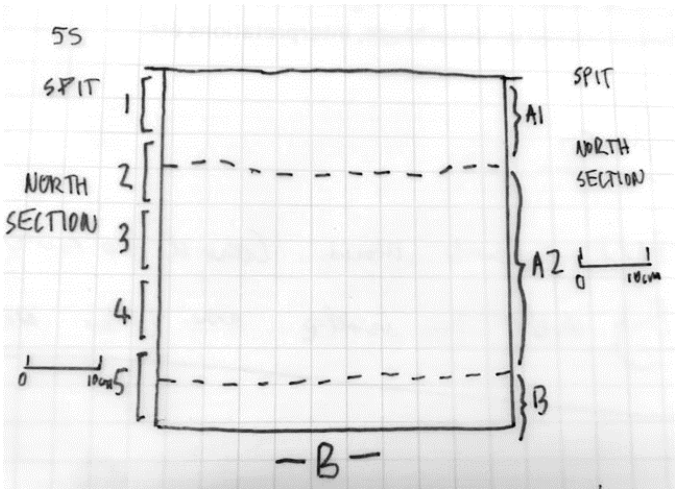


A1 Very dark brown silty loam, root inclusions, compact, clear transition to A2 brown silty loam with 2-6mm ironstone pebble inclusions (15%), gradual transition to B Mottled orange clay with ironstone staining.

North section

Pre-excavation, view north

TU ID	5S	Easting	753979	Northing	6139444
Date Recorded	17/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	50cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					

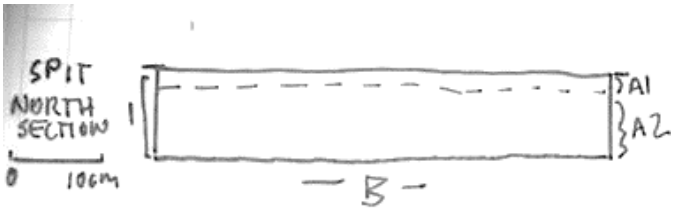


A1 medium chocolate brown fine grained loamy sand with few inclusions. Gradual transition to A2 Gradual transition to B horizon , pebble inclusion approximately 10-20% and 3-6mm. Gradual transition to B Light brown friable loamy sand/sandy clay loam, increased clay content in spit 5 and ironstone mottling on pit base. Increased inclusions (pebble 20-30% and 3-9mm).

North section

Pre-excavation, view north

TU ID	6	Easting	753985	Northing	6139469
Date Recorded	17/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	10cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



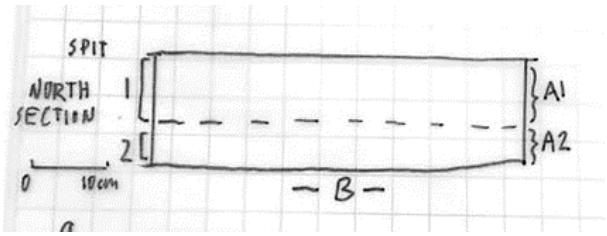
A1 Dark brown silty loam, small grassroot inclusions. Clear transition to A2 Brown silty loam, clear transition to B Orange clay (compact, plastic)

Pre-excavation, facing north

Pre-excavation, facing south

TU ID	7	Easting	753990	Northing	6139495
Date Recorded	18/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	15cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 Dark brown silty loam, root inclusions, clear transition to

A2 Brown silty clay loam, 10cm, increasing ironstone content and pebble. Clear transition

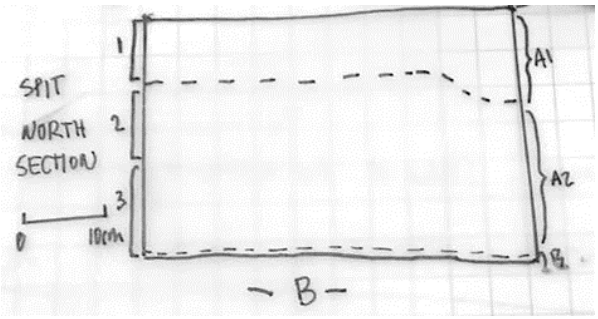
B Orange B horizon clay with ironstone (very compact)

Landscape context, view north-east

North section

TU ID	8	Easting	753993	Northing	6139509
Date Recorded	18/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos

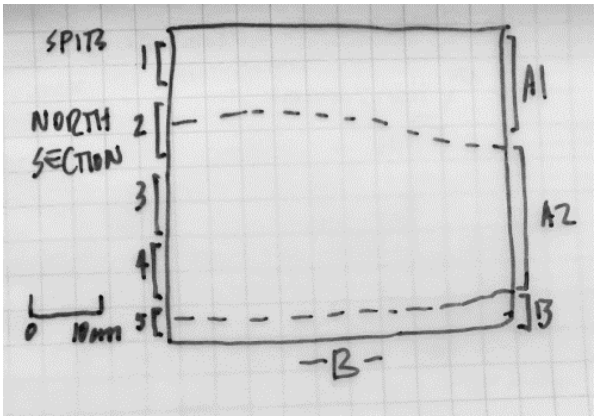


A1 very dark brown silty loam, root inclusions. Clear transition to A2 Brown silty clay loam, occasional ironstone flecks. Bottom 10cm: increasing clay content and large amount (30%) pebble (3-6mm) ironstone and pebble inclusions. Gradual transition to B Orange clay with ironstone and pebble inclusions.

Backfilled trench, facing south-east

North section

TU ID	9	Easting	753995	Northing	6139530
Date Recorded	18/04/2023				
Field Recorder	Lara T and Merekai B				
Max. Depth (cm)	46cm				
Termination	B Horizon Clay				
Artefacts	2				
Description and Photos					

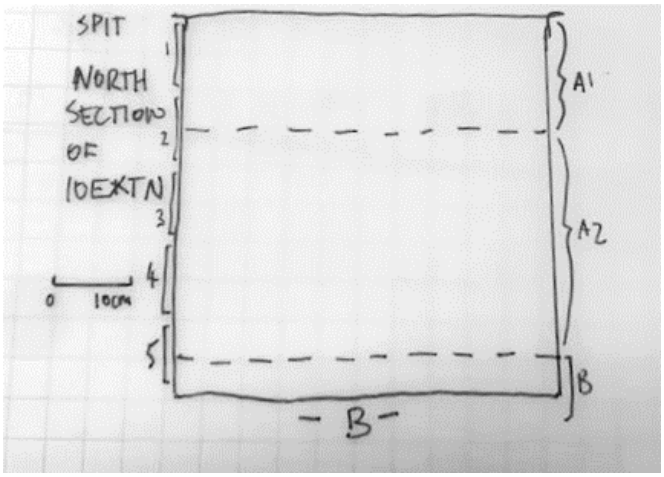


A1 Brown/ light orange silty soil, with roots and 2-4% pebble and small ironstone inclusion poorly sorted. Clear transition to A2 Light orange silty soils with 4 inclusion of pebbles and small iron stone. Clear transition to B orange silty clay soil with some inclusion of pebbles and clay nodules.

Post excavation facing north

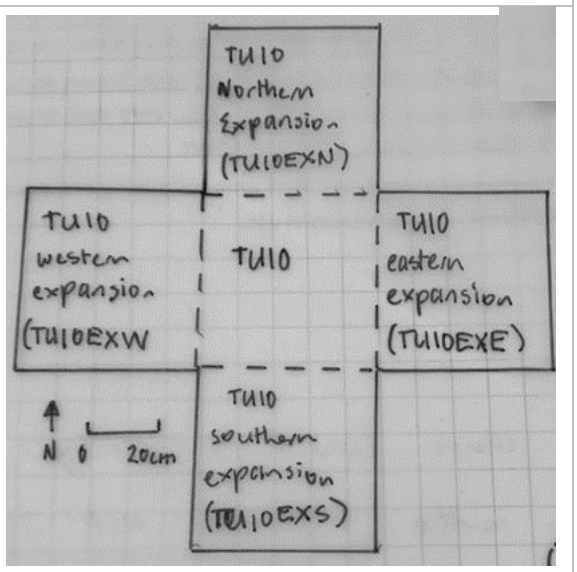
North section

TU ID	10	Easting	753998	Northing	6139550
Date Recorded	18/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	50cm				
Termination	B Horizon Clay				
Artefacts	29 *Across 5 TU; 10 (6), 10EXTN (6), 10EXTS (7), 10EXTE (9), 10EXTW (1)				
Description and Photos					

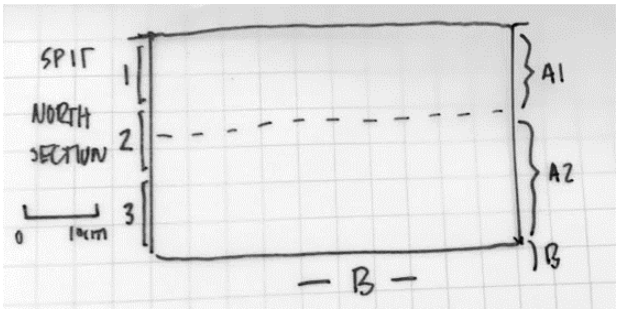


A1 Medium brown friable small grained loamy sand with few inclusions (10-20%, 3-6mm pebbles). Gradual transition to A2 As above but lighter, less humic content, and slight increase in pebbles. Clear transition to B Brown medium grained sandy loam with 20-50% pebbles.

End of excavation, facing north



TU ID	10N	Easting	753999	Northing	6139562
Date Recorded	18/04/2023				
Field Recorder	Alison F & Sarah M				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	9				
Description and Photos					

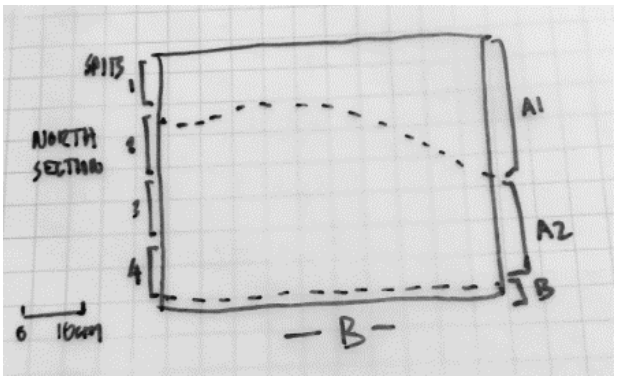


A1 Brown fine silty soil with orange mottles and very small pebble inclusions A2 Very pale brown fine silty sand with orange mottling and small pebbles inclusions (5%) B Orange-brown clay with small pebble inclusions (20%)

End of excavation, facing north

North section

TU ID	10S	Easting	753998	Northing	6139540
Date Recorded	19/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	4				
Description and Photos					



A1 Brown fine grained loamy sand with few pebble (10-15%, 3-6mm). Clear transition to

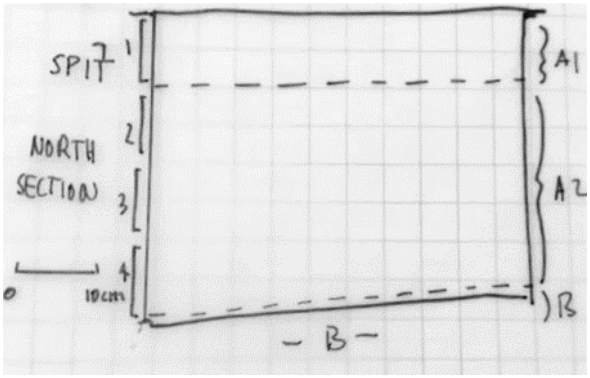
A2 Light orange, brown highly friable fine grained sandy loam. Increased inclusions (pebble 30%, 3-6mm)with some larger stones. Raw quartz identified. Gradual transition to

B Horizon sandy clay

North section

Pre-ex, facing southeast.

TU ID	10E	Easting	754006	Northing	6139548
Date Recorded	19/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	40cm				
Termination	clay				
Artefacts	0				
Description and Photos					



A1 Dark brown silty clay with root inclusions. Gradual transition to

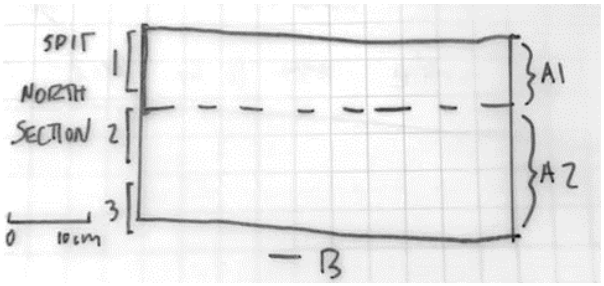
A2 Drown silty sand increasing charcoal and ironstone nodules (2-6mm, 10% spit1-3, 3-15mm, 25%, spit 4). Also increasing clay. Diffuse transition to

B Orange sandy clay with gravels (5-15mm)

End of excavation, facing north-east.

North section

TU ID	10W	Easting	753987	Northing	6139549
Date Recorded	19/04/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	30				
Termination	B Horizon Clay				
Artefacts	9				
Description and Photos					



A1 Brown fine silty sand with pebble inclusion and roots. Gradual transition to

A2 Very fine pale brown silty sand with pebble inclusions. Gradual transition to

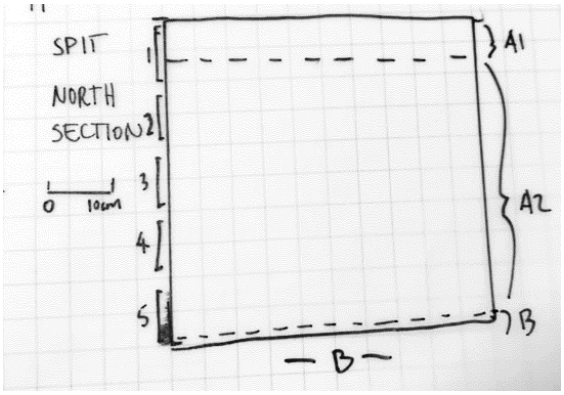
B Light brown, orange mottle clay

End of excavation, facing north

North section

TU ID	11	Easting	752433	Northing	6141105
Date Recorded	19/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	50cm				
Termination	B Horizon Clay				
Artefacts	0				

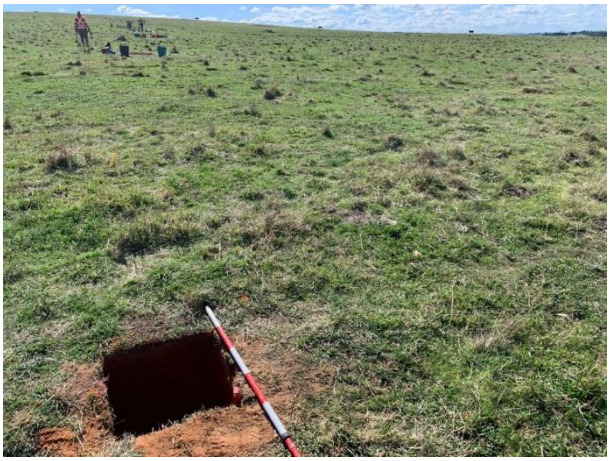
Description and Photos



A1 Dark brown sandy loam with root inclusions. Clear transition to

A2 Orange sandy clay loam, compact with 20% ironstone inclusions (5-8mm). Excavation ceased ended at transition period to

B Orange sandy clay

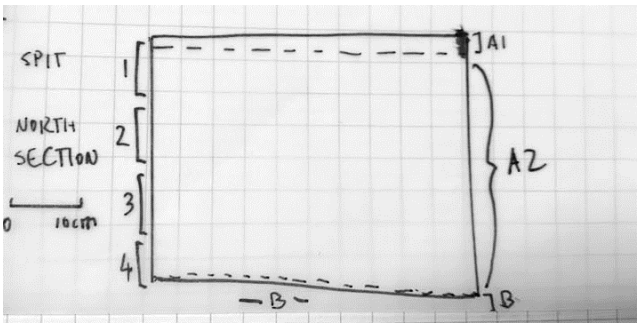


End of excavation, view north west.

North section

TU ID	12	Easting	752424	Northing	6141122
Date Recorded	19/4/2023				
Field Recorder	Lara T				
Max. Depth (cm)	40cm				
Termination	Clay				
Artefacts	0				

Description and Photos



A1 Dark brown silty loam with fine root inclusions. Clear transition to

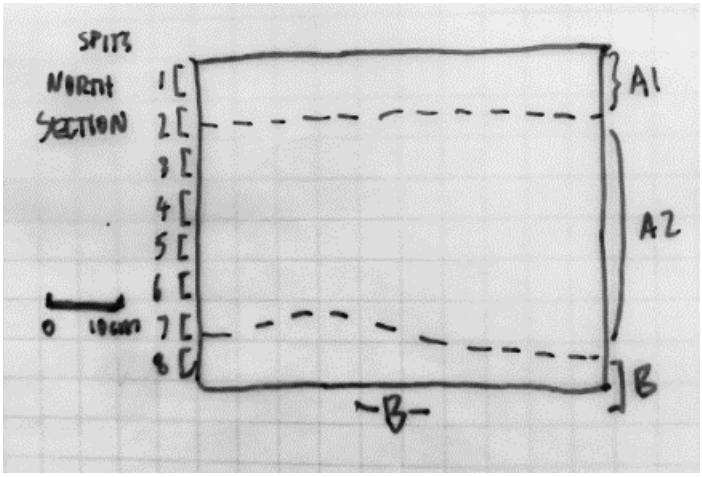
A2 Orange brown sandy loam with increasing ironstone inclusions (3-7mm, 10% spit 2, 5-10mm, 20% spit 4)

B Sandy clay (orange-brown)

Backfilled, facing north-west

North section

TU ID	13	Easting	752415	Northing	6141141
Date Recorded	19/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	80cm				
Termination	B Horizon Clay				
Artefacts	12				
Description and Photos					



A1 Brown, fine grain loamy sand, compacted and forming soil changes. Very few inclusions (pebbles <10% 3mm). Gradual transition to

A2 Brown grey medium grain loamy sand, minimal clay content. Very few inclusions. Gradual transition to

B Yellow-brown sandy clay

(5cm spits)

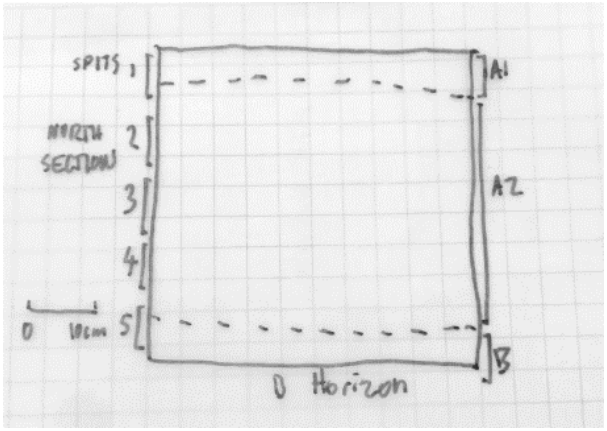
North section

Pre-ex landscape context, facing north

TU ID	13N	Easting	752417	Northing	6141148
Date Recorded	20/04/2023				

Field Recorder	Sarah M
Max. Depth (cm)	48cm
Termination	B Horizon Clay
Artefacts	3

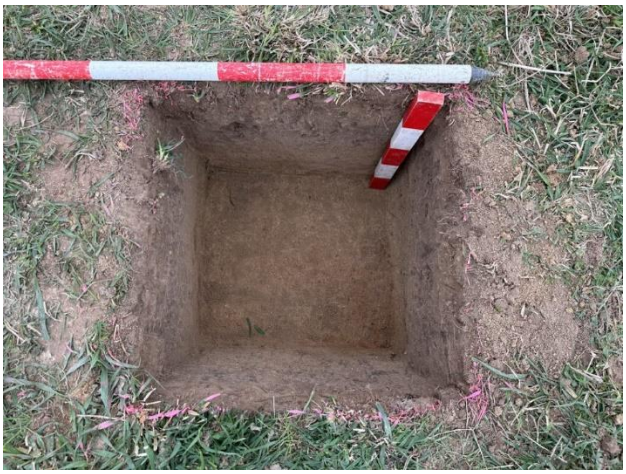
Description and Photos



A1 brown friable silty sandy loam gradually transitioning to

A2 pale brown fine silty clay with orange mottles and 5% pebble inclusions. Gradual transition to

B very pale brown sandy clay with orange mottles

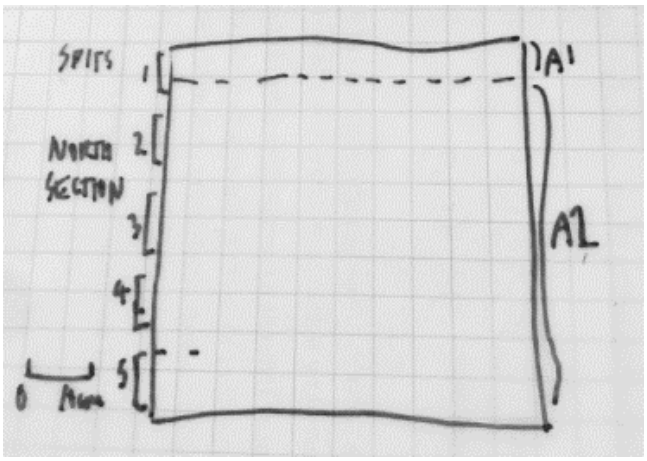


Overhead view of trench 13N

North section

TU ID	13S	Easting	752409	Northing	6141128
Date Recorded	20/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	50cm				
Termination	(see description)				
Artefacts	0				

Description and Photos



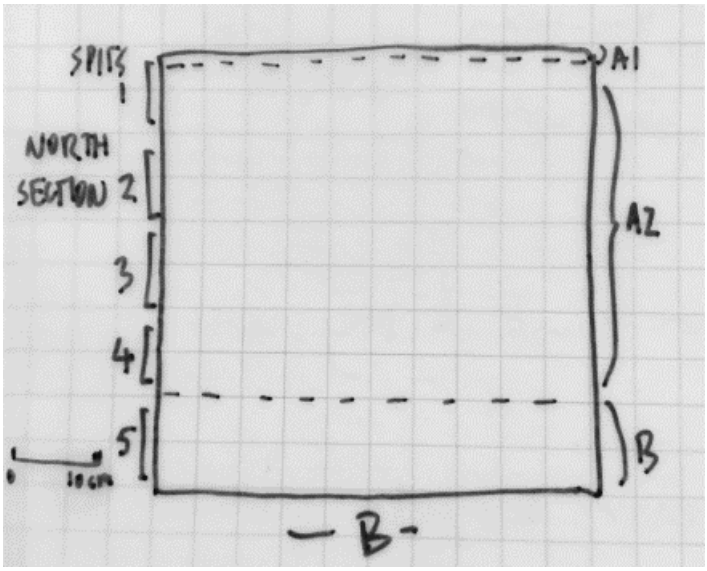
A1 Dark brown silty loam with fine root inclusions. Clear transition to

A2 Orange brown sandy loam, increasing inclusions. B Horizon not reached, but as context like 12 and 11 with no artefacts, and different to 13 (with artefacts), excavation ceased.

North section

Overhead view

TU ID	13E	Easting	752424	Northing	6141135
Date Recorded	20/04/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	50cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Light brown fine silty soil, no inclusions, clear transition to

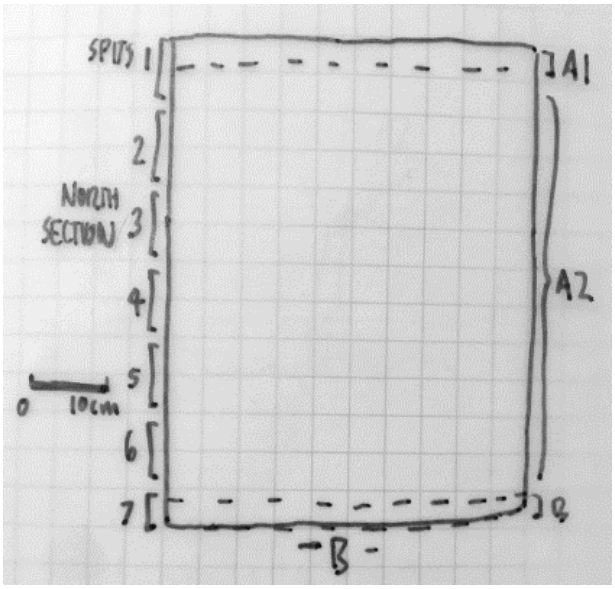
A2 Very pale brown clayey silt, no inclusions. Diffuse boundary to

B Orange mottled 'crumbly' clay

North section

Pre-ex, facing east.

TU ID	13W	Easting	752403	Northing	6141142
Date Recorded	20/04/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	65cm				
Termination	B Horizon Clay				
Artefacts	2				
Description and Photos					



A1 Brown silty sand gradually transitioning to pale brown fine silty soil

A2 Reddish brown clayey silt. Gradual transition to

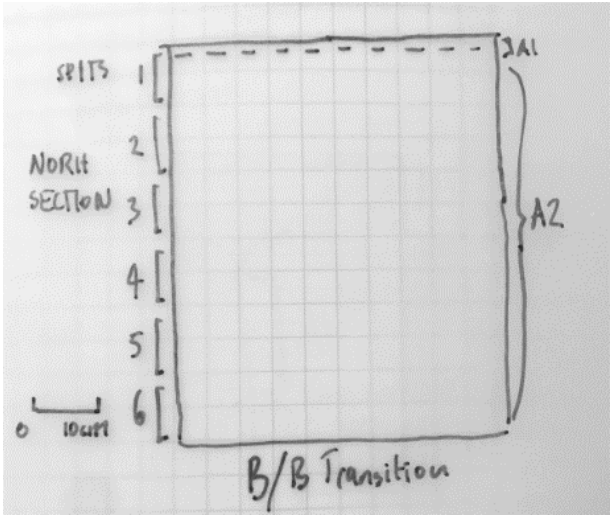
B Orange mottled 'crumbly' clay

Overhead view of trench

North section

TU ID	14	Easting	752407	Northing	6141158
Date Recorded	19/04/2023				
Field Recorder	Lara T				
Max. Depth (cm)	60cm				

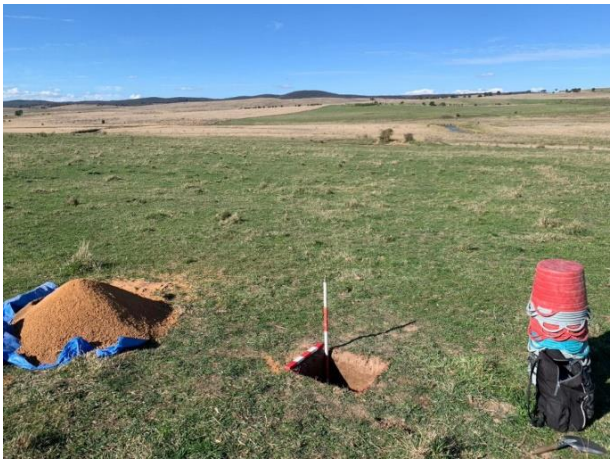
Termination	B Horizon Clay Transition and no artefacts
Artefacts	0
Description and Photos	



A1 Dark brown sandy loam with root inclusions and clear transition to

A2 Orange sandy clay loam, compact with 20% ironstone, 3-8mm inclusions.

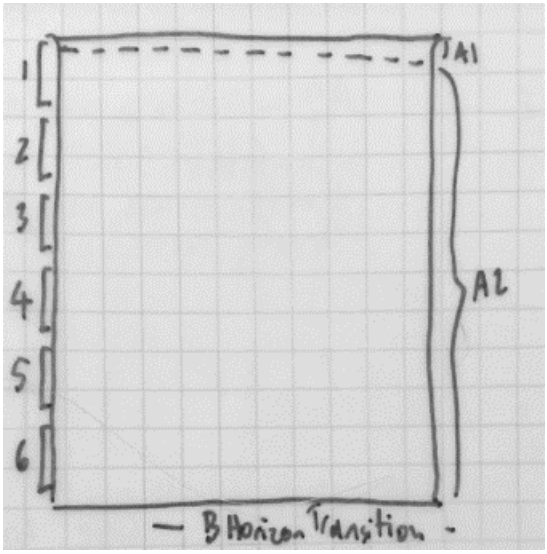
B Increasing clay content (B Horizon clay transition)



Landscape context, view north-east

North section

TU ID	15	Easting	752398	Northing	6141176
Date Recorded	19/04/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	60cm				
Termination	B Horizon Clay Transition				
Artefacts	2				
Description and Photos					



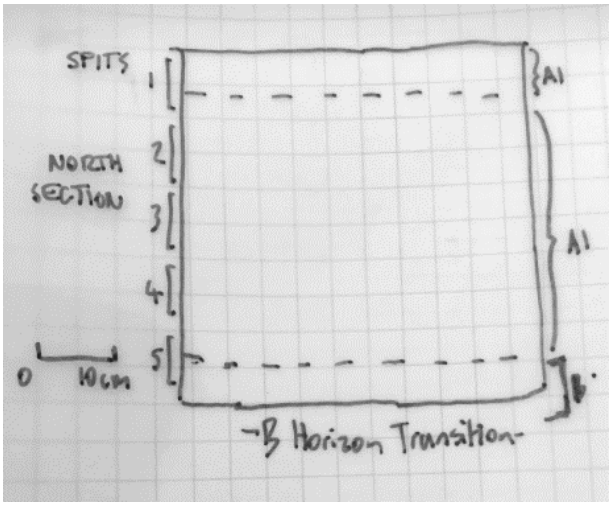
A1 Silty loam with pebbles and roots. Clear transition to

A2 Red to orange silty loam with pebbles, small pebbles, and ironstone, increasing with depth, poorly sorted. Increasing clay content at spit 6 indicating B horizon transition

View overhead of trench

North section

TU ID	16	Easting	752390	Northing	6141196
Date Recorded	19/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	50cm				
Termination	B Horizon Transition				
Artefacts	8				
Description and Photos					



A1 medium brown, loose fine grained sandy loam, very few inclusions (pebbles <10%, 3mm)

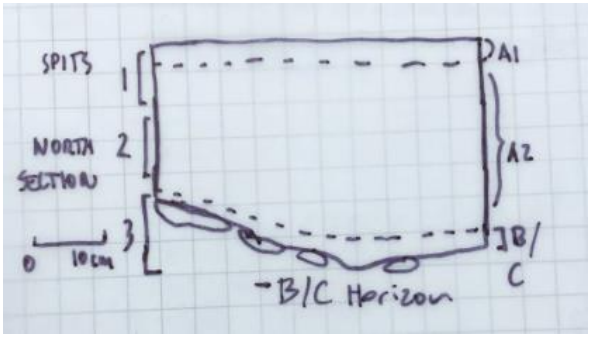
A2 Medium brown(yellow) coarse-grained loamy sand. Increased inclusions (pebbles, 30% 3-6mm and ironstone). Raw quartz from Spit 4-5.

B Increasing clay content at spit 5 indicating B horizon transition

End of excavation

North section

TU ID	17	Easting	752326	Northing	6141252
Date Recorded	20/4/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	30cm				
Termination	B/C Horizon				
Artefacts	0				
Description and Photos					



A1 Light brown sandy loam with roots. Clear transition to

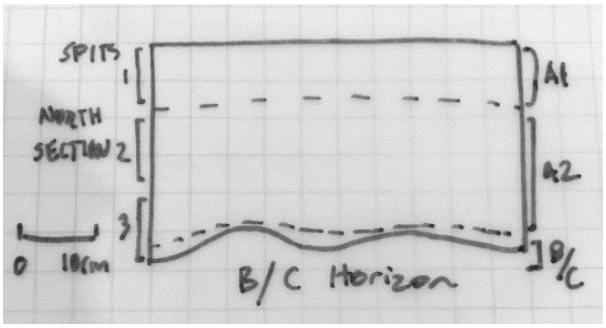
A2 Red to orange silty loam with pebbles, small pebbles, and ironstone, increasing with depth, poorly sorted.

B/C Degraded sandstone mudstone and sandstone with clay

End of excavation, facing north

North section

TU ID	18	Easting	752332	Northing	6141270
Date Recorded	20/04/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	30cm				
Termination	B/C Horizon				
Artefacts	0				
Description and Photos					



A1 Light brown sandy loam with roots. Clear transition to

A2 Brown silty sand with pebble and ironstone inclusions, increasing with depth. Gradual transition to

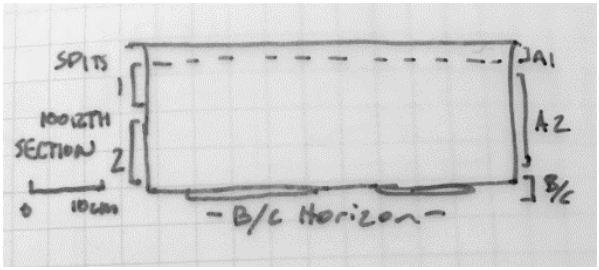
B/C Degraded sandstone mudstone and sandstone with clay

End of excavation, facing north

North section

TU ID	19	Easting	752340	Northing	6141289
Date Recorded	20/04/23				
Field Recorder	Merekai B				
Max. Depth (cm)	20cm				
Termination	B/C Horizon				
Artefacts	0				

Description and Photos



A1 Light brown sandy loam with roots. Clear transition to

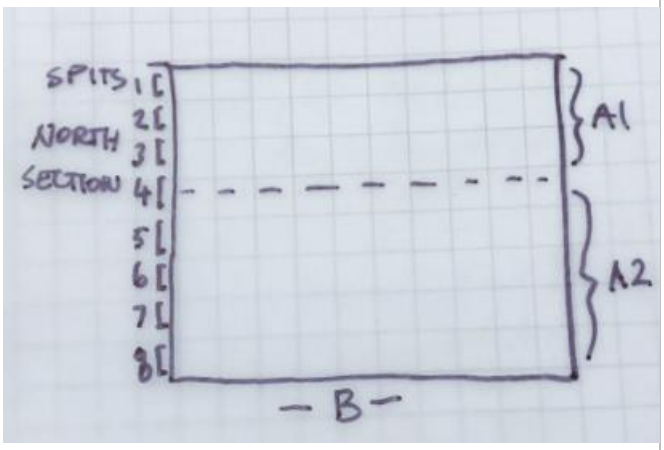
A2 Brown silty loam with pebbles, small pebbles, and ironstone, increasing with depth, poorly sorted.

B/C Degraded sandstone mudstone and sandstone with clay

Pre-test excavation

North section

TU ID	20	Easting	753494	Northing	6138554
Date Recorded	21/04/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	80cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Brown silty sand with small pebble inclusions (5-10%) and root inclusions. Gradual transition to

A2 Brown (with tinges of orange) silty sand with small pebble inclusions (5-10%). Gradual transition to

B Brown sandy clay.

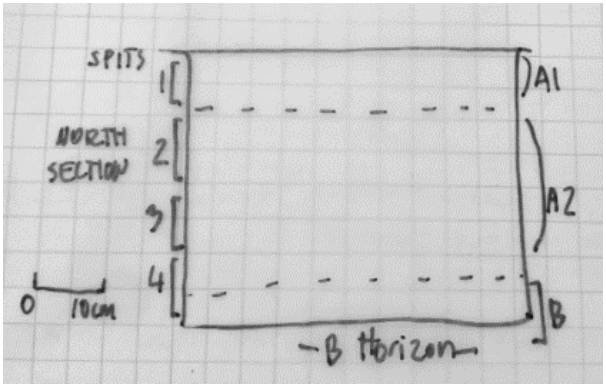
(5cm spits)

Pre-excavation, facing south.

North section

TU ID	21	Easting	753485	Northing	6138530
Date Recorded	21/4/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	40cm				

Termination	B Horizon Clay
Artefacts	1
Description and Photos	



A1 Brown silty sand. Gradual transition to

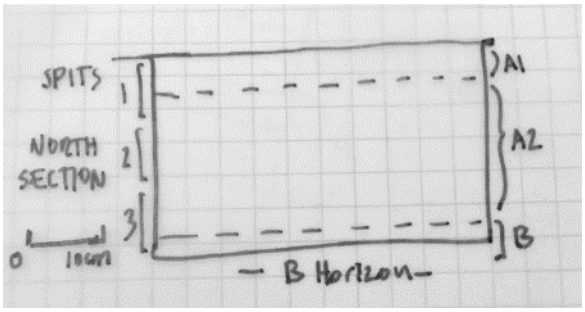
A2 Pale brown with orange mottle silty sand, with 20% pebble inclusions. Gradual transition to

B Reddish brown with orange mottle crumbly sandy clay

North section

Pre-ex, facing south.

TU ID	22	Easting	753477	Northing	6138512
Date Recorded	21/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Medium brown/grey compacted and damp silty loam. Pebble inclusion (30%, 6-12mm and some larger stones). Gradual transition to

A2 As above, but lighter and with, increased clay content, and increased size in pebble inclusions. Gradual transition to.

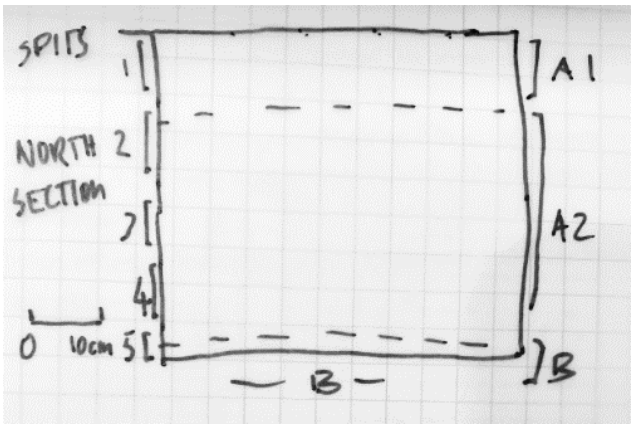
B Brown orange silty loam clay, coarse grain and large stone inclusions

End of excavation

North section

TU ID	23	Easting	753471	Northing	6138495
Date Recorded	21/4/2023				
Field Recorder	Merekai B				

Max. Depth (cm)	30cm
Termination	B Horizon Clay
Artefacts	1
Description and Photos	



A1 Brown silty sand with small pebble inclusions (5-10%) and root inclusions. Gradual transition to

A2 Brown to orange silty sand with small pebble inclusions (10-20%). Gradual transition to

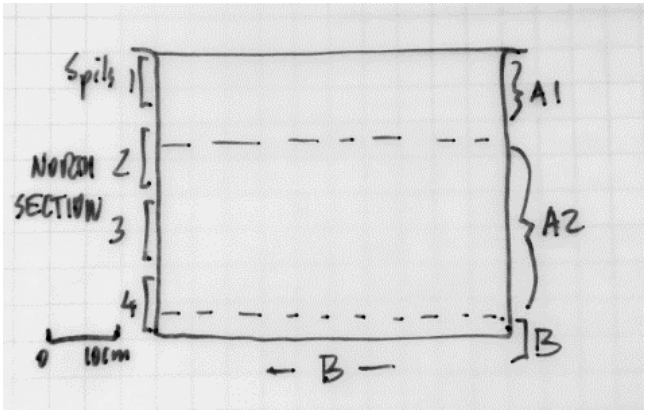
B Orange clayey sand to clay with some inclusions as above

North Section

Pre excavation, view east

TU ID	24	Easting	753464	Northing	6138478
Date Recorded	21/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 medium brown/grey damp fine grained silty loam, 20% pebble inclusions (3mm). Gradual transition to

A2 Slightly lighter brown/grey, increased inclusions (30%, 3-6mm) and compacted. Gradual transition to

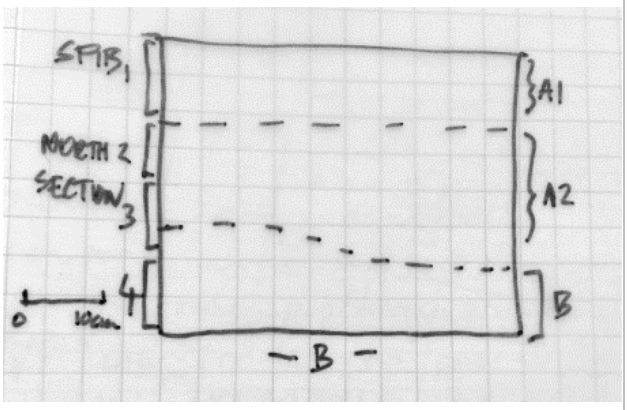
B Orange/brown compact silty loam clay with high clay content. Charcoal fragments/mottling on base.

North section

Backfilled trench, facing north

TU ID	25	Easting	753457	Northing	6138459
Date Recorded	21/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 medium brown/grey damp compacted fine grain silty loam. Minimal inclusions (10-15%, 3mm pebbles). Clear transition to

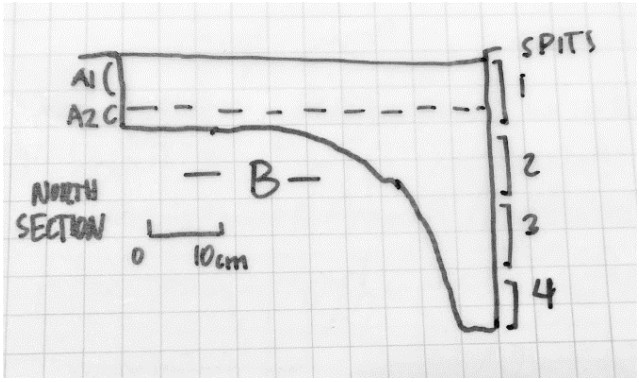
A2 slightly lighter brown/grey, , increased gravelly texture in A2 (30%, 3-6mm). Clear transition to B

B Brown/orange silty loam clay with high clay content, increased inclusions (35-40&) including some large stones

Pre test-ex, facing north.

North section

TU ID	26	Easting	753429	Northing	6138584
Date Recorded	21/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Grey-brown silty loam, dry and fine grained, with roots. Inclusions (pebbles 10-15% (3mm). Clear transition to

A2 Grey-brown silty loam, dry and fine grained. Inclusions (pebbles) 30% (3-12mm), including raw quartz in A2. Clear transition to

B Orange clay, high plasticity, uneven base sloping to the east.

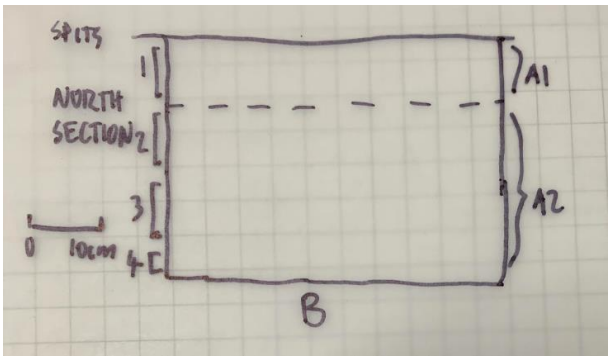
Northern section

Eastern section pre-ex

TU ID	27	Easting	753424	Northing	6138566
Date Recorded	21/04/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	35cm				
Termination	B Horizon Clay				

Artefacts	0

Description and Photos



A1 Brown silty sand with roots. 5-10% gravel inclusions. Clear transition to

A2 Light brown silty sand with 5-10% gravel inclusions. Clear transition to

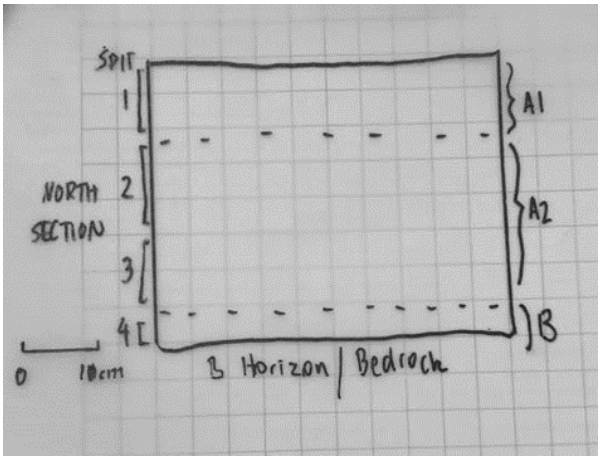
B Sandy clay with some gravel inclusions.

North section

Facing north, post excavation.

TU ID	28	Easting	753564	Northing	6138607
Date Recorded	21/04/2023				
Field Recorder	Alison F				
Max. Depth (cm)	40cm				
Termination	B Horizon / Bedrock				
Artefacts	0				

Description and Photos



A1 Dark brown fine grained silty loam, high volume of 1-3mm roots, minimal pebble inclusions (5%, 3mm), raw quartz fragments. Clear transition to

A2 Brown silty loam, more compacted. Large stone from spit 3 (10-20cm), ironstone present. Clear transition to

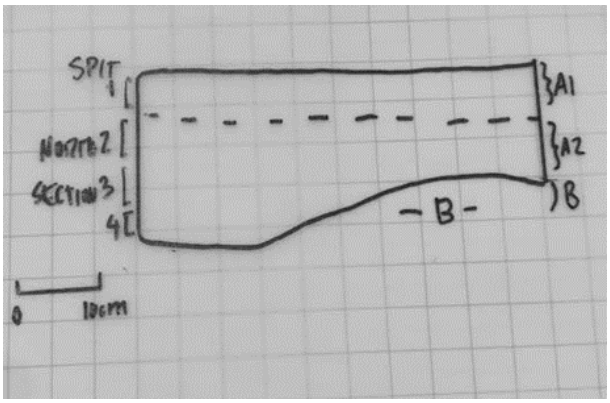
B horizon/bedrock, spit 4, terminated due to gradual increase in degraded bedrock

X, facing south.

North section

TU ID	29	Easting	754731	Northing	6139131
Date Recorded	1/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 Very dark brown sandy loam, grass roots. Distinct horizon with regular ironstone gravels. Angular ironstone gravels. Dark grey sandy loam gentle transition into A2.

A2 Pale grey silt with small gravel inclusions

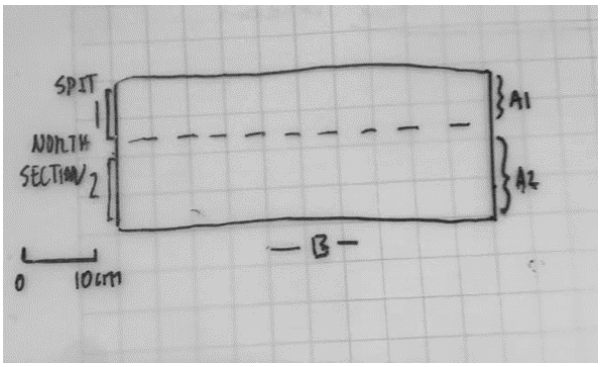
B Firm orange clay base with undulating surface

Post excavation, facing north.

North section

TU ID	30	Easting	754741	Northing	6139113
Date Recorded	1/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	23cm				
Termination	B Horizon Clay				
Artefacts	5				

Description and Photos



A1 Brown silty sandy loam with grass rootlets and small angular rocks (20%, 10mm) transitioning to a

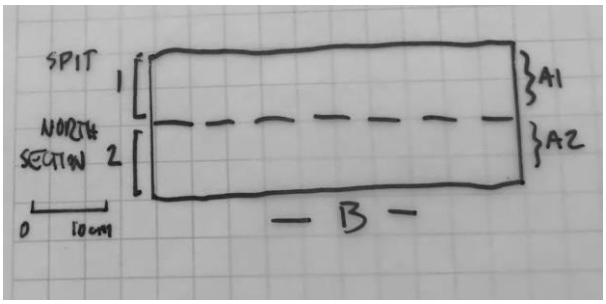
A2 Lighter brown silty sand with blocky rocks (20%, 40-50mm) transitioning to a pebbly clay

B Orange brown clay

End of excavation, facing north

North section

TU ID	30N	Easting	754736	Northing	6139123
Date Recorded	1/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	1				
Description and Photos					



A1 Brown fine silty loam with fine gravel (20%) and grass roots, transitioning to a

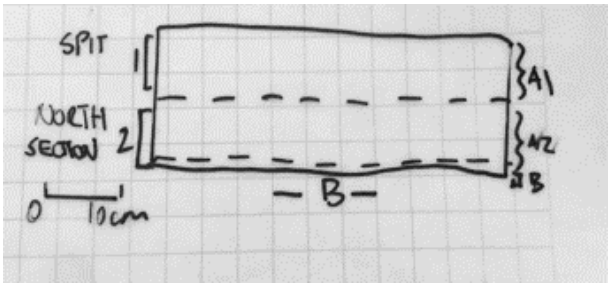
A2 Pale brown gravelly silty clay with angular blocky gravels 20%

B Orange brown clay

End of excavation

North section

TU ID	30S	Easting	754746	Northing	6139105
Date Recorded	1/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Brown fine silty loam with small pebbles

A2 Light pale brown clayey silt with pebbles 20% and ironstone

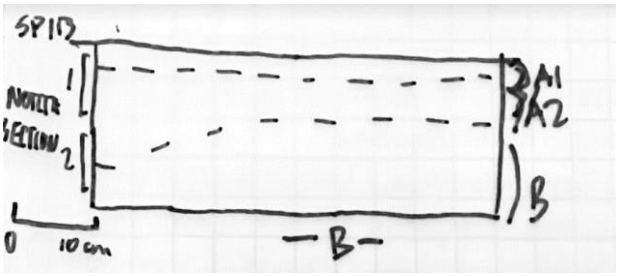
B Orange clay

End of excavation, facing north

North section

TU ID	31	Easting	754749	Northing	6139098
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown silty clay soil with 20-30% inclusion of pebbles and small rocks with the root system at the top

A2 Brown to light brown silty clay soil with 20-30% inclusion of pebble/gravel small rocks

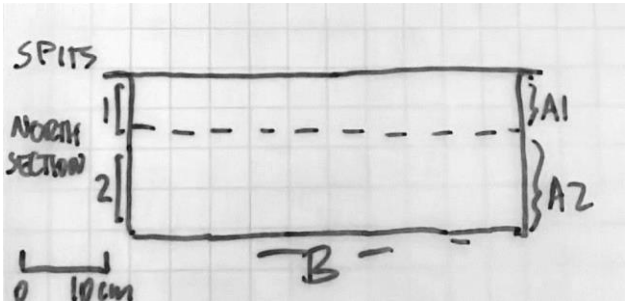
B Light brown to orange clay

Pre -excavation, facing south.

North section

TU ID	32	Easting	754759	Northing	6139098
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown silty clay soil with 20-30% inclusion of pebbles/gravel and small rocks, with root system present throughout

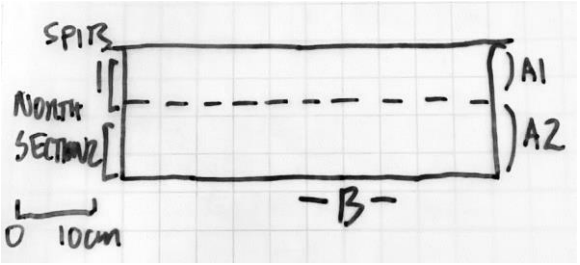
A2 Light brown to orange soil with 20-30% inclusion of pebbles/gravel and small rocks, roots

B Orange clay

End of excavation, facing north.

North section

TU ID	33	Easting	754770	Northing	6139063
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	1				
Description and Photos					



A1 Brown silty clay soil with 20-30% inclusion of pebbles/gravel, grass roots

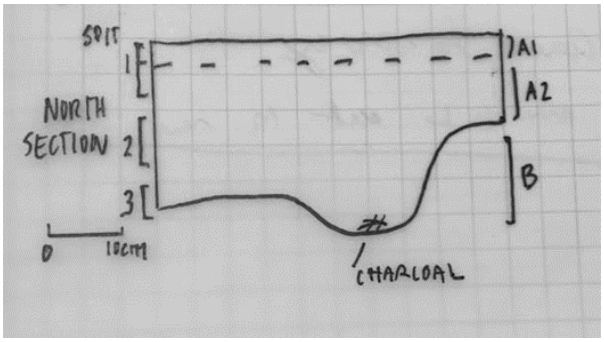
A2 Light brown silty clay soil with 20-30% inclusion of pebbles/gravel

B Orange clay

End of excavation, facing north

North section

TU ID	34	Easting	754779	Northing	6139063
Date Recorded	1/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Very dark brown sandy loam, grass roots and small gravel inclusions (5-28mm)

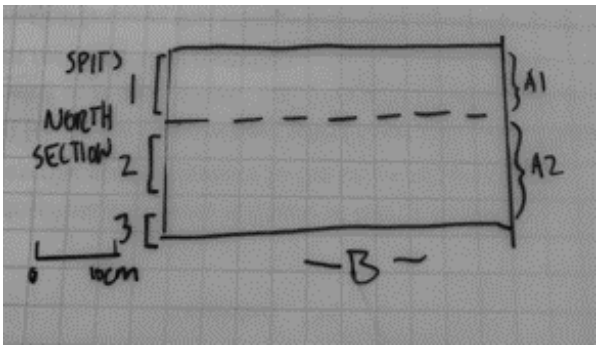
A2 Grey silty loam with high density of angular ironstone gravels (5mm-4cm) within bioturbated undulating depressions in basal clay. Charcoal inclusions in base, likely burnt-out tree roots.

B Firm orange basal clay

End of excavation

North section

TU ID	35	Easting	754789	Northing	6139026
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	26				
Termination	B Horizon Clay				
Artefacts	5				
Description and Photos					



A1 Brown silty soil with 20-30% inclusion of pebbles/gravel, small rocks and root system

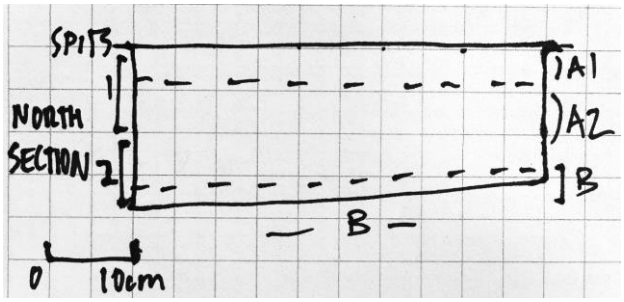
A2 Brown to light brown with 20-30% inclusion of pebbles/gravel, small rocks including root system

B Light brown to orange clay

Pre-excavation, facing east.

TU ID	35N	Easting	754785	Northing	6139035
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	18cm				
Termination	B Horizon Clay				

Artefacts	1
Description and Photos	



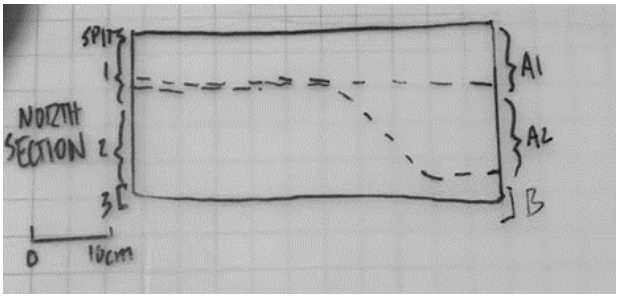
A1 Brown silty soil with 25-35% inclusion of pebbles/gravel

A2 Brown silty clay with 25-35% inclusion of pebbles/gravel

B Orange clay

Pre-excavation, view east

TU ID	35S	Easting	754796	Northing	6139020
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	28cm				
Termination	B Horizon Clay				
Artefacts	5				
Description and Photos					



A1 Brown silty soil with 20-30% inclusion of pebbles/gravel

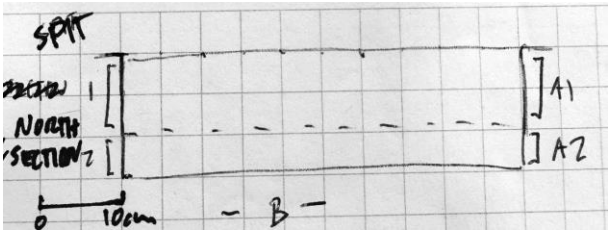
A2 Light brown silty clay soil with 20-30% inclusion of pebbles/gravel and small rocks

B Light brown silty clay

End of excavation, facing north

North section

TU ID	35E	Easting	754793	Northing	6139037
Date Recorded	1/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	26cm				
Termination	B Horizon Clay				
Artefacts	6				
Description and Photos					



A1 Damp compacted, dark brown fine silty loam with rootlets, small pebbles, occasional quartz fragments.

A2 Pale brown clayey silt, damp, very compacted, frequent angular rocks (ironstone) and some quartz (70%)

B Hard, slightly sticky orange clay

 End of excavation, facing north-east.	 North section

TU ID	35W	Easting	754780	Northing	6139019
Date Recorded	2/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	83				

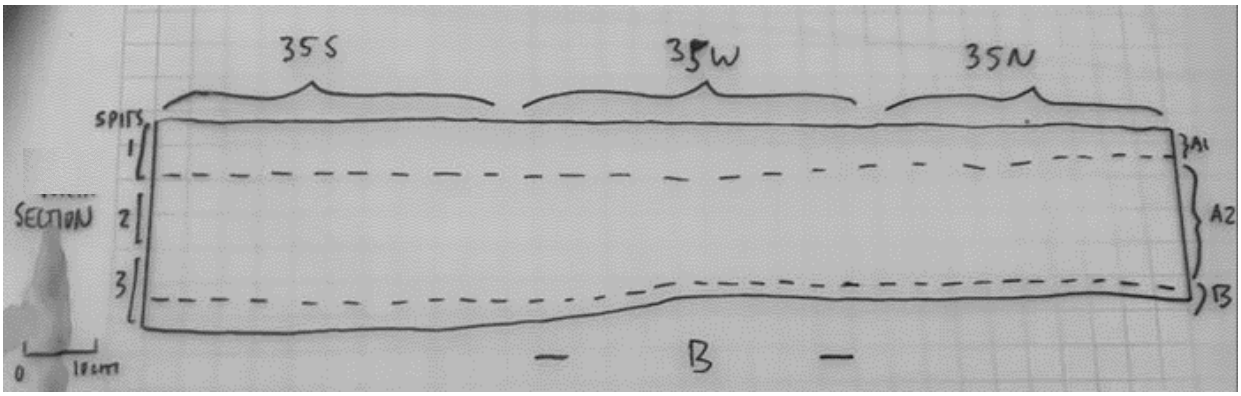
Description and Photos

End of excavation, facing northeast.

A1 very dark brown silty loam, includes roots and 20% small pebbles (10mm). Clear transition to

A2 Dark brown sandy clay loam 60% pebble inclusions/angular <15mm, including quartz. Clear transition to

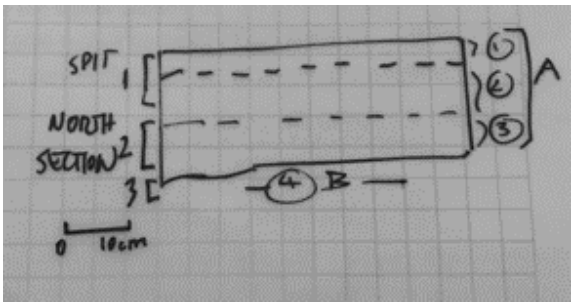
B Orange plastic clay



West section

TU ID	36	Easting	754801	Northing	6139008
Date Recorded	1/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 (1) Very dark brown silty loam with grass roots

A2 (2) grey silty loam with small angular ironstone inclusions

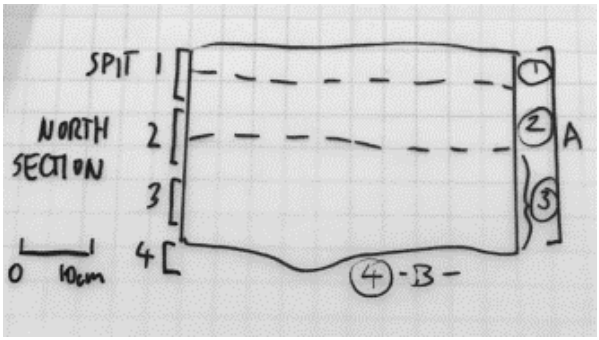
A2 (3) 2-5cm diffuse horizon with dry orange silty clay

B (4) Firm orange clay

End of excavation, facing south.

North section

TU ID	37	Easting	754766	Northing	61398994
Date Recorded	1/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	35cm				
Termination	B Horizon Clay				
Artefacts	7				
Description and Photos					



A1 (1) Very dark brown silty loam with grass roots

A2 (2) grey silty loam with small angular ironstone inclusions

A2 (3) 2-5cm diffuse horizon with dry orange silty clay

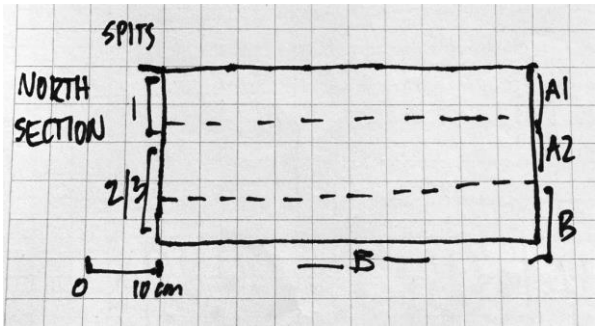
B (4) Firm orange clay

Pre-excavation, facing west.

North section

TU ID	37N	Easting	754765	Northing	6139004
Date Recorded	2/5/2023				
Field Recorder	Merekai B				

Max. Depth (cm)	31
Termination	B Horizon Clay
Artefacts	17
Description and Photos	



A1 Brown silty soil with 20-30% inclusion of pebbles/gravel/small rocks, and root system

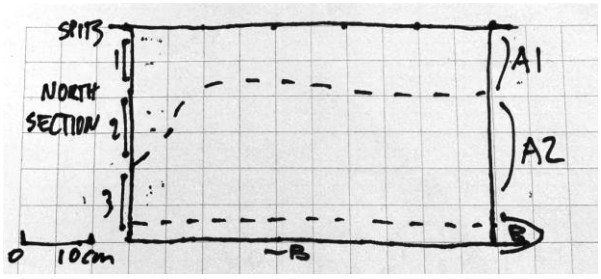
A2 Light brown silty clay soil with 30-40% inclusion of pebbles/gravel and small rocks

B Light brown silty clay to orange clay

North Section

Post excavation, facing north

TU ID	37S	Easting	754768	Northing	6138983
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	34				
Termination	B Horizon Clay				
Artefacts	13				
Description and Photos					



A1 Brown silty soil with 30-45% inclusion of pebbles/gravel/small rocks, and root system

A2 Light brown silty clay soil with 30-45% inclusion of pebbles/gravel and small rocks (some roots remaining)

B Light brown silty clay to clay

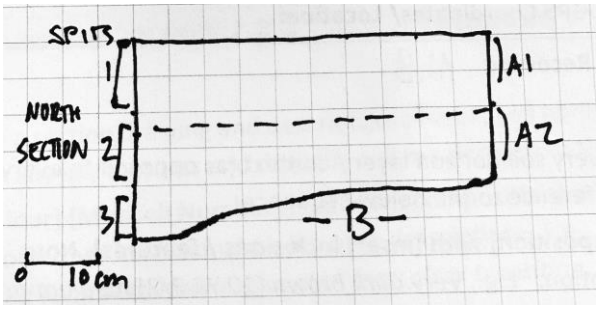
North Section

Post excavation, facing north

TU ID	38	Easting	754769	Northing	6138972
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	27cm				
Termination	B Horizon Clay				

Artefacts	4

Description and Photos



A1 Brown silty soil with inclusion of 40-50% of pebble/gravel

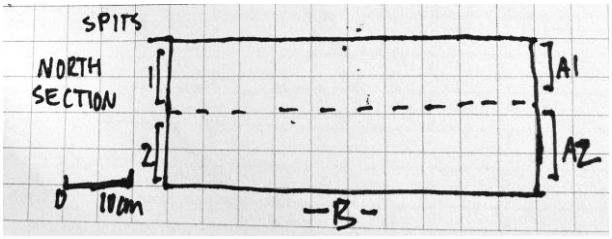
A2 Light brown with orange silty clay soil with 40-50% inclusions pebble/gravel

B Orange silty clay to orange clay

End of excavation, facing north

North section

TU ID	39	Easting	754771	Northing	6138954
Date Recorded	1/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	5				
Description and Photos					



A1 Brown silty soil with 40-50% inclusion of pebbles/gravel

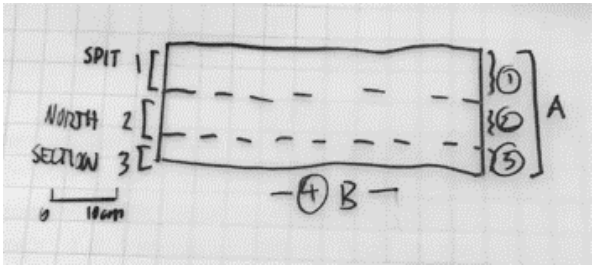
A2 Light brown soil with tinges of orange clay and 40-50% inclusion of pebbles/gravel

B Light brown to orange clay

End of excavation, facing north

North section

TU ID	40	Easting	754773	Northing	6138934
Date Recorded	2/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	20cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 (1) Very dark brown silty loam transitioning to A2 at layer of angular ironstone

A2 (2) Pale brown grey ironstone rich silty soil

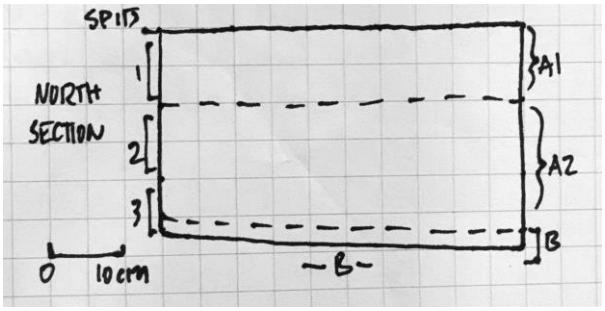
A2 (3) Transitioning to orange grey silty clay

B (4) Firm orange base clay

Pre-excavation, facing north.

North section

TU ID	41	Easting	754776	Northing	6138914
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	14				
Description and Photos					



A1 Brown silty soil with 20-30% inclusion of pebbles/gravel

A2 Light brown silty to silty clay with 20-30% pebbles/gravel

B Light brown silty clay to orange clay

End of excavation.

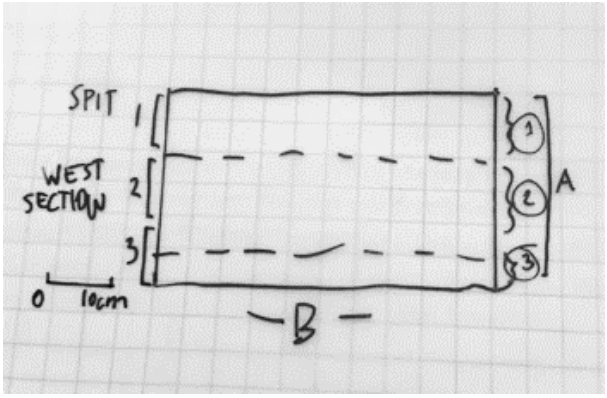
North section

TU ID	41N	Easting	754775	Northing	6138922
Date Recorded	-				
Field Recorder	-				
Max. Depth (cm)	-				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					

Fieldwork error – missing recording sheet. Test Unit was excavated, however, and no artefacts recovered.

Pre-excavation, facing north

TU ID	41S	Easting	754778	Northing	6138904
Date Recorded	2/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 (1) Very dark brown silty loam

A2 (2) Grey silty loam with angular ironstone throughout

A2 (3) Orange grey silty clay transition

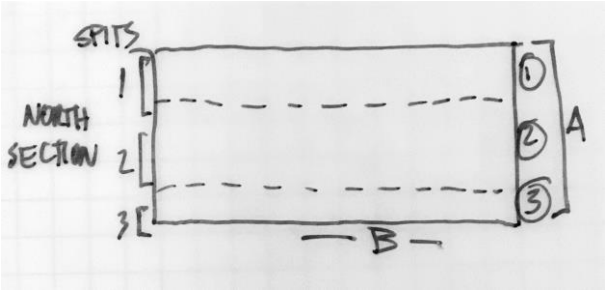
B Firm orange basal clay

North Section

Post excavation, facing north

TU ID	42	Easting	754779	Northing	6138894
Date Recorded	2/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	25cm				
Termination	B Horizon Clay				
Artefacts	15				

Description and Photos



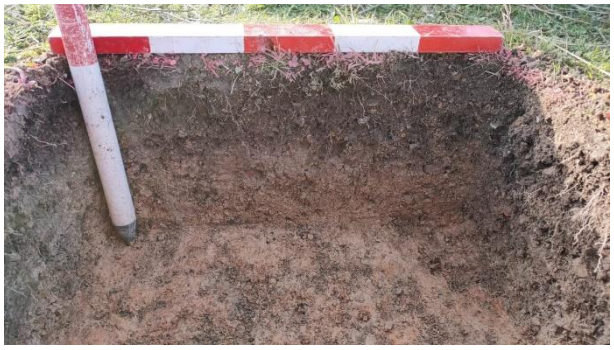
A1 (1) Very dark silty loam

A2 (2) pale grey silty soil with angular ironstone inclusions

A2 (3) Orange / grey silty clay

B (4) Firm orange clay base

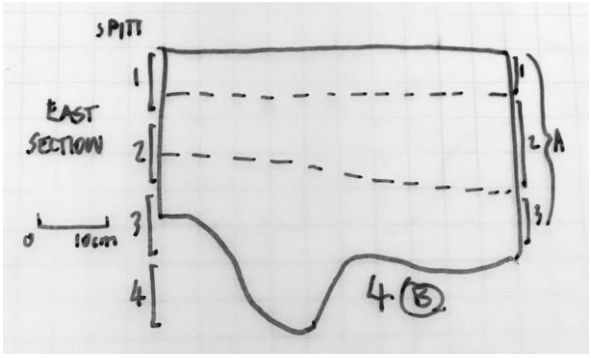
End of excavation.



North section

TU ID	43	Easting	754756	Northing	6138894
Date Recorded	2/5/2023				
Field Recorder	Andrew C				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 (1) Very dark brown silty soil

A2 (2) Dark brown silty soils with angular ironstone gravels

A2 (3) As above but with large pieces of burnt out tree roots and large charcoal throughout

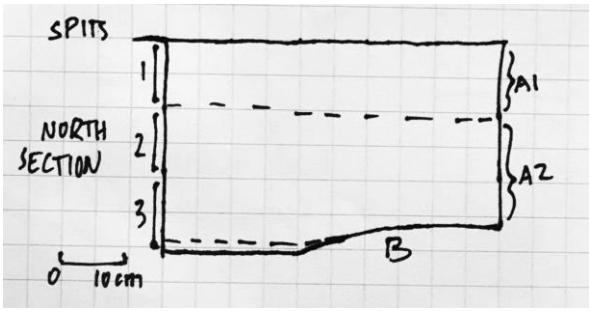
B firm orange clay base with significant root bioturbation in eastern and northwest corner

End of excavation

North section

TU ID	44	Easting	754760	Northing	6138869
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	31cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown silty soil with 20-30% inclusions of pebbles, small rocks and root system

A2 Light brown silty clay with 20-30% inclusion of pebbles/gravel

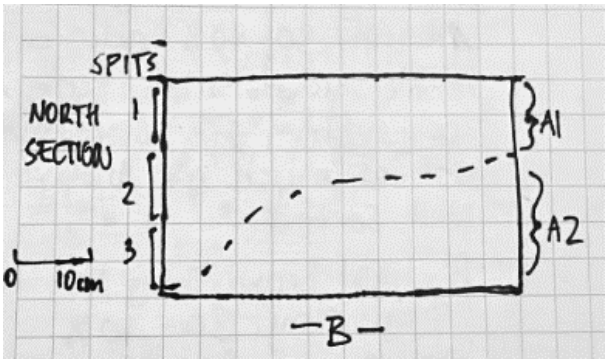
B Light brown to orange clay

Backfilled trench, facing north.

North section

TU ID	45	Easting	754761	Northing	6138849
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown silty soil with 30-40% gravel inclusion

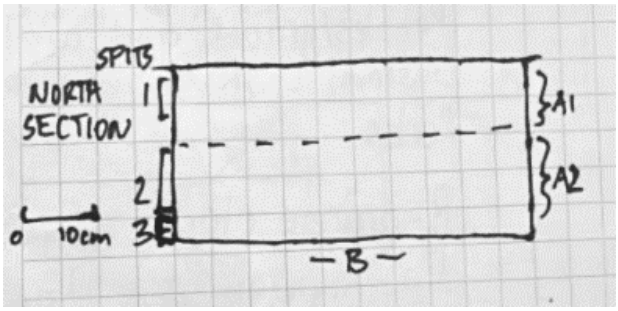
A2 Light brown silty soil with tinges of orange clay, 30-40% gravel inclusion

B Light brown to orange silty clay to clay base

Pre-excavation, facing south.

North section

TU ID	46	Easting	754763	Northing	6138830
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	24cm				
Termination	B Horizon Clay				
Artefacts	1				
Description and Photos					



A1 Brown silty soil with 30-40% gravel inclusion

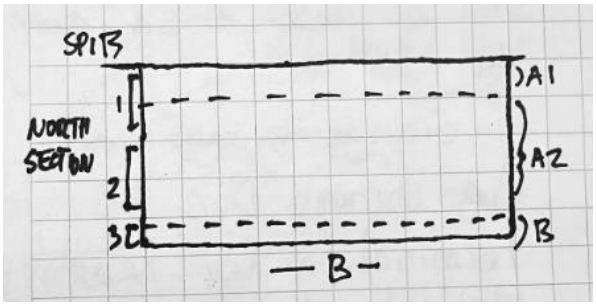
A2 Light brown silty soil with tinges of orange clay, 30-40% gravel inclusion

B Light brown to orange silty clay to clay base

Pre-excavation, facing south

TU ID	47	Easting	754762	Northing	6138811
Date Recorded	2/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	25				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown silty soil with 30-40% inclusion of pebbles and small rocks

A2 Light brown silty clay with 30-40% inclusion

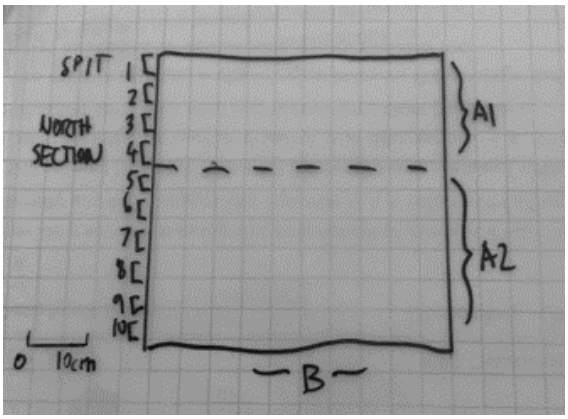
B Orange clay

End of excavation.

North section

TU ID	48	Easting	753162	Northing	6139579
Date Recorded	3/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	50cm				
Termination	Excavated to depth with clayey soils				
Artefacts	0				

Description and Photos



A1 Brown silty loam, 20% pebble inclusions

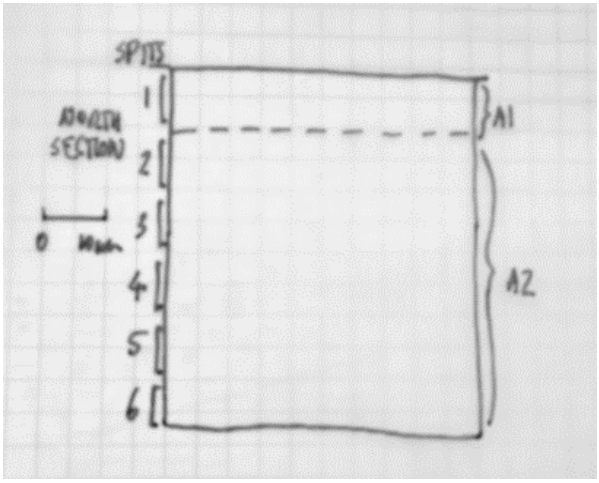
A2 Light brown sandy clay loam with ironstone and quartz inclusions 60%

B Yellowish brown silty clay with ironstone chunks.

End of excavation.

North section

TU ID	49	Easting	753162	Northing	6139601
Date Recorded	3/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	58cm				
Termination	Excavated to depth with clayey soils				
Artefacts	0				
Description and Photos					



A1 Dark brown silty loam, 5cm transition to

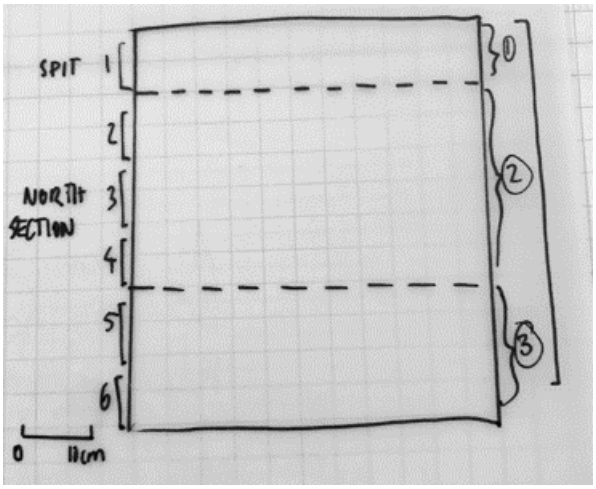
A2 Yellow brown sandy clay loam, large round ironstone inclusions between 25-50cm. Increasing clay content

B Sandy clay, moderately compact

View north.

North section

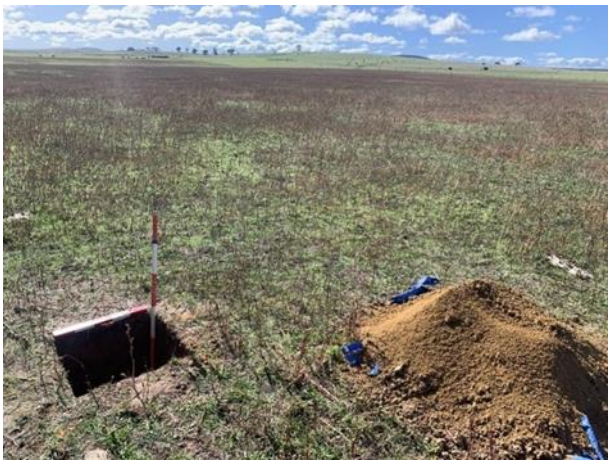
TU ID	50	Easting	753165	Northing	6139620
Date Recorded	3/5/2023				
Field Recorder	Merekai B				
Max. Depth (cm)	60				
Termination	Excavated to depth with clayey soils				
Artefacts	0				
Description and Photos					



1 Brown silty soil with 10-20% inclusion of pebbles/gravel

2 Light brown silty clay soil with 20-5-% inclusion of pebbles, gravel, small rocks and a lot of ironstone

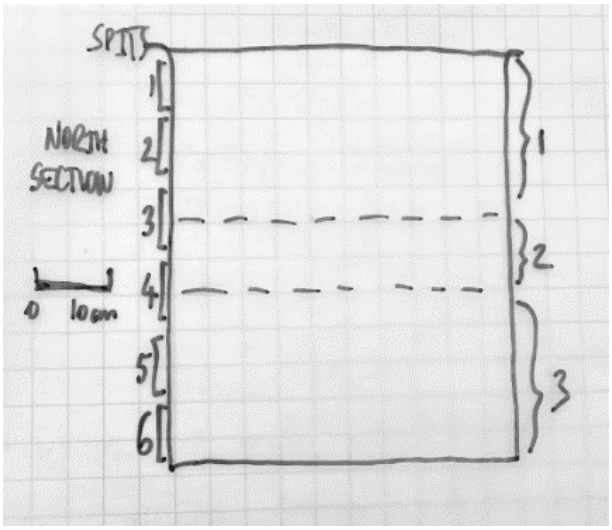
3 Light brown to orange silty clay with 20-35% inclusion of pebbles and gravel



Landscape view, facing north-east.

North section

TU ID	51	Easting	751382	Northing	6139576
Date Recorded	3/5/2023				
Field Recorder	Robert Y				
Max. Depth (cm)	57cm				
Termination	Excavated to depth with clayey soils				
Artefacts	1				
Description and Photos					



1 Brown fine silty soil, no inclusions

2 Light brown clay silt with ironstone inclusion 60%

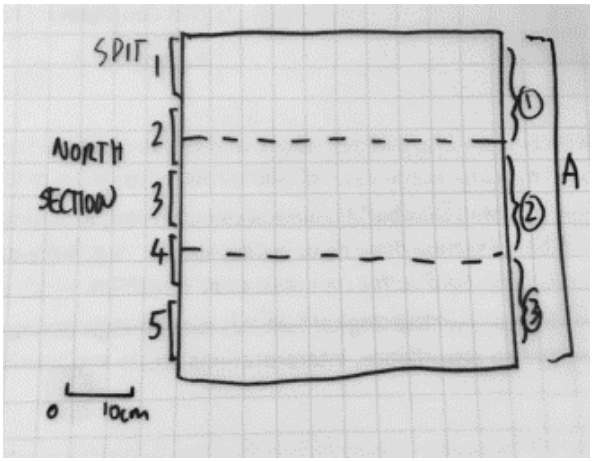
3 Silty clay, yellowish brown with orange mottle

End of excavation.

North section

TU ID	52	Easting	753184	Northing	6139598
Date Recorded	3/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	51				
Termination	Excavated to depth with clayey soils				
Artefacts	0				

Description and Photos



1 Pale brown damp weakly compacted silt, friable with occasional small irons stone pebbles. Merging contact

2 Orangey brown damp, compacted clayey silt with frequent degrading ironstone pebbles and angular rock (5cm). Merging contact

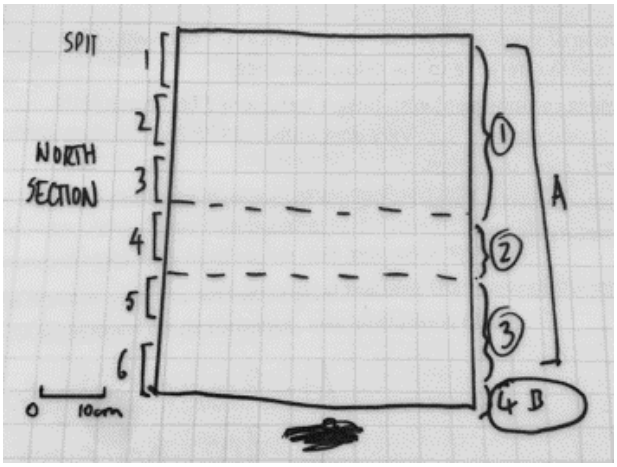
3 Orange moist, silty clay with same inclusions

End of excavation

North section

TU ID	53	Easting	753183	Northing	6139617
Date Recorded	3/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	60				
Termination	Excavated to depth with clayey soils				
Artefacts	0				

Description and Photos



1 Pale brown weakly compacted, damp, friable silt topsoil with grasses, rootlets, infrequent charcoal pieces and quartz rocks and angular ironstone. Merging transition (5cm)

2 Orangey brown, damp, compacted clayey silt, slightly friable with infrequent ironstone pebbles, merging transition

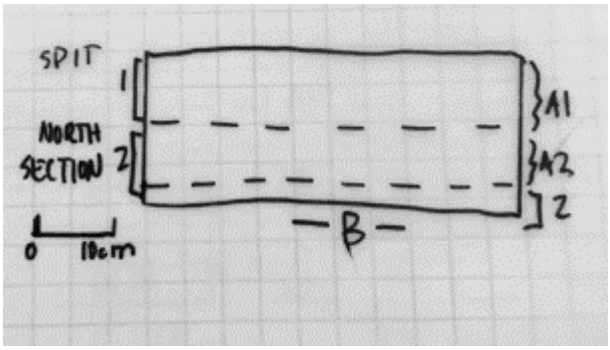
3/4 Orange, damp, clayey silt to silty clay with frequent degrading ironstone

End of excavation.

North section

TU ID	54	Easting	754769	Northing	6138773
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	25cm				
Termination	B Horizon Clay				
Artefacts	5				

Description and Photos



A1 Dark brown silty loam with angular gravels 40%

A2 Pale brown clayey silt with orange mottles and gravel

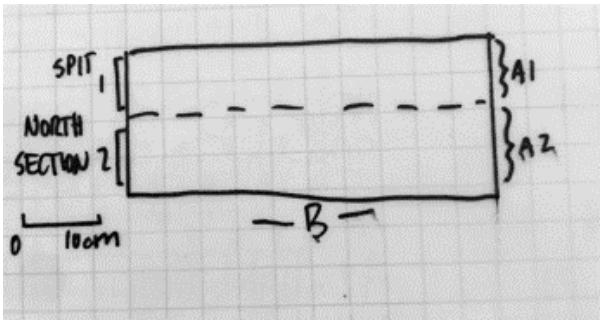
B Orange brown silty sandy clay with gravel inclusions 50%

End of excavation

North section

TU ID	55	Easting	754768	Northing	6138753
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	22cm				
Termination	B Horizon Clay				
Artefacts	5				

Description and Photos



A1 Dark brown fine silty loam w/ angular gavels

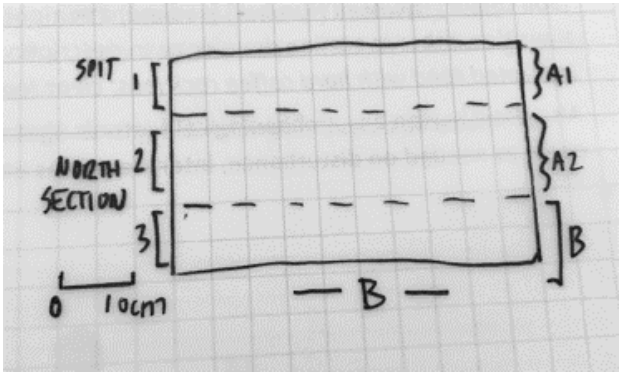
A2 Pale brown silty clay with rocky angular gravels 60%

B Orange clay

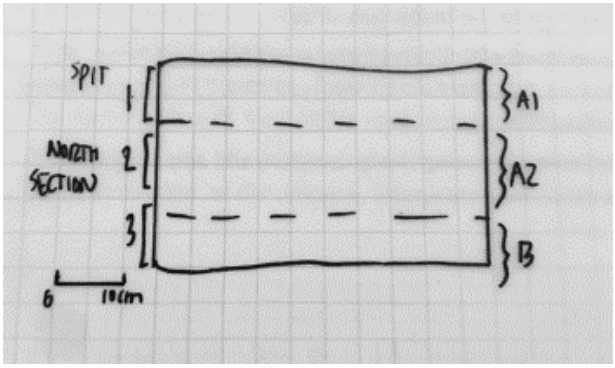
End of excavation

North section

TU ID	55N	Easting	754769	Northing	6138764
Date Recorded	4/5/2022				
Field Recorder	Sarah M				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos	
	A1 Dark brown silty loam with gravel inclusions A2 Light brown clayey silt with gravel inclusions B Orange clay with gravel inclusions
 Pre-excavation facing east	

TU ID	55S	**Easting**	754770	**Northing**	6138742
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				
Description and Photos					



A1 Dak brown fine silty soil with small pebble inclusions

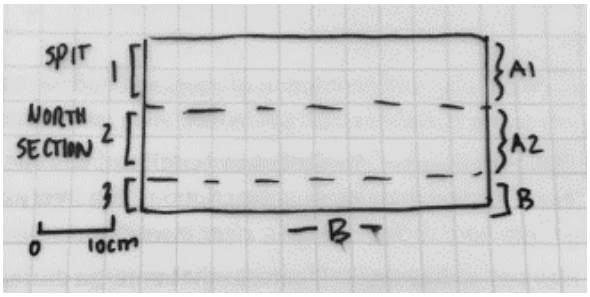
A2 Light brown with angular blocky gravels and rock

B Orange clay

Pre-excavation, facing west.

TU ID	56	Easting	754767	Northing	6138732
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	26cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Dark brown silty loam with angular gravels

A2 Transitioning over 10cm to pale brown clayey silt with orange mottles and gravel

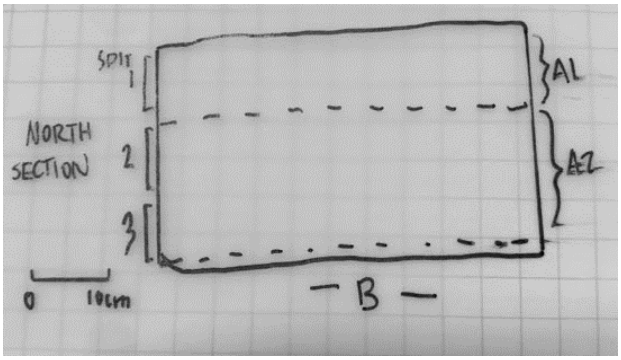
B Orange sandy clay

End of excavation

North section

TU ID	57	Easting	754765	Northing	6138711
Date Recorded	4/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	32cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



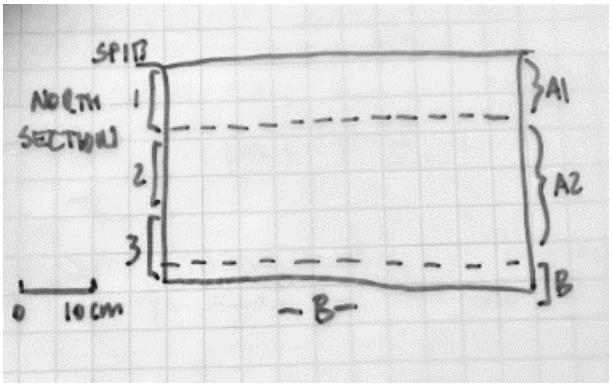
A1 Very dark brown silty loam
A2 Yellow brown loamy clay
B Orange clay

View north-east

North section

TU ID	58	Easting	754765	Northing	6138691
Date Recorded	4/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 Very dark brown silty loam

A2 Loamy clay, medium angular pebble inclusions 30%, burnt tree root at base

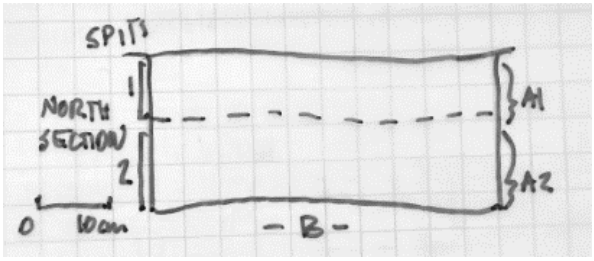
B Orange clay

Pre-excavation, view north-east

North section

TU ID	59	Easting	754763	Northing	6138671
Date Recorded	4/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	24cm				
Termination	B Horizon Clay				
Artefacts	5				

Description and Photos



A1 Very dark brown silty loam, friable, small-medium angular pebble inclusions, clear transition to

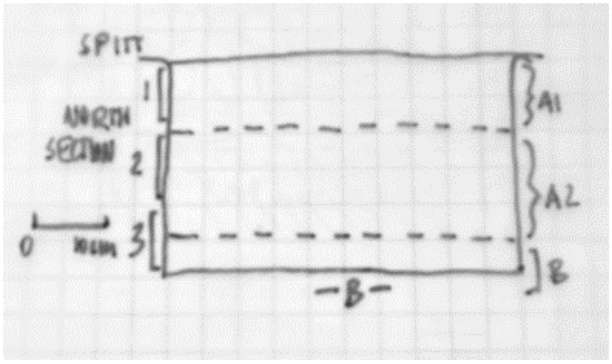
A2 Orange brown loamy clay, small-medium angular pebble inclusions, 4mm transition to

B Orange clay

Pre-excavation, facing northeast

North section

TU ID	60	Easting	754748	Northing	6138644
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	3				
Description and Photos					



A1 Dark brown silty loam

A2 Light brown silt with gravel and rock inclusions of increasing size, particularly on the eastern side

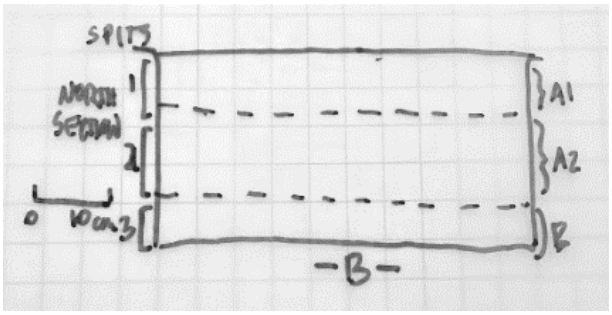
B Orange clay

End of excavation

North section

TU ID	61	Easting	754742	Northing	6138623
Date Recorded	5/4/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	25cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Dark brown silty sandy loam with small gravel inclusions

A2 Pale brown silt with gravel inclusions

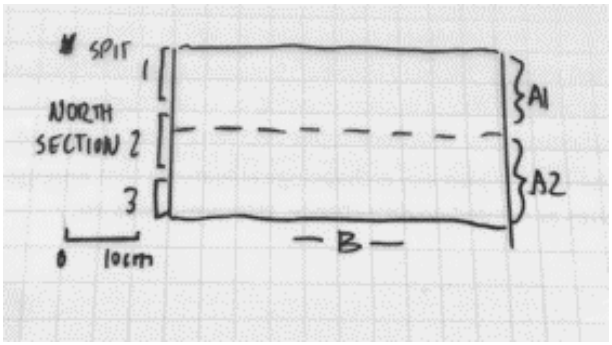
B Orange clay

View north of trench location

North section

TU ID	62	Easting	754737	Northing	6138604
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	26cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



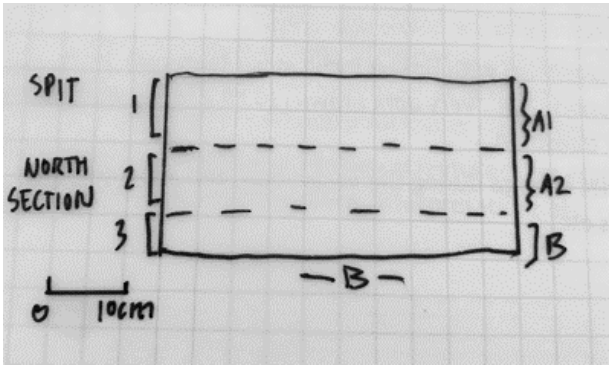
A1 Very dark brown to black sandy loam
A2 Pale brown silty loam
B Orange clay

End of excavation

North section

TU ID	63	Easting	754730	Northing	6138584
Date Recorded	4/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	25cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Dark brown silty loam with frequent angular rocks

A2 Pale brown silty soil with gravel inclusions

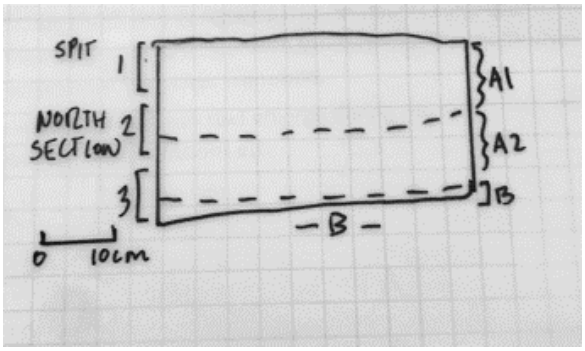
B Orange clay

View west, pre -excavation.

North section

TU ID	64	Easting	754725	Northing	6138631
Date Recorded	4/5/2023				
Field Recorder	Lara T				
Max. Depth (cm)	32cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Dark brown sandy loam, angular gravel inclusions

A2 Yellow brown loamy clay, gravel inclusions

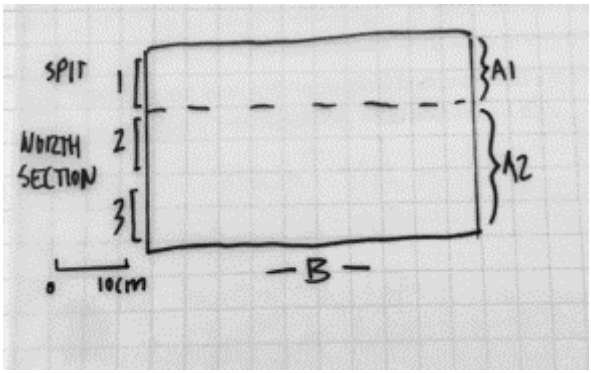
B Orange clay, brunt roots lying on top suggest previous tree cover

View north-west

North section

TU ID	65	Easting	754706	Northing	6138639
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	30cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



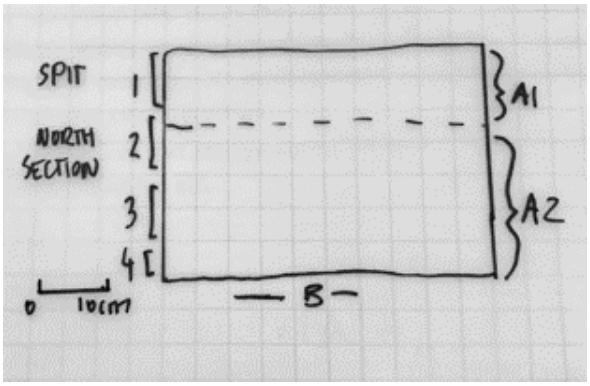
A1 Dark brown silty loam with gravel inclusions
A2 Light brown silty clayey sand with gravel 60%
B Orange clay

End of excavation

North section

TU ID	66	Easting	754687	Northing	6138646
Date Recorded	6/4/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	35cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Dark brown silty sandy loam with gravel inclusions

A2 Pale brown silty clayey sand with high proportion of rocky angular rock/gravel inclusions 60%

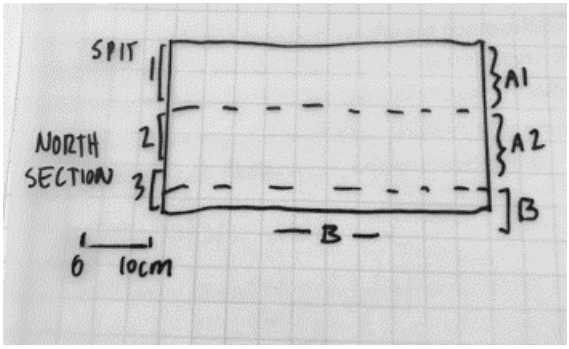
B Orange clay

View north-west

North section

TU ID	67	Easting	754592	Northing	6138682
Date Recorded	5/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	29				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown soft friable damp silt topsoil with grasses, rootlets, worms. Clear transition

A2 Orange brown, weakly compacted, damp clayey silt with small blackened pebbles throughout. Merging transition

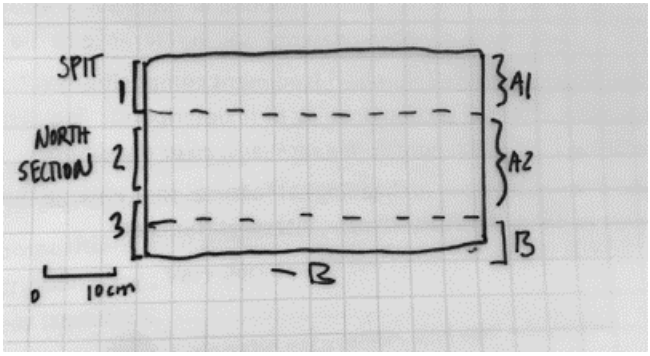
B Red – brown soft, weakly compacted, slightly sticky clay, with small pebbles

View east of excavated trench

North section

TU ID	68	Easting	754573	Northing	6138688
Date Recorded	5/5/				
Field Recorder	Elise N				
Max. Depth (cm)	29cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown soft, damp silt topsoil with grasses, rootlets, clear transition

A2 Orange brown weakly compacted, damp, clayey silt with occasional small black pebbles. Merging transition

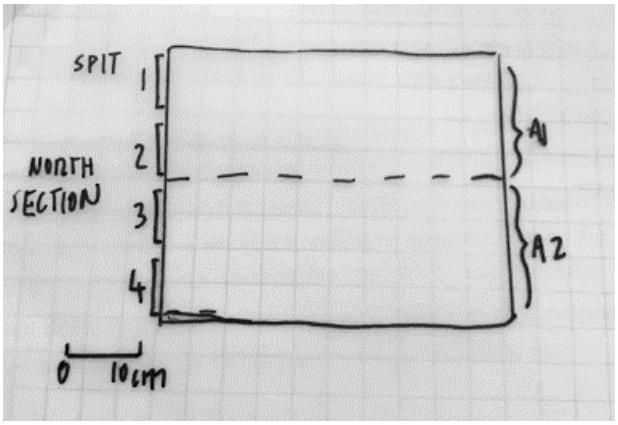
B red brown compacted, damp, slightly sticky clay with small black pebbles.

Excavated trench

North section

TU ID	69	Easting	754520	Northing	6138660
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 Brown silty sand with small pebbles inclusions 5%, gradual transition to redder soil

A2 Brown to reddish brown clayey silt with 10% pebble inclusions

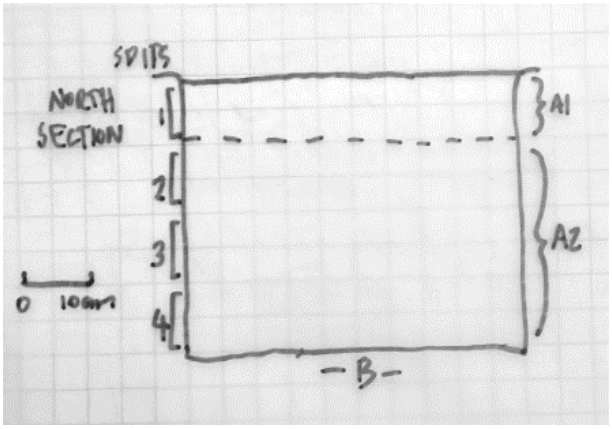
B Reddish brown clay

End of excavation

North section

TU ID	70	Easting	754538	Northing	6138655
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	40cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown fine silty sandy loam, gradually transitioning to a deeper red and clay based soil

A2 Reddish brown sandy clay loam with small gravel and ironstone inclusions

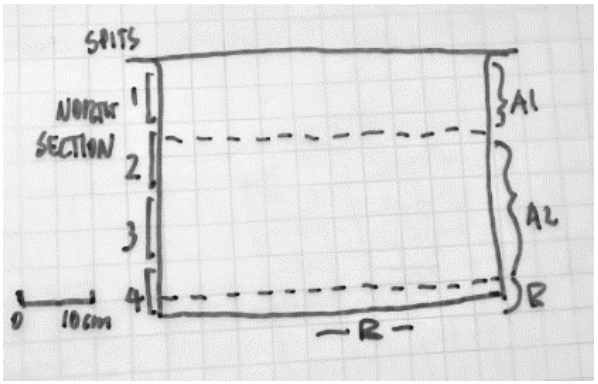
B Reddish brown sandy clay

Backfilled trench, view east

North section

TU ID	71	Easting	754567	Northing	6138669
Date Recorded	5/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	36cm				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown soft damp silt topsoil with rootlets, grasses ad merging transition

A2 Orangey brown damp clayey silt, frequent degrading small pebbles, charcoal pieces, possible burnt tree root in south wall. Merging transition

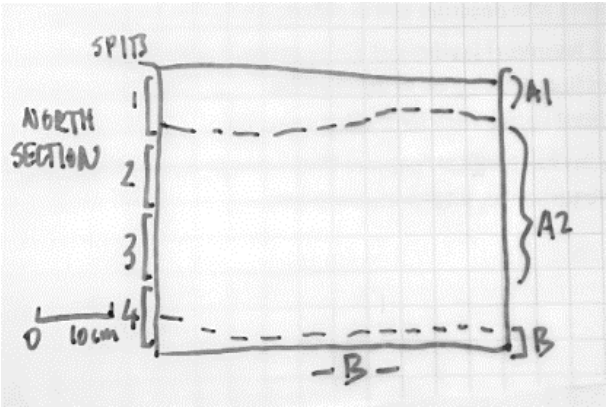
B Red brown compacted slightly sticky clay with small degrading ironstone pebbles

End of excavation

North section

TU ID	72	Easting	754563	Northing	6138650
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	40				
Termination	B Horizon Clay				
Artefacts	1				

Description and Photos



A1 Dark brown fine silty loam,

A2 Light orange-brown silty clayey loam with gravel inclusions 5%

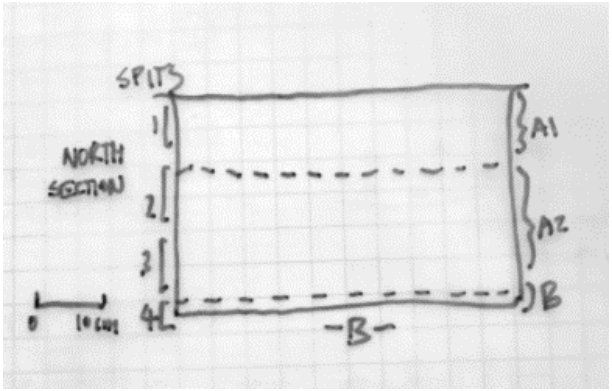
B Orange brown friable clay

End of excavation

North section

TU ID	73	Easting	754592	Northing	6138662
Date Recorded	5/5/2023				
Field Recorder	Elise N				
Max. Depth (cm)	33				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



A1 Brown soft damp silt topsoil with rootlets, grasses

A2 Orange-brown clayey silt, frequent degrading ironstone pebbles

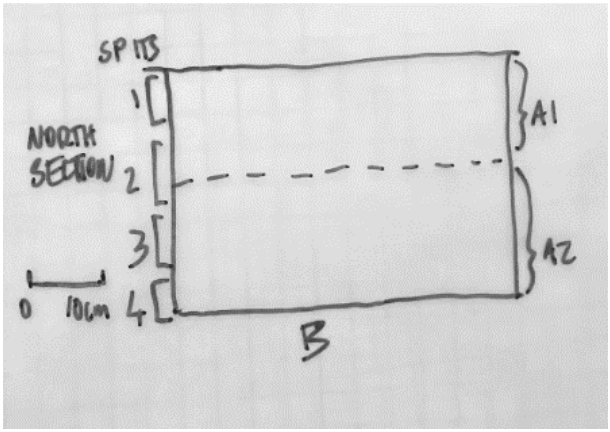
B Red brown, compacted, slightly sticky clay with degrading ironstone pebbles

End of excavation

North section

TU ID	74	Easting	754533	Northing	6138636
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	40				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



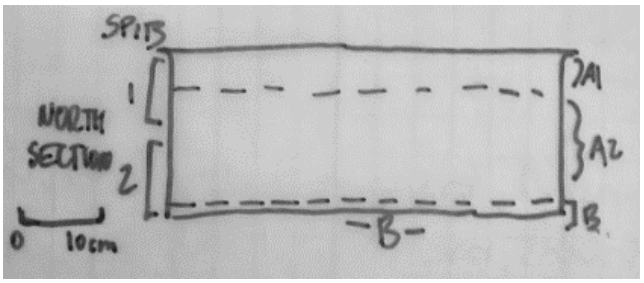
A1 Dark brown fine silty loam, no inclusions
A2 Light brown silty clay sand, no inclusions
B Light yellowish brown silty clay, no inclusions

End of excavation

North section

TU ID	75	Easting	754526	Northing	6138617
Date Recorded	5/5/2023				
Field Recorder	Sarah M				
Max. Depth (cm)	20				
Termination	B Horizon Clay				
Artefacts	0				

Description and Photos



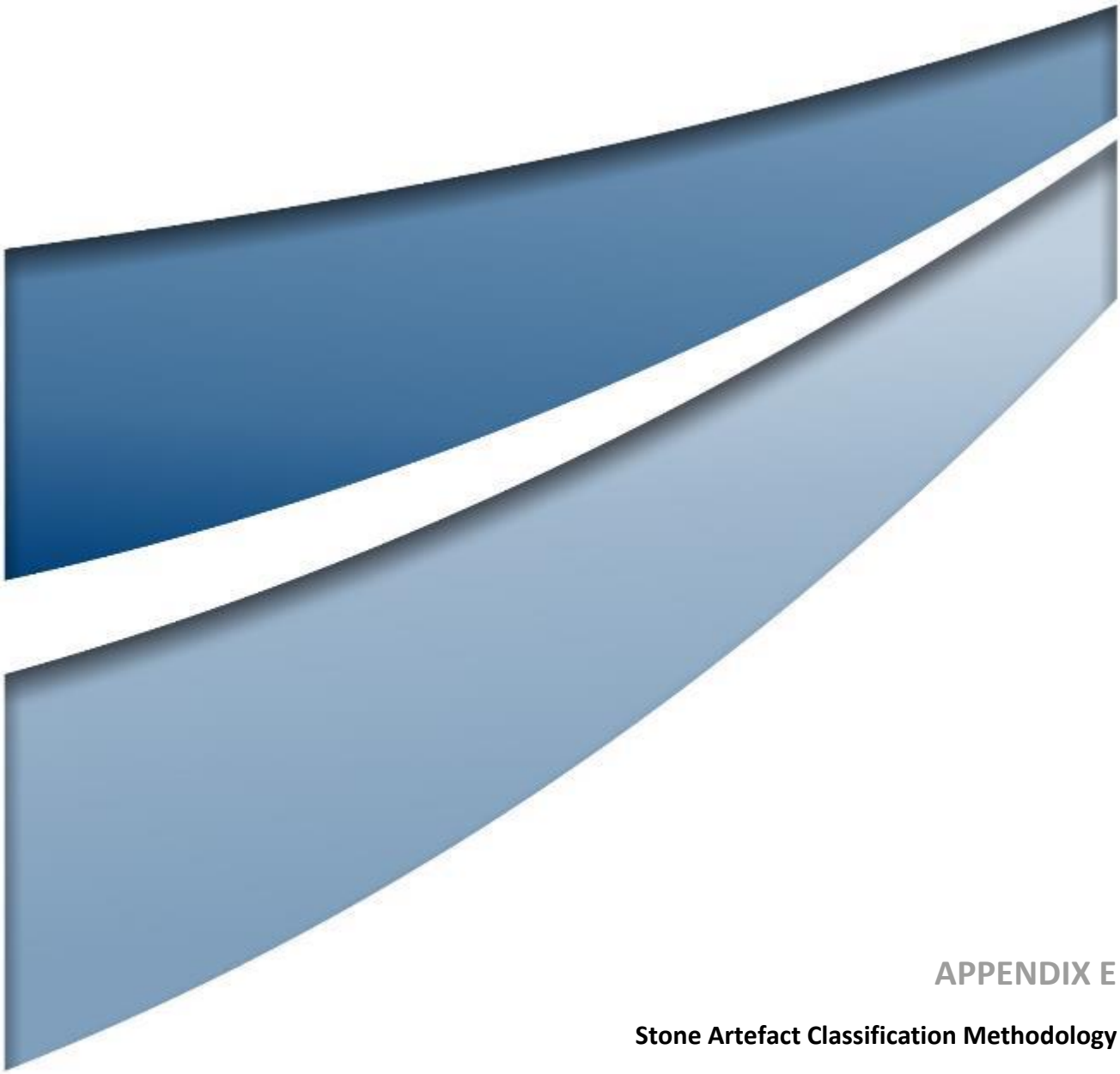
A1 very dark brown silty loam with some roots, bioturbation and occasional small pebbles

A2 brown silty clay, with occasional small ironstone pebbles, moist

B brown moist silty clay

End of trench excavation

North section



APPENDIX E

Stone Artefact Classification Methodology

Methodology for Recording of Artefacts

The below methodology was used by Lara Tooby for recording the artefact attributes and draws on the methodology outlined in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW[1] NSW 2010), as well as White (2002) and Holdaway and Stern (2004).

Category Type	Explanation / Details
ID/instance number	Each artefact assigned is unique ID number, usually in chronological order based on excavation location.
Excavation Date	Date that the context the artefact was found within was excavated based on fieldwork label.
TU/ Spit / Depth	The location the artefact was found based on fieldwork label.
Artefact material	Artefact generally assigned one of the following raw material categories: • **Chert:** Any semi-translucent silica-based material excluding silicified wood and quartz. Can sometimes be further classified into chalcedony (dull lustre on concordial surfaces), agate (a translucent and banded chalcedony) and flint (fine grained silicious material usually formed in nodules and masses of chalk). • **FGS (Fine Grained Silicious):** Any fine-grained silicious material that does not fit into the other raw material categories. • **Hornfels:** A Metamorphic rock, with an original material clay-rich rock (e.g., mudstone or shale). Dark stone composed of quartz, mica, and particular feldspars. • **IMT (Indurated Mudstone and Tuff):** A generally agreed classification following Hughes et al. (2011), describing materials that are commonly defined as indurated 'tuff' or 'mudstone'. The metamorphic processes regarding the formation of these two materials differ, however they are categorised together as they are usually impossible to distinguish without detail petrographic analysis (Corkill 1999, p. 45). • **Jasper:** Opaque fine grained silicious stained by oxides. Often (but not always) red and containing quartz veins. • **Quartz:** Semi opaque glass like mineral composing of silica. Shows a lustre on conchoidal surfaces. • **Quartzite:** Metamorphic rock, original material of sandstone. It is a quartz-rich stone which should be granular (sugary) in texture. • **Silcrete:** An indurated (hardening of rocks by heat or baking and resists crumbling) duricrust (a hard layer on or near the surface of soil) composed mainly of quartz clasts cemented by a matrix of host rocks. • **Silicified wood:** A rock in which the original structure of the woody material has been replaced by dissolved minerals (mostly silica). This happens when the wood is covered over millions of years, deprived of oxygen, and completely replaced by minerals. The structure of the wood may be visible in the rock but may be undetectable in small pieces or under low magnification (Corkill 1999, p. 48).

[1] Department of Environment, Climate Change and Water was the government agency involved administrating the NPW Act between 2009 and 2010. The functions of the agency are currently assumed by Heritage NSW.

	• **Volcanic:** Igneous rocks. Can sometimes be further classified into basalt, andesite, trachyte, rhyolite or obsidian, all of which are known to be used as stone artefact materials by Aboriginal people.
Artefact Type	**The following categories are applied to artefacts:** • **Anvil:** A flat **s**tone used as a base for working stone artefacts. It must have evidence of pitting from percussion on one or more surfaces. • **Backed Artefact:** A retouched artefact that has that has 'blunting' (vertical) retouch along a margin. • **Bipolar Artefact (core, flake, ind.):** Artefact resulting from bipolar knapping. Diagnostic features of a bipolar artefact are dependent on material -see de la Peña 2015 & de la Peña and Toscano 2013- but features can include on ore more of the following attributes: crushed platform, 'sheet' fracture instead of cone of percussion, distal spalling from force reverberating off the anvil, a 'bulb' in the centre of the flake the compression from both ends, cascading step fractures both at proximal and distal ends, quadrangular or rectangular morphology, and with two or more opposing edges and fissures on the edge knapped . • **Broken Flake and Fragments,** further divided into proximal, medial, distal and cone-split left and right: **- Proximal broken flake:** Artefacts containing a platform but are not complete flakes. Even flakes that appear to have a convincing step termination as opposed to a break, are classified as 'broken flakes', as it is usually too difficult to ascertain the difference between a step termination and a broken flake. **- Medial fragment:** A flake missing its distal and proximal ends. **- Distal fragment:** A flake showing termination attributes, but without any proximal ends **-Cone-split left:** linear longitudinal fracture curving to the left when viewed from the ventral **-Cone-split right:** linear longitudinal fracture curving to the right when viewed from the ventral • **Core:** An artefact from which flakes have been detached. In this case this category does not include flakes that have clearly been used as cores; these are classified as retouched flakes following Hiscock (1988); • **Flake:** Artefacts that have a ventral surface and were struck from a core. If they are not complete, they are classified as 'broken' flakes. • **Flaked Piece:** An artefact that cannot be orientated, but has features that indicate it is part of the knapping process. • **Hammerstone:** A rock used to strike a core to produce flakes. It should contain evidence of pitting. • **Heat shatter:** Although included as an artefact, it is not worked (knapped) stone, and more accurately defined as a cultural lithic. Heating could be caused by cultural (e.g., heat treatment) or than natural (e.g., bushfires) causes, a heat shatter is defined as cultural if other definite artefacts are found in the locality. Common heat shatter attributes include rough surface, no knapping fractures, changed colouring and potlid scarring. Different material shatters in different ways: Silcrete will only fracture if suddenly exposed to a temperature above a certain threshold (as opposed to extended periods of heating or sudden cooling) (Mercieca 2000). However, other materials suffer less fragmentation from heating:

	quartzite is moderately resistance, whilst quartz rarely shows any attributes resulting from thermal alteration (Richardson 2010). • **Indeterminate:** Non-diagnostic artefacts that, based on proximity to other artefacts and material, are determined to be cultural in origin despite having no discernable signs of knapping, or else quartz pieces that are borderline cultural or natural pieces that have not got clear diagnostic features. • **Manuport:** Although included as an artefact, it is not worked (knapped) stone, and is therefore be more accurately defined as a cultural lithic. It is a stone which does not occur naturally in the landscape, and appears to have been brought to site by an Aboriginal person. Examples include river pebbles that have been carried to an area away from a river, but with no evidence of knapping/pitting, or sandstones that have been brought to site to use in a hearth. • **Retouched Artefact:** An artefact with edges that have been modified *after* being struck from the core. A retouched artefact (including a backed artefact) must have retouch from the ventral, or dorsal and ventral; if the retouch were only coming from the dorsal, you would be unable to say definitively that the retouch was happening *after* the flake was struck. • **Retouched Flake:** A retouched artefact with proximal end (platform and initiation point) visible. Notes: Although there are some specialised 'tools' which have been identified by archaeologists (e.g. scrapers, blades, saws, burins, Bondi points, burins, choppers, adzes), these are normally very rare in assemblages. If one occurs in an assemblage, it will be explicitly photographed and defined.
Cortex	Cortex applies to the approximate coverage of weathered cortex on materials, defined with the following categories, with the allocated number is based on the percentage of material covered in cortex: • 100 = pebble (completely covered) • >70 = non-ventral or equivalent completely covered • 50 = half or more than half non-ventral or equivalent surfaces covered) • <30 less than half of dorsal covered • 0 (no cortex)
Platform Surface	Platform surfaces can provide useful information about the way a core was worked. For instance, a flake whose platform consists of natural surface(cortex) will tend to have been removed earlier, rather than later in the reduction of a core (Holdaway and Stern 2004, 119) Categories of platform considered include: • **Cortex**—Some cortex visible at the (even if cortex is not dominant, It indicates that flake was struck from at least partly cortical core, early on in reduction (Holdaway and Stern 2004, 120) **Bipolar**—Bipolar 'crushing' evident on two ends of the flake; bipolar flakes typically have multiple step fractures at dorsal and proximal ends (Holdaway and Stern 2004, 120) **Indeterminate** or **partly crushed**—Crushed platform, but without clearly being from bipolar flaking **Abraded**—Platform shows evidence of being ground. • **Flaked**—which can be further broken into:

	- **Plain**—Platform surface consisting of smooth surface (the only initiation points visible being that of the knapped flake) - **Ridged**— Platform surface had a ridge(s) formed by a remnant margin of a flake formerly struck across the core, but not evidence of initiation points visible for the previously struck flaked (the only initiation points visible being that of the knapped flake) - **Scarred**— Platform had one or two flake scars the points of force showing that they were initiated from blows struck on the dorsal edge of the platform surface. - **Faceted**—Platform has three or more scars initiated from the dorsal edge of the platform. - **Focal**—Only the initiation point of the platform remains.
Weight	Weight is recorded for each artefact to the nearest 0.1g (artefacts with weight that says 'O' are <0.1g).
Maximum size	The maximum size of artefacts along its longest dimension, (often diagonal measurement), to the nearest mm.
Length (mm) Width (mm) Thickness (mm)	*Measurement of length, thickness and width is dependent on whether and artefact has platform or not.* • ***Artefacts with platform:*** Length taken from the point of force application along the percussion access to the farthest distal end of the artefact. Width is measured at the midpoint of the length access and perpendicular to it, and the thickness measured at the intersection of length and width. If a flake is a proximal broken flake, retouched flake, cone-split, the measurements are written in brackets. • ***Artefacts without platform:*** Length is the maximum distance across the flake. Width is taken perpendicular to the length, at the mid-point of the length, and thickness taken at the intersection of length and width.
Comments	Other categories including A colour descriptor, and whether or not the stone is fine-grained or course-grained, whether it is a bending flake, whether photo was taken etc. If a core, the core flaking pattern will also be recorded, focusing on whether the core is: - **Unidirectional**—Scars from same platform - **Bidirectional**—Cores have two platforms, one opposite the other - **Bifacial**—Single platform, but the flakes have been detached from two core faces, forming a 'ridge' between two sets of negative scars - **Multidirectional**—Two or more platforms with no clear pattern Furthermore, the shape of scars is recorded where present, either: - **Elongate** —length more that twice its width - **Intermediate**—Length is greater than width, but scar is not twice as long as it is wide - **Expanding**—The width of a scar is greater than length Finally, a count of total negative scars as a whole, usually in a '>' (more than) count.

Not used (included in comments if relevant

Termination	The distal end of a flake or distal fragment (either feather, hinge or plunge).

	Note: As it is difficult to distinguish between a broken flake and a flake with a step termination, and platform artefacts with a step termination are defined as broken flakes.
Refits	*Only included in a database if refitting has been undertaken.* Documentation of conjoin sets the piece is linked to through refitting. Refitting involves reassembling knapped or shattered pieces of cultural lithics/stone artefacts forming conjoin sets. Usually, refitting entails reassembling lithics derived from the same core; however, it can also involve the reassembling of the shattered pieces of single artefacts (Holdaway and Stern 2004:207-208). Only included if refits have been made. ID /ID refers to refitted pieces from the same broken flake. 'ID + ID' refers to refitted pieces from separate cultural lithics.
Bending Flake	Only included in a database if a bending flake has been identified. Y/N whether it is a bending flake type. A 'bending flake', which is usually produced by the hammerstone being a lighter material than the core, or particularly acute platform (Figure 49). These flakes do not have a true bulb or percussion, usually thick platform with a 'lip', and a 'waisted' appearance (Holdaway and Stern 2004:109).

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Corkill, T. 1999 Here and there: Links between stone sources and Aboriginal archaeological sites in Sydney, Australia. Unpublished M.Phil Thesis, Department of Archaeology, University of Sydney.

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Simon, G and & N. Stern 2004, *A Record in Stone,* Canberra : Aboriginal Studies Press

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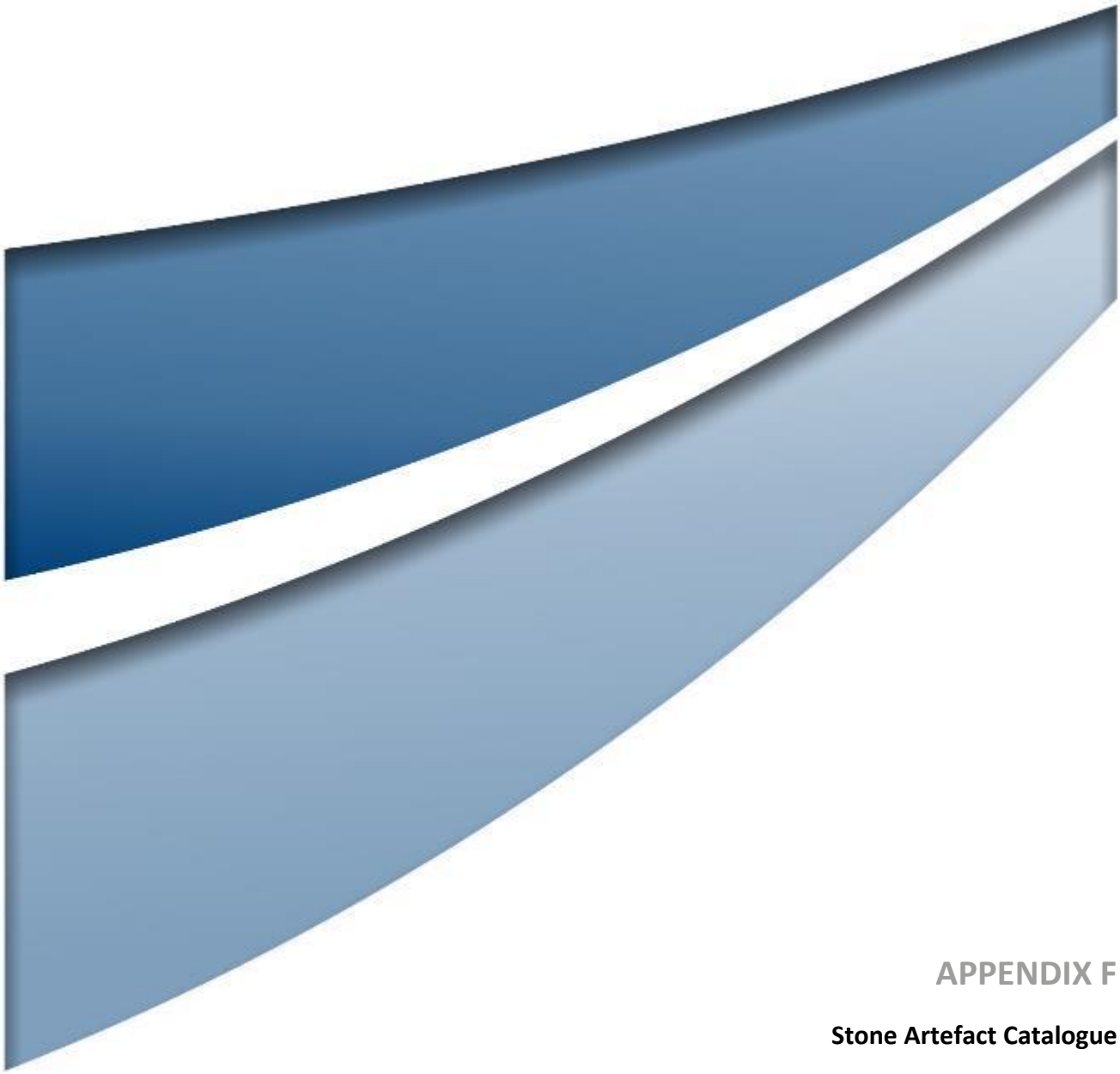

APPENDIX F

Stone Artefact Catalogue

ID	TU	Spit	Depth	Artefact material	Artefact Type	Cortex	Platform Suface	Weight	Max. Size	Length	Width	Thickness	Comments
22223 Gundary Solar Farm—Aboriginal Archaeological Test Excavation—Stone Artefact Catalogue | Lara Tooby, June 2023													
1	2	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	3.3	14	(11)	(10)	(4)	Red
2	2	2	100-200	Silcrete	Retouched Flake	0	Flaked-Ridged	51.3	30	(24)	(22)	(12)	Red, faceting and flaking along the edge
3	2	4	300-400	Quartz	Indeterminate	<30		12.3	18	18	15	7	White quartz, pebble cortex, potential flake
4	2N	1	0-100	IMT	Cone-split right	0	Flaked-Ridged	10	27	(25)	(10)	(4)	Yellow-brown
5	2N	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Ridged/Scarred	17.5	33	(16)	(30)	(5)	Yellow-brown
6	2S	2	100-200	Quartz	Flaked Piece	0		12	23	23	11	7	White quartz
7	2S	4	300-400	Quartz	Indeterminate	0		4.4	16	16	9	6	White-quartz
8	5	2	100-200	Silcrete	Flaked Piece	0		12.5	24	24	14	4	Grey
9	5	3	200-300	Quartz	Indeterminate	0		2.6	12	12	10	3	White-quartz
10	7	2	100-200	Quartz	Indeterminate	0		2	14	14	7	2	White-quartz
11	9	1	0-100	Quartz	Proximal Broken Flake	0	Flaked-Focal	2.5	14.6	(13)	(9)	(2)	White-quartz
12	9	2	100-200	Quartz	Indeterminate	0		4.9	21	21	5	5	White-quartz
13	10	1	0-100	Silcrete	Flaked Piece	0		9.3	27	27	11	5	Light-grey, fine-grained
14	10	1	0-100	Quartz	Flaked Piece	0		1.3	11	11	7	2	White-quartz
15	10	1	0-100	Quartz	Distal Fragment	0		1.6	11	11	8	2	White-quartz
16	10	2	100-200	Volcanic	Proximal Broken Flake	0	Flaked-Scarred	15.3	28	(27)	(15)	(5)	Black/grey (black when wet, grey when dry), sparkly, fine-grained, pourous
17	10	3	200-300	Silcrete	Core	0		27.2	22	22	14	11	Cream, very finegrained, >3 negative scars, bidirectional/bifacial, mostly elongated flakes removed
18	10	3	200-300	Silcrete	Flake	0	Flaked-Ridged	3.3	16	11	13	3	Cream
19	10EXN	2	100-200	Silcrete	Core	<30		76.2	34	34	20	13	Grey and red, >4 negative scars, bidirectional, elongated and intermediate flakes
20	10EXN	2	100-200	IMT	Proximal Broken Flake	<30		15.2	41	(41)	(14)	(4)	Cream-grey with red cortex (smooth), porous
21	10EXN	2	100-200	Silcrete	Flaked Piece	0		46.8	34	34	21	7	Grey
22	10EXN	2	100-200	Volcanic	Proximal Broken Flake	0	Flaked-Ridged	23.2	27	(26)	(21)	(5)	Black-grey, (as per 16, but lighter)
23	10EXN	2	100-200	Quartz	Distal Fragment	0		2.8	19	19	8	2	White quartz
24	10EXN	3	200-300	Quartz	Indeterminate	50		23.4	24	24	15	8	White quartz, potentially a pebble core
25	10EXS	1	0-100	Silcrete	Flake	0	Flaked-Plain	6.5	18	11	15	5	Grey, very fine-grained
26	10EXS	1	0-100	Silcrete	Flake	0	Flaked-Faceted	6	20	16	18	3	Grey, very fine-grained
27	10EXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Focal	2.6	17	(13)	(13)	(2)	Grey, very fine-grained
28	10EXS	1	0-100	Silcrete	Flake	0	Flaked-Focal	1.2	11	9	9	2	Grey, very fine-grained
29	10EXS	1	0-100	Silcrete	Flaked Piece	0		1.3	10	10	9	3	Cream
30	10EXS	2	100-200	Quartz	Indeterminate	0		22.3	30	30	9	11	White quartz, high-shine on at least one surface
31	10EXS	2	100-200	Quartz	Indeterminate	0		4.7	14	14	9	5	White quartz, high-shine on at least one surface
32	10EXE	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	21.3	27	(24)	(17)	(8)	Grey
33	10EXE	1	0-100	Silcrete	Flaked Piece	0		3.4	15	15	11	4	Blue/grey, fine-grained

34	10EXE	1	0-100	Silcrete	Flaked Piece	0		1.2	10	10	8	3	Blue/grey, fine-grained
35	10EXE	1	0-100	Silcrete	Flaked Piece	0		2.2	11	11	6	3	Cream, appears to be a 'snapped' end of a backed artefact, but too small to be certain
36	10EXE	1	0-100	Silcrete	Distal Fragment	0		1.1	11	11	7	1	White, very fine-grained
37	10EXE	2	100-200	Silcrete	Flaked Piece	0		13.3	17	17	11	6	Cream-grey, very fine-grained
38	10EXE	2	100-200	Silcrete	Flaked Piece	0		3.1	13	13	6	4	Red-brown
39	10EXE	4	300-400	Quartz	Indeterminate	0		1.3	9	9	6	3	White quartz, high shine, potential flake
40	10EXE	4	300-400	Silcrete	Retouched Flake	0	Flaked-Scarred	2	18	(4)	(13)	(3)	Cream-grey, very fine-grained, flake worked along edge (not backed)
41	10EXW	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Focal	1.6	15	(9)	(9)	(4)	White-cream
42	10N	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Focal	2.5	15	(8)	(11)	(3)	White-cream
43	10N	2	100-200	Silicified Wood	Backed Artefact	0		12.7	45	45	12	3	Brown, elongated back-artefact
44	10N	2	100-200	Silcrete	Flake	0	Flaked-Plain	13.1	24	13	9	6	Grey
45	10N	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	11.8	18	(16)	(10)	(7)	Grey
46	10N	2	100-200	Quartz	Core	0		100.8	38	38	19	17	White quartz, >3 negative scars, unidirectional, elongated and intermediate flakes
47	10N	2	100-200	Quartz	Indeterminate	0		42.4	28	28	19	10	White quartz, no clear diagnostic except a high-shine surface
48	10N	3	200-300	Silcrete	Distal Fragment	0		3	19	19	11	2	Cream-grey
49	10N	3	200-300	Quartz	Indeterminate	0		5	12	12	9	5	White quartz, no clear diagnostic except a high-shine surface
50	10N	3	200-300	Silcrete	Distal Fragment	0		1.3	13	13	8	1	Grey
51	10S	1	0-100	Silcrete	Flake	0	Flaked-Focal	6.9	29	28	8	3	Grey, potential retouch but coming from the dorsal, so unclear
52	10S	2	100-200	Silcrete	Cone-split right	0	Flaked-Ridged	10.5	26	(23)	(6)	(7)	Grey and red, flawed red surface one edge but not considered cortical
53	10S	3	200-300	IMT	Medial Fragment	0		1.7	12	12	9	2	White
54	10S	3	200-300	IMT	Flake	0	Flaked-Plain	22.3	27	19	16	6	Grey
55	10W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	29.5	40	(37)	(17)	(7)	Grey, platform is flawed but not considered cortical
56	10W	1	0-100	Silcrete	Flaked Piece	0		41.8	27	27	21	12	Grey, some flawed surface but not considered cortical
57	10W	1	0-100	Silcrete	Core	0		34.8	25	25	14	12	Grey, >2 negative scars, flawed surface not considered cortical, aysmetrical flaking, intermediate flakes
58	10W	1	0-100	IMT	Core	<30		33.4	25	25	19	10	Red-grey, along of unidirectional, some earlier asymetical flaking, >3 negative scars, cortical indicated pebble, potentially heated
59	10W	2	100-200	IMT	Proximal Broken Flake	0	Flaked-Scarred	9.8	20	(13)	(16)	(5)	Grey
60	10W	2	100-200	Silcrete	Distal Fragment	0		3.7	17	17	9	3	Grey
61	10W	3	200-300	Silcrete	Core	0		23.4	21	21	14	11	Cream, very fine-grained, asymetrical, flawed surface, >3 negative scars
62	10W	3	200-300	IMT	Flaked Piece	0		11	24	24	8	5	Grey
63	10W	3	200-300	Chert	Core	<30		25	20	20	14	11	Black chert (could be chalcedony or jasper) from small pebble, bifacial, >3 negative scars, intermediate flakes
64	13	1	0-50	FGS	Core	0		193	41	41	30	19	Grey, Asymetrical, >4 negative scars, indetermediate flakes
65	13	2	50-100	IMT	Retouched Artefact	0		18	28	28	13	6	Grey, flake struck off the ventral end of previous flake

66	13	2	50-100	Silcrete	Flaked Piece	0		13.8	18	18	16	8	Grey
67	13	3	100-150	Silcrete	Medial Fragment	0		9	21	21	11	5	Grey
68	13	3	100-150	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	6	21	(11)	(18)	(3)	Cream, very fine-grained
69	13	4	150-200	Silcrete	Proximal Broken Flake	0	Flaked-Ridged/Scarred	53	29	(21)	(23)	(10)	Cream, very fine-grained, negative scar on dorsal
70	13	4	150-200	Silcrete	Retouched Flake	0	Flaked-Ridged	26.4	24	(16)	(20)	(9)	Cream, very fine-grained, flake struck from ventral, near platform
71	13	5	200-250	Silcrete	Flake	0	Flaked-Scarred	49.6	34	25	30	7	Grey
72	13	5	200-250	FGS	Retouched Flake	0	Flaked-Ridged/Faceted	112.9	35	(30)	(27)	(15)	Blue and grey, flakes struck from ventral
73	13	6	250-300	Silcrete	Retouched Artefact	0		70.2	38	38	15	15	Cream, some flawed surface, retouch along ventral but no platform inititaiton visible
74	13	6	250-300	Silcrete	Retouched Artefact	0		31.6	33	33	23	7	Grey and red, ventral surface shows sign of retouch, no platform inititaiton visible
75	13	7	300-350	Chert	Retouched Flake	0	Flaked-Ridged	39.6	29	(25)	(16)	(9)	Black 'chert' (like 63), rtouch along the distal margins, causing faint marks on the ventral
76	13	7	300-350	Quartz	Indeterminate	0		21.9	21	21	14	23	White quartz, high-shine on at least one surface, potentially a core
77	13N	1	0-100	Silcrete	Flaked Piece	0		9.2	21	21	11	6	Grey
78	13N	2	100-200	Silcrete	Retouched Flake	0	Flaked-Ridged	27.1	29	(17)	(29)	(8)	Grey, small retouch near inititation point/platform on ventral
79	13N	3	200-300	Silcrete	Proximal Broken Flake	<30	Cortex	16	24	(19)	(20)	(5)	Grey, platform is considered cortical
80	13W	2	100-200	Silcrete	Flaked Piece	0		10.2	23	23	12	5	Grey
81	13W	3	200-300	Silcrete	Proximal Broken Flake	0	Flaked-Focal	2.5	14	(14)	(9)	(3)	Grey, very fine-grained
82	15	1	0-100	Silcrete	Flake	0	Flaked-Plain	5	19	11	13	3	Grey
83	15	5	400-500	Quartz	Indeterminate	0		155.2	45	45	28	18	Quartz-white, high-shine on at least one surface, potential core
84	16	4	300-400	Quartz	Flake	0	Flaked-Plain	5.4	12	12	6	2	Quartz-white
85	16	5	400-500	Quartz	Indeterminate	0		5.4	19	19	7	3	Quartz-white, high-shine on at least one surface
86	21	1	0-10	Quartz	Indeterminate-Manuport	0		13.6	15	15	11	8	Quartz-clear, looks like a 'gem'
87	23	1	0-100	IMT	Flake	0	Flaked-Ridged/Scarred	23.7	31	31	22	6	Brown, potential usewear along edge- potential 'tool'
88	24	1	0-100	Silcrete	Flaked-Piece	0		3.1	11	11	8	6	Cream
89	29	1	0-50	Silcrete	Flake	0	Flaked-Scarred	5.9	22	17	16	3	Cream, very fine-grained
90	30	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Scarred	2	16	(14)	(9)	(1)	Cream
91	30	1	0-100	FGS	Retouched Flake	0	Flaked-Ridged	143	45	(30)	(35)	(12)	Blue-grey,flawed surface, not considered context, distal used as a platform
92	30	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	1.6	13	(13)	(6)	(2)	Blue-grey
93	30	1	0-100	Quartz	Indeterminate	0		53.2	29	29	20	10	White-quartz, potential core, high-shine on at least one surface
94	30	1	0-100	Quartz	Indeterminate	0		1.2	9	9	4	3	White quartz, high-shine on at least one surface
95	30N	1	0-100	Quartz	Indeterminate	0		7.4	18	18	10	5	White quartz, high-shine on at least one surface
96	33	2	100-200	Silcrete	Distal Fragment	0		3.6	15	15	10	3	Light grey
97	35	1	0-100	Quartz	Indeterminate	0		4.6	20	20	10	3	White quartz, high-shine on at least one surface

98	35	1	0-100	Silcrete	Flake	0	Flaked-Scarred	2.7	13	10	12	3	Cream
99	35	1	0-100	Silcrete	Medial Fragment	0		2.6	15	15	7	2	Blue-grey
100	35	1	0-100	Quartz	Indeteterminate	0		7	20	20	8	4	White quartz, high-shine on at least one surface
101	35	2	100-200	Quartz	Indeterminate	0		3.2	19	19	7	2	White, high-shine on at least one surface
102	35N	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Ridged	21.7	26	(22)	(19)	(6)	Blue-grey; almost complete; just a small break on one end
103	35S	1	0-100	Silcrete	Flake	0	Flaked-Focal	2.3	17	15	8	2	Cream, very fine-grained
104	35S	1	0-100	IMT	Flake	0	Flaked-Scarred	13.2	27	22	17	4	Brown, rough
105	35S	1	0-100	Quartz	Flake	0	Flaked-Focal	1.7	17	17	5	3	White quartz
106	35S	1	0-100	Quartz	Medial Fragment	0		0.8	15	15	3	1	White quartz
107	35S	2	100-200	Quartz	Indeterminate	0		4.4	14	14	10	5	White quartz, high-shine on at least one surface
108	35E	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	8.3	24	(20)	(14)	(3)	Pink and Grey
109	35E	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Plain	6.9	17	(12)	(11)	(5)	Grey
110	35E	1	0-100	Silcrete	Flake	0	Flaked-Focal	1.2	13	13	3	2	Cream
111	35E	1	0-100	Silcrete	Medial Fragment	0		1.1	10	11	7	2	Cream
112	35E	1	0-100	Silcrete	Flaked Piece	0		0.8	8	8	6	1	Cream
113	35E	1	0-100	Quartz	Indeterminate	0		2.9	15	15	9	3	White quartz, high-shine on at least one surface
114	35W	1	0-100	Quartzite	Proximal Broken Flake	0	Flaked-Ridged	3.8	14	(11)	(13)	(4)	Transulcent grey, grainy
115	35W	1	0-100	Quartzite	Indeterminate	<30		2	11	11	8	1	Translucent white, extremely sparkly, grainy, could contain cortex, or might just be in impperfection
116	35W	1	0-100	Silcrete	Distal Fragment	0		11.7	29	29	13	6	Cream, platform appears to be broken, potential usewear along edge
117	35W	1	0-100	Silcrete	Flaked Piece	0		0.8	9	9	5	2	Cream
118	35W	1	0-100	Silcrete	Distal Fragment	0		1.2	12	12	7	1	Blue
119	35W	1	0-100	Silcrete	Distal Fragment	0		3	20	20	8	3	Blue, potential usewear
120	35W	1	0-100	Silcrete	Medial Fragment	0		1.8	17	17	6	3	Blue
121	35W	1	0-100	Silcrete	Medial Fragment	0		1.5	14	14	6	2	Blue
122	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Faceted	1.4	12	(5)	(11)	(3)	Blue
123	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	2.6	15	(14)	(7)	(3)	Blue
124	35W	1	0-100	Silcrete	Flaked Piece	0		1.2	10	10	7	2	Blue-grey
125	35W	1	0-100	Silcrete	Flake	0	Flaked-Ridged	10.7	18	16	15	6	Blue-grey with red
126	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Plain	0.9	12	(12)	(8)	(1)	Blue-grey
127	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	13.5	27	(25)	(5)	(4)	Blue-grey with red
128	35W	1	0-100	Silcrete	Core	0		37.1	26	26	17	10	Blue-grey, aysemtetical, >2 negative scars, intermediate flakes, a flawed surface
129	35W	1	0-100	Silcrete	Flake	0	Flaked-Scarred	14.6	25	23	16	6	Grey and red
130	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Plain	3.1	22	(21)	(11)	(2)	Grey
131	35W	1	0-100	Silcrete	Flake	0	Flaked-Plain	1.5	22	21	5	2	Grey
132	35W	1	0-100	Silcrete	Flake	0	Flaked-Scarred	6.5	16	13	11	4	Grey

133	35W	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	22	27	(20)	(16)	(4)	Grey
134	35W	1	0-100	Silcrete	Flaked Piece	0		7.2	23	23	13	2	Grey
135	35W	1	0-100	Silcrete	Flaked Piece	0		2.1	14	14	9	2	Grey
136	35W	1	0-100	Silcrete	Flaked Piece	0		0.8	10	10	5	2	Grey
137	35W	1	0-100	Silcrete	Flaked piece	0		0.8	10	10	6	1	Grey
138	35W	1	0-100	Silcrete	Retouched Artefact	0		47.5	29	29	18	12	Grey with red, no clear initiation point, but ventral surface (which has been impacted by flaking) present
139	35W	1	0-100	Quartz	Indeterminate	0		2.3	12	12	9	3	White quartz, high-shine on at least one surface
140	35W	1	0-100	Quartz	Indeterminate	0		2.1	13	13	6	4	White quartz, high-shine on at least one surface
141	35W	1	0-100	Quartz	Indeterminate	0		0.7	9	9	6	2	White quartz, high-shine on at least one surface
142	35W	1	0-100	Quartz	Indeterminate	0		1.4	9	9	5	3	White quartz, high-shine on at least one surface
143	35W	1	0-100	Quartz	Indeterminate	0		1.6	12	12	7	2	White quartz, high-shine on at least one surface
144	35W	1	0-100	Quartz	Indeterminate	0		0.8	9	9	6	2	White quartz, high-shine on at least one surface
145	35W	1	0-100	Quartz	Indeterminate	<30		1.1	8	8	5	2	White quartz, high-shine on at least one surface
146	35W	2	100-200	Silcrete	Retouched Flake	0	Flaked-Scarred	54	32	(30)	(20)	(11)	Grey, very fine-grained. Flake that had been rotated and then the edge used as a platform
147	35W	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	4	18	(17)	(9)	(3)	Grey
148	35W	2	100-200	Silcrete	Medial Fragment	0		0.9	11	11	7	1	Grey
149	35W	2	100-200	Silcrete	Flaked Piece	0		2.2	12	12	9	3	Grey
150	35WEXN	1	0-100	Quartzite	Flake	0	Flaked-Plain	22.8	27	22	21	6	Cream
151	35WEXN	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	24	31	(26)	(17)	(5)	Grey
152	35WEXN	1	0-100	Silcrete	Flake	0	Flaked-Ridged	21.2	23	21	12	6	Red and grey, potentially retouched flake, but unlcear if negative scarring pre or post flake removal
153	35WEXN	1	0-100	Quartzite	Flake	0	Flaked-Plain/Ridged	12.9	21	20	15	5	Creamy-red, coarse grained
154	35WEXN	1	0-100	Silcrete	Flake	0	Flaked-Scarred	4.3	21	20	11	3	Grey
155	35WEXN	1	0-100	Silcrete	Medial Fragment	0		4.1	18	18	7	4	Grey
156	35WEXN	1	0-100	Silcrete	Medial Fragment	0		1	11	11	7	2	Grey
157	35WEXN	2	100-200	Silcrete	Flaked Piece	0		4	17	17	7	4	Red
158	35WEXN	2	100-200	Silcrete	Distal Fragment	0		2.6	16	16	6	3	Red and grey, inititation incomplete
159	35WEXN	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	1.2	12	(9)	(10)	(2)	Grey
160	35WEXN	2	100-200	Silcrete	Distal Fragment	0		1.1	7	7	4	1	Light grey
161	35WEXN	3	200-300	IMT	Retouched Flake	0		18.5	22	17	20	5	Brown, notching along edge, flake removal along distal end
162	35WEXS	1	0-100	Silcrete	Core	0		437.1	54	54	38	35	Grey and Red, aystmetrical , >8 negative scars, flawed surface determined not to be cortical, intermediate flakes
163	35WEXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	6	13	(11)	(12)	(4)	Red
164	35WEXS	1	0-100	Silcrete	Flake	0	Flaked-Focal	1.7	17	17	7	2	Light grey
165	35WEXS	1	0-100	Quartzite	Flake	0	Flaked-Ridged/Plain	2.2	15	10	12	2	Yellow-red
166	35WEXS	1	0-100	Silcrete	Distal Fragment	0		3.1	16	16	11	2	Blue
167	35WEXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	1	13	(12)	(6)	(2)	Light grey

168	35WEXS	1	0-100	Silcrete	Distal Fragment	0		1.3	14	14	6	2	Cream
169	35WEXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	5	18	(11)	(12)	(4)	Light grey
170	35WEXS	1	0-100	Silcrete	Flaked Piece			2.2	11	11	6	3	Light grey
171	35WEXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	1.5	12	(9)	(8)	(2)	Light grey
172	35WEXS	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Plain	1.3	10	(10)	(6)	(3)	Light grey
173	35WEXS	1	0-100	Quartzite	Flake	0	Flaked-Plain	4.1	13	12	13	3	Brown (rough) with quartz, sugary
174	35WEXS	1	0-100	Quartz	Indeterminate	0		13	22	22	12	6	White quartz, high-shine on at least one surface
175	35WEXS	1	0-100	Quartz	Indeterminate	0		6.2	17	17	9	4	White quartz, high-shine on at least one surface
176	35WEXS	1	0-100	Quartz	Indeterminate	0		3.4	15	15	10	2	White quartz, high-shine on at least one surface
177	35WEXS	1	0-100	Quartz	Indeterminate	0		1.2	10	10	5	3	White quartz, high-shine on at least one surface
178	35WEXS	1	0-100	Quartz	Indeterminate	0		2.6	13	13	8	3	White quartz, high-shine on at least one surface
179	35WEXS	1	0-100	Quartz	Indeterminate	0		7	15	15	11	6	White quartz, high-shine on at least one surface
180	35WEXS	1	0-100	Quartz	Indeterminate	0		1.3	13	13	6	2	White quartz, high-shine on at least one surface
181	35WEXS	1	0-100	Quartz	Indeterminate	0		1.3	13	13	6	2	White quartz, high-shine on at least one surface
182	35WEXS	1	0-100	Quartz	Indeterminate	0		12.9	20	20	15	5	White quartz, high-shine on at least one surface
183	35WEXS	1	0-100	Quartz	Indeterminate	0		18	19	19	11	8	White quartz, high-shine on at least one surface
184	35WEXS	1	0-100	Quartz	Indeterminate	0		11.3	19	29	13	6	White quartz, high-shine on at least one surface
185	35WEXS	1	0-100	Quartz	Indeterminate	0		1.3	9	9	6	3	White quartz, high-shine on at least one surface
186	35WEXS	1	0-100	Quartz	Indeterminate	0		1.4	11	11	6	3	White quartz, high-shine on at least one surface
187	35WEXS	2	100-200	Quartz	Indeterminate	0		67.4	28	28	23	12	White, potential negative scar on one side; unclear.
188	35WEXS	2	100-200	Quartzite	Flake	0	Flaked-Scarred/Ridged	17.3	28	27	21	5	Red, very sparkly, coarse grained
189	35WEXS	2	100-200	Silcrete	Flake	0	Flaked-Faceted	35.8	32	30	19	8	Grey-blue, scarred
190	35WEXS	2	100-200	Silcrete	Flake	0	Flaked-Scarred	1.6	13	13	8	3	Light grey, feather termination
191	35WEXS	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	5.7	19	(18)	(11)	(3)	Light grey
192	35WEXS	2	100-200	Quartz	Indeterminate	0		1.3	10	10	8	2	White quartz, could potentially be a small flake
193	35WEXS	2	100-201	Quartz	Indeterminate	0		67.4	28	28	23	12	White quartz, high-shine on at least one surface
194	35WEXS	2	100-202	Quartz	Indeterminate	0		49.1	33	33	18	9	White quartz, high-shine on at least one surface
195	35WEXS	2	100-200	Quartz	Indeterminate	0		2.3	14	14	7	3	White, from 'potential hearth' artefact -potential flake
196	35WEXS	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Plain	0.8	10	(7)	(7)	(1)	Light grey from 'potential hearth'
197	37	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Scarred	13.5	25	(21)	(19)	(4)	Light brown
198	37	1	0-100	Silcrete	Flaked Piece	0		1.3	12	12	6	2	Cream, fine grained, unable to be orinetated
199	37	1	0-100	Silcrete	Flaked Piece	0		1.6	16	16	7	2	Grey-cream, coarse
200	37	1	0-100	FGS	Distal Fragment	0		0.7	10	10	6	2	Light-cream, very fine-grained
201	37	1	0-100	Silcrete	Flaked Piece	0		0.6	8	8	6	1	Cream, fine-grained
202	37	1	0-100	Quartz	Intermediate	0		4.3	15	15	9	4	White quartz
203	37	2	100-200	Silcrete	Proximal Broken Flake	<30	Cortex	7	19	(15)	(14)	(3)	Grey/red, fine grained, Potential cotext on the platform

204	37N	1	0-100	Quartz	Proximal Broken Flake	0	Flaked-Scarred	7	20	(12)	(18)	(4)	White
205	37N	1	0-100	Silcrete	Medial Fragment	0		23.7	32	32	17	7	Blue-grey
206	37N	1	0-100	Silcrete	Distal Fragment	0		3.7	16	16	12	3	Cream, very fine-grained
207	37N	1	0-100	Silcrete	Distal Fragment	0		17.4	26	26	19	5	Blue-Grey
208	37N	1	0-100	Silcrete	Medial Fragment	0		2	13	13	8	2	Blue-Grey
209	37N	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	1	9	(7)	(6)	(2)	Blue-Grey
210	37N	1	0-100	Silcrete	Flaked Piece	0		1.2	9	9	7	2	Cream, very fine-grained
211	37N	1	0-100	Quartz	Distal Fragment	0		2.4	12	12	8	2	White
212	37N	1	0-100	Quartz	Indeterminate	0		1.4	12	12	7	2	White
213	37N	1	0-100	Quartz	Distal Fragment	0		0.7	8	8	6	2	White
214	37N	2, 3	100-300	Silcrete	Flake	0	Flaked-Scarred/Faceted	14.9	25	22	19	5	Cream
215	37N	2, 3	100-300	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	18	20	(14)	(17)	(7)	Blue-grey
216	37N	2, 3	100-300	Silcrete	Retouched Artefact	0		5.1	21	21	11	3	Red, knotching on the ventral
217	37N	2, 3	100-300	Quartz	Core	0		14	22	22	11	8	White, >1 negative scar, unidirectional, intermediate
218	37N	2, 3	100-300	Quartz	Flake	0	Flaked-Plain	3.7	15	13	11	2	White
219	37N	2, 3	100-300	Quartz	Proximal Broken Flake	0	Flaked-Plain	2.2	14	(10)	(10)	(2)	White
220	37N	2, 3	100-300	Quartz	Distal Fragment	0		2.1	17	17	10	2	White
221	37S	1	0-100	Silcrete	Core	0		37.6	30	30	15	8	Blue-grey, >6 negative scars, asymetrical, intermediate
222	37S	1	0-100	Silcrete	Flaked Piece	0		3	17	17	8	3	Blue-grey, very fine grained
223	37S	1	0-100	Silcrete	Flaked Piece	0		3.5	12	12	10	5	Blue-grey, very fine grained
224	37S	1	0-100	Quartz	Indeterminate	0		1	8	8	6	2	Clear/ white - potential flake
225	37S	1	0-100	Quartz	Indeterminate	0		3.5	16	16	9	3	White quartz
226	37S	1	0-100	Quartz	Indeterminate	0		19	21	21	11	9	White quartz- potential core
227	37S	1	0-100	Quartz	Indeterminate	0		8.8	19	19	8	6	White quartz- potential flake
228	37S	1	0-100	Quartz	Indeterminate	0		2.5	14	14	8	3	White quartz- potential flake
229	37S	1	0-100	Quartz	Indeterminate	0		1.5	12	12	6	3	White quartz- potential flake
230	37S	1	0-100	Quartz	Indeterminate	0		3	10	20	6	6	Clear quartz- quality/aethetics indicate it may have been sought
231	37S	1	0-100	Quartz	Indeterminate	0		2.9	10	10	6	5	White quartz
232	37S	1	0-100	Quatz	Indeterminate	0		8.5	19	19	9	5	White quartz
233	37S	2	100-200	Quartz	Indeterminate	0		3.7	11	11	7	6	White
234	38	1	0-100	Silcrete	Cone-split right	0	Flaked-Focal	12.6	29	(29)	(10)	(6)	Grey/red, very fine grained
235	38	1	0-100	IMT	Medial Fragment	0		11.2	21	21	15	5	Cream
236	38	1	0-100	Silcrete	Retouched Flake	0	Flaked-Scarred	41.5	29	29	17	12	Blue-grey, fine-grained, crushed (potentially retouched) platform, and notch on ventral
237	38	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	2	12	(10)	(10)	(3)	Cream - fine grained
238	39	1	0-100	IMT	Core	50		234	46	46	36	26	Brown, aysmetric, >5 negative scars, generally intermeridate
239	39	1	0-100	Silcrete	Distal Fragment	0		4.7	18	18	9	3	Grey
240	39	1	0-100	Quartz	Indeterminate	0		6.5	20	20	9	4	White quartz
241	39	1	0-100	Quartz	Indeterminate	0		7.9	18	18	11	6	White quartz
242	39	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	3.6	14	(8)	(10)	(4)	Grey, finegrained, might be considered under 'scarred' platform classificaition

243	41	1	0-100	Silcrete	Proximal Broken Flake	0	Partially Crushed	5.3	10	(18)	(13)	(2)	
244	41	1	0-100	Quartz	Indeterminate	0		1.9	11	11	9	4	White
245	41	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	0.8	0	(8)	(6)	(1)	Red, fine-grained
246	41	1	0-100	Silcrete	Medial Fragment	0		3	15	15	6	3	Grey
247	41	1	0-100	Silcrete	Flake	0	Focal	3	16	16	6	3	Grey with red
248	41	1	0-100	FGS	Flaked Piece	0		3	12	12	9	5	White-grey
249	41	1	0-100	Silcrete	Flaked Piece	0		6.7	18	18	10	5	Grey
250	41	1	0-100	IMT	Medial Fragment	0		3.5	17	17	12	2	Cream-brown
251	41	1	0-100	FGS	Flaked Piece	0		3.4	18	18	8	3	White-pink-grey
252	41	1	0-100	Quartzite	Indeterminate	0		9.3	19	19	10	9	Brown
253	41	2	100-200	Silcrete	Medial Fragment	0		2.8	18	18	10	2	Cream, fine grained
254	41	2	100-200	Silcrete	Distal Fragment	0		1.1	10	10	7	2	Cream, fine grained
255	41	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Plain	3	14	11	9	3	Cream-white, fine grained
256	41	2	100-200	Quartz	Backed Artefact	0		4.6	20	20	9	3	White
257	42	1	0-100	Quartz	Indeterminate	0		1.3	11	11	8	2	White
258	42	1	0-100	Quartz	Flake	0	Flaked-Plain	7.6	21	11	17	3	White
259	42	1	0-100	IMT	Flaked Piece	0		12	20	20	14	5	Grey-red
260	42	1	0-100	IMT	Flaked Piece	0		4	13	13	8	5	Grey-red
261	42	1	0-100	Silcrete	Core	0		26.4	24	24	12	8	Grey-red
262	42	1	0-100	IMT	Distal Fragment	0		7.6	20	20	14	2	Grey-blue, platform absent
263	42	1	0-100	IMT	Flaked Piece	0		7.9	18	18	8	5	Cream-red
264	42	1	0-100	Silcrete	Medial Fragment	0		1.4	12	12	5	2	Blue-Grey
265	42	1	0-100	IMT	Distal Fragment	<30		16	21	21	15	8	Grey-Cream
266	42	1	0-100	FGS	Core	0		29.8	22	22	17	14	Red
267	42	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Plain	19.7	35	(24)	(14)	(4)	Light grey
268	42	1	0-100	IMT	Flaked Piece	0		33.3	29	29	19	10	Cream-brown
269	42	1	0-100	IMT	Flaked Piece	0		3.8	14	14	8	5	Grey-red
270	42	1	0-100	IMT	Flaked Piece	0		3.4	11	11	8	5	Cream
271	42	1	0-100	IMT	Flaked Piece	0		2.6	13	13	9	2	Grey-red
272	43	1	0-100	Silcrete	Retouched Artefact	0		26.6	30	30	15	8	Grey, finegrained, with backing along edge
273	46	2	100-200	Silcrete	Retouched Artefact	0		4.3	17	17	9	4	Grey-blue serrated edge retouch
274	51	2	100-200	Quartz	Indeterminate	0		19.2	19	19	15	8	White-quartz, potential core
275	54	1	0-100	Silcrete	Retouched Artefact	0		3.8	17	17	10	3	Blue-grey, serrated edge retouch
276	54	1	0-100	FGS	Proximal Broken Flake	0	Flaked-Ridged	3.2	13	(10)	(10)	(3)	Dark grey, fine grained, banded
277	54	1	0-100	FGS	Proximal Broken Flake	0	Partly crushed	3.2	13	(10)	(11)	(3)	Dark-grey,finegrained, banded
278	54	1	0-100	Quartz	Indeterminate	0		2.9	10	10	6	6	White
279	54	1	0-100	Quartz	Indeterminate	0		1.7	12	12	6	4	White
280	55	1	0-100	IMT	Core	0		62.6	29	29	24	14	Dark brown, the rough dark surface on one side determined not to be cortext, lacks lustre, multidirectional, intermedialte and expanding scars, >3 negative scars.

281	55	1	0-100	IMT	Retouched Artefact	0		126.52	39	39	26	18	Cream, lacks lustre, Flake used as a core, multidirectional, elongagated and intermediate, >5 negative scars
282	55	1	0-100	Silcrete	Retouched Artefact	0		9.6	18	18	14	4	Grey, fine grained, ventral edge had evidence of knotching
283	55	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Ridged	1.4	10	(8)	(7)	(2)	Grey, fine grained
284	55	1	0-100	Silcrete	Flake	0	Flaked-Ridged	12.2	21	20	16	5	Grey, fine grained
285	58	1	0-100	Quartz	Core	0		105	32	32	23	17	White, >1 negative scar (intermediate), appears mostly unidirectional
286	59	1	0-100	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	2.9	15	(9)	(11)	(3)	Cream-grey, Very fine-grained,
287	59	1	0-100	Quartz	Indeterminate	0		17.8	23	23	17	6	Red and white - very poor quality, could potentailly be a flake
288	59	1	0-100	Quartz	Flaked Piece	0		5.3	20	20	9	4	White-has been flaked but could be orientated multiple ways
289	59	1	0-100	Quartz	Indeterminate	0		14.3	15	15	12	5	White, at least one glossy surface, in context of knapped quartz
290	59	1	0-100	Quartz	Flaked Piece	0		7	19	19	16	7	White, at least one glossy surface, in context of knapped quartz
291	60	1	0-100	FGS	Indeterminate	0		1.4	12	12	9	3	Dark black, opaque but fine grained material.
292	60	1	0-100	IMT	Proximal Broken Flake	0	Flaked-Ridged/Faceted	1.6	11	(10)	(8)	(3)	Brown-cream
293	60	2	100-200	Silcrete	Proximal Broken Flake	0	Flaked-Scarred	23.4	31	(27)	(16)	(5)	Cream, fine frained
294	69	1	0-100	Quartz	Flaked Piece	0		1.2	9	9	8	2	White
295	72	2	100-200	FGS	Flake	<30	Flaked-Scarred	1.7	14	13	9	2	Green-drak grey