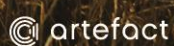


Albion Park Rail Bypass PACHCI Stage 3

Aboriginal Cultural Heritage
Assessment Report

Report to Hyder Cardno Joint Venture
October 2015



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EXECUTIVE SUMMARY

Artefact Heritage has been engaged by Hyder Consulting on behalf of the Roads and Maritime Services (Roads and Maritime) to prepare an Aboriginal Cultural Heritage Assessment (CHAR) for the Albion Park Rail bypass project. The Albion Park Rail bypass project would provide a 9.8 kilometre extension of the M1 Princess Motorway between Yallah and Oak Flats and bypass Albion Park Rail. The project will allow for a high standard road between Sydney and Bomaderry and would provide easy access to Dapto, Albion Park and Oak Flats.

The study area is located to the west of the M1 Princess Highway and is situated within the Local Government Areas of Shellharbour and Wollongong.

The proposed development is being assessed as State Significant Infrastructure (SSI) under the *Environmental Planning and Assessment Act 1979*. As such, approval from the Office of Environment and Heritage (OEH) to impact Aboriginal heritage items would not be required provided that the requirements of the Secretary Environmental Assessment Requirements (SEARS) and Ministers Conditions of Approval are met.

Artefact Heritage has prepared this CHAR in accordance with the OEH *Guide to Investigating and Reporting on Aboriginal Cultural Heritage in NSW 2010* (herein referred to as the Guide) and Stage 3 of the Roads and Maritime PACHCI.

The objectives of the CHAR are to:

- Assess the Aboriginal cultural heritage values of the study area, including archaeological and community cultural values, and the significance of identified values
- Identify Aboriginal cultural heritage values that may be impacted by the proposed works, including consideration of cumulative impacts, and measures to avoid significant impacts
- Ensure appropriate Aboriginal community consultation in the assessment process
- Identify any recommended further investigations, mitigation and management measures should the project proceed.

Background to this assessment

Artefact Heritage was engaged by Roads and Maritime in 2013 to prepare an archaeological survey report (ASR) as part of Stage 2 of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) for the project. A further three addendums followed finalisation of that document. The ASR and subsequent addendums identified additional Aboriginal sites and areas of potential archaeological deposit (PAD) within the study area.

Artefact Heritage recommended test excavation of an identified site and areas of potential, in order to investigate the nature and extent of subsurface deposits and for the purpose of informing and assessment of archaeological significance. Prior to test excavation commencing, Roads and Maritime advised that one of the PADs would no longer be impacted by the proposed works. As such, a total of one Aboriginal site (AHIMS site # 52-5-0512) and six areas of PAD were excavated.

Test excavations were carried out between the 10 and 27 November 2014 with the aim of informing this Aboriginal Cultural Heritage Assessment Report (CHAR) and guiding finalisation of the concept design and placement of ancillary facilities. Test excavation identified that seven of the PADs were indeed new Aboriginal sites (YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF

AS 8 and YTOF IF 4) and also redefined the boundary of the previously recorded AHIMS site # 52-5-0512.

The archaeological test excavation report is included as Appendix F to this CHAR.

Waters Consultancy Pty Ltd (Waters Consultancy) was engaged by Roads and Maritime in 2014 to undertake the assessment of Aboriginal cultural heritage values in relation to this project. The resulting 'Albion Park Rail Bypass: Aboriginal Cultural Assessment Report' is attached in full in Appendix A. The relevant sections of this report have also been incorporated verbatim (including footnotes) into the body of the CHAR at sections 2.1, 3.22, 4.3, 5.6.2 and 5.8.4.1.

Overview of CHAR findings

- A total of 21 Aboriginal sites were identified during the ASR, addendums and test excavation investigations.
- Following reconsideration of the concept designs, eight sites will now be avoided by the proposed works. AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1 are now outside the project boundaries will no longer be impacted.
- The proposed works will impact 13 Aboriginal sites (AHIMS site # 52-5-0484/52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766).
 - Of these, ten sites have been assessed as demonstrating low archaeological significance (YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766). Impacts to nine of these sites would result in total loss of value. Impacts to YTOF AS 2 will result in partial loss of value.
 - AHIMS site # 52-5-0484/52-2-0512 has been assessed as demonstrating low-moderate archaeological significance. Impacts to this site would result in partial loss of value.
 - YTOF AS 4 and YTOF AS 5 have been assessed as demonstrating moderate archaeological significance. Impacts would result in partial loss of value at YTOF AS 4 and total loss of value at YTOF AS 5.
- Three areas of cultural significance were identified through Aboriginal stakeholder consultation for the cultural assessment report (Waters Consultancy 2015).
- One of those areas of cultural significance, Area B: Macquarie Riveulet Cultural Site, will be impacted by the proposal.
- Two of those identified areas of cultural significance, Area A: Duck Creek Cultural Site and Area C: YTOF CS 1, will not be impacted by the proposal.

It is recommended that:

- No further investigation is required at the eight sites which are no longer being impacted by the proposed works (AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1).
- If impacts cannot be avoided, no further archaeological investigation is required at the ten sites which have been assessed as demonstrating low archaeological significance (YTOF AS 1, YTOF

AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766).

- If impacts cannot be avoided, no further archaeological investigation is required at AHIMS site # 52-5-0484/52-2-0512 as this site has been fully investigated.
- Salvage excavation would occur at sites YTOF AS 4 and YTOF AS 5 if impacts are unavoidable.
- Long term arrangements for the management of excavated artefacts, such as reburial, should be determined in accordance with the recommendations of registered Aboriginal stakeholders
- Site impact recording forms should be submitted to AHIMS for all 13 sites which would be impacted by the proposed works (AHIMS site # 52-5-0484/52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766) following the commencement of work.
- Inadvertent impacts to sites outside of the project boundary should be avoided by including information on the location of these sites in the CEMP (AHIMS site # 52-5-0473, 52-5-0512, YTOF AS 6, YTOF AS7, YTOF IF 4, YTOF PAD 3, and HLA 2007). The location of YTOF CS 1 should not be included in the CEMP as it is culturally sensitive information. Where necessary, fencing may be used to assist workers in avoiding AHIMS site # 52-5-0473, YTOF AS 6, YTOF IF 4, YTOF PAD 3, and HLA 2007.
- Waters Consultancy (2015) recommended in relation to Site A: [REDACTED] Creek Cultural Site that the following management measures are enacted during neighbouring construction works:
 - Temporary fencing be erected between the zone of construction activity and the site.
 - That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).
- Waters Consultancy (2015) recommend in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occur as follows:
 - temporary fencing be erected between the zone of construction activity and the old growth eucalypt located within this site [REDACTED].
 - That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).
 - Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with Roads and Maritime guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area.
 - Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works.
 - The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution to local libraries and educational institutions. The final content of the booklet to be developed in consultation with the Aboriginal knowledge holders.

- The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.
- A CEMP and accompanying unexpected finds procedure will provide a method to manage potential heritage constraints and unexpected finds during construction works. Aspects of site and cultural area protection that should be included in the CEMP include:
 - Establishing no-harm areas where appropriate. Depending on the nature and timing of works in the vicinity of identified Aboriginal sites or cultural areas that will not be impacted by the proposed works, it may be appropriate to establish visual markers around no-harm areas to avoid inadvertent impacts.
 - Nature of the visual markers around no-harm areas. The CEMP should document what type of visual marker will be put in place, such as temporary fencing, high visibility tape, and temporary signage.
 - Provide clear guidance to all site workers on access restrictions to no-harm areas.
 - Unexpected finds procedure in accordance with the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.
- It is recommended that an Aboriginal Heritage Management Plan (AHMP) should be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The AHMP should provide specific guidance on measures and controls to be undertaken to avoid and mitigate impacts on Aboriginal cultural heritage during construction. It is recommended that the cultural heritage consultant (Waters Consultancy) be present at the contractor inductions in relation to those components of the project that include the three identified cultural sites, including the Macquarie Rivulet as a whole. The AHMP should directly reference and outline the mitigation measures outlined in this CHAR.
- If any suspected human remains are located during any stage of the proposed works, work should stop immediately procedures outlined in the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.
 - In addition it is recommended that the AHMP require that Roads and Maritime immediately notify the identified knowledge holders of the discovery of suspected archaeological Aboriginal human remains. If the material is confirmed to be archaeological Aboriginal human remains it is recommended that consultation occur with the identified knowledge holders in relation to: the development of a Management Plan for future proposed works in the relevant area; cultural ceremonies in relation to the human remains and the site of their occurrence; repatriation of the human remains.

- Should any changes be made to the proposed works boundary, these should be assessed by an archaeologist in consultation with the registered Aboriginal stakeholder groups and further investigation may be necessary.
- This CHAR and accompanying documentation should be forward to registered Aboriginal stakeholders and OEH.

NOTE:

For confidentiality reasons some detail regarding the location of Aboriginal sites, including maps, site coordinates and locational descriptions, have been removed from the public version of this report.

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Artefact Heritage has been engaged by Hyder Consulting on behalf of the Roads and Maritime Services (Roads and Maritime) to prepare an Aboriginal Cultural Heritage Assessment (CHAR) for the Albion Park Rail bypass project (previously referred to as the Yallah to Oak Flats Road upgrade). The Albion Park Rail bypass project would provide a 9.8 kilometre extension of the M1 Princess Motorway between Yallah and Oak Flats and bypass Albion Park Rail. The project will allow for a high standard road between Sydney and Bomaderry and would provide easy access to Dapto, Albion Park and Oak Flats.

The proposed development is being assessed as State Significant Infrastructure (SSI) under the *Environmental Planning and Assessment Act 1979*. As such, approval from the Office of Environment and Heritage (OEH) to impact Aboriginal heritage items would not be required provided that the requirements of the Secretary Environmental Assessment Requirements (SEARS) and Ministers Conditions of Approval are met.

Artefact Heritage has prepared this CHAR in accordance with Stage 3 of the Roads and Maritime PACHCI. This report has also been prepared in accordance with the OEH *Guide to Investigating and Reporting on Aboriginal Cultural Heritage in NSW 2010* (herein referred to as the Guide) and the *Draft Guidelines for Aboriginal Cultural heritage Impact Assessment and Community Consultation 2005* as best practice.

Waters Consultancy Pty Ltd (Waters Consultancy) was engaged by Roads and Maritime in 2014 to undertake the assessment of Aboriginal cultural heritage values in relation to this project. The resulting 'Albion Park Rail Bypass: Aboriginal Cultural Assessment Report' is attached in full in Appendix A.

1.2 Background to this assessment

Artefact Heritage was engaged by Roads and Maritime in 2013 to prepare an archaeological survey report (ASR) as part of Stage 2 of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) for the project. A further two addendums followed finalisation of that document. The first addendum concerned properties within the study area that were not accessible for the original investigation, as well as an addition to the study area that incorporated the Croom Regional Sporting Complex. As part of final options development for the project, additional areas were identified, outside the previous boundaries of the study area, which required archaeological investigation. This included the possible location of road interchanges and widening of the originally proposed corridor to accommodate alignment alterations. As such, Artefact Heritage prepared a second and third addendum PACHCI Stage 2 ASR for those additional areas.

The ASR and subsequent addendums identified additional Aboriginal sites and areas of potential archaeological deposit (PAD) within the study area. Artefact Heritage recommended test excavation of an identified site and areas of potential, in order to investigate the nature and extent of subsurface deposits, for the purpose of informing and assessment of archaeological significance. Prior to test excavation commencing, Roads and Maritime advised that one of the PADs would no longer be impacted by the proposed works. As such, a total of one Aboriginal site (AHIMS site # 52-5-0512) and six areas of PAD were excavated.

Test excavations were carried out between the 10 and 27 November 2014 with the aim of informing this CHAR and guiding finalisation of the concept design and placement of ancillary facilities. Test excavation identified that seven of the identified PADs were indeed new Aboriginal sites (YTOF AS 3,

YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4) and also redefined the boundary of the previously recorded AHIMS site # 52-5-0512. The archaeological test excavation report is included as Appendix F to this CHAR.

1.3 Objectives of this Cultural Heritage Assessment Report

The objectives of this report are to:

- Assess the Aboriginal cultural heritage values of the study area, including archaeological and community cultural values, and the significance of identified values. This is also a requirement of the Secretary Environmental Assessment Requirements (SEARS).
- Identify Aboriginal cultural heritage values that may be impacted by the proposed works, including consideration of cumulative impacts, and measures to avoid significant impacts. This is also a requirement of the SEARS.
- Ensure appropriate Aboriginal community consultation in the assessment process, as required by the SEARS.
- Identify any recommended further investigations, mitigation and management measures required, in compliance the SEARS, should the project proceed.
- To detail the results of the physical test excavation which established the spatial extent of sites and areas of PAD and their archaeological content, as required by the SEARS.

This CHAR has been prepared in accordance with:

- Roads and Maritime PACHCI guidelines
- Albion Park Rail bypass SEARS
- Guide to Investigating and Reporting on Aboriginal Cultural Heritage in NSW 2010 (herein referred to as the Guide)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010 (herein referred to as the Code of Practice)
- Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (herein referred to as the Consultation Requirements)

This report includes:

- A description of the scope of the project and the extent of the study area.
- A description of the Aboriginal community involvement and Aboriginal consultation.
- A significance assessment of the study area including cultural and archaeological values.
- A description of the statutory requirements for the protection of Aboriginal heritage.
- An impact assessment for recorded Aboriginal sites and areas of archaeological potential.
- Provision of measures to avoid, minimise, and if necessary, offset the predicted impacts on Aboriginal heritage values.

1.4 Authorship

This report was written by Alyce Howard (Heritage Consultant). Josh Symons (Senior Heritage Consultant) and Dr Sandra Wallace (Director/ Principal Heritage Consultant) reviewed this report and provided management input.

Sections 2.1, 3.2.2, 4.3, 5.6.2, 5.7.2 and part 5.8.4 and 5.8.5 relating to the cultural heritage significance assessment have been reproduced from the 'Albion Park Rail Bypass: Aboriginal Cultural Assessment Report' (see Appendix A) written by Kate Waters of Waters Consultancy.

1.5 Description of the proposed works

Roads and Maritime propose to construct a 9.8 kilometre extension of the Princes Motorway between Yallah and Oak Flats to Bypass Albion Park Rail. The purpose of the project is to complete the missing link for a high standard road between Sydney and Bomaderry. The project aims to address short and long term transport needs.

Key features of the project include:

- A motorway with two lanes in each direction (with capacity for additional lanes). The motorway would extend from the existing Princes Highway at Yallah, traversing south and crossing the Macquarie Rivulet west of the existing Princes Highway. South of the Macquarie Rivulet the alignment would generally follow the existing Illawarra Highway alignment, running to the west of the Illawarra Regional Airport. The alignment would then continue south between Albion Park and Albion Park Rail, crossing Tongarra Road. In the south, the alignment would skirt the southern side of the Croom Reserve passing through the north eastern section of the Croom Regional Sporting Complex. The alignment would then head east following the existing East West Link alignment before connecting into the existing Princes Highway at the Oak Flats interchange (Figure 1)
- Three interchanges connecting the local road network with the motorway at Yallah, Albion Park and Oak Flats
- A new southbound motorway entry ramp from Tongarra Road and a northbound exit ramp at the Illawarra Highway (these ramps may not be needed until a later stage)
- Construction of bridges at the following locations
 - Water courses at Macquarie Rivulet, Duck Creek and Frazers Creek
 - Tongarra Road and the existing Princes Highway
 - South Coast Railway Line
 - Floodways
- Demolition and removal of the existing bridge on the Princes Highway across Duck Creek
- Local road changes or upgrades
- Pedestrian and cycleway connections
- Drainage
- Emergency access and management facilities
- Flood storage adjustments

- Noise barriers
- Lighting
- Earthworks and landscaping
- Pavements and line marking
- Reconfiguration of the Croom Regional Sporting Complex, including replacement of directly impacted sporting facilities and changes to the southern access and internal roads of the sporting complex.

1.6 Study area

Since the original investigations in 2013, the project boundaries have been expanded three times. The study area is marked in red in Figure 2 and incorporates all investigated areas which were the subject of the original ASR and subsequent addendums.

The study area is within the Wollongong and Shellharbour Local Government Areas (LGAs) and is within the boundary of the Illawarra Local Aboriginal Land Council (ILALC).

Figure 1: Project area boundary (supplied by Cardno)

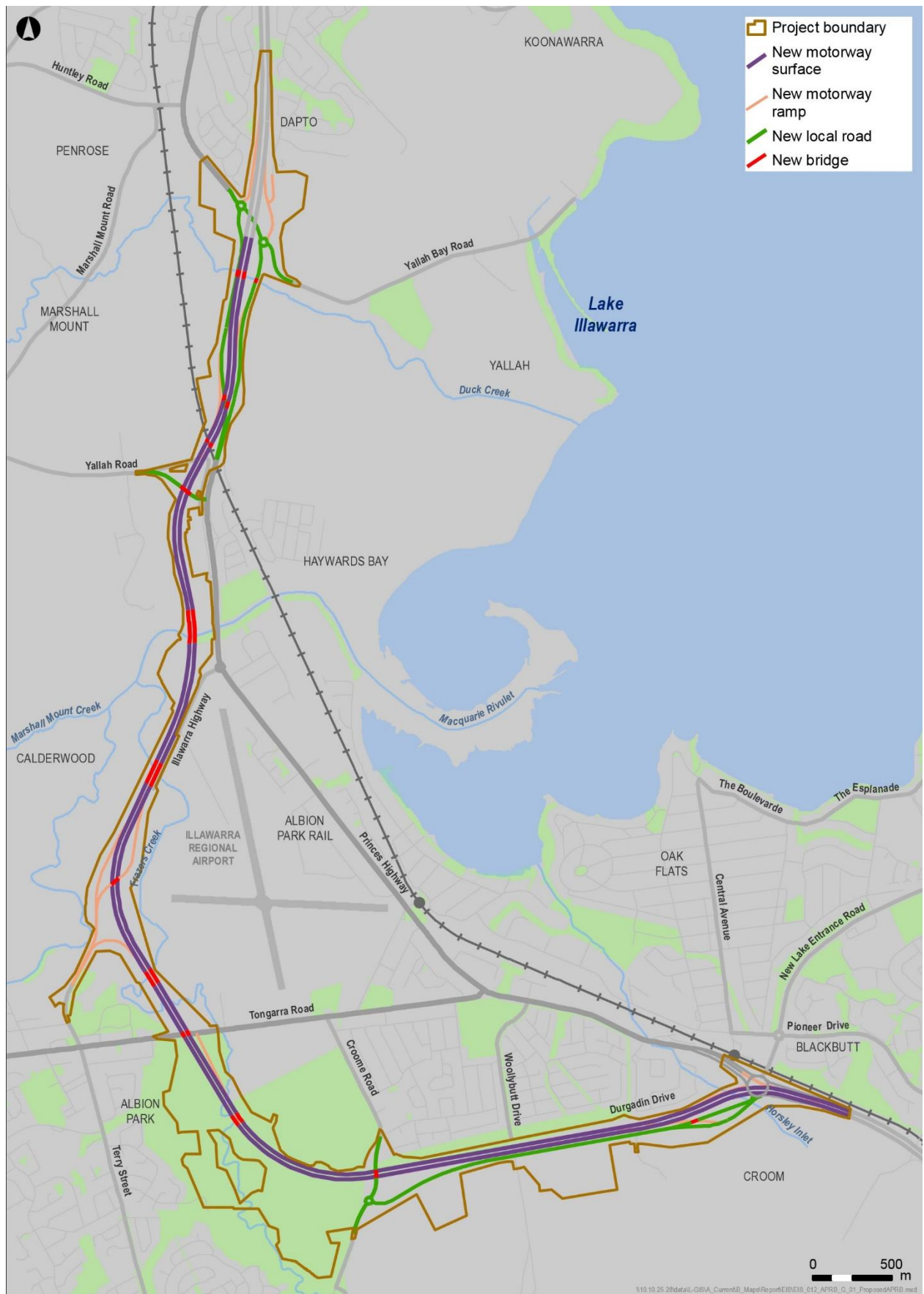


Figure 2: Investigated area and project boundary



1.7 Statutory Requirements

This CHAR has been prepared in accordance with relevant legislative requirements, policies and procedural guidelines applicable to Aboriginal heritage and its protection in New South Wales.

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides statutory protection to all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW). As the current project is being assessed as state significant infrastructure under the EP&A Act, the approval requirements of the NPW Act will not apply if planning approval is granted.

To support effective implementation of the NPW Act, OEH has developed a range of guidelines addressing requirements for the undertaking of archaeological investigations, preparation of Aboriginal cultural heritage assessments and consultation with Aboriginal communities. The guidelines have been followed and applied in preparation of this CHAR.

Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (the EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process.

As noted above, the proposal is being assessed under Part 5.1 of the EP&A Act, which establishes an assessment and approval regime for SSI. An environmental impact statement (EIS) is being prepared to assess the impacts of the proposal, in accordance with requirements issued by the Secretary of the Department of Planning and Environment. That includes consideration of impacts on Aboriginal cultural heritage values.

This CHAR will inform and support preparation of the EIS.

2.0 CONSULTATION PROCESS

All Aboriginal community consultation was conducted by Roads and Maritime. Roads and Maritime have undertaken Aboriginal consultation consistent with the Roads and Maritime PACHCI guideline and OEH *Aboriginal cultural heritage consultation requirements for applicants 2010*.

An initial site survey was conducted of the original study area (see ASR in Appendix B) and was conducted on the 30 April to 1 May 2013 with representatives from ILALC.

The second stage of survey was conducted with representatives from ILALC on the 25 - 27 February 2014 (see first addendum- Appendix C). The second survey concerned properties that were not accessible during the first stage of survey and the Croom Regional Sporting Complex.

An advertisement was placed in the Koori Mail, National Indigenous Times, Lake Times and Illawarra Mercury on 30 July 2014 to identify and notify Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places within the Albion Park Rail bypass project area.

The third stage of survey was conducted with representatives from ILALC on the 9 July, 13 - 15 August and the 21 - 22 August 2014 (see second addendum in Appendix D). The third stage of surveying concerned additions to the study area to incorporate options for locations of ancillary facilities, road interchanges and widening. Analysis of survey coverage and results are included in the ASR and addendums (Appendix B- Appendix D).

On the 18th of June letters were sent to OEH, NSW Aboriginal Land Council, ILALC, Office of Communities, Aboriginal Affairs, National Native Title Tribunal, NSW Native Title Services, Southern Rivers Catchment Authority, Wollongong City Council, and Shellharbour City Council to identify people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places within the Albion Park Rail bypass project area. Receipt of registration to participate in Aboriginal cultural heritage assessment process was issued on 18 September 2014.

All registered stakeholders were invited to attend an Aboriginal Focus Group (AFG) meeting. Invites were sent out on 3 October 2014. The proposed methodology was sent to registered stakeholders on 8 October 2014. No written responses were received.

The AFG meeting was held on 16 October 2014 at Dapto Ribbonwood Centre. The attendees at the AFG identified a cultural area at Macquarie Rivulet which is the site of a battlefield and contains burial grounds. The identification of this culturally significant area, and the concerns raised by stakeholders over the management of the site were key factors in the decision to add a specialist cultural and historical assessment to the cultural heritage investigations for the Albion Park Rail bypass project. Specialist cultural and historical assessment has been conducted by Waters Consultancy (2015) in order to better inform this investigation and supplement this CHAR. Specialist cultural and historical assessment is included as an Appendix to this CHAR and details of consultation conducted during the specialist cultural and historical assessment are outlined in Section 2.1 below.

Copies of all written correspondence, the advertisement, consultation log and minutes of the Aboriginal Focus Group meeting are included as Appendices to this CHAR.

A second AFG meeting was held on 28 April 2015 in Wollongong following issuance of the draft version of this document for stakeholder review and comment. No comments on the draft CHAR were noted during the AFG or in writing during the review and comment period following the AFG.

The fourth stage of survey was conducted with representatives from ILALC on the 4 and 11 June 2015 (see third addendum in Appendix E). The fourth stage of survey concerned further additions to the study area to incorporate options for locations of ancillary facilities, road interchanges and widening. The results of this survey are included in the third addendum to the ASR (Appendix B – Appendix E).

2.1 Cultural assessment consultation

The proposed cultural assessment methodology was provided to the registered Aboriginal stakeholders for comment on 23 December 2014 (see Appendix A). In addition the consultant provided a verbal explanation of the cultural assessment methodology to all registered Aboriginal stakeholders and AFG attendees. No written comments were received in relation to the cultural assessment methodology. The verbal feedback provided endorsed the proposed methodology as appropriate.

For the purposes of this assessment the registered Aboriginal stakeholders were requested to nominate individuals who they considered held cultural heritage knowledge of the area. The request for nominations was made in a letter (see Appendix A) sent out to all registered Aboriginal stakeholders by Roads and Maritime on 23 December 2014. All registered Aboriginal stakeholders, and all those individuals who registered their attendance at the AFG held on 16 October 2014, were contacted. In some instances the attempts at contact were unsuccessful despite numerous attempts via telephone and email (where emails were provided).

The registered Aboriginal stakeholders nominated nine individuals as knowledge holders. Of the nine individuals identified as holding cultural heritage knowledge of relevance to the area, two stated that they regarded other of the named knowledge holders as being more appropriate to speak for the area. Detailed interviews were conducted with six of the seven remaining identified knowledge holders in relation to the cultural heritage values within the study area (Waters 2015 details the knowledge holders interviewed). A planned interview with the seventh identified knowledge holder had to be rescheduled and despite repeated attempts to make contact via telephone it has not been possible to reschedule (see Waters 2015).

Within the specific study area consultation with the six knowledge holders has identified one site of cultural significance located directly adjacent to the proposed footprint (Site A: █████ Creek Cultural Site), one site of cultural significance located within the proposed footprint (Site B: Macquarie Rivulet Cultural Site), and one site of cultural significance located outside the proposed footprint (Site C: YTOF CS 1).

The six identified knowledge holders spoken with also provided cultural and historical information on the broader cultural landscape of the region and their family connection to the area. This information has informed the assessment process in relation to the cultural heritage values and significance of the identified cultural heritage sites. The significance assessments and mitigation recommendations are based on this assessment process and consultation with the knowledge holders.

3.0 SUMMARY AND ANALYSIS OF BACKGROUND INFORMATION

3.1 Environmental context

The underlying geology of the study area primarily consists of sedimentary rock of the Berry Siltstone formation, part of the Permian-aged sediments of the Shoalhaven Group. The Berry Siltstone geological unit consists of dark-grey siltstone and very fine felspathic litharenite and is found exposed in low-lying parts of the study area and along drainage channels. This is overlain by Quaternary Alluvium material that has been eroded from the local geological units and transported and deposited by water. It comprises gravel, swamp deposits, peat, silt, beach sand and dune sand. The east-west stretch of the study area is underlain in places by Late Permian Gerringong volcanics, which include laterite (Rose 1966; AMBS 2006a: 16-18).

The study area passes through three main soil landscapes (Hazelton 1992; Hazelton and Tille 1990). Fairy Meadow is the most predominant and is widely present in the alluvial plains, floodplains, valley flats and terraces below the Illawarra Escarpment. Topography of this soil landscape is relatively flat, generally consisting of slopes less than 10 metres in height and inclined less than 5 percent. Soils on terraces are moderately deep (50 to 100 centimetres) Alluvial Loams and Siliceous Sands. Drainage plains include Prairie Soils and Yellow Podzolic Soils. The Fairy Meadow soil landscape is characterised by flood hazard topsoils of low wet bearing strength that are highly permeable, with high water tables (Hazelton 1992: 97).

A small part of the northern sector of the study area, and the entire east-west stretch of the study area, passes through the Albion Park soil landscape. The very northern and eastern ends of the study area cross the Shellharbour soil landscape. Both soil landscapes are subject to localised mass movement and are characterised by eroding soils. The Albion Park soil landscape is subject to seasonal waterlogging, whilst the Shellharbour soil landscape is subject to localised water erosion hazards. Soil depths range from shallow, at less than 50 centimetres, to deep, at over 150 centimetres (AMBS 2006a: 23).

The study area is largely within the Macquarie Rivulet Catchment, which covers an area of approximately 110 square kilometres from the Illawarra Escarpment in the west to Lake Illawarra in the east. The study area crosses over a number of water courses that transect the landscape. These watercourses generally flow eastwards from the Illawarra Escarpment, and northwards from the southern elevated regions, towards Lake Illawarra. From north to south, the water courses crossed by the study area include Duck Creek and its tributaries; Macquarie Rivulet; and Frazers Creek (a tributary to Macquarie Rivulet that drains the southern portion of the Macquarie Rivulet Catchment). To the south, the study area turns eastwards and crosses over the northwards flowing Frazers Creek, and the north-westwards flowing Horsley Inlet and its tributaries. The study area is mostly within a distance of 2.5 kilometres to the west and south of Lake Illawarra. These water courses provide semi-permanent and permanent water sources.

3.2 Aboriginal land use

3.2.1 Aboriginal histories of the locality

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The study area is located within the Dharawal language group area (Attenbrow 2010: 34). The Dharawal language group was largely coastal and is thought to have extended from the Shoalhaven River in the south, to Botany Bay in the north and then inland to Camden (Attenbrow

2010: 34). The Dharawal language group was bordered to the north in the Botany Bay – southern Sydney region by the Darug and to the west in the Mittagong – Moss Vale region by the Gundungurra. The study area falls within the territory of the Dharawal-speaking Wodi Wodi people. Tindale (1974) described the territory of the Wodi Wodi as extending from north of the Shoalhaven River at Nowra to Wollongong and inland to Moss Vale.

The area covered by the Dharawal language included a variety of landscape and resource types, including coastal and estuarine environments, rolling hills and creeks bordering the coastal environment, and the large sandstone escarpment and plateau. Sullivan (cited in Rich 1988: 23) suggested that the boundary between the Gundungurra and the Dharawal was the divide between the coastal and inland river systems, which runs on an approximate south-west to north-east line east of Wingello, Bundanoon, Robertson and Mittagong. Movement across these different terrain types and resource areas may have been dictated by the season or purpose (DEC 2005: 8). Additionally, exchange with people from surrounding language groups included Gundungarra and Wiradjuri people travelling to the coast to exchange foods and raw materials, whilst the Dharawal and Awabakal (Central Coast region) shared ceremonies (DEC 2005: 8).

Long-term areas of interaction and ‘travel corridors’ for movement between different language groups may have existed where there were shared boundaries. Laila Haglund has suggested that the Campbelltown area in south-west Sydney may have represented the intersection between the boundaries of the Dharawal, Darug and Gundungurra, and that the Narellan Valley may have been part of a ‘travel corridor’ facilitating movement between the north-western Sydney and the Illawarra (JMcD CHM 2007: 21 after Haglund 1989).

Early interaction between the Dharawal and the British was intermittent and brief. The earliest sighting of British people by the Dharawal would most likely have been when they saw sailing ships along the coast. The records of Captain Cook and several of his crew document seeing numerous fires and occasional Aboriginal people on the coastline in the Illawarra region (Organ 1993: 46). Organ (1993: 49) documents an anonymous exploration journal attributed to surveyor George William Evans, which recorded an overland expedition north from Jervis Bay via Wollongong in 1812. The exploration party encountered several groups of Aboriginal people, and at one point exchanged some of their possessions with one of the groups for oysters (Organ 1993: 49).

Several of the early British settlers in the Illawarra documented large gatherings of Aboriginal people, including a reference by Navin (1994: 8) that Robert James, a local resident of the area, recorded a camp of around 100 Aboriginal people on the banks of American Creek at Mount Kembla. In 1836 a group of around 200 Aboriginal people were observed in the Illawarra area as they were preparing to travel to Cowpastures in south-west Sydney (Griffin 1986: 6 cited in AMBS 2010: 33).

A variety of flora and fauna resources were utilised in the Illawarra region for subsistence, personal ornament and tool requirements. The variety of subsistence resources in the Illawarra included marine, estuarine, freshwater and hinterland flora and fauna. Early British records documented torchlight spearing of bream and consumption of whale meat (Organ 1993: 262). The consumption of whale was documented as an important event linked to the spirits of their ancestors (Organ 1993: 262). Cabbage trees were used for various purposes, including utilisation of the fibre (Organ 1993: 155), used to make bridges over creeks and for food (AMBS 2010: 35). Other plant species utilised for food and tools included bats-wing tree, grass tree, Gynea lily, various Eucalypt sp., mat-rush, sticky hop bush, Melaleuca and black wattle (AMBS 2010: 35).

3.2.2 Aboriginal people of the Illawarra (Waters Consultancy 2015)

The study area lies within the Illawarra region that extends from Stanwell Park in the north to Bass Point in the south. The Illawarra is a diverse region supporting a wide range of vegetation

communities including eucalypt forests, woodlands, subtropical rainforests, swamps, grasslands and scrubs.

Aboriginal people of the Illawarra were closely connected through ceremonial cycles, trade networks and kinship to communities north to Sydney, south to Victoria and west up onto the tablelands and alps. Particularly close connections existed between the communities on the Illawarra and those in the area extending from Botany Bay and the Nepean and Georges River areas, west to Moss Vale, and south to the Shoalhaven River and Jervis Bay. These connections continue to exist today in a complex web of kinship and interaction.

The area immediately surrounding the study area has a rich history of occupation by Aboriginal people. Bass Point, approximately 15 kilometres to the south east of Albion Park, has a dating of 17,500 years for Aboriginal occupation¹. The involvement of Albion Park in a trade network that extended north to Sydney is evident in the archaeological record where a fine grained basaltic rock identified as coming from the bed of the Macquarie Rivulet near Albion Park was one of two sources of raw material for stone hatchet heads found at the Kurnell Peninsula in Sydney. Petrified wood found in the same area was identified as coming from the south coast, with one possible site being the hills above Albion Park².

Prior to the impact of the European intrusion this was a resource rich area encompassing marine environments and freshwater and estuary wetlands. As would be expected in such a resource rich area the early European records give a clear impression of a well-populated region³.

Aboriginal people utilized the resources of the oceans and rivers throughout the region including a wide range of fish, eels, and shellfish. The remains of middens that occur throughout the region are testimony to the importance of shellfish as a resource. The utilization of whales and seals is also evident in middens in the wider area⁴.

The freshwater and estuary wetlands which have been such an important resource for multiple generations of Aboriginal people in the region have been heavily modified as a result of European land management practices including altering river and stream courses, drainage and infilling.

Aboriginal people also utilised a wide range of land-based resources, including animals such as wallabies and possums, plant foods, and honey as food sources⁵. In the study area there is a reference to the location on which the Albion Park Dairy Factory was built in 1885 as having been, “...the great roasting place of the aboriginals, who resorted to that particular spot to cook the wallabies taken in the chase.”⁶. The former Albion Park Dairy building is located on Creamery Road alongside the railway line approximately 500 metres north of the current Albion Park Railway Station⁷.

¹ Erick Carl Ecklund “Putting into Port: Society, Identity and Politics at Port Kembla, 1900 to 1940, PhD Thesis, University of Sydney, 1994, f/n 3, p.155.

²Val Attenbrow, *Sydney’s Aboriginal past: investigating the archaeological and historical records*, Sydney, University of New South Wales Press, 2002, p.124.

³ Ecklund, *op.cit.*, p.155 ; see also Michael Organ *Illawarra and South Coast Aborigines 1770-1900*, Australian Institute of Aboriginal and Torres Strait Islander Studies, December 1993 and Michael Organ *A Documentary History of the Illawarra & South Coast Aborigines 1770-1850*, Aboriginal Education Unit, Wollongong University, 1990.

⁴ Sue Wesson *A History of Aboriginal People of the Illawarra 1770 to 1970*, (based on a 2004 report by Kate Gahan), Department of Environment and Conservation, NSW, 2005, p.11

⁵ Ecklund, *op.cit.*, p.157. ; Wesson (based on Gahan), *op.cit.*, pp.12-13

⁶ Anon, ‘Opening of the Albion Park Dairy Factory’, *The Kiama Independent and Shoalhaven Advertiser*, 20 November 1885, p.2.

⁷ The building itself has been listed on the State Heritage Register by the current landholder, RailCorp, in relation to its association with the development of the dairy industry, the listing does not reference the potential Aboriginal significance of the site. See: ‘Albion Park Dairy (Former)’, listed under the Heritage Act (NSW), s.170 – NSW

Other land based resources that were utilized by Aboriginal people in the region include plants for bush medicine, fish poison and dyes, wood to make boomerangs, spears, digging sticks, bark for canoes and shelters, fibre to produce string, and stone to make axes, grinding stones, and spear points⁸.

Aboriginal people of the Illawarra are recorded as having used a wide range of techniques to harvest fish, crustacean, eels etc. These included stunning fish with poison, luring fish with torchlight, harvesting shallow creeks with large open weave baskets, spearing fish, and line fishing with shell hooks⁹.

The first intensive European intrusion into the area occurred in the 1810s with the movement of cedar cutters into the region¹⁰. In the 1810s and '20s cedar cutters were extremely active in the Illawarra region with Kiama developing as a centre for the cedar trade¹¹.

Despite government attempts to control cedar cutting it continued at a rapid rate, particularly in the Hunter, Illawarra and Shoalhaven regions. By the 1850s the Illawarra and Shoalhaven stands had already been reduced dramatically and the focus of the cedar cutters had shifted to the north coast of New South Wales. Just twenty years later Red Cedar was scarce throughout the whole of New South Wales¹².

There are accounts in the early records that indicate conflict between the local Aboriginal people and the cedar getters who were active in the region prior to permanent European settlement¹³. Certainly there are documented instances of violence by Europeans against Aboriginal people on the Illawarra¹⁴.

The beginning of a permanent European presence in the Illawarra occurred around 1815 when Dr. Charles Throsby moved cattle into the area via the Bulli Pass. By December 1817 the first land grants to Europeans had been issued on the land of the Illawarra people. Settlement intensified in the 1820s with the establishment of towns such as Wollongong and Kiama¹⁵.

The first land grant in the study area was to a land speculator and former convict, Samuel Terry, in 1817; he called it Terry's Meadows. It was renamed Albion Park by his nephew, John Terry Hughes, who inherited the estate following Samuel's death in 1838¹⁶.

The Albion Park township developed in the 1870s and '80s with the construction of various commercial buildings. In 1897 the Shellharbour council relocated to Albion Park reflecting the decline

State agency heritage register,

<http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4804464>.

⁸ Ecklund, *op.cit.*, p.157. ; Wesson (based on Gahan), *op.cit.*, pp.12-13

⁹ Wesson (based on Gahan), *op.cit.*, pp.10-11 ; Attenbrow, *op.cit.*, *passim*

¹⁰ Ecklund, *op.cit.*, p.158

¹¹ Kate Waters Cullunghutti the mountain and its people: *Cullunghutti the Mountain and its People: A Documentary History of Cullunghutti Mountain, Aboriginal People and the Shoalhaven (1770 to 1920)*, Waters Consultancy Pty Ltd for Office of Environment & Heritage (Nowra), 2013, p.36.

¹² John Vader, *Red Cedar: The Tree of Australia's History*, Sydney, Reed, 1987, pp.7, 24, 48, and see Chapters 1,3-4,7-8. ; J.H. Maiden, *The Forest Flora of New South Wales, Volume 1*, William Applegate Gullick, Government Printer, Sydney, 1904, pp.57-58. [electronic addition from University of Sydney Library Setis, <http://setis.library.usyd.edu.au/badham>.] ; Buthring in Campbell in Michael Organ, *A Documentary History of the Illawarra and South Coast Aborigines 1770-1850*, Aboriginal Education Unit, University of Wollongong, 1990, p.470

¹³ Michael Bennett, *For a Labourer Worthy of His Hire: Aboriginal Economic Responses to Colonisation in the Illawarra and Shoalhaven, 1770-1900*, PhD Thesis, University of Canberra, 2003, p.52. ; Anon, 'Sydney', Sydney Gazette and New South Wales Advertiser, 25 February 1815, p.2. ; See also references in the Section Arrawarra in Waters, *op.cit.*

¹⁴ Bennett, *op.cit.*, 2003, pp.56-57, 88-89.

¹⁵ Wesson (based on Gahan), *op.cit.*, pp.15-16 ; Bennett, 2002, pp.3-6

¹⁶ Tongarra Museum, Shellharbour City Council ; Gwyneth Dow, 'Terry, Samuel (1776-1838)', *Australian Dictionary of Biography*, Volume 2, Melbourne University Press, 1967.

of Shellharbour and the growth of Albion Park due to the development of the beef and dairy cattle industry¹⁷.

As the patterns of European land use increasingly alienated Aboriginal people from the hinterland, the resources of the ocean and rivers grew in importance. The reminiscences of an early European resident of the area include his memories of large-scale fishing on the Macquarie Rivulet around the mid nineteenth century as well as spear fishing on the beach,

A very old resident of the district... speaking of the aborigines, said he had, when a boy, seen at the Macquarie Rivulet a crowd of between 200 and 300 of them engaged in a fishing operation, which consisted in putting a pole across and banking up the water; they went in then and chucked out great quantities of fish. Settlers about used to come with their carts and participate in the catch. He got his father's permission once to accompany the King fishing; they went to the beach and soon the King, saying "big schnapper longa' there," threw his spear, and, sure enough, struck a big fish out in the surf. Aborigines, it may be mentioned, did not stand in one spot wearily waiting for a finny customer to come for the bait; they moved about till they found where the fish were, which their knowledge of nature enabled them to do¹⁸.

Fishing had been an important traditional resource all along the coast and continued to be an important economic resource for Aboriginal people on the south coast throughout the nineteenth century and into the second half of the twentieth century¹⁹. In an article examining the history of Aboriginal fishing in the Illawarra and Shoalhaven regions in the 19th century the historian Michael Bennett concluded, *"What is clear is that people continued to use their immense knowledge, skills and experience to catch and collect the bounty of the seas and streams"*²⁰. Fishing is still an important aspect of the lives of many Aboriginal people on the south coast with economic and cultural meaning, although due to the depletion of the fishing stocks it is no longer as important an economic resource as it was²¹.

The Macquarie Rivulet was, and is, an important cultural place within the study area. It was a rich resource area and formed part of one of the pathways along which people travelled and connected to groups to the west and north²². The Rivulet also has importance for its association with the burial of Aboriginal people. A newspaper article from 1919 referred to the memoirs of an old European resident of a funeral occurring in the area when he was a young boy in the mid nineteenth century,

The banks of the Macquarie were used by the aborigines for burial purposes, being easy to make graves in. As a boy, our informant remembered being at a funeral of a young woman. The pall bearers walked crooked ways, the object of this being to cause the spirit of the dead, in the event of emergence, to get lost in making for the camp. On this occasion the interment had taken place contrary to the custom of the body being viewed first by the "doctor." The latter came along just after and was very wrath; he threw his boomerang a long shot and back it came to his feet. Billy Broughton, who was a stockman at the meadows here, advised the white people to leave, as there was going to be a quarrel. The aborigines here expressed fear of those on the tableland, saying they were wild fellows. They were expert in the use of their weapons and very agile in dodging them. Punishment for offences was dealt out by placing the offender at some distance and setting two men to throw spears

¹⁷ Tongarra Museum, Shellharbour City Council

¹⁸ Anon, 'Aboriginal Customs. Fishing.', *The Gosford Times and Wyong District Advocate*, 16 October 1919, p.16

¹⁹ Ecklund, *op.cit.*, p.163, 171-2 ; Wesson (based on Gahan), *op.cit.*, pp.39-40 ; Waters, *op.cit.*, p.270.

²⁰ Michael Bennett, 'The economics of fishing: sustainable living in colonial new South Wales', *Aboriginal History*, Vol.31, 2007, p.99.

²¹ Report on south coast fishing boats, 1876 in NSW Police to NSW Colonial Secretary, Box 1/2349, Letter no.76/8919, cited in Bennett, *op.cit.*, 2007, pp.93-94 ; Waters, *op.cit.*, p.270

²² Interviews with knowledge holders for this project (see bibliography).

*at him. He had the defence of his womera, a small oval shield, and with that he took his chance of stopping them*²³.

It is not known where along the Macquarie Rivulet, or how far from the banks, burials occurred. The funeral of Tullimbar, an important local figure, was also recorded as occurring on the Macquarie Rivulet in the late nineteenth century²⁴.

The Macquarie Rivulet also holds importance as the location of a battle that was said to have occurred in the early nineteenth century between people from the Illawarra and people travelling up from the Shoalhaven Cullunghutti (Coolangatta) area²⁵. It is not known where along the Macquarie Rivulet this battle occurred. This account of the battle comes from a 1929 newspaper article,

*....about the year 1820, the chief camping-ground of the Illawarra aborigines was at Hooka Creek, which runs into the western side of Lake Illawarra, not far from Port Kembla. The tribe was then ruled by a chief named Hooka, who was friendly with, and at many times protected the early settlers. On one notable occasion he made plans to defend the settlers of the Dapto district against an attack which was to have been made on them by the natives from the further south Coolangatta district. He led 200 of his men, who gathered at Mullet Creek, and whose cry was "Hooka, Hooka," into battle at the Macquarie Rivulet, when a number of the southern men were killed and the remainder driven southwards*²⁶.

Other accounts date this battle to the 1840s²⁷. In an 1893 article Charlie Hooka was referred to as the King of Mullet Creek²⁸. Some written accounts of the story recorded that Charlie Hooka died during the battle and was buried at either Kanahooka Point on Lake Illawarra or in the Albion Park area²⁹.

The Aborigines Protection Board emerged in the 1880s and soon developed into an agency of government control over the lives of Aboriginal people in New South Wales. The Board's role initially involved overseeing the distribution of blankets, rations and various other goods to 'destitute' Aboriginal people. In later years the formation and management of reserves became a major part of the Board's functions³⁰. From its official formation in 1883 the Aborigines Protection Board increasingly intruded into the lives of the Aboriginal communities of New South Wales, dramatically increasing the regulations and limitations governing Aboriginal people's lives³¹.

In the vicinity of the study region there was a reserve formed at Berrwarra Point by the Board in 1894, some 12 kilometres north east of Albion Park at the mouth of Lake Illawarra. It appears that people were already living in the area prior to the reserve's formation. A reserve was formed at Minnamurra River in 1896, again where people were already living. This Minnamurra River reserve was revoked in 1898 and the Board attempted to move the people living there to Kiama. However, by

²³ Anon, 'Aboriginal Customs. Fishing.', *The Gosford Times and Wyong District Advocate*, 16 October 1919, p.16.

²⁴ E.H. Weston 'Reminiscences of an Australian Pioneer, n.d., quoted in Wesson (based on Gahan), *op.cit.*, , p.34.

²⁵ Interviews with knowledge holders for this project (see bibliography) and see following two endnotes.

²⁶ Anon, 'Aborigines. Relics Discovered "Chief of the Five Islands"', *Sydney Morning Herald*, 14 September 1929, p.21.

²⁷ Wesson (based on Gahan), *op.cit.*, p.34.

²⁸ Boomerang, 'Lake Illawarra and its Islands', *Illawarra Mercury*, 7 September, 1893, p.3.

²⁹ Wesson (based on Gahan), *op.cit.*, pp.34, 16-17.

³⁰ John Chesterman & Brian Galligan, *Citizens without rights: Aborigines and Australian Citizenship*, Melbourne, Cambridge University Press, 1997, pp.133-139. : Goodall, *op.cit.*, Chapter 10 & 11. : Peter Read, *The Stolen Generations: The Removal of Aboriginal Children in New South Wales 1883 to 1969*, NSW Department of Aboriginal Affairs, 1996, p.10. : 'Minute of Colonial Secretary re Protection of the Aborigines', dated 26th February 1883, *Votes & Proceedings of the Legislative Assembly*, 1883, Vol.3, p.919

³¹ Waters, *op.cit.*, p.200

the following year people were again recorded as living at Minnamurra. Queen Rosie and her husband Mickey Johnson lived on both these reserves in the 1890s and early 1900s³².

The majority of Aboriginal people in the region lived off the reserves in a series of camps located along the coast and waterways. By 1900 Aboriginal people in the area were concentrated at Minnamurra and Port Kembla. There were important camps in the region at Salty Creek, Coomaditchy Lagoon, Tom Thumb's Lagoon and Red Point, which was later known as Hill 60³³.

In the early 1900s repeated attempts were made to remove Aboriginal people from the Port Kembla camps such as Salty Creek and Tom Thumb's Lagoon³⁴. During the 1920s pressure increased on the Hill 60 camp as a result of urban expansion in the area and the resulting pressure from European residents and town councils to remove Aboriginal people from the area. The attempts to remove the Hill 60 community was strongly opposed by the Aboriginal residents³⁵. However, in the late 1930s or early 1940s³⁶ with the development of the site by the Department of Defence the Aboriginal residents were moved to what was known as the Official Camps near Coomaditchy (Coomaditchie) Lagoon though some families went temporarily further down the south coast including to the Berry area³⁷.

In addition to fishing Aboriginal people in the region worked throughout the nineteenth and into the twentieth century as guides, stockmen, agricultural labourers, and domestic workers. In the twentieth century Aboriginal people also began to get employment in industrial areas as wharf labourers and coal trimmers³⁸. Another important area of employment for Aboriginal people in the area, particularly from the mid- twentieth century was seasonal crop-picking. The two major centres for south coast crop-picking in the mid twentieth century were Bodalla and Bega³⁹ (Waters Consultancy 2013:277-278 Ecklund 1994: 164, 171-172 Wesson as cited in Gahan 2004:39-41).

Aboriginal people's involvement in the seasonal picking work, so central for many decades to the rural industries of the south coast, constituted a major economic contribution to the region. The freedom of movement associated with the availability of seasonal work also played an important role in allowing for the maintenance of wide ranging networks of kinship amongst the Aboriginal people of the south coast and connected regions (Waters Consultancy 2013:278).

There are many places within Albion Park and the wider region within which it is situated that continue to hold cultural significance for the Aboriginal people who live there and for those who have kinship connections to the area.

3.2.3 Natural resources

Much of the study area has been cleared as a result of European land use practices. The area would have featured a diverse range of flora and fauna resources prior to clearance. Ecological communities that have been identified across low-lying swamp landscapes within the wider region include Alluvial Swamp Mahogany Forest, comprising *Eucalyptus robusta*, *E. botroides* and *Casuarina glauca* (NSW NPWS 2003: 42).

The original vegetation of the study area would have supported a diverse range of mammals, reptiles, insects and birdlife, all of which would have been utilised by Aboriginal hunter-gatherers. Plants were also an important resource, being used for food or as sources of raw material for manufacture (Attenbrow 2010: 41). The presence of nearby fresh water sources would have attracted

³² Wesson (based on Gahan), *op.cit.*, pp.24025, 42-4 ; Ecklund, *op.cit.*, pp.160-161

³³ Ecklund, *op.cit.*, p.159-166 ; Wesson (based on Gahan), *op.cit.*, pp.48-52.

³⁴ Ecklund, *op.cit.*, p.166-167 ; Wesson (based on Gahan), *op.cit.*, pp.48-49

³⁵ Ecklund, *op.cit.*, p.169-170

³⁶ Wesson (based on Gahan), *op.cit.*, provides a date of 1942, Ecklund, *op.cit.*, provides a date of 1939

³⁷ Ecklund, *op.cit.*, p.164, 171-2 ; Wesson (based on Gahan), *op.cit.*, pp.39-41

³⁸ Ecklund, *op.cit.*, p.164, 171-2 ; Wesson (based on Gahan), *op.cit.*, pp.39-41

³⁹ Waters, *op.cit.*, pp.277-278 ; Ecklund, *op.cit.*, p.164, 171-2 ; Wesson (based on Gahan), *op.cit.*, pp.39-41

Aboriginal people to the area. These water sources would also have provided Aboriginal people with fish and shellfish resources.

No specific sources of stone for artefact manufacture are known within the study area. AMBS (2010: 27) note that the underlying geology to the north of Lake Illawarra comprises Late Permian Gerringong volcanics. These include laterite, trachytes tuff with pebbly sandstone bands, siltstone and conglomerate. Some types of tuff are used in stone tool production and the area may therefore have been exploited by Aboriginal people in the region. The Illawarra escarpment edge to the west of the study area is made up of the Illawarra coal measures. Rock types include chert and mudstone, which are sometimes used in stone tool production and may therefore have been exploited by local Aboriginal people (AMBS 2010: 27).

In an earlier study that incorporates a small section of the current study area, AMBS (2006: 250) determined that the diversity and varying quality of the raw materials used in stone tool manufacture is suggestive of local sourcing. It is thought likely that the materials were sourced from the conglomerate gravels of the underlying sandstone and siltstone bedrock, particularly quartz and quartzite. Other possible local raw material sources are the pebbles and cobbles identified from a paleo-channel adjacent to the existing alignment of Robins Creek to the west of Horsley.

It is therefore likely that the local geology, which provided a variety of stone resources, was an influencing factor on Aboriginal occupation of the area.

3.3 Historical land use

The Macquarie Rivulet Catchment area has been subject to a diverse range of land uses, including rural practices; low/medium density residential areas; industrial development; and regionally significant developments such as the Illawarra Regional Airport. Much of the study area incorporates existing roads/corridors (e.g. Princes Highway and Motorway; Illawarra Highway; Tongarra Road; East-West Link). A small portion of the study area crosses over the Illawarra Railway, near where it meets Yallah Road. For the most part, the roads and road reserve that are encompassed by the study area pass through land that is used for agricultural purposes. Small sections also pass through, or run adjacent to, areas of industrial and residential development.

3.4 Aboriginal material culture

The oldest dated sites for Aboriginal occupation in the Sydney Basin are from the late Pleistocene period, with a securely dated site at the base of the Blue Mountains of 14,700 years before present (yBP), and two coastal sites south of Wollongong at Bass Point and Burrill Lake in the Shoalhaven both dated to around 20,000 yBP (Lampert 1971; Nanson et al 1987). Evidence of Aboriginal occupation has been found dated to 50-60,000 yBP at Lake Mungo in NSW, so it would be likely that Aboriginal people have lived in the Illawarra region for even longer than indicated by the oldest recorded dates available at present. The archaeological material record provides evidence of this long occupation, but also provides evidence of a dynamic culture that has changed through time.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts. Archaeological analyses of these artefacts in their contexts have provided the basis for the interpretation of change in material culture over time. Technologies used for making tools changed, along with preference of raw material. Different types of tools appeared at certain times, for example ground stone hatchets are first observed in the archaeological record around 4,000 yBP in the Sydney region (Attenbrow 2010: 102). It is argued that these changes in material culture were an indication of changes in social organisation and behaviour.

3.5 Registered Aboriginal archaeological sites in the local area- AHIMS search results

The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal, be removed from this report if it is to enter the public domain.

AHIMS searches were carried out as follows:

- 23 April 2013 – based on the original study area
- 20 February 2014 – following the first addendum study area
- 10 July 2014 – following the second addendum study area
- 3 June 2015 – following the third addendum and encompassing the entire study area that is the subject of this CHAR.

The AHIMS search on the 3 June 2015 used the parameters and recorded the results below:

GDA 1994 MGA 56	294010E – 302780E
	6169000N – 6179570N
Buffer	50 m
Number of sites	110
AHIMS Search ID	175825

The search returned a total of 110 previously recorded Aboriginal sites. The frequency of recorded sites in the local region is detailed in the ASR and addendums (Appendix B, C, D and E).

3.6 Previous archaeological investigations in the local area

A number of previous archaeological investigations have been carried out within and around the study area. These have generally been associated with large land releases and the development of related infrastructure. The following discussion takes into account the most recent and relevant studies and aims to provide contextual information for the current study.

Comber (2010)

Comber (2010) conducted test and salvage excavations at Lot 107 and 108, DP 1076242 (currently 17 and 19 Larkins Lane, respectively). The properties are located along the Marshall Mount spur crest which runs approximately southwest-northeast. An Aboriginal site (WDRA_AS_09) was recorded adjacent to the properties in 2006 by AMBS (AMBS 2006a). WDRA_AS_09 was recorded as a high density open campsite and Comber (2010) postulated that it was likely to continue as subsurface deposit into Lots 107 and 108. AMBS noted that oral history indicates that the spur crest was used as an access route to an important ceremonial place located on Mount Marshall (west of the excavations) (AMBS 2006:108).

Excavation of Lots 107 and 108 yielded a total of 119 stone artefacts. The assemblage is characterised as a low density deposit, with chert being the predominant raw material (52%). Quartz (33%) and silcrete (15%) stone artefacts were also present (Comber 2010:52). Artefacts retrieved from each trench ranged in number from n = 0 to n = 6. Flaked pieces were the most common artefact type. Of 119 artefacts retrieved, only six examples of retouch and only two cores were retrieved (Comber 2010:26).

Australian Museum Business Services (AMBS) 2006a

An inspection of registered sites; a sample survey of West Dapto Release Area landforms; and a targeted survey of areas of archaeological and social/cultural interest were undertaken as part of the assessment by AMBS (2006a). The sample survey of West Dapto Release Area landforms covered 104 hectares of the assessment area (approximately 3.5 percent of the West Dapto Release Area). All landform units were covered, including streams (36), alluvial flats (9), streams and alluvial flats (1), hilltops (27) and spur crests (10). Twenty-four archaeological sites were identified, including those previously recorded. The sites comprised 13 open camp sites, six isolated finds and five scarred tree locations (containing a total of eight scarred trees). Sites were located on a variety of landforms. Six sites were located along creek lines; three on alluvial flats; three across both creeks and alluvial flats; eight on hill slopes; and four on spur crests (AMBS 2006a: v-vi). One open camp site (AHIMS site # 52-5-0512, originally recorded as WDRA_AS_09) is located within the current study area. Another open camp site (AHIMS Site 52-5-0483/52-5-0513 [WDRA_AS_10]) is located approximately 40 metres to the west of the current study area.

A total of 136 test pits were excavated across the West Dapto Release Area by AMBS (2006a), sampling the main landform units within the study area – slope, alluvial flat, drainage channels and crest. The number of artefacts recovered totalled 425, and these were retrieved from just over half of the test pits (n=75). The highest number of artefacts retrieved (n=146) came from a single test pit in a slope landform context. Artefacts were recovered from all creek catchments (AMBS 2010: 38).

The majority of artefacts (n=353) were recovered from the upper 20 cm of deposit. The total assemblage comprised a range of raw materials, with chert being predominant (n=176). Quartz was the next most frequent material (n=100), followed by silicified wood (n=51), quartzite (n=41), silcrete (n=38), silicified tuff (n=13) and fine-grained siliceous (n=6). Broken flakes were the most frequent artefact type (n=209), followed by flakes (n=112), flaked pieces (n=82) and cores (n=22). Twenty-nine artefacts displayed modification or retouching. Usewear was identified on five artefacts, and evidence for both retouch and usewear was identified on one artefact (AMBS 2010: 39). The results of the test excavation program demonstrated that higher frequencies of artefacts were found along certain watercourses and on some ridges (AMBS 2010: 93).

Areas of high archaeological potential were identified based on the available archaeological information, including the results of the test excavation program, and on predictive modelling. Areas considered to be of high archaeological potential include major creek lines of the West Dapto Release Area; the wetlands of Mullet, Duck and Marshall Mount Creeks; the foothills of the Illawarra Escarpment; high points on ridges through the West Dapto Release Area; and any sources of stone material for flaking, such as pebbles and cobbles along tributaries (AMBS 2006a: 266). Three areas of high archaeological potential were identified within the current study area. The first is located along the alignment of Duck Creek, in the very north of the current study area; the second is positioned on the slope and crest landform where AHIMS site # 52-5-0512 is located; and the third is located along the northern side of Macquarie Rivulet (AMBS 2006a: Fig. 25b).

AMBS 2006b

AMBS (2006b) undertook a cultural heritage assessment of the proposed Larkins Lane subdivision at Yallah, within the West Dapto Release Area. The study area is located immediately to the west of the current study area, between Macquarie Rivulet in the south and Yallah Road in the north. The AMBS study area comprised 35 Lots, covering a continuous land area of approximately 750 x 500 metres of varying topography. The subdivision is bisected through the middle by the Marshall Mount spur crest that runs in a southwest to northeast direction (AMBS 2006b: 3). Aboriginal stakeholders have previously advised AMBS that a ceremonial place was located on Mount Marshall to the west of the West Dapto Release Area. This supports the assessment of archaeological potential for the Marshall

Mount spur crest because the landform would have provided an important access route to the ceremonial place (AMBS 2006b: 10).

One known site (WDRA_AS_10) is located within the subdivision. This site is located approximately 40 metres to the west of the current study area. Two known sites (WDRA_AS_09) and AHIMS site 52-5-0398 are located immediately adjacent to the eastern and southern boundaries of the subdivision respectively. Site WDRA_AS_09 is located within the current study area (now registered as AHIMS site # 52-5-0512). Aboriginal objects were identified on 13 Lots throughout the subdivision, in areas where the ground surface had been disturbed by development activities such as road construction. Eight isolated stone artefacts and ten locations of very low density shell remains (1-12 fragments) were recorded, a large proportion of which were associated with the upper slope of the ridge crest landform in the northern half of the study area. It was determined that due to the very low density of archaeological materials, and to the low archaeological integrity of the landscape resulting from development activities throughout a large proportion of the site, the entire Larkins Lane study area was of low archaeological significance (AMBS 2006b: ii).

HLA-Envirosciences (HLA) 2007

HLA (2007) conducted an Aboriginal and historical heritage assessment of the proposed Illawarra Regional Business Park. The study area comprised approximately 80 hectares of dairy farmland at 78 Tongarra Road, Albion Park NSW. It incorporates a section of the current study area immediately to the north of Tongarra Road, which could not be accessed during the current survey. It was determined that no previously recorded Aboriginal sites are situated within the study area (HLA 2007: 9). One previously unrecorded Aboriginal site was identified during the survey. This was an isolated silcrete flake of approximately 16 x 20 millimetres, found on the side of an embankment on a bend in Frazers Creek. The 0.5 metre high embankment had been formed through the dredging of Frazers Creek in the recent past (HLA 2007: 13). No other Aboriginal sites or PADs were located in the HLA 2007 study area. It was concluded that the isolated find is likely to have been redeposited and therefore has low scientific value. However, due to low ground surface visibility, recognition must be made of the possibility of further Aboriginal sites within the study area (HLA 2007: 16). The isolated artefact has not been registered on the OEH AHIMS site register and is not located within the current study area.

3.7 Predictive model

AMBS (2006a: 63-86) provide a comprehensive overview of previous archaeological research undertaken in the local region relevant to the West Dapto Release Area, and to the current study area. The review includes regional assessments of the Illawarra undertaken by Dallas and Sullivan (1995) and Therin (2003). Both studies note that drinking water is freely available within the Illawarra, so whilst still important, would not be the overriding factor determining landscape use. Instead, the composition and distribution of known archaeological sites throughout the Illawarra is found to be strongly correlated with bedrock geology and landform features, such as sandstone outcrops that are suitable for shelter and axe grinding grooves (AMBS 2006a: 65). It is acknowledged within both studies that the current understanding of Aboriginal heritage of the Illawarra is limited. Investigations have been focused on landforms of the immediate coast and escarpment, with the archaeology of the Coastal Plain and escarpment foothills less well known. Alluvial landforms (streams) have been the focus of test excavation, meaning the potential of higher landforms that offer vantage points and elevated pathways has not been recognised (AMBS 2006a: 94).

AMBS (2006a: 87- 92) also review studies that have contributed to the assessment of archaeological potential of the West Dapto Release Area, including that undertaken by Sefton (1984) for Stage 1 of the West Dapto Release Area. Whilst recognising the limited understanding of Aboriginal heritage in the Illawarra, areas of potential within the West Dapto Release Area are nominated as being

archaeologically sensitive based on Sefton's predictive model (AMBS 2006a: 93). Of particular relevance to the current study area is the prediction that all level areas of the Western foothills zone and the Coastal Plain within 100 m of a creek situated on: (a) quaternary deposits (flood plains); (b) Budgong Sandstone; and (c) Berry Siltstone are archaeologically sensitive.

3.8 Results of site survey

Representatives from ILALC attended all stages of site survey. Site survey was conducted in three stages.

- The first stage concerned the original study area (see ASR in Appendix B) and was conducted on the 30 April to 1 May 2013.
- The second stage of survey was conducted on the 25 - 27 February 2014 (see first addendum in Appendix C) and concerned properties that were not accessible during the first stage of survey and the Croom Regional Sporting Complex .
- The third stage of survey was conducted on the 9 July, 13 - 15 August and the 21 - 22 August 2014 (see second addendum in Appendix D). The third stage of survey concerned additions to the study area to incorporate options for locations of ancillary facilities, road interchanges and widening.
- The fourth stage of survey was conducted on the 4 and 11 June 2015 (see third addendum in Appendix E). The fourth stage of survey considered additional areas to the study area incorporating further options for locations of ancillary facilities, road interchanged and widening.

Analysis of survey coverage is included in the ASR and addendums (Appendix B- Appendix E).

A total of 21 Aboriginal sites have been identified within or in the immediate vicinity of the study area. Following updates to the concept designs and project boundaries, it was found that eight of these sites are outside of the project boundaries and will no longer be impacted by the proposed works (AHIMS site # 52-5-0473, YTOF AS 6, YTOF IF 4, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF CS 1 and HLA 2007). The proposed works will therefore impact 13 Aboriginal sites (AHIMS site # 52-5-0484/52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766).

3.9 Results of test excavation

Test excavations were carried out between the 10 and 27 November 2014 with the aim of informing this CHAR and guiding finalisation of the concept design and placement of ancillary facilities.

Of the 21 sites identified within or in the immediate vicinity of the study area, seven were subject to test excavation in order to determine the presence and nature of subsurface archaeological deposits. This was necessary as these seven sites were identified during site survey as areas of PAD. Areas of PAD are identified through a combination of landscape, disturbance and land use context indicating the likelihood of aboriginal objects remaining below the ground surface.

Seven of the sites identified within the study area were confirmed as Aboriginal sites through test excavation (YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4). Test excavation also redefined the boundary of the previously recorded AHIMS site # 52-5-0512.

Note that prior to test excavation commencing, Roads and Maritime advised that one area of PAD (YTOF PAD 3) would no longer be impacted by the proposed works. As such, YTOF PAD 3 was not test excavated and remains an area of PAD (Figure 3).

The archaeological test excavation report is included as Appendix G to this CHAR. Sites subject to test excavation, as well as all previously recorded sites identified as part of this investigation are described below.

The PADs YTOF PAD 8 and YTOF PAD 9 were recorded during the survey for the third addendum to the PACHCI Stage 2 ASR. This occurred after the test excavations had been completed. The areas of PAD were excised from the study area subsequent to the survey and therefore will not be impacted by the proposed works.

3.10 Summary of Aboriginal archaeological sites

3.10.1 Archaeological sites within the current project boundary

The following 13 sites are located within the current concept design for the project and are likely to be impacted.

AHIMS site # 52-5-0484/52-2-0512

AHIMS site # 52-5-0484/52-2-0512 was originally recorded as WDRA_AS_09 by AMBS in 2006 as a high density surface artefact scatter. The site is located on the Marshall Mount spur crest in an exposed area of 180 square metres of ungraded access road.

Test excavation of the portion of AHIMS site # 52-5-0484/52-2-0512 which lies within the current concept design identified a low density subsurface artefact scatter. The boundaries of the site were updated to reflect the lack of artefacts found in the southern margin of the site. An updated site card has been submitted to AHIMS.

YTOF AS 1 (AHIMS site 52-5-0762)

YTOF AS 1 is an artefact scatter site recorded in the narrow reserve which borders the northern margin of the East West Link. The site comprises two small (each less than 15 centimetre in maximum dimension) artefacts, found on an area of exposure. Some disturbance to the site is likely as the flat landform is low-lying and prone to flooding. Furthermore, the planting of trees and maintenance of the park may have contributed to some disturbance to the site.

YTOF AS 2 (AHIMS site 52-5-0763)

YTOF AS 2 is an artefact scatter site recorded on the southern boundary of Transgrid property. YTOF AS 2 is located upon an area of exposure beside a driveway, approximately five by ten metres. Little modification is evident near the site, however there is some minor disturbance associated with construction of a driveway and installation of transmission towers. The driveway is approximately 10 metres east of the site and the transmission lines are approximately 20 metres south of the site.

YTOF AS 3 (AHIMS site 52-5-0787)

YTOF AS 3 was originally recorded as YTOF PAD 1 by Artefact Heritage in 2013. The site is located on a very gentle southwest facing slope above a flat that extends from Frazers Creek. Test

excavation of YTOF AS 3 identified a low density subsurface artefact scatter comprising YTOF AS 3. A distinct, small artefact scatter was identified in close proximity (YTOF AS 8). A site recording card has been submitted to AHIMS.

YTOF AS 4 (AHIMS site 52-5-0788)

YTOF AS 4 was originally recorded as YTOF PAD 2 by Artefact Heritage in 2014. The site is located on an elevated, level terrace that rises above the flat immediately adjacent to the eastern edge of Frazers Creek. An artefact (YTOF IF 1) was identified in close proximity to YTOF AS 4.

Test excavation identified a moderate density subsurface artefact scatter including some specialised tools and a wide variety of raw materials. A site recording card has been submitted to AHIMS.

YTOF AS 5 (AHIMS site 52-5-0789)

YTOF AS 5 was originally recorded as YTOF PAD 4 by Artefact Heritage in 2014. The site is located on an elevated terrace and gentle east facing slope toward an unnamed tributary of Frazers Creek. Test excavation of the area of PAD identified a moderately dense subsurface artefact scatter (YTOF AS 5) and a discrete artefact adjacent to the creek line (YTOF IF 4). The moderately dense artefact scatter comprises numerous specialised tools and a variety of raw materials in the assemblage. A site recording form has been submitted to AHIMS.

YTOF AS 7 (AHIMS site 52-5-0791)

YTOF AS 7 was originally recorded as YTOF PAD 6 by Artefact Heritage in 2014. The site was recorded as an area of potential, located on a raised area adjacent a creek within an area of known archaeological sensitivity.

Test excavation of YTOF AS 7 identified a very low density subsurface artefact scatter. A site recording card has been submitted to AHIMS.

YTOF AS 8 (AHIMS Site 52-5-0793)

YTOF AS 8 was originally recorded as YTOF PAD 1 by Artefact Heritage in 2014. YTOF AS 8 is a small discrete subsurface artefact scatter identified during test excavation of the PAD (YTOF AS 3 was also identified within this area of PAD).

YTOF IF 1 (AHIMS Site 52-5-0757)

YTOF IF 1 is an isolated surface artefact identified in close proximity to YTOF AS 4. The site was originally recorded by Artefact Heritage in 2014. YTOF IF 1 is located on an elevated, level terrace that rises above the flat immediately adjacent to the eastern edge of Frazers Creek.

YTOF IF 2 (AHIMS site 52-5-0764)

YTOF IF 2 is an isolated find recorded on a small exposure within a private property. The artefact is a complete flake of silcrete. A small, modified drainage channel is located approximately 30 metres northeast of YTOF IF 2. The drainage channel has been altered as a result of agricultural activity. However, the natural alignment of the drainage channel is evident where it originates on the southern side of the East West Link.

YTOF IF 3 (AHIMS site 52-5-0765)

YTOF IF 3 is an isolated find recorded on a small exposure immediately adjacent a small, modified drainage channel. YTOF IF 3 is located approximately 35 metres northeast of YTOF IF 2. They are assessed as separate isolated finds as YTOF IF 3 is located on the bank of a drainage channel and is unlikely to be *in situ*.

Macquarie Rivulet 1 (AHIMS site 52-5-0227)

AHIMS site 52-5-0227 is a low density artefact scatter recorded 1986/1987 in a disturbed context in [REDACTED]. The original site recording notes that sparse, fragmentary shell material was present at the time of recording and also that disturbance associated with landscaping and the construction of the park was already apparent. No record of a Section 90 permit for impact to the site has been identified on the original site recording form or on the AHIMS site register search results. Based on the site condition description on the site recording form it is likely that surface disturbance associated with establishment of the park had already occurred when the site was first recorded. The site is located on a terrace and flat landform. No artefacts were visible when the site was relocated during survey for the original ASR (Artefact 2013). The site has been heavily disturbed by installation of the park, roadway and picnic facilities, as well as industrial development in the adjacent lot (Artefact 2013).

AHUGC001 (AHIMS Site 52-5-0766)

AHIMS site 52-5-0766 is a disturbed midden site recorded beneath a sediment trap within a lot in the industrial estate to the south of Darcy Dunster Park by Ainsworth Heritage (2012). The midden comprises a small scatter of shells and fragments of shell, including turbo, cockle and whelks. None of the intact shells were greater than four centimetres in length. It was noted during site survey that the midden appeared to be eroding out of the edge of the development area. The stratigraphy of the midden was not evident from the surface examination and it was suggested that the midden may have been disturbed or shifted during construction of the road. It could not be determined how far the midden may extend beneath the development area (Ainsworth Heritage 2012: 38).

3.10.2 Other archaeological sites included in the original ASR and addendums (outside current project boundaries)

The following eight sites are located outside of project boundaries and will not be impacted.

YTOF AS 6 (AHIMS site 52-5-0790)

YTOF AS 6 was originally recorded as YTOF PAD 5 by Artefact Heritage in 2014. The site is located on an terrace and lower slope at the confluence of two small ephemeral creeks. An area of approximately 30 x 30 metres within the PAD has been modified by the construction of a dam. However, other subsurface impacts are minimal.

Test excavation of the site identified a low density subsurface artefact scatter. A site recording form has been submitted to AHIMS.

YTOF IF 4 (AHIMS site 52-5-0792)

YTOF IF 4 was originally recorded as YTOF PAD 4 by Artefact Heritage in 2014. The site is located on an elevated terrace and gentle east facing slope toward an unnamed tributary of Frazers Creek. Test excavation of the area of PAD identified a moderately dense subsurface artefact scatter (YTOF AS 5) and a discrete artefact adjacent to the creek line (YTOF IF 4). YTOF IF 4 was deemed to be a discrete site as numerous void test pits separated it and YTOF AS 5. Furthermore, YTOF IF 4 is located on the bank of the creek and is unlikely to be *in situ*. A site recording form has been submitted to AHIMS.

YTOF PAD 3

YTOF PAD 3 was recorded by Artefact Heritage in 2014. The PAD is located along a broad, elevated and relatively level west-facing slope that rises up to the east of an unnamed tributary to Frazers Creek. The PAD is located within 200 metres to the east of Frazers Creek and less than 100 metres to the east of the tributary.

YTOF PAD 3 was recommended for test excavation in the ASR, however, prior to test excavations Roads and Maritime advised that the PAD would no longer be impacted by the proposed works. As such, no further investigations have been undertaken at YTOF PAD 3.

YTOF PAD 8

YTOF PAD 8 was recorded by Artefact Heritage in June 2015. The PAD encompasses a lower slope landform that extends towards a tributary of Duck Creek. The PAD is approximately 50 metres North West of Duck Creek. The southern and western boundaries of YTOF PAD 8 are delineated by the survey area boundary. YTOF PAD 8 is likely to extend outside the survey area towards Duck Creek.

YTOF PAD 9

YTOF PAD 9 was recorded by Artefact Heritage in June 2015. The PAD is located on a raised terrace landform just east of Frazers Creek. The site features very little evidence of disturbance. The boundaries of the PAD are delineated by a discrete raised area and is not likely to extend beyond the PAD boundary shown in Figure 15.

YTOF CS 1

YTOF CS 1 is a cultural site located in the far south-eastern corner of the original study area. The site comprises an old growth fig tree located on a small terrace of a north facing slope. Troy Tungai of ILALC identified the tree as a women's site. Fig trees such as this have been identified as 'birthing trees', places of meeting for women where birthing and associated rituals took place within the local Illawarra context (Timberey-Bennett 2004).

AHIMS site # 52-5-0473

AHIMS site # 52-5-0473 was originally recorded as LLS1. The site comprises four stone artefacts identified on a vehicle track exposure within the property at 11 Larkins Lane. The site card notes that Yallah is a known hunting ground and that the Marshall Mount spur crest, on which Larkins Lane is located, is of cultural significance. The site was unable to be accessed during the current survey as the property owner did not grant permission. However, a house has been constructed over the location of the site since the time of original recording. The site is therefore likely to have been impacted or destroyed.

HLA 2007

HLA 2007 is an isolated silcrete flake located on the side of an embankment on a bend in Frazers Creek, recorded by HLA in 2007. The embankment was formed through a recent (at the time) dredging of Frazers Creek. No other Aboriginal objects were identified in the vicinity. It was therefore concluded that the isolated find was likely to have been redeposited and therefore has low scientific value. However, due to low ground surface visibility, recognition must be made of the possibility of further Aboriginal sites within the study area (HLA 2007: 16). The isolated artefact has not been registered on AHIMS and is not located within the current project boundaries (Figure 3).

3.10.3 Veracity of PAD boundaries

The nature and extent of YTOF PADs 1 – 7 was established through archaeological test excavation in accordance with the OEH code of practice. This excavation program included the development of a test excavation methodology that was forwarded to Aboriginal stakeholders for review and comment, discussed with Aboriginal stakeholders at the October 2014 AFG, and also forwarded to OEH prior to the two week notification period required under the OEH code of practice.

The test excavation results, which are summarised on a site basis above and outlined in full in the archaeological test excavation report, demonstrate that the nature and extent of each PAD was adequately assessed. The results of test excavation assisted with delineating the revised site boundaries as shown in Figure 3, and preparing advice on which sites would require archaeological salvage excavation based on an impact assessment.

The locations of YTOF PAD 8 and PAD 9 were assessed in the third PACHCI Stage 2 addendum report and subsequent to archaeological test excavation. The boundaries of those sites were delineated based on background information and the results of archaeological test excavation in similar landform contexts for the Albion Park Rail Bypass project. The extent of PADs 8 and 9 have been adequately assessed based on that information.

3.11 Maps of Aboriginal sites

The following maps detail each site which has been included in the original ASR and the following two addendums. Note the sites which are now outside of the project boundaries (YTOF AS 6, YTOF IF 4, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF CS 1, AHIMS site # 52-5-0473 and HLA 2007).

Cultural sites included in Waters Consultancy (2015) report are included in all relevant maps for reference purposes.

Figure 3: Overview of all sites and areas of PAD

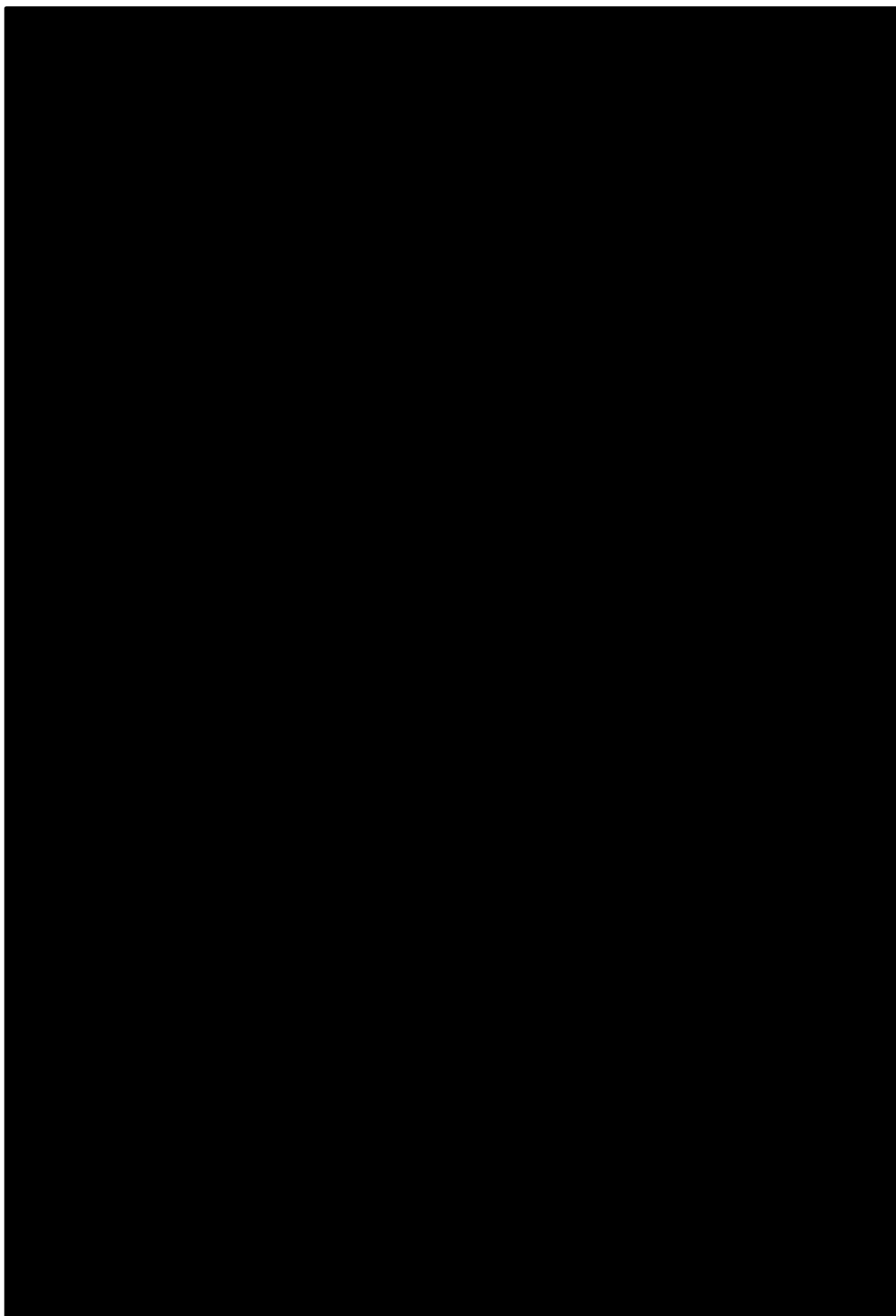


Figure 4: YTOF AS 7, YTOF AS 2 and AHIMS site # 52-5-0473 (AHIMS site # 52-5-0473 outside of project boundaries)

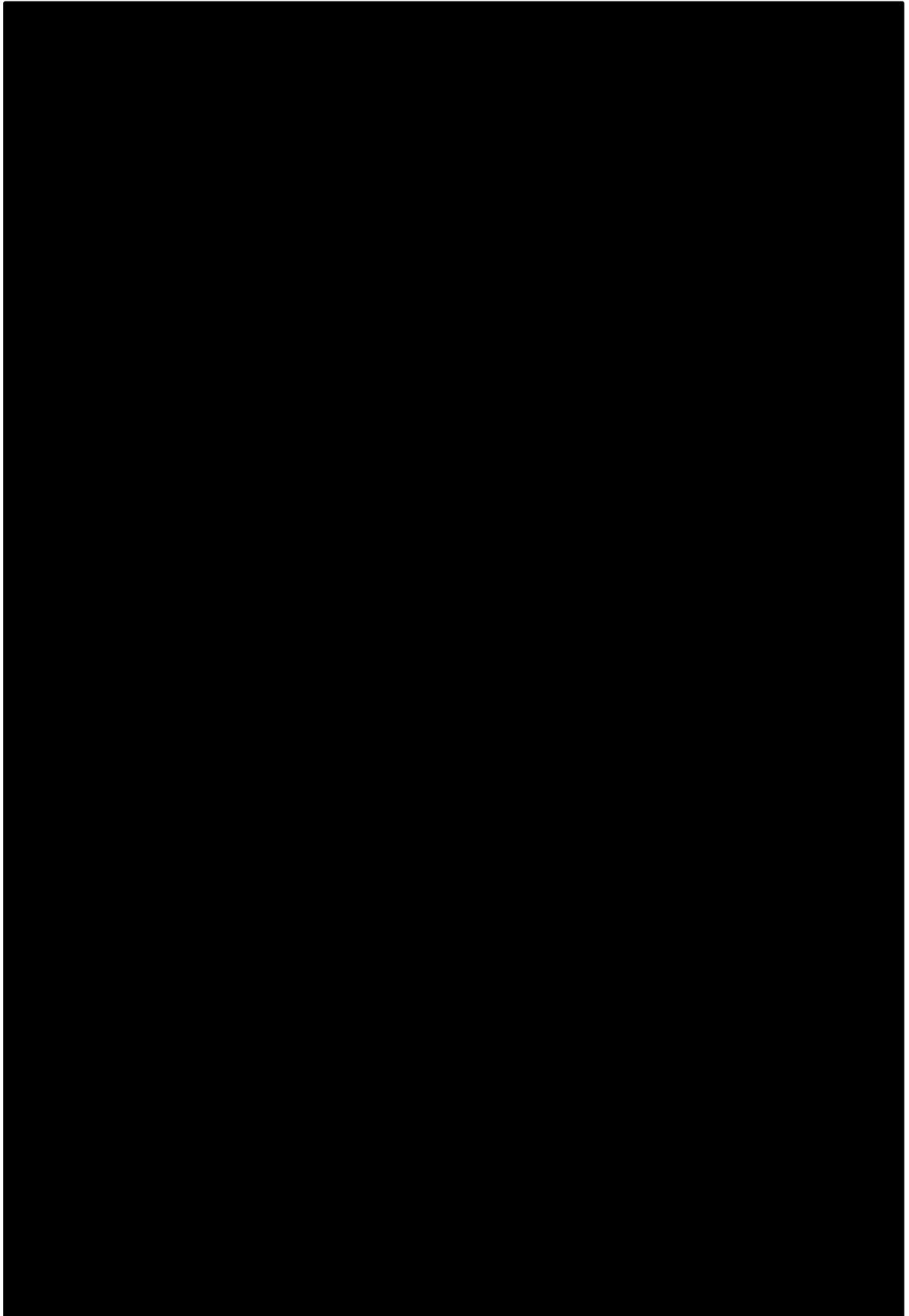


Figure 5: AHIMS site #52-2-0512

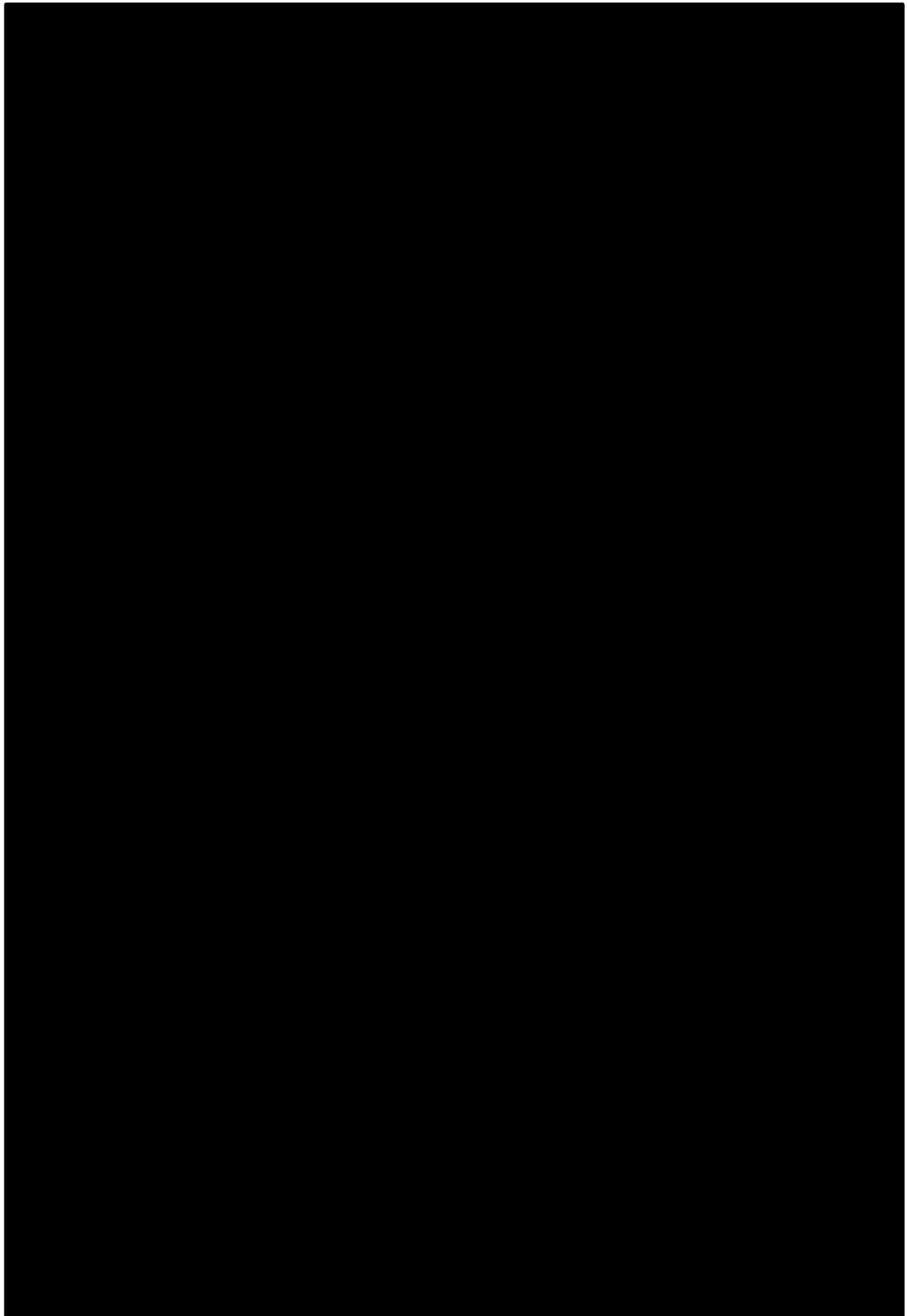


Figure 6: 52-5-0766 and 52-5-0227

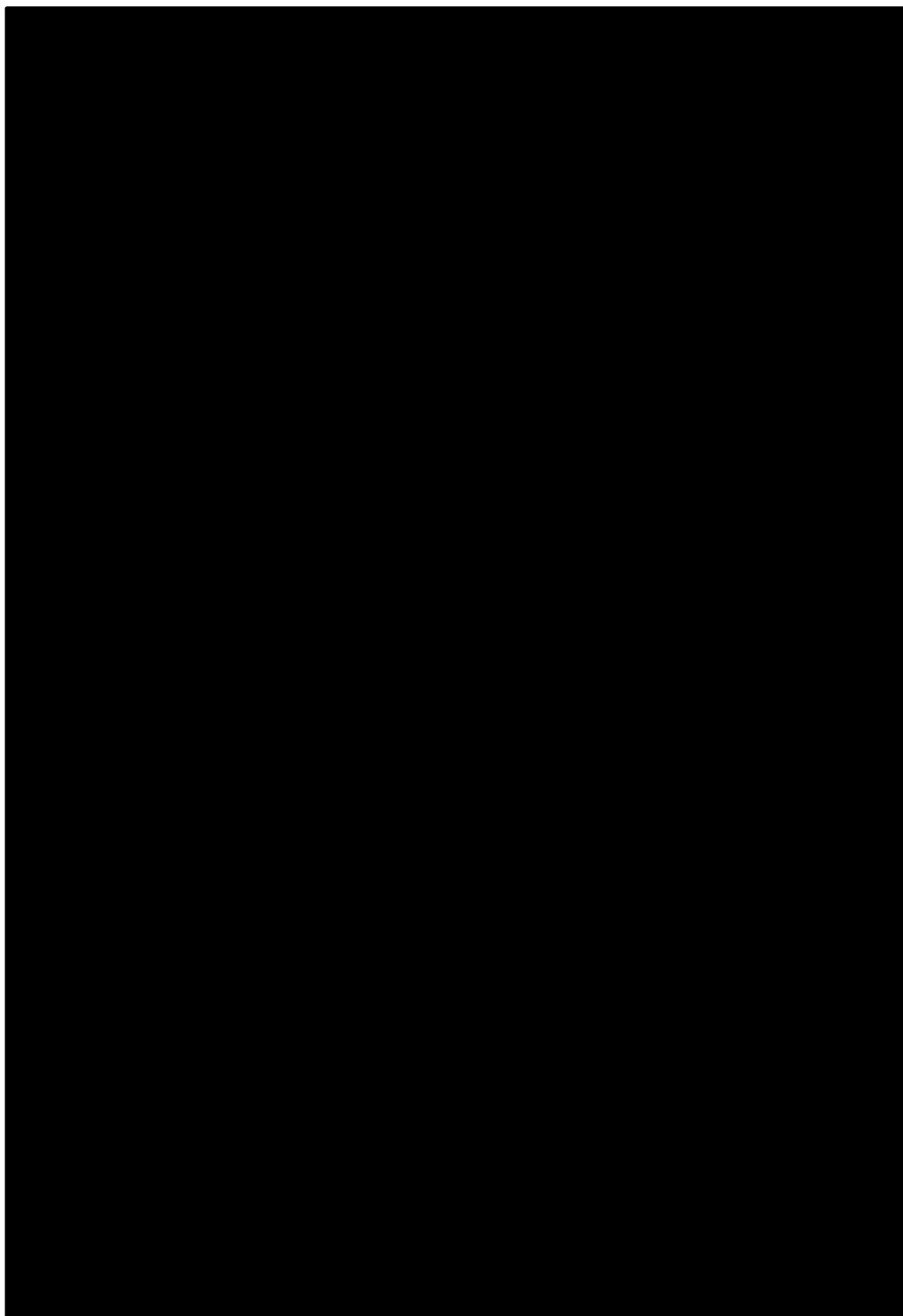


Figure 7: HLA 2007 site (outside of project boundaries)

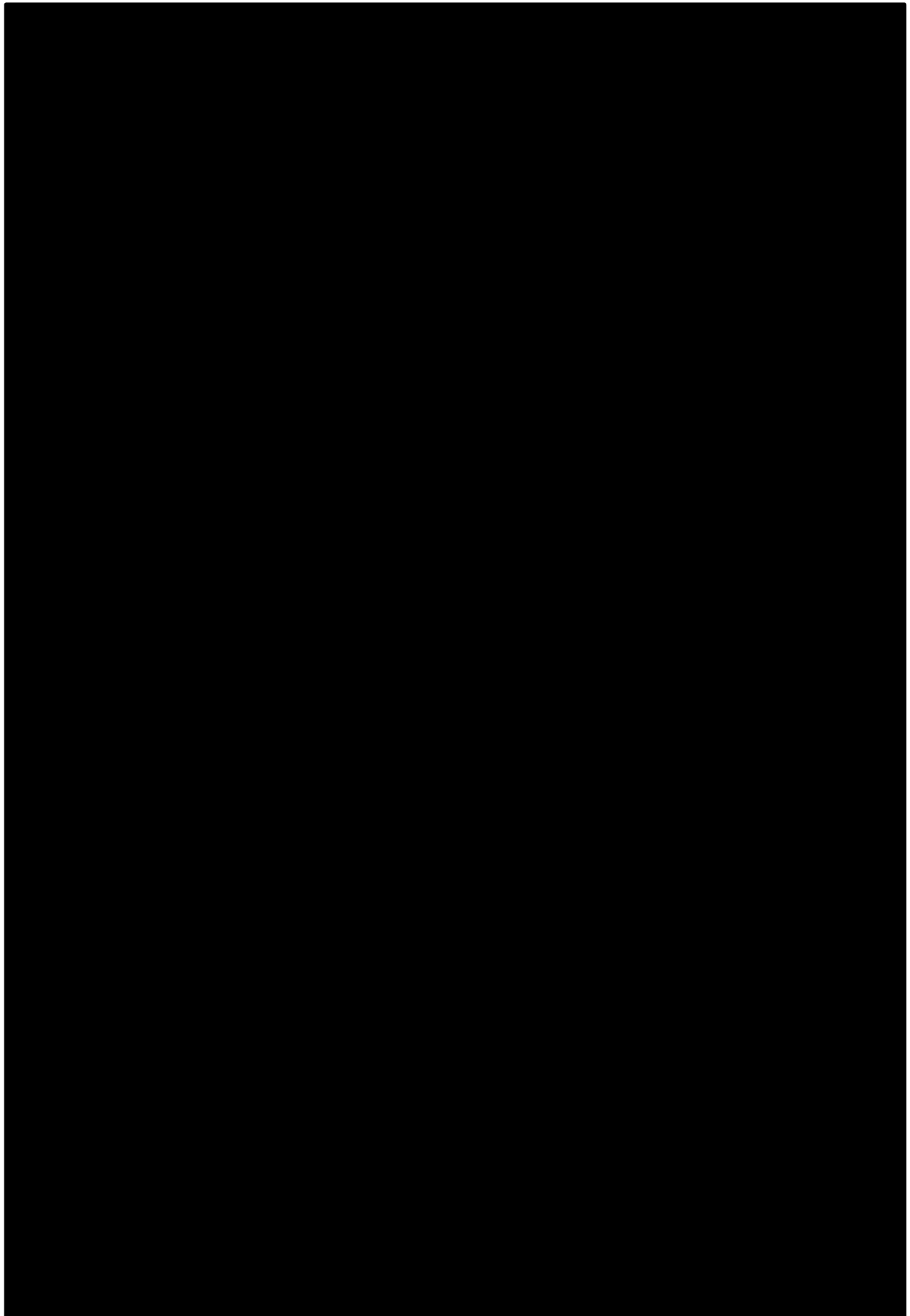


Figure 8: YTOF AS 5 and YTOF IF 4

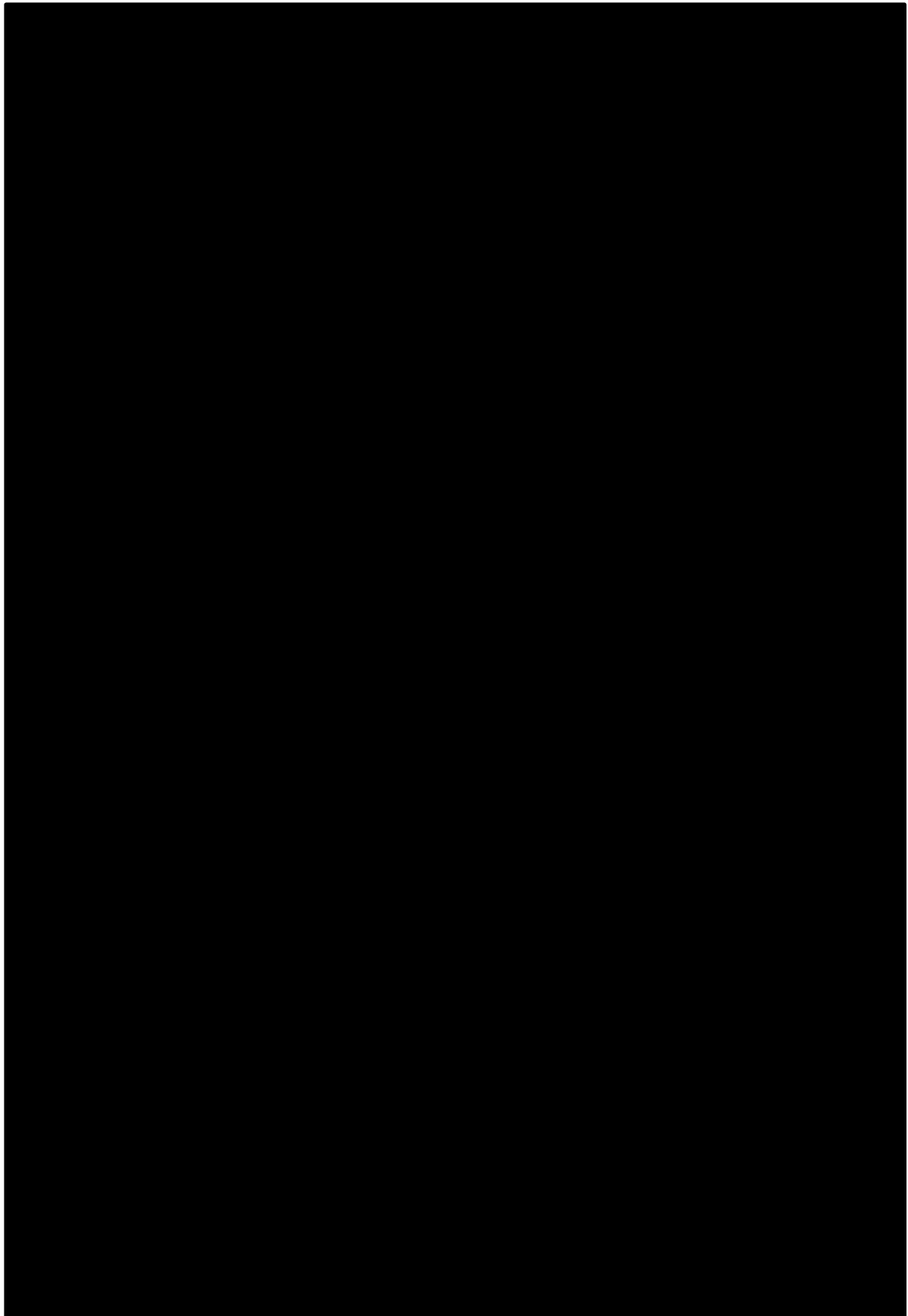


Figure 9: YTOF AS 4, YTOF IF 1 and YTOF PAD 3 (YTOF PAD 3 now outside of project boundary)

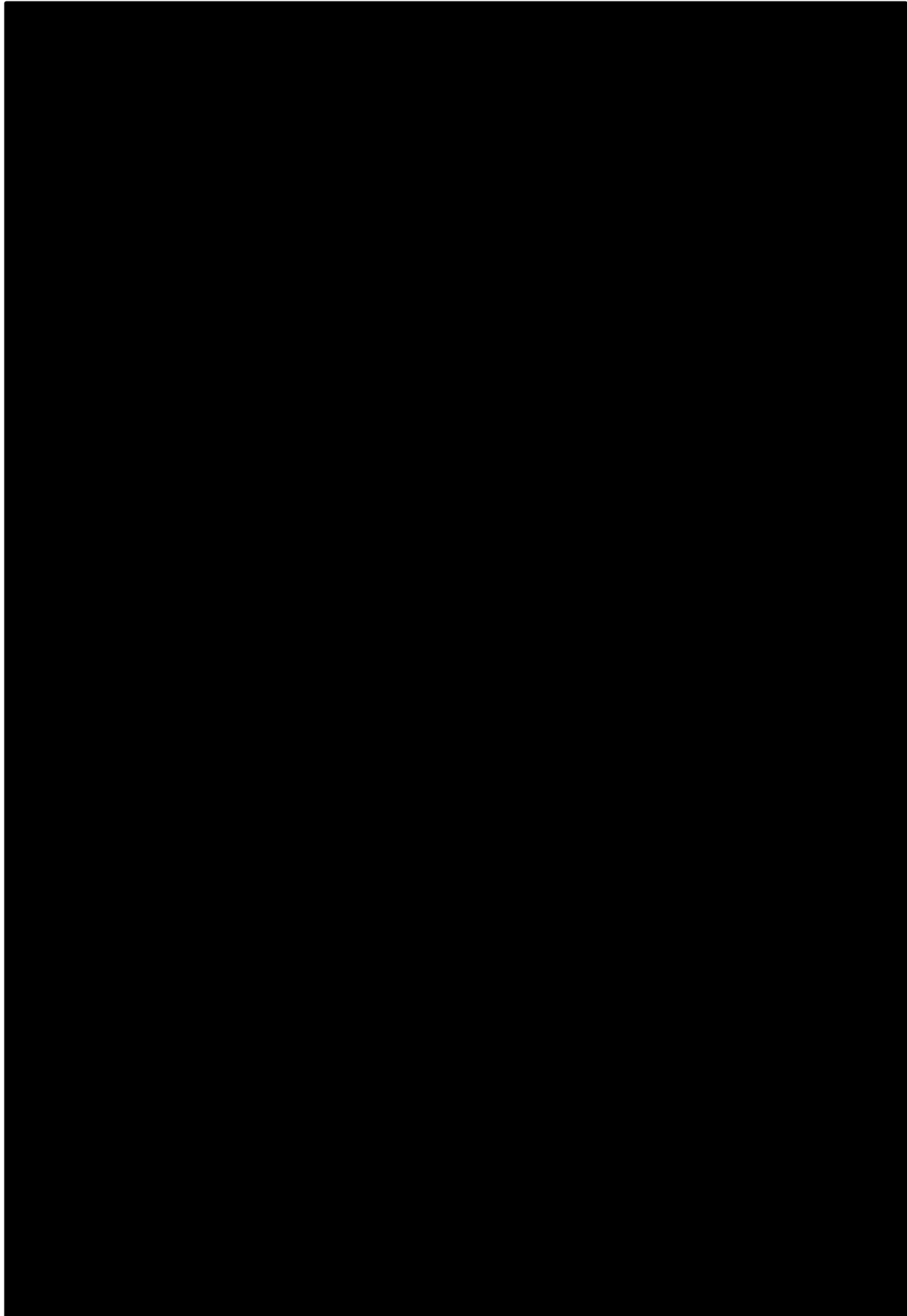


Figure 10: YTOF AS 3 and YTOF AS 8

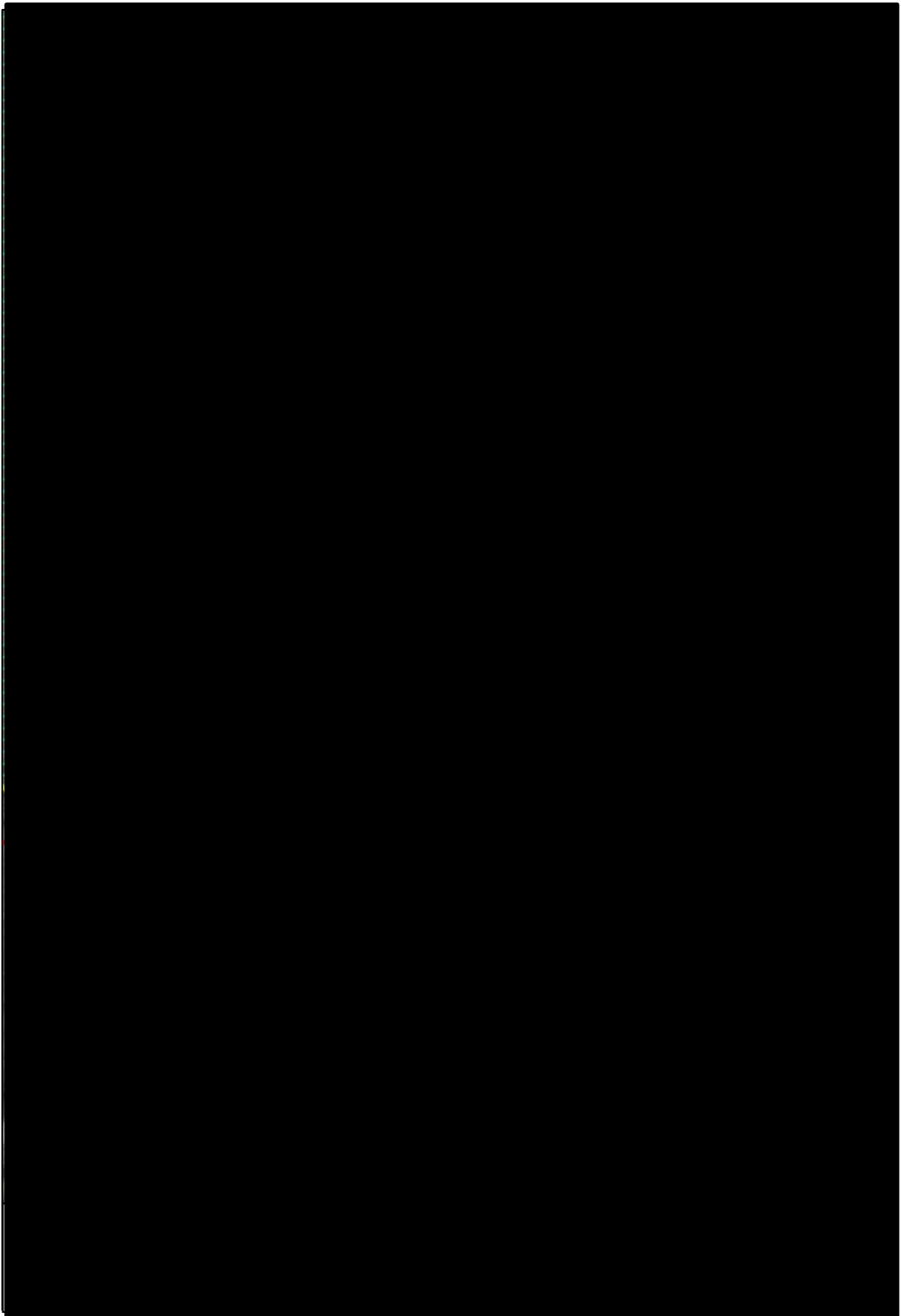


Figure 11: YTOF IF 2 and YTOF IF 3

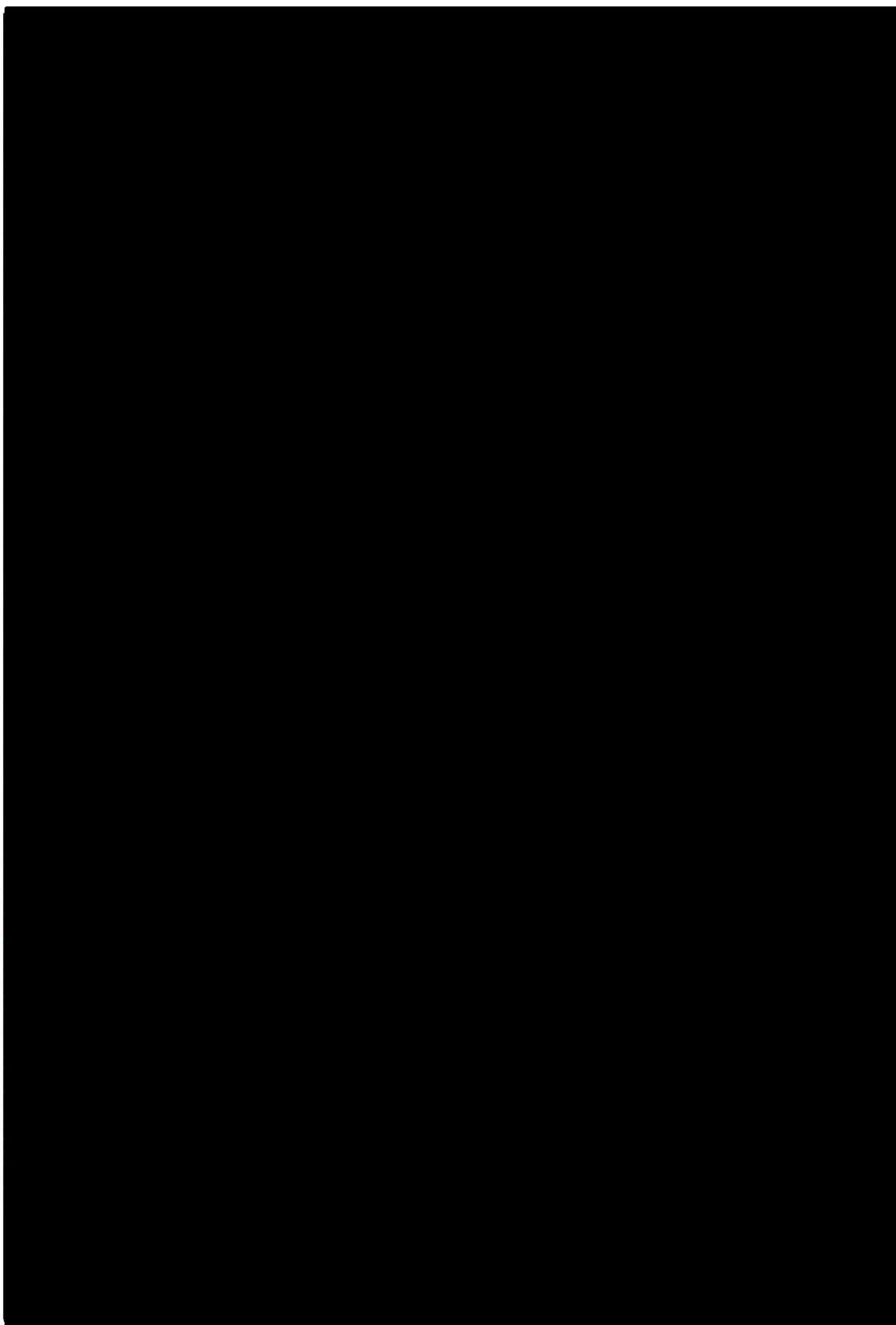


Figure 12: YTOF AS 1

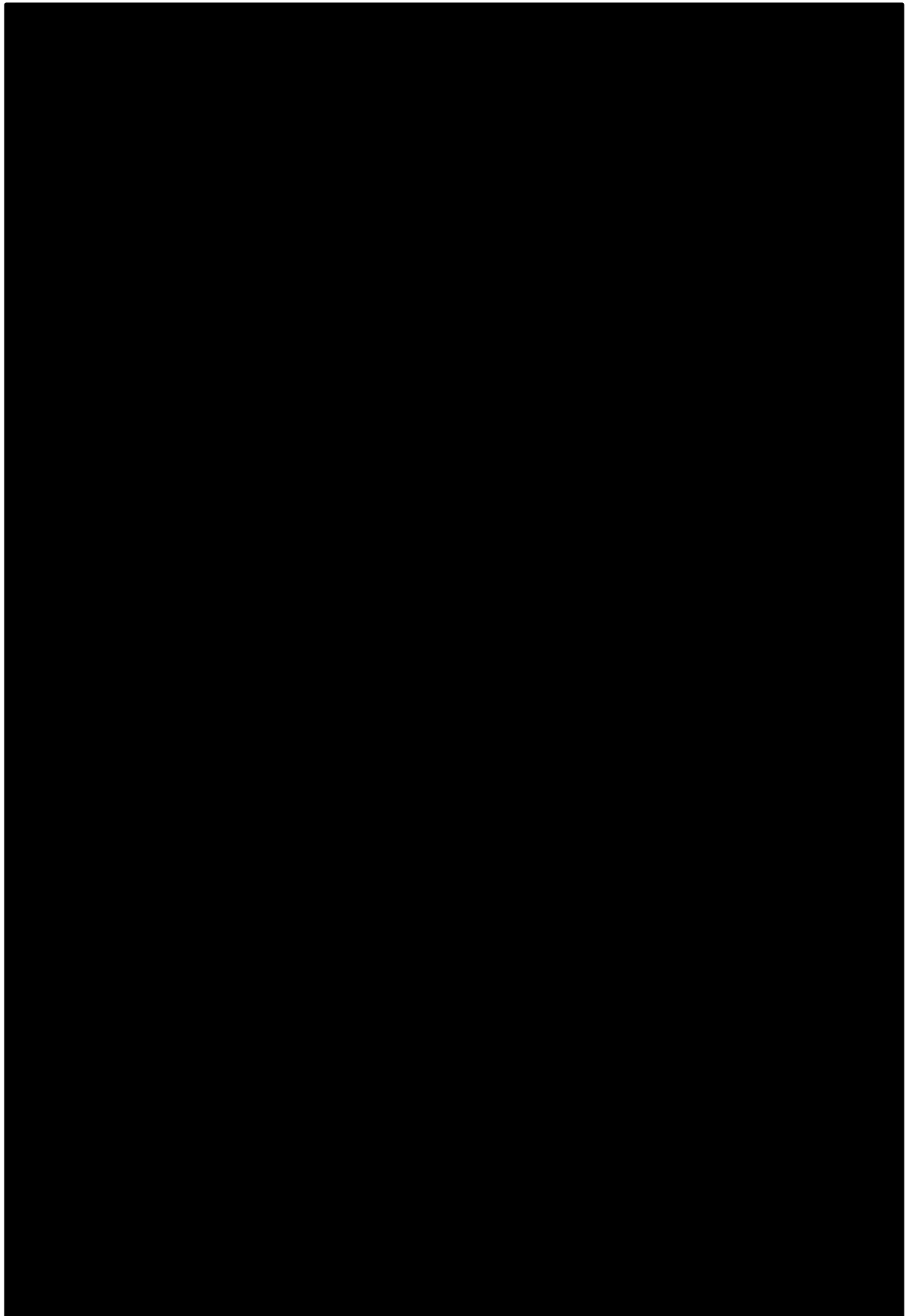


Figure 13: YTOF AS 6 (outside of project boundaries)

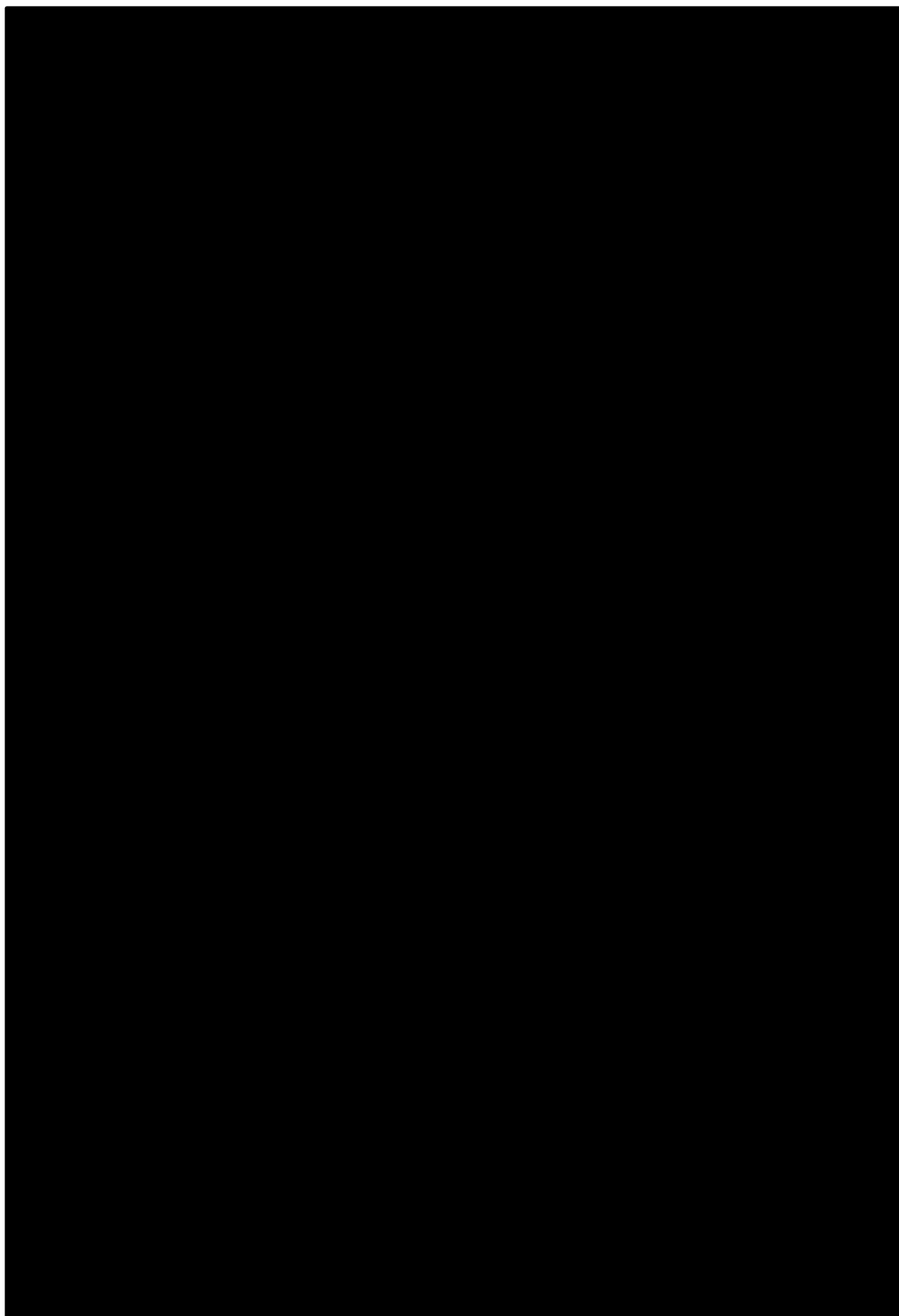


Figure 14: YTOF CS 1 (outside of project boundaries)

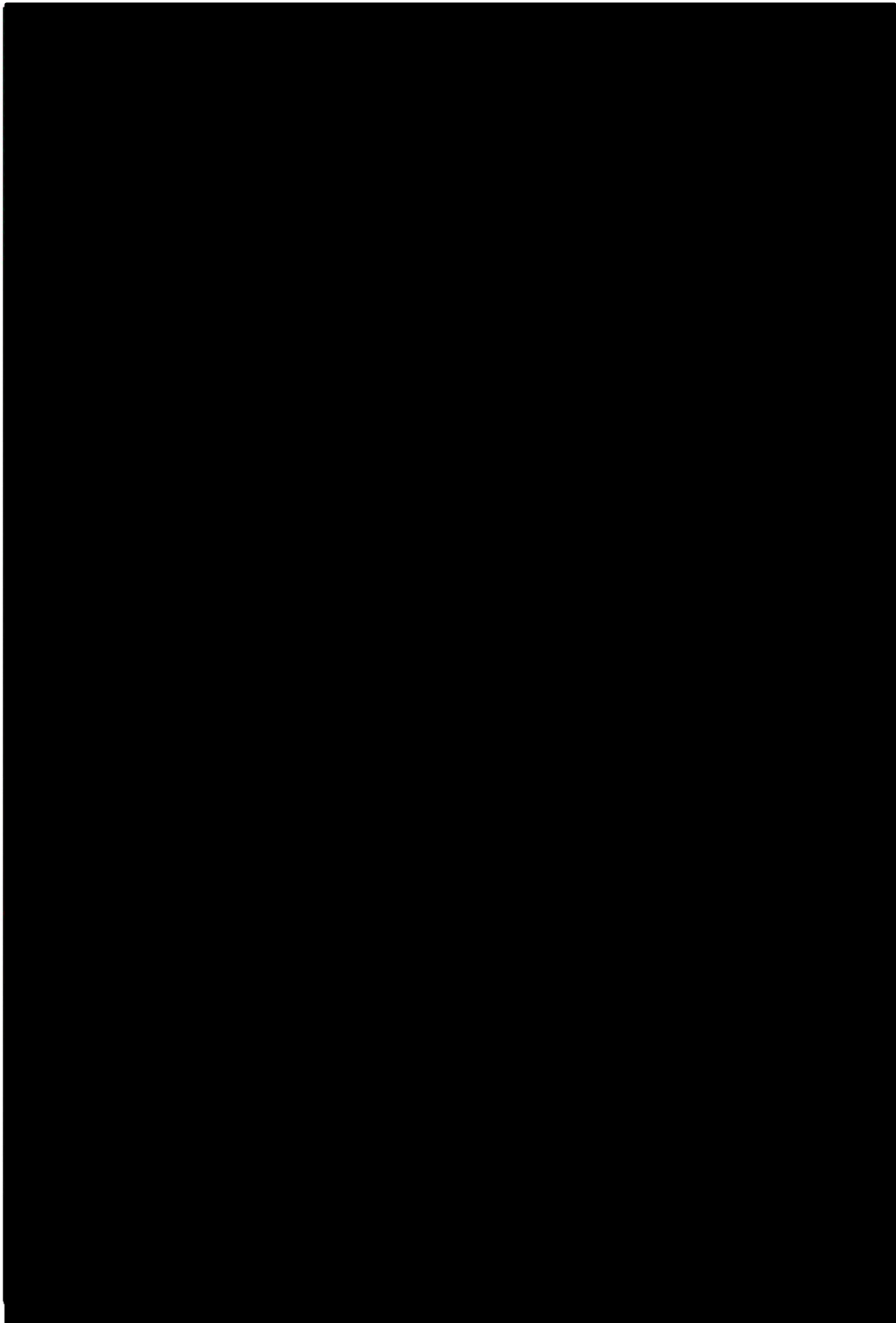


Figure 15: YTOF PAD 8

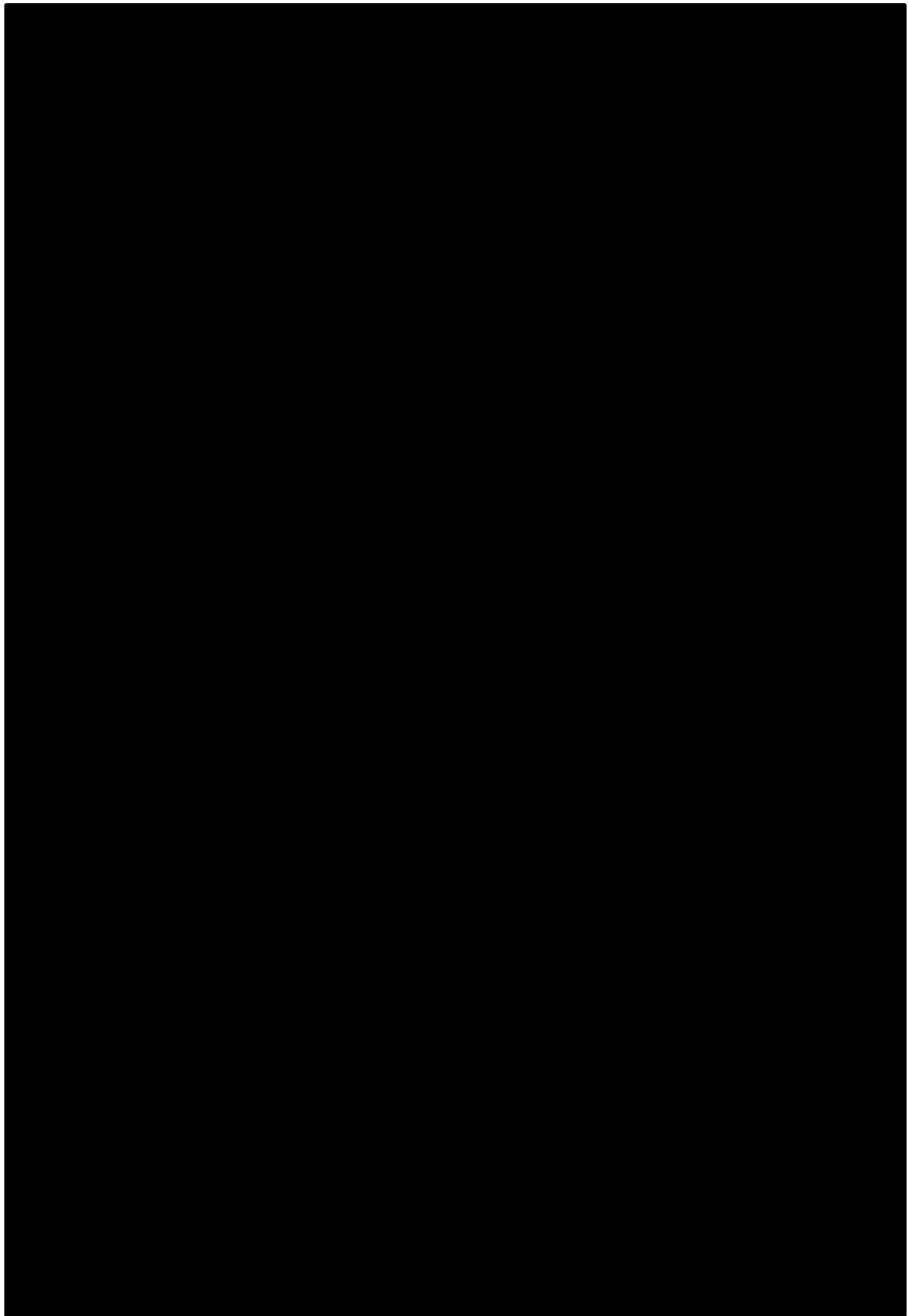
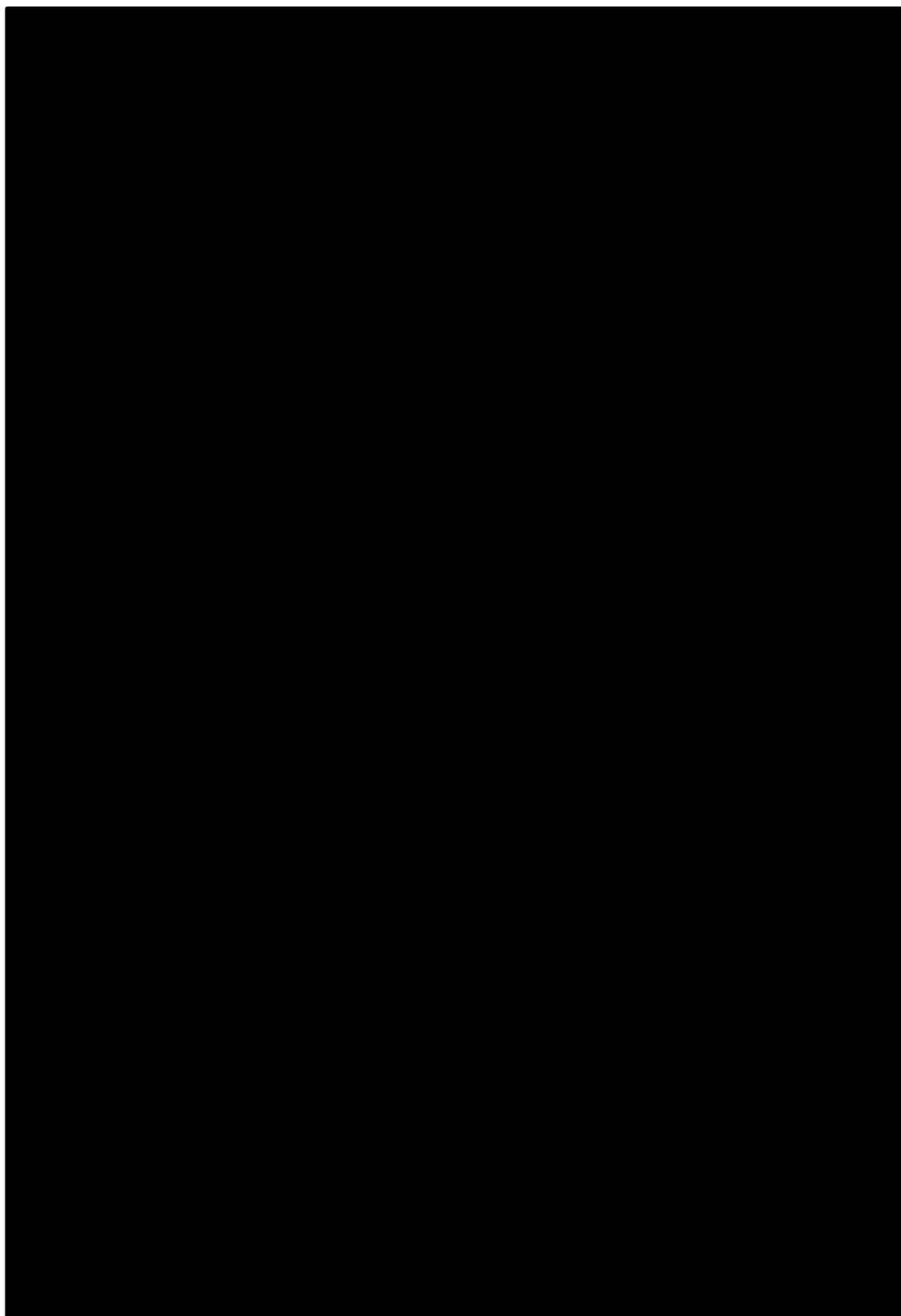


Figure 16: YTOF PAD 9



4.0 SIGNIFICANCE ASSESSMENT

4.1 Archaeological Significance

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised by using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

A summary of the archaeological significance values of each recorded site within and in the vicinity of the study area is outlined in Table 1 and discussed below.

Table 1: Significance assessment

Site	Research potential	Representativeness	Rarity	Education potential	Overall significance assessment
# 52-2-0512	low	low	moderate	low	low-moderate
YTOF AS 1	low	low	low	low	low
YTOF AS 2	low	low	low	low	low
YTOF AS 3	low	low	low	low	low
YTOF AS 4	moderate	moderate	low	moderate	moderate
YTOF AS 5	moderate	moderate	low	moderate	moderate
YTOF AS 6	low	low	low	low	low
YTOF AS 7	low	low	low	low	low
YTOF AS 8	low	low	low	low	low
YTOF IF 1	low	low	low	low	low
YTOF IF 2	low	low	low	low	low
YTOF IF 3	low	low	low	low	low
YTOF IF 4	low	low	low	low	low
YTOF PAD 3	moderate	unknown	unknown	unknown	unknown

Site	Research potential	Representativeness	Rarity	Education potential	Overall significance assessment
YTOF PAD 8	high	unknown	unknown	unknown	unknown
YTOF PAD 9	high	unknown	unknown	unknown	unknown
52-5-0473	low	low	low	low	low
52-5-0766	low	low	low	low	low
52-5-0227	low	low	low	low	low
HLA 2007	low	low	low	low	low

Low

YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 6, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, YTOF IF 4, AHIMS site # 52-5-0473, 52-5-0227, HLA 2007 and 52-5-0766 are assessed as demonstrating low archaeological significance.

AHIMS site # 52-5-0473, 52-5-0227, HLA 2007 and 52-5-0766 are all highly disturbed since their original recordings. Test excavation identified a low density artefact scatter at YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 6, YTOF AS 7 and YTOF AS 8. YTOF IF 1, YTOF IF 2, YTOF IF 3 and YTOF IF 4 are isolated artefacts. These sites are common within the regional context and do not provide opportunity for further research or education.

Low-moderate

AHIMS site # 52-2-0512 is assessed as demonstrating low-moderate archaeological significance.

AHIMS site # 52-2-0512 was originally identified by AMBS in 2006 as a surface scatter artefacts located on the Marshall Mount spur crest. Surface artefacts scatters are rare within the regional context. As such, AHIMS site # 52-2-0512 has been assessed as demonstrating moderate rarity value.

AHIMS site # 52-2-0512 only partially falls within the study area for this project. Test excavation identified that the portion of AHIMS site # 52-2-0512 which lies within the study area is a low density artefact scatter. As such, the portion of AHIMS site # 52-2-0512 which lies within the study area is assessed as having low research potential. AHIMS site # 52-2-0512 is therefore assessed as demonstrating low- moderate archaeological significance.

Moderate

YTOF AS 4 and YTOF AS 5 are assessed as demonstrating moderate archaeological significance. Both sites are moderately dense artefacts scatters and though they are common in the regional context. However, YTOF AS 4 and YTOF AS 5 present the opportunity to provide further information on Aboriginal activity in the region and contribute to the body of archaeological knowledge, due to the high densities of artefacts and specialised tools represented in the assemblages.

Unknown

YTOF PAD 3, YTOF PAD 8 and YTOF PAD 9 were not test excavated as Artefact Heritage was advised that these areas of PAD would no longer be impacted by the proposed works. YTOF PAD 3, YTOF PAD 8 and YTOF PAD 9 therefore remain of unknown archaeological significance. YTOF PAD 3, YTOF PAD 8, YTOF PAD 9 are outside the current project boundaries.

N/A (not applicable)

Assessment of the archaeological significance of YTOF CS 1 is not applicable as YTOF CS 1 is a cultural site, not an archaeological site.

4.2 Aesthetic value and significance

Aesthetic values refer to the sensory, scenic, architectural and creative aspects of the place. These values may be related to the landscape and are often closely associated with social/cultural values. Aesthetic values with regards to Aboriginal Heritage are distinct from those assessed in other technical reports which contribute to the EIS.

Much of the study area retains some aesthetic significance, particularly when juxtaposed with developed areas such as Albion Park to the southwest, Oak Flats to the east and Haywards Bay to the North. Major impacts to the aesthetic value of the study area generally concern the construction of roads and the low to medium intensity agricultural activity which has occurred in historic times.

The cleared, pastoral paddocks that dominate the study area would be reminiscent of the natural landscape, excepting the original vegetation and superficial impacts associated with agricultural activity.

Some drainage channels have been altered by historic agricultural works. However, creeks and many natural drainage channels remain within the study area. Very little native vegetation is present within the study area.

The study area as a whole has been assessed as demonstrating moderate aesthetic significance.

4.3 Cultural Significance Assessment (Waters Consultancy 2015)

The assessment of Aboriginal cultural heritage values was undertaken by Waters Consultancy through consultation with knowledge holders, as identified by the registered Aboriginal stakeholders, regarding historical and cultural values within the study area. Historical research has been undertaken to provide a contextual understanding to allow for the interpretation and assessment of the cultural information

4.3.1 Previous Historical and Cultural Assessment

No Aboriginal cultural assessment has previously occurred in relation to the Albion Park Rail bypass project.

During archaeological survey and assessment undertaken by Artefact Heritage in relation to this project a single cultural site was identified. This site was recorded as YTOF CS 1 in an October 2014 addendum report resulting from an expansion of the original study area.

Site YTOF CS 1 (not yet issued an AHIMS site number) is a cultural site within private property located in [REDACTED], in the far south-eastern corner of the project area. The site comprises an old growth fig tree located on a small terrace of a north facing slope (Plate 41). Troy Tungai of ILALC identified the tree as a women's site. Fig trees such as this have been identified as 'birthing trees', places of meeting for women where birthing and associated rituals took place within the local Illawarra context (Timberey- Bennett 2004).⁴⁰

⁴⁰ Artefact Heritage, *Albion Park Rail Bypass PACHCI Stage 2: Second Addendum*, Report to Roads & Maritime Services, October 2014, p.29.

This site is not located within the impact footprint. However, all six knowledge holders have identified the old growth fig tree, which constitutes this site, as holding cultural significance (see section 4.3.3 below).

4.3.2 What is cultural significance?

The concept of cultural significance encompasses all the cultural values and meanings that could potentially be recognised in a place. The cultural and natural values of a place are generally indivisible in the context of Aboriginal cultural heritage. The cultural values and meanings in a place can be both tangible and intangible.

Cultural significance is embodied in the place: in its tangible or physical form, in the wider cultural landscape that it is located in, in the ways in which the place is used or interacted with, and in the associations, stories, and meanings of the place to the people and community it holds significance for.

Aboriginal cultural heritage consists of any places and objects of significance to Aboriginal people because of their traditions, observances, lore, customs, beliefs and history. It provides evidence of the lives and existence of Aboriginal people before European settlement through to the present... For Aboriginal people, cultural heritage and cultural practices are part of both the past and the present and that cultural heritage is kept alive and strong by being part of everyday life (the Guide OEH 2011)

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all of the cultural values and meanings that might be recognised in a place. Cultural significance is often defined as the sum of the qualities or values that a place has with particular reference to the five values – aesthetic, historic, scientific, social and spiritual – that are listed in the *Burra Charter*.

The three key values in relation to Aboriginal cultural heritage assessments are the social, spiritual and historic. Social or cultural value refers to the associations that a place has for a particular community or cultural group and the resulting social or cultural meanings that it holds for them. It can encompass traditional, historical or contemporary associations. Spiritual value is often subsumed within the category of social or cultural value. It refers more specifically to the intangible values and meanings embodied or evoked by a place to a specific cultural group and that relate to that group's spiritual identity or traditional practices. Historic values refer to the associations of a place with an individual person, event, phase or activity that has historical importance to a specific community or cultural group.

Consultation with Aboriginal knowledge holders is a key component to the assessment of Aboriginal cultural heritage values. The assessment of Aboriginal cultural heritage values must be undertaken collaboratively with the Aboriginal community and identified Aboriginal knowledge holders. This is consistent with the guidelines for the assessment of Aboriginal cultural heritage produced by OEH (the Guide 2011) and the practice notes produced by the ICOMOS on the application of the *Burra Charter* to Indigenous heritage (ICOMOS 2013).

4.3.3 Identified areas of cultural significance

Within the specific study area consultation with the six knowledge holders has identified three areas of cultural significance as set out in Table 2 below.

Table 2: Summary of Significance of Identified Cultural Sites

Site Name	Description	Cultural significance
Site A: [REDACTED] Creek Cultural Site	A cultural site associated with the stones on the creek bed.	This area has High Significance as a site of cultural and spiritual significance as a place that embodies a cultural tradition. The site encompasses the tangible physical presence of the stones on the creek bed and the intangible associated cultural story that identifies the stones as holding the souls of departed individuals. The site is regarded as a 'no go' area.
Site B: Macquarie Rivulet Cultural Site	The Macquarie Rivulet, throughout its length, is a culturally significant waterway and associated resource zone.	The Macquarie Rivulet is of High Significance to the local Aboriginal community. The waterway and its adjacent resource areas hold high cultural significance for the local Aboriginal community. This cultural significance is a result of the waterway's association with traditional patterns of movement and resource use, with tangible evidence of Aboriginal occupation of the region, and with the intangible story lines that link the coast to the escarpment and the tablelands. The ongoing use of the waterway as a resource area contributes to its cultural significance as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.
Site C: YTOF CS 1	An old growth fig tree.	This site has Medium Significance for the Aboriginal community as an old growth fig tree. Old growth fig trees, as a class, hold cultural significance for the Aboriginal community of the region being understood variously as resource trees and as places associated with childbirth rituals.

The three areas of cultural significance listed in Table 2 are outlined in detail below.

4.3.4 Site A: [REDACTED] Creek Cultural Site

Location: [REDACTED]
[REDACTED]
[REDACTED]

Description: This cultural site is associated with the stones on the creek bed. It has been identified [REDACTED] as a cultural avoidance site or 'no go' area taught to them by their grandparents. The cultural story associated with this site identifies the stones that lie on the creek bed in this area as holding the souls of departed individuals, *"The stones hold the souls."*⁴¹ The site is regarded as a 'no go' area due to the nature of the individuals whose souls are held in the stones.

*The stones hold the departed souls of 'yeo' devil people, that's why this area is called 'yallah-yeo', 'yallah' means 'go away'. We were told never to collect any food, anything, there.*⁴²

*When the water is about is when the old people believed that it was most dangerous, it's when the souls were most known to linger and taunt the living.*⁴³

Significance: This area has High Significance as a site of cultural and spiritual significance as a place that embodies a cultural tradition. The site encompasses the tangible physical presence of the

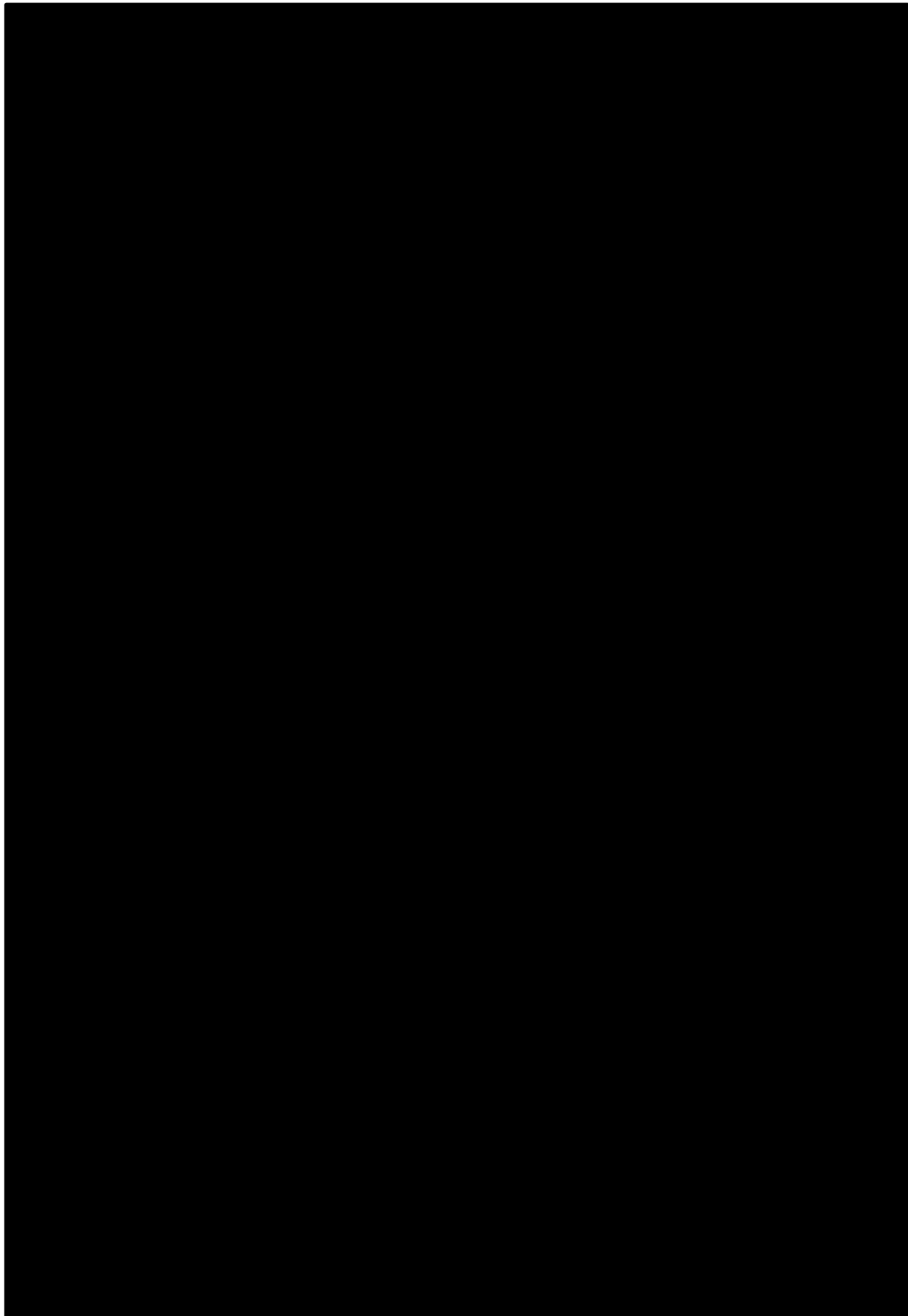
⁴¹ Interview with Richard Campbell, 12th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴² Interview with Aaron Broad, 12th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴³ Interview with Aaron Broad, 12th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

stones on the creek bed. The cultural and spiritual significance of the site results from the intangible cultural tradition embodied by the stones and the creek bed in which they lay.

Figure 17: Site A: [REDACTED] Creek Cultural Site



4.3.5 Site B: Macquarie Rivulet Cultural Site

Location: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Description:

The Macquarie Rivulet was identified by all the knowledge holders spoken with as an area of high cultural significance;

*The whole lot of the Rivulet is significant... around the water areas there is significance to Koori people.*⁴⁴

*Macquarie Rivulet is a very sacred place. People camped all along there [pre invasion].*⁴⁵

*It's always the river, the rivulet, that's important.*⁴⁶

*It's important from the entrance at Lake Illawarra all the way up to the escarpment.*⁴⁷

The Macquarie Rivulet holds cultural significance as a result of its association with traditional patterns of movement, camping and resource use.

*That whole waterway, that river, was a significant food bowl all the way from the lake back. They have put weirs in there and some of that watercourse has changed from its original course. At the base of the mountain that watercourse is still very much original.*⁴⁸

The Macquarie Rivulet is understood as the local focus point for a traditional pattern of seasonal movement from the coast up onto the escarpment and the highlands and extending into the St. George's River area.

*They went from the Macquarie Rivulet, worked their way up onto the escarpment and then right up to Saltpan - if there was a ceremonial thing on or they were trading, they had to be invited into the area - and then up to Moss Vale way and then they'd come back round to the rivulet.*⁴⁹

This traditional cycle of movement, associated with resource use and management, holds cultural importance as it embodies traditional patterns of life, knowledge of country, and links with neighbouring cultural groups.

⁴⁴ Interview with Allan Max Carriage, 24th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴⁵ Interview with Reuben Brown and Gwen Brown nee Bell, 9th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴⁶ Interview with Roy 'Dootch' Kennedy, 9th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴⁷ Interview with Richard Campbell & Aaron Broad, 12th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

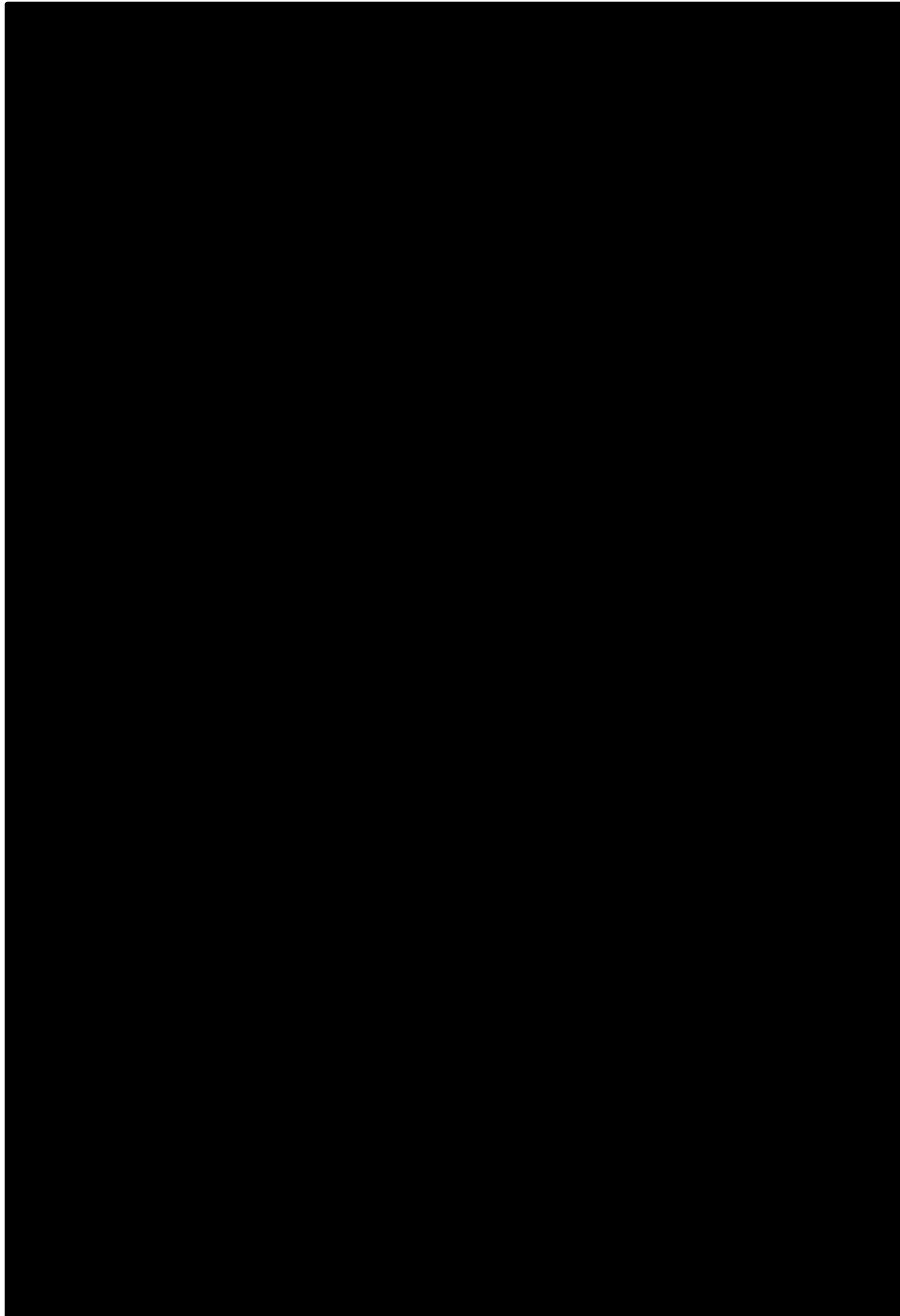
⁴⁸ Interview with Roy 'Dootch' Kennedy, 9th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

⁴⁹ Interview with Reuben Brown, 9th February 2015, Albion Park Rail Bypass Road and Maritime Services Project, Waters Consultancy Pty Ltd.

They moved with their seasons and their clans... They'd go round in a circle, start here at the rivulet, build a camp where the food all was and then go all the way round... they always followed the food.⁵⁰

Because people camped all the way along there and the pathways they came all the way down from the escarpment.⁵¹

Figure 18: Site B: Macquarie Rivulet Cultural Site. Purple area defines the area of the cultural site within the potential impact zone. The red star located on the southern bank is the location of the old growth eucalypt.



⁵⁰ Interview with Reuben Brown, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

⁵¹ Interview with Richard Campbell, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

Figure 19: Reed beds along the Macquarie Rivulet⁵²



Figure 20: Macquarie Rivulet, looking north west from the Darcy Dunster Reserve⁵³



Figure 21: Macquarie Rivulet, looking north from the Darcy Dunster Reserve⁵⁴

⁵² Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

⁵³ Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.



The Macquarie Rivulet has continued to be used as a resource area for the local Aboriginal community,

That area is very special cause I used to go there a lot fishing, I took all my boys there fishing. When I was a kid I used to fish on there but down towards the lake, that's where you get the blood mussels (cockles) too, down in the sea weed, the lake weed. There's middens all along the rivulet. There's a lot of fish all around here. You go up this creek, there's freshwater marrons up there, at each waterhole.⁵⁵

This continuity of use contributes to the cultural significance of the site as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.

All of the knowledge holders spoken with referred to the presence of middens associated with the Macquarie Rivulet. In some instances reference was made to specific midden sites whilst in others more general reference was made to the presence of middens. The specific middens referred to were not located within the area of the Macquarie River Cultural Site that lies within the current project's impact zone.

The tangible evidence of Aboriginal occupation of the region that is provided by the middens and shell scatters that are known to the Aboriginal community and those that have been archaeologically recorded in the area⁵⁶ contribute further to the significance of the Macquarie Rivulet.

⁵⁴ Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

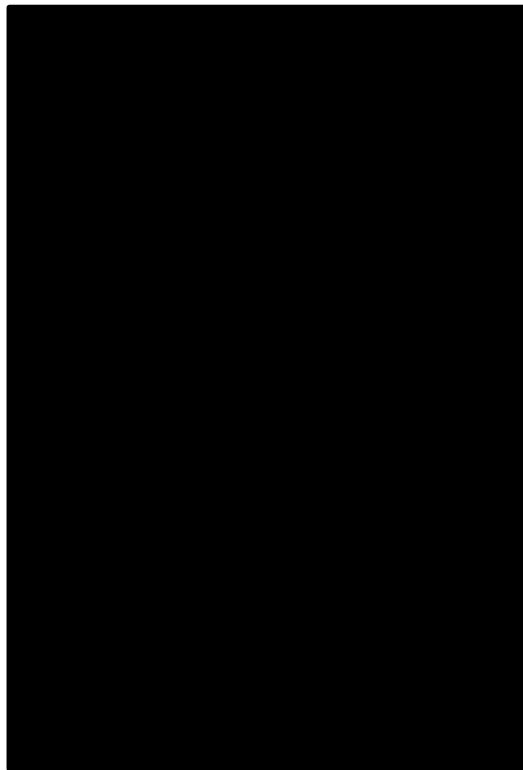
⁵⁵ Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

⁵⁶ See for example NPWS Site Recording forms 52-5-0474 ; 52-5-0475 ; 52-5-0476 ; 52-5-0481 ; 52-5-0482 all located within the Larkins Lane subdivision ; 52-5-229 adjacent to the Macquarie Rivulet on the east side of the Princes Highway ; 52-5-0227 located within Darcy Dunster Reserve ; 52-5-1803 on the Macquarie Rivulet at Haywards Bay ; 52-5-0728 on Yallah Bay Road ; 52-5-0766 on the south side of Darcy Dunster Reserve.

Figure 22: The Macquarie Rivulet, looking east from the Darcy Dunster Reserve⁵⁷



Figure 23: Old Growth Eucalypt, Macquarie Rivulet⁵⁸



⁵⁷ Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

⁵⁸ Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

The retention of any tangible cultural material on site was considered to be culturally appropriate by all the knowledge holders. To facilitate this it has been recommended that the topsoil from the impacted area of the cultural site be removed and stockpiled during the construction process. The knowledge holders request that the topsoil be stockpiled on or adjacent to the cultural site. At the completion of construction activities it is recommended that the topsoil be returned to the cultural site and utilised in the landscaping and revegetation of the area. The knowledge holders have requested that the revegetation of the area be undertaken with locally Indigenous plant species.

Significance: The Macquarie Rivulet is of High Significance to the local Aboriginal community. The waterway and its adjacent resource areas hold high cultural significance for the local Aboriginal community. This cultural significance is a result of the waterway's association with traditional patterns of movement and resource use, with tangible evidence of Aboriginal occupation of the region, and with the intangible story lines that link the coast to the escarpment and the tablelands. The ongoing use of the waterway as a resource area contributes to its cultural significance as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.

Archaeological potential of the Macquarie Rivulet area, including potential for burials to occur (Artefact Heritage): PACHCI Stage 2 investigations of the Albion Park Rail Bypass project did not identify any areas of archaeological potential associated with the Macquarie Rivulet area due to the significant flood events that occur in that area.

The results of geotech results across the Macquarie Rivulet area demonstrate varying depths of alluvium. Borehole 223 (BH223), located on the northern side of Macquarie Rivulet, showed alluvium to a depth of 15 metres overlying bedrock. The northern side of Macquarie Rivulet is a slightly lower than the southern side. BH319, Test Pit 318a (TP318a) and BH103 were located on the southern side of Macquarie Rivulet and near the break of slope between the gently slope bordering Macquarie Rivulet and higher flat land immediately to the south. Borehole and test pits across that area demonstrated clay residual soil to a depth of around 2.5 to three metres. Further to the south on the high flat area adjacent to the Illawarra Highway, BH319 encountered clay residual soil down to bedrock at 2.8 metres.

These results suggest that where floodwaters are likely to be more frequent, deeper and remain for longer time periods, alluvium is extremely deep (15 metres). On the southern bank of Macquarie Rivulet where flooding activity is likely to be frequent but not remain for such a long period of time alluvium is shallower and generally consists of clay. The higher flat terrain to the south would be flooded less frequently and only in major events. Residual soil in those areas consists of clay and is generally shallow.

The presences of AHIMS site 52-5-0227 demonstrates although sub-surface artefacts may be present in the area, the high level of disturbance and the alluvial context mean that they are likely to have been redeposited. Kelleher Nightingale Consulting (KNC) recently undertook an assessment of Aboriginal cultural heritage along the banks of the Hawkesbury River for the Windsor Bridge Replacement project. It was determined that collections of artefacts in active floodplain environments are likely to become archaeologically dilute due to aggrading processes (increased deposition of sediment) and/or displacement by flood events. This means that the integrity of single artefacts can never be certain and such environments therefore offer low levels of archaeological significance (KNC 2012: 12). Potential Aboriginal burials in the area may also have been affected by flooding events, with the possible redistribution of skeletal material and/or mixing of remains amongst the alluvial soils.

4.3.6 Site C: YTOF CS 1

Location: [REDACTED]

Description: An old growth fig tree located on private property outside the project boundary. All of the knowledge holders spoken with expressed the understanding that all old growth fig trees within the region were of cultural significance. The cultural value of old growth fig trees was understood by some knowledge holders to stem from an association with childbirth rituals.⁶⁰

Fig trees we were taught very young, there was three at La Perouse near where the tram used to terminate, three big fig trees, Granny Cook who was a midwife, whenever children were born there was a mark put on to signify their birth. That happened down here too. Two at Fig Tree, two at Primbee, and another one further south towards Gerringong. In just about every town, or close to, there's one of those fig trees that has those marks.⁶¹

For other knowledge holders old growth fig trees held cultural significance as resource trees.

Fig trees were places for rest and protection.⁶²

Wild fig trees is what they used to eat for their bowels... there's two big fig trees down at Killalea the same, that's where Wonganloo died there, in his daughter's arms, right down that end towards the south.⁶³

It is noted that these two understandings of the cultural value of old growth fig trees, as resource trees and as places associated with childbirth rituals, are mutually compatible. The cultural significance attached to this site was not based on knowledge of the specific tree but on the cultural values attached to all similar old growth fig trees in the region.

Significance: This site has Medium Significance for the Aboriginal community as an old growth fig tree. Old growth fig trees, as a class, hold cultural significance for the Aboriginal community of the region.

⁵⁹ Note that the location of this site is based on its mapping by Artefact Heritage, *Second addendum to the PACHCI Stage 2 archaeological survey report for the Albion Park Rail Bypass Project*, October 2014, p.37.

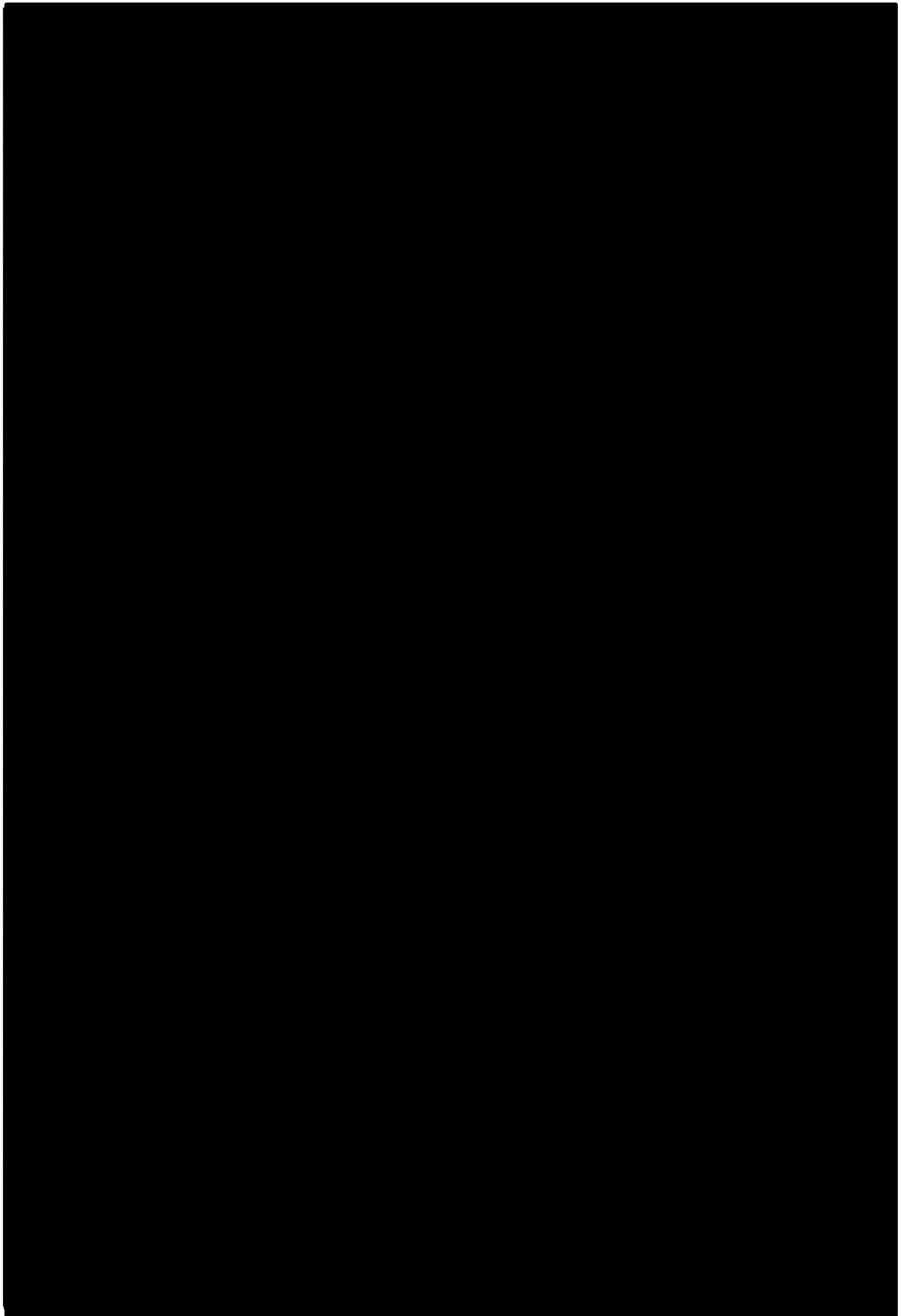
⁶⁰ Interview with Richard Campbell and Aaron Broad, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd. Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

⁶¹ Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

⁶² Interview with Allan Max Carriage, 24th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

⁶³ Interview with Gwen Brown nee Bell, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

Figure 24: Site C: YTOF CS 1 Old Growth Fig Tree.



4.4 Overall statement of significance

YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 6, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, YTOF IF 4, AHIMS site # 52-5-0473, 52-5-0227, HLA 2007 and 52-5-0766 have been assessed as demonstrating low archaeological significance.

AHIMS site # 52-2-0512 is assessed as demonstrating low-moderate archaeological significance.

YTOF AS 4 and YTOF AS 5 are assessed as demonstrating moderate archaeological significance.

YTOF PAD 3 has unknown archaeological significance as it was not subject to test excavation, following advice that it would not be impacted by the proposed works.

The archaeological significance of YTOF CS 1 has not been assessed as YTOF CS 1 is a cultural site, not an archaeological site.

Cultural Sites A (██████ Creek Cultural Site) and B (Macquarie Rivulet Cultural Site) have been assessed in the Aboriginal cultural assessment report (Waters Consultancy 2015) as demonstrating high cultural significance. Cultural Site C (YTOF CS 1) has been assessed as demonstrating medium cultural significance.

5.0 AVOIDING AND MINIMISING HARM

5.1 Summary of impacts to archaeological sites

Roads and Maritime has advised that there will be impacts to 13 identified Aboriginal sites within the study area. A summary of impacted sites from north to south through the study area is outlined below:

- YTOF AS 2 and YTOF AS 7 are located within the project boundaries and would be impacted due to the proposed realignment of Yallah Road.
- AHIMS site # 52-5-0484/ 52-2-0512, 52-5-0227 and site 52-5-0766 are located within the project boundaries and would be impacted due to the proposed motorway alignment
- YTOF AS 3 and YTOF AS 8 are located within the project boundaries and would be impacted by relocation of parts of the Croom Regional Sporting Complex.
- YTOF IF1 and the western portion of YTOF AS 4 are located within the within the project boundaries. YTOF IF 1 will be impacted due to the proposed road alignment and YTOF AS 4 will be partially impacted.
- YTOF IF2, YTOF IF3 and YTOF AS 1 are located within the proposed road alignment and will be impacted.
- YTOF AS 5 is located within an area identified as a potential stockpile and compound site and will be impacted by these activities.

5.2 Archaeological sites that will not be impacted

Roads and Maritime have taken into consideration the location of identified Aboriginal site and areas of PAD during the design process adjusted the project boundaries to avoid impact to the following sites:

- AHIMS site # 52-5-0473 (Larkins Lane property)
- IF 4 (Frazers Creek floodplain)
- YTOF AS 6 (Oak Flats)
- YTOF PAD 3 (Roads and Maritime advised prior to test excavation that this area of PAD would not be impacted)
- YTOF PAD 8
- YTOF PAD 9
- HLA 2007 (Frazers Creek)

5.3 Summary of impacts

The assessment of impact is summarised in Table 3.

Table 3: Summary of impacts

Site number/name	Type of harm	Degree of harm	Consequence of harm
52-5-0484/ 52-2-0512	direct	partial	partial loss of value
YTOF AS 1	direct	total	total loss of value
YTOF AS 2	direct	partial	partial loss of value
YTOF AS 3	direct	total	total loss of value
YTOF AS 4	direct	partial	partial loss of value
YTOF AS 5	direct	total	total loss of value
YTOF AS 6	none	none	no loss of value
YTOF AS 7	direct	total	total loss of value
YTOF AS 8	direct	total	total loss of value
YTOF IF1	direct	total	total loss of value
YTOF IF 2	direct	total	total loss of value
YTOF IF 3	direct	total	total loss of value
YTOF IF 4	none	none	no loss of value
YTOF PAD 3	none	none	no loss of value
YTOF PAD 8	none	none	no loss of value
YTOF PAD 9	none	none	no loss of value
52-5-0227	direct	total	total loss of value
52-5-0766	direct	total	total loss of value
52-5-0473	none	none	no loss of value
HLA 2007	none	none	no loss of value

5.4 Summary of impacts to areas of cultural heritage significance (Waters Consultancy 2015)

Waters Consultancy (2015) has identified that one identified area of high cultural significance will be impacted by the proposal:

- Site B: Macquarie Rivulet Cultural Site

The Macquarie Rivulet Cultural Site is located at the proposed bridge crossing of Macquarie Rivulet.

One area of identified high cultural significance and one area of medium cultural significance will not be impacted by the proposal:

- Site A: [REDACTED] Creek Cultural Site (high cultural significance)
- Site C: YTOF CS1 (medium cultural significance)

5.5 Consideration of alternatives and justification of impacts

Impacts to Aboriginal cultural heritage values have been considered during the planning stage of the proposed works and archaeological test excavation has further investigated the nature and extent of subsurface archaeology.

The proposed works are deemed necessary by Roads and Maritime to provide a long term solution for an upgrade of the Princes Motorway. The study area is within a locality that is undergoing rapid development. The study area is partly within the West Dapto Release Area. Development projects that are associated with this area include water and wastewater infrastructure provision by the Sydney Water Corporation.

This CHAR and test excavation has confirmed that the proposed works will not impact on areas of high scientific significance.

Cultural significance of the study area has been assessed through consultation with registered Aboriginal stakeholders as part of preparation of the Specialist Aboriginal Cultural and Historical Assessment Report (Waters Consultancy 2015). That assessment identified three areas of cultural significance, of which one area of high cultural significance (Macquarie Rivulet Cultural Site). The Specialist Aboriginal Cultural and Historical Assessment Report (see Appendix A) identifies measures to mitigate impact to that site that were developed in consultation with Aboriginal stakeholders.

5.6 Ecologically Sustainable Development principles

In accordance with the Guide, Ecologically Sustainable Development principles have been considered in preparation of this CHAR, including options to avoid impacts to Aboriginal cultural heritage, assessment of unavoidable impacts, identification of mitigation and management measures, and taking account of Aboriginal community views.

The principles of Ecologically Sustainable Development are detailed in the NSW *Protection of the Environment Administration Act 1991*. Ecologically Sustainable Development principles relevant to assessment of the current proposal as it relates to Aboriginal cultural heritage are considered below.

5.6.1 The integration principle

Decision-making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations (the 'integration principle'). The proposal would comply with the Integration Principle in regard to Aboriginal heritage. The Aboriginal heritage values of the study area have been considered as part of the planning process for the proposed works. Throughout the development of concept designs for this project, Roads and Maritime have used the findings of the ASR and subsequent addendums to inform placement of the proposed motorway and ancillary facilities. As a result of this, eight sites which were within the original study area are now outside and will not be impacted (AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1). Archaeological test excavation was

conducted in order to identify whether the proposed works will impact on any areas of high archaeological significance, and found that it would not.

Roads and Maritime engaged Waters Consultancy to prepare a Specialist Aboriginal Cultural and Historical Assessment Report (see Appendix A). That report identified three areas of cultural significance, including one area of high cultural significance that will be impacted by the proposal. Through consultation with Aboriginal stakeholders Waters Consultancy outlines a series of measures to mitigate impact to that area of high cultural significance.

5.6.2 The precautionary principle

If there are threats of serious or irreversible environmental damage, lack of full scientific confidence should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle').

Twelve Aboriginal sites would be impacted by the proposed works. For several of these sites, scientific confidence was achieved through assessment of prior research and/or through observations made during site survey (52-5-0227, 52-5-0766, YTOF IF 1, YTOF IF 2, YTOF IF 3, YTOF AS 1 and YTOF AS 2). 52-5-0227, 52-5-0766, YTOF IF 1, YTOF IF 2, YTOF IF 3, YTOF AS 1 and YTOF AS 2 have been assessed as demonstrating low archaeological significance.

Three sites which are to be impacted required further investigation in order to achieve scientific confidence (YTOF AS 3, YTOF AS 7 and YTOF AS 8). Archaeological test excavation was necessary to inform the assessment of archaeological significance and management and mitigations measures for these sites. Following archaeological test excavation YTOF AS 3, YTOF AS 7 and YTOF AS 8 were assessed as demonstrating low archaeological significance.

Archaeological test excavation was also necessary to achieve scientific confidence regarding AHIMS site # 52-2-0512 YTOF AS 4 and YTOF AS 5. Following archaeological test excavation, AHIMS site # 52-2-0512 was assessed as demonstrating low-moderate archaeological significance and YTOF AS 4 was assessed as demonstrating moderate archaeological significance.

Throughout the development of concept designs for this project, Roads and Maritime have used the findings of the ASR and subsequent addendums to inform placement of the proposed motorway and ancillary facilities. As a result of this, six sites which were within the original study area are now outside and will not be impacted (AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF IF 4, YTOF AS 6 and YTOF CS 1).

5.6.3 The principle of intergenerational equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'principle of intergenerational equity'). 52-5-0227, 52-5-0766, YTOF IF 1, YTOF IF 2, YTOF IF 3, YTOF AS 1 and YTOF AS 2 have been assessed as demonstrating low archaeological significance.

Test excavation identified that the archaeological deposits at YTOF AS 3, YTOF AS 7 and YTOF AS 8 are low density subsurface artefact scatters that are common in the local region and present no further potential for research or education. Test excavation has adequately captured the nature and extent of subsurface archaeological deposits at these sites, and has informed the assessment of these sites as also demonstrating low archaeological significance.

Archaeological test excavation also informed the assessment of AHIMS site # 52-2-0512 as demonstrating low-moderate archaeological significance. AHIMS site # 52-2-0512 is rare in the regional context as it was originally identified as a surface artefact scatter. However, test excavation

identified that the portion of the site which falls within the study area is characterised as a low density subsurface artefact scatter that presents no further potential for research or education. Test excavation has adequately captured the nature and extent of subsurface archaeological deposits at this site.

Archaeological test excavation also informed the assessment of YTOF AS 4 and YTOF AS 5 as demonstrating moderate archaeological significance. Both sites are moderately dense artefact scatters. Though this site type is common in the regional context, they present the opportunity for further research. It is unlikely that test excavation has adequately captured the nature and extent of subsurface archaeological deposits at these sites.

No sites of high archaeological significance will be impacted by the proposed works. Management and mitigation measures for sites which are to be impacted by the proposed works are detailed in section 5.5.

Eight Aboriginal sites which were a part of earlier investigations will no longer be impacted by the proposed works. As such, AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1 will be protected for the benefit of future generations and further research.

Roads and Maritime engaged Waters Consultancy to prepare an Aboriginal Cultural Assessment Report (see Appendix A). That report identified three areas of cultural significance, including one area of high cultural significance that will be impacted by the proposal. Through consultation with Aboriginal stakeholders Waters Consultancy outlines a series of measures to mitigate impact to that area of high cultural significance.

5.6.4 Conservation of biodiversity

Cultural values of biodiversity are intertwined with the lives of Aboriginal people and their use of the landscape. Biological impacts of the project are considered in separate technical report.

5.6.5 Improved valuation, pricing and incentive mechanisms

Roads and Maritime are committed cultural heritage protection as a key component of project development. The costs and time required to ensure these high standards of assessment and protection measures are maintained are a standard part of road infrastructure planning. Roads and Maritime strive to comprehensively assess impacts, avoid impacts (where feasible), work with the community, and implement mitigation and management measures which strike a balance between meeting the state's infrastructure needs and the protecting Aboriginal heritage values, for the betterment of all.

5.7 Management and mitigation measures

5.7.1 Archaeological sites

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved. As such, the current project boundary has been developed to avoid impacts to Aboriginal sites wherever possible. Eight sites (AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4 and YTOF AS 6) will no longer be impacted by the proposed works.

Where unavoidable impacts occur then measures to mitigate and manage impacts are proposed. Mitigation measures primarily concern preserving the heritage values of sites beyond the physical

existence of the site. The most common methods of this involve detailed recording of Aboriginal objects, archaeological test and salvage excavations, artefact analysis and, where appropriate, reburial of Aboriginal objects in a location determined by the registered Aboriginal stakeholders.

Mitigation measures vary depending on the assessment of archaeological significance of a particular Aboriginal site and are based on its research potential, rarity, representativeness and educational value. In general, the significance of a site would influence the choice of preferred conservation outcomes and appropriate mitigation measures, usually on the following basis:

- **Low archaeological significance**- Conservation where possible, but usually no mitigation required if impacts are unavoidable.
- **Moderate archaeological significance**- Conservation where possible. If conservation is not practicable, salvage excavations or similar mechanisms determined in consultation with the Aboriginal community may be necessary.
- **High archaeological significance**- conservation as a priority. Only if all practicable alternatives have been exhausted would impacts be considered justified. Comprehensive salvage excavations may be necessary.

The proposed works are likely to have an unavoidable impact on 13 sites. Of those:

- Ten sites have been assessed as demonstrating low archaeological significance (YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0766 and 52-5-0227)
- One site is of low-moderate archaeological significance (AHIMS site # 52-2-0512)
- Two sites are of moderate archaeological significance (YTOF AS 4 and YTOF AS 5).

Given these findings, consideration of ESD principles, the views of the registered Aboriginal stakeholders, and the lack of practicable alternatives to avoid impacts, the recommended mitigation and management measures are presented in Table 3.

In particular, it is recommended that if the project proceeds and unavoidable impacts will occur, no further mitigation measures are required at AHIMS site # 52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0766 and 52-5-0227.

Should the project proceed, salvage excavation at YTOF AS 4 and YTOF AS 5 is recommended in order to mitigate against impacts at these sites.

Table 4: Summary of impacts and mitigation and management recommendations for all sites (impacted sites highlighted)

Site name	Site type	Significance	Type of harm	Degree of harm	Mitigation/Management
					None (all data available from the site has been retrieved)
52-2-0512	Artefact	Low-moderate	Direct	Partial	Submit site impact recording form to AHIMS following impacts High visibility fencing required during construction works for portion of site not within the study area

Site name	Site type	Significance	Type of harm	Degree of harm	Mitigation/Management
YTOF AS 1	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts
YTOF AS 2	Artefact	Low	Direct	Partial	High visibility fencing required during construction works for portion of site not within the study area Submit site impact recording form to AHIMS following impacts
YTOF AS 3	Artefact	Low	Direct	Total	None (all data available from the site has been retrieved) Submit site impact recording form to AHIMS following impacts
YTOF AS 4	Artefact	Moderate	Direct	Partial	Salvage excavation if impacts are unavoidable High visibility fencing required during construction works for portion of site not within the study area
YTOF AS 5	Artefact	Moderate	Direct	Total	Salvage excavation if impacts are unavoidable
YTOF AS 6	Artefact	Low	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works
YTOF AS 7	Artefact	Low	Direct	Total	None (all data available from the site has been retrieved) Submit site impact recording form to AHIMS following impacts High visibility fencing required during construction works for portion of site not within the study area
YTOF AS 8	Artefact	Low	Direct	Total	None (all data available from the site has been retrieved) Submit site impact recording form to AHIMS following impacts
YTOF IF 1	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts
YTOF IF 2	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts
YTOF IF 3	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts

Site name	Site type	Significance	Type of harm	Degree of harm	Mitigation/Management
YTOF IF 4	Artefact	Low	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works
YTOF PAD 3	PAD	Unknown	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works
YTOF PAD 8	PAD	Unknown	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works
YTOF PAD 9	PAD	Unknown	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works
52-5-0227	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts
52-5-0766	Artefact	Low	Direct	Total	None Submit site impact recording form to AHIMS following impacts
52-5-0473	Artefact	Low	None	-	Site likely to have been impacted by housing works on Larkins Lane. Include location of site in CEMP
HLA 2007	Artefact	Low	None	-	Include location of site in CEMP to ensure no inadvertent impacts during construction works

5.7.2 Areas of identified cultural significance

Within the specific study area consultation with the six knowledge holders has identified three areas of cultural significance as set out in Table 5 below.

Table 5: Summary of Significance of Identified Cultural Sites (impacted sites highlighted)

Site Name	Description	Cultural significance
Site A: [REDACTED] Creek Cultural Site	A cultural site associated with the stones on the creek bed.	This area has High Significance as a site of cultural and spiritual significance as a place that embodies a cultural tradition. The site encompasses the tangible physical presence of the stones on the creek bed and the intangible associated cultural story that identifies the stones as holding the souls of departed individuals. The site is regarded as a 'no go' area.

Site Name	Description	Cultural significance
Site B: Macquarie Rivulet Cultural Site	The Macquarie Rivulet, throughout its length, is a culturally significant waterway and associated resource zone.	The Macquarie Rivulet is of High Significance to the local Aboriginal community. The waterway and its adjacent resource areas hold high cultural significance for the local Aboriginal community. This cultural significance is a result of the waterway's association with traditional patterns of movement and resource use, with tangible evidence of Aboriginal occupation of the region, and with the intangible story lines that link the coast to the escarpment and the tablelands. The presence of historical burials along the Macquarie Rivulet, though the specific locations are unknown, contributes to its cultural significance. The ongoing use of the waterway as a resource area contributes to its cultural significance as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.
Site C: YTOF CS 1	An old growth fig tree.	This site has Medium Significance for the Aboriginal community as an old growth fig tree. Old growth fig trees, as a class, hold cultural significance for the Aboriginal community of the region being understood variously as resource trees and as places associated with childbirth rituals.

Specific site based actions and mitigation measures have been recommended in relation to two of the three identified cultural sites within the study area, these are set out in Table 6 on the following pages.

Table 6: Recommended Site Specific Actions and Mitigations for Cultural Sites

Site Name	Description	Cultural Heritage Significance	Impact? Yes/No	Action	Mitigation
Site A: [REDACTED] Creek Cultural Site	A cultural site associated with the stones on the creek bed.	High	No	In relation to Site A: [REDACTED] Creek Cultural Site it is recommended that: 1) Temporary fencing be erected between the zone of construction activity and the site. 2) That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).	In relation to Site A: [REDACTED] Creek Cultural Site no mitigation is recommended as there is no known impact.
Site B: Macquarie Rivulet Cultural Site	The Macquarie Rivulet, throughout its length, is a culturally significant waterway and associated resource zone.	High	Yes	It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that: 1) Temporary fencing be erected between the zone of construction activity and the old growth eucalypt located within this site. 2) That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).	It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occurs as follows: 1) Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with RMS guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area. 2) Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works. 3) The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution to local libraries and educational institutions. The final content of the booklet to be

Site Name	Description	Cultural Heritage Significance	Impact? Yes/No	Action	Mitigation
					developed in consultation with the Aboriginal knowledge holders. 4) The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.
Site C: YTOP CS 1	An old growth fig tree.	Medium	No	In relation to Site C: YTOP CS 1 no actions are recommended as there is no known impact.	In relation to Site C: YTOP CS 1 no mitigation is recommended as there is no known impact.

5.8 Proposed management policy for Aboriginal heritage

5.8.1 Salvage excavation

Archaeological salvage excavation would be conducted at sites YTOF AS 4 and YTOF AS5 to mitigate impacts. A salvage excavation methodology is included in Section 6.

5.8.2 Site A: [REDACTED] Creek Cultural Site

Waters Consultancy (2015) recommended in relation to Site A: [REDACTED] Creek Cultural Site that the following management measures are enacted during neighbouring construction works:

- Temporary fencing be erected between the zone of construction activity and the site.
- That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).

5.8.3 Site B: Macquarie Rivulet Cultural Site

Waters Consultancy (2015) recommend in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occur as follows:

- Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with RMS guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area.
- Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works.
- The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution to local libraries and educational institutions. The final content of the booklet to be developed in consultation with the Aboriginal knowledge holders.
- The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.

5.8.4 Construction Environment Management Plan (CEMP) and unexpected finds procedure

A CEMP and accompanying unexpected finds procedure will provide a method to manage potential heritage constraints and unexpected finds during construction works. Aspects of site and cultural area protection that should be included in the CEMP include:

- Establishing no-harm areas where appropriate. Depending on the nature and timing of works in the vicinity of identified Aboriginal sites or cultural areas that will not be impacted by the proposed works, it may be appropriate to establish visual markers around no-harm areas to avoid inadvertent impacts.
- Nature of the visual markers around no-harm areas. The CEMP should document what type of visual marker will be put in place, such as temporary fencing, high visibility tape, and temporary signage.
- Provide clear guidance to all site workers on access restrictions to no-harm areas.
- Unexpected finds procedure in accordance with the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.

Addition from Waters Consultancy (2015) – In addition it is recommended that an Aboriginal Heritage Management Plan (AHMP) should be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The AHMP should provide specific guidance on measures and controls to be undertaken to avoid and mitigate impacts on Aboriginal cultural heritage during construction. Measures and controls should include protection measures to be applied during construction, including but not limited to the Actions recommended in Table 6, contractor training in general Aboriginal cultural heritage awareness, and any on-going opportunities for Aboriginal community engagement. It is recommended that the cultural heritage consultant (Waters Consultancy) be present at the contractor inductions in relation to those components of the project that include the three identified cultural sites.

5.8.5 Discovery of human remains

If suspected human skeletal remains are uncovered at any time throughout undertaking the proposed works, procedures outlined in the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.

Addition from Waters Consultancy (2015) – In the event of the unexpected discovery of suspected archaeological Aboriginal human remains during the proposed works, in addition to the procedures outlined in the Roads and Maritime *Unexpected Heritage Items Procedure 2015*, it is recommended that the AHMP require that RMS immediately notify the identified knowledge holders of the discovery. If the material is confirmed to be archaeological Aboriginal human remains it is recommended that consultation occur with the identified knowledge holders in relation to: the development of a Management Plan for future proposed works in the relevant area; cultural ceremonies in relation to the human remains and the site of their occurrence; repatriation of the human remains.

5.8.6 Changes to the proposed works

This CHAR is based upon the most recent information made available to Artefact Heritage as of the date of preparation of this report. Any changes made to the proposed works should be assessed by an archaeologist in consultation with the registered Aboriginal stakeholder groups. Any changes that may impact on Aboriginal sites not assessed during the current study may warrant further investigation and result in changes to the recommended management and mitigation measures.

5.8.7 Ongoing consultation with Aboriginal stakeholder groups

Consultation with registered Aboriginal stakeholders would continue throughout the life of the project, as necessary. Ongoing consultation with registered Aboriginal stakeholders will take place throughout

preparation and display of the EIS, any salvage excavations, reburial of retrieved artefacts and in the event of any unexpected Aboriginal objects being identified during works.

5.8.8 Management of Aboriginal objects

Further consultation with registered Aboriginal stakeholders will take place regarding the appropriate strategy for future long-term management of the retrieved artefact assemblage from test excavation and salvaged artefacts following EIS approval.

Suitable long-term management of the retrieved artefact assemblage may include reburial at one location within the project area. The topsoil that is kept and set-aside during construction works at Macquarie Rivulet will be returned to the Macquarie Rivulet area upon completion of construction works. Due to the identified cultural significance of the kept topsoil, that location is likely to be a suitable location for reburial of the retrieved artefact assemblage.

6.0 ARCHAEOLOGICAL SALVAGE EXCAVATION METHODOLOGY FOR SITES YTOF AS 4 AND YTOF AS 5

6.1 Salvage excavation methodology scope

The scope of this archaeological salvage excavation methodology is YTOF AS 5 and the portion of YTOF AS 4 that will be impacted by construction of the Albion Park Rail bypass. The extent of the project boundaries in relation to the identified extent of the sites is shown as Figure 8 and Figure 9 in the CHAR.

The salvage excavation methodology should be read in conjunction with the PACHCI Stage 3 Aboriginal Cultural Heritage Assessment Report (CHAR) and archaeological test excavation report. Detailed information in those reports relating to Aboriginal stakeholder consultation, environmental context, archaeological context, project description and management and mitigation measures is not repeated in full in this methodology.

6.2 Salvage excavation justification

Archaeological test excavation informed the assessment of YTOF AS 4 and YTOF AS 5 as demonstrating moderate archaeological significance. Both sites are moderately dense artefact scatters.

Though the artefact scatter site type is common in the regional context, both sites present the opportunity for further research due to the densities of artefacts and specialised tools represented in the assemblages. Furthermore, it is unlikely that test excavation has adequately captured the nature and extent of subsurface archaeological deposits at these sites. Salvage excavation presents the opportunity for further research regarding site formation processes in their unique contexts, overlooking Frazers Creek (YTOF AS 4) and its tributary (YTOF AS 5).

Justification for archaeological salvage excavation within the project area includes:

- The results of archaeological test excavation that indicate a moderately dense artefact scatters at YTOF AS 4 and YTOF AS 5.
- The assessment of both sites as demonstrating moderate archaeological significance.
- The relatively limited amount of information available in the local area from archaeological subsurface investigation and the possibility of adding to the current corpus of information on Aboriginal land-use strategies in the Albion Park area.
- To further investigate the unique landform context of both sites, including a defined raised area overlooking the Frazers Creek floodplain and one in 100 year flood level (YTOF AS 4) and a tributary of Frazers Creek (YTOF AS 5).
- To retrieve a representative sample of the site prior to impacts.

6.3 Research questions

The research questions are designed to focus the field work and analysis on particular aspects of archaeological investigation, and therefore to maximise the research value gained from the non-renewable resource of the archaeological record.

Question 1: Can salvage excavation confirm the artefact distribution identified during the test excavation program?

Archaeological test excavation identified a concentration of artefacts within test pit X4015 Y 5000 at YTOF AS 4. A total of 19 artefacts were retrieved from the four excavation units at that point down to a depth of 500 millimetres. One of the aims of the archaeological salvage excavation will be to determine if test excavation result represent a broader high density artefact distribution associated with test pit X4015 Y 5000.

Archaeological test excavation identified a concentration of artefacts in test pits X3060 Y 4000 at YTOF AS 5, which appears to extend to pits X3075 Y4000 and X3070 Y3985 also. A total of 10 artefacts were retrieved from four excavation units at these points down to an average depth of 500 millimetres. One of the aims of the archaeological salvage excavation will be to determine if that test excavation result represents a broader moderate density artefact distribution associated with these test pits.

Question 2: Can salvage excavation provide information on the formation processes associated with YTOF AS 4 and YTOF AS 5?

Archaeological test excavation at YTOF AS 4 generally identified a deep deposit that demonstrated a higher clay and gravel content with depth rather than a clear B horizon transition. A clear B horizon was only identified in two test pits. Although test excavation proceeded to a depth of one metre at several locations, no artefacts were retrieved from below 500 millimetres. One of the aims of archaeological salvage excavation will be to further investigate the site formation processes at YTOF AS 4 and confirm that the deposit below 500 millimetres is void of Aboriginal artefacts. This could include a geomorphological investigation conducted in tandem with the salvage excavation program and further investigation of the depth of artefacts.

Archaeological test excavation of the terrace landform at YTOF AS 5 identified a relatively shallow deposit comprising an A horizon of brown grey silty clay with intrusions of localised compact orange silt and gravels in some excavation units. The B horizon consisted of dark brown heavy clay. The majority of artefacts (71 per cent of the assemblage) were retrieved from between 200-400 millimetres depths. One of the aims of salvage excavation would be to investigate whether this artefact bearing deposit is consistent across YTOF AS 5.

Question 3: Is there evidence of single or overlapping knapping events?

One of the aims of post-excavation artefact analysis would be to identify any indication that artefacts retrieved from open area excavation resulted from one or more knapping events, including further investigation of possible artefact use and manufacturing activities identified during analysis of the test excavation assemblage. This information may include data on depth of retrieved artefacts, differences in raw material, differing treatment of the raw material (ie heat treatment), and conjoin analysis. This information would be discussed in the context of previous predictive models for the distribution of archaeological material in the local and regional context.

Question 4: How was raw material utilised in the local context?

By analysing the amount of cortex, average size range and weight, utilisation of different raw material types would be discussed in the context of raw material reduction and conservation away from source areas. This information would be used to discuss the likely context of the sites in relation to raw material use across the landscape.

Question 5: How does the test excavation compare to the results of sub-surface investigation in the regional context?

The results of test excavation would be discussed in relation to the findings of previous sub-surface investigation in the region. Comparative information would include intactness of deposit, degree of truncation, and nature and frequency of retrieved Aboriginal objects.

Question 6: What information can the retrieved assemblage provide on land-use patterns in the local context?

The comparative results of test excavation and the results of other sub-surface investigations in the area would be discussed in terms of Aboriginal land-use strategies of the local region. This would include a discussion of raw material conservation techniques, artefact types and size and weight characteristics of the assemblage.

6.4 Excavation approach and methodology

To further investigate the distribution of artefacts in the vicinity of test pit X4015 Y 5000 (YTOF AS 4) and X4015 Y 5000 (YTOF AS 5), a staged salvage excavation approach is recommended. This would include an initial stage (Stage I) of one metre square pits surrounding around the above test pits, followed by open area excavation (Stage II) based on the results of Stage I excavation. One metre square pits will form the basis of both Stage I and Stage II excavation.

The aim of Stage I excavation would be to further investigate the high density of artefacts retrieved from test pit X4015 Y 5000 (YTOF AS 4) and X4015 Y 5000 (YTOF AS 5). This would involve the excavation of at least five one metre square pits spaced at five metre intervals around test pit X4015 Y 5000 (YTOF AS 4) and X4015 Y 5000 (YTOF AS 5). At least one pit from Stage I excavation would be selected for expansion as part of an open area excavation (Stage II). Depending on the results of Stage I, a second pit may also be selected for expansion into an open area excavation.

The decision to expand excavation pits (Stage II) will be made by the supervising archaeologist in consultation with registered Aboriginal stakeholders on site with regard to the following 'triggers' identified during Stage I test excavation:

- Relative density of artefacts retrieved during Stage 1 test excavation.
- Rare or unusual artefact types.
- Unusual raw material types and changes in raw material types.
- Archaeological features such as hearths and/ or middens.
- Cultural material with potential for scientific dating.
- Any other features identified by the supervising archaeologist and Aboriginal stakeholder representatives.
- Geomorphological data/ environmental site data relevant to understanding the site formation process. This may include geomorphological investigation during the test excavation program.

Indicative salvage pit locations are detailed in Figure 25 and Figure 26. The final location of the salvage pits would be determined by the supervising archaeologist and Aboriginal stakeholder representatives at the commencement of salvage excavation.

To confirm the vertical distribution of artefacts from the test excavation, Stage I pits at YTOF AS 4 would be excavated to a depth of 700 millimetres or a clear transition to the B horizon, whichever is encountered first. Stage I excavation would proceed deeper than 700 millimetres where artefacts are

still being retrieved from excavation at that depth. Stage 1 pits at YTOF AS 5 would be excavated until the compacted B horizon of dark brown heavy clay is reached.

Open area Stage II excavation would be conducted around at least one Stage I pit at each site, based on the archaeological 'triggers' outlined above. Depending on the results of Stage I, a second pit may also be selected for expansion into an open area excavation. The basal depth of Stage II excavation would be based on the results of Stage I excavation.

An indicative total of up to 25 square metres would be allocated for Stage II excavation at each site. As a minimum, one Stage I pit would be expanded into a three metre square open area excavation (utilising eight square metres). The remainder of the 25 square metres allocated for Stage II excavation at each site may be utilised to further expand that open area based on the archaeological 'triggers' listed above, as well as allowing for the possible expansion of one other Stage I pit. Excavation of between eight and 25 Stage II pits at each site is a guide only. The total number of salvage pits excavated during Stage II would be dependent upon the findings and liaison between the supervising archaeologist, Aboriginal stakeholder representatives in the field at the time, and Roads and Maritime representatives (Project Manager and ACHA).

All excavated squares would be recorded in detail including photographs, level readings, plans and context sheets. Stratigraphic sections detailing the stratigraphy and features within the excavated deposit would also be drawn. A detailed geomorphological analysis would be undertaken by a qualified geomorphologist where appropriate.

All squares would be excavated according to soil horizons where practicable, or 10 centimetre or 20 centimetre arbitrary spits where defined units within the A horizon are absent. Excavating in spits provides some vertical control, especially if a conjoin analysis is performed. If a stratigraphic deposit is identified, for example in alluvial soils on the terrace landform, excavation may be conducted stratigraphically.

All material retrieved from the excavated pits would be hand sieved through nested 3 millimetre and 5 millimetre mesh. Wet sieving would be preferred, especially in clay soils. All recovered stone artefacts would be cleaned, dried and bagged with a brief analysis conducted in the field. This analysis would include logging artefact type, raw material, and dimensions. These items would then be taken off site to be analysed in detail by relevant specialists in consultation with Aboriginal stakeholder groups. Wet sieving will be conducted on site close to the excavation area.

6.4.1 Procedure for the discovery of human remains

If suspected human skeletal remains are uncovered at any time throughout the excavation program, the following actions will be followed:

- cease all excavation activity;
- notify NSW Police;
- notify OEH via the Environment Line on 131 555 to provide details of the remains and their location;
- notify the Department of Planning and Infrastructure; and,
- excavation activity will not recommence unless authorised in writing by the relevant agency, including Department of Planning and Infrastructure and OEH.

6.4.2 Reporting and Aboriginal objects

All Aboriginal objects retrieved during the course of test excavation would be washed and placed in re-sealable bags for further analysis and recording. Once salvage excavation has been completed, the artefact assemblage would be recorded and stored as stipulated in the OEH code of practice as best practice. This includes recording key attributes of material, artefact type, platform type, termination type and dimensions, as well as photographic and drawn records of representative artefacts.

All recorded information would be entered into a Microsoft Excel table with detail linked to the provenance of each artefact. Once entered into the Excel table, the data can be readily supplied with the test excavation report to OEH and registered Aboriginal stakeholders in either electronic or hard-copy form. An archaeologist experienced in stone artefact recording will conduct the attribute recording and analysis.

All artefacts would be given a unique number and stored in double re-sealable specimen bags. A permanent marker will be used to record the provenance and unique number of artefacts in each bag in writing on the outside of the bag and on an archival grade tag such as Dupont TM Tyvek [®] paper.

Further consultation with registered Aboriginal stakeholders will take place to determine the long-term care and management of the retrieved Aboriginal objects. This may include reburial within YTOF AS 4 and YTOF AS 5 in a location that will not be impacted by the proposed works.

Figure 25: Indicative salvage pit location YTOF AS 4

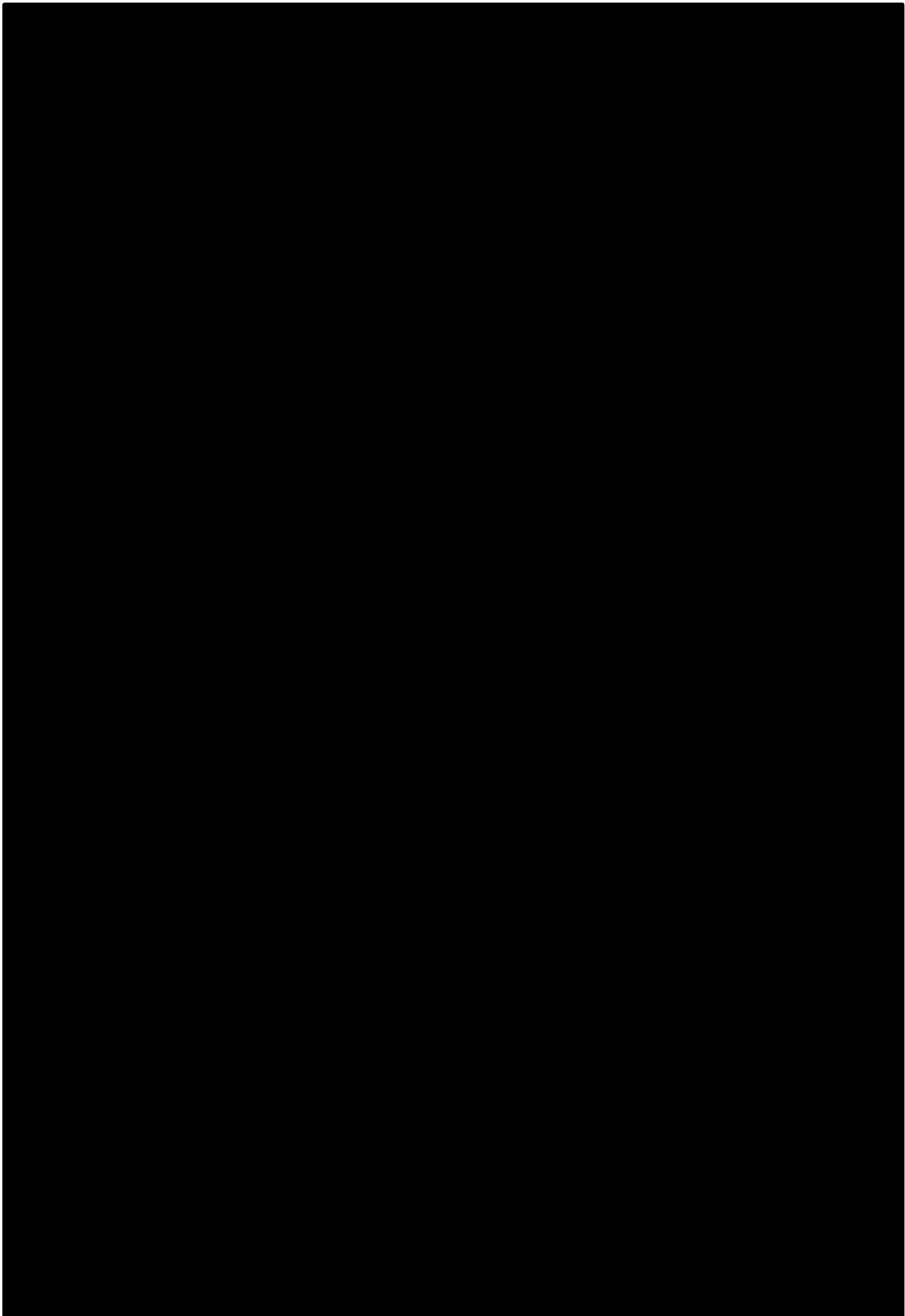
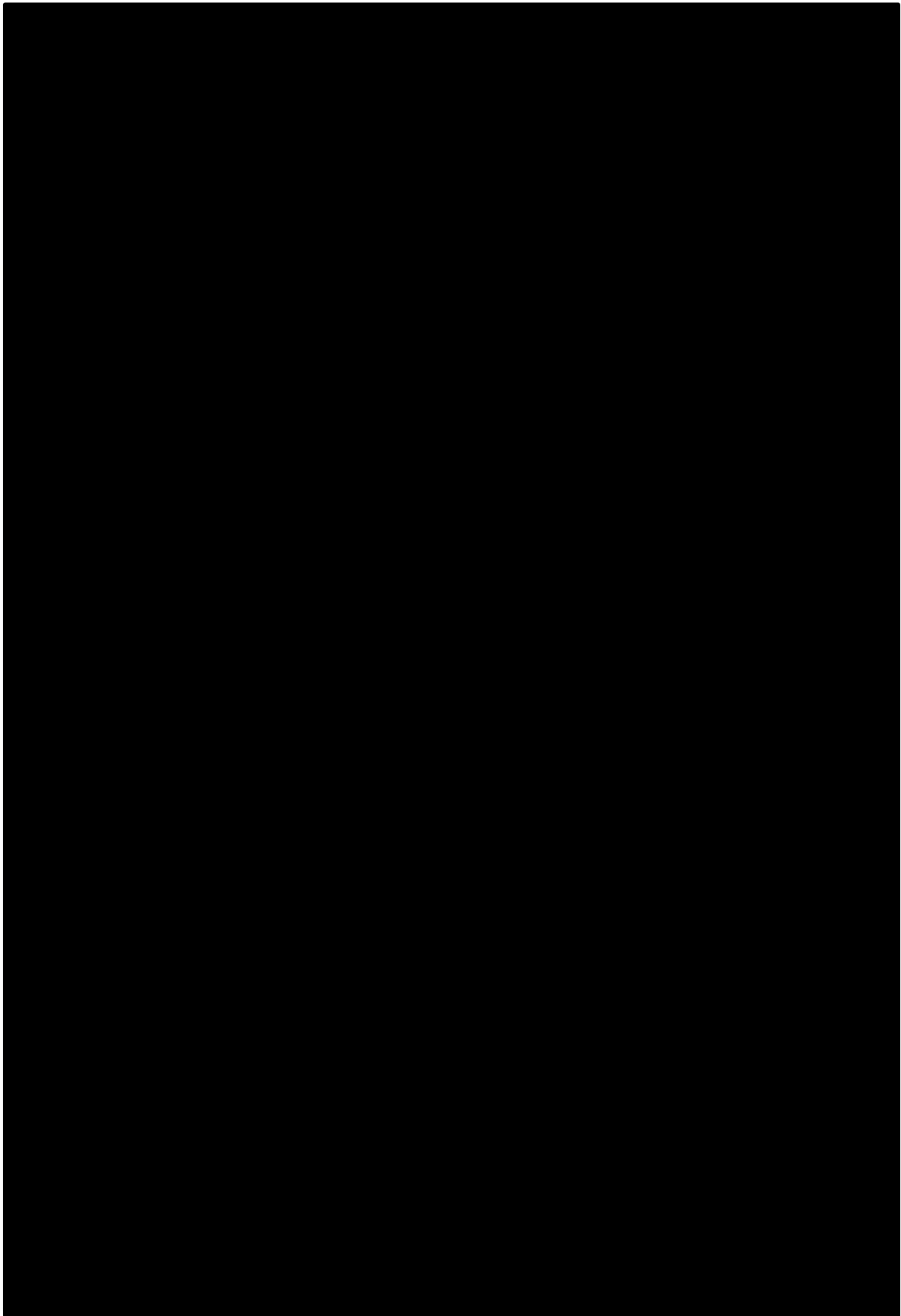


Figure 26: Indicative salvage pit location YTOF AS 5



7.0 RECOMMENDATIONS

The following recommendations are based on consideration of:

- Legislative, policy and procedural requirements for the assessment of Aboriginal cultural heritage
- The recommendations of the ASR
- The 'Albion Park Rail Bypass: Aboriginal Cultural Assessment Report' prepared by Waters Consultancy (2015)
- The findings of test excavations
- ESD principles
- The views and information provided by registered Aboriginal stakeholder groups
- The likely impacts of the proposed development.

It was found that:

- A total of 21 Aboriginal sites were identified during the ASR, addendums and test excavation investigations.
- Following reconsideration of the concept designs, eight sites will now be avoided by the proposed works. AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1 are now outside the project boundaries will no longer be impacted.
- The proposed works will impact 13 Aboriginal sites (AHIMS site # 52-5-0484/52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766).
 - Of these, ten sites have been assessed as demonstrating low archaeological significance (YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766). Impacts to nine of these sites would result in total loss of value. Impacts to YTOF AS 2 will result in partial loss of value.
 - AHIMS site # 52-5-0484/52-2-0512 has been assessed as demonstrating low-moderate archaeological significance. Impacts to this site would result in partial loss of value.
 - YTOF AS 4 and YTOF AS 5 have been assessed as demonstrating moderate archaeological significance. Impacts would result in partial loss of value at YTOF AS 4 and total loss of value at YTOF AS 5.
- Three areas of cultural significance were identified through Aboriginal stakeholder consultation for the cultural assessment report (Waters Consultancy 2015).
- One of those areas of cultural significance, Area B: Macquarie Riveulet Cultural Site, will be impacted by the proposal.
- Two of those identified areas of cultural significance, Area A: [REDACTED] Creek Cultural Site and Area C: YTOF CS 1, will not be impacted by the proposal.

It is recommended that:

- No further investigation is required at the eight sites which are no longer being impacted by the proposed works (AHIMS site # 52-5-0473, HLA 2007, YTOF PAD 3, YTOF PAD 8, YTOF PAD 9, YTOF IF 4, YTOF AS 6 and YTOF CS 1).
- If impacts cannot be avoided, no further archaeological investigation is required at the ten sites which have been assessed as demonstrating low archaeological significance (YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766).
- If impacts cannot be avoided, no further archaeological investigation is required at AHIMS site # 52-5-0484/52-2-0512 as this site has been fully investigated.
- Salvage excavation would occur at sites YTOF AS 4 and YTOF AS 5 if impacts are unavoidable.
- Long term arrangements for the management of excavated artefacts, such as reburial, should be determined in accordance with the recommendations of registered Aboriginal stakeholders
- Site impact recording forms should be submitted to AHIMS for all 13 sites which would be impacted by the proposed works (AHIMS site # 52-5-0484/52-2-0512, YTOF AS 1, YTOF AS 2, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 7, YTOF AS 8, YTOF IF 1, YTOF IF 2, YTOF IF 3, 52-5-0227 and 52-5-0766) following the commencement of work.
- Inadvertent impacts to sites outside of the project boundary should be avoided by including information on the location of these sites in the CEMP (AHIMS site # 52-5-0473, 52-5-0512, YTOF AS 6, YTOF AS7, YTOF IF 4, YTOF PAD 3, and HLA 2007). The location of YTOF CS 1 should not be included in the CEMP as it is culturally sensitive information. Where necessary, fencing may be used to assist workers in avoiding AHIMS site # 52-5-0473, YTOF AS 6, YTOF IF 4, YTOF PAD 3, and HLA 2007.
- Waters Consultancy (2015) recommended in relation to Site A: [REDACTED] Creek Cultural Site that the following management measures are enacted during neighbouring construction works:
 - Temporary fencing be erected between the zone of construction activity and the site.
 - That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).
- Waters Consultancy (2015) recommend in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occur as follows:
 - Temporary fencing be erected between the zone of construction activity and the old growth eucalypt located within this site (red star on Figure 18 above indicates location).
 - That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).
 - Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with Roads and Maritime guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area.

- Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works.
 - The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution to local libraries and educational institutions. The final content of the booklet to be developed in consultation with the Aboriginal knowledge holders.
 - The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.
- A CEMP and accompanying unexpected finds procedure will provide a method to manage potential heritage constraints and unexpected finds during construction works. Aspects of site and cultural area protection that should be included in the CEMP include:
 - Establishing no-harm areas where appropriate. Depending on the nature and timing of works in the vicinity of identified Aboriginal sites or cultural areas that will not be impacted by the proposed works, it may be appropriate to establish visual markers around no-harm areas to avoid inadvertent impacts.
 - Nature of the visual markers around no-harm areas. The CEMP should document what type of visual marker will be put in place, such as temporary fencing, high visibility tape, and temporary signage.
 - Provide clear guidance to all site workers on access restrictions to no-harm areas.
 - Unexpected finds procedure in accordance with the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.
 - It is recommended that an Aboriginal Heritage Management Plan (AHMP) should be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The AHMP should provide specific guidance on measures and controls to be undertaken to avoid and mitigate impacts on Aboriginal cultural heritage during construction. It is recommended that the cultural heritage consultant (Waters Consultancy) be present at the contractor inductions in relation to those components of the project that include the three identified cultural sites, including the Macquarie Rivulet as a whole. The AHMP should directly reference and outline the mitigation measures outlined in this CHAR.
 - If any suspected human remains are located during any stage of the proposed works, work should stop immediately procedures outlined in the Roads and Maritime *Unexpected Heritage Items Procedure 2015* would be followed.

- In addition it is recommended that the AHMP require that Roads and Maritime immediately notify the identified knowledge holders of the discovery of suspected archaeological Aboriginal human remains. If the material is confirmed to be archaeological Aboriginal human remains it is recommended that consultation occur with the identified knowledge holders in relation to:
the development of a Management Plan for future proposed works in the relevant area;
cultural ceremonies in relation to the human remains and the site of their occurrence;
repatriation of the human remains.
- Should any changes be made to the proposed works boundary, these should be assessed by an archaeologist in consultation with the registered Aboriginal stakeholder groups and further investigation may be necessary.
- This CHAR and accompanying documentation should be forward to registered Aboriginal stakeholders and OEH.

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9.0 APPENDICES

9.1 Appendix A: Specialist Cultural Heritage and Historical Report

ALBION PARK RAIL BYPASS

Aboriginal Cultural Assessment

Prepared by: Waters Consultancy Pty Ltd
Client: Roads and Maritime Services

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Introduction

This report is a component in the investigations undertaken by Roads and Maritime Services (RMS) in relation to the Albion Park Rail Bypass Project. The project boundaries for the bypass route are shown on Figure 1.

In the mid 1990s the then Roads and Traffic Authority (RTA) identified a preferred route for the Albion Park Rail bypass. As a result of this study a road corridor was reserved within the Wollongong and Shellharbour City Council Local Environmental Plans. In 2013 the RMS reviewed the reserved road corridor to assess its continuing suitability as a bypass location. RMS has since undertaken detailed design of the preferred route option that involves a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail. The bypass requires the construction of three new interchanges between the Princes Motorway and the surrounding road network to be located at Yallah, Albion Park, and Oak Flats.

RMS has engaged Hyder Cardno Joint Venture (HCJV) to manage the preparation of an Environmental Impact Statement (EIS). As part of the assessment process RMS engaged Artefact Heritage in 2013 to undertake an archaeological survey report in relation to Aboriginal heritage. Waters Consultancy were engaged by RMS to undertake the Aboriginal cultural assessment in December 2014.

This report is the outcome of the Aboriginal cultural assessment undertaken by Waters Consultancy. It is a stand-alone report but will also inform the Aboriginal Cultural Heritage Assessment Report being prepared for HCJV by Artefact Heritage as one component of the EIS.

The proposed development is being assessed as State Significant Infrastructure (SSI) under Part 5.1 of the Environment Planning and Assessment Act 1979 (EP&A Act).

Proposed Projectⁱ

Roads and Maritime propose to construct a 9.8 kilometre extension of the Princes Motorway between Yallah and Oak Flats to Bypass Albion Park Rail. The purpose of the project is to complete the missing link for a high standard road between Sydney and Bomaderry. The project aims to address short and long term transport needs.

Key features of the project include:

- A motorway with two lanes in each direction (with capacity for additional lanes). The motorway would extend from the existing Princes Highway at Yallah, traversing south and crossing the Macquarie Rivulet west of the existing Princes Highway. South of the Macquarie Rivulet the alignment would generally follow the existing Illawarra Highway alignment, running to the west of the Illawarra Regional Airport. The alignment would then continue south between Albion Park and Albion Park Rail, crossing Tongarra Road. In the south, the alignment would skirt the southern side of the Croom Reserve passing through the north eastern section of the Croom Regional Sporting Complex. The alignment would then head east following the existing East West Link alignment before connecting into the existing Princes Highway at the Oak Flats interchange (Figure 1).

- Three interchanges connecting the local road network with the motorway at Yallah, Albion Park and Oak Flats.
- A new southbound motorway entry ramp from Tongarra Road and a northbound exit ramp at the Illawarra Highway (these ramps may not be needed until a later stage).
- Construction of bridges at the following locations:
 - Water courses at Macquarie Rivulet, Duck Creek and Frazers Creek;
 - Tongarra Road and the existing Princes Highway;
 - South Coast Railway Line;
 - Floodways.
- Demolition and removal of the existing bridge on the Princes Highway across Duck Creek.
- Local road changes or upgrades.
- Pedestrian and cycleway connections.
- Drainage.
- Emergency access and management facilities.
- Flood storage adjustments.
- Noise barriers.
- Lighting.
- Earthworks and landscaping.
- Pavements and line marking.
- Reconfiguration of the Croom Regional Sporting Complex, including replacement of directly impacted sporting facilities and changes to the southern access and internal roads of the sporting complex.

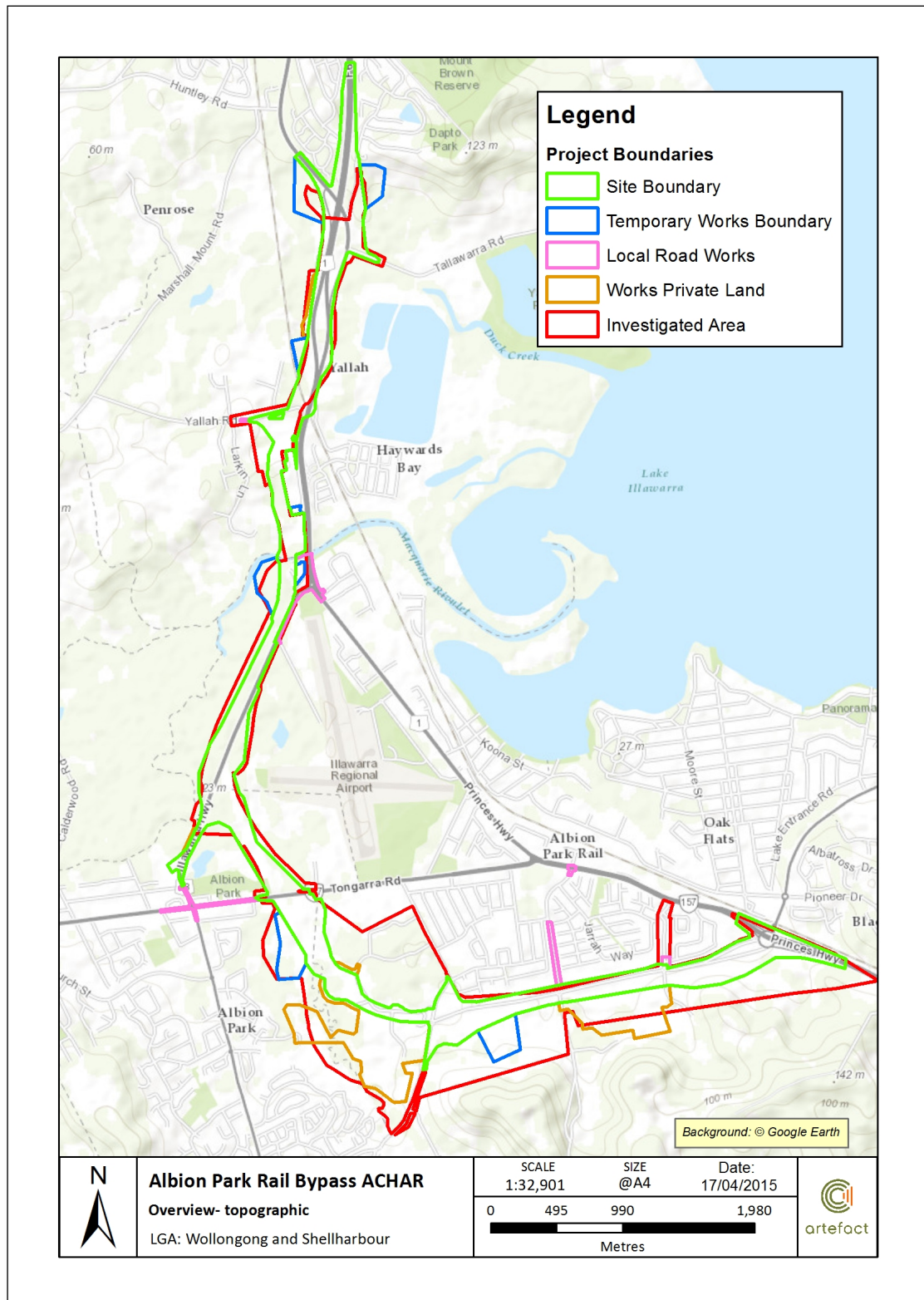


Figure 1: The proposed Albion Park Rail Bypass Project. ⁱⁱ

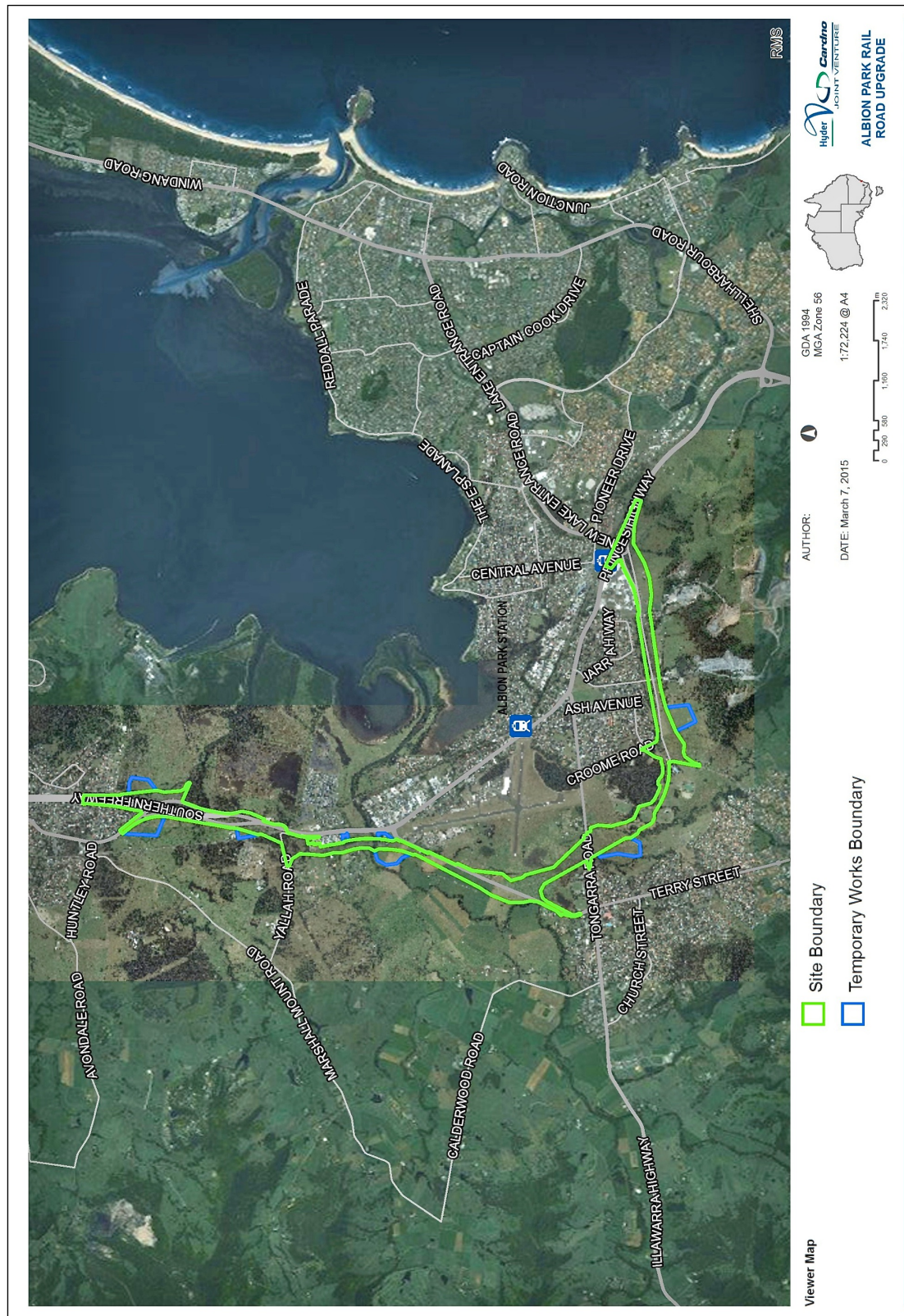


Figure 2: Albion Park Rail Bypass Project boundaries. ⁱⁱⁱ

The study area for this assessment included the area mapped as the site boundaries (green) and the ancillary areas (blue).

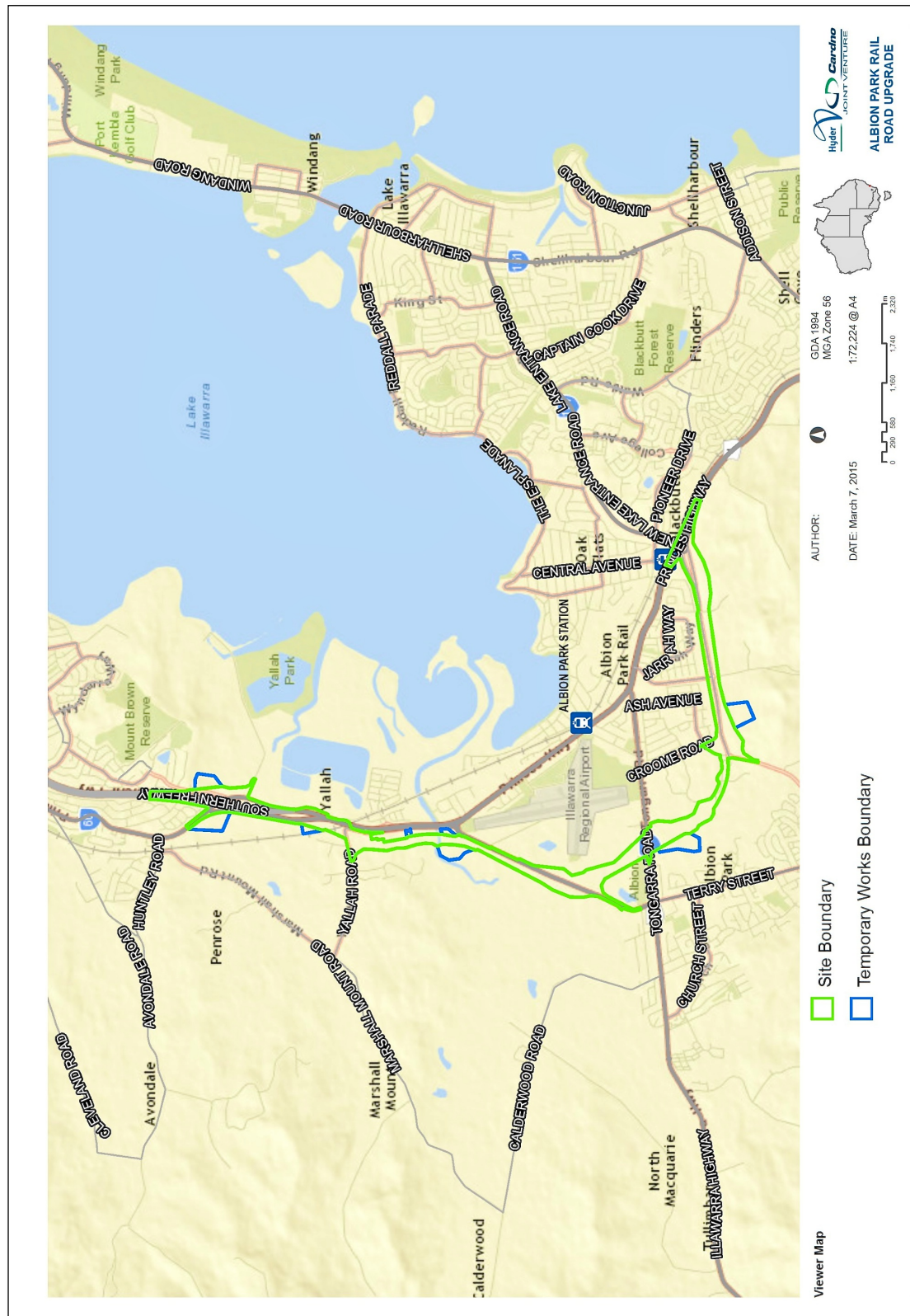


Figure 3: Albion Park Rail Bypass Project boundaries.^{iv}

The study area for this assessment included the area mapped as the site boundaries (green) and the ancillary areas (blue).

Methodology

This Aboriginal cultural assessment has been undertaken through consultation with knowledge holders, as identified by the registered Aboriginal stakeholders, regarding historical and cultural values within the study area. Historical research has been undertaken to provide a contextual understanding to allow for the interpretation and assessment of the cultural information.

Consultation with Aboriginal knowledge holders is a key component to the assessment of Aboriginal cultural heritage values. As stated in the guidelines produced by the International Council on Monuments and Sites (ICOMOS) on the application of the Burra Charter to Indigenous heritage,^v

Indigenous people are the relevant knowledge-holders for places of Indigenous cultural significance. Their traditional knowledge and experience must be appropriately used and valued in the assessment of places. Advice may need to be sought on who are the relevant knowledge holders.^{vi}

The assessment of Aboriginal cultural heritage values was undertaken collaboratively with the Aboriginal community and identified Aboriginal knowledge holders. This is consistent with the guidelines for the assessment of Aboriginal cultural heritage produced by the Office of Environment & Heritage (OEH).^{vii}

Consultation Process

The proposed cultural assessment methodology was provided to the registered Aboriginal stakeholders for comment on 23 December 2014 (see Appendix One). In addition the consultant provided a verbal explanation of the cultural assessment methodology to all registered Aboriginal stakeholders and AFG attendees who were contacted. No written comments were received in relation to the cultural assessment methodology. The verbal feedback provided endorsed the proposed methodology as appropriate.

For the purposes of this assessment the registered Aboriginal stakeholders were requested to nominate individuals who they considered held cultural heritage knowledge of the area. The request for nominations was made in a letter (see Appendix One) sent out to all registered Aboriginal stakeholders by RMS on 23 December 2014. All registered Aboriginal stakeholders, and all those individuals who registered their attendance at the Aboriginal Focus Group (AFG) held on 16 October 2014, were contacted. In some instances the attempts at contact were unsuccessful despite numerous attempts via telephone and email where provided.

The registered Aboriginal stakeholders nominated nine individuals as knowledge holders. Of the nine individuals identified as holding cultural heritage knowledge of relevance to the area, two stated that they regarded other of the named knowledge holders as being more appropriate to speak for the area. Detailed interviews were conducted with six of the seven remaining identified knowledge holders in relation to the cultural heritage values within the study area.^{viii} A planned interview with the seventh identified knowledge holder had to be rescheduled and despite repeated attempts to make contact via telephone it has not been possible to reschedule.^{ix}

Within the specific study area consultation with the six knowledge holders has identified one site of cultural significance located directly adjacent to the proposed footprint (Site A: Duck Creek Cultural Site), one site of cultural significance located within the proposed footprint (Site

B: Macquarie Rivulet Cultural Site), and one site of cultural significance located outside the proposed footprint (Site C: YTOF CS 1).

The six identified knowledge holders spoken with also provided cultural and historical information on the broader cultural landscape of the region and their family connection to the area. This information has informed the assessment process in relation to the cultural heritage values and significance of the identified cultural heritage sites. The significance assessments and mitigation recommendations are based on this assessment process and consultation with the knowledge holders.

Previous Historical and Cultural Assessment

No Aboriginal cultural assessment has previously occurred in relation to the Albion Park Rail Bypass.

During archaeological survey and assessment undertaken by Artefact Heritage in relation to this project a single cultural site was identified. This site was recorded as YTOF CS 1 in an October 2014 addendum report resulting from an expansion of the original study area.

Site YTOF CS 1 (not yet issued an AHIMS site number) is a cultural site within private property located in [REDACTED], in the far south-eastern corner of the project area. The site comprises an old growth fig tree located on a small terrace of a north facing slope (Plate 41). Troy Tungai of ILALC identified the tree as a women's site. Fig trees such as this have been identified as 'birthing trees', places of meeting for women where birthing and associated rituals took place within the local Illawarra context (Timberley- Bennett 2004).^x

This site is not located within the impact footprint. However, all six knowledge holders have identified the old growth fig tree, which constitutes this site, as holding cultural significance (for further discussion see **Site C: YTOF CS 1** below).

What is Cultural Significance?

The concept of cultural significance encompasses all the cultural values and meanings that could potentially be recognised in a place. The cultural and natural values of a place are generally indivisible in the context of Aboriginal cultural heritage. The cultural values and meanings in a place can be both tangible and intangible.

Cultural significance is embodied in the place: in its tangible or physical form, in the wider cultural landscape that it is located in, in the ways in which the place is used or interacted with, and in the associations, stories, and meanings of the place to the people and community it holds significance for.

Aboriginal cultural heritage consists of any places and objects of significance to Aboriginal people because of their traditions, observances, lore, customs, beliefs and history. It provides evidence of the lives and existence of Aboriginal people before European settlement through to the present... For Aboriginal people, cultural heritage and cultural practices are part of both the past and the present and that cultural heritage is kept alive and strong by being part of everyday life.^{xi}

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all of the cultural values and meanings that might be recognised in a place. Cultural significance is often defined as the sum of the qualities or values that a place has with particular reference to the five values – aesthetic, historic, scientific, social and spiritual – that are listed in the *Burra Charter*.

The three key values in relation to Aboriginal cultural heritage assessments are the social, spiritual and historic. Social or cultural value refers to the associations that a place has for a particular community or cultural group and the resulting social or cultural meanings that it holds for them. It can encompass traditional, historical or contemporary associations. Spiritual value is often subsumed within the category of social or cultural value. It refers more specifically to the intangible values and meanings embodied or evoked by a place to a specific cultural group and that relate to that group's spiritual identity or traditional practices. Historic values refer to the associations of a place with an individual person, event, phase or activity that has historical importance to a specific community or cultural group.

Consultation with Aboriginal knowledge holders is a key component to the assessment of Aboriginal cultural heritage values. The assessment of Aboriginal cultural heritage values must be undertaken collaboratively with the Aboriginal community and identified Aboriginal knowledge holders. This is consistent with the guidelines for the assessment of Aboriginal cultural heritage produced by OEH^{xii} and the practice notes produced by the ICOMOS on the application of the Burra Charter to Indigenous heritage.^{xiii}

Aboriginal People of the Illawarra

The study area lies within the Illawarra region that extends from Stanwell Park in the north to Bass Point in the south. The Illawarra is a diverse region supporting a wide range of vegetation communities including eucalypt forests, woodlands, subtropical rainforests, swamps, grasslands and scrubs.

Aboriginal people of the Illawarra were closely connected through ceremonial cycles, trade networks and kinship to communities north to Sydney, south to Victoria and west up onto the tablelands and alps. Particularly close connections existed between the communities on the Illawarra and those in the area extending from Botany Bay and the Nepean and Georges River areas, west to Moss Vale, and south to the Shoalhaven River and Jervis Bay. These connections continue to exist today in a complex web of kinship and interaction.

The area immediately surrounding the study area has a rich history of occupation by Aboriginal people. Bass Point, approximately 15 kilometres to the south east of Albion Park, has a dating of 17,500 years for Aboriginal occupation.^{xiv} The involvement of Albion Park in a trade network that extended north to Sydney is evident in the archaeological record where a fine grained basaltic rock identified as coming from the bed of the Macquarie Rivulet near Albion Park was one of two sources of raw material for stone hatchet heads found at the Kurnell Peninsula in Sydney. Petrified wood found in the same area was identified as coming from the south coast, with one possible site being the hills above Albion Park.^{xv}

Prior to the impact of the European intrusion this was a resource rich area encompassing marine environments and freshwater and estuary wetlands. As would be expected in such a resource rich area the early European records give a clear impression of a well populated region.^{xvi}

Aboriginal people utilised the resources of the oceans and rivers throughout the region including a wide range of fish, eels, and shellfish. The remains of middens that occur throughout the region are testimony to the importance of shellfish as a resource. The utilisation of whales and seals is also evident in middens in the wider area.^{xvii}

The freshwater and estuary wetlands which have been such an important resource for multiple generations of Aboriginal people in the region have been heavily modified as a result of European land management practices including altering river and stream courses, drainage and infilling.

Aboriginal people also utilised a wide range of land-based resources, including animals such as wallabies and possums, plant foods, and honey as food sources.^{xviii} In the study area there is a reference to the location on which the Albion Park Dairy Factory was built in 1885 as having been, *"...the great roasting place of the aboriginals, who resorted to that particular spot to cook the wallabies taken in the chase."*^{xix} The former Albion Park Dairy building is located on Creamery Road alongside the railway line approximately 500 metres north of the current Albion Park Railway Station.^{xx}

Other land based resources that were utilised by Aboriginal people in the region include plants for bush medicine, fish poison and dyes, wood to make boomerangs, spears, digging sticks, bark for canoes and shelters, fibre to produce string, and stone to make axes, grinding stones, and spear points.^{xxi}

Aboriginal people of the Illawarra are recorded as having used a wide range of techniques to harvest fish, crustacean, eels etc. These included stunning fish with poison, luring fish with torchlight, harvesting shallow creeks with large open weave baskets, spearing fish, and line fishing with shell hooks.^{xxii}

The first intensive European intrusion into the area occurred in the 1810s with the movement of cedar cutters into the region.^{xxiii} In the 1810s and '20s cedar cutters were extremely active in the Illawarra region with Kiama developing as a centre for the cedar trade.^{xxiv}

Despite government attempts to control cedar cutting it continued at a rapid rate, particularly in the Hunter, Illawarra and Shoalhaven regions. By the 1850s the Illawarra and Shoalhaven stands had already been reduced dramatically and the focus of the cedar cutters had shifted to the north coast of New South Wales. Just twenty years later Red Cedar was scarce throughout the whole of New South Wales.^{xxv}

There are accounts in the early records that indicate conflict between the local Aboriginal people and the cedar getters who were active in the region prior to permanent European settlement.^{xxvi} Certainly there are documented instances of violence by Europeans against Aboriginal people on the Illawarra.^{xxvii}

The beginning of a permanent European presence in the Illawarra occurred around 1815 when Dr. Charles Throsby moved cattle into the area via the Bulli Pass. By December 1817 the first land grants to Europeans had been issued on the land of the Illawarra people. Settlement intensified in the 1820s with the establishment of towns such as Wollongong and Kiama.^{xxviii}

The first land grant in the study area was to a land speculator and former convict, Samuel Terry, in 1817; he called it Terry's Meadows. It was renamed Albion Park by his nephew, John Terry Hughes, who inherited the estate following Samuel's death in 1838.^{xxix}

The Albion Park township developed in the 1870s and '80s with the construction of various commercial buildings. In 1897 the Shellharbour council relocated to Albion Park reflecting the decline of Shellharbour and the growth of Albion Park due to the development of the beef and dairy cattle industry.^{xxx}

As the patterns of European land use increasingly alienated Aboriginal people from the hinterland, the resources of the ocean and rivers grew in importance. The reminiscences of an early European resident of the area include his memories of large-scale fishing on the Macquarie Rivulet around the mid nineteenth century as well as spear fishing on the beach,

A very old resident of the district... speaking of the aborigines, said he had, when a boy, seen at the Macquarie Rivulet a crowd of between 200 and 300 of them engaged in a fishing operation, which consisted in putting a pole across and banking up the water; they

went in then and chucked out great quantities of fish. Settlers about used to come with their carts and participate in the catch. He got his father's permission once to accompany the King fishing; they went to the beach and soon the King, saying "big schnapper longa' there," threw his spear, and, sure enough, struck a big fish out in the surf. Aborigines, it may be mentioned, did not stand in one spot wearily waiting for a finny customer to come for the bait; they moved about till they found where the fish were, which their knowledge of nature enabled them to do.^{xxxix}

Fishing had been an important traditional resource all along the coast and continued to be an important economic resource for Aboriginal people on the south coast throughout the nineteenth century and into the second half of the twentieth century.^{xxxix} In an article examining the history of Aboriginal fishing in the Illawarra and Shoalhaven regions in the 19th century the historian Michael Bennett concluded, "*What is clear is that people continued to use their immense knowledge, skills and experience to catch and collect the bounty of the seas and streams.*"^{xxxix} Fishing is still an important aspect of the lives of many Aboriginal people on the south coast with economic and cultural meaning, although due to the depletion of the fishing stocks it is no longer as important an economic resource as it was.^{xxxix}

The Macquarie Rivulet was, and is, an important cultural place within the study area. It was a rich resource area and formed part of one of the pathways along which people travelled and connected to groups to the west and north.^{xxxix} The Rivulet also has importance for its association with the burial of Aboriginal people. A newspaper article from 1919 referred to the memoirs of an old European resident of a funeral occurring in the area when he was a young boy in the mid nineteenth century,

The banks of the Macquarie were used by the aborigines for burial purposes, being easy to make graves in. As a boy, our informant remembered being at a funeral of a young woman. The pall bearers walked crooked ways, the object of this being to cause the spirit of the dead, in the event of emergence, to get lost in making for the camp. On this occasion the interment had taken place contrary to the custom of the body being viewed first by the "doctor." The latter came along just after and was very wrath; he threw his boomerang a long shot and back it came to his feet. Billy Broughton, who was a stockman at the meadows here, advised the white people to leave, as there was going to be a quarrel. The aborigines here expressed fear of those on the tableland, saying they were wild fellows. They were expert in the use of their weapons and very agile in dodging them. Punishment for offences was dealt out by placing the offender at some distance and setting two men to throw spears at him. He had the defence of his womera, a small oval shield, and with that he took his chance of stopping them.^{xxxix}

It is not known where along the Macquarie Rivulet, or how far from the banks, burials occurred. The funeral of Tullimbar, an important local figure, was also recorded as occurring on the Macquarie Rivulet in the late nineteenth century.^{xxxix}

The Macquarie Rivulet also holds importance as the location of a battle that was said to have occurred in the early nineteenth century between people from the Illawarra and people travelling up from the Shoalhaven Cullunghutti (Coolangatta) area.^{xxxix} It is not known where

along the Macquarie Rivulet this battle occurred. This account of the battle comes from a 1929 newspaper article,

....about the year 1820, the chief camping-ground of the Illawarra aborigines was at Hooka Creek, which runs into the western side of Lake Illawarra, not far from Port Kembla. The tribe was then ruled by a chief named Hooka, who was friendly with, and at many times protected the early settlers. On one notable occasion he made plans to defend the settlers of the Dapto district against an attack which was to have been made on them by the natives from the further south Coolangatta district. He led 200 of his men, who gathered at Mullet Creek, and whose cry was "Hooka, Hooka," into battle at the Macquarie Rivulet, when a number of the southern men were killed and the remainder driven southwards.^{xxxix}

Other accounts date this battle to the 1840s.^{xl} In an 1893 article Charlie Hooka was referred to as the King of Mullet Creek.^{xli} Some written accounts of the story recorded that Charlie Hooka died during the battle and was buried at either Kanahooka Point on Lake Illawarra or in the Albion Park area.^{xlii}

The Aborigines Protection Board emerged in the 1880s and soon developed into an agency of government control over the lives of Aboriginal people in New South Wales. The Board's role initially involved overseeing the distribution of blankets, rations and various other goods to 'destitute' Aboriginal people. In later years the formation and management of reserves became a major part of the Board's functions.^{xliii} From its official formation in 1883 the Aborigines Protection Board increasingly intruded into the lives of the Aboriginal communities of New South Wales, dramatically increasing the regulations and limitations governing Aboriginal people's lives.^{xliv}

In the vicinity of the study region there was a reserve formed at Berrwarra Point by the Board in 1894, some 12 kilometres north east of Albion Park at the mouth of Lake Illawarra. It appears that people were already living in the area prior to the reserve's formation. A reserve was formed at Minnamurra River in 1896, again where people were already living. This Minnamurra River reserve was revoked in 1898 and the Board attempted to move the people living there to Kiama. However, by the following year people were again recorded as living at Minnamurra. Queen Rosie and her husband Mickey Johnson lived on both these reserves in the 1890s and early 1900s.^{xlv}

The majority of Aboriginal people in the region lived off the reserves in a series of camps located along the coast and waterways. By 1900 Aboriginal people in the area were concentrated at Minnamurra and Port Kembla. There were important camps in the region at Salty Creek, Coomaditchy Lagoon, Tom Thumb's Lagoon and Red Point, which was later known as Hill 60.^{xlvi}

In the early 1900s repeated attempts were made to remove Aboriginal people from the Port Kembla camps such as Salty Creek and Tom Thumb's Lagoon.^{xlvii} During the 1920s pressure increased on the Hill 60 camp as a result of urban expansion in the area and the resulting pressure from European residents and town councils to remove Aboriginal people from the area. The attempts to remove the Hill 60 community was strongly opposed by the Aboriginal residents.^{xlviii} However, in the late 1930s or early 1940s^{xlix} with the development of the site by

the Department of Defence the Aboriginal residents were moved to what was known as the Official Camps near Coomaditchy (Coomaditchie) Lagoon though some families went temporarily further down the south coast including to the Berry area.ⁱ

In addition to fishing Aboriginal people in the region worked throughout the nineteenth and into the twentieth century as guides, stockmen, agricultural labourers, and domestic workers. In the twentieth century Aboriginal people also began to get employment in industrial areas as wharf labourers and coal trimmers.ⁱⁱ Another important area of employment for Aboriginal people in the area, particularly from the mid- twentieth century was seasonal crop-picking. The two major centres for south coast crop-picking in the mid twentieth century were Bodalla and Bega.ⁱⁱⁱ

Aboriginal people's involvement in the seasonal picking work, so central for many decades to the rural industries of the south coast, constituted a major economic contribution to the region. The freedom of movement associated with the availability of seasonal work also played an important role in allowing for the maintenance of wide ranging networks of kinship amongst the Aboriginal people of the south coast and connected regions.ⁱⁱⁱⁱ

There are many places within Albion Park and the wider region within which it is situated that continue to hold cultural significance for the Aboriginal people who live there and for those who have kinship connections to the area.

Overview of Findings and Recommendations

Within the specific study area consultation with the six knowledge holders has identified three areas of cultural significance as set out in Table 1 below. A detailed discussion of the cultural significance of these three sites is provided in the following section (**Detailed Cultural Significance Assessments**).

Table 1: Summary of Significance of Identified Cultural Sites

Site Name	Description	Cultural significance
Site A: [REDACTED] Creek Cultural Site	A cultural site associated with the stones on the creek bed.	This area has High Significance as a site of cultural and spiritual significance as a place that embodies a cultural tradition. The site encompasses the tangible physical presence of the stones on the creek bed and the intangible associated cultural story that identifies the stones as holding the souls of departed individuals. The site is regarded as a 'no go' area.
Site B: Macquarie Rivulet Cultural Site	The Macquarie Rivulet, throughout its length, is a culturally significant waterway and associated resource zone.	The Macquarie Rivulet is of High Significance to the local Aboriginal community. The waterway and its adjacent resource areas hold high cultural significance for the local Aboriginal community. This cultural significance is a result of the waterway's association with traditional patterns of movement and resource use, with tangible evidence of Aboriginal occupation of the region, and with the intangible story lines that link the coast to the escarpment and the tablelands. The presence of historical burials along the Macquarie Rivulet, though the specific locations are unknown, contributes to its cultural significance. The ongoing use of the waterway as a resource area contributes to its cultural significance as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.
	An old growth fig tree.	This site has Medium Significance for the Aboriginal community as an old growth fig tree. Old growth fig trees, as a class, hold cultural significance for the Aboriginal community of the region being understood variously as resource trees and as places associated with childbirth rituals.

Specific site based actions and mitigation measures have been recommended in relation to two of the three identified cultural sites within the study area, these are set out in Table 2 on the following pages.

In addition it is recommended that an Aboriginal Heritage Management Plan (AHMP) should be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The AHMP should provide specific guidance on measures and controls to be undertaken to avoid and mitigate impacts on Aboriginal cultural heritage during construction. Measures and controls should include protection measures to be applied during construction, including but not limited to the Actions recommended in Table 2 below, contractor training in general Aboriginal cultural heritage awareness, and any on-going opportunities for Aboriginal community engagement. It is recommended that the cultural heritage consultant (Waters

Consultancy) be present at the contractor inductions in relation to those components of the project that include the three identified cultural sites.

In the event of the unexpected discovery of suspected archaeological Aboriginal human remains during the proposed works, in addition to the procedures outlined in the Roads and Maritime *Unexpected Heritage Items Procedure 2015*, it is recommended that the AHMP require that RMS immediately notify the identified knowledge holders of the discovery. If the material is confirmed to be archaeological Aboriginal human remains it is recommended that consultation occur with the identified knowledge holders in relation to: the development of a Management Plan for future proposed works in the relevant area; cultural ceremonies in relation to the human remains and the site of their occurrence; repatriation of the human remains.

Table 2: Recommended Site Specific Actions and Mitigations

Site Name	Description	Cultural Heritage Significance	Impact? Yes/No	Action	Mitigation
Site A: [REDACTED] Creek Cultural Site	A cultural site associated with the stones on the creek bed.	High	No	In relation to Site A: [REDACTED] Creek Cultural Site it is recommended that: 1) temporary fencing be erected between the zone of construction activity and the site; 2) That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).	In relation to Site A: [REDACTED] Creek Cultural Site no mitigation is recommended as there is no known impact.
Site B: Macquarie Rivulet Cultural Site	The Macquarie Rivulet, throughout its length, is a culturally significant waterway and associated resource zone.	High	Yes	It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that: 1) temporary fencing be erected between the zone of construction activity and the old growth eucalypt located within this site (red star on Figure 3 indicates location); 2) That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).	It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occurs as follows: 1) Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with RMS guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area. 2) Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works. 3) The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution

Site Name	Description	Cultural Heritage Significance	Impact? Yes/No	Action	Mitigation
					to local libraries and educational institutions. The final content of the booklet to be developed in consultation with the Aboriginal knowledge holders.
					4) The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.
Site C: YTOF CS 1	An old growth fig tree.	Medium	No	In relation to Site C: YTOP CS 1 no actions are recommended as there is no known impact.	In relation to Site C: YTOP CS 1 no mitigation is recommended as there is no known impact.

Detailed Cultural Significance Assessments

This section provides a detailed discussion of the three sites identified within the specific study area as having Aboriginal cultural significance. Of these three sites of cultural significance, one is located directly adjacent to the proposed footprint (Site A: [REDACTED] Creek Cultural Site), one is located within the proposed footprint (Site B: Macquarie Rivulet Cultural Site), and one is located outside the proposed footprint (Site C: YTOF CS 1).

1.1 Site A: [REDACTED] Creek Cultural Site

Location: [REDACTED]
[REDACTED]
[REDACTED]

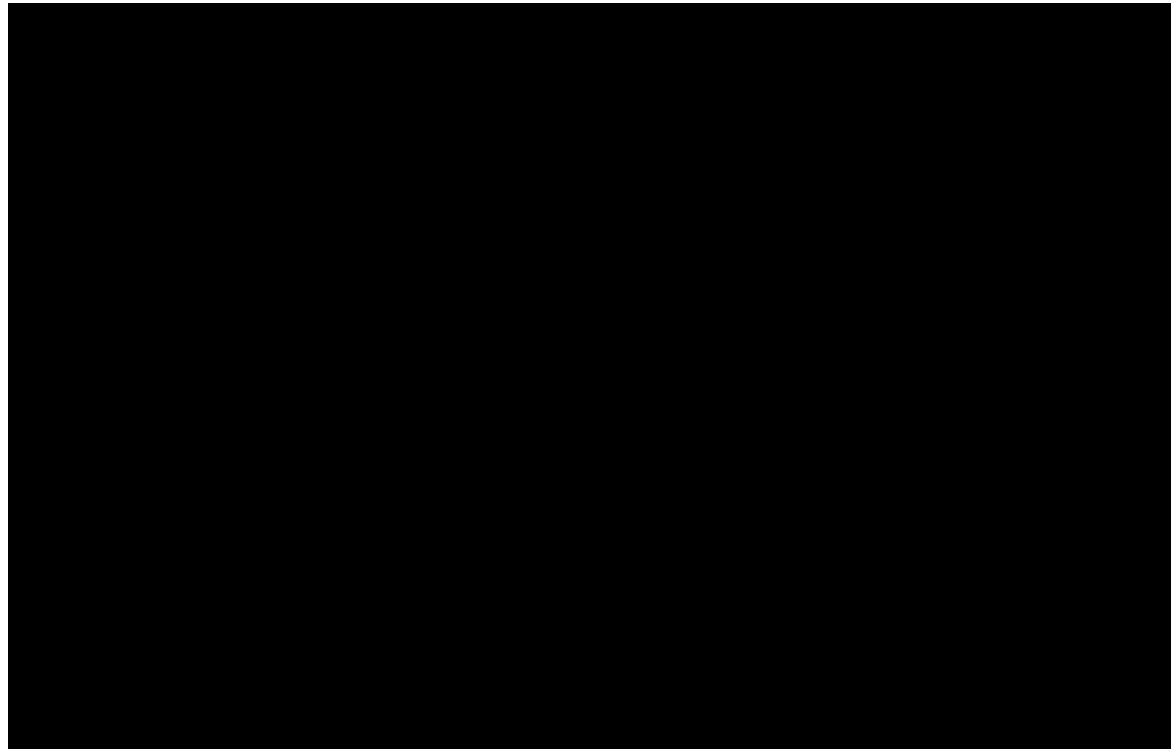


Figure 4: Site A: [REDACTED] Creek Cultural Site.^{liv}

Description: This cultural site is associated with the stones on the creek bed. It has been identified [REDACTED] as a cultural avoidance site or ‘no go’ area taught to them by their grandparents. The cultural story associated with this site identifies the stones that lie on the creek bed in this area as holding the souls of departed individuals, *“The stones hold the souls.”^{lv}* The site is regarded as a ‘no go’ area due to the nature of the individuals whose souls are held in the stones.

The stones hold the departed souls of ‘yeo’ devil people, that’s why this area is called ‘yallah-yeo’, ‘yallah’ means ‘go away’. We were told never to collect any food, anything, there.^{lvi}

When the water is about is when the old people believed that it was most dangerous, it’s when the souls were most known to linger and taunt the living.^{lvii}

Significance: This area has High Significance as a site of cultural and spiritual significance as a place that embodies a cultural tradition. The site encompasses the tangible physical presence of the stones on the creek bed. The cultural and spiritual significance of the site results from the intangible cultural tradition embodied by the stones and the creek bed in which they lay.

Impact: No known impact.

Recommended Actions: In relation to Site A: [REDACTED] Creek Cultural Site it is recommended that:

1. temporary fencing be erected between the zone of construction activity and the site;
2. That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).

Mitigation Recommendations: In relation to Site A: [REDACTED] Creek Cultural Site no mitigation is recommended as there is no known impact.

1.2 Site B: Macquarie Rivulet Cultural Site

Location:

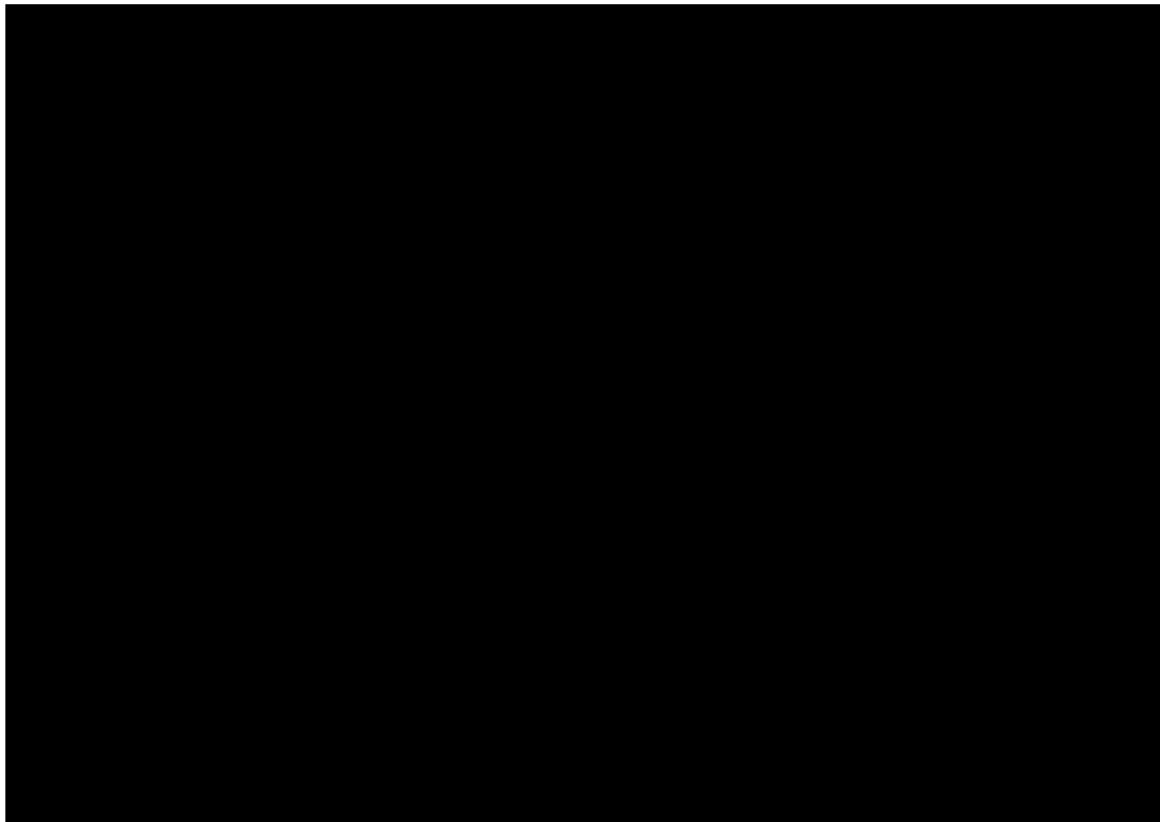


Figure 5: Site B: Macquarie Rivulet Cultural Site.^{lviii}



Description:

The Macquarie Rivulet was identified by all the knowledge holders spoken with as an area of high cultural significance;

The whole lot of the Rivulet is significant... around the water areas there is significance to Koori people.^{lix}

Macquarie Rivulet is a very sacred place. People camped all along there [pre invasion].^{lx}

It's always the river, the rivulet, that's important.^{lxi}

It's important from the entrance at Lake Illawarra all the way up to the escarpment.^{lxii}

The Macquarie Rivulet holds cultural significance as a result of its association with traditional patterns of movement, camping and resource use.

That whole waterway, that river, was a significant food bowl all the way from the lake back. They have put weirs in there and some of that watercourse has changed from its original course. At the base of the mountain that watercourse is still very much original.^{lxiii}



Image 1: Reed beds along the Macquarie Rivulet^{lxiv}



Image 2: Macquarie Rivulet, looking north west from the Darcy Dunster Reserve^{lxv}

The Macquarie Rivulet is understood as the local focus point for a traditional pattern of seasonal movement from the coast up onto the escarpment and the highlands and extending into the St. George's River area.

They went from the Macquarie Rivulet, worked their way up onto the escarpment and then right up to Saltpan - if there was a ceremonial thing on or they were trading, they had to be invited into the area - and then up to Moss Vale way and then they'd come back round to the rivulet.^{lxvi}

This traditional cycle of movement, associated with resource use and management, holds cultural importance as it embodies traditional patterns of life, knowledge of country, and links with neighbouring cultural groups.

They moved with their seasons and their clans... They'd go round in a circle, start here at the rivulet, build a camp where the food all was and then go all the way round... they always followed the food.^{lxvii}

Because people camped all the way along there and the pathways they came all the way down from the escarpment.^{lxviii}



Image 3: Macquarie Rivulet, looking north from the Darcy Dunster Reserve^{lxi}

The Macquarie Rivulet has continued to be used as a resource area for the local Aboriginal community,

That area is very special cause I used to go there a lot fishing, I took all my boys there fishing. When I was a kid I used to fish on there but down towards the lake, that's where you get the blood mussels (cockles) too, down in the sea weed, the lake weed. There's middens all along the rivulet. There's a lot of fish all around here. You go up this creek, there's freshwater marrons up there, at each waterhole.^{lxx}

This continuity of use contributes to the cultural significance of the site as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.



Image 4: The Macquarie Rivulet, looking east from the Darcy Dunster Reserve^{lxxi}

All of the knowledge holders spoken with referred to the presence of middens associated with the Macquarie Rivulet. In some instances reference was made to specific midden sites whilst in others more general reference was made to the presence of middens. The specific middens referred to were not located within the area of the Macquarie River Cultural Site that lies within the current project's impact zone.

The tangible evidence of Aboriginal occupation of the region that is provided by the middens and shell scatters that are known to the Aboriginal community and those that have been archaeologically recorded in the area^{lxxii} contribute further to the significance of the Macquarie Rivulet.



Image 5: Old Growth Eucaplypt, Macquarie Rivulet^{lxiii}

The retention of any tangible cultural material on site was considered to be culturally appropriate by all the knowledge holders. To facilitate this it has been recommended that the topsoil from the impacted area of the cultural site be removed and stockpiled during the construction process. The knowledge holders request that if possible the topsoil be stockpiled on or adjacent to the cultural site. At the completion of construction activities it is recommended that the topsoil be returned to the cultural site and utilised in the landscaping and revegetation of the area. The knowledge holders have requested that the revegetation of the area be undertaken with locally Indigenous plant species.

Significance: The Macquarie Rivulet is of High Significance to the local Aboriginal community. The waterway and its adjacent resource areas hold high cultural significance for the local Aboriginal community. This cultural significance is a result of the waterway's association with traditional patterns of movement and resource use, with tangible evidence of Aboriginal occupation of the region, and with the intangible story lines that link the coast to the escarpment and the tablelands. The ongoing use of the waterway as a resource area contributes to its cultural significance as it provides a sense of cultural continuity from the pre-invasion traditional society to the contemporary Aboriginal community.

Impact: Impact from construction activities and adjacent ancillary area.

Recommended Actions: It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that:

- 1) temporary fencing be erected between the zone of construction activity and the old growth eucalypt located within this site ([REDACTED]);
- 2) That the placement of the fencing be confirmed on site by the consultant (Waters Consultancy).

Mitigation Recommendations: It is recommended in relation to Site B: Macquarie Rivulet Cultural Site that mitigation occurs as follows:

- 1) Topsoil within the impacted area to be separated from other earthworks and if possible stockpiled within the adjacent ancillary area. While stockpiled, the topsoil should be managed in accordance with RMS guidelines to ensure segregation and retention of the material until construction is complete. At completion of construction separated topsoil to be returned to the site area.
- 2) Rehabilitation and revegetation of the impacted area with local Indigenous plant species at completion of construction works.
- 3) The development of a booklet (in a format appropriate for local publication) by a cultural heritage specialist on the cultural values and historical records relating to the Macquarie Rivulet. The report to be produced as a full colour booklet for distribution to local libraries and educational institutions. The final content of the booklet to be developed in consultation with the Aboriginal knowledge holders.
- 4) The development of interpretative signage relevant to this cultural site to be displayed in an appropriate area. The content of the signage to be developed in consultation with the Aboriginal knowledge holders. The preferred location for the placement of the signage, dependent on consultation with the relevant landholder, would be on site in redevelopment of Darcy Dunster Reserve.

1.3 Site C: YTOF CS 1

Location:

lxxiv

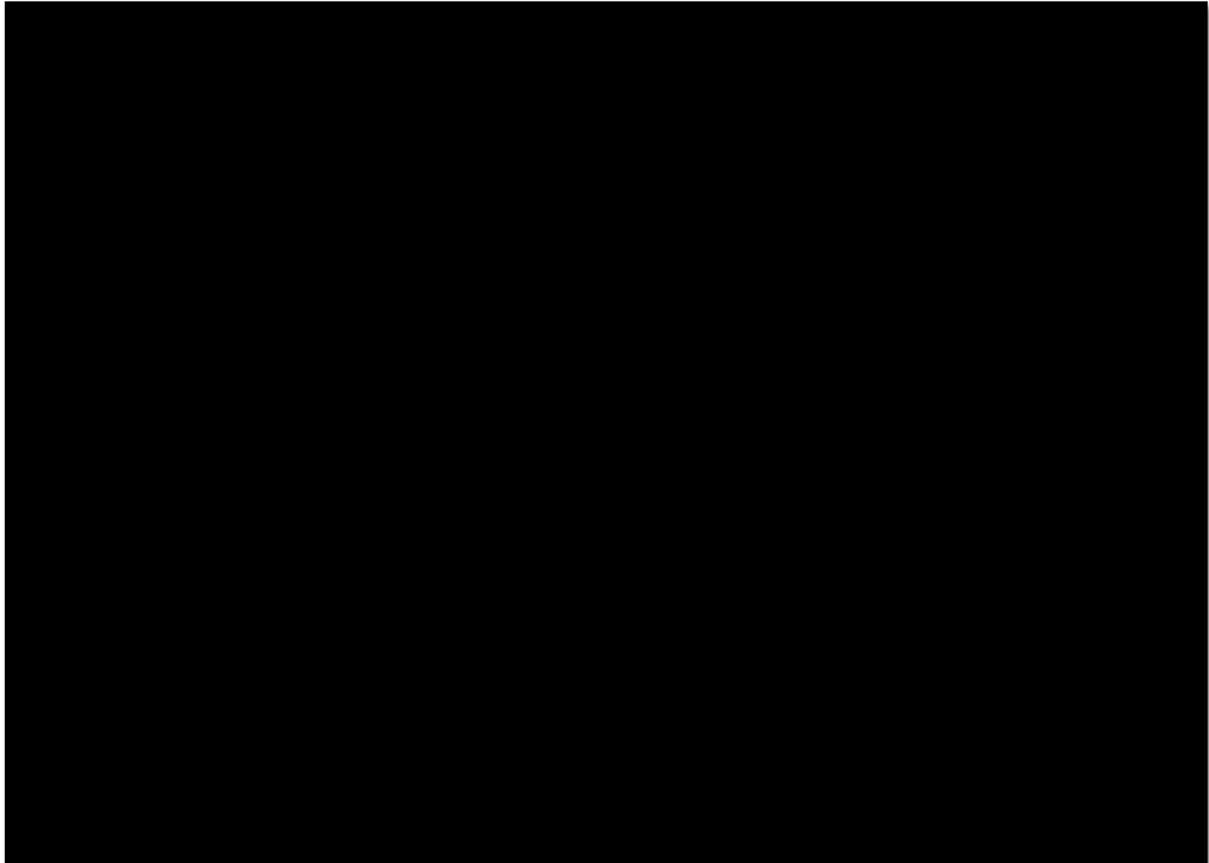


Figure 6: Site C: YTOF CS 1 Old Growth Fig Tree. lxxv

Description: An old growth fig tree located on private property outside the project boundary. All of the knowledge holders spoken with expressed the understanding that all old growth fig trees within the region were of cultural significance. The cultural value of old growth fig trees was understood by some knowledge holders to stem from an association with childbirth rituals.^{lxxvi}

Fig trees we were taught very young, there was three at La Perouse near where the tram used to terminate, three big fig trees, Granny Cook who was a midwife, whenever children were born there was a mark put on to signify their birth. That happened down here too. Two at Fig Tree, two at Primbee, and another one further south towards Gerringong. In just about every town, or close to, there's one of those fig trees that has those marks.^{lxxvii}

For other knowledge holders old growth fig trees held cultural significance as resource trees.

Fig trees were places for rest and protection.^{lxxviii}

Wild fig trees is what they used to eat for their bowels... there's two big fig trees down at Killalea the same, that's where Wonganloo died there, in his daughter's arms, right down that end towards the south.^{lxxix}

It is noted that these two understandings of the cultural value of old growth fig trees, as resource trees and as places associated with childbirth rituals, are mutually compatible. The cultural significance attached to this site was not based on knowledge of the specific tree but on the cultural values attached to all similar old growth fig trees in the region.

Significance: This site has Medium Significance for the Aboriginal community as an old growth fig tree. Old growth fig trees, as a class, hold cultural significance for the Aboriginal community of the region.

Impact: No known impact potential.

Actions: In relation to Site C: YTOF CS 1 no actions are recommended as there is no known impact.

Impact Mitigation and Management: In relation to Site C: YTOF CS 1 no mitigation is recommended as there is no known impact.

Sources

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Appendix A: Letter to Stakeholders



Dear

Invitation to participate in the detailed cultural assessment process the Albion Park Rail bypass

Roads and Maritime Services (RMS) is planning for a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail.

At the Albion Park Rail bypass Aboriginal focus group meeting held on the 16 October 2014, a number of community members mentioned elders who were not present at the meeting that held cultural knowledge of the project area. At the same meeting, Kate Waters from Waters Consultancy was identified as a suitable person to discuss cultural knowledge that the Aboriginal community had worked with on previous projects and were comfortable dealing with.

A draft methodology for the detailed cultural assessment has been prepared and is attached for your review and comment. It outlines the process to be used to interview identified knowledge holders about the cultural values of the study area and describes the approach to be used to undertake the historical research of relevant documentary and audiovisual material of cultural heritage relating to the study area.

The copy of the draft cultural assessment methodology is attached for your review and comment. All comments on the draft cultural assessment methodology must be received by 23 January 2015. Comments can be provided in writing, or by phone to Kate Waters on the details below.

Kate Waters (Waters Consultancy)
28 Govett Street Katoomba, NSW, 2780
Mobile - 0417 438146
Email - waters.consult@bigpond.com

Roads and Maritime has engaged Kate Waters to undertake the detailed cultural assessment for the Albion Park Rail bypass. As part of the cultural assessment Roads and Maritime seeks knowledge holders who have information of any places of cultural value to Aboriginal people in the area of the proposed project. This includes places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

If you are a knowledge holder or know of a knowledge holder please contact Kate Waters to provide cultural information, on the details provided.

We look forward to your participation in the detailed cultural assessment for this project.

Yours faithfully

A handwritten signature in black ink, appearing to read 'P. Hawkins', written over a light blue circular stamp.

Peter Hawkins
Project Development Manager

Proposed Methodology

The proposed approach would build on the existing research and analysis primarily through consultation with identified knowledge holders regarding cultural values within the study area. In addition historical research would be carried out in available documentary and audiovisual sources to identify and assess the cultural values within the study area.

The proposed approach to undertaking the detailed assessment of the Aboriginal cultural values of the study area would be two pronged:

- Detailed consultation with identified knowledge holders regarding the cultural values of the study area;
- Historical research in documentary and audiovisual holdings of relevance to the cultural heritage of the study area.

All registered Aboriginal stakeholders and interested parties would be contacted and requested to identify individuals who they understand to hold cultural knowledge of the study area (knowledge holders). All identified knowledge holders would be contacted and their participation in the assessment process would be requested. All identified knowledge holders who were willing to participate in the project would be interviewed in order to gather oral histories, and undertake detailed cultural mapping, relevant to the study area. Interviews would be conducted with participants in either their own homes, a location of their choice, or during a field visit to the study area. For those individuals who may be unable to undertake a field visit cultural mapping would be facilitated through the use of detailed aerial images and maps.

It is envisaged that potential sources of historical information would include: archival land records; historical manuscripts; newspaper accounts; field recordings; site records; and photographic evidence. The documentary and audiovisual holdings of the following institutions would be investigated:

- Illawarra Museum & Historical Society local historical holdings;
- Wollongong University Archives local historical holdings;
- Mitchell Library of NSW historical manuscripts;
- National Library of Australia archival holdings;
- OEH site and assessment records;
- AIATSIS documentary and audiovisual material;
- SRNSW archival land records.

The research and heritage significance assessment would be undertaken in line with the ICOMOS guidelines (as provided for by the Heritage Council of NSW)¹ and the Aboriginal cultural heritage assessment guidelines produced by the Office of Environment & Heritage (NSW).²

Endnotes

- ⁱ This section, including Figure 1, is a standard project description as provided by Artefact Heritage.
- ⁱⁱ Figure 1 as provided by Artefact Heritage.
- ⁱⁱⁱ Map produced from Albion Park Rail Upgrade Project maps as provided by Roads and Maritime Services, 2015.
- ^{iv} Map produced from Albion Park Rail Upgrade Project maps as provided by Roads and Maritime Services, 2015.
- ^v See The Burra Charter (The Australia ICOMOS Charter for Places of Cultural Significance, 2013), Australia International Council on Monuments and Sites.
- ^{vi} *Practice Note: The Burra Charter and Indigenous Cultural Heritage Management*, Version 1: November 2013, Australia International Council on Monuments and Sites.
- ^{vii} See Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW, 2011, Office of Environment and Heritage (NSW).
- ^{viii} The six individuals identified as knowledge holders by the registered Aboriginal stakeholders who participated in this project were: Reuben Brown, Gwen Brown nee Bell, Roy 'Dootch' Kennedy, Allan Carriage, Richard Campbell, and Aaron Broad.
- ^{ix} The seventh individual identified as a knowledge holder who has not been spoken with to date is James Davis.
- ^x Artefact Heritage, *Albion Park Rail Bypass PACHCI Stage 2: Second Addendum*, Report to Roads & Maritime Services, October 2014, p.29.
- ^{xi} See *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, 2011, Office of Environment and Heritage (NSW).
- ^{xii} See *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, 2011, Office of Environment and Heritage (NSW).
- ^{xiii} See *The Burra Charter (The Australia ICOMOS Charter for Places of Cultural Significance, 2013)* and *Practice Note: The Burra Charter and Indigenous Cultural Heritage Management*, Version 1: November 2013, Australia International Council on Monuments and Sites.
- ^{xiv} Erick Carl Ecklund 'Putting into Port': *Society, Identity and Politics at Port Kembla, 1900 to 1940*, PhD Thesis, University of Sydney, 1994, f/n 3, p.155.
- ^{xv} Val Attenbrow, *Sydney's Aboriginal past: investigating the archaeological and historical records*, Sydney, University of New South Wales Press, 2002, p.124.
- ^{xvi} Ecklund, *op.cit.*, p.155 ; see also Michael Organ *Illawarra and South Coast Aborigines 1770-1900*, Australian Institute of Aboriginal and Torres Strait Islander Studies, December 1993 and Michael Organ *A Documentary History of the Illawarra & South Coast Aborigines 1770-1850*, Aboriginal Education Unit, Wollongong University, 1990.
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- ^{xviii} Ecklund, *op.cit.*, p.157. ; Wesson (based on Gahan), *op.cit.*, pp.12-13.
- ^{xix} Anon, 'Opening of the Albion Park Dairy Factory', *The Kiama Independent and Shoalhaven Advertiser*, 20 November 1885, p.2.
- ^{xx} The building itself has been listed on the State Heritage Register by the current landholder, RailCorp, in relation to its association with the development of the dairy industry, the listing does not reference the potential Aboriginal significance of the site. See: 'Albion Park Dairy (Former)', listed under the Heritage Act (NSW), s.170 – NSW State agency heritage register, <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4804464>.
- ^{xxi} Ecklund, *op.cit.*, p.157. ; Wesson (based on Gahan), *op.cit.*, pp.12-13.
- ^{xxii} Wesson (based on Gahan), *op.cit.*, pp.10-11 ; Attenbrow, *op.cit.*, *passim*.
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- ^{xxiv} Kate Waters *Cullunghutti the mountain and its people: A Documentary History of Cullunghutti Mountain, Aboriginal People and the Shoalhaven (1770 to 1920)*, Waters Consultancy Pty Ltd for Office of Environment & Heritage (Nowra),

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xxvi Michael Bennett, *For a Labourer Worthy of His Hire: Aboriginal Economic Responses to Colonisation in the Illawarra and Shoalhaven, 1770-1900*, PhD Thesis, University of Canberra, 2003, p.52. ; Anon, 'Sydney', *Sydney Gazette and New South Wales Advertiser*, 25 February 1815, p.2. ; See also references in the Section Arrawarra in Waters, op.cit.

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xxxv Interviews with knowledge holders for this project (see bibliography).

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xxxvii E.H. Weston, *Reminiscences of an Australian Pioneer*, n.d., quoted in Wesson (based on Gahan), op.cit., , p.34.

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xxxix Anon, 'Aborigines. Relics Discovered "Chief of the Five Islands"', *Sydney Morning Herald*, 14 September 1929, p.21.

xl Wesson (based on Gahan), op.cit., p.34.

xli Boomerang, 'Lake Illawarra and its Islands', *Illawarra Mercury*, 7 September, 1893, p.3.

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xlvii Ecklund, op.cit., p.166-167 ; Wesson (based on Gahan), op.cit., pp.48-49.

xlviii Ecklund, op.cit., p.169-170.

xlvi Wesson (based on Gahan), op.cit., provides a date of 1942, Ecklund, op.cit., provides a date of 1939.

¹ Wesson (based on Gahan), op.cit., pp.49-52 ; Ecklund, op.cit., pp. 173-4 ; Interviews with knowledge holders for this project (see bibliography).

li Ecklund, op.cit., p.164, 171-2 ; Wesson (based on Gahan), op.cit., pp.39-41.

lii Waters, op.cit., pp.277-278 ; Ecklund, op.cit., p.164, 171-2 ; Wesson (based on Gahan), op.cit., pp.39-41.

liii Waters, *op.cit.*, p.278.

liv Map produced from Albion Park Rail Upgrade Project maps as provided by Roads and Maritime Services, 2014.

lv Interview with Richard Campbell, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lvi Interview with Aaron Broad, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lvii Interview with Aaron Broad, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

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lix Interview with Allan Max Carriage, 24th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lx Interview with Reuben Brown and Gwen Brown nee Bell, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

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lxiii Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxiv Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

lxv Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

lxvi Interview with Reuben Brown, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxvii Interview with Reuben Brown, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxviii Interview with Richard Campbell, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxix Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

lxx Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxxi Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

lxxii See for example NPWS Site Recording forms 52-5-0474 ; 52-5-0475 ; 52-5-0476 ; 52-5-0481 ; 52-5-0482 all located within the Larkins Lane subdivision ; 52-5-229 adjacent to the Macquarie Rivulet on the east side of the Princes Highway ; 52-5-0227 located within Darcy Dunster Reserve ; 52-5-1803 on the Macquarie Rivulet at Haywards Bay ; 52-5-0728 on Yallah Bay Road ; 52-5-0766 on the south side of Darcy Dunster Reserve.

lxxiii Photograph by Korey Moon, Waters Consultancy Pty Ltd, February 2015.

lxxiv Note that the location of this site is based on its mapping by Artefact Heritage, Second addendum to the PACHCI Stage 2 archaeological survey report for the Albion Park Rail Bypass Project, October 2014, p.37.

lxxv Map produced from Albion Park Rail Upgrade Project maps as provided by Roads and Maritime Services, 2014.

lxxvi Interview with Richard Campbell and Aaron Broad, 12th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd. Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxxvii Interview with Roy 'Dootch' Kennedy, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

lxxviii Interview with Allan Max Carriage, 24th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

^{lxxix} Interview with Gwen Brown nee Bell, 9th February 2015, *Albion Park Rail Bypass Road and Maritime Services Project*, Waters Consultancy Pty Ltd.

9.2 Appendix B: Consultation

Agency Letters

18 June 2014

D/00437/C/E1

Mr Terry Bailey
Deputy Chief Executive - Regional Operations
Office of Environment and Heritage
PO Box A290
SOUTH SYDNEY NSW 1232

Dear Mr Bailey

To seek Aboriginal knowledge holders to assist Roads and Maritime Services to prepare a cultural heritage assessment report for the Albion Park Rail bypass.

Roads and Maritime is seeking the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places within the project area for the Albion Park Rail bypass.

Aboriginal people identified by your agency will be notified of the project and invited to participate in the assessment process as described in Office of Environment and Heritage's requirements. Please forward the details of relevant Aboriginal people to Roads and Maritime before 7 July 2014.

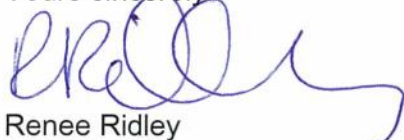
The contact details for this project are:

Joanne Damcevski
Aboriginal Cultural Heritage Officer - Southern
Roads and Maritime Service
Level 5, 90 Crown Street
WOLLONGONG NSW 2500

Roads and Maritime Services is planning for a future extension of the M1 Princes Motorway between Yallah and Oak Flats to provide a bypass of Albion Park Rail. Attached is a copy of the project corridor map.

This letter forms part of the Roads and Maritime's commitment to actively identify relevant Aboriginal people in accordance with section 4.1.2 of the Office of Environment and Heritage *Aboriginal cultural heritage consultation requirements for proponents* (2010).

Yours sincerely



Renee Ridley
Senior Communications and Stakeholder Engagement Officer



**Office of
Environment
& Heritage**

Your reference:
Our reference:
Contact:

D/00437/C/E1
DOC14/107323-01
Sam Higgs
02 4224 4187

Ms Joanne Damcevski
Aboriginal Cultural Heritage Officer – Southern
Roads and Maritime Service
Level 5, 90 Crown Street
WOLLONGONG NSW 2500

Dear Ms Damcevski

**WRITTEN NOTIFICATION OF PROPOSAL AS REQUIRED UNDER OEH ABORIGINAL CULTURAL
HERITAGE CONSULTATION REQUIREMENTS FOR PROPONENTS 2010
RE: Albion Park Rail Bypass, Yallah to Oak Flats
Wollongong LGA, NSW**

I refer to your letter of 18 June 2014 to the Office of Environment and Heritage (OEH) regarding the above matter.

Attached is a list of known Aboriginal parties for the Wollongong local government area that OEH feels is likely to have an interest in the development. Please note this is not necessarily an exhaustive list of all interested Aboriginal parties and receipt of this list does not remove the requirement of a proponent / consultant to advertise in local print media and contact other bodies seeking interested Aboriginal parties, in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (April 2010).

Please note that the contact details in the attached list may be out of date as we rely on third parties to advise us when their details change. If individuals or companies undertaking consultation are aware that any groups contact details are out of date, or letters are returned unopened, please contact either the relevant stakeholder group (if you know their more current details) and /or OEH. AHIP applicants should make a note of any group they are unable to contact as part of their consultation record.

If you wish to discuss any of the above matters further please contact Sam Higgs on (02) 4224 4187.

Yours sincerely

7/7/14

**Jedda Lemmon
A/Senior Team Leader
Regional Operations Group
Planning - Illawarra**

Enclosure

3 October 2014

Terry Bailey
Deputy Chief Executive - Regional Operations
Office of Environment and Heritage
PO Box A290
SOUTH SYDNEY NSW 1232

Dear Sir/Madam

Below is the list of names of the registered Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places within the project area for the Albion Park Rail bypass.

First Name	Last Name
Edward	Moran
Sheryl	Davis
Ali	Maher
Geoff	Maher
Maria	Maher
Leonard	Wright
Troy	Tungai
Richard	Campbell
Anthony	Moore
Derek	Hardman
Leanne	Tungai
Craig	Tungai
Sheree	Rankmore
James	Davis

Also enclosed is a copy of the advertisement placed in the Koori Mail, National Indigenous Times, Lake Times and Illawarra Mercury, and the notification letter sent to registered Aboriginal parties.

Yours sincerely



Paul Vecovski
Project Development Manager

Advertisement



Transport
Roads & Maritime
Services

Aboriginal Heritage Albion Park Rail bypass

Roads and Maritime Services invites Aboriginal people and Aboriginal groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and places for the Albion Park Rail bypass to register to be consulted.

To register your interest, please contact:

Joanne Damcevski

Aboriginal Cultural Heritage Officer – Southern
Roads and Maritime Services

M: PO Box 477 Wollongong, NSW 2520

E: Joanne.Damcevski@rms.nsw.gov.au

T: (02) 4221 2767

Registrations must be received by phone or in writing by **Wednesday 13 August 2014.**

Roads and Maritime is planning for a future extension of the M1 Princes Motorway between Yallah and Oak Flats to provide a bypass of Albion Park Rail.

A map of the study area is available at: rms.nsw.gov.au/roadprojects/apr or by contacting Roads and Maritime.

The proposal may result in Roads and Maritime:

- Applying for an Aboriginal Heritage Impact Permit (AHIP) under Part 6 of the *National Parks and Wildlife Act 1974*, and/or
- Undertaking investigations in accordance with the *Code of practice for archaeological investigations in NSW 2010*, and/or
- Undertaking an environmental impact assessment under the *Environmental Planning & Assessment Act 1979*.

N45754

PUBLICATION	SECTION/SORT	MODULE SIZE	SIZE H (cm) x COL W (mm)	MONO/COLOUR	APPEARANCE DATE
Woll Adv/Lake Times/Kiama Ind	EGN	T41	186mm x 63mm	Mono	30/7
Illawarra Mercury	EGN	T41	186mm x 63mm	Mono	30/7

Registered Stakeholders

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Receipt of Registration



Dear [REDACTED]

Receipt of registration to participate in Aboriginal cultural heritage assessment process for the Albion Park Rail bypass

Thank you for registering your interest with the Roads and Maritime Services to be involved in the Aboriginal cultural heritage consultation process for this project.

Shortly, you will receive an invitation to attend an Aboriginal focus group meeting. At this meeting, Roads and Maritime will present an overview of the project; describe the statutory approvals process; outline critical milestones and invite you to discuss or present cultural information relevant to the Aboriginal objects or places that may be affected by the project.

You will receive a copy of a draft archaeological methodology which will outline how Roads and Maritime proposes to manage its impact on Aboriginal objects and/or places. You are invited to review this methodology and provide comment.

As part of the consultation process, Roads and Maritime is required to give Office of Environment and Heritage (OEH) and the relevant local Aboriginal land council(s) the names of all parties that have registered. **If you do not want your name to be forwarded, please inform the contact person for this project.**

Aboriginal community consultation will be undertaken in accordance with:

- The Office of Environment and Heritage (OEH) Aboriginal cultural heritage consultation requirements for applicants 2010; and
- The RTA's *Procedure for Aboriginal cultural heritage consultation and investigation* 2010.

Please find enclosed information about the project to assist you with your understanding of potential impacts to Aboriginal cultural heritage.

For more information contact Joanne Damcevski, Aboriginal Cultural Heritage Officer – Southern on 4221 2767.

Yours faithfully

Paul Vecovski
Project Development Manager

Roads & Maritime Services

Invitation to AFG #1

3 October 2014

SF2012/052661

Dear [REDACTED]

Invitation to participate in the heritage assessment process and to attend an Aboriginal focus group meeting for Albion Park Rail bypass.

Roads and Maritime Services is planning for a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail.

Roads and Maritime believes the project may have an impact on Aboriginal cultural heritage. As a consequence, Roads and Maritime may require approvals under *National Parks & Wildlife Act 1974* and/or the *Environmental Planning & Assessment Act 1979* for this project.

As part of the consultation process, Roads and Maritime seeks cultural information to identify:

- Whether there are any Aboriginal objects of cultural value to Aboriginal people in the area of the proposed project.
- Whether there are any places of cultural value to Aboriginal people in the area of the proposed project. This includes places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

Roads and Maritime will be holding an Aboriginal focus group meeting to discuss the management of Aboriginal cultural heritage for this project at the **Dapto Ribbonwood Centre, Sassafras Room, 93-109 Princes Highway, Dapto on Thursday 16 October from 10am to 12midday. A light lunch will be provided.** An agenda for the meeting has been enclosed.

Aboriginal site officers will be required to undertake archaeological field work for this project. An Aboriginal Site Officer Application Form will be issued shortly, along with a draft archaeological methodology and archaeological report your review and comment.

Please advise Roads and Maritime if any specific disability assistance is required to assist in your attendance at the meeting, such as wheelchair access, hearing loops and dietary requirements.

Please note that travel expenses will not be reimbursed for attendance at focus group meetings and site visits for this project.

Roads & Maritime Services

To register your interest in attending the Aboriginal focus group meeting, you should write, email or phone: 1800 708 727, AlbionParkRailbypass@rms.nsw.gov.au, PO Box 477 Wollongong NSW 2520.

We look forward to your participation in the assessment of this project.

Yours faithfully

A handwritten signature in blue ink, appearing to read 'P. Vecovski', with a stylized flourish at the end.

Paul Vecovski
Project Development manager

AFG #1 held 16 October 2014

Aboriginal Focus Group (AFG)

Terms of Reference

Albion Park Rail bypass

October 2014

Introduction

Roads and Maritime Services aims to manage the impact of its projects on Aboriginal cultural heritage to meet legislative responsibilities. Roads and Maritime is committed to being culturally sensitive, proficient, practical and cost effective. This procedure provides Roads and Maritime and Aboriginal stakeholders with a process for consultation on Aboriginal cultural heritage issues associated with the planning, development, construction and maintenance of roads. The role, function and views of Aboriginal stakeholders will be considered and respected by Roads and Maritime.

Purpose

- Meet the Department of Environment and Climate Change (DECC) requirements for consultation with Aboriginal community stakeholders regarding the application of section 87 (Preliminary Research) Permit and/or Section 90 (Consent to destroy) permit.
- Provide information on the scope, timing and reasons for the project proposal.
- Inform Aboriginal community stakeholders on the NSW Government Aboriginal Affairs 10 year policy ("Two ways together" policy), DECC Interim requirements for consultation with Aboriginal community for the applications under section 87 & section 90 and Aboriginal Participation in Construction.
- Provide a connection to Roads and Maritime's Aboriginal Program in support of the working in partnership options to provide genuine training and realistic employment for local Aboriginal people.
- Provide information about the current knowledge of Aboriginal cultural values and archaeological investigations to date.
- Allow Aboriginal community input into the design and methodology for the Aboriginal cultural and archaeological assessment.
- Allow Aboriginal community stakeholders to contribute to the development of Aboriginal heritage management recommendations.
- Discuss the process of engagement of Aboriginal stakeholders to assist in the Aboriginal cultural assessment and archaeological assessment.
- Discuss the care and control of Aboriginal artefacts identified during the Aboriginal heritage investigations.
- Provide archaeological and project standards to identify and preserve traditional Aboriginal sites

- Provide comment on all aspects of the Aboriginal heritage management.

Objectives of the AFG

- Work collaboratively with Roads and Maritime and all stakeholders for the benefit of Aboriginal cultural heritage and the project.
- Facilitate processes for improved communication and flow of information between all stakeholders.
- Respectfully acknowledge the traditional land, law and customs of the Traditional Owners/Custodians.
- Acknowledge the diversity of our Aboriginal community and their contributions to the process.

Role of the AFG

The key role of the AFG is to discuss the process of engagement of Aboriginal stakeholders to assist in the:

- Aboriginal cultural assessment and archaeological assessment.
- Care and control of Aboriginal artefacts identified during the Aboriginal heritage investigations and to provide comment on all aspects of the Aboriginal heritage management.

Decision making

The AFG is not a decision making body and there is no requirement to reach a consensus amongst members on issues discussed. There is likely to be a diversity of viewpoints expressed on a number of issues. Roads and Maritime will consider all viewpoints.

Proposed membership

Membership of the AFG includes those who registered to participate in the Aboriginal cultural assessment process for the Albion Park Rail bypass.

Appendix A - Aboriginal Focus Group (AFG) meeting protocols and guidelines

The following meeting protocol and guidelines set a framework for on-going meetings of the AFG. The meeting facilitator/chairperson is responsible for ensuring that the meeting protocol and guidelines are adhered to:

Behaviour

- Members will respect other members opinions and accept the responsibilities of the group purpose as follows:
- Treat members with respect and courtesy
- Enable all members to be equally heard, not speak over each other and listen to all other members' points of view.
- Take all relevant information into consideration
- Act with honesty and in good faith
- Act reasonably
- Refrain from any form of conduct that may cause a reasonable person unwarranted offence or embarrassment.

Role and responsibility of members

All members are responsible for seeking the views of the communities they represent concerning all aspect of Aboriginal heritage management. This involves:

- Providing Leadership for communities being represented
- Sharing information from the AFG with the community represented and from the community with the AFG
- Listening to the views of all communities with representation on the AFG
- Respecting the views of all communities with representation on the AFG

The AFG may determine who has the right to speak for country and provide cultural knowledge.

Meeting attendance and function

All registered AFG stakeholders are expected to attend all meetings.

Roads and Maritime's Project Manager, Aboriginal Cultural Heritage Advisor is to attend all AFG meetings.

New members will be welcomed to meetings but it is expected that they spend time outside the meeting to be educated in the group process and function.

At each meeting the previous meeting notes will be reviewed for accuracy and adopted with any amendments.

Meeting frequency and location

All meetings will be held at the Ribbonwood Centre at Dapto. Meetings will be held as and when required. Two weeks notice prior to each meeting will be provided.

Issues to be discussed

AFG meetings will discuss Aboriginal cultural heritage issues relating to the Albion Park Rail bypass only.

Employment issues arising from the preservation of Aboriginal cultural heritage under this project may be discussed as necessary in AFG meetings.

Employment issues relating to Aboriginal participation in construction will be dealt with in a separate forum under the Roads and Maritime's Aboriginal Program.

Response to comments and recommendations

Roads and Maritime will provide feedback through meeting notes and AFG meetings to AFG members on the resolution of issues raised.

Technical presentations

Where information of a more technical nature is to be presented to the group, the relevant experts will be invited to present at an AFG meeting. This may include representatives from other government agencies and Roads and Maritime Contractors.

Meeting Facilitator/chairperson

Roads and Maritime's Project Manager and Aboriginal Cultural Heritage Advisor will co-chair the meetings.

Role of the Chairpersons

- Chair all AFG meetings.
- Ensure that the AFG fulfils its Terms of Reference.
- Implement the AFG meeting protocol and guidelines in a fair manner will all members.
- Review and endorse agendas and notes of meetings before distribution.

Information recording and dissemination

Notes of all AFG meetings will be prepared by a Roads and Maritime representative and reviewed by the chairpersons prior to distribution. Notes will include an attendance record, key issues raised and actions recommended or agreed.

Notes of meetings will be distributed to all registered stakeholders within 14 days of the last meeting.

Any changes to the notes will be discussed at the following meeting and recorded as amendments by the Chairpersons.

Name of meeting: Albion Park Rail bypass, Aboriginal Focus Group (AFG) Meeting

Location of meeting: Ribbonwood Function Centre Dapto

Meeting facilitator: Paul Vecovski

Date 16 October 2014. 10:00 am – 2:00 pm 10:00 am

Attendees **RMS:** Paul Vecovski, Peter Hawkins, Renee Ridley, Laura Aboozaid, Gunther, Joanne Damcevski, Josh Symmonds, Peter Rand

Irene Moran, Robert Moran, Gordon Moran, Louise David, Jason Davison, Jodie Stewart, Richard Campbell, Trevor Walker, Aaron Broad, Lee-Roy Boota, Esther Bell, Dawn Bell, Joshua Daniel Marijancevic, Clayton Stewart, Leonard Wright, Gillian Camppei Maria Maher, Geoff Maher, Dale Mcleod, Hika Te-Kowhai, Keeden Daniels, Corey Butler, Jarl Walker, Rhonda Davison, Bruce Davison, Della Hogkins, Craig, Glenn Campbell, Jo Davis, Patricia Campbell

MEETING MINUTES

Welcome to Country

Aboriginal representative

Introductions and apologies

Paul Vecovski, Project Development Manager

General discussion

- Questions were raised around how Roads and Maritime selects stakeholders to attend the meeting
- Barry Gunther explained that a stakeholder list is provided by the Office of Environment and Heritage (OEH). The list consists of all Aboriginal groups registered with OEH in the identified area. All registered groups were sent the information package via mail.
- There was discussion around why any Aboriginal person in the country can put an application in for this work. Many in the group felt that local people with local knowledge should only be allowed to work on local land.
- Discussions between attendees about who is entitled to speak on behalf of country
- Some attendees wanted a copy of the stakeholders who were invited to the meeting. Attendee read from the NPWS Act 1974. He argued that Roads and Maritime had a responsibility to engage with the stakeholder groups (most importantly the Elders). **Action: Joanne Damcevski to follow up on who the Elders are and the best way to consult with them.**
- Barry Gunther explained the list could not be released for confidential reasons. The list was generated by OEH and that the purpose of this meeting is to communicate with the group about the project and site officer work opportunities. Every group on this list was sent the information package regarding the meeting.
- The group felt that key personal/organisations were not present at the meeting. A number of attendees requested Shellharbour City Council and OEH representatives should be in attendance. Attendees proposed the meeting be postponed until these representatives and elders could be in attendance.

- Paul Vecovski explained the meeting would still be going ahead today. He noted that applications for the work would be closing on 31 October.
- Barry Gunther explained the OEH processes are currently being reviewed. Barry will pass this information onto AFG members once approved. **Action: Barry Gunther.**
- Some group members had concerns with the work timeline Roads and Maritime has allocated. They felt this was not enough time to do the work required. The Roads and Maritime team was asked what the procedure is if something significant is found during the site work? What happens if the site work takes longer than the given timeframe Roads and Maritime has given for these works to be completed?
 - Paul Vecovski said timelines would be adjusted if needed.
- Paul Vecovski advised Roads and Maritime would circulate the agenda prior to future meetings. **Action: Paul Vecovski.**

Agenda

1. Define roles and scope of meeting

- Paul Vecovski read out the Terms of Reference for the group which defined the roles, functions and responsibilities. The group agreed to adhere to the terms of reference.

Lunch break

The proposal

- Peter Hawkins outlined the project details and known impacts, the environmental impact assessment process, critical timeframes and milestones for completion of assessments activities and delivery of reports.

Archaeological assessment

- Josh Symons presented the survey results, the proposed methodology for further investigation.
- Some of the group indicated they had worked with Kate Waters before and were happy to work with her again. **Action: Jo Damcevski to pass contact details onto Paul Vecovski.**
- Question: Is Roads and Maritime hand testing? Answer: Josh Symons advised at this only stage Roads and Maritime is only hand testing
- There was a comment that there were songlines present from the escarpment that passed through the project site and to the coast these were present near the Macquarie Rivulet.
- Peter Hawkins explained if large cultural heritage artefacts are located in the Croome Road area the scope of the project can change. Pit sizes to be excavated will be 50cm by 50cm. Group members indicated concerns with sizes and items could be missed.
- Roads and Maritime indicated they are open to ideas on how the excavation process is undertaken.
- There was a discussion on what information National Parks receive from Roads and Maritime and what Roads and Maritime receives from National Parks. There is an understanding that at times this information is confidential due to the sensitivity of the information.
- Questions asked about Larkins Lane and Section 90 for the development. Peter Hawkins advised that the Department of Planning is the approving body for this project.
- Some in the group had concerns about the walk over of site Roads and Maritime had with the local land council. The group would like to see the Elders have the opportunity to be involved in the process at this stage of the project lifecycle. **Action: Jo Damcevski to follow up with Elders.**

- Questions raised on the maximum payment rate and expenses for Aboriginal Site Officers. The group would like to know if there is a manual they can refer to. Barry Gunther advised that RMS is currently reviewing payment rates. **Action: Jo Damcevski to follow up and provide.**

Cultural assessment

- The group told Roads and Maritime there is a heritage site identified at Macquarie Rivulet. The site is a site of a battlefield and contains burial grounds (related to Aaron's family).
- Peter Hawkins encouraged attendees to contact their Elders regarding any cultural areas of concerns/or sites Roads and Maritime should avoid. Asked that this information be passed onto RMS.
- Some in the group were not happy that they need to justify the sites that Roads and Maritime should avoid. Roads and Maritime stated that if RMS did not know what the sites were then they could not identify them to avoid them. Roads and Maritime would discuss any confidential site information separately, attendees are to contact Roads and Maritime if they hold this knowledge.
- Barry Gunther advised OEH will require information regarding sites Roads and Maritime has been requested not to disturb.
- The group would like female aboriginal site officers only on identified female sites.

Site officer applications

- The group would like senior site officers paired up with trainees. Roads and Maritime agreed to have 8 site officers consisting of 4 seniors and 4 trainees.
- Paul Vecovski confirmed that local residents will get first preference in the application process.
- Peter Hawkins advised that as the project progresses and additional site work is required the advertisement and application process will be undertaken again.
- One group member said they would like to see a process put in place for Aboriginal site officers who get removed from site to allow them to return to site once issues have been resolved.
- The group would like Elders to be placed on the selection panel for the site officers. This was discussed. Barry Guthrie advised that ensuring the process is fair and based on merit and accepted by the whole group would be difficult. This was noted but not to be followed up. The group was advised that Laura Aboozaid and Greg Evans (Greg has an Aboriginal background).
- The group raised questions about the expenses paid for site officers and how this is calculated. Peter Hawkins advised that this is in line with Roads and Maritime policy.

Meeting End

Paul Vecovski closed the meeting and advised that the next meeting would be in early 2015. Invites and an agenda will be circulated to those who registered at today's meeting and the OEH stakeholder list.



Dear 

Background information for Aboriginal focus group meeting for Albion Park Rail bypass.

Roads and Maritime Services is planning for a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail.

Roads and Maritime will be holding an Aboriginal focus group meeting to discuss the management of Aboriginal cultural heritage for this project at the **Dapto Ribbonwood Centre, Sassafras Room, 93-109 Princes Highway, Dapto on Thursday 16 October from 10am to 12midday. A light lunch will be provided.**

As part of the Aboriginal focus group background information is included in this package, this being:

- Aboriginal archaeological survey report (October 2013)
- Aboriginal archaeological survey report first addendum (March 2014)
- Aboriginal archaeological survey report second addendum (October 2014)
- Archaeological test excavation methodology (October 2014)

Aboriginal site officers will be required to undertake archaeological field work for this project. An Aboriginal Site Officer Application Form is also attached.

Please note that travel expenses will not be reimbursed for attendance at focus group meetings and site visits for this project.

We look forward to your participation in the assessment of this project.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Peter Hawkins'.

Peter Hawkins
Project Development manager

Invitation to AFG #2



Tuesday, 14 April 2015

[Redacted]

[Redacted]

Dear [Redacted]

Invitation to attend an Aboriginal focus group meeting for the Albion Park Rail bypass on 28 April 2015

Roads and Maritime Services is planning for a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail.

As part of the consultation process Roads and Maritime is holding a second Aboriginal focus group meeting to discuss the results of the archaeological investigations and plans for managing impacts to Aboriginal cultural heritage for this project.

The Aboriginal focus group meeting will be held on **Tuesday, 28 April 2015 at the Illawarra Aboriginal Corporation, 22 Kenny Street Wollongong, from 10am to 2pm**. A light lunch will be provided. An agenda for the meeting is enclosed.

Please advise Roads and Maritime if any specific disability assistance is required to assist in your attendance at the meeting, such as wheelchair access, hearing loops and dietary requirements. Please note that travel expenses will not be reimbursed for attendance at focus group meetings for this project.

A draft cultural heritage assessment report will be mailed to you shortly for your review and feedback. This report covers the sites identified as areas of potential Aboriginal cultural significance, results of the test excavations and overall assessment of archaeological significance within the project area.

To register your interest in attending the Aboriginal focus group meeting please email AlbionParkRailbypass@rms.nsw.gov.au or phone 1800 708 727.

We look forward to your participation in this project.

Yours faithfully

Paul Vecovski
Project Development Manager

Roads & Maritime Services

Letter accompanying draft CHAR sent to Stakeholders 22 April 2015

Albion Park Rail bypass



Transport
Roads & Maritime
Services

22 APRIL 2015

Roads and Maritime Services is planning for a 9.8 kilometre extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail.

Enclosed is a copy of the Draft Cultural Heritage Assessment Report for your review and feedback.

The Draft Cultural Heritage Assessment Report covers the sites identified as areas of potential Aboriginal cultural significance, results of the test excavations and overall assessment of archaeological significance within the project area.

This is your opportunity to review the report and provide feedback to Roads and Maritime.

Please provide feedback on the Draft Cultural Heritage Assessment Report by Friday, 22 May 2015.

The next Aboriginal focus group meeting will be held on Tuesday, 28 April 2015 at the Illawarra Aboriginal Corporation, 22 Kenny Street Wollongong, from 10am to 2pm. The Draft Cultural Heritage Assessment Report will be discussed at this meeting.

To register your interest in attending the Aboriginal focus group meeting and/or to provide feedback on the draft cultural heritage assessment report, please write, email or phone: 1800 708 727, AlbionParkRailbypass@rms.nsw.gov.au, PO Box 477 Wollongong NSW 2520.

We look forward to your participation in this project.

Yours faithfully

Paul Vecovski
Project Development Manager

For further enquiries:

Level 4, 90 Crown Street, Wollongong NSW 2500 | PO Box 477 Wollongong NSW 2520

T 1800 708 727 | E albionparkrailbypass@rms.nsw.gov.au | www.rms.nsw.gov.au/apr

AFG #2 held 28 April 2015

APRIL 2015

Aboriginal focus group meeting

A second Aboriginal focus group meeting for the proposed Albion Park Rail bypass was held on Tuesday 28 April 2015 at the Illawarra Aboriginal Corporation, Wollongong.

Purpose of the meeting

Roads and Maritime Services invited community representatives to participate in a second Aboriginal focus group meeting to discuss the results of the archaeological investigations and plans for managing impacts to Aboriginal cultural heritage for this project.

Meeting Summary

The actions from the first Aboriginal focus group meeting, held in October 2014, were discussed and closed.

A project update was provided by Roads and Maritime.

The test digging results from the eight sites excavated were presented and discussed. The artefacts found and the next steps were discussed. This included two sites recommended for salvage and how we propose to undertake the salvage. The draft salvage methodology was presented and discussed. Salvage works are expected to start after the project has been approved. This is likely to be in the second half of 2016.

The cultural assessment process was discussed, including the areas of cultural significance identified. Plans to preserve the cultural site were discussed. These included:

- Protecting an old growth eucalyptus tree and topsoil material on the banks of Macquarie Rivulet,
- Ensuring this area is revegetated with local plant species, and
- Developing interpretive signage showing the cultural values of the Macquarie Rivulet.

The Draft Cultural Heritage Assessment Report has been mailed out to stakeholders for comment. The report covers the excavation and cultural assessment process, findings and proposed way forward. It includes the archaeological salvage methodology (at the very back of the report). Feedback on the report closes on **Friday, 22 May 2015**. Feedback can be provided by:

- **Email:** AlbionParkRailbypass@rms.nsw.gov.au
- **Address:** PO Box 477 Wollongong NSW 2520

Roads and Maritime will talk to the group again after we have planning approval. This is planned for 2016.

Aboriginal employment during construction was also discussed.

The following is a summary of the comments and questions raised at the meeting.

<i>Comment/question</i>	<i>Discussion and Roads and Maritime response</i>
Issues around invoices not being paid on time were raised.	When sending in invoices please make sure you highlight what the project is i.e. Albion Park Rail bypass, Berry to Bomaderry upgrade, Foxground and Berry bypass.
Discussion around what should be done with the artefacts found.	The group felt they should be reburied close to where they were found. The Elders should be involved and consulted on this. There was some concern that not the whole community was represented at this meeting. Roads and Maritime suggested sending a letter to the stakeholders proposing to rebury the artefacts close to the site they were found and asking for feedback on this approach. The group agreed. This will be done once the salvage works is completed.
Employment process for site officers was discussed.	Discussion around how the process works. Roads and Maritime advised site officer employment is a merit based process. This is in line with all state government recruitment. There were questions around if someone was sick and unable to attend on a certain day why can't that company just send someone else to cover. Roads and Maritime advised this isn't appropriate because employment must be merit based and the person from that company is not necessarily the next person in line for employment. There was discussion around the employment of equal numbers of male and female site officers. Roads and Maritime acknowledged that the process isn't perfect. We intend to recruit more people than needed for the next round of site officer work to be able to backfill more easily when someone can make work as rostered.
Concern raised around trainees being left alone on site.	On this project the archaeologist was advised who is a trainee and who isn't so they can be matched to prevent this issue. Roads and Maritime recognises that it is important for trainees to be supervised. Feedback was that this worked well on this project but there have been issues on other projects.
When will there be more site officer work?	We won't do salvage at the two sites until after we have project approval. We expect this to be in late 2016. Closer to the time we will send a letter out to stakeholders to let them know about the opportunity of upcoming work.

	Roads and Maritime will hold an information session to help people fill in the employment application form.
Once salvage is completed will monitoring be required?	No.

Albion Park Rail bypass



Transport
Roads & Maritime
Services

8 MAY 2015

Dear stakeholder

An Aboriginal Focus Group meeting was held on 28 April 2015 at the Illawarra Aboriginal Corporation. Enclosed is a copy of the meeting notes.

The Draft Cultural Heritage Assessment Report was discussed at the meeting. The report covers the sites identified as areas of potential Aboriginal cultural significance, results of the test excavations and overall assessment of archaeological significance within the project area.

The report has been mailed out to stakeholders. If you did not receive a copy please call 1800 708 727.

This is your opportunity to review the Draft Cultural Heritage Assessment Report and provide feedback to Roads and Maritime.

Please provide feedback by Friday, 22 May 2015.

To provide feedback on the draft cultural heritage assessment report, please write, email or phone: 1800 708 727, AlbionParkRailbypass@rms.nsw.gov.au, PO Box 477 Wollongong NSW 2520.

We look forward to your participation in this project.

Yours faithfully

Paul Vecovski
Project Development Manager

For further enquiries:

Level 4, 90 Crown Street, Wollongong NSW 2500 | PO Box 477 Wollongong NSW 2520

T 1800 708 727 | E albionparkrailbypass@rms.nsw.gov.au | www.rms.nsw.gov.au/apr

1.2 Appendix C: PACHCI Stage 2 ASR

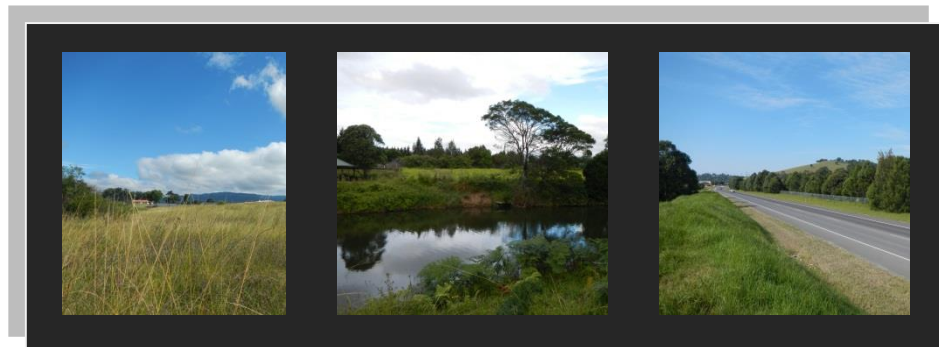
Yallah to Oak Flats Road Upgrade

Stage 2 PACHCI Aboriginal Archaeological Survey Report

Wollongong and Shellharbour Local Government Areas

Report to Roads and Maritime Services (RMS)

June 2013



Artefact Heritage
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Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
A	13 May 2013	SW	SW	13 May 2013	Internal review
B	12 June 2013	SW	SW	13 June 2013	Amendments to draft report in response to RMS comments
C	17 June 2013	SW	SW	17 June 2013	Amendment to Figure 4

Printed:**Last saved:**

13 October 2015 03:53 PM

File name:

Yallah to Oak Flats Road Upgrade Aboriginal Archaeological Survey Report

Author:

Samantha Gibbins

Project manager:

Sandra Wallace

Name of organisation:

Artefact Heritage

Name of project:

Yallah to Oak Flats Road upgrade

Name of document:

Aboriginal Archaeological Survey Report

Document version:

Final report

Executive summary

Roads and Maritime Services (RMS) is currently examining whether a proposed road corridor between Yallah and Oak Flats is suitable to provide a long term solution for an upgrade of the Princes Highway. Artefact Heritage has been engaged by RMS to conduct an Aboriginal archaeological survey and assessment for the study area in accordance with Stage 2 of the RMS *Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011* (PACHCI). The resulting Archaeological Survey Report (ASR) will be used to guide the future planning of an upgrade of the Princes Highway between Yallah and Oak Flats.

The aims of the study were to accurately locate previously registered Aboriginal sites and identify new sites within the study area, and to assess their archaeological significance. Preliminary recommendations have been made regarding further assessment or management measures for Aboriginal sites and areas of potential archaeological deposit (PAD). These would be confirmed once a concept design has been developed and potential impacts are more definitively known.

Two Aboriginal sites (52-5-0484/52-5-0512 and 52-5-0227) were previously recorded within the current study area and one area of PAD (YTOF PAD 1) was identified during this assessment.

Site 52-5-0484/52-5-0512 has been assessed as having a moderate archaeological potential and an unknown archaeological significance. YTOF PAD 1 has been assessed as having a high archaeological potential and an unknown archaeological significance. Prior to works being undertaken that may result in impacts to site 52-5-0484/52-5-0512 or YTOF PAD 1, archaeological test excavations under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010* (referred to as the Code of Practice) would be conducted in both areas. Test excavations would be required to inform an assessment of archaeological significance and recommendations regarding management and mitigation if required.

Site 52-5-0227 has been assessed as having low archaeological significance. No further archaeological investigation of this site is necessary. An Aboriginal Heritage Impact Permit (AHIP) would be required prior to impacts occurring at this site.

This ASR complies with the requirements of Stage 2 of the RMS PACHCI. RMS and Artefact consulted with the Illawarra Local Aboriginal Land Council (ILALC) during Stage 2. Representatives from ILALC participated in the field survey.

If Aboriginal objects or areas of PAD were to be impacted by the proposal, Stage 3 of the PACHCI would be initiated by RMS. Stage 3 requires comprehensive stakeholder consultation to be undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (referred to as the Consultation Requirements). This would be undertaken by RMS and would involve a process of formal notification of the project proposal and Aboriginal stakeholder registration. As part of Stage 3 the cultural significance of the study area would be addressed during



consultation with the registered Aboriginal stakeholder groups. If test excavation were recommended a methodology would also be prepared in consultation with the Aboriginal stakeholder groups at an Aboriginal Focus Group (AFG) meeting. In accordance with Stage 3 PACHCI a Cultural Heritage Assessment Report (CHAR) would be prepared to accompany the future AHIP application.

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1.0 Introduction and background

1.1 Description of the proposal

RMS is currently examining whether a proposed road corridor between Yallah and Oak Flats is suitable to provide a long term solution for an upgrade of the Princes Highway (Figure 1). Artefact Heritage has been engaged by RMS to conduct an Aboriginal archaeological survey and assessment for the proposal in accordance with Stage 2 of the RMS PACHCI. The resulting ASR will be used to guide the future planning of an upgrade of the Princes Highway between Yallah and Oak Flats.

1.2 Scope of the study

This study would form part of an initial constraints analysis for the proposed upgrade of the Princes Highway from Yallah to Oak Flats. This ASR complies with Stage 2 of the RMS PACHCI. If Aboriginal sites or archaeological deposits were to be impacted by the proposal, Stage 3 PACHCI would be initiated by RMS. The study area is the road corridor as shown in Figure 1.

1.3 Objectives of the study

The objectives of this study are to comply with the RMS PACHCI, and the Office of Environment and Heritage (OEH) regulations, including the Code of Practice and the Consultation Requirements. The main objectives of this study include providing:

- A description of the proposal and the extent of the study area.
- A description of Aboriginal community involvement and Aboriginal consultation.
- Discussion of the environmental context of the study area.
- Discussion of the Aboriginal historical context of the study area.
- A summary of the archaeological context of the study area including a discussion of previous archaeological work in the area.
- Development of an archaeological predictive model.
- Description of Aboriginal sites and areas of PAD within the study area.
- Development of a significance assessment for these sites addressing archaeological values.
- Recommendations for management and mitigation measures for Aboriginal sites and PADs.

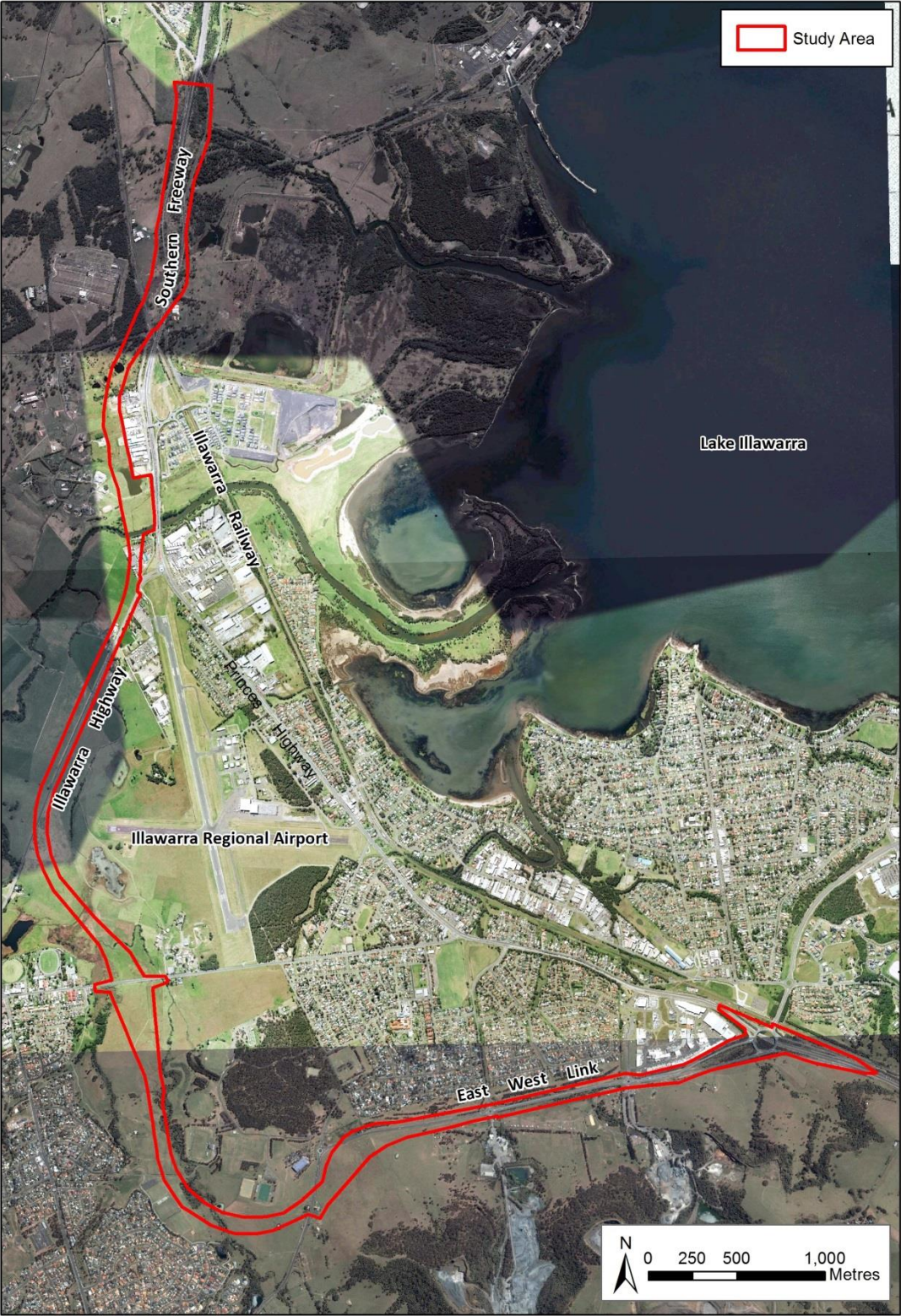


Figure 1: The study area. Background image source Google© 2013 and Land and Property Information NSW.

1.4 Development context

The study area is within a locality that is undergoing rapid development. The study area is partly within the West Dapto Release Area (WDRA). Development projects that are associated with this area include water and wastewater infrastructure provision by the Sydney Water Corporation.

1.5 Investigator and contributions

Josh Symons, Senior Archaeologist at Artefact Heritage, undertook this study along with Archaeologist Samantha Gibbins. Samantha Gibbins prepared this report with management input from Josh Symons. Principal Archaeologist Dr Sandra Wallace provided management input and reviewed the report. Josh Symons and Samantha Gibbins attended the site survey.

1.6 Aboriginal community involvement

Aboriginal consultation has been conducted in accordance with Stage 2 of the RMS PACHCI. A Native Title search was requested on the 23 April 2013 by Artefact. The results indicated that there were no Native Title claims granted or registered for consideration within the study area. The study area is within the boundary of Illawarra Local Aboriginal Land Council (ILALC). Pam Glover, Neville Maher, William Butler and Jon Kirby represented ILALC throughout the survey.

2.0 Environmental context

2.1 Landform units

Much of the study area crosses through the floodplain associated with Duck Creek and Macquarie Rivulet. The land at the very northern end of the study area rises up moderately into the hill slopes of Mount Brown. South of this, the terrain flattens out towards the floodplain. The area immediately to the north and west of where the study area crosses Macquarie Rivulet is gently undulating. The east-west stretch of the study area runs along the northern basal slopes of Wentworth Hills and Signal Hill, which are drained by Horsley Inlet and its tributaries. Overall, the landform units within the study area range from alluvial flats and creek terraces, to gentle and moderate hill slopes and gullies. The study area presents an opportunity to investigate a variety of landform units across a large area.

2.2 Geomorphology

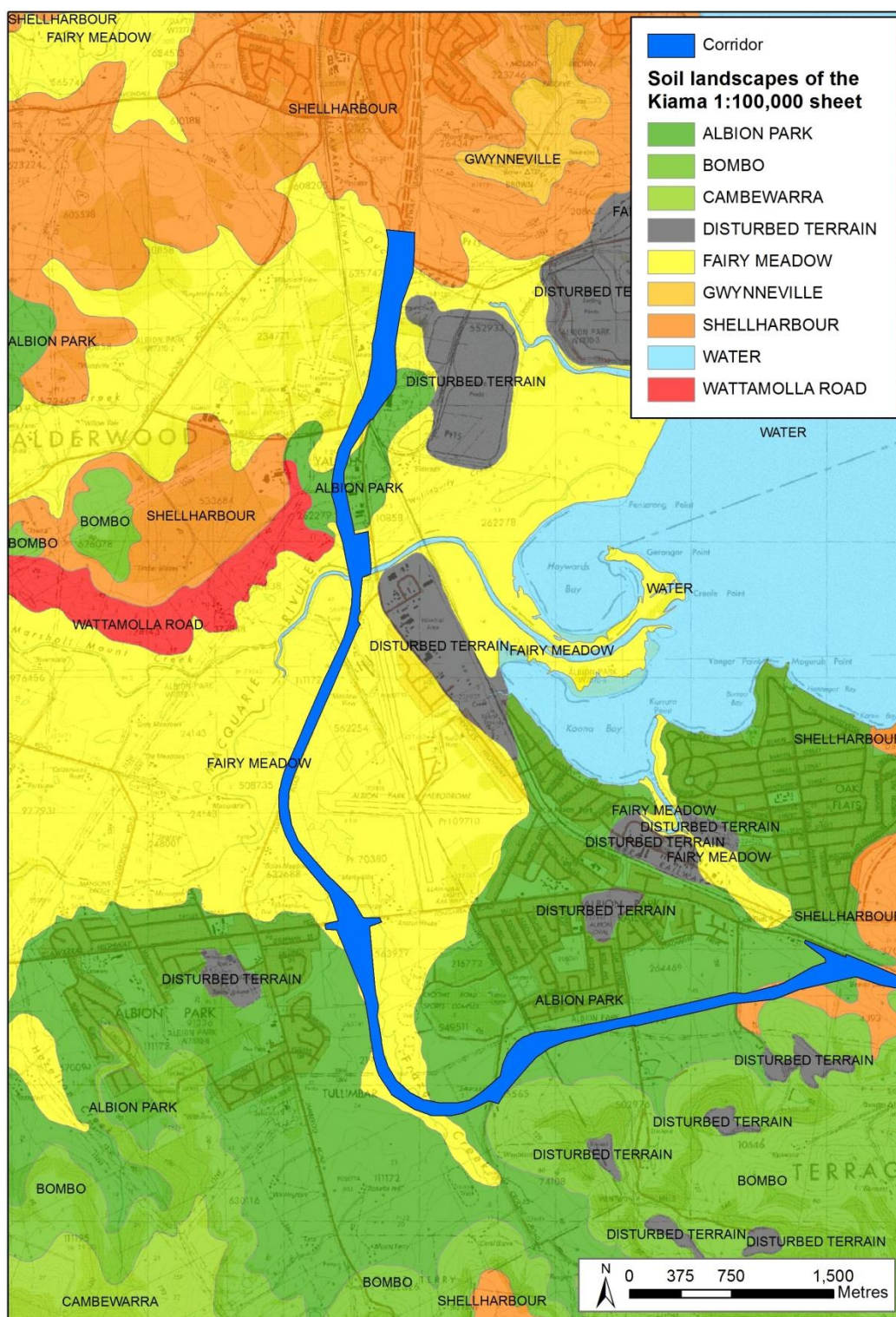
The underlying geology of the study area primarily consists of sedimentary rock of the Berry Siltstone formation, part of the Permian-aged sediments of the Shoalhaven Group. The Berry Siltstone geological unit consists of dark-grey siltstone and very fine felspathic litharenite. The matrix includes pebbles of quartzite, reef quartz and basic igneous materials that are up to 20 millimetres in diameter. The Berry siltstone formation is found exposed in low-lying parts of the study area, along drainage channels. This is overlain by Quaternary Alluvium - material that has been eroded from the local geological units and transported and deposited by water. It comprises gravel, swamp deposits, peat, silt, beach sand and dune sand. The east-west stretch of the study area is underlain in places by Late Permian Gerringong volcanics, which include laterite (Rose 1966; AMBS 2006a: 16-18).

As shown in Figure 2, the study area passes through three main soil landscapes (Hazelton 1992; Hazelton and Tille 1990). Fairy Meadow is the most predominant and is widely present in the alluvial plains, floodplains, valley flats and terraces below the Illawarra Escarpment. Topography of this soil landscape is relatively flat, generally consisting of slopes less than 10 metres in height and inclined less than 5 percent. Soils on terraces are moderately deep (50 to 100 centimetres) Alluvial Loams and Siliceous Sands. Drainage plains include Prairie Soils and Yellow Podzolic Soils. The Fairy Meadow soil landscape is characterised by flood hazard, low wet bearing strength, topsoils that are highly permeable, and high water tables (Hazelton 1992: 97).

A small part of the northern sector of the study area, and the entire east-west stretch of the study area, passes through the Albion Park soil landscape. The very northern and eastern ends of the study area cross the Shellharbour soil landscape. Both soil landscapes are subject to localised mass movement and are characterised by eroding soils. The Albion Park soil landscape is subject to seasonal waterlogging,



whilst the Shellharbour soil landscape is subject to localised water erosion hazard. Soil depths range from shallow, at less than 50 centimetres, to deep, at over 150 centimetres (AMBS 2006a: 23).



2.3 Hydrology

The study area mostly falls within the Macquarie Rivulet Catchment, which covers an area of approximately 110 square kilometres from the Illawarra escarpment in the west to Lake Illawarra in the east. The study area crosses over a number of water courses that transect the landscape. These watercourses generally flow eastwards from the Illawarra Escarpment, and northwards from the southern elevated regions, towards Lake Illawarra. From north to south, the water courses crossed by the study area include Duck Creek and its tributaries; Macquarie Rivulet; and Frazers Creek – a tributary to Macquarie Rivulet that drains the southern portion of the Macquarie Rivulet Catchment. At the southern end, the study area turns eastwards and crosses over the northwards flowing Frazers Creek, and the north-westwards flowing Horsley Inlet and its tributaries. The study area is mostly within a distance of 2.5 kilometres to the west and south of Lake Illawarra. These water courses provide semi-permanent and permanent water sources.

2.4 Natural resources

Much of the study area has been cleared as a result of European land use practices. The area would have featured a diverse range of flora and fauna resources prior to clearance. Ecological communities that have been identified across low-lying swamp landscapes within the wider region include Alluvial Swamp Mahogany Forest, comprising *Eucalyptus robusta*, *E. botroides* and *Casuarina glauca* (NSW NPWS 2003: 42). More specifically, the floodplains of the Duck Creek and Macquarie Rivulet Catchments feature “highly degraded freshwater wetlands.” The floristic composition of these wetlands is apparently inconsistent, dependent on water levels and the degree of disturbance (NSW NPWS 2003: 41).

Macquarie Rivulet supports an apparently unique riparian vegetation community that is not found further north. This features Tall River Oak (*C. cunninghamiana*) that grows along the banks of the drainage lines in narrow bands. Closer to Lake Illawarra, in areas affected by tidal waters, Tall River Oak is replaced by *C. glauca* and *Melaleuca species* (NSW NPWS 2003: 42).

Other vegetation communities identified across the floodplain landforms within the wider region include Coastal Grassy Red Gum Forest and Lowland Woollybutt-Melaleuca Forest. The Coastal Grassy Red Gum Forest is dominated by Red Gums (*E. tereticornis*, *E. amplifolia*). These may occur with Stringybarks (*E. eugenoides*), *Melaleuca styphelioides* and *E. bosistoana*. The Lowland Woollybutt-Melaleuca Forest consists of *E. longifolia*, *M. decora* and *E. pilularis*, with Red Gum less dominant. This community occurs towards the margins and on the bordering slopes of the alluvial floodplains (NSW NPWS 2003: 42).

The original vegetation of the study area would have supported a diverse range of mammals, reptiles, insects and birdlife, all of which would have been utilised by Aboriginal hunter-gatherers. Plants were also an important resource, being used for food or as sources of raw material for manufacture (Attenbrow

2010: 41). The presence of nearby fresh water sources would have attracted Aboriginal people to the area. These water sources would also have provided Aboriginal people with fish and shellfish resources.

No specific sources of stone for artefact manufacture are known within the study area. AMBS (2010: 27) note that the underlying geology to the north of Lake Illawarra comprises Late Permian Gerringong volcanics. These include laterite, trachytes tuff with pebbly sandstone bands, siltstone and conglomerate. Some types of tuff are used in stone tool production and the area may therefore have been exploited by Aboriginal people in the region. The Illawarra escarpment edge to the west of the study area is made up of the Illawarra coal measures. Rock types include chert and mudstone, which are sometimes used in stone tool production and may therefore have been exploited by local Aboriginal people (AMBS 2010: 27).

In an earlier study that incorporates a small section of the current study area, AMBS (2006: 250) determined that the diversity and varying quality of the raw materials used in stone tool manufacture is suggestive of local sourcing. It is thought likely that the materials were sourced from the conglomerate gravels of the underlying sandstone and siltstone bedrock, particularly quartz and quartzite. Other possible local raw material sources are the pebbles and cobbles identified from a paleo-channel adjacent to the existing alignment of Robins Creek to the west of Horsley.

It is therefore likely that the local geology, which provided a variety of stone resources, was an influencing factor on Aboriginal occupation of the area.

2.5 Land use history

The Macquarie Rivulet Catchment area has been subject to a diverse range of land uses, including rural practices; low/medium density residential areas; industrial development; and regionally significant developments such as the Illawarra Regional Airport.¹ Much of the study area incorporates existing roads/corridors (e.g. Princes Highway and Motorway; Illawarra Highway; Tongarra Road; East-West Link). A small portion of the study area crosses over the Illawarra Railway, near where it meets Yallah Road. For the most part, the roads and road reserve that are encompassed by the study area pass through land that is used for agricultural purposes. Small sections also pass through, or run adjacent to, areas of industrial and residential development.

2.6 Archaeological implications for the study area

The study area would have provided a wide range of food and manufacturing resources for the local Aboriginal population. It is also located within close proximity to perennial fresh water. As noted by Dallas and Sullivan (1995: 14, 19) the largest areas of alluvial deposit in the region are located between the

¹ Shellharbour City Council website (<http://www.shellharbour.nsw.gov.au/default.aspx?WebPage=165>) viewed 24 April 2013.



foothills and Lake Illawarra, and are associated with, amongst others, the Duck Creek system and the Marshall Mount/Macquarie Rivulet creek system. It has been observed that depositional and swamp landscapes are characterised by the retention of parent soil, along with the deposition of transported soil, therefore making them more likely to retain archaeological materials (AMBS 2006a: 24). These factors combined imply that Aboriginal objects are likely to be present in certain parts of the study area. The steeper slopes within the study area are not likely to have been sites of frequent or repeated Aboriginal activity, nor are they likely to retain intact Aboriginal deposit.

3.0 Aboriginal historical and archaeological context

3.1 Aboriginal material culture

The oldest dated sites for Aboriginal occupation in the Sydney Basin are from the late Pleistocene period, with a securely dated site at the base of the Blue Mountains of 14,700 years before present (yBP), and two coastal sites south of Wollongong at Bass Point and Burrill Lake in the Shoalhaven both dated to around 20,000 yBP (Lampert 1971; Nanson *et al* 1987). Evidence of Aboriginal occupation has been found dated to 50-60,000 yBP at Lake Mungo in NSW, so it would be likely that Aboriginal people have lived in the Illawarra region for even longer than indicated by the oldest recorded dates available at present. The archaeological material record provides evidence of this long occupation, but also provides evidence of a dynamic culture that has changed through time.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts. Archaeological analyses of these artefacts in their contexts have provided the basis for the interpretation of change in material culture over time. Technologies used for making tools changed, along with preference of raw material. Different types of tools appeared at certain times, for example ground stone hatchets are first observed in the archaeological record around 4,000 yBP in the Sydney region (Attenbrow 2010: 102). It is argued that these changes in material culture were an indication of changes in social organisation and behaviour.

The Eastern Regional Sequence was first developed by McCarthy in 1948 to explain the typological differences he was seeing in stone tool technology in different stratigraphic levels during excavations such as Lapstone Creek near the foot of the Blue Mountains (McCarthy *et al* 1948). The sequence had three phases that corresponded to different technologies and tool types (the Capertian, Bondaian and Eloueran). The categories have been refined through the interpretation of further excavation data and radiocarbon dates (Hiscock & Attenbrow 2005; JMcD CHM 2005). It is now thought that prior to 8,500 yBP tool technology remained fairly static with a preference for silicified tuff, quartz and some unheated silcrete. Bipolar flaking was rare with unifacial flaking predominant. No backed artefacts have been found of this antiquity. After 8,500 yBP silcrete was more dominant as a raw material, and bifacial flaking became the most common technique for tool manufacture. From about 4,000 yBP to 1,000 yBP backed artefacts appear more frequently. Tool manufacture techniques become more complex and bipolar flaking increases (JMcD CHM 2006). It has been argued that from 1,400 to 1,000 years before contact there is evidence of a decline in tool manufacture. This reduction may be the result of decreased tool making, an increase in the use of organic materials, changes in the way tools were made, or changes in what types of tools were preferred (Attenbrow 2010: 102). The reduction in evidence coincides with the reduction in frequency of backed blades as a percentage of the assemblage.

3.2 Aboriginal histories of the locality

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The study area is located within the Dharawal language group area (Attenbrow 2010: 34). The Dharawal language group was largely coastal and is thought to have extended from the Shoalhaven River in the south, to Botany Bay in the north and then inland to Camden (Attenbrow 2010: 34). The Dharawal language group was bordered to the north in the Botany Bay – southern Sydney region by the Darug and to the west in the Mittagong – Moss Vale region by the Gundungurra. The study area falls within the territory of the Dharawal-speaking Wodi Wodi people. Tindale (1974) described the territory of the Wodi Wodi as extending from north of the Shoalhaven River at Nowra to Wollongong and inland to Moss Vale.

The area covered by the Dharawal language included a variety of landscape and resource types, including coastal and estuarine environments, rolling hills and creeks bordering the coastal environment, and the large sandstone escarpment and plateau. Sullivan (cited in Rich 1988: 23) suggested that the boundary between the Gundungurra and the Dharawal was the divide between the coastal and inland river systems, which runs on an approximate south-west to north-east line east of Wingello, Bundanoon, Robertson and Mittagong. Movement across these different terrain types and resource areas may have been dictated by the season or purpose (DEC 2005: 8). Additionally, exchange with people from surrounding language groups included Gundungarra and Wiradjuri people travelling to the coast to exchange foods and raw materials, whilst the Dharawal and Awabakal (Central Coast region) shared ceremonies (DEC 2005: 8).

Long-term areas of interaction and ‘travel corridors’ for movement between different language groups may have existed where there were shared boundaries. Laila Haglund has suggested that the Campbelltown area in south-west Sydney may have represented the intersection between the boundaries of the Dharawal, Darug and Gundungurra, and that the Narreelan Valley may have been part of a ‘travel corridor’ facilitating movement between the north-western Sydney and the Illawarra (JMcD CHM 2007: 21 after Haglund 1989).

Early interaction between the Dharawal and the British was intermittent and brief. The earliest sighting of British people by the Dharawal would most likely have been when they saw sailing ships along the coast. The records of Captain Cook and several of his crew document seeing numerous fires and occasional Aboriginal people on the coastline in the Illawarra region (Organ 1993: 46). Organ (1993: 49) documents an anonymous exploration journal attributed to surveyor George William Evans, which recorded an overland expedition north from Jervis Bay via Wollongong in 1812. The exploration party encountered several groups of Aboriginal people, and at one point exchanged some of their possessions with one of the groups for oysters (Organ 1993: 49).

Several of the early British settlers in the Illawarra documented large gatherings of Aboriginal people, including a reference by Navin (1994: 8) that Robert James, a local resident of the area, recorded a camp of around 100 Aboriginal people on the banks of American Creek at Mount Kembla. In 1836 a group of around 200 Aboriginal people were observed in the Illawarra area as they were preparing to travel to Cowpastures in south-west Sydney (Griffin 1986: 6 cited in AMBS 2010: 33).

A variety of flora and fauna resources were utilised in the Illawarra region for subsistence, personal ornament and tool requirements. The variety of subsistence resources in the Illawarra included marine, estuarine, freshwater and hinterland flora and fauna. Early British records documented torchlight spearing of bream and consumption of whale meat (Organ 1993: 262). The consumption of whale was documented as an important event linked to the spirits of their ancestors (Organ 1993: 262). Cabbage trees were used for various purposes, including utilisation of the fibre (Organ 1993: 155), used to make bridges over creeks and for food (AMBS 2010: 35). Other plant species utilised for food and tools included bats-wing tree, grass tree, Gynea lily, various Eucalypt *sp.*, mat-rush, sticky hop bush, Melaleuca and black wattle (AMBS 2010: 35).

3.3 Registered Aboriginal sites in the local area – AHIMS search

An extensive search of the Aboriginal Heritage Information System (AHIMS) database was undertaken on the 23 April 2013 for sites registered within the following coordinates:



Buffer	50 m
Number of sites	102
AHIMS Search ID	98600

The distribution of recorded sites within the AHIMS search area is shown in Figure 3. The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal be removed from this report if it is to enter the public domain.

The frequency of recorded site types is summarised in Table 1. Of the 102 sites previously recorded in the 10.5 x 8.7 kilometre search area, Artefact sites are predominant (n=72). The remaining site types include Shell with Artefact (n=14); Potential Archaeological Deposit (PAD) (n=7); Shell (n=6); Modified Tree (n=2); and Modified Tree with Artefact (n=1). It can be seen in Figure 3 that the majority of sites are located within 200 m of water sources such as Duck Creek, Macquarie Rivulet, Marshall Mount Creek and their tributaries, or close to the shores of Lake Illawarra. The site distribution is also a reflection of the pattern of archaeological assessments undertaken in relation to development activities.

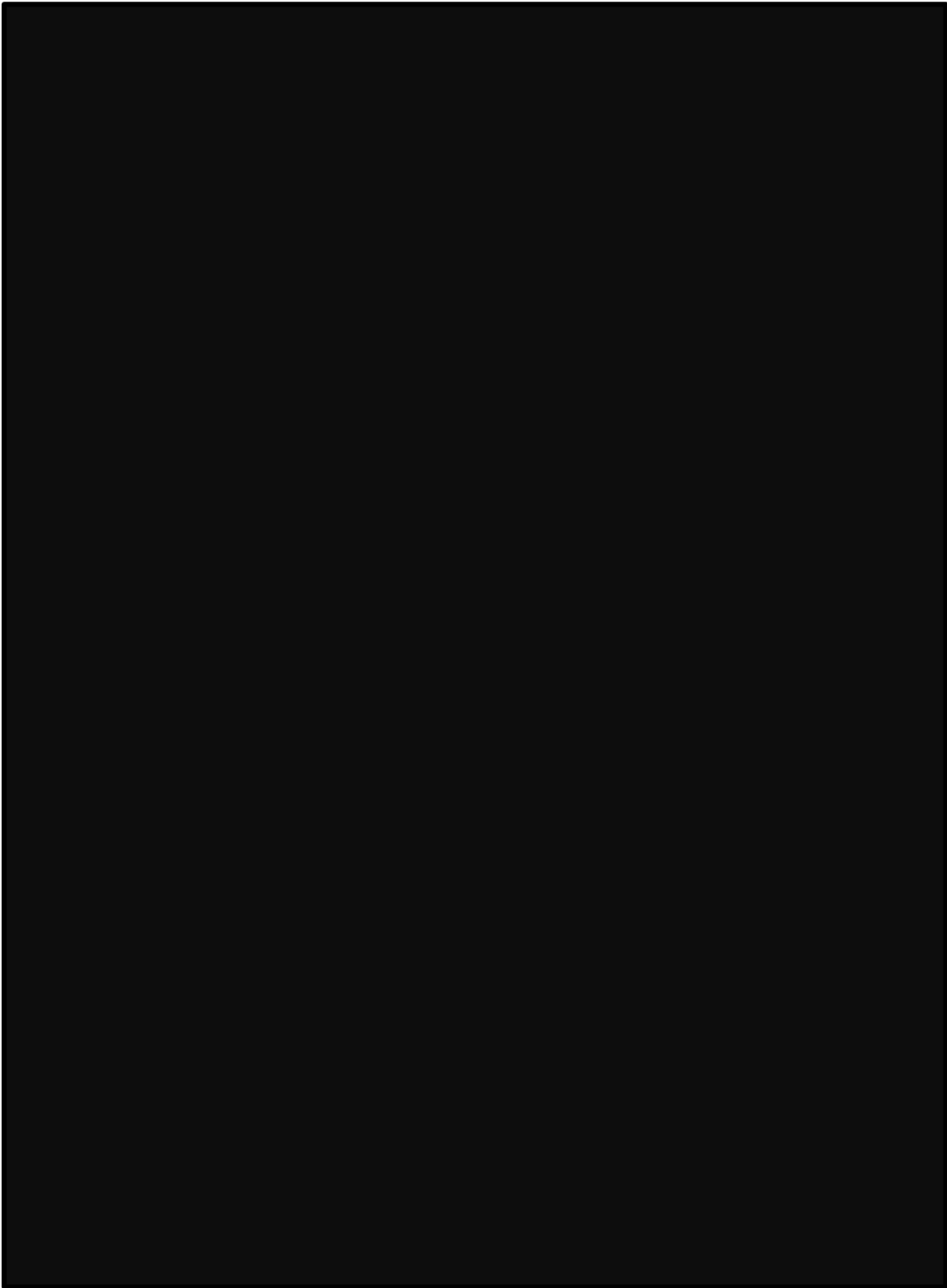


Figure 3: AHIMS results within/near the study area. Background image sourced from Land and Property Information NSW.

Two previously recorded sites are located within the current study area (Figure 12). A substantial artefact scatter was recorded during survey work undertaken by AMBS (2006a) within the West Dapto Release Area (AHIMS site 52-5-0484) at approximately 420 metres to the south of Yallah Road. This site is duplicated within the AHIMS database as site 52-5-0512. Another artefact scatter was recorded by Navin, Officer and McIntyre as part of research for a Bachelor of Arts Honours thesis (Navin 1987) near the southern bank of Macquarie Rivulet (AHIMS site 52-5-0227). Description of these sites is provided below.

AHIMS site 52-5-0484/52-5-0512 (WDRA_AS_09) comprises 89 artefacts located on the Marshall Mount spur crest in an exposed area of 180 square metres of ungraded access road. The assemblage consists of flakes, broken flakes, cores and flaked pieces. Raw materials include silcrete, chert, quartz, chalcedony, fine-grained siliceous and fine-grained volcanic. It is noted that A1 and A2 soils were exposed at the surface in the area. According to AMBS (2006a: Table 37) this site has high archaeological potential. The surface scatter had the highest density of those recorded within the West Dapto Release Area. The potential to contain additional surface/subsurface deposit was identified. Some impacts from vehicle use in the known site area were noted.

AHIMS site 52-5-0227 (Macquarie Rivulet 1) is an artefact scatter located on a terrace approximately 20 metres to the south of Macquarie Rivulet, within [REDACTED]. The site is described on the site card as a midden/artefact scatter, with artefacts scattered over the park. Artefacts include beach pebble flakes. Other artefact raw materials include chert, silcrete, fossilised wood and mudstone. Shell fragments of *Anadara trapezia* were noted to be scattered sparsely throughout the area. The recorders determined that possible surface disturbance may have occurred when the park was established; however, it is possible that undisturbed sub-surface material is present.

Three other sites, all clustered together, have been previously recorded outside the study area, but within close proximity (100 metres) to the western boundary (Figure 3). Site 52-5-0483 (WDRA_AS_10) is duplicated on the AHIMS database as site 52-5-0513. This site was recorded by AMBS (2006a) during survey of the West Dapto Release Area. It consists of an isolated fine-grained volcanic flake located on an exposure under a large fig tree on a hill crest. The site is positioned approximately 40 metres west of the western boundary of the current study area, and around 200 metres to the north of Macquarie Rivulet.

Sites 52-5-0480 (Larkins Lane Site 10 [LLS10]) and 52-5-0481 (Larkins Lane Site 8 [LLS8]) were both recorded by AMBS (2006b) as part of an Aboriginal Cultural Heritage Assessment undertaken for the Larkins Lane subdivision, Yallah. Site 52-5-480 is an isolated chert flake measuring 36.2 x 22 millimetres. It is positioned on a northeast facing slope, approximately 20 metres west of the western boundary of the current study area, and roughly 300 metres to the north of Macquarie Rivulet. Site 52-5-0481 comprises the isolated find (site 52-5-0513) previously recorded by AMBS (2006a) beneath a fig tree and 4-6 small shell fragments. The shell is noted to be highly fragmented and disbursed, with oyster and possible turbo present.

Table 1: Frequency of site features from AHIMS data

Site Feature	Frequency	Percentage
Artefact	72	70.5
Shell; Artefact	14	13.7
PAD	7	6.9
Shell	6	5.9
Modified Tree	2	2
Modified Tree; Artefact	1	1

3.4 Site types

Material traces of Aboriginal occupation exist throughout the landscape and are known as Aboriginal sites. The primary site types that are found in the region are as follows:

- **Stone artefacts** – Flaked and ground stone artefacts are the most common trace of Aboriginal occupation in the Sydney region. Aboriginal people used particular techniques to flake stone and these changed over time. The approximate age of a tool can often be diagnosed by the way that it was made. Stone artefacts are most often found in scatters that may indicate an Aboriginal campsite was once present. Stone artefacts may also be found as isolated finds. Stone tools in the Sydney region are most often made from raw materials known as silcrete, tuff and quartz. These are all easily flaked and form sharp edges, which can be used for cutting or barbing spears. Two artefact sites have previously been recorded within the study area. It is possible that further unrecorded stone artefacts, either on the surface, or buried, exist within the study area.
- **Rock shelters with deposit** – Rock shelters were used by Aboriginal people for habitation, rest places and as art or ceremonial sites. Deposits can build up on the floor of these shelters over time and bury traces of Aboriginal occupation. If these deposits are not disturbed, rock shelters can provide an intact stratigraphy that can tell us about the way Aboriginal occupation changed through time. It is unlikely that rock shelters will be present within the study area due to the lack of suitable topographical features.
- **Shell middens** – Shell middens are remains of campsites in which the primary traces are shell and/or bones of fish. Shell middens are often found close to rivers or streams and are either along banks or within enclosed shelters. A surface scatter of shell has been previously recorded near the southern bank of Macquarie Rivulet.
- **Rock engravings/Rock art** – Rock engravings are often found in Hawkesbury geologies on flat sandstone platforms. Shapes of animals, ancestor figures or other symbols were carved into the sandstone. Weathering has affected the visibility of many rock engravings. Other rock art of various

forms has also been recorded in the Sydney basin. Stencils, charcoal drawings and paintings are examples of the techniques used by Aboriginal people. Rock art is relatively rare, but is most common on sandstone geologies than on the plains of western Sydney. It is unlikely that engravings exist in the study area due to the absence of suitable horizontal sandstone outcrops.

- **Axe grinding grooves** – Axe grinding grooves are created when axe blanks (often basalt cobbles) are shaped by rubbing the stone across an abrasive rock such as sandstone, often using water. Sharpening axes and other tools also forms them. Axe grinding grooves are often found on the banks of streams or rock pools. It is unlikely that axe grinding grooves are present within the study area due to the absence of suitable horizontal sandstone outcrops.
- **Scarred trees** – Aboriginal people practiced tree marking or scarring for a variety of reasons. Large scars are often the result of a tree being debarked for a canoe blank and smaller scars may have been the result of making shields or coolamons (storage vessels). Tree marking may have been the result of ritual practices, or associated with burial. Scarred trees that remain today would be over 150 years old and the scar would retain certain characteristics that enable its identification as cultural.
- **Post-contact sites** – Sites with evidence of early interaction between Aboriginal people and Europeans. Artefacts found may include flaked glass or ceramic. This site type is usually known from historical records or knowledge within the local community. It is considered unlikely that a post-contact site will be present within the study area.
- **Quarries** – Quarries are areas where people procured resources for the manufacture of stone artefacts (Hiscock and Mitchell 1993). Raw materials often occurred in the form of cobbles. Cobbles were reduced on site and made into smaller cores, which could be transported. Tool manufacture may also occur at quarry sites (JMcD CHM 2006). No quarries have been previously recorded in the vicinity of the study area and it is considered unlikely that quarries are present in the study area.
- **Potential Archaeological Deposit (PAD)** – Areas are classified as PADs if there is a likelihood of archaeological material existing below the ground surface, or on the ground surface but obscured from view. An Aboriginal object does not need to be recorded for an area of PAD to be specified.
- **Aboriginal ceremony and dreaming** – Such sites are important and many were recorded in the early years of the NSW Aboriginal Site Register. As more recent recordings are relatively rare, it is unlikely that additional unrecorded Aboriginal ceremony and dreaming sites are present in the local area (AMBS 2010: 41).
- **Burial sites** – Aboriginal burials are found in a variety of landscape types throughout NSW, although most frequently they are found in middens, sand dunes, lunettes and other sandy/soft sedimentary soils. AMBS (2010: 41) note from personal communication with Aboriginal representative Allan Carriage in 2006 that Aboriginal burials are present in the West Dapto Release Area, particularly along Mullet Creek. Aboriginal burials can occur anywhere across the landscape, with acidic soils greatly reducing the likelihood of long-term bone survival.

3.5 Previous archaeological investigations

A number of archaeological investigations have been carried out within and around the study area. These have generally been associated with large land releases and the development of infrastructure to service these precincts. The following discussion takes into account the most recent and relevant studies and aims to provide contextual information for the current study.

West Dapto Release Area

Extensive archaeological assessment and preliminary sub-surface excavation have occurred within the WDRA, located across gently undulating farming land between the Princes Highway and the Illawarra Escarpment (Figure 4). The WDRA covers a planned residential release area, and extends over a large area stretching from Yallah in the south to Kembla Grange in the north. The WDRA has been subject to an archaeological assessment with sample field survey and test excavation (AMBS 2006a); cultural heritage assessment of specific release areas (AMBS 2006b); a preliminary Sydney Water Aboriginal heritage desktop assessment that covered both the WDRA and surrounding area, including the current study area (AMBS 2010); and sub-surface investigation in specific release areas (AHMS 2011). The section of the current study area to the west of the Princes Highway (M1) between Macquarie Rivulet and the area just to the north of Yallah Road (where it meets the Illawarra Railway line) falls within the WDRA.

Australian Museum Business Services (AMBS) 2006a

An inspection of registered sites; a sample survey of WDRA landforms; and a targeted survey of areas of archaeological and social/cultural interest were undertaken as part of the assessment by AMBS (2006a). The sample survey of WDRA landforms covered 104 hectares of the assessment area (approximately 3.5 percent of the WDRA). All landform units were covered, including streams (36), alluvial flats (9), streams and alluvial flats (1), hilltops (27) and spur crests (10). Twenty-four archaeological sites were identified, including those previously recorded. The sites comprised 13 open camp sites, six isolated finds and five scarred tree locations (containing a total of eight scarred trees). Sites were positioned on all landforms.



artefact

current study area. Details of both sites are provided in section 3.3.

A total of 136 test pits were excavated across the WDRA by AMBS (2006a), sampling the main landform units within the study area – slope, alluvial flat, drainage channels and crest. The number of artefacts recovered totalled 425, and these were retrieved from just over half of the test pits (n=75). The highest number of artefacts retrieved (n=146) came from a single test pit in a slope landform context. Artefacts were recovered from all creek catchments (AMBS 2010: 38).

The majority of artefacts (n=353) were recovered from the upper 20 cm of deposit. The total assemblage comprised a range of raw materials, with chert being predominant (n=176). Quartz was the next most frequent material (n=100), followed by silicified wood (n=51), quartzite (n=41), silcrete (n=38), silicified tuff (n=13) and fine-grained siliceous (n=6). Broken flakes were the most frequent artefact type (n=209), followed by flakes (n=112), flaked pieces (n=82) and cores (n=22). Twenty-nine artefacts displayed modification or retouching. Usewear was identified on five artefacts, and evidence for both retouch and usewear was identified on one artefact (AMBS 2010: 39). The results of the test excavation program demonstrated that higher frequencies of artefacts were found along certain watercourses and on some ridges (AMBS 2010: 93).

Areas of high archaeological potential were identified based on the available archaeological information, including the results of the test excavation program, and on predictive modeling. Areas considered to be of high archaeological potential include major creek lines of the WDRA; the wetlands of Mullet, Duck and Marshall Mount Creeks; the foothills of the Illawarra Escarpment; high points on ridges through the WDRA; and any sources of stone material for flaking, such as pebbles and cobbles along tributaries (AMBS 2006a: 266). Three areas of high archaeological potential were identified within the current study area. The first is located along the alignment of Duck Creek, in the very north of the current study area; the second is positioned on the slope and crest landform where site 52-5-0484/52-5-0512 is located; and the third is located along the northern side of Macquarie Rivulet (AMBS 2006a: Fig. 25b).

AMBS 2006b

AMBS (2006b) undertook a cultural heritage assessment of the proposed Larkins Lane subdivision at Yallah, within the WDRA. The study area is located immediately to the west of the current study area, between Macquarie Rivulet in the south and Yallah Road in the north. The AMBS study area comprised 35 Lots, covering a continuous land area of approximately 750 x 500 metres of varying topography. The subdivision is bisected through the middle by the Marshall Mount spur crest that runs in a southwest to northeast direction (AMBS 2006b: 3). Aboriginal stakeholders have previously advised AMBS that a ceremonial place was located on Mount Marshall to the west of the WDRA. This supports the assessment of archaeological potential for the Marshall Mount spur crest because the landform would have provided an important access route to the ceremonial place (AMBS 2006b: 10).

One known site (WDRA_AS_10) is located within the subdivision. As discussed in section 3.3 above, this site is located approximately 40 metres to the west of the current study area. Two known sites (WDRA_AS_09) and AHIMS site 52-5-0398 are located immediately adjacent to the eastern and southern boundaries of the subdivision respectively. As discussed in section 3.3 above, site WDRA_AS_09 is located within the current study area. Aboriginal objects were identified on 13 Lots throughout the subdivision, in areas where the ground surface had been disturbed by development activities such as road construction. Eight isolated stone artefacts and ten locations of very low density shell remains (1-12 fragments) were recorded, a large proportion of which were associated with the upper slope of the ridge crest landform in the northern half of the study area. It was determined that due to the very low density of archaeological materials, and to the low archaeological integrity of the landscape resulting from development activities throughout a large proportion of the site, the entire Larkins Lane study area was of low archaeological significance (AMBS 2006b: ii).

AMBS 2010

AMBS (2010) also undertook an Aboriginal and historic heritage desktop assessment for the provision of proposed water and wastewater infrastructure for the WDRA. The current study area falls within the area that was the focus of that study. AMBS determined that 309 registered Aboriginal sites were located in their study area. An assessment of Aboriginal scientific (archaeological) significance was undertaken and it was found that, overall, areas of high potential were focused on certain watercourses and specific ridges. Of the approximately 31 square kilometre area of the study area, approximately 12 percent was assessed to be of high archaeological significance; 74 percent was assessed to be of moderate archaeological significance; and 14 percent was assessed to be of low archaeological significance. It was recommended that all registered Aboriginal sites and areas of high archaeological significance be avoided when planning the pipelines and other assets.

Archaeological & Heritage Management Solutions (AHMS) 2011

AHMS (2011) conducted further archaeological test excavation of a property off Bong Bong Road in the WDRA that had been the subject of limited test excavation by AMBS (2006a). This property is located approximately 4 km to the northwest of the current study area. AMBS (2006a) had retrieved three artefacts from six test pits in the property, with AHMS conducting an extended test excavation program of 47 test pits. The 47 test pits were distributed across transects that sampled each of the landform units within the property, including low-lying open depression, a creek levee and undulating slopes (AHMS 2011: 18). A total of 34 stone artefacts were retrieved from the test excavation program, with an average artefact density of 0.7 per square metre (AHMS 2011: 19). AHMS (2011: 52) suggested that the retrieved lithic assemblage demonstrated activities associated with raw material procurement, knapping and tool utilisation.

Biosis Research 2007

Biosis Research (2007) undertook an archaeological assessment along a proposed gas pipeline route near the Tallawarra Power Station, at Yallah NSW. The survey area crosses from west to east through the northern sector of the current study area, near Duck Creek. Two areas of PAD and surface artefacts were identified to the west of the current study area. No sites or areas of PAD were identified along the pipeline route within, or to the east of, the current study area. The two areas of PAD - Tallawarra Pipeline 1 (AHIMS site 52-5-0471) and Tallawarra Pipeline 2 (AHIMS site 52-5-0472) - were subject to a program of test excavation. Thirty-six 1.0 x 0.5 metre test pits were excavated, totalling an area of 18 square metres. A total of 136 artefacts were recovered – nine from Tallawarra Pipeline 1 (seven percent of the excavated assemblage) and 127 from Tallawarra Pipeline 2 (93 percent of the excavated assemblage). The predominant raw material is silcrete (43 percent), with other common raw materials including chert, quartz and volcanics. Manufacturing debris including flakes, cores and angular fragments comprised 96 percent of the assemblage (Biosis Research 2007: 21-24).

Very few (if any) artefacts were recovered from within many of the test pits, and it is concluded that this distribution represents background scatter. Relatively higher densities were recovered from two areas within Tallawarra Pipeline 2, both associated with locally elevated positions close to the aggraded channel of Duck Creek. It was suggested that these areas were more frequently occupied and utilised than is indicated by the background scatter elsewhere. It was determined that a main function of the area appears to have been stone tool production. The overall low numbers of artefacts possibly indicates that sites were occupied at a low level of intensity, and the area may have been used intermittently to access local wetland sources (Biosis Research 2007: 29-30). It was concluded that the findings are comparable with site predictive models for the Illawarra region, where artefact scatters are the common site types and are usually located on level, well-drained ground, close to water sources and wetlands such as Duck Creek (Biosis Research 2007: 30).

HLA-Envirosciences (HLA) 2007

HLA (2007) conducted an Aboriginal and historical heritage assessment of the proposed Illawarra Regional Business Park. The study area comprised approximately 80 hectares of dairy farmland at 78 Tongarra Road, Albion Park NSW. It incorporates a section of the current study area immediately to the north of Tongarra Road, which could not be accessed during the current survey. It was determined that no previously recorded Aboriginal sites are situated within the study area (HLA 2007: 9). One previously unrecorded Aboriginal site was identified during the survey. This was an isolated silcrete flake of approximately 16 x 20 millimetres, found on the side of an embankment on a bend in Frazers Creek. The 0.5 metre high embankment had been formed through the dredging of Frazers Creek in the recent past (HLA 2007: 13). No other Aboriginal sites or PADs were located in the study area. It was concluded that

the isolated find is likely to have been redeposited and therefore has low scientific value. However, due to low ground surface visibility, recognition must be made of the possibility of further Aboriginal sites within the study area (HLA 2007: 16). The isolated artefact has not been registered on the OEH AHIMS site register and is not located within the current study area. The site is shown as a purple dot on Figure 4.

Godden Mackay Logan (GML) 2012

Test excavation of PAD SUFA 3 at Lot 12 Ashburton Drive, Albion Park, was undertaken by GML (2012). The PAD area is located on a spur between two second order creeks, approximately 1.5 kilometres to the southwest of the current study area. Thirty-five test pits were excavated, each of 0.50 x 0.50 metres. The total excavation area comprised 8.75 square metres (0.044 percent of the PAD). A total of 54 artefacts were recovered across the 35 test pits. Eleven test pits contained no artefacts. The highest number of artefacts recovered from one test pit was nine, while the remaining test pits contained between one and three artefacts (GML 2012: 25-27). The assemblage included three retouched tools; two artefacts with possible usewear; a broken core; a bipolar flake; 11 complete flakes; seven proximal broken flakes; eight cone-split broken flakes; 11 medial and five distal flake fragments; and five flaked pieces (GML 2012: 30). The most common raw material was fine-grained siliceous, followed by chalcedony, petrified wood, chert and silcrete, most of which can be found within the local area. The uneven soil depths and presence of certain stratigraphic layers across the site reflected the erosional hill slope landform the study area is located on (GML 2012: 34-35). It was concluded that the artefacts of the PAD appear to be part of background scatter as opposed to a concentrated camp site. The PAD has low potential for additional scientific information, and low significance based on scientific value (GML 2012: 54-55).

3.6 Previous predictive models

AMBS (2006a: 63-86) provide a comprehensive overview of previous archaeological research undertaken in the local region relevant to the WDRA, and to the current study area. The review includes regional assessments of the Illawarra undertaken by Dallas and Sullivan (1995) and Therin (2003). Both studies note that drinking water is freely available within the Illawarra, so whilst still important, would not be the overriding factor determining landscape use. Instead, the composition and distribution of known archaeological sites throughout the Illawarra is found to be strongly correlated with bedrock geology and landform features, such as sandstone outcrops that are suitable for shelter and axe grinding grooves (AMBS 2006a: 65). It is acknowledged within both studies that the current understanding of Aboriginal heritage of the Illawarra is limited. Investigations have been focused on landforms of the immediate coast and escarpment, with the archaeology of the Coastal Plain and escarpment foothills less well known. Alluvial landforms (streams) have been the focus of test excavation, meaning the potential of higher landforms that offer vantage points and elevated pathways has not been recognised (AMBS 2006a: 94).



AMBS (2006a: 87- 92) also review studies that have contributed to the assessment of archaeological potential of the WDRA, including that undertaken by Sefton (1984) for Stage 1 of the WDRA. Whilst recognising the limited understanding of Aboriginal heritage in the Illawarra, areas of potential within the WDRA are nominated as being archaeologically sensitive based on Sefton's predictive model (AMBS 2006a: 93). Of particular relevance to the current study area is the prediction that all level areas of the Western foothills zone and the Coastal Plain within 100 m of a creek situated on: (a) quaternary deposits (flood plains); (b) Budgong Sandstone; and (c) Berry Siltstone are archaeologically sensitive.

4.0 Predictions

4.1 Aboriginal land use

Assumptions about Aboriginal land use patterns are made on the basis of archaeological information gained from the local area, from observations made by Europeans after settlement of the area, and from information known about available natural resources.

As Aboriginal people were mobile hunter-gatherers, it would be likely that they moved across the landscape between resources. It would also be likely that movement was related to socio/cultural factors such as gatherings and ceremonial obligations. Campsites would have provided temporary residences such as bark structures. It is difficult to ascertain whether a campsite existed at a given location, but correlations between stone artefact density and campsites are often assumed. While it would be likely that knapping would have occurred at a campsite, it would also be likely that knapping would have occurred during movement across the landscape, as tools were prepared or repaired during hunting and gathering activities.

Archaeological data gathered in the locality suggests that artefacts would be found across the landscape in varying densities, with higher densities expected in close proximity to water sources. The main limitations to the survivability of archaeological material in the study area include impacts of soil erosion, flooding, and infrastructure development.

4.2 Predictive model

The predictive model used in the current study comprises a series of statements about the nature and distribution of evidence of Aboriginal land use that is expected in the study area. These statements were based on the information gathered regarding:

- Landscape context and landform units.
- Ethno-historical evidence of Aboriginal land use.
- Distribution of natural resources.
- Results of previous archaeological work in the vicinity of the study area.
- Predictive modeling proposed in previous investigations.

Predictive statements for the study area are as follows:

- Stone artefacts/artefact scatters will be the most likely Aboriginal site type.
- Artefact densities will be low.
- Stone artefacts will be less likely to be identified on steep slopes.
- *In situ* artefacts will be located in areas of least ground disturbance.



It is probable that the only material traces of Aboriginal occupation remaining will be stone artefacts. The potential for shelter sites, rock engravings and axe grinding grooves is limited by the nature of the underlying geology. There is some potential for shell middens and burials to exist along/near the banks of the major waterways within the study area (e.g. Duck Creek, Macquarie Rivulet and Frazers Creek). Scarred tree sites would be rare in areas that have been extensively cleared following European colonisation such as the Illawarra coastal plain, suggesting that there is limited potential for suitable old growth trees to occur within the study area.

Areas of PAD would be dependent on landform and levels of disturbance. Areas of PAD would not be identified across steep slopes, in areas of flooding, or in areas of high disturbance.

5.0 Field methods

5.1 Site definition

An Aboriginal site is generally defined as an Aboriginal object or place. An Aboriginal object is the material evidence of Aboriginal land use, such as stone tools, scarred trees or rock art. Some sites, or Aboriginal places can also be intangible and although they might not be visible, these places have cultural significance to Aboriginal people.

OEH guidelines state in regard to site definition that one or more of the following criteria must be used when recording material traces of Aboriginal land use:

- The spatial extent of the visible objects, or direct evidence of their location.
- Obvious physical boundaries where present, e.g. mound site and middens (if visibility is good), a ceremonial ground.
- Identification by the Aboriginal community on the basis of cultural information.

For the purposes of this study an Aboriginal site was defined by recording the spatial extent of visible traces or the direct evidence of their location.

PADs are areas where sub-surface stone artefacts and/or other cultural materials are likely to occur (DECCW 2010: 38). These areas may be associated with recorded sites but are often greater in extent, taking in areas around the visible artefacts where there is a potential for further buried artefacts to exist. PADs may also be present where no visible artefacts are located. This may be the case when there is no ground surface visibility, but the area is seen to have a high likelihood of containing artefacts.

5.2 Survey methodology

The survey was conducted on foot over two days (30 April to 1 May 2013). The survey was undertaken by Josh Symons and Samantha Gibbins (Artefact Heritage). Pam Glover, Neville Maher, William Butler and Jon Kirby represented ILALC throughout the survey.

The study area is a long, linear strip of land that crosses multiple landform units. The study area was divided into six survey units, each containing several landform units (Figure 5). A sample survey of Survey Unit 1 was undertaken (see below). Full survey coverage of all other survey units was undertaken, apart from the areas where property access had not been granted.

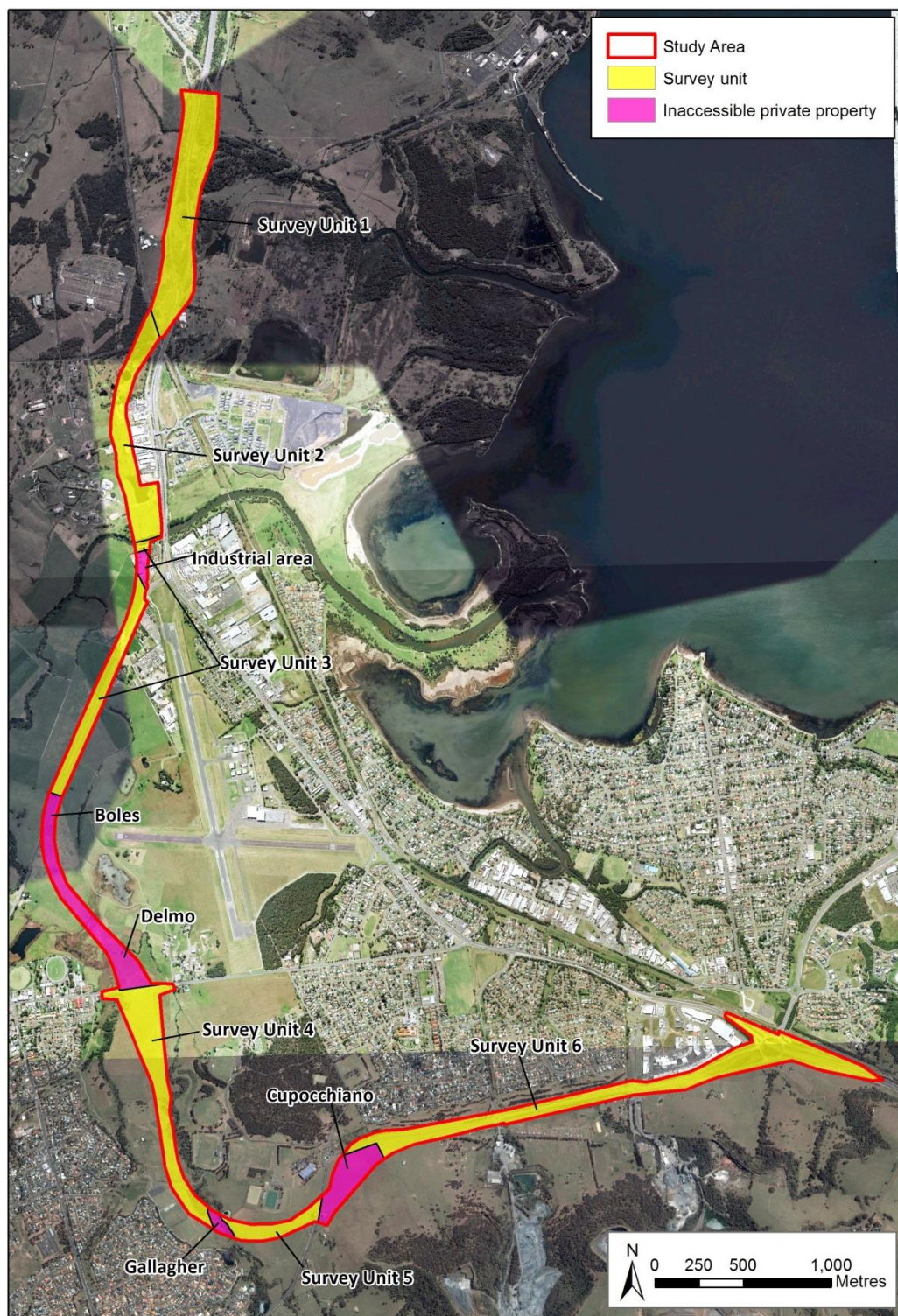


Figure 5: Overview of Survey Units. Background image source Google© 2013 and Land and Property Information NSW.



The survey was undertaken in accordance with relevant OEH standards and guidelines, as part of Stage 2 of the RMS PACHCI. A handheld Global Positioning System (GPS) was used to track the path of the surveyors, and to record the co-ordinates of sites, features and location of landform units within the study area. An aerial map of the study area was also carried by members of the survey team in the field. GDA94 coordinates for sites and PADs were taken with a handheld GPS.

All ground exposures were examined for stone artefacts, shell, or other traces of Aboriginal occupation. Old growth trees were examined for signs of cultural scarring or marking.

A photographic record was kept of all sections of the study area that were accessible. Photographs were taken to record different aspects of the landform units within the study area, vegetation, levels of disturbance, Aboriginal sites and PADs. Scales were used for photographs where appropriate.

Survey Unit 1 Sample Survey

A sample survey is acceptable under the OEH Code of Practice with justification. A sample survey of Survey Unit 1 was conducted primarily because parts of the unit were covered in dense, impenetrable vegetation, and also because other sections could not be accessed due to the alignment of the rail corridor, the Princes Highway (M1), F6 Freeway and associated on/off ramps. Dense grass and vegetation cover also reduced ground surface visibility to zero over most of the survey unit. Surface visibility was limited to small portions of exposures along drainage channels, erosion scours and in areas of roadside disturbance.

Properties to which access was not granted

Several properties within the study area could not be surveyed because property access was not granted (Figure 5). These properties are not included in the survey units shown in Figure 5.

6.0 Results

6.1 Effective survey coverage

The study area is a long, linear strip of land that crosses multiple landform units. The study area was divided into six survey units, each containing several landform units (Figure 5). Although mostly cleared of original vegetation, the landforms within the study area (crests, hill slopes, flats and terraces) were covered in dense grass that limited ground surface visibility to zero, except in the odd areas of exposure. The only areas of surface visibility were observed in vehicle tracks, animal tracks, exposures around tree bases, exposures around dams and other areas of disturbance, and odd patches of erosion on the steeper slopes. Standing sections of deposit could be observed in some places along drainage channels. Vegetation was impenetrable or extremely dense in several sections of the study area and these were not surveyed. Parts of the study area could not be surveyed because property access had not been granted. Visibility and exposure levels have been taken into consideration in determining the effective coverage area on this survey (Table 2 and Table 3).

Table 2: Survey Coverage

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
1	Open depression, modified	247,210 (46,869*)	3	2	28	0.06
2	Open depression, modified, crest, slope, flat	153,757	5	3	230	0.15
3	Open depression, terrace, flat	99,536	1	5	50	0.05
4	Open depression, terrace, flat	175,404	2	5	175	0.1
5	Open depression, slope, flat	48,723	5	3	73	0.15
6	Modified, crest, slope	308,263	3	5	462	0.15

* = sample survey area

Table 3: Landform survey coverage

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Open depression	70,730	66	0.09	-	-
Modified	272,376	388	0.14		
Crest	37,017	55	0.14	1 site (AHIMS ID 52-5-0484/52-5-0512)	89*
Slope	155,589	233	0.15	1 PAD (YTOF PAD 1)	-
Terrace	91,664	73	0.08	1 site (AHIMS ID 52-5-0227)	-
Flat	211,048	206	0.09	-	-

* 89 artefacts were originally recorded at site 52-5-0484/52-5-0512 by AMBS (2006a).

6.2 Survey observations

Survey Unit 1 (Figure 6)

Survey Unit 1 has been extremely disturbed and modified due to the installation of the Princes Highway (M1), F6 Freeway and associated on/off ramps and bridges (Plate 1). Other disturbances within the survey area include the construction of the Illawarra Railway line, installation of a property access road leading off the Princes Highway, installation of an overhead transmission line and water pipeline, and modifications made to drainage channels such as Duck Creek (Plate 2 and Plate 3).

Ground surface visibility across the survey area was generally nil due to dense grass and vegetation cover. Odd exposures were observed along drainage channels, erosion scours and in areas of roadside disturbance. The main observed landforms include Duck Creek in the north and a swamp/drainage channel in the south, both of which have been heavily modified. Beyond the southern swamp/drainage channel the land sloped up towards the south. As observed from the road, this area appears to have undergone disturbance, with mounds visible along the surface. The remainder of the original landforms within the parts of Survey Unit 1 that were inspected were all heavily modified (e.g. through the construction of embankments along the highway).

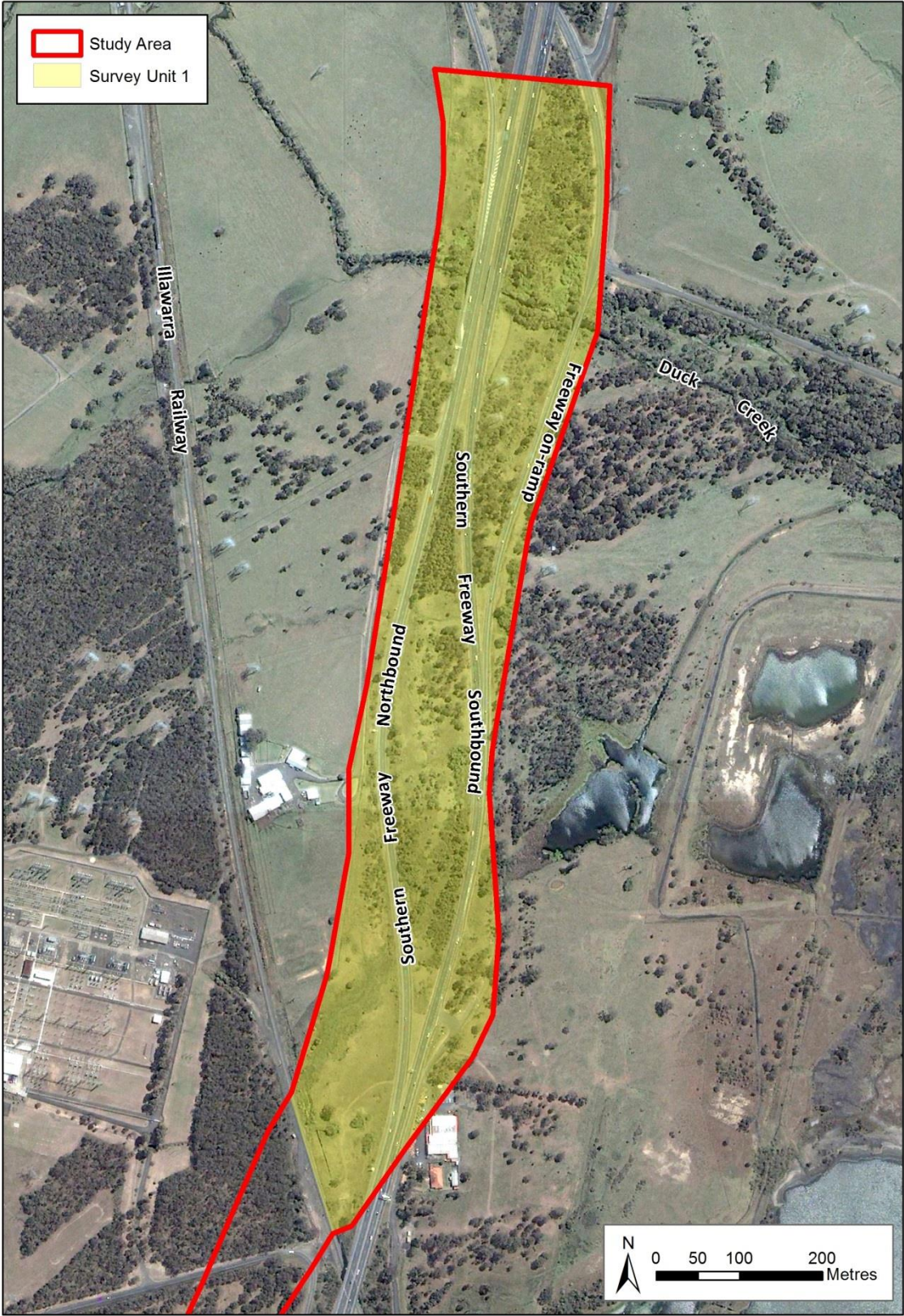


Figure 6: Survey Unit 1. Background image sourced from Land and Property Information NSW.

Plate 1: Survey Unit 1 – disturbance and modification associated with highway, view to N.

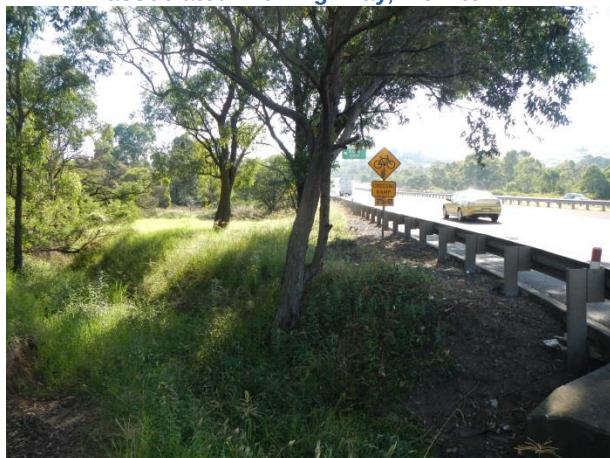


Plate 2: Survey Unit 1 – transmission line and embankment associated with highway, view to N.

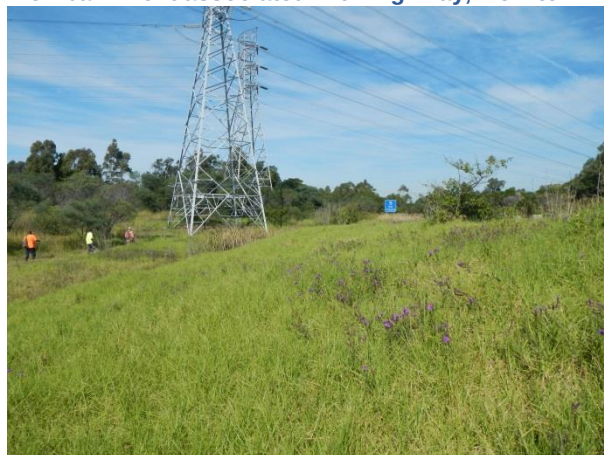


Plate 3: Survey Unit 1 – modifications made to Duck Creek, view to N.

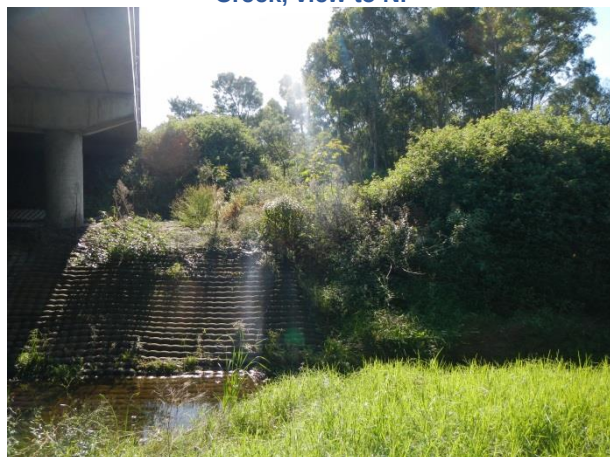


Plate 4: Survey Unit 1 - impenetrable swamp/drainage channel in south, view to E.



Survey Unit 2 (Figure 7)

Survey Unit 2 incorporates four main landform units – slope, crest, flat and open depression. The area is dominated by a broad crest that runs roughly across the centre. This is part of the Marshall Mount spur crest that runs in a southwest to northeast direction through the region. Previously recorded site 52-5-0484/52-5-0512 (WDRA_AS_09) is located on the crest. The location of the site was inspected, but no artefacts were visible on the surface due to the dense vegetation cover (see discussion in section 6.4). The land to the north of the crest slopes gently to the north and west, towards a drainage channel that runs from southwest to northeast through the area. The drainage channel has been heavily modified and dams have been installed along the drainage depression. The land to the north and west of the drainage channel slopes gently eastwards towards the channel.



Figure 7: Survey Unit 2. Background image sourced from Land and Property Information NSW.



To the south of the crest, the land slopes down moderately and then more gently towards a drainage channel and flat above Macquarie Rivulet in the south (Plate 5). This land is used mostly for pastoral purposes. The drainage channel has been modified and a large dam has been constructed along the flat. The land to the west of the dam rises up moderately towards a crest where several sites have previously been recorded outside of the study area (AHIMS sites 52-5-0483/52-5-0513, 52-5-0480 and 52-5-0481). The flat is dissected by artificial drainage channels in several places.

Ground surface visibility across Survey Unit 2 was generally nil due to the dense grass cover. Some infrequent exposures were present in areas of disturbance, such as dam walls, animal and vehicle tracks, erosion scours and areas that had been leveled by previous development. Overall, Survey Unit 2 has been subject to significant disturbance, including the installation of Yallah Road and the Illawarra Railway line in the north and substantial industrial development along much of the eastern edge, which has encroached particularly upon the crest landform (Plate 6 and Plate 7). In spite of this, the crest landform appears to be relatively intact, however, previously recorded site 52-5-0484/52-5-0512 (WDRA_AS_09) was not visible and it was evident that the area had been subject to some disturbance since the site was recorded (Plate 8).

All drainage channels in Survey Unit 2 have been modified or constructed, and the installation of dams has led to further ground disturbance in the area. Evidence of frequent flooding along the flat near Macquarie Rivulet was found in the deep homogenous deposits observed in an exposed section of one of the drainage channels.

Plate 5: Survey Unit 2 – slope and flat towards Macquarie Rivulet (note dam in centre), view to SE.



Plate 6: Survey Unit 2 – railway embankment and drainage channel/drain in the north, view to SE.



Plate 7: Survey Unit 2 – industrial development on crest landform, view to S.



Plate 8: Survey Unit 2 – location of site 52-5-0484, view to W.



Survey Unit 3 (Figure 8)

Survey Unit 3 incorporates three main landform units – flat, terrace and drainage channel. Survey Unit 3 included the disturbed road corridor along the eastern and western edges of the Illawarra Highway. This is a major disturbance throughout the survey unit. The road easement to the property boundaries along the eastern edge of the highway was covered during the survey.

The land to the south of the industrial development is a broad, flat terrace, which slopes down gently to the west (beyond the study area). Ground surface visibility along the terrace was generally nil due to the dense grass cover. Some exposures were evident along vehicle tracks and areas of cattle mustering. The southern portion of the terrace has been heavily disturbed by the construction of a dairy complex, which is currently functioning, and an associated residence (Plate 10). South of the residence, the land slopes gently southwards into an extensive flat, which extends through the remainder of Survey Unit 3 (Plate 11). The flat is dissected by Frazers Creek, which is modified in this area, passing beneath the Illawarra Highway. The flat is used for pastoral purposes and was covered in dense grass, leading to nil visibility. The installation of property fences has resulted in minor localised disturbance in the area. Conversation with a property owner during the survey confirmed that the flat is frequently inundated (Plate 12).

The land immediately to the south of Macquarie Rivulet is relatively flat for a distance of approximately 20 metres. It then rises up gently to the south to form an elevated terrace overlooking the Rivulet. Previously recorded site 52-5-0227 (Macquarie Rivulet 1) is located on this terrace. The location of the site was inspected, but no artefacts were visible on the surface due to the dense grass cover (see discussion in section 6.4). The terrace and flat have been heavily disturbed by landscaping and by the installation of a roadway, parking and picnic facilities associated with [REDACTED]. Immediately to the south of the terrace is an industrial development, where the land has been heavily disturbed and modified. Construction of this would also have impacted on the terrace landform.

Plate 9: Survey Unit 3 – modified flat and terrace (Darcy Dunster Park), view to NE.



Plate 10: Survey Unit 3 – dairy complex on southern portion of terrace, view to S.



Plate 11: Survey Unit 3 – terrace slope and flat (Illawarra Road to left), view to S.



Plate 12: Survey Unit 3 – flat that is subject to frequent inundation, view to S.



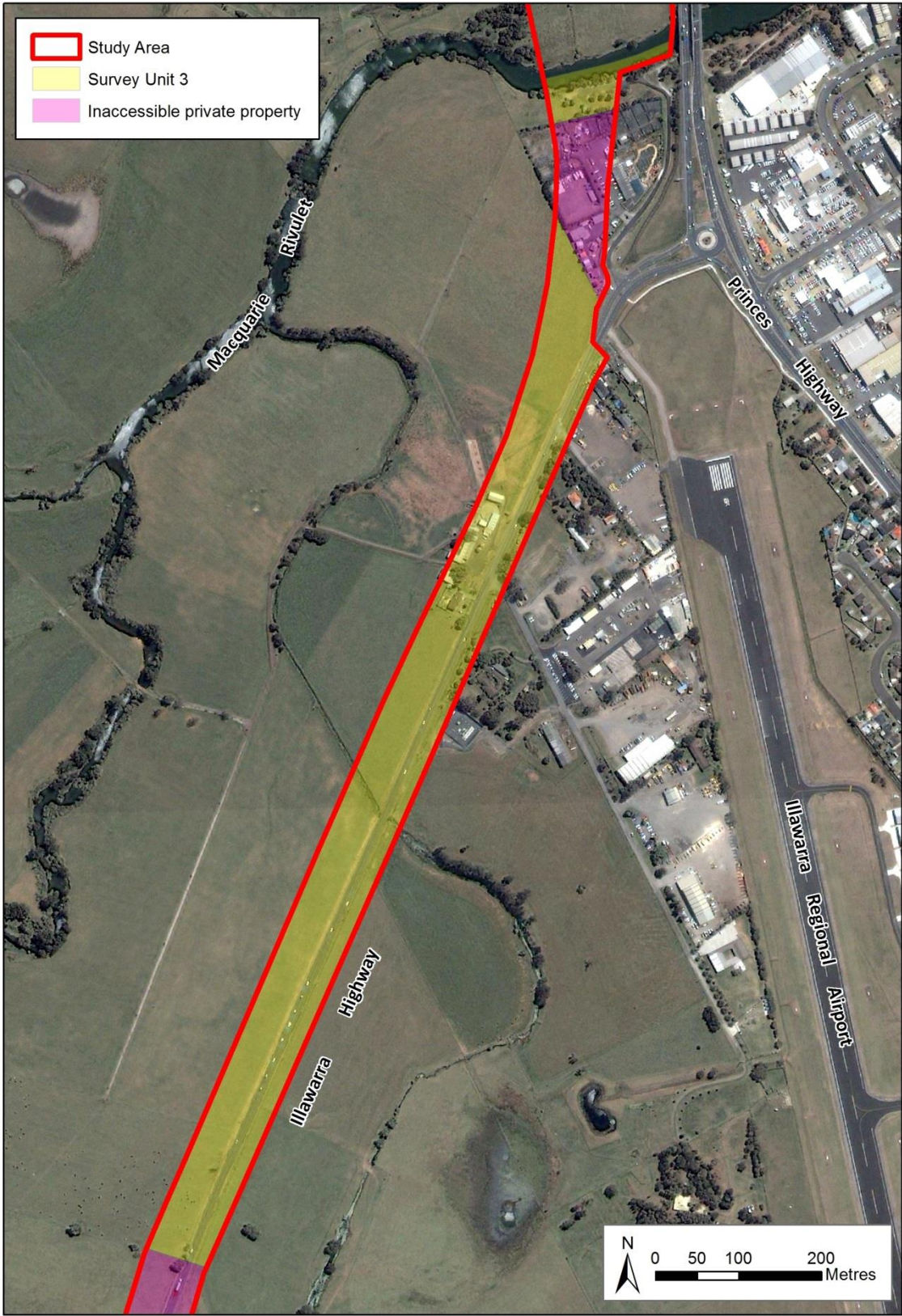


Figure 8: Survey Unit 3. Background image sourced from Land and Property Information NSW.

Survey Unit 4 (Figure 9)

Survey Unit 4 incorporates three main landform units – flat, terrace and drainage channel. The northern end of Survey Unit 4 is marked by Tongarra Road, which has resulted in major disturbance in this section (Plate 13). Frazers Creek generally runs along the eastern edge of the survey unit, but meanders into it in several places. The land to the south of Tongarra Road is relatively flat, with undulations possibly representing remnant terraces, particularly in the northern half of the survey area (RMS land). This northern area is currently used for pastoral purposes. Disturbances appear to be relatively localised, including mounding of earth, fencing, animal tracks and vehicle tracks. An underground gas pipeline runs from north to south through the area.

The flat landform with undulating terraces continues southwards into the land currently occupied by the pony club (Plate 14). This area has been levelled and landscaped, resulting in significant disturbance to the ground surface (Plate 15). The underground gas pipeline also continues into this area. Further south, the land has been levelled to accommodate sports grounds, again resulting in major ground surface disturbance (Plate 16). Where Frazers Creek enters Survey Unit 4, it appears to have been heavily modified, with built up embankments and fencing evident in places (Plate 16).

Overall, visibility throughout Survey Unit 4 was restricted by dense grass cover. Odd patches of exposure were evident along animal tracks in the northern sector, revealing silty alluvial deposit. Exposures in the southern, more disturbed section of Survey Unit 4 were limited to odd water erosion scours and vehicle tracks. Clay was noted to be present in the basal layers of the creek section in this area.

Plate 13: Survey Unit 4 – Tongarra Road at northern end of unit, view to E.



Plate 14: Survey Unit 4 – undulating terrace landform, view to S.



Plate 15: Survey Unit 4 – levelling and landscaping in pony club area, view to S.



Plate 16: Survey Unit 4 – levelled sports ground and modified Frazers Creek, view to E.



Survey Unit 5 (Figure 10)

Survey Unit 5 incorporates three main landform units – flat, slope and drainage channel. The survey unit includes the road corridor of Croome Road, which is a major disturbance at the eastern end of the unit. Frazers Creek runs from south to north through the western end of the survey unit. A dam has been installed nearby and the creek appears to be heavily modified in this area, with built up embankments evident. The land to the east of Frazers Creek is relatively flat. The slope rises gradually from the flat towards the east, culminating in a spur crest near Croome Road where a residential property is present (Plate 17). The lower and mid slopes are relatively gentle, with the upper slope becoming moderately inclined towards the crest. A dam has been installed along the mid slope and falls partially within the study area. Dense grass cover across the survey unit resulted in mostly nil visibility, however, exposures were evident along animal and vehicle tracks. The land is currently used for horse agistment, and property fences divide the area. Overall, the gentle slope landform appears to be relatively intact, with localised disturbances only, such as the dam, tracks and fences (Plate 18).

Plate 17: Survey Unit 5 – slope landform above flat, view to E.



Plate 18: Survey Unit 5 – slope landform viewed from crest (note dam and fencing to left), view to W.



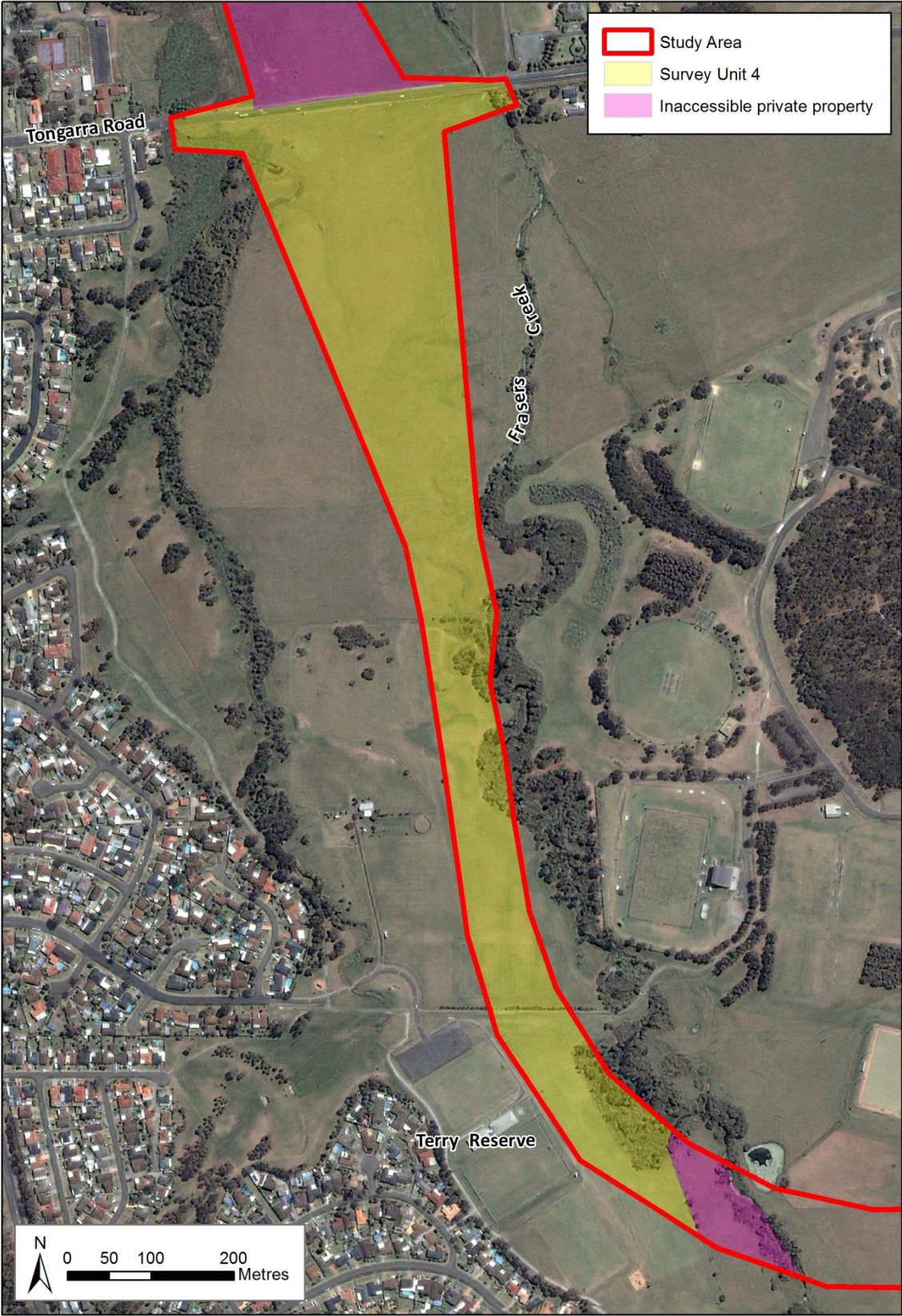


Figure 9: Survey Unit 4. Background image sourced from Land and Property Information NSW.

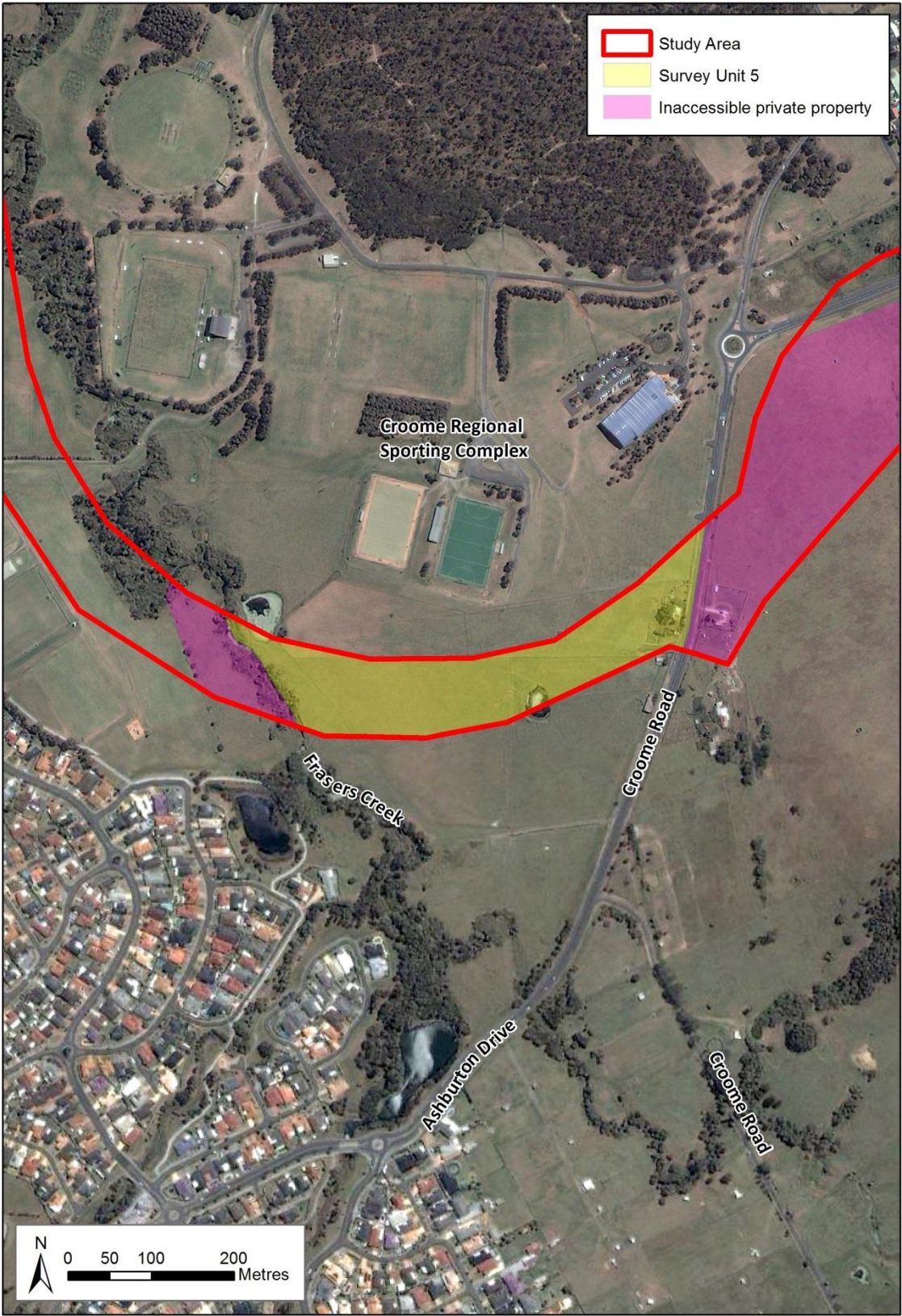


Figure 10: Survey Unit 5. Background image sourced from Land and Property Information NSW.

Survey Unit 6 (Figure 11)

Survey Unit 6 includes four main intact landform units – slope, crest, flat and drainage channel. The survey unit includes the disturbed road corridor of the East West Link; associated roundabouts (Woollybutt Drive and Durgadin Drive); the truck stop; the major roundabout and on/off ramps at the intersection of the East West Link, Princes Highway and New Lake Entrance Road; and short stretches of the Princes Highway on each side of the roundabout. The majority of Survey Unit 6 has been heavily disturbed and modified as a result of the road construction. The road easement to the property boundaries along the northern edge of the East West Link was covered during the survey.

Visibility throughout the survey unit was generally nil due to the dense grass cover across most of the area. Areas of exposure were evident along vehicle tracks and in odd erosion scours. The section of the survey unit to the north of the East West Link was dominated by a large artificial embankment with intermittent road bunds (Plate 19). This entire area was highly disturbed. South of the East West Link, between Woollybutt Drive and Durgadin Drive, the land is currently being used for horse agistment. This area has been heavily modified through the installation of an artificial drainage channel and the construction of a levelled retention basin immediately to the south (Plate 20). Landscaping and tree plantings have also been undertaken in this area.

South of the East West Link, west of Woollybutt Drive, the original landform is intact but ground surface disturbance is evident. The area runs along the basal slopes of a hill that rises up to the south. The land within the study area rises gently from west to east, towards a crest. Beyond the crest, the land slopes gently eastwards towards a drainage channel (Plate 21). Disturbances to the area were evident, including earthen mounds, blue metal around the trees on the crest, a road bund, drainage installations, and an overhead transmission line. Patches of exposure near the crest revealed sandstone bedrock very close to the surface, indicative of the shallow depth of remnant deposit.

South of the East West Link, east of Durgadin Drive, a slope and crest formation is intact, but again has been highly disturbed (cut through during the road construction [Plate 22]). Erosion scours along the crest revealed bedrock very close to the surface, suggesting that any remnant deposit would be very shallow (Plate 23). Further evidence of major disturbance was detected within the island in between the two branches of the East West Link, leading on to and off of the major roundabout (Plate 24). A massive earthen mound was present in this area, and it was noted that the original topsoil had been stripped down to bedrock, presumably during road construction.

Plate 19: Survey Unit 6 – massive embankment and road bund along northern edge of East West Link, view to W.



Plate 20: Survey Unit 6 – retention basin (left), drainage channel and embankment to south of East West Link, view to W.



Plate 21: Survey Unit 6 – slope and crest landform to south of East West Link, view to W.



Plate 22: Survey Unit 6 – cutting through slope and crest landform to south of East West Link, view to E.



Plate 23: Survey Unit 6 – exposed/disturbed bedrock along crest landform to south of East West Link.



Plate 24: Survey Unit 6 – disturbed island between the branches of the East West Link, view to NE.



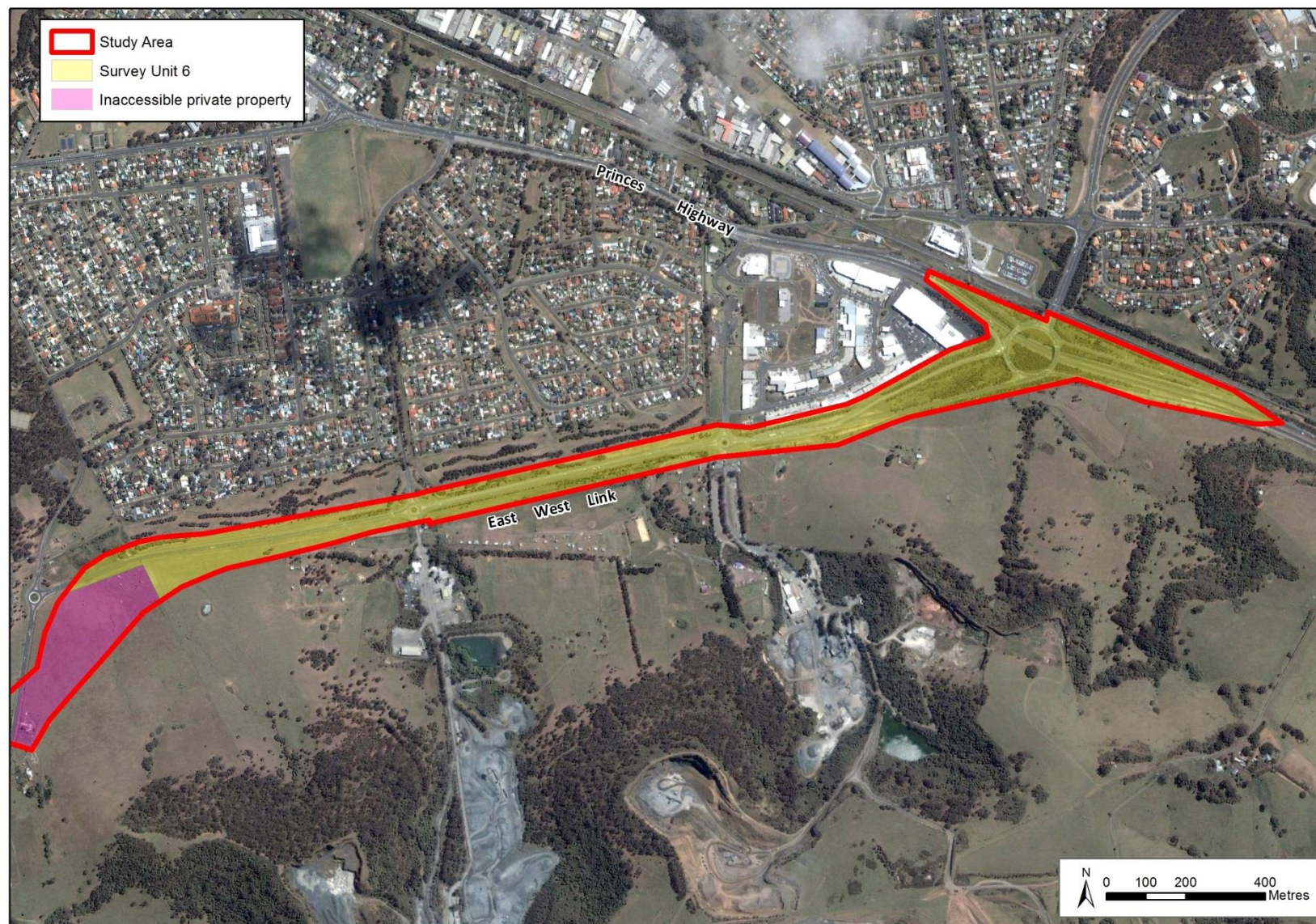


Figure 11: Survey Unit 6. Background image sourced from Land and Property Information NSW.

Properties to which access was not granted

The section of the study area between Tongarra Road in the south and to the Illawarra Highway in the north (between Survey Units 3 and 4) could not be surveyed because property access was not granted. It is to be noted that HLA (2007) undertook an assessment of an area that incorporates a small section of the current study area immediately to the north of Tongarra Road. One isolated artefact was found on the side of an embankment on a bend in Frazers Creek (not within the current study area). This is thought to have possibly been redeposited during dredging of the creek in the recent past, and indicates that the creek has been heavily modified in this area. No other sites or PADs were identified during the assessment.

The industrial estate immediately to the south of Darcy Dunster Park could not be surveyed because property access was not granted. A portion of the study area to the east of Croome Road (between Survey Units 5 and 6) could not be surveyed because property access was not granted. A small section of the study area immediately to the west of Frazers Creek (between Survey Units 4 and 5) also could not be surveyed because property access was not granted.

6.3 Summary of results

Two previously recorded Aboriginal sites were located within the study area (AHIMS sites 52-5-0484/52-5-0512 [WDRA_AS_09] and 52-5-0227 [Macquarie Rivulet 1]). Descriptions of these sites as recorded are provided in section 3.3 and the locations are shown on Figures 12-14. Both sites were located during the field survey using GPS coordinates and photographs. No artefacts were visible on the surface at either site. No previously unrecorded Aboriginal sites were detected during the field survey. One area of PAD was identified during the field survey (see Figure 12 and Figure 15). A summary of the recorded sites and PAD is included in Table 4.

Table 4: Summary of survey findings

AHIMS number	Site name	Feature(s)	Survey Unit	Landform
52-5-0484/ 52-5-0512	WDRA_AS_09	Artefact scatter	2	Crest
52-5-0227	Macquarie Rivulet 1	Artefact scatter	3	Terrace
-	YTOF PAD1	PAD	5	Lower slope

A detailed description of each site and the PAD is included below.

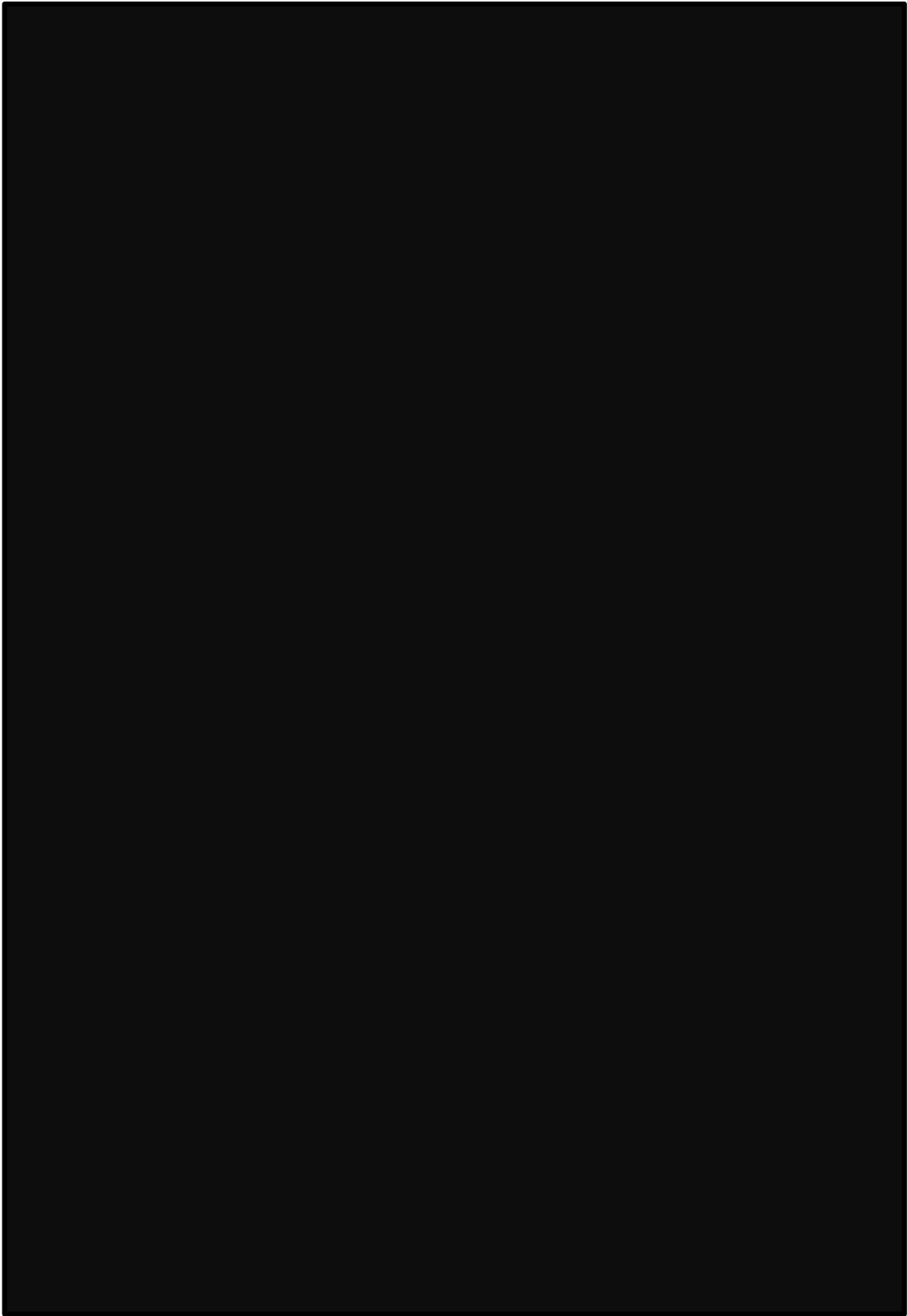


Figure 12: Overview of sites and PAD located within the study area. Background image source Google© 2013 and Land and Property Information NSW.

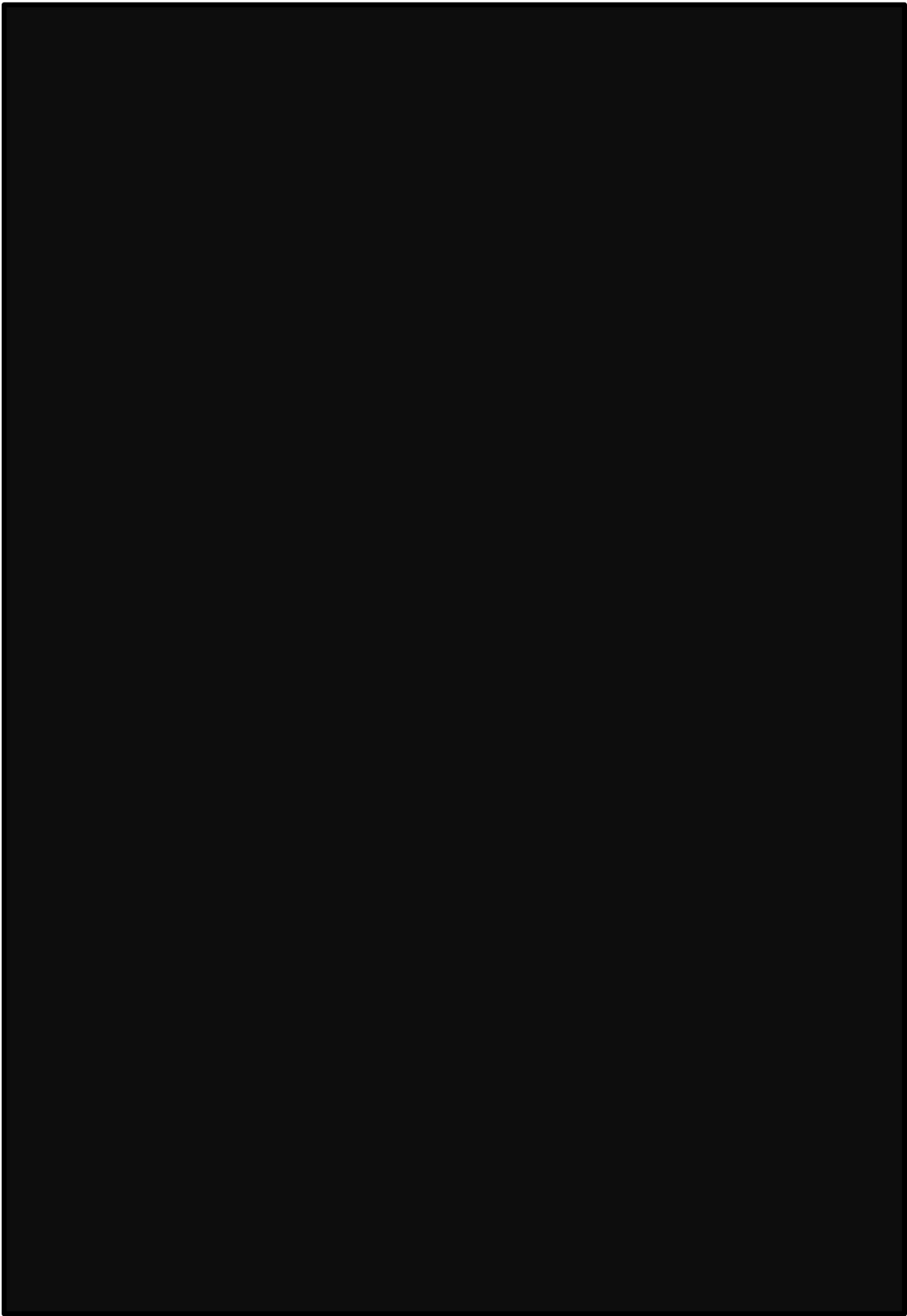


Figure 13: Location and extent of site 52-5-0484/52-5-0512. Background image sourced from Land and Property Information NSW.

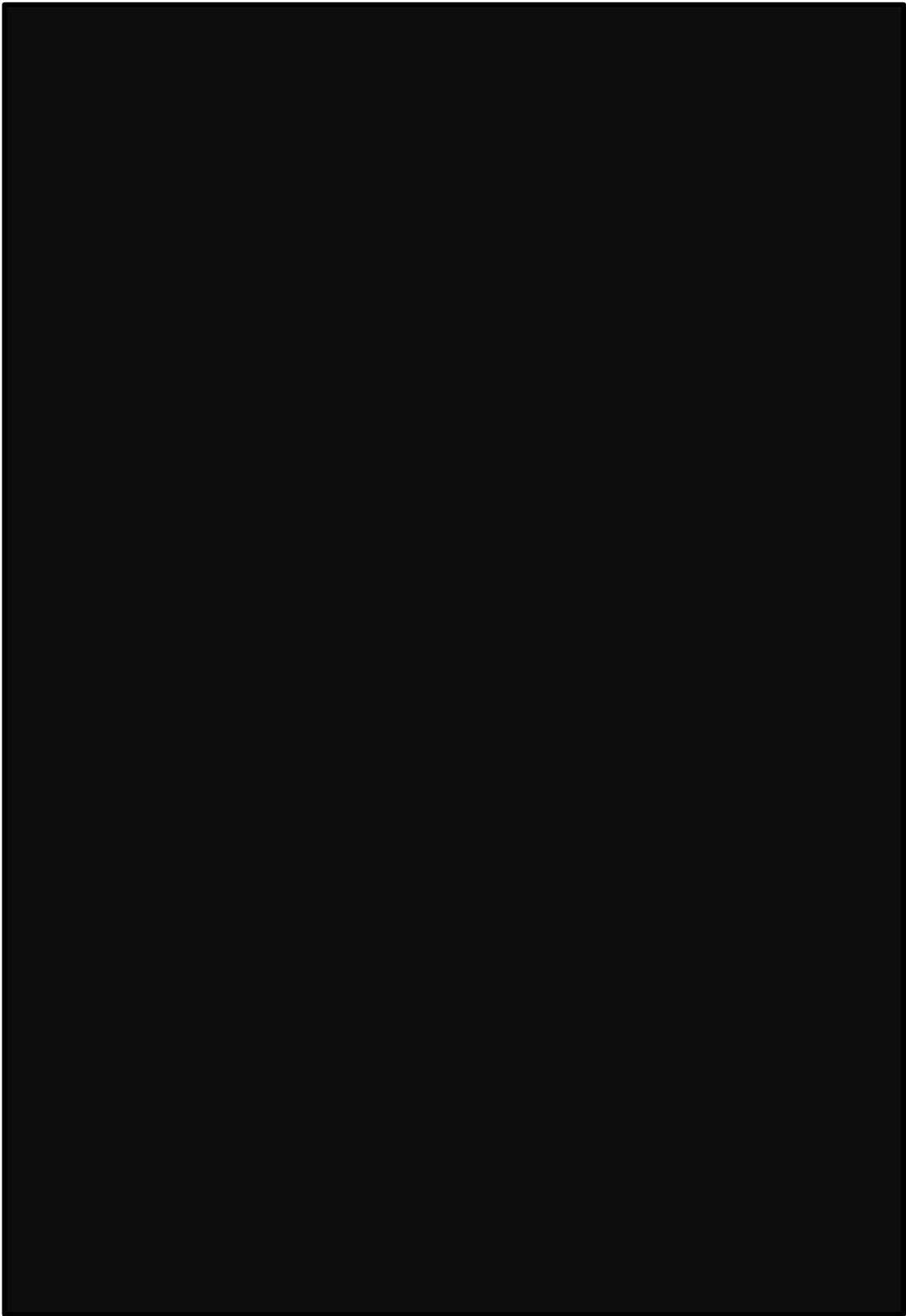


Figure 14: Location of site 52-5-0227. Background image sourced from Land and Property Information NSW.

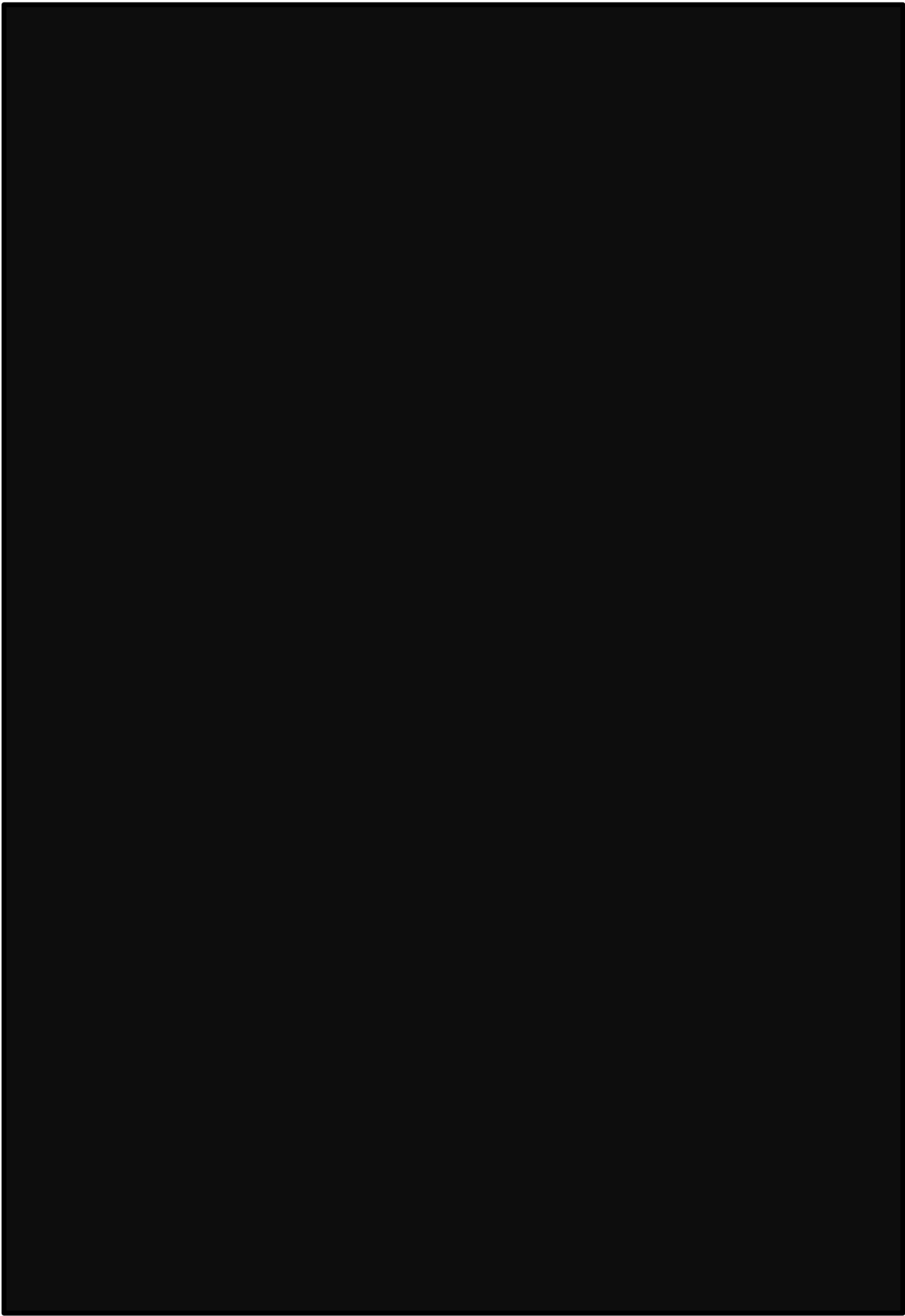


Figure 15: Location and extent of YTOF PAD 1. Background image sourced from Land and Property Information NSW.

6.4 Previously recorded Aboriginal sites

AHIMS site 52-5-0484/52-5-0512 (WDRA_AS_09)

Landform:	Crest
Coordinates:	
Site type:	Open artefact scatter
Site Area:	180 square metres

AHIMS site 52-5-0484/52-5-0512 comprises 89 artefacts scattered across an exposed area of 180 square metres. The assemblage consists of flakes, broken flakes, cores and flaked pieces. Raw materials include silcrete, chert, quartz, chalcedony, fine-grained siliceous and fine-grained volcanic. A1 and A2 soils were exposed at the surface in the area. According to AMBS (2006a: Table 37) this site has high archaeological potential. The potential to contain additional surface/subsurface deposit was identified. Some impacts from vehicle use in the known site area were noted at the time.

Site 52-5-0484/52-5-0512 was located during the current field survey using GPS coordinates and photographs. No artefacts were visible on the ground surface due to dense grass and vegetation cover. The presence of mounds across the site area indicates that some disturbance (e.g. dumping of rubbish and spoil) has occurred since the site was recorded.

Plate 25: View eastwards across site 52-5-0484/52-5-0512.



Plate 26: View north to crest on which site 52-5-0484/52-5-0512 is located.



AHIMS site 52-5-0227 (Macquarie Rivulet 1)

Landform:	Terrace
Coordinates:	
Site type:	Open artefact scatter
Site Area (original):	Unknown (site card states "artefacts scattered over park")

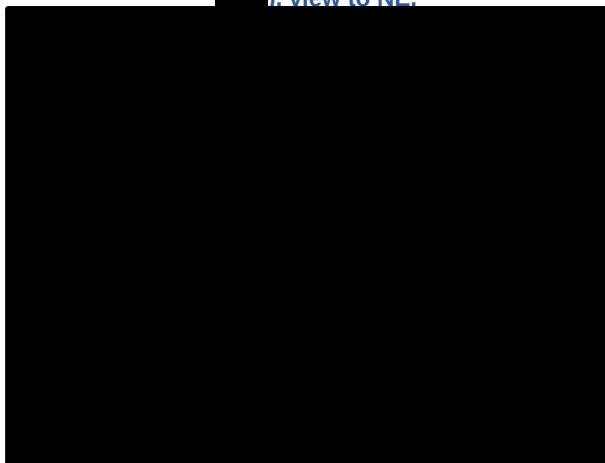
AHIMS site 52-5-0227 is an artefact scatter located on a terrace approximately 20 metres to the south of Macquarie Rivulet, within [REDACTED]. The site is described on the site card as a midden/artefact scatter, with artefacts scattered over the park. Artefacts include beach pebble flakes. Other artefact raw materials include chert, silcrete, fossilised wood and mudstone. Shell fragments of *Anadara trapezia* were noted to be scattered sparsely throughout the area. The recorders determined that possible surface disturbance may have occurred when the park was established; however, it is possible that undisturbed sub-surface material is present.

Site 52-5-0227 was located during the current field survey using GPS coordinates. No artefacts were visible on the ground surface. The terrace and creek flat have been heavily disturbed by landscaping and by the installation of a roadway, parking and picnic facilities associated with [REDACTED]. Immediately to the south of the terrace is an industrial development, where the land has been heavily disturbed and modified. Construction would also have impacted on the terrace landform. Although sub-surface artefacts may be present in the area, the high level of disturbance and the alluvial context mean that they are likely to have been redeposited.

Plate 27: View SW to approximate GPS coordinate location of site 52-5-0227.



Plate 28: Location of site 52-5-0227 ([REDACTED]), view to NE.



6.5 Newly recorded PAD

YTOF PAD 1

Landform:	Lower slope
Coordinates:	[REDACTED]
Site type:	PAD
Site Length:	85 metres (north-south)
Site Width:	70 metres (east-west)
Site Area:	6050 square metres

PAD 1 is positioned on a very gentle southwest-facing slope above a flat that extends to Frazers Creek. The PAD is located less than 200 metres to the east of the creek. The PAD area was densely grassed, leading to nil ground surface visibility. A dam is located approximately 50 metres to the east of the eastern edge of the PAD. The construction of this dam does not appear to have impacted on the PAD area. Other disturbances within the vicinity of the PAD are minimal, related to the installation of property fences and the use of the land for pastoral purposes. AMBS (2006a) found that eight of 24 archaeological sites identified within the WDRA were located on hill slopes. During test excavations within the WDRA it was determined that the highest number of artefacts was retrieved from a single test pit in a slope landform context. There is, therefore, potential for sub-surface artefacts to be present within the hill slope landform of PAD 1, particularly given the close proximity to Frasers Creek.

Plate 29: View east across PAD 1.



Plate 30: View west across PAD 1.



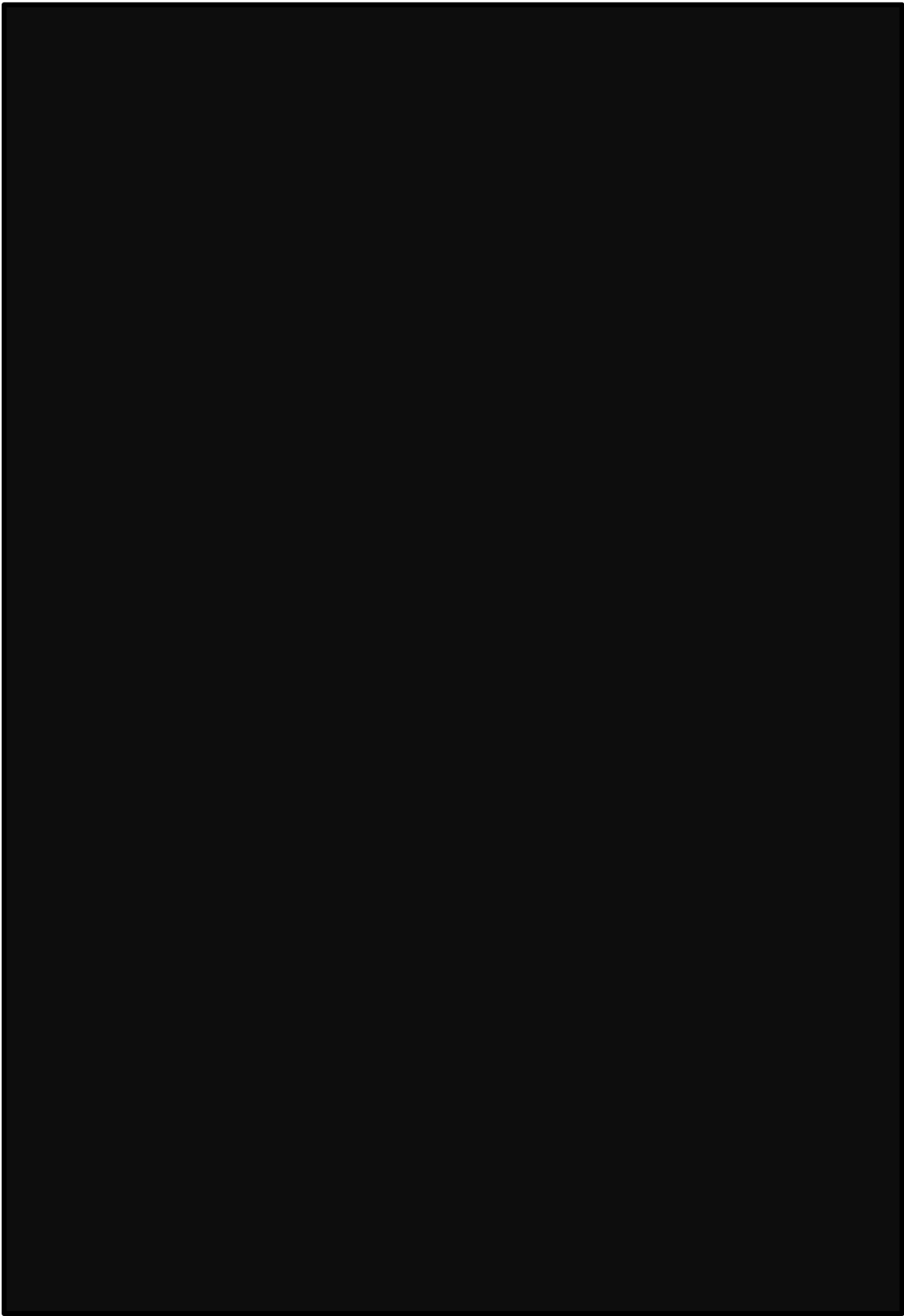


Figure 16: Sites and PAD within the study area. Background image source Google© 2013 and Land and Property Information NSW.

7.0 Analysis and discussion

7.1 Disturbance levels

Overall the study area has high levels of ground disturbance. The construction of roads and the railway, and associated ground modification, has resulted in disturbance along most of the study area. The northern sector (Survey Unit 1) has been extremely disturbed and modified due to the installation of the Princes Highway (M1), F6 Freeway and associated on/off ramps and bridges. The construction of the Illawarra Highway and Yallah Road has led to localised disturbance within Survey Units 1 and 2. Survey Unit 3 incorporates the highly disturbed road corridor along the eastern and western edges of the Illawarra Highway. The area at northern end of Survey Unit 4 has been subject to localised disturbance associated with the construction of Tongarra Road. Survey Units 5 and 6 in the eastern sector of the study area have been heavily impacted by Croome Road; the East West Link; associated roundabouts (Woollybutt Drive and Durgadin Drive); the truck stop; the major roundabout and on/off ramps at the intersection of the East West Link, Princes Highway and New Lake Entrance Road; and short stretches of the Princes Highway on each side of the roundabout.

All drainage channels within the study area, including Duck Creek, Macquarie Rivulet and Frazers Creek, have been heavily modified. Some modifications are associated with the construction of roads (e.g. the Princes Highway crossing over Duck Creek and Macquarie Rivulet; and the Illawarra Highway crossing over Frazers Creek). Other modifications are associated with dredging and the installation of dams (e.g. Frazers Creek). A section of Frazers Creek within the vicinity of the current study area has been noted by a previous study to have been dredged, resulting in the formation of an embankment (HLA 2007: 13). The flat and terrace immediately to the south of Macquarie Rivulet has been subject to extensive disturbance through landscaping and the installation of a roadway, parking and picnic facilities associated with Darcy Dunster Park. The construction of an industrial development immediately to the south of the terrace has also impacted on this area.

Substantial industrial development along much of the eastern edge of Survey Unit 2 has resulted in major disturbance to the area, including to part of the crest landform on which site 52-5-0484/52-5-0512 is located, although the site itself does not appear to have been impacted. A dairy complex and residence has caused localised disturbance within Survey Unit 3. Similarly, a residence and associated infrastructure has resulted in localised disturbance within Survey Unit 5. Landscaping and levelling within the pony club and sports ground areas in Survey Unit 4 have caused significant disturbance to the ground surface. The section of Survey Unit 6, south of the East West Link, between Woollybutt Drive and Durgadin Drive has been heavily modified through the installation of an artificial drainage channel and the construction of a levelled retention basin immediately to the south. Other localised disturbances within the study area have resulted from the installation of utilities such as an underground gas pipeline and

overhead transmission lines. Localised dumping of rubbish and mounding of earth was noted intermittently throughout the study area (e.g. in the area of site 52-5-0484/52-5-0512).

The study area to the south of Macquarie Rivulet is mostly located along an alluvial floodplain, which is subject to frequent inundation. Flat areas adjacent to drainage channels within the study area would also be subject to frequent flooding.

7.2 Archaeological potential

Archaeological potential is closely related to the levels of ground disturbance in the area. Other factors are also taken into account when assessing archaeological potential, such as whether artefacts were located on the surface, and whether the area is within a sensitive landform unit according to the predictive statements for the area.

Two Aboriginal sites were previously recorded within the study area. No new Aboriginal sites were located during the survey. One area of PAD (YTOF PAD 1) was identified during the survey.

Site 52-5-0484/52-5-0512 (WDRA_AS_09) was located during the current field survey using GPS coordinates and photographs. No artefacts were visible on the ground surface due to dense grass and vegetation cover. AMBS (2006a) originally assessed this site as demonstrating high archaeological potential. However, the presence of mounds across the site area observed during the current assessment indicates that extensive rubbish/spoil deposition and possible sub-surface impacts have occurred since the original recording. Due to the undulating nature of the deposits, the level of disturbance to the original ground surface is unknown. The remainder of the crest landform to the south of the site location appeared to be more intact. Based on the observed changes to the site area and possible surface impact since the original recording, the site area has been reassessed as demonstrating moderate archaeological potential.

Site 52-5-0227 (Macquarie Rivulet) was located during the current field survey using GPS coordinates. No artefacts were visible on the ground surface. The terrace and creek flat have been heavily disturbed by landscaping and by the installation of a roadway, parking and picnic facilities associated with [REDACTED]. Immediately to the south of the terrace is an industrial development, where the land has been heavily disturbed and modified. Construction of this would also have impacted on the terrace landform. Although sub-surface artefacts may be present in the area, the high level of disturbance and the alluvial context mean that they are likely to have been redeposited. Kelleher Nightingale Consulting (KNC) recently undertook an assessment of Aboriginal cultural heritage along the banks of the Hawkesbury River for the Windsor Bridge Replacement project. It was determined that collections of artefacts in active floodplain environments are likely to become archaeologically dilute due to aggrading processes (increased deposition of sediment) and/or displacement by flood events. This means that the integrity of single artefacts can never be certain and such environments therefore offer low levels of

archaeological significance (KNC 2012: 12). This finding supports our re-assessment of the archaeological potential of site 52-5-0227 as low.

As RMS requires management measures regarding archaeological potential to be based on the definition of PAD, areas of archaeological potential within the study area are described in terms of PAD instead of in terms of a gradient from low to high archaeological potential or sensitivity. One area of PAD was identified during this study (YTOF PAD 1). Because of the sensitivity of the locality (very gentle slope less than 200 metres from Frazers Creek) and low level of ground disturbance, there is potential for sub-surface artefacts to be present within PAD 1. This assessment is supported by the findings of AMBS (2006a) that eight of 24 archaeological sites identified within the WDRA were located on hill slopes. Further, during test excavations within the WDRA it was determined that the highest number of artefacts was retrieved from a single test pit in a slope landform context. YTOF PAD 1 was assessed as having a high archaeological potential.

Several other intact landforms were identified within the study area, but these were determined to be of low archaeological potential. The hill slopes to the south of the crest in Survey Unit 2 were moderately steep and would not have been suited to Aboriginal occupation. The crest and slope formations within Survey Unit 6 have been heavily disturbed during road construction and remnant topsoils were very shallow. These areas are therefore assessed as having a low archaeological potential. The alluvial floodplain and creek flats would not have been suited to occupation due to frequent inundation, and therefore have a low archaeological potential. The remainder of the study area has low archaeological potential due to the high levels of ground disturbance.

No shell midden or scarred tree Aboriginal sites were observed during the field survey. No specific areas for burials were identified during the field survey. As burials have the potential to occur across the landscape, further stakeholder consultation during Stage 3 of the PACHCI should include a request for cultural information relating to the study area, including any knowledge of potential burial locations.

Archaeological potential of areas not surveyed

A field investigation of the properties not accessible for the current investigation would be required to verify the archaeological potential of those areas.

A preliminary assessment of archaeological potential within those inaccessible properties is outlined below based on background research and observations made of similar landforms during the field survey.

Industrial area between the Illawarra Highway and the Princes Highway

The industrial estate, which included a nursery and other businesses, was located across a terrace landform between two portions of Survey Unit 3. The industrial area appeared highly disturbed with

building construction, landscaping, and extensive areas of excavation associated with the nursery. The preliminary assessment of archaeological potential within the industrial area is low.

Boles, Delmo and Gallagher properties

The Boles, Delmo and Gallagher properties demonstrate a continuation of the flat, terrace and drainage channel landforms assessed in Survey Units 3 and 4. No areas of archaeological potential were identified in either Survey Units 3 or 4. The low-lying portions of both properties would likely be inundated during high water events.

Site integrity in low-lying areas subject to frequent inundation is likely to be low. Frequent inundation and movement / deposition of sediments are likely to have resulted in the dilution of any sub-surface Aboriginal objects in a deep homogenous deposit. Portions of the surveyed properties had been affected by historical period landform modification, including creek dredging and re-alignment.

An Aboriginal heritage assessment was conducted within the Delmo property by HLA-Envirosciences in 2007. This includes the portion of that property within the Yallah to Oak Flats corridor. HLA identified on isolated Aboriginal object on the bank of Frazers Creek and approximately 85 metres east of the current study area. HLA concluded that the artefact was likely to have been disturbed by dredging activities and suggested that the property was likely to have been heavily modified by flooding events and historical period landform modifications.

Based on observations during the field survey within Survey Units 3 and 4, and the results of field investigation by HLA, the preliminary assessment of archaeological potential within the Boles, Delmo and Gallagher properties is low

Cupocchiano Property

The Cupocchiano property is a cleared area with limited built infrastructure. The property is situated on a gently sloping crest landform at the base of a steep incline and local high point of approximately 120 metres AHD 300 metres to the south of the Yallah to Oak Flats corridor. One ephemeral drainage channel flows north through the portion of the property within the road corridor.

A disturbed area associated with several built structures and landform modification was located in the northeast corner of the property. The remainder of the property within the road corridor is potentially more intact.

The distance of the corridor within the Cupocchiano property from reliable water supply indicates that occupation of this area is unlikely to have resulted in a high density sub-surface archaeological deposit. The closest reliable water source was Frazers Creek approximately 700 metres away. However, there is potential for any deposited Aboriginal objects to have remained relatively *in situ* within the sandy loam



soils across the relatively undisturbed portion of the property. The preliminary assessment of archaeological potential within the Cuppocchiano property is low-moderate.

8.0 Statutory requirements

This study has been undertaken in the context of several items of legislation that relate to Aboriginal heritage and its protection in New South Wales.

National Parks and Wildlife Act (1974)

The *National Parks & Wildlife Act 1974*, administered by the OEH provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84.

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is, of special significance to Aboriginal culture.

The Act was amended in 2010 and, as a result, the legislative structure for seeking permission to impact on heritage items has changed. A section 90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and is granted by the OEH. Various factors are considered by OEH in the AHIP application process, such as site significance, Aboriginal consultation requirements, ESD principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object have also recently been increased.

As part of the administration of Part 6 of the Act OEH regulatory guidelines on Aboriginal consultation are in place, which are outlined in the Consultation Requirements. Guidelines are also in place for the processes of due diligence - *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (2010), and for investigation of Aboriginal objects – the Code of Practice in accordance with the 2010 amendment to the Act.

There are no gazetted Aboriginal Places within the study area. There are two registered Aboriginal sites within the study area which are subject to the provisions of the National Parks and Wildlife Act 1974. All Aboriginal objects, whether recorded or not are protected under the Act.

Heritage Act (1977)

The *Heritage Act 1977* is administered by the Department of Premier and Cabinet and protects the natural and cultural heritage of NSW. Generally this Act only pertains to Aboriginal Heritage if it is listed on the State Heritage Register, or subject to an interim heritage order.

There are no Aboriginal heritage items listed on the State Heritage Register within the study area.

Aboriginal Land Rights Act (1983)

The Aboriginal Land Rights Act 1983 is administered by the NSW Department of Human Services - Aboriginal Affairs. This Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

There are no lands held, or currently claimed, by the Local Aboriginal Land Council under the Aboriginal Land Rights Act 1983 within the study area.

Native Title Act (1994)

The Native Title Act 1994 was introduced to work in conjunction with the Commonwealth Native Title Act. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.

There are no Native Title claims registered within the study area.

9.0 Significance assessment

9.1 Assessment criteria

Archaeological significance refers to the archaeological or scientific importance of a landscape, site or area. This is characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance would be discussed by the Aboriginal groups during ongoing Aboriginal consultation for the project and would be detailed in the Cultural Heritage Assessment Report during Stage 3 of the RMS PACHCI.

9.2 Archaeological significance assessment

The archaeological significance of site 52-5-0227 has been determined based on the findings of the previous recorders, observations made during the current field survey, and on the type and distribution of other previously recorded Aboriginal sites in the local context. This artefact scatter was found to be located in a disturbed context on a floodplain and was therefore assessed as having a low archaeological significance.

The significance of site 52-5-0484/52-5-0512 (WDRA_AS_09) could not be accurately assessed based on observations in the field. The archaeological potential of the site was assessed to be moderate. The current levels of sub-surface disturbance are unknown and therefore further archaeological investigations would be required prior to assessments of representative, rarity, educational and archaeological values can be known. The archaeological significance of the site is therefore unknown.

As the identification of the PAD (YTOF PAD 1) was based on the research potential of the designated area, the archaeological significance of the PAD cannot be determined until the results of further archaeological investigations are known. The PAD was assessed as having a high archaeological potential.

A summary of the significance values of each recorded site and PAD within the study area is outlined in Table 5, and discussed below.

Table 5: Summary of significance values

Site name	Research Potential	Scientific / Archaeological Value	Representative Value	Rarity Value	Overall Significance
52-5-0484/ 52-5-0512 (WDRA_AS_09)	Moderate	Unknown	Unknown	Unknown	Unknown
52-5-0227 (Macquarie Rivulet 1)	Low	Low	Low	Low	Low
YTOF PAD 1	High	Unknown	Unknown	Unknown	Unknown

52-5-0484/52-5-0512 (WDRA_AS_09)

The surface artefact scatter as originally recorded indicates a relatively extensive site on a crest landform context. The site was originally assessed by AMBS (2006a) as having high archaeological potential. However, ground surface visibility was very low during the current survey and no artefacts were visible on the surface. Mounds were observed across the site area, indicating that extensive rubbish/spoil deposition and possible sub-surface impacts have occurred since the original recording. Due to the undulating nature of the deposits, the level of disturbance to the original ground surface is unknown. The remainder of the crest landform to the south of the site location appeared to be more intact. Based on the changes to the site area and possible sub-surface impact since the original recording, the site area has been reassessed as demonstrating moderate archaeological potential. Further archaeological investigation would collect additional information on the archaeological, representative and rarity values of the site and therefor to assess archaeological significance. The site has potential to provide information on the nature of Aboriginal occupation/utilisation of elevated crest landforms.

52-5-0227 (Macquarie Rivulet 1)

Artefact scatter 52-5-0227 has been assessed as demonstrating low archaeological significance. The terrace on which the site is located has been heavily disturbed by landscaping and by the installation of a roadway, parking and picnic facilities associated with [REDACTED]. Construction of the industrial development to the south of the terrace would also have impacted on the area. Although sub-surface artefacts may be present in the area, the high level of disturbance and the alluvial context mean that their integrity cannot be assured. As previously discussed, active floodplain environments offer low levels of archaeological significance. This factor, combined with the high level of disturbance observed in the area, has led to archaeological significance of site 52-5-0227 being assessed as low.

PAD

The identified PAD (YTOF PAD 1) has been assessed as demonstrating high research potential. The PAD area has the potential to provide information on the nature of occupation in the area and enable a comparative analysis with other sites in the vicinity. The archaeological values, representative and rarity values cannot be accurately determined until the results of further archaeological investigation are known.

Remainder of the study area

The remainder of the survey area was generally disturbed or included areas of low archaeological potential and low rarity and representative values. The remainder of the survey area was assessed as demonstrating low archaeological significance.

10.0 Impact assessment

10.1 Impact assessment

An impact assessment cannot yet be made as there are no development plans available. Once a concept design has been developed an updated impact assessment would be added to this report.

11.0 Management and Mitigation Measures

11.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites would be conserved. If conservation is not practical, measures would be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended is primarily based on an assessment of archaeological significance. The final recommendations would also be informed by cultural significance to be discussed by the Aboriginal stakeholder groups during RMS PACHCI Stage 3 consultation.

11.2 Mitigation measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of an area, which is based on the research potential, rarity, representativeness and educational value. In general the significance of a site would involve the following mitigation measures:

- Low archaeological significance – No further investigations required. An Aboriginal Heritage Impact Permit (AHIP) would be required to impact the site before works can commence.
- Moderate archaeological significance – Conservation where possible. If conservation was not practicable further archaeological investigation would be required such as salvage excavation or surface collection. An AHIP would be required if Aboriginal objects are present.
- High archaeological significance – Conservation as a priority. An AHIP would be required only if other practical alternatives have been discounted. Conditions of this AHIP would depend on the nature of the site, but may include comprehensive salvage excavations.

Site 52-5-0227 has been assessed as demonstrating low archaeological significance therefore no further archaeological investigations are required. If it is not practicable to avoid site 52-5-0227 an AHIP will be required prior to impacts occurring.

The archaeological significance of site 52-5-0484/52-5-0512 and PAD YTOF PAD 1 is at present unknown. Site 52-5-0484/52-5-0512 has been assessed as having moderate archaeological potential and the PAD (YTOF PAD 1) has been assessed as having high archaeological potential. If impacts to the site or PAD cannot be avoided by the proposed development, test excavation under the OEH Code of Practice would be undertaken in order to determine whether sub-surface Aboriginal objects are present in each area. The purpose of these excavations would be to assess the significance of the PAD and site 52-5-0484/52-5-0512, not to mitigate against impacts.



If the site or PAD area was found to be of a low archaeological significance, there would be no Aboriginal heritage constraints on the proposed development in those areas. However, an AHIP would be required prior to any works commencing.

If the site or PAD area was found to have a moderate archaeological significance it is likely that there would be no constraints on the proposed development in those areas, but that archaeological salvage excavations would be recommended to mitigate against any proposed impacts as a condition of an AHIP. An AHIP would be obtained from OEH prior to works commencing.

If the site or PAD area was found to be of high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding the future management of the areas, such as conservation where possible. It is therefore important to understand the nature of the buried archaeological deposits within the site and PAD area before further recommendations are made.

12.0 Recommendations

The following recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- The results of the background research, site survey and assessment.
- The interests of the Aboriginal stakeholder groups.
- The likely impacts of the proposed development.

It was found that:

- Two artefact scatter sites (AHIMS sites 52-5-0484/52-5-0512 and 52-5-0227) were previously recorded within the study area. Site 52-5-0484/52-5-0512 has been assessed as having moderate archaeological potential and an unknown archaeological significance. Site 52-5-0227 has been assessed as having low archaeological significance.
- One area of high archaeological potential (YTOF PAD 1) was located within the study area. The PAD has been assessed as having a high archaeological potential and an unknown archaeological significance.

It is therefore recommended that:

- If site 52-5-0227 was to be impacted by the proposed development an AHIP will be required prior to impacts occurring. No further archaeological investigations would be required at this site.
- If site 52-5-0484/52-5-0512 was to be impacted by the proposed development test excavations under the OEI Code of Practice would be necessary. Test excavations would be required to inform an assessment of archaeological significance. If the test excavations show that the site has low archaeological significance, there would be no constraints on impacts (apart from an AHIP if required). If the site was shown to have a moderate archaeological significance, further mitigation measures such as salvage excavation and an AHIP may be recommended before impacts were to occur. If the site was shown to have high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding the future management of the site.
- If the PAD area (YTOF PAD 1) were to be impacted, test excavation under the OEI Code of Practice would be necessary. Test excavations would be required to inform an assessment of archaeological significance. If the test excavations show that the PAD has low archaeological significance, there would be no constraints on impacts (apart from an AHIP if required). If the PAD was shown to have a moderate archaeological significance, further mitigation measures such as salvage excavation and an AHIP may be recommended before impacts were to occur. If the PAD was shown to have high



archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding future management of that area.

- If impacts are proposed to the recorded Aboriginal sites and/or PAD area, including test excavations under the OEH Code of Practice, Stage 3 PACHCI, including comprehensive Aboriginal consultation, would be initiated by RMS. A Cultural Heritage Assessment Report (CHAR) would be prepared as part of the Stage 3 PACHCI.
- If Aboriginal objects are located at any stage outside areas where test excavations are being undertaken, or outside areas for which an AHIP is granted, work would stop immediately and the RMS *Unexpected Archaeological Finds Procedure 2011* would be followed. If human remains are located during any works associated with the project within the study area the RMS *Unexpected Archaeological Finds Procedure 2011* would be followed.
- If the project design is changed and areas not surveyed are to be impacted, or other Aboriginal sites not identified are to be impacted, further archaeological assessment would be required.
- Field survey of the inaccessible properties should be conducted to update the preliminary assessment of archaeological potential for those areas outlined in this report.

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9.3 Appendix D: PACHCI Stage 2 Addendum to ASR



31 March 2014

Peter Hawkins
Project Development Manager
Development South
Infrastructure Development
Roads and Maritime Services
Level 6, 90 Crown Street
Wollongong NSW 2500

Dear Peter,

Re: Addendum to the PACHCI Stage 2 archaeological survey report for the Albion Park Rail Bypass Project

Artefact Heritage prepared an archaeological survey report in 2013 as part of Stage 2 of the Roads and Maritime Services (Roads and Maritime) *Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011* (PACHCI) of the proposed Albion Park Rail Bypass Project (previously referred to as the Yallah to Oak Flats Road Upgrade). Following finalisation of that document in June 2013, Roads and Maritime engaged Artefact Heritage to prepare an addendum to that investigation for properties within the study area that were not accessible for the original investigation, as well as an addition to the study area that incorporates the Croom Regional Sporting Complex. For the purposes of this report, the first PACHCI Stage 2 survey area is referred to as the original study area and the addendum PACHCI Stage 2 survey area is referred to as the current study area.

The aim of this investigation is to identify Aboriginal sites or areas of archaeological potential within the previously inaccessible areas and the additional area, and to assess the archaeological significance of any sites recorded. An Aboriginal Heritage Information Management System (AHIMS) database search will be undertaken to ascertain whether there are any recorded sites within the additional areas, and whether any sites have been recorded within or adjacent to the remainder of the original study area since the initial investigation. A ground survey will be conducted within those properties that could not be accessed for the original investigation, as well as within the additional area incorporating the Croom Regional Sporting Complex. This addendum report is to be read in conjunction with the 2013 PACHCI Stage 2 archaeological survey report prepared by Artefact Heritage, and will be included as an Appendix to that document.

The proposal and study area

Roads and Maritime is currently examining whether a proposed road corridor between Yallah and Oak Flats is suitable to provide a long term solution for an upgrade of the Princes Highway. Artefact Heritage has been engaged by Roads and Maritime to conduct an Aboriginal archaeological survey and assessment for the proposal in accordance with Stage 2 of the RMS PACHCI. The resulting ASR will be used to guide the future planning of an upgrade of the Princes Highway between Yallah and Oak Flats.

This addendum report deals with the properties within the proposed road corridor that were not accessible for the original investigation, as well as an addition to the study area that incorporates the Croom Regional Sporting Complex. These areas combined make up the current study area (Figure 1).

Objectives of addendum

This letter report outlines the following information:

- Description and analysis of the identified Aboriginal sites within the current study area.
- An updated Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) search.
- Development of a significance assessment and impact assessment for Aboriginal sites located within the current study area.
- Management and mitigation measures for Aboriginal sites located within the current study area.

Further details of the proposal, including environmental and archaeological context of the local area, Aboriginal histories of the area, and predictive modelling are outlined in the 2013 archaeological survey report (Artefact Heritage 2013).

Aboriginal stakeholder consultation

Aboriginal stakeholder consultation throughout the preparation of this document was conducted by Barry Gunther, Roads and Maritime Senior Aboriginal Cultural Heritage Advisor, and Joanne Damcevski, Roads and Maritime Aboriginal Cultural Heritage Officer.

As the current study area is located within the boundaries of the Illawarra Local Aboriginal Land Council (ILALC), representatives of ILALC were invited to take part in the additional survey by Barry Gunther. Pamela Glover and Allan Walker, both representatives of ILALC, participated in the additional survey on 25-27 February 2014 inclusive. A copy of the report on the survey prepared by ILALC is attached to this report.

Figure 1: The study area (background © Google 2014 and © NSW LPI).



Legislative context

This letter report addendum was prepared in accordance with the following NSW legislation and legislative guidelines:

National Parks & Wildlife Act (1974)

The *National Parks & Wildlife Act 1974* (the NP&W Act) provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 90. Aboriginal objects are afforded automatic statutory protection in NSW whereby it is an offence to:

'damage, deface or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service (now the OEH).'

The Act defines an Aboriginal 'object' as:

'any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons of non-Aboriginal European extraction, and includes Aboriginal remains'.

The Act was recently amended (2010), with the legislative structure for seeking permission to impact on heritage items modified. A s90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and may only be granted by OEH if the conditions of the 'due diligence guidelines', and/or an 'archaeological investigation' have been met. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

The Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (the EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The overall study area falls within the boundaries of the Wollongong and Shellharbour Local Government Areas and is covered by the Wollongong Local Environmental Plan (LEP) 2009 and the Shellharbour LEP 2013. As the proposal is being undertaken by a state agency (Roads and Maritime), the LEP is overridden by the State Environmental Planning Policy (Infrastructure) (ISEPP) 2007.

Investigators and contributors

This report was written by Samantha Gibbins, archaeologist at Artefact Heritage. Project Director Dr Sandra Wallace provided management input and reviewed the report.

OEH Aboriginal Heritage Information Management System (AHIMS) search

A search of the OEH AHIMS site register was undertaken on 20 February 2014 (Client Service ID 125766). An earlier AHIMS search was conducted on 23 April 2013 (Client Service ID 98600). The later search on 20 February was required to determine whether any new sites had been recorded within the study area, including the additional area incorporating the Croom Regional Sporting Complex (the current study area), since the first search was undertaken.

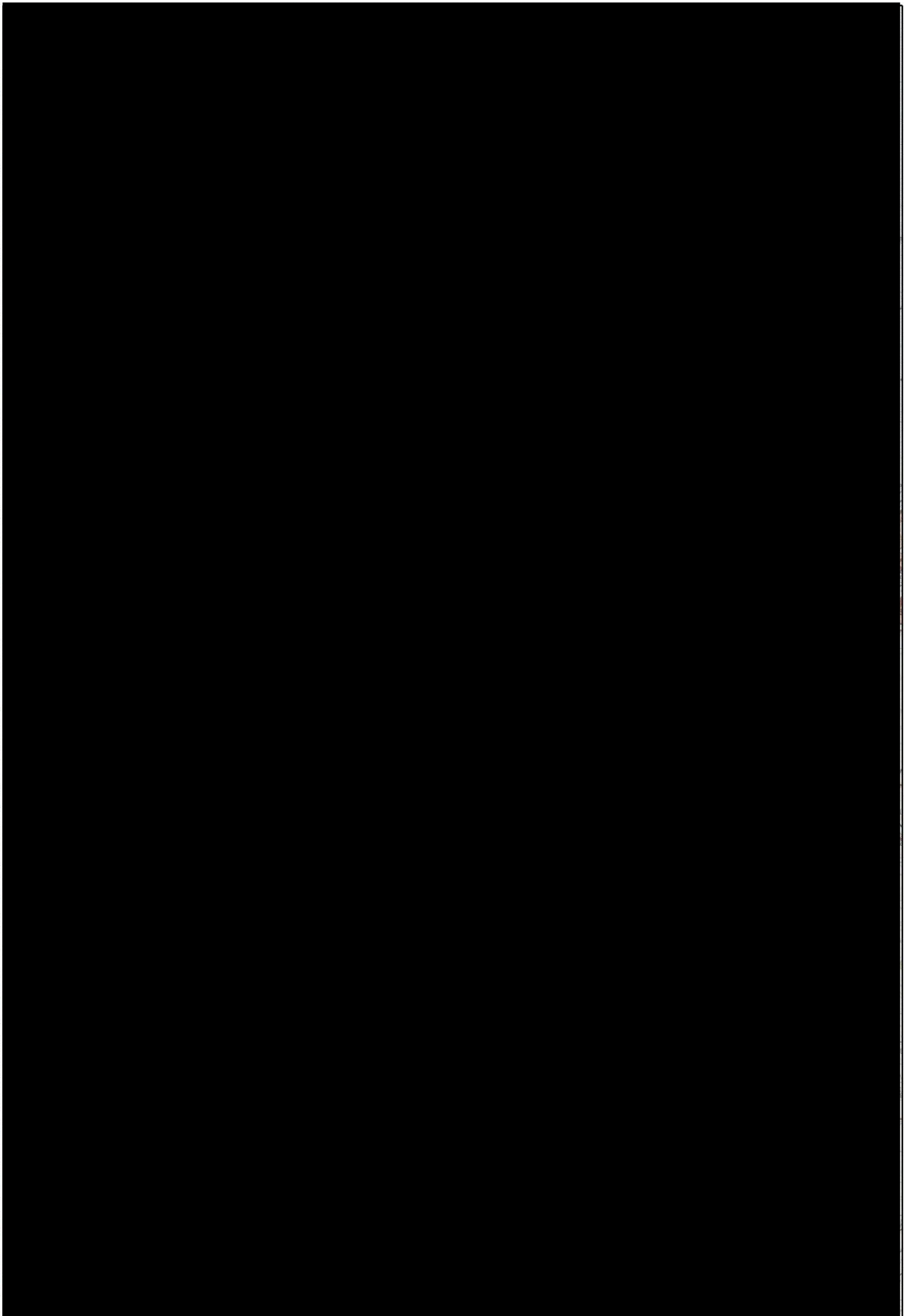
A search of 10.5 x 8.7 kilometre area centred on the study area was undertaken, with a total of 104 sites identified. The distribution of recorded sites within the search area is shown in (Figure 2). The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal, be removed from this report if it is to enter the public domain.

The frequency of recorded site types is summarised in Table 1. Of the 104 sites previously recorded in the 10.5 x 8.7 kilometre search area, Artefact sites are predominant (n=73). The remaining site types include Shell with Artefact (n=15); Potential Archaeological Deposit (PAD) (n=7); Shell (n=6); Modified Tree (n=2); and Modified Tree with Artefact (n=1). It can be seen in Figure 2 that the majority of sites are located within 200 metres of water sources such as Duck Creek, Macquarie Rivulet, Marshall Mount Creek and their tributaries, or close to the shores of Lake Illawarra. The site distribution is also a reflection of the pattern of archaeological assessments undertaken in relation to development activities.

Table 1: Frequency of site features from AHIMS data

Site Feature	Frequency	Percentage
Artefact	73	70.2
Shell; Artefact	15	14.4
PAD	7	6.7
Shell	6	5.8
Modified Tree	2	1.9
Modified Tree; Artefact	1	1.0

Figure 2: AHIMS results within/near the study area. Background image © NSW LPI.



Two previously recorded sites are located within the original study area (Figure 8). A substantial artefact scatter was recorded during survey work undertaken by AMBS (2006a) within the West Dapto Release Area (AHIMS site 52-5-0484) at approximately 420 metres to the south of Yallah Road. This site is duplicated within the AHIMS database as site 52-5-0512. Another artefact scatter was recorded by Navin, Officer and McIntyre as part of research for a Bachelor of Arts Honours thesis (Navin 1987) near the southern bank of Macquarie Rivulet (AHIMS site 52-5-0227). Description of these sites and an assessment of their significance are provided in the 2013 archaeological survey report, along with recommended mitigation measures (Artefact Heritage 2013). No sites have been newly recorded within or adjacent to the remainder of the original study area since the initial investigation.

No other previously recorded sites registered on AHIMS are located within or in close proximity to the previously inaccessible areas and the additional area that incorporates the Croom Regional Sporting Complex that make up the current study area.

Previously recorded Aboriginal sites that have not been registered on AHIMS

One previously recorded site that has not been registered on AHIMS is located within the current study area, in the industrial estate immediately to the south of Darcy Dunster Park. Ainsworth Heritage conducted an Aboriginal heritage due diligence assessment within the existing garden centre complex at [REDACTED]. A small midden site (AHUGC001), approximately two metres long, was recorded beneath a sediment trap at the north-eastern corner of the development site (Figure 8). The midden comprised a minimal scatter of shells and fragments of shell, including turbo, cockle and whelks. None of the intact shells were greater than four centimetres in length. It was noted that the midden appeared to be eroding out of the edge of the development area. The stratigraphy of the midden was not evident from the surface examination and it was suggested that the midden may have been disturbed or shifted during construction of the road. It could not be determined how far the midden may extend beneath the development area (Ainsworth Heritage 2012: 38). It was recommended that design modifications be implemented in order to avoid impact to the site and prevent the need for an AHIP (Ainsworth Heritage 2012: 44).

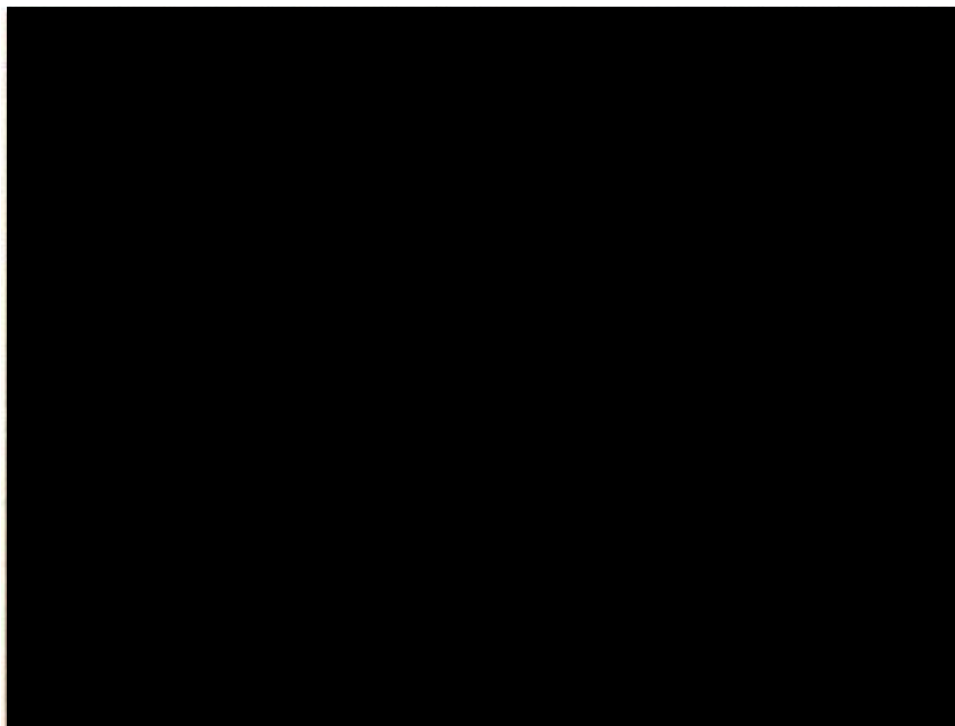
An Aboriginal heritage assessment was conducted within the Tate (former Delmo) property by HLA-Envirosciences in 2007. This includes the portion of that property within the proposed road corridor. An isolated Aboriginal object was identified on the bank of Frazers Creek, approximately 85 metres east of the current study area (Figure 2). It was concluded that the artefact was likely to have been disturbed by dredging activities and suggested that the property was likely to have been heavily modified by flooding events and historical period landform modifications (HLA 2007). This site is not registered on AHIMS.

Previously recorded Aboriginal archaeological potential

AHMS (2008)

Archaeological and Heritage Management Solutions (AHMS) undertook an Aboriginal and Historical Assessment and Impact Assessment at Lot 11 DP 883605, Albion Park in 2008. This area is immediately to the south of Tongarra Road, and incorporates part of the addition to the study area to the north of the Croom Regional Sporting Complex. An area of high potential for Aboriginal objects to occur in undisturbed A horizon soils at the top of the waning upper slope to within the first 150 metres east of Frazer's Creek was identified by AHMS (2008: 14). An area of moderate potential for Aboriginal objects to occur within 50 metres to the east and west of Frazer's Creek was also identified (Figure 3).

Figure 3: Approximate areas of Aboriginal archaeological potential identified by AHMS (2008: Fig. 7).
Yellow = low potential; orange = moderate potential; red = high potential



Artefact Heritage (2013)

One area of potential archaeological deposit (PAD) was identified during the initial survey of the proposed road corridor undertaken by Artefact Heritage in 2013. This is located along a very gentle lower slope less than 200 metres to the east of Frazers Creek (YTOF PAD 1), south of the Croom Regional Sporting Complex. Description of this PAD and recommended mitigation measures are provided by Artefact Heritage (2013). This PAD is discussed in more detail below.

Survey methodology

The study area was divided into seven survey units, some of which contained multiple landform units (Figure 4). The same survey methodology used during the original survey was employed (Artefact Heritage 2013: 25, 27).

A sample survey of Survey Units 5 and 6 was undertaken. A sample survey is acceptable under the OEH Code of Practice with justification. A sample survey of Survey Unit 5 was conducted primarily because the majority of the unit was covered in trees, dense grass and low-lying shrubs. Ground surface visibility across the majority of the survey unit was nil. A sample survey of Survey Unit 6 was undertaken because the majority of the survey unit was heavily disturbed through the installation of multiple sports fields, associated infrastructure and landscaping. Dense grass cover across most of the survey unit severely limited the ground surface visibility.

Survey results

Effective survey coverage

The study area was divided into seven survey units, all of which contained multiple landform units (Figure 4). Although mostly cleared of original vegetation, the landforms within the study area (flats, slopes and terrace) were covered in dense grass that limited ground surface visibility to zero, except in the odd areas of exposure. The only areas of surface visibility were observed in vehicle tracks, animal tracks, exposures around tree bases, exposures around sports fields and other areas of disturbance, and odd patches of erosion on the steeper slopes. Standing sections of deposit could be observed in some places along drainage channels. Vegetation was impenetrable or extremely dense in several sections of the study area and these were not surveyed. Visibility and exposure levels have been taken into consideration in determining the effective coverage area on this survey (Table 2 and Table 3).

Table 2: Survey Coverage

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
1	Modified	11,196	1	10	11.2	0.1
2	Flat, open depression, slope	113,197	1	10	113.2	0.1
3	Flat, open depression	10,749	1	10	10.8	0.1
4	Flat, open depression, slope	74,656	5	10	373.3	0.5
5*	Open depression, slope	58,010	5	20	580	1

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
6*	Flat, open depression, slope	72,350	5	20	723.5	1
7	Flat, terrace, open depression, slope	102,586	5	10	512.9	105

* = sample survey area

Table 3: Landform survey coverage

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Modified	11,196	11.2	0.1	1 site (AHUGC001)	-
Flat	132,478	363.1	0.27		
Open depression	44,590	228.2	0.51		-
Slope	235,716	1628.4	0.7	2 PAD (YTOF PAD1 and YTOF PAD3)	-
Terrace	18,764	94	0.5	1 site (YTOF IF1) 1 PAD (YTOF PAD2)	1

Figure 4: Overview of Survey Units (background © Google 2014 and © NSW LPI).



Survey observations

Survey Unit 1

Survey Unit 1 encompasses the industrial estate immediately to the south of Darcy Dunster Park (Figure 5). This estate, which includes a nursery and other businesses, is located across a terrace landform approximately 40 metres to the south of Macquarie Rivulet. Survey Unit 1 has been subject to high levels of disturbance associated with the construction of buildings and sheds, and the installation of paved roads, car park areas and landscaping. Levelling through the use of introduced fill was evident, and portions of the garden centre (nursery section) at the northern end had recently been scraped, with the earth mounded up along the northern boundary of the property.

According to the owner of the garden centre that currently occupies the northern third of the survey unit, the site was originally a sand and soil depot established in 1998. This area was very swampy, and in order to establish the depot excavation was undertaken across the area up to a depth of 600 millimetres. Imported fill was used to level the site, which was then compacted to facilitate heavy vehicle access (Michael McGill, personal communication, February 2014).

Ground surface visibility across the survey area was generally nil due to coverage by the buildings, paved surfaces and landscaped areas Plate 1. The bulk of the ground surface in the garden centre nursery was covered in matting and pot plants. Exposures were limited to the scraped area through the garden centre, and the small standing section along the western edge of the access road to the garden centre (Plate 2 and Plate 3). The middle lot within the industrial complex, currently occupied by DMT, could not be accessed during the survey because the gate was locked. However, it was evident in the standing section along the eastern property boundary that this lot has been levelled with introduced fill and the original ground surface would not have been visible in the area.

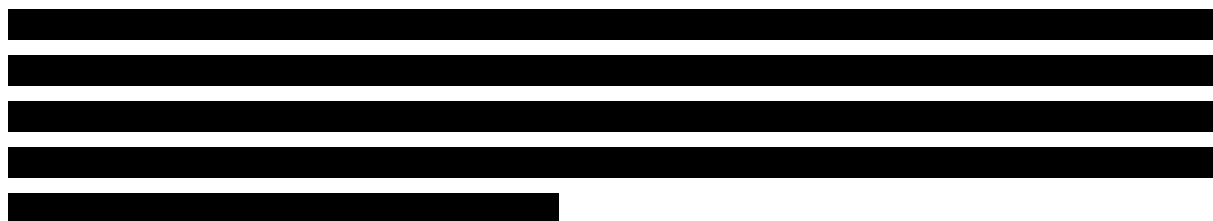


Figure 5: Survey Unit 1 (background © Google 2014).

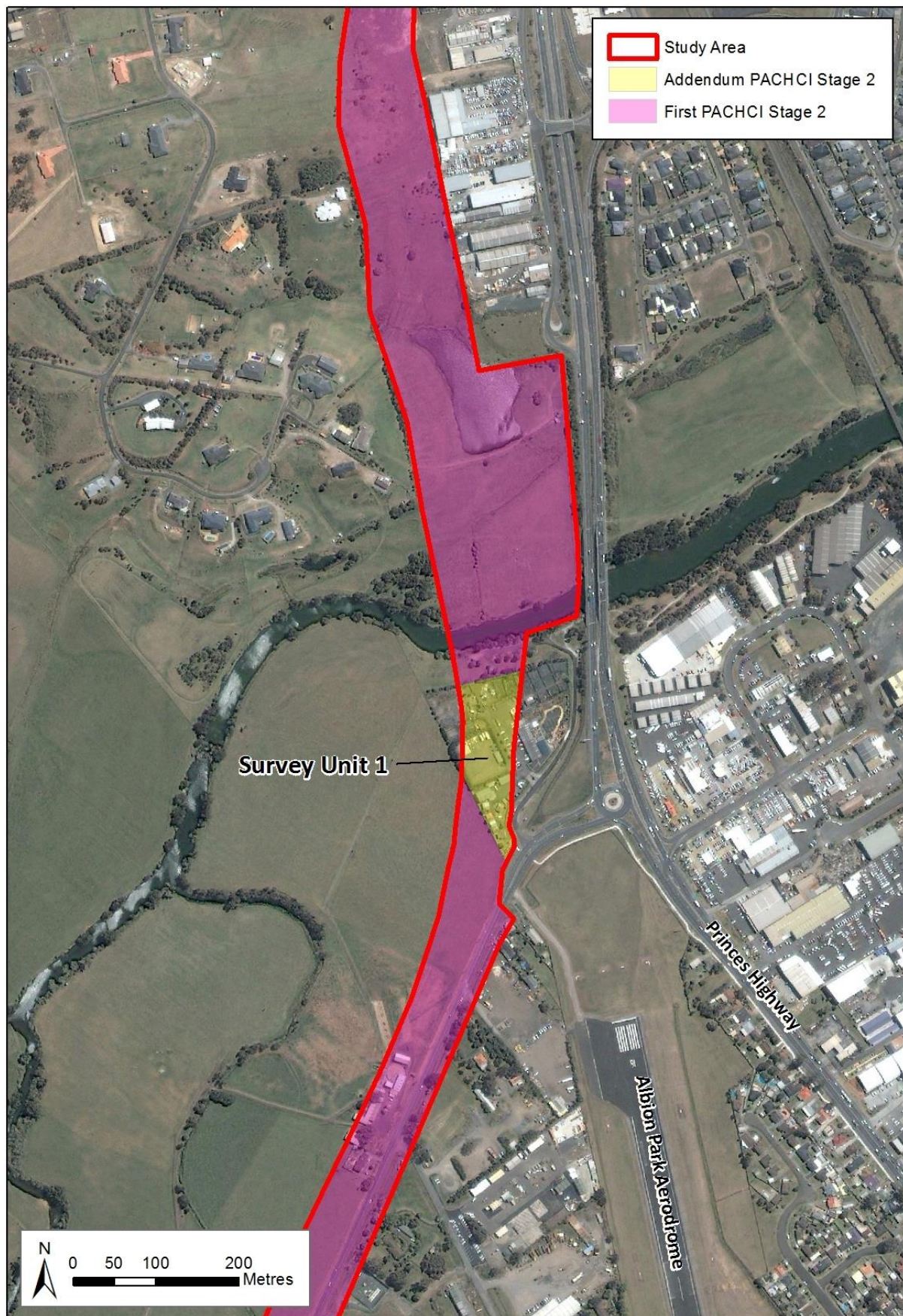


Plate 1: Survey Unit 1 – levelled, gravel surface, view to SW.



Plate 2: Survey Unit 1 – scraped surface through nursery (mounded earth to left), view to NE.



Plate 3: Survey Unit 1 – [REDACTED], view to SW.

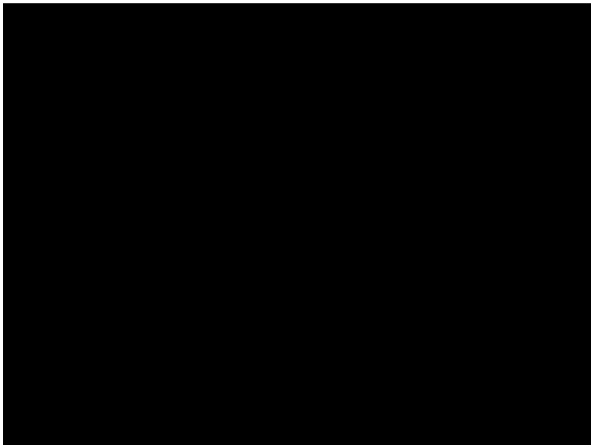
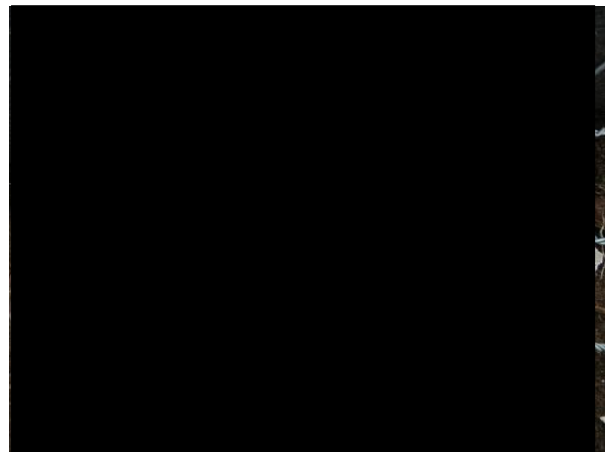


Plate 4: Survey Unit 1 – [REDACTED]



Survey Unit 2

Survey Unit 2 incorporates three main landform units – flat, open depression and slope. The section of the survey unit that crosses over the Illawarra Highway is classed as modified. Survey Unit 2 is a single, linear strip of land that crosses over the Illawarra Highway in the north and runs southwards, then south-eastwards, across a flat, low-lying landform towards Tongarra Road (Figure 6). The survey unit crosses over an unnamed drainage channel and two east-west branches of Frazers Creek, all of which have been modified and lead to dams and/or wetlands. To the south of the southern-most branch of Frazers Creek, the land rises up gently towards Tongarra Road and also slopes up gently, then more steeply, to the east.

Ground surface visibility across Survey Unit 2 was generally nil due to the dense grass cover. Some infrequent exposures were present in areas of disturbance, such as along drainage channels, animal tracks, vehicle tracks and erosion scours. Significant disturbance was noted at the northern end of the survey unit, associated with the construction of the Illawarra Highway (Plate 5). The flat is used for

pastoral purposes and an underground gas pipeline runs from north to south through the area. Much of the land was waterlogged, confirming that the area is frequently inundated (Plate 6 and Plate 7). The slightly more elevated slope landform at the southern end of the survey unit is positioned between two north-south running arms of Frazers Creek, within the floodplain, and would be subject to frequent inundation. This end of the survey unit has also been substantially disturbed by the construction of Tongarra Road (Plate 8).

Plate 5: Survey Unit 2 – northern end (Illawarra Highway in the background), view to south.



Plate 6: Survey Unit 2 – view to SE across proposed road corridor (note dense grass).



Plate 7: Survey Unit 2 – view to NW across proposed road corridor from southern-most branch of Frazers Creek (wetlands to left of frame).



Plate 8: Survey Unit 2 – sloping landform at southern end of survey unit (Tongarra Road in background), view to south.



Figure 6: Survey Unit 2 (background © Google 2014).



Survey Unit 3

Survey Unit 3 incorporates two main landform units – flat and open depression. The survey unit is bounded by Frazers Creek along the eastern edge and sports fields along the western edge (Figure 7). Ground surface visibility across Survey Unit 3 was generally nil due to the dense grass cover. Some infrequent exposures were present along eroded sections of the creek bank (Plate 9). The area is used for pastoral purposes and appears to be relatively disturbed. The ground was lumpy and mounded in places, possibly as a result of the installation of the adjacent sports fields, and a drainage ditch ran west-east through the area, leading to the creek. The northern end of the survey unit was slightly elevated and levelled, and an underground gas pipeline transects the south-eastern corner of the survey unit (Plate 10). The creek in this area appears to have been modified and is densely vegetated with introduced plant species such as Lantana. Overall, this is a low-lying landform adjacent to a creek that is subject to flooding.

Plate 9: Survey Unit 3 – erosion along the western bank of Frazers Creek, view to NW.



Plate 10: Survey Unit 3 – view to NW along gas pipeline route (sports fields in background).



Survey Unit 4

Survey Unit 4 incorporates three main landform units – slope, flat and open depression. It is bounded along the western edge by Croome Road and along the northern edge by the East West Link (Figure 7). The survey unit runs from southwest to northeast across the moderate to gentle lower northwest facing slopes of a steep hill. The slope culminates in a low-lying flat area at the north-eastern end of the survey unit. Two main ephemeral drainage channels dissect the slope, running downhill from south to north and discharging into the low-lying flat, which forms a broad drainage depression.

Ground surface visibility across Survey Unit 4 was generally nil due to dense grass cover (Plate 11). Some infrequent exposures were present in areas of disturbance, such as along vehicle and animal tracks, and along the drainage channels (Plate 12). The area is presently used for pastoral purposes. The southern end of the survey unit has been substantially disturbed by the construction of the existing house, outbuildings and associated infrastructure, including access tracks (Plate 13).

Dumped vehicles and building material were present in the vicinity of the house and a large drainage ditch had been excavated to bedrock to the south of the house. The western and northern edges of the survey unit have been heavily disturbed by the installation of Croome Road and the East West Link, respectively. The low-lying flat at the north-eastern end of the survey unit is occupied by a series of small sheds and fences, the installation of which has resulted in disturbances to the ground surface (Plate 14). Dumped rubbish and mounded earth was evident in the vicinity of the structures. Multiple small drainage channels run through this area, and a dam has been constructed along one of the main channels. Flash flooding was evident along the drainage channels.

Plate 11: Survey Unit 4 – view to north across survey unit (note grass cover).



Plate 12: Survey Unit 4 – exposure along drainage channel, view to SE.



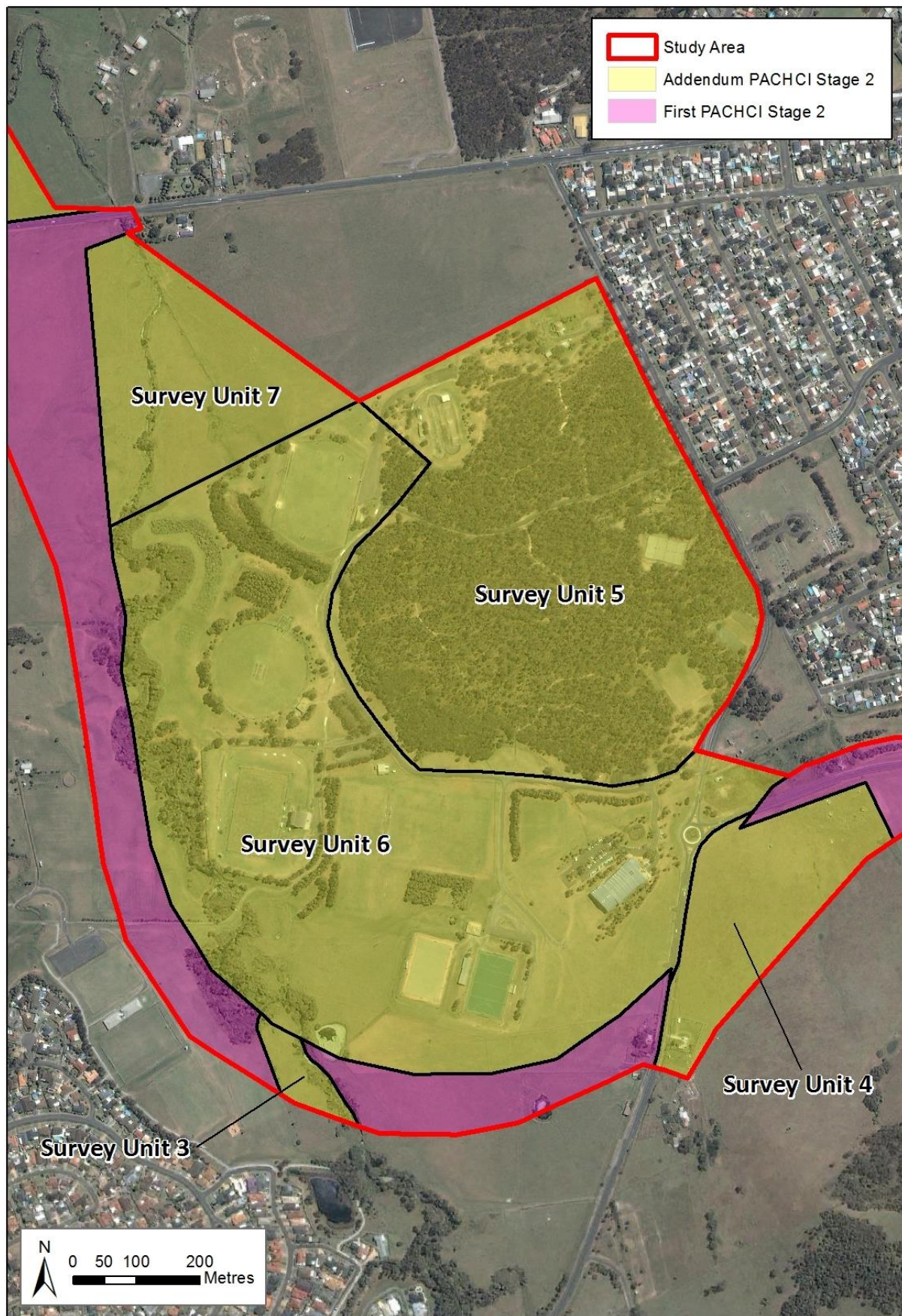
Plate 13: Survey Unit 4 – view to west across southern end of survey unit near the house (note steep slope down to Croome Road).



Plate 14: Survey Unit 4 – view to NE of sheds and fencing on the low-lying flat at the north-eastern end of the survey unit.



Figure 7: Survey Units 3-7 (background © Google 2014).



Survey Unit 5

Survey Unit 5 encompasses an area of bushland along the eastern edge of the Croom Regional Sporting Complex. It is bounded to the east and south by Croome Road, and to the south and west by the main access road within the sporting complex. The northern boundary is formed by the northern boundary of the sporting complex (Figure 7). A sample survey of Survey Unit 5 was conducted primarily because the majority of the unit was covered in trees, dense grass and low-lying shrubs. The survey unit incorporates two main landform units – slope, and open depression. An ephemeral tributary to Frazers Creek runs along the western edge of the survey unit. The gentle lower slopes of the Wentworth Hills extend north-westwards through the area. The ground rises gently-moderately eastwards from the tributary, before levelling out and then sloping gently down eastwards towards Croome Road.

Ground surface visibility across Survey Unit 5 was generally nil due to the dense grass and vegetation cover (Plate 15). Exposures were evident along the vehicle tracks and bike tracks that criss-crossed the area, and in patches of disturbance such as erosion scours (Plate 16). The trees in the area were mostly immature (regrowth) and the ground surface was lumpy and mounded in many places. Major disturbances within the survey unit have resulted from the installation of the BMX track and car parking facilities at the north-western end (Plate 17); the construction of a house and outbuildings (now abandoned) at the north-eastern end; and the installation of a tennis court complex, horse paddocks and dam in the south-eastern sector (Plate 18). Further disturbances have resulted from the installation of dirt tracks, pathways and paved roads through, and immediately adjacent to, the survey unit (Plate 19). Intermittent dumped rubbish was evident across the area. The drainage channel has been modified and is heavily eroded (Plate 20). A hard stand and blue metal stockpile has been installed at the southern end of the survey unit, leading off the access road to the sporting complex.

Plate 15: Survey Unit 5 – view to east across survey unit (note vegetation cover).



Plate 16: Survey Unit 5 – dirt vehicle track through area, view to north.



Plate 17: Survey Unit 5 – BMX track at north-western end, view to view to SW.



Plate 18: Survey Unit 5 – horse paddock in south-eastern sector, view to SE.



Plate 19: Survey Unit 5 – paved pathway at north-eastern end (near abandoned house), view to NE.



Plate 20: Survey Unit 5 – eroded bank of tributary to Frazers Creek, view to SSE.



Survey Unit 6

Survey Unit 6 incorporates the Croom Regional Sporting Complex and the land immediately to the south and west of the complex (including Frazers Creek). It is bounded to the north by the northern boundary of the sporting complex; to the east by Survey Unit 5; and to the south and west by the proposed road corridor that was originally surveyed in 2013 (Figure 7). A sample survey of Survey Unit 6 was undertaken because the majority of the survey unit was heavily disturbed through the installation of multiple sports fields, associated infrastructure and landscaping. The bulk of the survey unit has been classed as modified. The remainder of the survey unit incorporates three main landform units – slope, flat and open depression. Frazers Creek runs along the western edge of the survey unit and an unnamed tributary to Frazers Creek runs southeast to northwest through the survey unit at the northern end.

Ground surface visibility across Survey Unit 6 was generally nil due to dense grass cover. The creek banks were lined with dense, impenetrable vegetation including introduced species such as Lantana (Plate 21). Exposures were evident in areas of disturbance such as along artificial drainage ditches, vehicle tracks and erosion scours. The bulk of the survey unit has been highly disturbed and modified through the installation of the multiple sports fields and associated infrastructure, and the construction of Croome Road and the East West Link (Plate 22). The landforms were more intact along the southern edge of the survey unit (outside of the sporting complex) and, to some extent, on the flats immediately adjacent to Frazers Creek.

The land along the southern edge of Survey Unit 6 (immediately to the south of the hockey fields) comprises a flat adjacent to the eastern edge of Frazers Creek that rises gradually, and then more steeply, towards Croome Road in the east (Plate 23). This land is currently used for pastoral purposes, and disturbances through the area are localised only, including fencing and tracks. An artificial drainage ditch runs from east to west along the northern boundary of the survey unit. A second, deeper drainage ditch runs from northeast to southwest into a dam near Frazers Creek (Plate 24). During the original survey, YTOF PAD 1 was recorded within the proposed road corridor in the adjacent property (immediately to the south). It was determined during the current survey that YTOF PAD 1 extends northwards across the continuing landform through Survey Unit 6. For full details, refer to the summary of results section below.

The section of Survey Unit 6 to the west of the hockey fields and to the north of the dam comprises a low-lying flat adjacent to the eastern edge of Frazers Creek. This land undulates gently, but is prone to inundation. Disturbances in this area relate to the installation of the dam, sports and hockey fields, and a transmission line that runs from east to west through the area (Plate 25). The ground was highly disturbed in places, with earth mounds and localised excavation evident.

The areas immediately to the east and west of Frazers Creek in the northern portion of the survey unit also comprise low-lying flats with gentle undulations. The areas to the east of the creek have been substantially disturbed through the construction of sports fields and landscaping (Plate 26). The areas

to the west of the creek have been disturbed by landscaping and levelling associated with the pony club facilities and sports fields. Frazers Creek is heavily modified, with built up embankments and fencing evident in places, and the banks are lined with dense, impenetrable vegetation (Plate 21).

Plate 21: Survey Unit 6 – Modified and densely vegetated Frazers Creek, view to NW.



Plate 22: Survey Unit 6 – one of the sports fields, view to SE.



Plate 23: Survey Unit 6 – intact sloping landform along southern edge of survey unit, view to west.



Plate 24: Survey Unit 6 – drainage ditch leading into dam, view to SW.



Plate 25: Survey Unit 6 – disturbed flat to the west of the hockey fields, view to north.



Plate 26: Survey Unit 6 – Landscaping through north-western section of unit, view to south.



Survey Unit 7

Survey Unit 7 incorporates four main landform units – slope, flat, terrace and open depression. It is bounded to the north and west by the proposed road corridor that was originally surveyed in 2013; to the east by fields; and to the south by the Croom Regional Sporting Complex (Figure 7). Frazers Creek and an unnamed ephemeral tributary to Frazers Creek run south-north through the survey unit and converge in the northern portion of the unit. The creeks mostly cross through a low-lying flat area. A broad, elevated west-facing slope rises up from the flat to the east of the tributary, then levels out and extends into a crest beyond the eastern boundary of the survey unit. An elevated, level terrace rises above the flat immediately adjacent to the eastern edge of Frazers Creek at the southern end of the survey unit. The land to the west of Frazers Creek is a low-lying flat with some gentle undulations.

Ground surface visibility across Survey Unit 7 was generally nil due to dense grass cover (Plate 27 and Plate 28). Some infrequent exposures were evident in areas of disturbance such as vehicle and animal tracks, erosion scours and the eroded creek banks. A substantial area of erosion was noted at the confluence of Frazers Creek and its tributary (Plate 29). The land is currently used for pastoral purposes. Disturbances are localised only, associated with erosion, the construction of the house at the northern end of the survey unit, and the installation of fencing and vehicle tracks (Plate 30). Dumped building material was noted at the confluence of the creeks. The flat, low-lying portions of the survey unit would be subject to frequent inundation.

An isolated find (YTOF IF1) was located on an unformed vehicle track on the eastern bank of Frazers Creek during the survey. An area of PAD (YTOF PAD 2) was defined across the elevated, level terrace that rises above the flat immediately adjacent to the eastern edge of Frazers Creek at the southern end of the survey unit. The artefact is in close proximity to YTOF PAD 2. An area of PAD (YTOF PAD 3) was defined along the elevated west-facing slope that rises up to the east of the tributary, along the eastern edge of the survey unit. For full details of YTOF IF1, YTOF PAD 2 and YTOF PAD 3, refer to the summary of results section below.

Plate 27: Survey Unit 7 – view to SW across survey unit (Frazers Creek in background).



Plate 28: Survey Unit 7 – view to SE across survey unit.



Plate 29: Survey Unit 7 – erosion at confluence of Frazers Creek and its tributary, view to NE.



Plate 30: Survey Unit 7 – view to NW along flat towards confluence of creeks.



Summary of results

One previously recorded Aboriginal site is located within the current study area (AHUGC001). A description of this site as recorded is provided above in the section on previously recorded Aboriginal sites that have not been registered on AHIMS. A copy of the site card for this site is also attached to this report. This site was located during the current survey. One isolated artefact (YTOF IF1) was recorded during the current survey. The area of PAD (YTOF PAD 1) that was recorded during the original survey in 2013 was extended, and two new areas of PAD were defined during the current survey (YTOF PAD 2 and YTOF PAD 3). The locations of the sites and PADs are shown in (Figure 8). A summary of the recorded sites and PADs is included in Table 4, and descriptions are provided below.

Figure 8: Sites and PAD within the study area (background © Google 2014 and © NSW LPI).

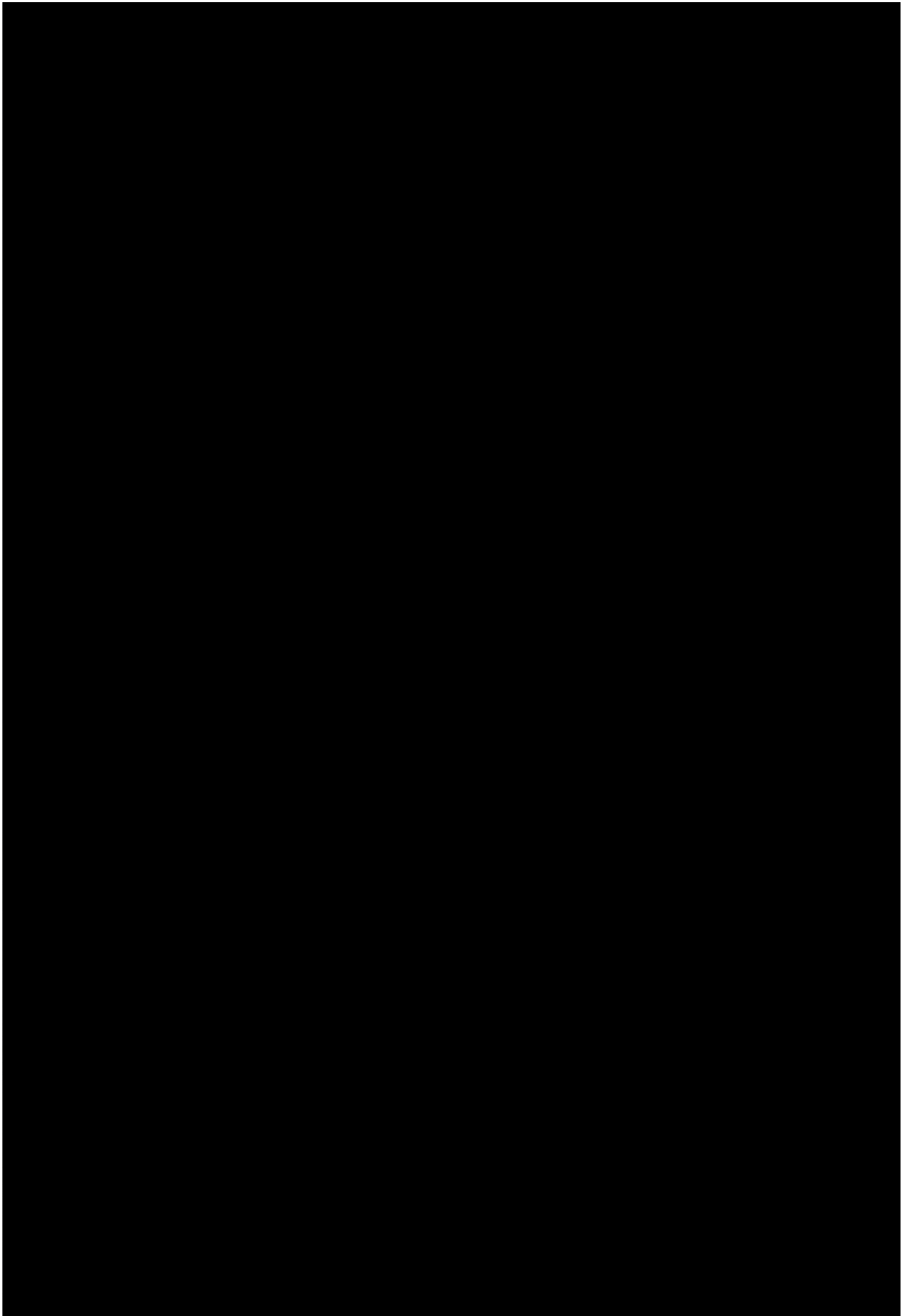


Table 4: Summary of survey findings

AHIMS number	Site name	Feature(s)	Survey Unit	Landform
-	AHUGC001	Midden	1	Modified terrace
-	YTOF IF1	Isolated find	7	Flat
-	YTOF PAD 1	PAD	5	Lower slope
-	YTOF PAD 2	PAD	7	Terrace
-	YTOF PAD 3	PAD	7	Slope

Site AHUGC001

Landform: Terrace
 Coordinates: [REDACTED]
 Site type: Midden
 Site Area: 2.0 x 0.1 m (visible extent)

Site AHUGC001 (not registered on AHIMS) is a disturbed midden site recorded [REDACTED] by Ainsworth Heritage (2012) [REDACTED]. The midden comprised a minimal scatter of shells and fragments of shell, including turbo, cockle and whelks. None of the intact shells were greater than four centimetres in length. It was noted that the midden appeared to be eroding out of the edge of the development area. The stratigraphy of the midden was not evident from the surface examination and it was suggested that the midden may have been disturbed or shifted during construction of the road. It could not be determined how far the midden may extend beneath the development area (Ainsworth Heritage 2012: 38). It was recommended for the previous development that design modifications be implemented in order to avoid impact to the site and prevent the need for an AHIP (Ainsworth Heritage 2012: 44).

The site was located during the current field survey. The details of the original recording were confirmed. However, the midden does not appear to be *in situ*. The shell material has clearly been disturbed and is likely to have been brought to the site as part of the levelling fill (Plate 3 and Plate 4).

Site YTOF IF1

Landform: Flat
 Coordinates: [REDACTED]
 Site type: Isolated find
 Site Area: n/a

Figure 9: Location of site AHUGC001 (background © Google 2014).

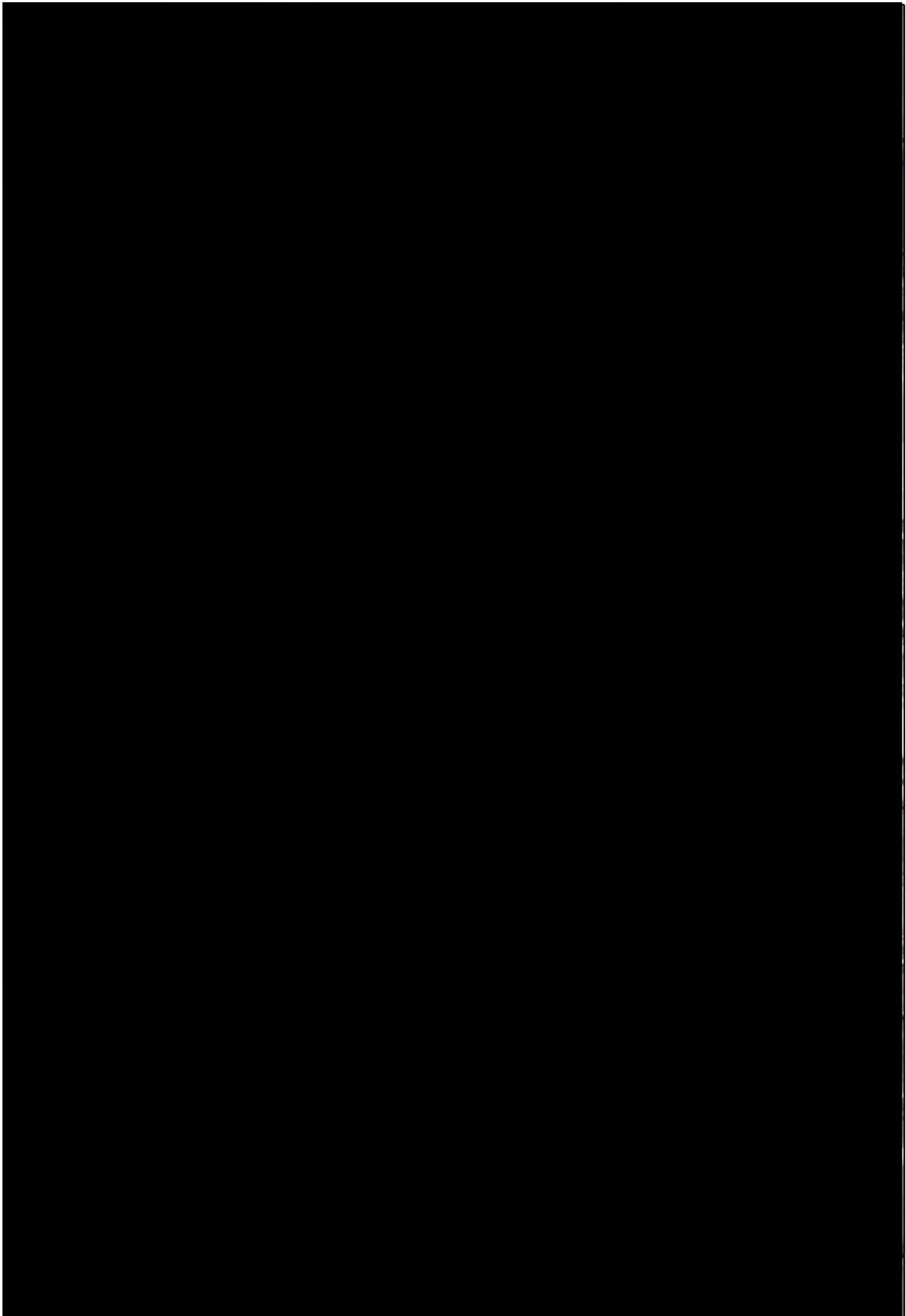
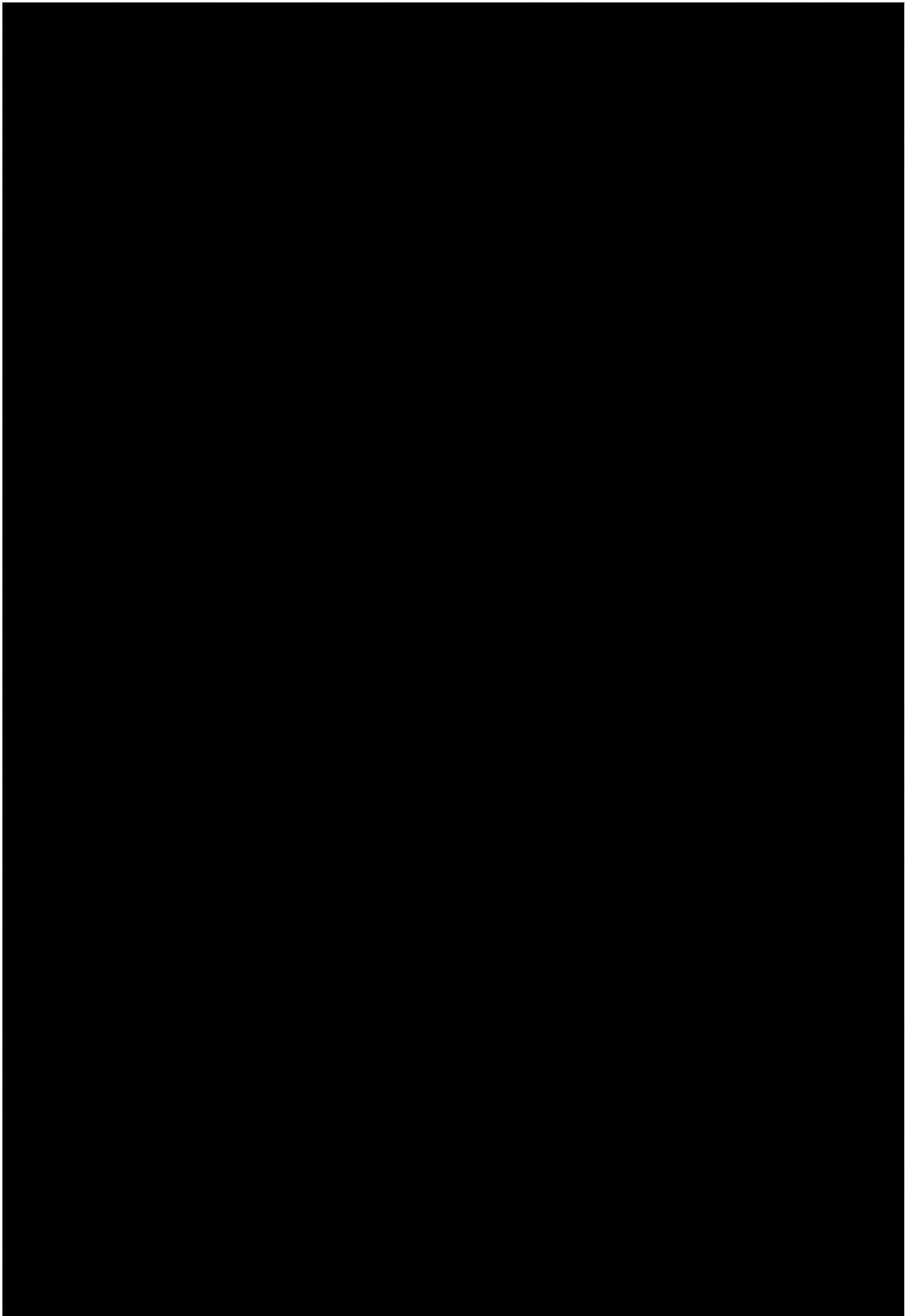


Figure 10: Location of YTOF IF1, YTOF PAD2 and YTOF PAD 3 (background © Google 2014).



Site YTOF IF1 is an isolated artefact located on an unformed vehicle track/erosion scour near the top of the eastern bank of Frazers Creek (Figure 10 and Plate 31). The artefact is a unifacial core of grey chert, which has been heavily reduced and possibly retouched. Two negative flake scars were evident (Plate 32). The overall dimensions were 8 mm long x 8 mm wide x 5 mm thick. The artefact was located in a disturbed context on a vehicle track/erosion scour. It is likely to have washed down from higher up and is therefore not at its original point of discard. The artefact may be associated with the nearby elevated terrace to the east that has been designated as YTOF PAD 2.

Plate 31: Location of YTOF IF1, view to NW.



Plate 32: YTOF IF1 (detail).



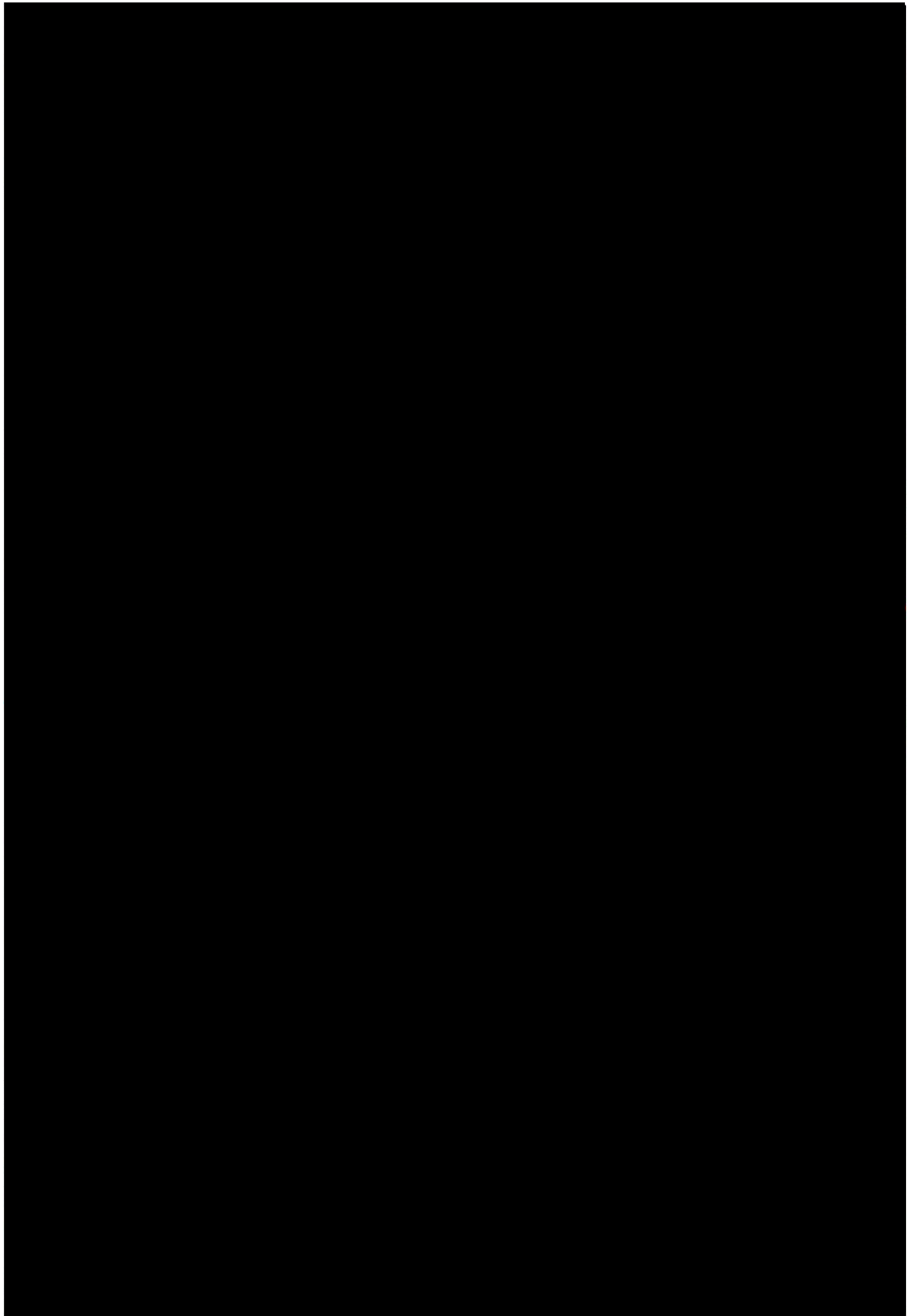
YTOF PAD 1

Landform:	Lower slope
Coordinates:	
Site type:	PAD
Site length:	340 metres
Site width:	80 metres
Site Area:	20,804 square metres

YTOF PAD 1 was identified during the original survey and is described by Artefact Heritage (2013: 50-51). It was determined during the current survey that YTOF PAD 1 extends northwards across the continuing landform through Survey Unit 6. The PAD is described here in its entirety.

PAD 1 is positioned on a very gentle southwest-facing slope above a flat that extends to Frazers Creek (Figure 11; Plate 33 and Plate 34). The PAD is located less than 200 metres to the east of the creek. The PAD area was densely grassed, leading to nil ground surface visibility. A dam is located approximately 50 metres to the east of the eastern edge of the PAD. The construction of this dam does not appear to have impacted on the PAD area. Other disturbances within PAD area are minimal and localised, related to the installation of property fences, unformed vehicle tracks and a drainage ditch. Minimal disturbances have resulted from the use of the land for pastoral purposes.

Figure 11: Location and extent of YTOF PAD 1 (background © Google 2014).



AMBS (2006) found that eight of 24 archaeological sites identified within the West Dapto Release Area (WDRA) were located on hill slopes. During test excavations within the WDRA it was determined that the highest number of artefacts was retrieved from a single test pit in a slope landform context. There is, therefore, potential for sub-surface artefacts to be present within the hill slope landform of PAD 1, particularly given the close proximity to Frazers Creek.

Plate 33: View to SE across YTOF PAD 1.



Plate 34: View to WSW across YTOF PAD 1.



YTOF PAD 2

Landform:	Terrace
Coordinates:	
Site type:	PAD
Site length:	100 metres
Site width:	120 metres
Site Area:	9342 square metres

YTOF PAD 2 is positioned on a broad, elevated flat terrace that is immediately adjacent to the eastern edge of Frazers Creek (Figure 10; Plate 35 and Plate 36). The PAD area was densely grassed, leading to nil ground surface visibility. Disturbances within the PAD area are minimal, related to the installation of property fences and unformed vehicle tracks. Minimal disturbances have resulted from the use of the land for pastoral purposes. The PAD does not extent south beyond the northern boundary of the Croom Regional Sporting Complex as this area is highly disturbed. Isolated artefact YTOF IF1 was located several metres to the west of the designated PAD area and may be associated with it, having washed downslope towards the creek.

Plate 35: View to south across YTOF PAD 2.



Plate 36: View to north across YTOF PAD 2.



YTOF PAD 3

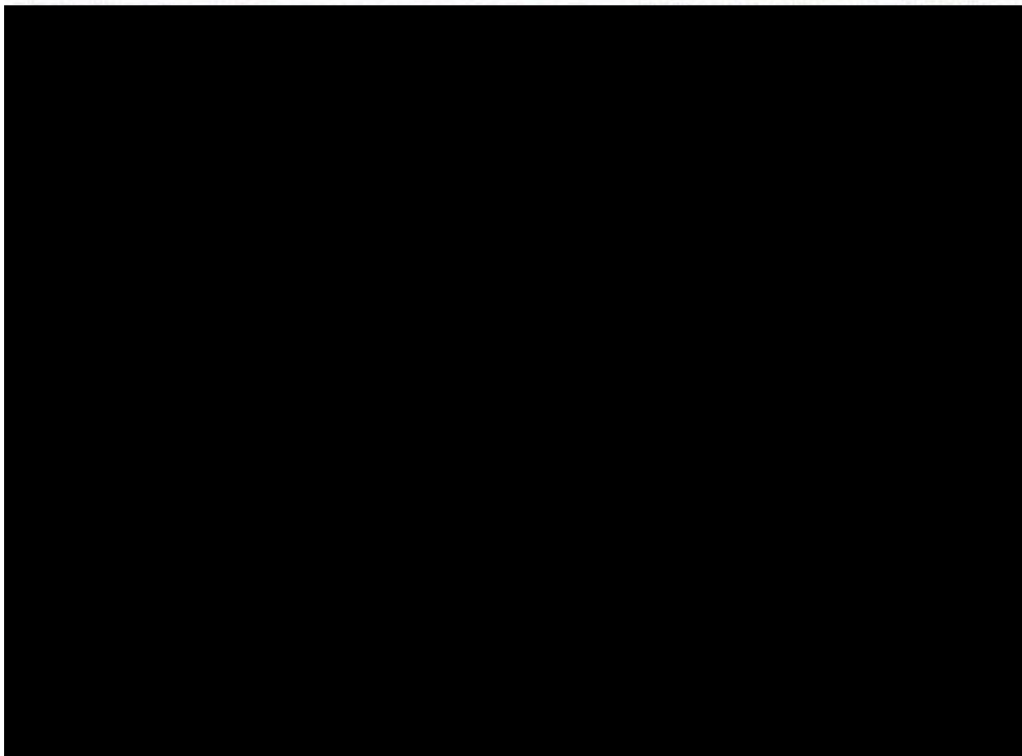
Landform:	Slope
Coordinates:	
Site type:	PAD
Site length:	340 metres
Site width:	80 metres
Site Area:	20,804 square metres

YTOF PAD 3 is positioned along a broad, elevated and relatively level west-facing slope that rises up to the east of an unnamed tributary to Frazers Creek (Figure 10 and Plate 37). The PAD is located within 200 metres to the east of Frazers creek and less than 100 metres to the east of the tributary. Dense grass cover across the PAD area led to nil ground surface visibility. Up to 30 centimetres depth of A Horizon soils were evident in the eroded section at the confluence of Frazers Creek and its tributary, near the PAD area. During the survey, disturbances across the PAD area appeared to be minimal, associated with localised fencing and use of the land for pastoral purposes. Research undertaken by AHMS (2008: 11) indicates that in 1949 several buildings were present within and in the immediate vicinity of the PAD area, along with a broad area of ploughing and/or cultivation (Figure 12). However, associated impacts to the ground surface would be localised and would not have necessarily impacted on any potential sub-surface Aboriginal objects.

Plate 37: View to west across YTOF PAD 3.



Figure 12: 1949 aerial indicating several buildings within and in the immediate vicinity of YTOF PAD 3 (source: AHMS 2008: Fig. 5).



Analysis and discussion

Disturbance levels

Overall, the current study area has high levels of ground disturbance. The construction of the Illawarra Highway, Tongarra Road, Croome Road and the East West Link has resulted in disturbance to localised sectors of the study area (Survey Units 2, 4 and 5). A substantial portion of the study area (most of Survey Unit 6) has been highly disturbed and modified through the installation of the multiple sports fields and infrastructure associated with the Croom Regional Sporting Complex.

The main drainage channels within the study area, including Frazers Creek and its unnamed tributary, have been heavily modified. Modifications include dredging and the installation of dams (e.g. Frazers Creek). A section of Frazers Creek within the vicinity of the current study area has been noted by a previous study to have been dredged, resulting in the formation of an embankment (HLA 2007: 13). The terrace immediately to the south of Macquarie Rivulet has been subject to extensive disturbance through the construction of an industrial development (Survey Unit 1).

Other localised disturbances within the study area have resulted from the construction of houses (Survey Units 4, 5 and 7) and the installation of utilities such as an underground gas pipeline and overhead transmission lines. Localised dumping of rubbish and mounding of earth was noted intermittently throughout parts of the study area. Low-lying flat areas adjacent to the drainage channels within the study area would be subject to frequent flooding.

Archaeological potential

Archaeological potential is closely related to the levels of ground disturbance in the area. Other factors are also taken into account when assessing archaeological potential, such as whether artefacts were located on the surface, and whether the area is within a sensitive landform unit according to the predictive statements for the area.

One Aboriginal site was previously recorded within the current study area. One new Aboriginal site was located during the current survey (YTOF IF1). The area of PAD (YTOF PAD 1) that was recorded during the original survey was extended as a result of the current assessment. Two new areas of PAD (YTOF PAD 2 and TYOF PAD 3) were identified during the current survey.

Site AHUGC001 (not registered on AHIMS) was located during the current survey, [REDACTED]. The details of the original recording were confirmed. The site comprised a sparse scatter of shells and fragments of shell, visible across a depth of approximately 10 centimetres within an exposed section along the eastern edge of an industrial lot. The material is located beneath a sediment trap and introduced fill within the lot. The scatter of shell extends for a length of approximately two metres, and it is uncertain how far the material may extend to the west beneath the sediment trap and fill. During the current survey it was observed that the shell material does not appear to be part of an *in situ* midden. The shell material has clearly been disturbed and is likely to have been brought to the

site as part of the levelling fill. Accordingly, the site has been assessed as demonstrating low archaeological potential.

Site YTOF IF1 is an isolated artefact located on an unformed vehicle track/erosion scour near the top of the eastern bank of Frazers Creek. The artefact was located in a disturbed context on a vehicle track/erosion scour. It is likely to have washed down from higher up and is therefore not at its original point of discard. The artefact may be associated with the nearby elevated terrace that has been designated as YTOF PAD 2. However, due to the disturbed context, site YTOF IF1 itself has been assessed as demonstrating low archaeological potential.

As Roads and Maritime requires management measures regarding archaeological potential to be based on the definition of PAD, areas of archaeological potential within the study area are described in terms of PAD instead of in terms of a gradient from low to high archaeological potential or sensitivity. One area of PAD was identified during the original survey (YTOF PAD 1). The area of this PAD was extended as a result of the current assessment. Because of the sensitivity of the locality (very gentle slope less than 200 metres from Frazers Creek) and low level of ground disturbance, there is potential for sub-surface artefacts to be present within YTOF PAD 1. This assessment is supported by the findings of AMBS (2006) that eight of 24 archaeological sites identified within the WDRA were located on hill slopes. Further, during test excavations within the WDRA it was determined that the highest number of artefacts was retrieved from a single test pit in a slope landform context. YTOF PAD 1 has been assessed as having a high archaeological potential.

Two new areas of PAD were identified during the current survey (YTOF PAD 2 and TYOF PAD 3). YTOF PAD 2 is positioned on a broad, elevated flat terrace that is immediately adjacent to the eastern edge of Frazers Creek. The terrace overlooks the lower flats of Frazers Creek and its tributary. Isolated artefact YTOF IF1 was located several metres to the west of the designated PAD area and may be associated with it, having washed downslope towards Frazers Creek. Ground surface disturbances within the PAD area are minimal. The elevated position of the terrace, above the creek and flats and immediately adjacent to the creek, would have made it a favourable camping location. YTOF PAD 2 has been assessed as having a high archaeological potential.

YTOF PAD 3 is positioned along a broad, elevated and relatively level west-facing slope that rises up to the east of an unnamed tributary to Frazers Creek. The PAD is located within 200 metres to the east of Frazers creek and less than 100 metres to the east of the tributary. The slope is prominent within the immediate landscape, rising well above the flats and terraces associated with Frazers Creek and its tributary and extending into a broad crest to the east beyond the study area. Ground surface disturbances across the PAD area appeared to be minimal and localised. The elevated, relatively level position providing a good vantage point over the surrounding areas, and the close proximity to Frazers Creek, would have made this a favourable camping location. YTOF PAD 3 has been assessed as having high archaeological potential.

Several other intact landforms were identified within the current study area, but these were determined to be of low archaeological potential. The hill slopes within Survey Unit 4 were moderate to steep and would not have been suited to Aboriginal occupation. The more gentle, relatively flat lower slopes within Survey Unit 4 (towards the East West Link) are located over 700 metres away from reliable water at Frazers Creek and would not have been suited to Aboriginal occupation. The archaeological potential is therefore assessed as low. The alluvial floodplain and creek flats within the current study area would not have been suited to occupation due to frequent inundation, and therefore have a low archaeological potential. The remainder of the current study area has low archaeological potential due to the high levels of ground disturbance.

No culturally modified trees were observed during the current survey. No specific areas for burials were identified during the current survey. As burials have the potential to occur across the landscape, further stakeholder consultation during Stage 3 of the PACHCI should include a request for cultural information relating to the study area, including any knowledge of potential burial locations.

Significance Assessment

Archaeological significance refers to the archaeological or scientific importance of a landscape, site or area. This is characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance would be discussed by the Aboriginal groups during ongoing Aboriginal consultation for the project and would be detailed in the Cultural Heritage Assessment Report during Stage 3 of the RMS PACHCI.

Site AHUGC001

The archaeological significance of site AHUGC001 has been determined based on the findings of the previous recorders, observations made during the current survey, and on the type and distribution of

other previously recorded Aboriginal sites in the local context. The shell material recorded as midden site AHUGC001 does not appear to be part of an *in situ* midden. The shell material has clearly been disturbed and is likely to have been brought to the site as part of the levelling fill. Accordingly, site AHUGC001 has low research potential, representative and rarity values. The shell material is located within a highly disturbed and modified terrace landform and would not enhance the current understanding of Aboriginal utilisation of these contexts. The site has been assessed as having low archaeological significance.

Site YTOF IF1

Site YTOF IF1 is an isolated artefact found in a disturbed context. It is likely to have eroded downslope out of its original context. Such artefacts have low representative and rarity values in the local/regional context. Accordingly, site YTOF IF1 has been assessed as having low archaeological significance.

PAD

The three identified PADs, YTOF PAD 1, PAD 2 and PAD 3, have been assessed as demonstrating high research potential. The identified PAD areas have the potential to provide information on the nature of occupation in the area and enable a comparative analysis with other sites in the vicinity. The archaeological values, representative and rarity values cannot be accurately determined until the results of further archaeological investigation are known.

A summary of the significance values of each recorded site and PAD within the current study area is outlined in Table 5.

Table 5: Summary of archaeological significance values

Site name	Research Potential	Scientific / Archaeological Value	Representative Value	Rarity Value	Overall Significance
AHUGC001	Low	Low	Low	Low	Low
YTOF IF1	Low	Low	Low	Low	Low
YTOF PAD 1	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 2	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 3	High	Unknown	Unknown	Unknown	Unknown

Impact assessment

An impact assessment cannot yet be made as there are no development plans available. Once a concept design has been developed an updated impact assessment would be added to this report.

Mitigation Measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of an area, which is based on the research potential, rarity, representativeness and educational value. In general the significance of a site would involve the following mitigation measures:

- Low archaeological significance – No further investigations required. An Aboriginal Heritage Impact Permit (AHIP) would be required to impact the site before works can commence.
- Moderate archaeological significance – Conservation where possible. If conservation was not practicable further archaeological investigation would be required such as salvage excavation or surface collection. An AHIP would be required if Aboriginal objects are present.
- High archaeological significance – Conservation as a priority. An AHIP would be required only if other practical alternatives have been discounted. Conditions of this AHIP would depend on the nature of the site, but may include comprehensive salvage excavations.

Site AHUGC001 has been assessed as demonstrating low archaeological significance therefore no further archaeological investigations are required. If it is not practicable to avoid site AHUGC001 an AHIP will be required prior to impacts occurring.

Site YTOF IF1 has been assessed as demonstrating low archaeological significance therefore no further archaeological investigations are required. If it is not practicable to avoid site YTOF IF1 an AHIP will be required prior to impacts occurring.

The archaeological significance of the three PADs (YTOF PAD 1, PAD 2 and PAD 3) is at present unknown. If impacts to the PADs cannot be avoided by the proposed development, test excavation under the OEH Code of Practice would be undertaken in order to determine whether sub-surface Aboriginal objects are present in each area. The purpose of these excavations would be to assess the significance of the PADs, not to mitigate against impacts.

If a PAD area was found to be of a low archaeological significance, there would be no Aboriginal heritage constraints on the proposed development in that area. However, an AHIP would be required prior to any works commencing.

If a PAD area was found to have a moderate archaeological significance it is likely that there would be no constraints on the proposed development in that area, but that archaeological salvage excavations would be recommended to mitigate against any proposed impacts as a condition of an AHIP. An AHIP would be obtained from OEH prior to works commencing.

If a PAD area was found to be of high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding the future management of the area, such as conservation where possible. It is therefore important to understand the nature of the buried archaeological deposits within the PAD areas before further recommendations are made.

Recommendations

The following findings and recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- *Roads and Maritime Services procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) (November 2011).
- The results of the 2013 PACHCI Stage 2 archaeological survey report (Artefact Heritage 2013).
- The results of background research and additional (recent) survey.
- The likely impacts of the proposed development.

The findings and recommendations incorporate those made in the 2013 PACHCI Stage 2 archaeological survey report by Artefact Heritage (2013: 66-67).

It was found that:

- Two artefact scatter sites (AHIMS sites 52-5-0484/52-5-0512 and 52-5-0227) were previously recorded within the original study area (Figure 8). Site 52-5-0484/52-5-0512 has been assessed as having moderate archaeological potential and an unknown archaeological significance. Site 52-5-0227 has been assessed as having low archaeological significance (Artefact Heritage 2013: 61).
- One midden site (AHUGC001, not registered on AHIMS) was previously recorded within the current study area (■■■■■). Site AHUGC001 has been assessed as having low archaeological significance.
- One newly recorded Aboriginal site (YTOF IF1, AHIMS # pending) was recorded within the current study area (Figure 8). Site YTOF IF1 has been assessed as having low archaeological significance.
- One area of high archaeological potential (YTOF PAD 1) was located within the original study area (Artefact Heritage 2013: 50-51). The area of this PAD was extended into the current study area as a result of the current assessment (Figure 8). The PAD has been assessed as having a high archaeological potential and an unknown archaeological significance.
- Two areas of high archaeological potential (YTOF PAD 2 and YTOF PAD 3) were located within the current study area (Figure 8). The PADs have both been assessed as having a high archaeological potential and an unknown archaeological significance.

It is therefore recommended that:

- If site 52-5-0227 was to be impacted by the proposed development an AHIP will be required prior to impacts occurring. No further archaeological investigations would be required at this site.
- If site 52-5-0484/52-5-0512 was to be impacted by the proposed development test excavations under the OEH Code of Practice would be necessary. Test excavations would be required to inform an assessment of archaeological significance. If the test excavations show that the site has low archaeological significance, there would be no constraints on impacts (apart from an AHIP if

required). If the site was shown to have a moderate archaeological significance, further mitigation measures such as salvage excavation and an AHIP may be recommended before impacts were to occur. If the site was shown to have high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding the future management of the site.

- If site AHUGC001 was to be impacted by the proposed development an AHIP will be required prior to impacts occurring. No further archaeological investigations would be required at this site.
- If site YTOF IF1 was to be impacted by the proposed development an AHIP will be required prior to impacts occurring. No further archaeological investigations would be required at this site.
- If the PAD areas (YTOF PAD 1, PAD 2 and PAD 3) were to be impacted, test excavation under the OEH Code of Practice would be necessary. Test excavations would be required to inform an assessment of archaeological significance. If the test excavations show that a PAD area has low archaeological significance, there would be no constraints on impacts in that area (apart from an AHIP if required). If a PAD area was shown to have a moderate archaeological significance, further mitigation measures such as salvage excavation and an AHIP may be recommended before impacts were to occur in that area. If a PAD area was shown to have high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding future management of that area.
- If impacts are proposed to the recorded Aboriginal sites and/or PAD areas, including test excavations under the OEH Code of Practice, Stage 3 PACHCI, including comprehensive Aboriginal consultation, would be initiated by RMS. A Cultural Heritage Assessment Report (CHAR) would be prepared as part of the Stage 3 PACHCI.
- If Aboriginal objects are located at any stage outside areas where test excavations are being undertaken, or outside areas for which an AHIP is granted, work would stop immediately and the RMS *Unexpected Archaeological Finds Procedure* 2011 would be followed. If human remains are located during any works associated with the project within the study area the RMS *Unexpected Archaeological Finds Procedure* 2011 would be followed.
- If the project design is changed and areas not surveyed are to be impacted, or other Aboriginal sites not identified are to be impacted, further archaeological assessment would be required.

If you have any queries regarding this assessment and recommendations, please do not hesitate to contact me.

Yours sincerely,

Samantha Gibbins

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ROADS AND MARITIME SERVICES

**ARTEFACT CULTURAL HERITAGE MANAGEMENT
ARCHAEOLOGISTS- JOSH SYMON-SAM GIBBONS**

REPORT

ALBION PARK BYPASS

ABORIGINAL SITE OFFICERS

**PAM GLOVER
ALLAN WALKER**

**25-26-27 FEBRUARY 2014
25-26-27 FEBRUARY 2014**



SURVEY AIM

Conduct an Aboriginal Cultural Heritage site survey, to identify Aboriginal artifacts and sites of cultural significance and to assess the impact of the proposed works, (Albion Park Bypass) on Aboriginal heritage.

SURVEY EXAMINATION

Pam Glover-Allan Walker

Day 1-25 February 2014
Croome Road Complex

Today we conducted a visual site survey on foot north and south of the Croome Road complex. Visibility was poor due to the long grass, fallen tree branches and dense vegetation. The area was very wooded (Eucalyptus, paper bark, red cedar Etc.) it is also used as a dumping area for building materials. The small drainage connected to the creek has thick vegetation. No Artefacts were found.

Day 2-26 February 2014
Tongarra Road

Today we surveyed a number of properties, the first property ran from the sporting complex, visibility was good and it had a running creek on it. The land was elevated and used to run cattle and horses, it also had some material waste (landfill-bricks and rocks).

We then surveyed a property on the Illawarra Highway visibility was good, no Artefact's were found.

We crossed over to the Bowels property, it had dense bush and very high grass. The land was level and used to run cattle and horses on it. There is a creek running through the land with thick vegetation.

Day 3-27 February 2014
East West Link

Today we surveyed land which was elevated and had a creek running through it. It is used to run cattle and sheep, there is a house and horse sheds on it and some building material waste.

Old Illawarra Highway-Nursery

We surveyed inside of the Nursery, Macquarie Rivulet. Next to the Nursery was highly disturbed, we found Shells (very chalky but whole) near a tarred road on entry to the nursery.



OUTCOME

No artefacts were identified during the survey.

RECOMMENDATION

- Any excavation/construction work carried out throughout this project will require Aboriginal site monitoring.
- Any Aboriginal artefacts identified during construction should remain in their place; if this is not possible then a care and control process should be discussed with the relevant Aboriginal stakeholders
- RMS should enter into discussion with the Aboriginal community (ILALC) regarding employment opportunities created throughout this project.

If you require any further information regarding this report, please don't hesitate to contact me on the numbers listed below.

Yours in UNITY

Sharralyn Robinson
Illawarra Local Aboriginal Land Council
Acting CEO
Ph: 42 263338
Fax: 42 263360

9.4 Appendix E: PACHCI Stage 2 second addendum to ASR

artefact

...discover

7 October 2014

Peter Rand
Technical Director- Environment
Hyder Consulting Pty Ltd
Locked Bag 6503
North Sydney NSW 2060

Dear Peter,

Re: Second addendum to the PACHCI Stage 2 archaeological survey report for the Albion Park Rail Bypass Project

Artefact Heritage prepared an archaeological survey report (ASR) in 2013 as part of Stage 2 of the Roads and Maritime Services Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI) of the proposed Albion Park Rail Bypass Project (previously referred to as the Yallah to Oak Flats Road Upgrade). Following finalisation of that document in June 2013, Roads and Maritime engaged Artefact Heritage to prepare a first addendum to that investigation in March 2014. The first addendum concerned properties within the study area that were not accessible for the original investigation, as well as an addition to the study area that incorporates the Croom Regional Sporting Complex.

As part of the development of the preferred option for the Albion Park Rail Bypass, Hyder Cardno Joint Venture (HCJV), on behalf of Roads and Maritime, has identified a number of additional areas which require Aboriginal heritage investigation outside the previous study boundaries of the project area. This includes the possible location of road interchanges and widening of the originally proposed corridor to accommodate alignment alterations and service roads. As such, Artefact Heritage has been engaged to complete this second addendum to the PACHCI Stage 2 ASR report.

The aim of this investigation is to identify Aboriginal sites or areas of archaeological potential within the additional areas, and to assess the archaeological significance of any sites recorded. An Aboriginal Heritage Information Management System (AHIMS) database search has been undertaken to ascertain whether there are any recorded sites within the additional areas, and whether any sites have been recorded within or adjacent to the remainder of the original study area since the initial investigation. A ground survey was conducted within the additional project areas. This second addendum report is to be read in conjunction with the PACHCI Stage 2 ASR (Artefact Heritage 2013) and the first addendum

report (Artefact Heritage March 2014). This second addendum will be included as an Appendix to the original PACHCI Stage 2 ASR document.

The proposal and study area

Roads and Maritime is currently developing the preferred option for an extension of the Princes Motorway to bypass Albion Park Rail. Artefact Heritage has been engaged by Roads and Maritime to conduct an Aboriginal archaeological survey and assessment for the proposal in accordance with Stage 2 of the RMS PACHCI. The resulting ASR will be used to guide the future planning of an upgrade of the Princes Highway between Yallah and Oak Flats.

This addendum report deals with the several additions to the original survey area. These additions are detailed in Figure 1.

The following table details the terminology used in this report:

Table 1: Definition of terminology used throughout this report

Term	Description
Study area	Refers to the area captured in Figure 1. The study area encompasses the wider region of the project area in order to provide context.
Project area	Refers to all polygons marked in Figure 1. The project area is the area which could be disturbed by the proposed bypass construction.
Original survey area	Refers to the areas surveyed as part of the original Stage 2 PACHCI report (Artefact Heritage 2013) marked in purple in Figure 1.
First addendum survey area	Refers to the areas surveyed as part of the first addendum report, (Artefact Heritage March 2014) marked in blue in Figure 1.
Current survey area	Refers to the areas surveyed as part of the current addendum report, marked in yellow in Figure 1.

Objectives of addendum

This letter report outlines the following information:

- Description and analysis of the identified Aboriginal sites within the current study area.
- An updated AHIMS search.
- Development of a significance assessment and impact assessment for Aboriginal sites located within the current study area.
- Management and mitigation measures for Aboriginal sites located within the current study area.

Further details of the proposal, including environmental and archaeological context of the local area, Aboriginal histories of the area, and predictive modelling are outlined in the PACHCI Stage 2 ASR (Artefact Heritage 2013).

Aboriginal stakeholder consultation

Aboriginal stakeholder consultation throughout the preparation of this document was conducted by Barry Gunther, Roads and Maritime Senior Aboriginal Cultural Heritage Advisor, and Joanne Damcevski, Roads and Maritime Aboriginal Cultural Heritage Officer.

As the current study area is located within the boundaries of the Illawarra Local Aboriginal Land Council (ILALC), representatives of ILALC were invited to take part in site surveys. Leanne Tungai and Craig Tungai, both of ILALC, participated in the survey on the 9 July 2014. Troy Tungai of ILALC participated in the surveys which were conducted on the 13-15 August and the 21-22 August 2014.

An Aboriginal focus group (AFG) meeting will be conducted in order to facilitate review and comments on the management of Aboriginal heritage for the proposed works.

Figure 1: The study with respective stages of surveying marked (background © Google 2014 and © NSW LPI).



Legislative context

This letter report addendum was prepared in accordance with the following NSW legislation and legislative guidelines:

National Parks & Wildlife Act (1974)

The *National Parks & Wildlife Act 1974* (the NP&W Act) provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 90. Aboriginal objects are afforded automatic statutory protection in NSW whereby it is an offence to:

'...damage, deface or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service (now the OEH).'

The Act defines an Aboriginal 'object' as:

'...any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons of non-Aboriginal European extraction, and includes Aboriginal remains'.

The Act was recently amended (2010), with the legislative structure for seeking permission to impact on heritage items modified. An s90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and may only be granted by OEH if the conditions of the 'due diligence guidelines', and/or an 'archaeological investigation' have been met. The penalties and fines for damaging or defacing an Aboriginal object have also increased. As the project will be approved as State Significant Infrastructure (SSI) no permit would be required under the Act.

The Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (the EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The overall study area falls within the boundaries of the Wollongong and Shellharbour Local Government Areas and is covered by the Wollongong Local Environmental Plan (LEP) 2009 and the Shellharbour LEP 2013.

It is assumed that the proposal will be assessed under Part 5.1 of the EP&A Act, which establishes an assessment and approval regime for SSI. Part 5.1 applies to development that is declared to be SSI

by a State Environmental Planning Policy (SEPP). Section 115ZG of the EP&A Act specifies that approvals or permits under section 90 of the NPW Act 1974 are not required for approved SSI.

Investigators and contributors

This report was written by Alyce Howard, archaeologist at Artefact Heritage. Project Director Dr Sandra Wallace provided management input and reviewed the report.

Aboriginal Heritage Information Management System (AHIMS) search

The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal, be removed from this report if it is to enter the public domain.

A search of the Office of Environment and Heritage (OEH) AHIMS was carried out on the 10 July 2014 with the following parameters and results:

Buffer	50 m
Number of sites	105
AHIMS Search ID	144007

Two earlier AHIMS searches were carried out to reflect the original survey area and the first addendum survey area on the 23 April 2013 and the 20 February 2014 respectively. The AHIMS search encompasses the entire study area in order to give context to the project area. The search returned a total of 105 previously recorded Aboriginal sites. The distribution of recorded sites within the search area is shown in Figure 2.

The frequency of recorded site types is summarised in Table 2. Of the 105 sites previously recorded in the study area, Artefact sites are predominant (n=74). The remaining site types include Shell with Artefact (n=15); Potential Archaeological Deposit (PAD) (n=7); Shell (n=6); Modified Tree (n=2); and Modified Tree with Artefact (n=1). Figure 2 illustrates that the majority of sites are located within 200 metres of water sources such as Duck Creek, Macquarie Rivulet, Marshall Mount Creek and their tributaries, or close to the shores of Lake Illawarra. Site distribution is also a reflection of the pattern of archaeological assessments undertaken in relation to development activities.

Table 2: Frequency of site features from AHIMS data

Site Feature	Frequency	Percentage
Artefact	74	70
Shell; Artefact	15	14
PAD	7	7
Shell	6	6
Modified Tree	2	2
Modified Tree; Artefact	1	1

Previously recorded sites within the original and first addendum survey areas are discussed in detail in the original PACHCI Stage 2 ASR report (Artefact Heritage 2013) and in the first addendum report (Artefact Heritage March 2014) respectively.

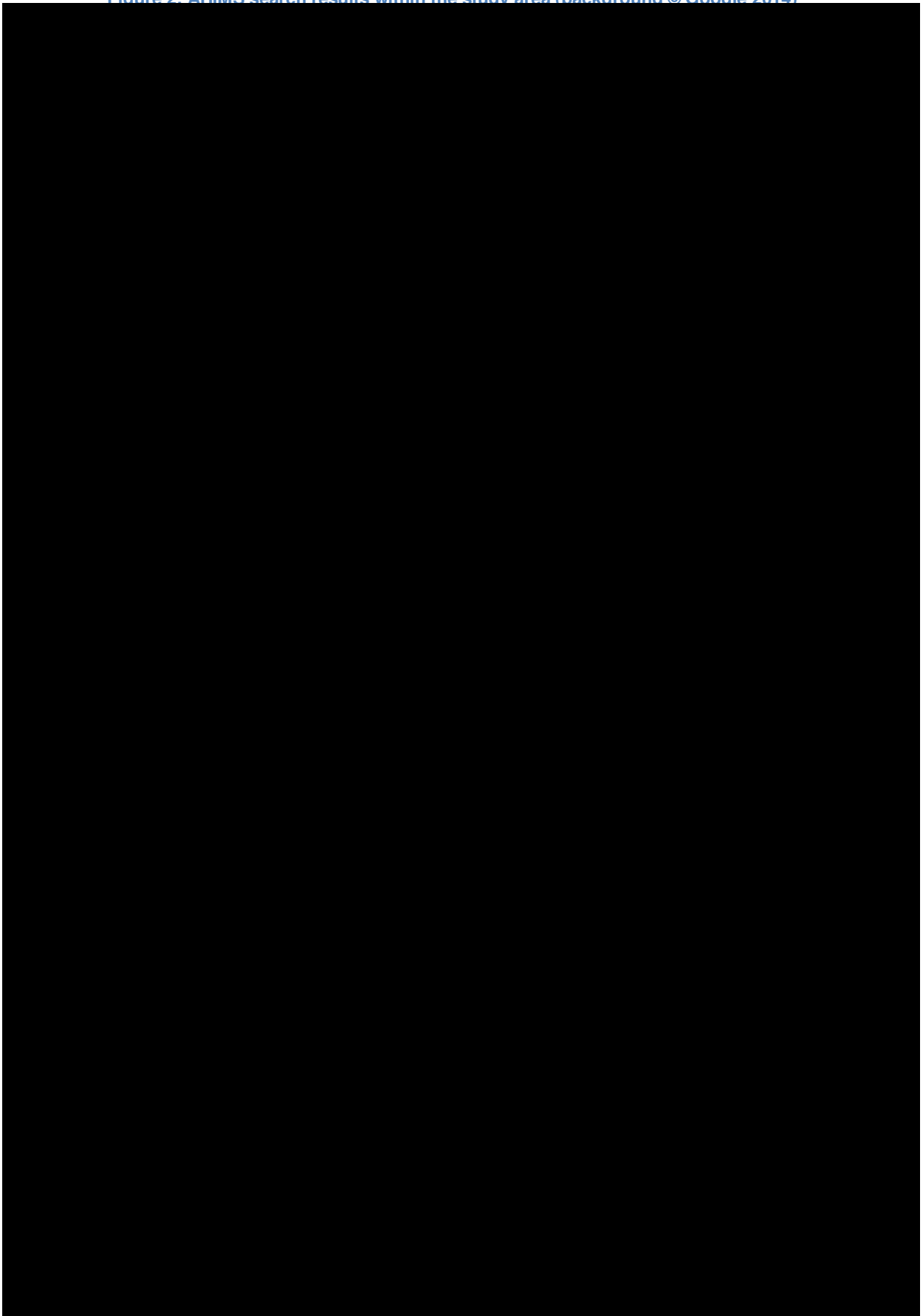
Previously recorded sites within the current survey area

One previously recorded Aboriginal site is located within the current survey area. AHIMS site # 52-5-0473 is a small (n=4) artefact scatter located within the private property at 11 Larkins Lane. The site was originally recorded as LLS1. The site card notes that Yallah is a known hunting ground, and that the Marshall Mount spur crest, on which Larkins Lane is located, is of cultural significance. The site comprises four stone artefacts, located on a vehicle track within the lot and was identified prior to the Larkins Lane development. A house appears to have been constructed over the location of the site since the time of original recording. The site is therefore likely to have been impacted or destroyed.

Comber (2010)

Comber (2010) conducted test and salvage excavations at Lot 107 and 108, DP 1076242 (currently 17 and 19 Larkins Lane, respectively). The properties are located along the Marshall Mount spur crest which runs approximately southwest-northeast. An Aboriginal site (WDRA_AS_09) was recorded adjacent to the properties in 2006 by AMBS. WDRA_AS_09 was recorded as a high density open campsite and Comber (2010) postulated that it was likely to continue as subsurface deposit into Lots 107 and 108. AMBS noted that oral history indicates that the spur crest was used as an access route to an important ceremonial place located on Mount Marshall (west of the excavations) (AMBS 2006:108).

Figure 2: AHIMS search results within the study area (background © Google 2014)



Previous subsurface investigation in the project area

Excavation of Lots 107 and 108 yielded a total of 119 stone artefacts. The assemblage is characterised as a low density deposit, with chert being the predominant raw material (52%). Quartz (33%) and silcrete (15%) stone artefacts were also present (Comber 2010:52). Artefacts retrieved from each trench ranged in number from $n = 0$ to $n = 6$. Flaked pieces were the most common artefact type. Of 119 artefacts retrieved, only six examples of retouch and only two cores were retrieved (Comber 2010:26).

Survey methodology

The survey area was divided into six survey units, each containing multiple landform units (Figure 3 Table 3). The same survey methodology used during the original survey was employed (Artefact Heritage 2013: 25, 27).

A sample survey of all survey units was undertaken. A sample survey is acceptable under the OEH Code of Practice with justification. Justification regarding each survey unit is as follows:

Survey unit 1

A sample survey was utilised in survey unit 1 as ground surface visibility across the majority of the unit was nil due to dense grasses, some stands of trees and shrubs and water obscuring the ground surface as a result of recent heavy rain. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey unit 2

A sample survey was utilised in survey unit 2 as ground surface visibility across the majority of the unit was nil due to dense grasses, as well as stands of shrubs and trees. Ground surface exposures were small and infrequent. Portions of the unit had been subject to extensive disturbance and modification (discussed further below). All observed exposures were investigated for Aboriginal cultural material.

Survey unit 3

A sample survey was utilised in survey unit 3 as ground surface visibility across the majority of the unit was nil due to extremely dense grasses which were waist-high in some areas. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey unit 4

A sample survey was utilised in survey unit 4 as ground surface visibility across the majority of the unit was nil due to dense grasses. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey unit 5

A sample survey was utilised in survey unit 5 as ground surface visibility across the majority of the unit was nil due to dense grasses and thickets of trees, shrubs and weeds. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey unit 6

A sample survey was utilised in survey unit 6 because ground surface visibility across the majority of the unit was nil due to grasses and thickets of trees, shrubs and weeds. Sections of the eastern corner of the unit were impenetrable due to thickets of weeds. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey results

Effective survey coverage

The study area was divided into six survey units, all of which contained multiple landform units (Figure 3). Although mostly cleared of original vegetation, the landforms within the study area (flats, slopes and terraces) were covered in dense grass that limited ground surface visibility to zero, except in infrequent areas of exposure. Infrequent areas of surface visibility were observed in vehicle tracks, animal tracks, exposures around tree bases, exposures around sports fields and other areas of disturbance, and odd patches of erosion on the slopes (Plate 24). Standing sections of deposit could be observed in some places along drainage channels (Plate 11). Vegetation was impenetrable or extremely dense in some sections of the study area and these were not surveyed (Plate 4). Visibility and exposure levels have been taken into consideration in determining the effective coverage area on this survey (Table 2 and Table 3).

Table 3: Survey Coverage

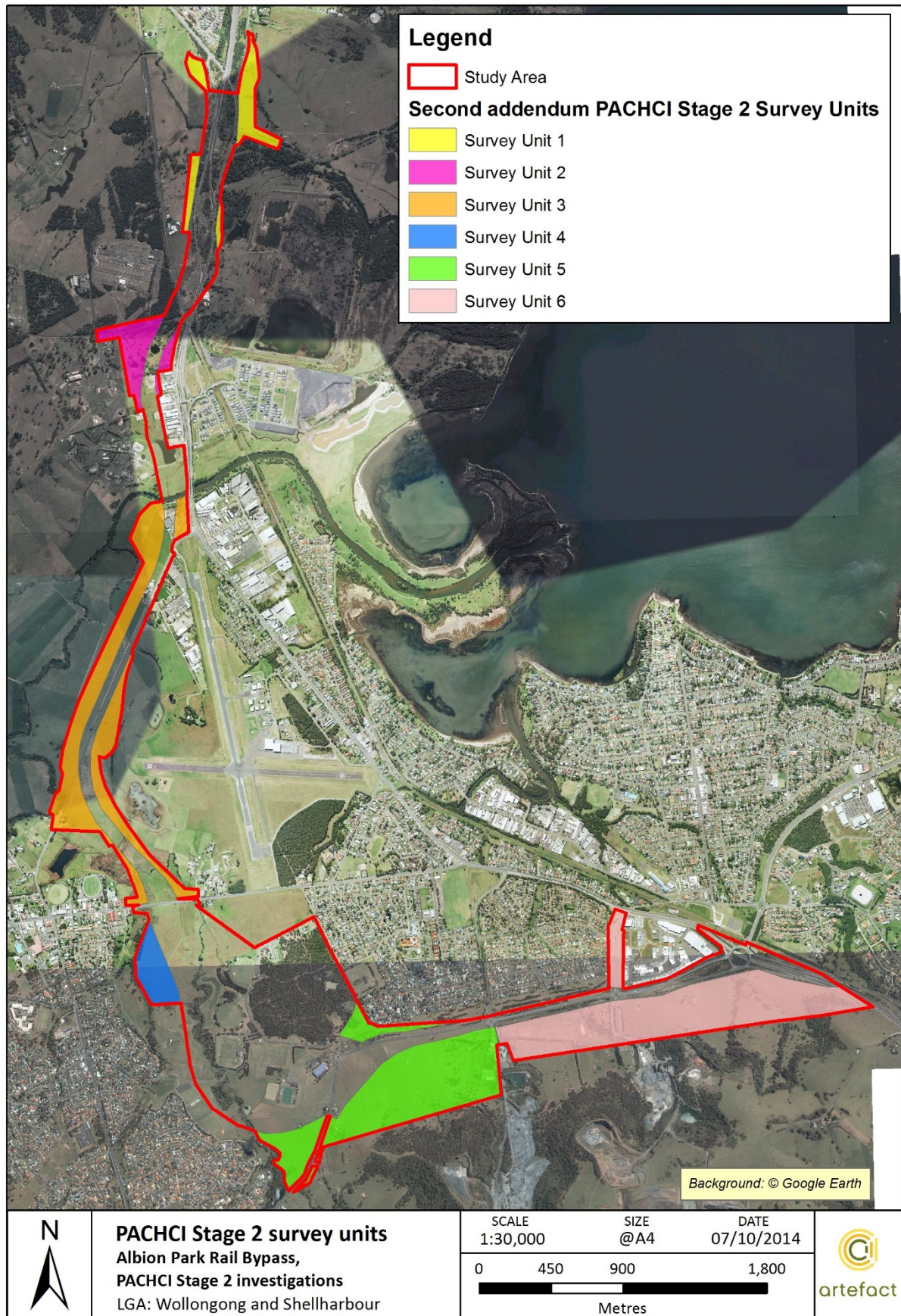
Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
1	Flat, modified, terrace, open depression, slope	11,196	1	10	11.2	0.1
2	Flat, modified, terrace, open depression, slope	113,197	1	10	113.2	0.1
3	Flat, modified, terrace, open depression, slope	10,749	1	10	10.8	0.1
4*	Flat, modified, terrace, open depression, slope	74,656	5	10	373.3	0.5
5	Flat, modified, terrace, open	58,010	5	20	580	1

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
6	depression, slope Flat, modified, terrace, open depression, slope	72,350	5	20	723.5	1

Table 4: Landform survey coverage

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Modified	11,196	11.2	0.1	0	0
Flat	132,478	363.1	0.27	3	3
Open depression	44,590	228.2	0.51	0	0
Slope	235,716	1628.4	0.7	3	2
Terrace	18,764	94	0.5	3	2

Figure 3: Survey units for the second addendum (background © Google 2014)



Survey observations

Survey Unit 1

Survey Unit 1 is the northernmost survey unit and includes two polygons to the west of the Princes Highway and two to the east (Figure 3). The western polygons are within the same lot of private property, used as agricultural land. The eastern polygons are also used for agricultural purposes and are part of the Tallawarra Lands property, associated with Tallawarra Power Station. Disturbances within Survey Unit 1 are primarily related to agricultural activity, public and unsealed private roads and the installation of overhead transmission lines

Landforms throughout Survey Unit 1 includes slopes, terraces and flats, with some modifications noted throughout, primarily associated with agricultural activity and the construction of the Princes Highway and Princes Motorway. Duck Creek runs approximately east-west through the north of Survey Unit 1, before turning south and running adjacent to western margin of the survey unit.

Ground surface visibility throughout Survey Unit 1 was generally nil due to grass and vegetation cover. Infrequent exposures were observed along drainage channels, erosion scours, vehicle tracks and animal tracks. Some localised dumping of rubbish and household goods was observed in Tallawarra lands, immediately adjacent the eastern margin of the Princes Highway.

No previously recorded sites were located within Survey Unit 1.

One area of PAD, (YTOF PAD 7) was identified within the southern polygon the west of the Princes Highway (Figure 5) and is discussed in detail below. Duck Creek is located approximately 700 metres to the west. A small ephemeral drainage channel that feeds into Duck Creek intersects the lower half of Survey Unit 1.

Plate 1: Survey Unit 1. Private property west of Princes Highway, view S.



Plate 2: Survey Unit 1. Detail of obstructive vegetation in Tallawarra lands property, view N.



Plate 3: Survey Unit 1. Tallawarra Lands Property, view S.



Plate 4: Survey Unit 1. Tallawarra Lands property, view N.



Survey Unit 2

Survey Unit 2 encompasses land on both sides of the Princes Highway. To the east is a small, triangular parcel of land adjacent to the recently developed Hungry Jack and Coles express service station. Land to the west is owned by Transgrid (north of Yallah Bay Road), and private property within a sub-development (bordered by Larkins Lane to the west and Yallah Bay Road to the north). Disturbances throughout this survey unit are primarily associated with the construction of private and public roads, unsealed vehicle tracks, agricultural activity and construction of the sub-development.

Landforms throughout Survey Unit 2 include gentle slopes and flats, with some modifications noted (primarily associated with agricultural activity and the construction of the Princes Highway and Princes Motorway). Duck Creek runs approximately one kilometre to the west of the survey unit.

Ground surface visibility throughout Survey Unit 2 was generally nil due to grass and vegetation cover (Plate 8). Infrequent exposures were observed along drainage channels, erosion scours, some vehicle tracks and animal tracks (Plate 7).

One previously recorded site is located within Survey Unit 2. The site was originally recorded as LLS1 and is catalogued as AHIMS site # 52-5-0473. The site comprises four stone artefacts identified on a vehicle track exposure within 11 Larkins Lane. The site card notes that Yallah is a known hunting ground and that the Marshall Mount spur crest, on which Larkins Lane is located, is of cultural significance. The site was unable to be accessed during the current survey as the property owner did not grant permission. However, a house has been constructed over the location of the site since the time of original recording. The site is therefore likely to have been impacted or destroyed.

One artefact site (YTOF AS 2) and one area of PAD (YTOF PAD 6) were identified within Survey Unit 2 and are discussed in detail below.

Plate 5: Survey Unit 2. Vehicle track and dense vegetation. View SW.



Plate 6: Survey Unit 2. Within Larkins Lane private property. View N.



Plate 7: Survey Unit 2. Detail of exposure. No artefacts were observed.



Plate 8: Survey Unit 2. Detail of vegetation within Transgrid property, view E.



Survey Unit 3

Survey unit 3 includes long, narrow stretches of land either side of the Illawarra Highway within private property, currently used for agricultural purposes. Landforms throughout the survey unit include terraces, gently undulating terrain and large expanses of floodplain (Plate 9). The Macquarie Rivulet runs parallel to the Illawarra Highway, approximately 200 metres from the western border of the survey unit. A small tributary of the Macquarie Rivulet intersects the survey unit (Plate 10).

Visibility throughout Survey Unit 3 was generally nil due to dense grass coverage (Plate 9). Occasional stands of trees occur throughout the survey unit, however, vegetation has been largely cleared and the land used for grazing and crop production. Infrequent exposures were observed along animal tracks, vehicle tracks and near fences.

No previously recorded sites were located within Survey Unit 3

No Aboriginal artefacts or areas of PAD were identified within Survey Unit 3.

Plate 9: Survey Unit 3. Low-lying floodplain on western margin of Princes Highway. View S.



Plate 10: Survey Unit 3. Adjacent to small tributary of Macquarie rivulet. View SE.



Plate 11: Survey Unit 3. Detail of exposure and bedrock. No artefacts were identified. View N

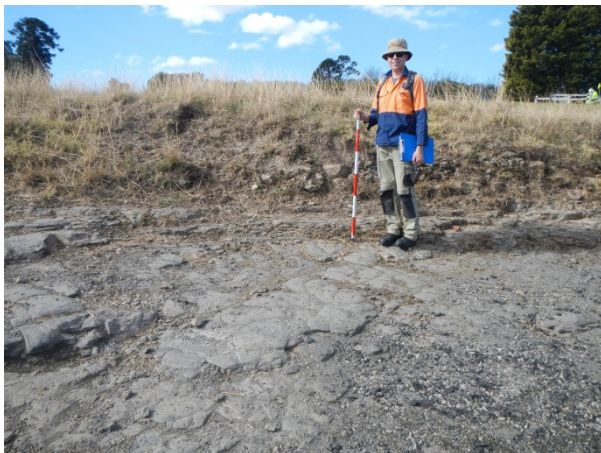


Plate 12: Survey Unit 3. Detail of exposure. No artefacts were identified. View S.



Survey Unit 4

Survey Unit 4 is a small parcel of land in the south-western corner of the project area, currently used for agricultural purposes. Landforms within Survey Unit 4 include a terraces, crests and gentle slopes. Slopes and gentle undulations lead west toward a small ephemeral drainage channel then runs north-south on the western margin of the survey unit.

Very little disturbance was noted throughout Survey Unit 4, excepting minor evidence of agricultural activity including vehicle and animal tracks. Visibility was generally nil due to dense grass coverage. The infrequent areas of exposure were inspected and found to be void of Aboriginal artefacts.

No previously recorded sites were located within survey unit 4.

One area of PAD was identified within Survey Unit 4 (YTOF PAD 4) and is discussed in detail below.

Plate 13: Survey Unit 4. Crest landform. View E.



Plate 14: Survey Unit 4. Gentle undulations View E.



Plate 15: Survey Unit 4. Gentle slope toward drainage channel, view SW.



Plate 16: Survey Unit 4. Gentle slope toward drainage channel, view NW.



Survey Unit 5

Survey Unit 5 is bordered to the east by Woollybutt Drive and encompasses a large area of land south and east of the Croom Regional Sporting Complex as well as a small corner of land bordered by Croome Road and the East West Link. Landforms throughout Survey Unit 5 include gentle slopes, terraces and low-lying flats.

Disturbance throughout Survey Unit 5 is predominately related to agricultural activities. Modification and disturbances associated with the construction of the East West Link are evidence in the eastern half of the survey unit, where the unit borders this road. Visibility was generally nil due to dense grass coverage. Occasional stands of trees and shrubs occur throughout the survey unit. Areas of exposure were infrequent and generally associated with erosional scours and vehicle and animal tracks.

One recorded site (YTOF PAD 1) was recorded during a previous survey as having an open boundary which bordered the northern margin of the current Survey Unit 5. During the current survey this boundary was established and the site was extended.

Three new Aboriginal sites (YTOF AS1, YOF IF 2 and YTOF IF 3) were identified within Survey Unit 5, all of which were located within the section north of the East West Link. These sites are discussed in detail below.

Plate 17: Survey Unit 5. Gentle slope in private property south of East West Link, view NW



Plate 18: Survey Unit 5. Gentle slopes within private property south of East West Link, view SE.



Plate 19: Survey Unit 5. Detail of exposure within private property north of East West Link.



Plate 20: Survey Unit 5. Low-lying flat within private property north of East west Link, view W.



Survey Unit 6

Survey Unit 6 extends east of Woollybutt Drive to the Princes Highway. Landforms throughout Survey Unit 6 include slopes, terraces and flats. A large artificial detention basin has been constructed in the north-western corner of the survey unit, adjacent to the East West Link.

Major disturbances and modifications in Survey Unit 6 are associated the construction of the East West Link, Princes Highway and the artificial detention basin (Plate 21). Outside of the impacted corridor associated with these roads, disturbances were predominately the result of minor agricultural activities. Ground surface visibility across survey unit 6 was generally nil due to dense grass cover. Areas of exposure were infrequent and generally associated with erosional scours and vehicle and animal tracks. Occasional stands of trees and shrubs occur throughout the unit. The easternmost corner of the Survey Unit 6 featured a dense copse of trees and weeds which was impenetrable in places (Plate 24).

No previously recorded sites were located within survey unit 6

Two new sites (YTOF PAD 5 and YTOF CS 1) were identified within Survey Unit 6 and are discussed below.

Plate 21: Survey Unit 6. Artificial detention basin, view N.



Plate 22: Survey Unit 6. Private property on southern side of East West Link, view E.



Plate 23: Survey Unit 6. Within Cleary Bros Property, Colden Drive, view S.



Plate 24: Survey Unit 6 Detail of exposure in south-eastern corner of survey unit.



Summary of results

One previously recorded Aboriginal site is located within the current survey area (AHIMS site # 52-5-0473). The site is a small artefact scatter recorded before the sub development of Larkins Lane was constructed (within Survey Unit 2). The site was unable to be inspected during the current survey as the property owner did not grant access. However, analysis of the AHIMS site cards and aerial imagery indicate that a house has been constructed over the site. The site is therefore likely to have been impacted or destroyed.

One previously recorded site (YTOF PAD 1) was recorded during the original survey (Artefact Heritage 2013) with an open boundary. The open boundary fell within the current Survey Unit 5. The site was extended during the current survey and the complete boundary established.

Two sites (YTOF AS 1 and YTOF AS 2) and two isolated artefacts (YTOF IF 2 and YTOF IF 3) were identified during the current survey.

Four areas of PAD (YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7) were identified during the current survey.

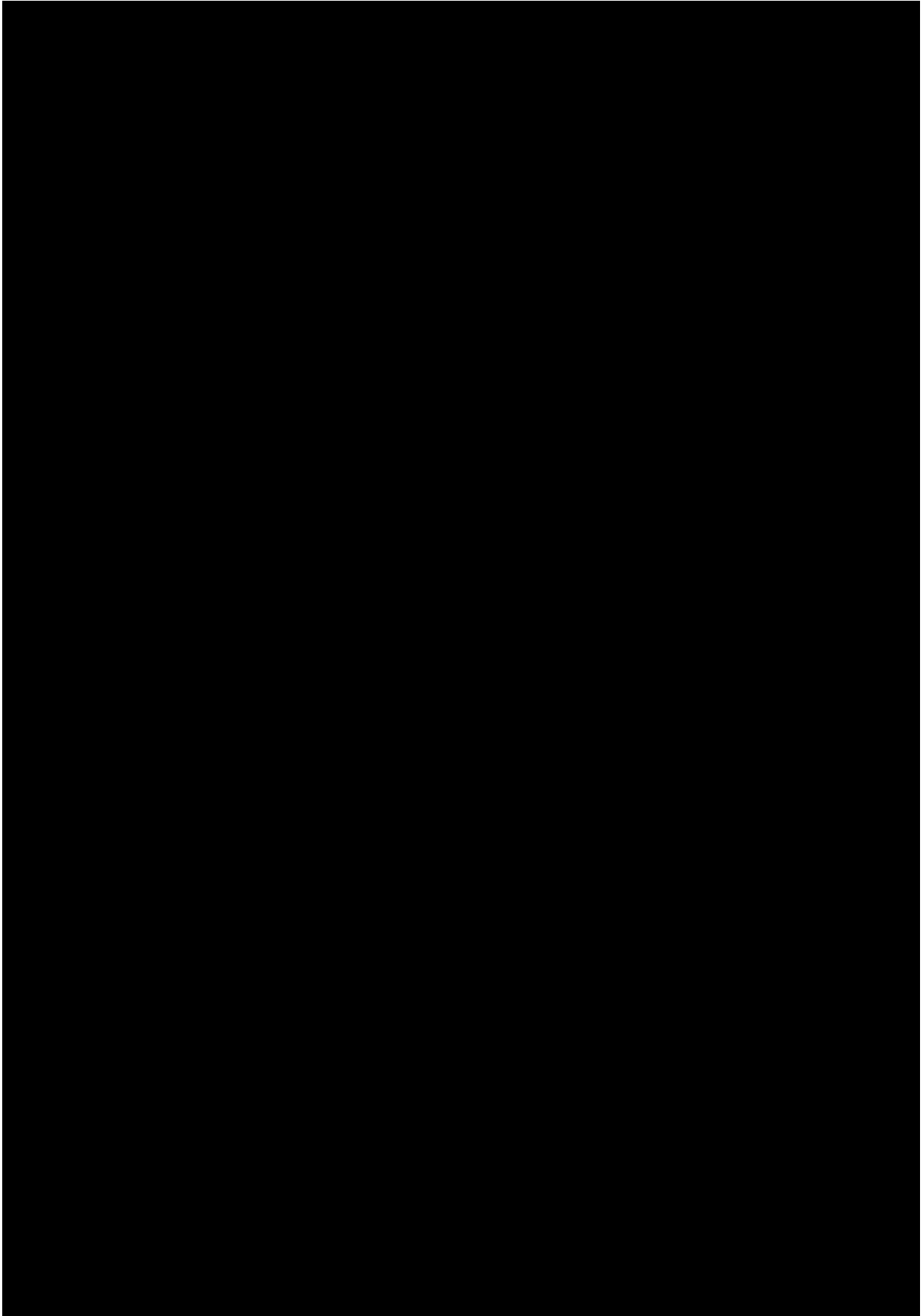
One cultural site (YTOF CS 1) was identified during the current survey. YTOF C 1 is a large fig tree identified by Troy Tungai of ILALC as a women's site.

Table 5 summarises the sites and PADs recorded during the current survey. Details and descriptions of the sites are provided below.

Table 5: Summary of survey findings

AHIMS number	Site name	Feature(s)	Survey Unit	Landform
-	YTOF AS 1	Artefact scatter	5	Flat
-	YTOF AS 2	Artefact scatter	2	Terrace
-	YTOF IF 2	Isolated find (artefact)	5	Flat
-	YTOF IF 3	Isolated find (artefact)	5	Slope
-	YTOF PAD 4	PAD	4	Lower slope
-	YTOF PAD 5	PAD	6	Terrace and lower slope
-	YTOF PAD 6	PAD	2	Terrace
-	YTOF PAD 7	PAD	1	Flat
-	YTOF CS 1	Cultural site	6	Slope

Figure 4: Sites and PAD within the study area (background © Google 2014 and © NSW LPI).



Site YTOF AS 1

Landform: Flat
 Coordinates: [REDACTED]
 Site type: Artefact scatter
 Site Area: 2 x 2 metres (visible extent)

Site YTOF AS 1 (not yet issued an AHIMS site number) is an artefact scatter site recorded in the narrow reserve which borders the northern margin of the East West Link (within Survey Unit 5). The site comprises two small (each less than 15 centimetre in maximum dimension) artefacts, found on an area of exposure (Plate 25). The first artefact is a flake fragment and the second is an angular fragment (Plate 26). Both are of the same mudstone/tuff raw material.

Extensive modification and disturbance has occurred approximately 20 metres south of the site due to construction of the East West Link. However, the flat where YTOF AS 1 is located was observed to be relatively unmodified. Some disturbance to the site is likely as the flat landform is low lying and prone to flooding. Furthermore, the planting of trees and maintenance of the park may have contributed to some disturbance to the site.

Plate 25: Location of YTOF AS 1, range pole marks site. View SW.



Plate 26: Detail of artefacts YTOF AS 1 (scale = 10cm).



Site YTOF AS 2

Landform: Terrace
 Coordinates: [REDACTED]
 Site type: Artefact Scatter
 Site Area: 5 x 10 metres (visible extent)

Site YTOF AS 2 (not yet issued an AHIMS site number) is an artefact scatter site recorded on the southern boundary of the Transgrid property, within Survey Unit 2 (Plate 27). The site is located on an exposure beside a driveway (the last driveway off Yallah Road before Larkins Lane). YTOF AS 2

comprises two artefacts; one complete flake of mudstone/tuff and one medial flake fragment of silcrete (Plate 28).

YTOF AS 2 is located upon an area of exposure which is approximately five by ten metres. Little modification is evident near the site, however there is some minor disturbance associated with construction of the driveway and transmission towers. The driveway is approximately 10 metres east of the site and the transmission lines are approximately 20 metres south of the site.

Plate 27: Location of YTOF AS 2, view E.



Plate 28: Artefact detail YTOF AS 2 (scale 10cm).



Site YTOF IF 2

Landform:	Flat
Coordinates:	████████████████████
Site type:	Isolated find
Site Area:	2 x 2 metres (visible extent)

Site YTOF IF 3 (not yet issued an AHIMS site number) is an isolated find recorded on a small exposure within a private property currently used for horse agistment within Survey Unit 5 (Plate 29). The artefact is a complete flake of silcrete. No other Aboriginal artefactual material was observed (Plate 30).

A small, modified drainage channel is located approximately 30 metres northeast of YTOF IF 2. The drainage channel has been altered as a result of agricultural activity. However, the natural alignment of the drainage channel is evident where it originates on the southern side of the East West Link.

Plate 29: Location of YTOF IF 2, view W.

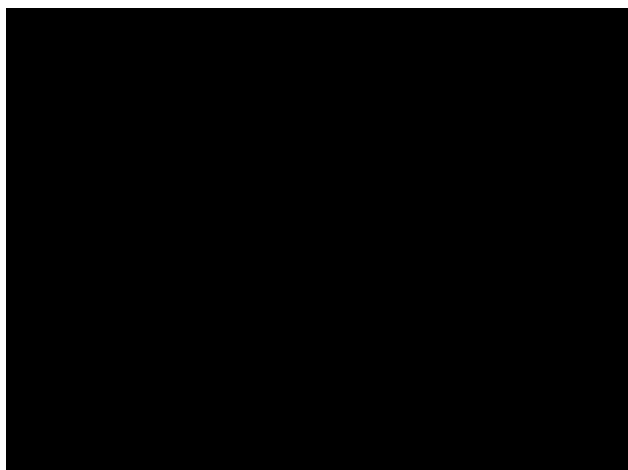


Plate 30: Artefact detail YTOF IF 2.



Site YTOF IF 3

Landform:	Slope
Coordinates:	[REDACTED]
Site type:	Isolated find
Site Area:	2 x 2 metres (visible extent)

Site YTOF IF 2 (not yet issued an AHIMS site number) is an isolated find recorded on a small exposure immediately adjacent a small, modified drainage channel (Plate 31). The site is located within the same a private property as YTOF IF 2, currently used for horse agistment, within Survey Unit 5. The artefact is a longitudinally broken flake of silcrete (Plate 32). No other Aboriginal artefactual material was observed in the vicinity. YTOF IF 3 is located approximately 35 metres northeast of YTOF IF 2. They are assessed as separate isolated finds as YTOF IF 3 is located on the bank of a drainage channel and is unlikely to be *in situ*.

The small, modified drainage channel which YTOF IF 3 is located beside is likely to have been altered as a result of agricultural activity. However, the natural alignment of the drainage channel is evident where it originates on the southern side of the East West Link.

Plate 31: Location of YTOF IF 3, view to NW.**Plate 32: Artefact detail YTOF IF 3****Site YTOF PAD 4**

Landform:	Lower slope
Coordinates:	[REDACTED]
Site type:	PAD
Site Area:	200 x 100 metres

Site YTOF PAD 4 (not yet issued an AHIMS site number) is an area of PAD recorded within private property located in the south-western corner of the project area. The PAD encompasses a lower slope landform in Survey Unit 4 that sweeps gently toward a tributary of the Macquarie Rivulet (Plate 33 and Plate 34).

The tributary of the Macquarie Rivulet runs approximately south-north, adjacent to the western border of the PAD, and corresponds with the western border of the project area (Plate 33). Minor disturbances and modifications throughout the site predominately relate to agricultural activities. It is likely that the integrity of subsurface deposits remain intact.

Plate 33: Location of YTOF PAD 4, view to W.**Plate 34: YTOF PAD 4 view to E.****Site YTOF PAD 5**

Landform:	Terrace and lower slope
Coordinates:	
Site type:	PAD
Site Area:	120 x 80 metres

Site YTOF PAD 5 (not yet issued an AHIMS site number) is an area of PAD recorded within RMS property located in the south-eastern corner of the project area (Plate 35). The PAD is situated on a terrace and lower slope at the confluence of two small ephemeral creeks within Survey Unit 6 (Plate 36).

An area of approximately 20 x 20 metres within the PAD has been modified by the construction of a dam. However, other subsurface impacts are minimal. Disturbances across the YTOF PAD 5 are minimal and primarily the result of agricultural activities.

Plate 35: Location of YTOF Pad 5, view W.**Plate 36: YTOF PAD 5, view N****Site YTOF PAD 6**

Landform:	Terrace
Coordinates:	[REDACTED]
Site type:	PAD
Site Area:	200 x 80 metres

Site YTOF PAD 6 (not yet issued an AHIMS site number) is an area of PAD recorded within private property located in Survey Unit 2 (Plate 37). The PAD is situated on a terrace landform within survey unit 2 (Plate 38).

YTOF PAD 6 is within an area of known archaeological sensitivity, with excavations located 300 metres southwest of the site yielding Aboriginal cultural material (Comber 2010). The land surrounding YTOF PAD 6 has been subject to modification and disturbance, evidenced by truncated ground surface and frequent spoil heaps. The area marked out as YTOF PAD 6 is less modified and disturbed and therefore is considered the most likely to retain intact subsurface deposits.

Plate 37: Location of YTOF PAD 6, view to W.



Plate 38: YTOF PAD 6, view E



Site YTOF PAD 7

Landform: Flat
 Coordinates: [REDACTED]
 Site type: PAD
 Site Area: 80 x 30 metres

Site YTOF PAD 7 (not yet issued an AHIMS site number) is an area of PAD recorded within private property located in Survey Unit 1, on the north-western margin of the project area (Plate 40). The PAD is situated on a flat to gently undulating plain which extends from the Princes Highway in the east to a small, north-south running, tributary of Duck Creek in the west (Plate 39).

YTOF PAD 7 is assessed as a likely area to contain subsurface Aboriginal cultural material due to its proximity the archaeologically sensitive Duck Creek and its tributaries (discussed in Artefact Heritage [2013]). Furthermore, modification and disturbance across YTOF PAD 7 is minimal, excepting minor impacts from agricultural activities.

Plate 39: Location of YTOF PAD 7, view W.**Plate 40: YTOF PAD 7, view N.****Site YTOF CS 1**

Landform:	Slope
Coordinates:	[REDACTED]
Site type:	Cultural site
Site Area:	20 x 20 metres

Site YTOF CS 1 (not yet issued an AHIMS site number) is a cultural site within private property located in Survey Unit 6, in the far south-eastern corner of the project area. The site comprises an old growth fig tree located on a small terrace of a north facing slope (Plate 41). Troy Tungai of ILALC identified the tree as a women's site. Fig trees such as this have been identified as 'birthing trees', places of meeting for women where birthing and associated rituals took place within the local Illawarra context (Timberey-Bennett 2004).

Plate 41: YTOF CS1, view E.

Figure 5: Location of site YTOF PAD 7 (background © Google 2014).

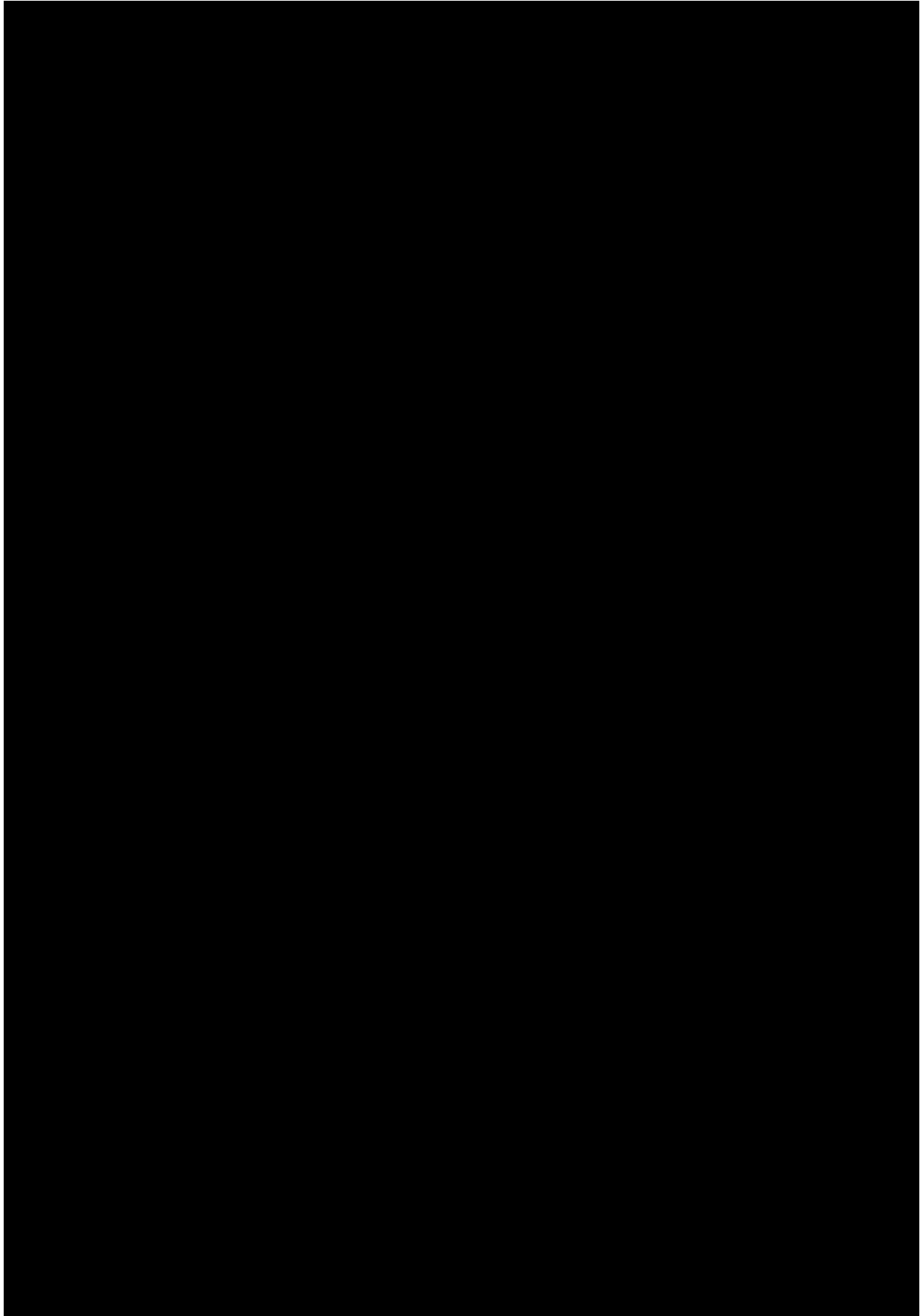


Figure 6: Location of YTOF AS 1 and YTOF PAD 6 (background © Google 2014).

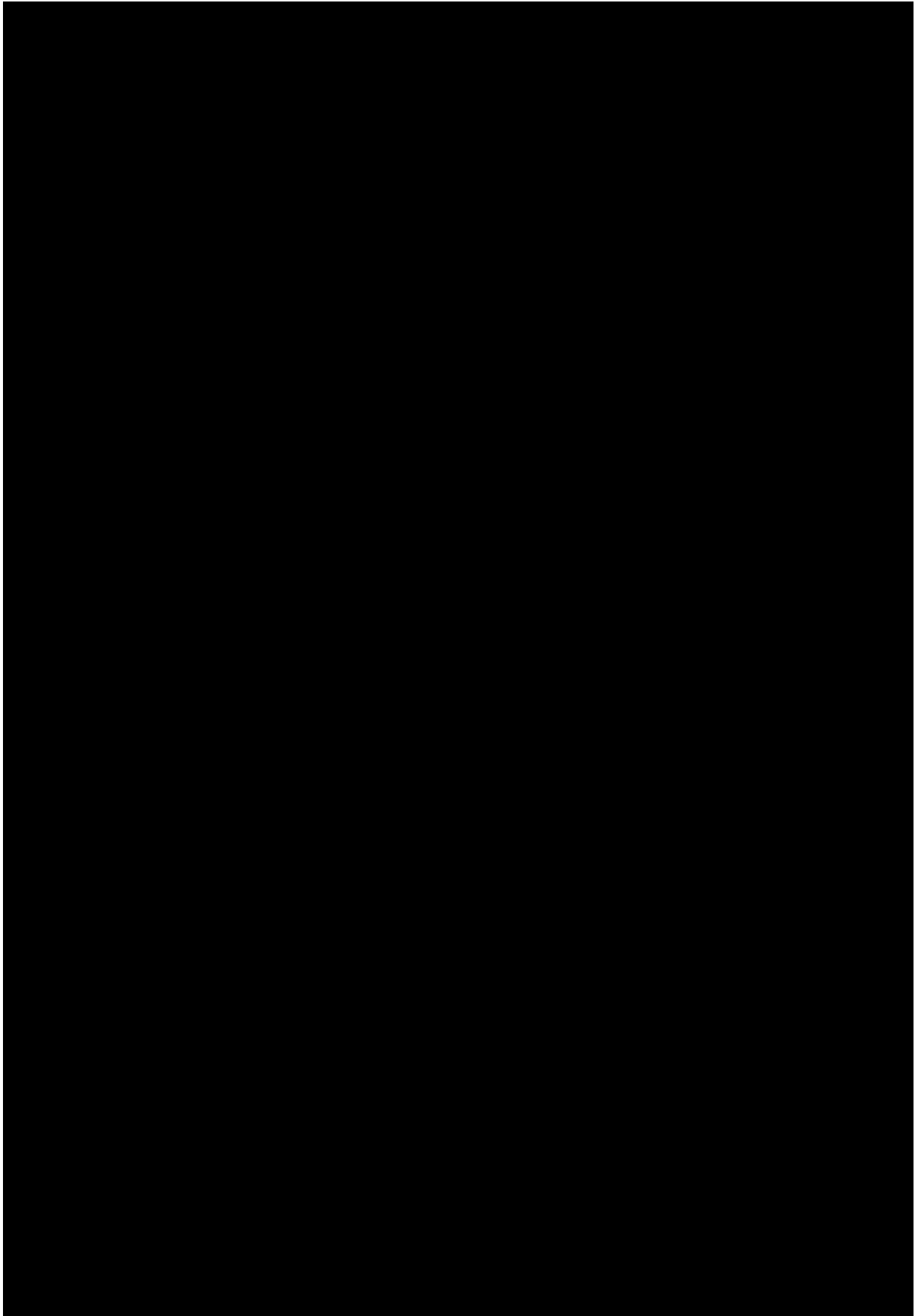


Figure 7: Location of YTOF PAD 4, YTOF PAD 3, YTOF PAD 2 and YTOF IF 1 (background © Google 2014).

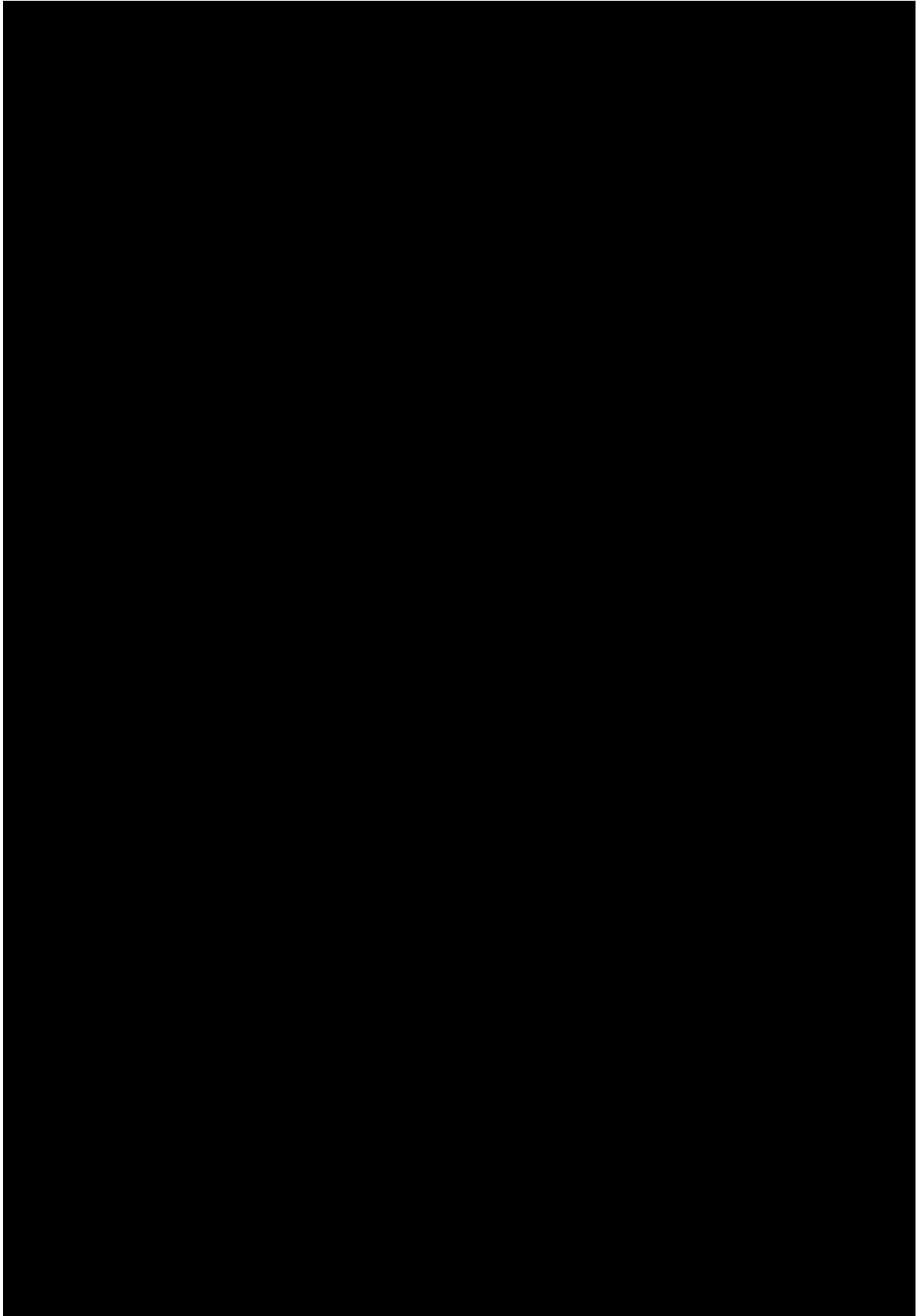


Figure 8: Location of YTOF PAD 1 (background © Google 2014).

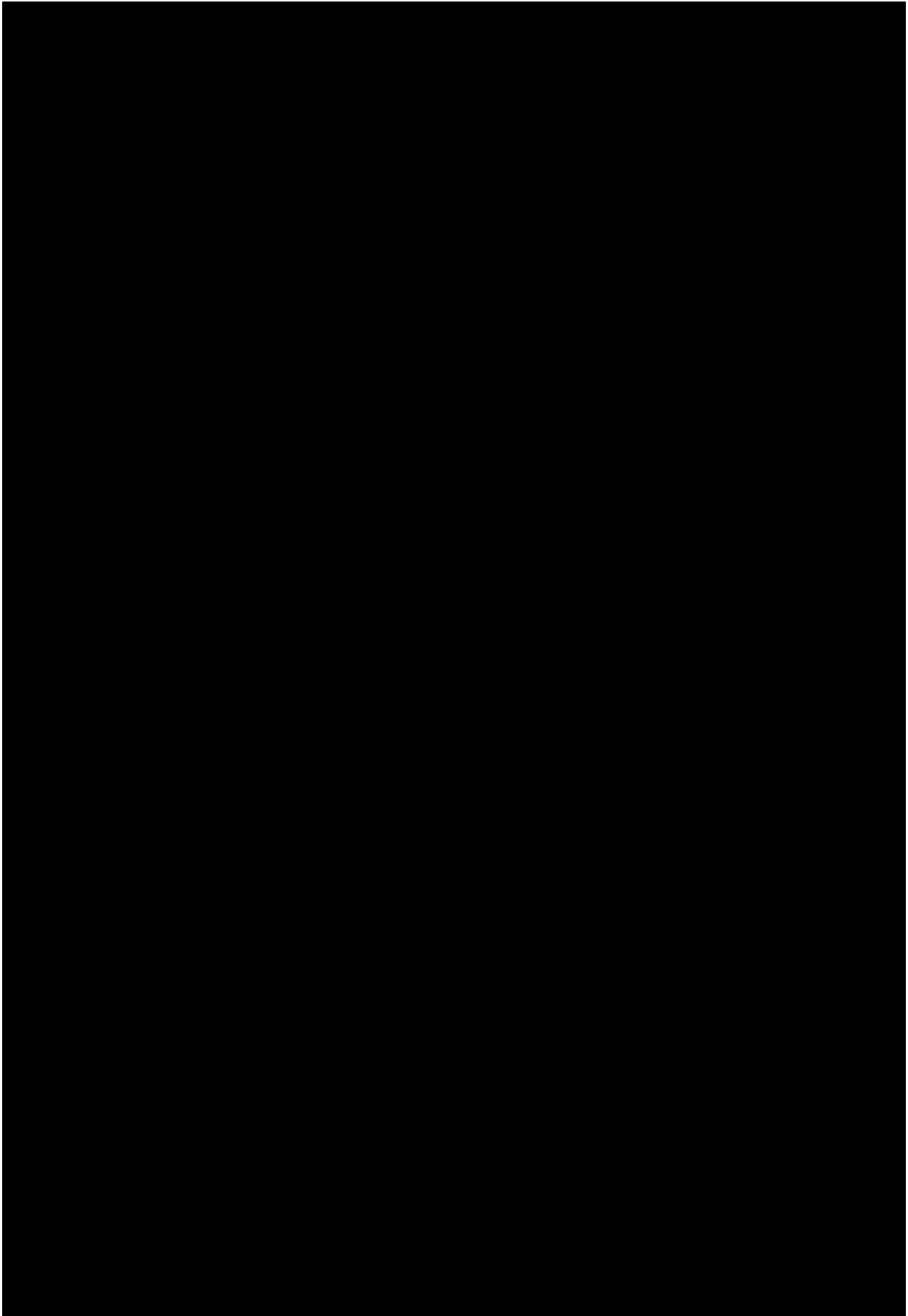


Figure 9: Location of YTOF IF 2 and YTOF IF 3 (background © Google 2014).

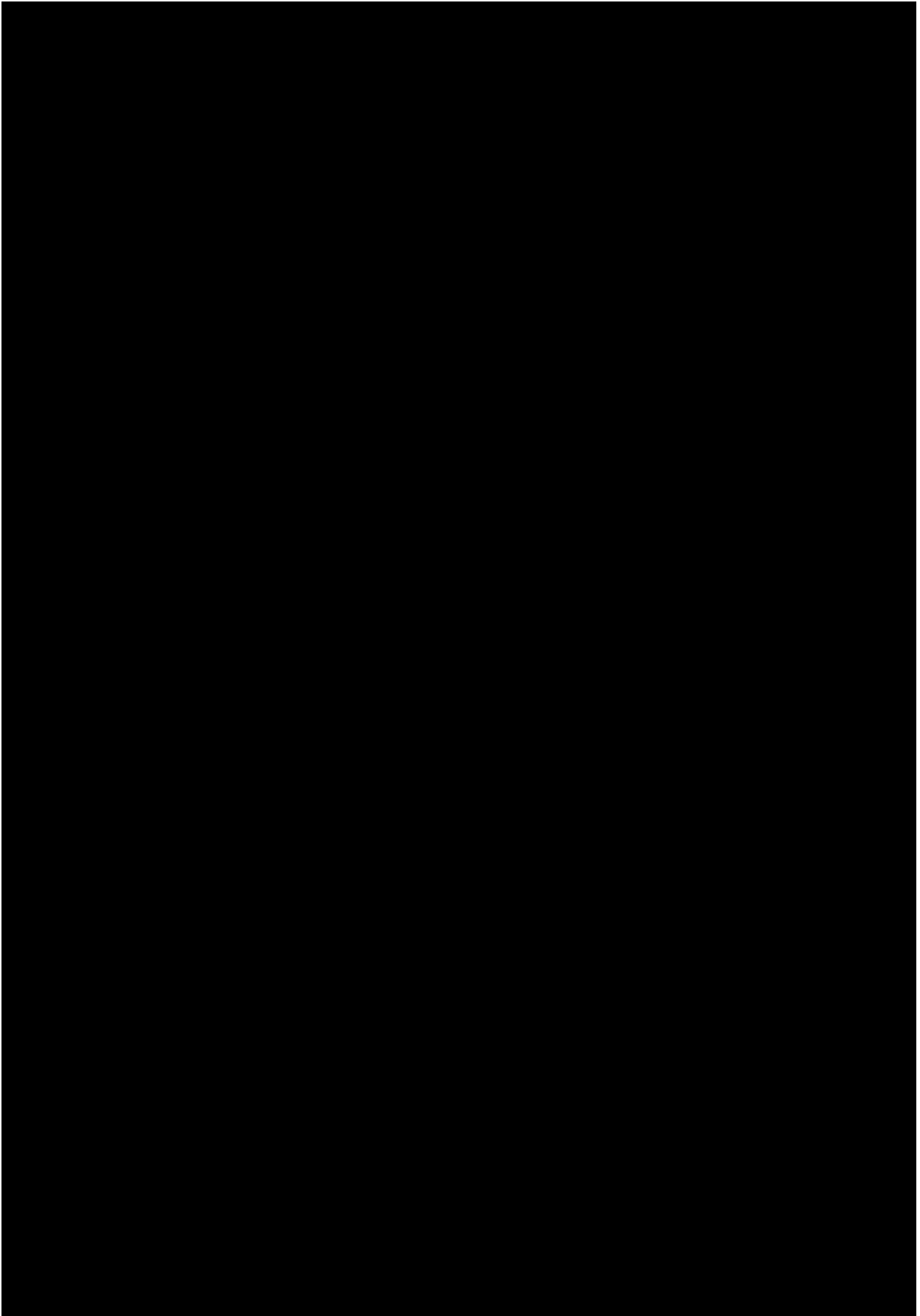


Figure 10: Location of YTOF AS 1 (background © Google 2014).

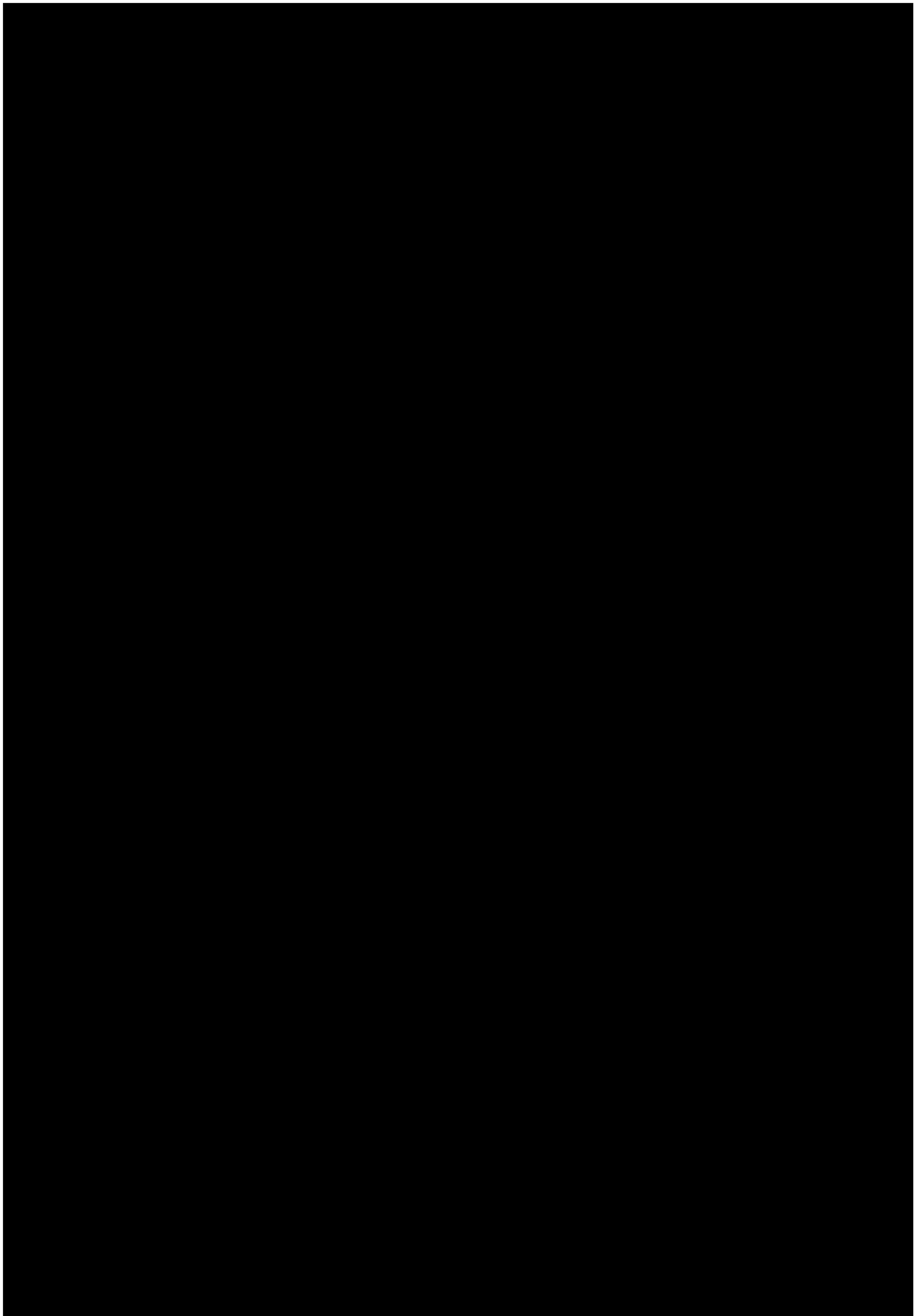


Figure 11: Location of YTOF PAD 5 (background © Google 2014).

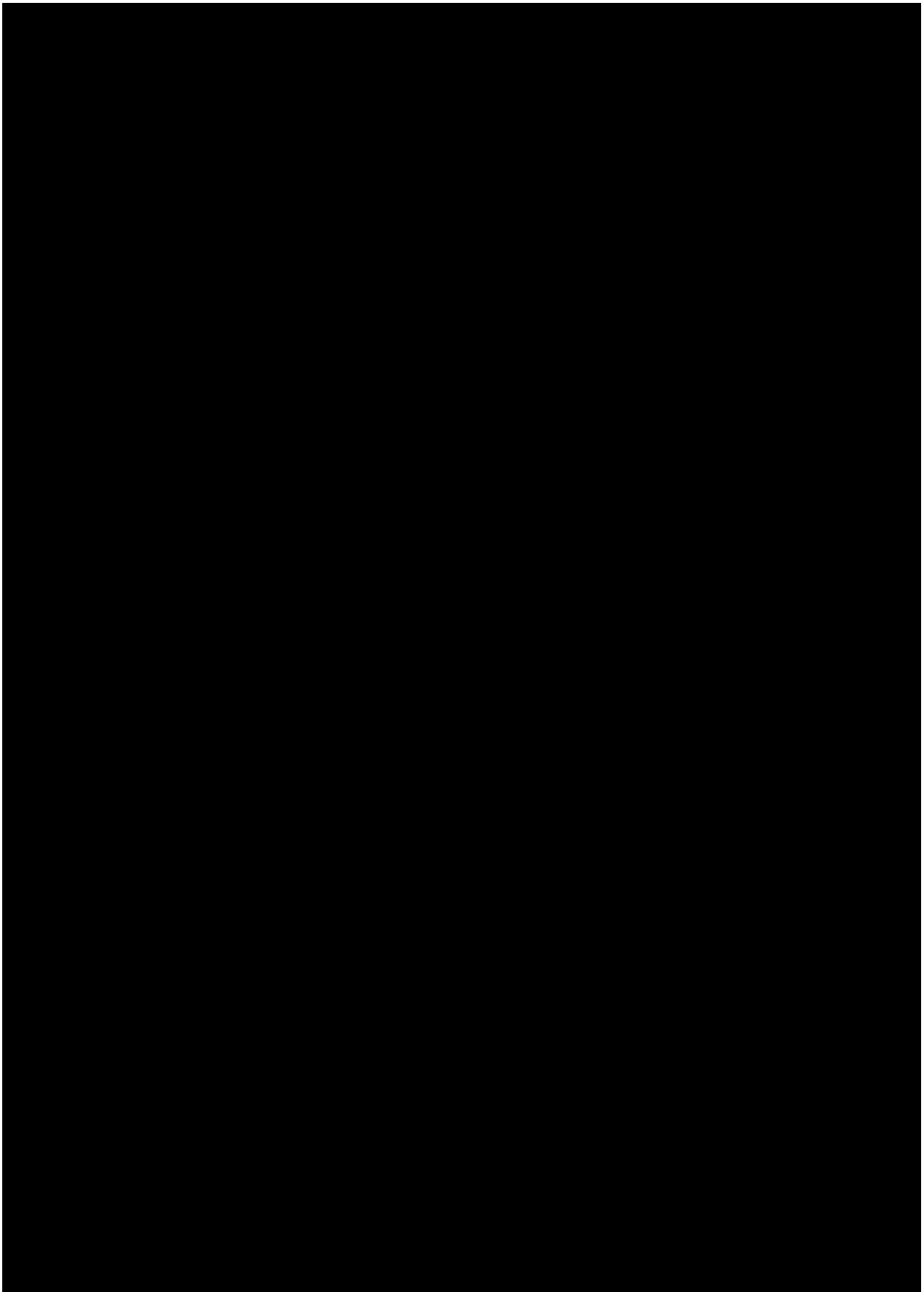
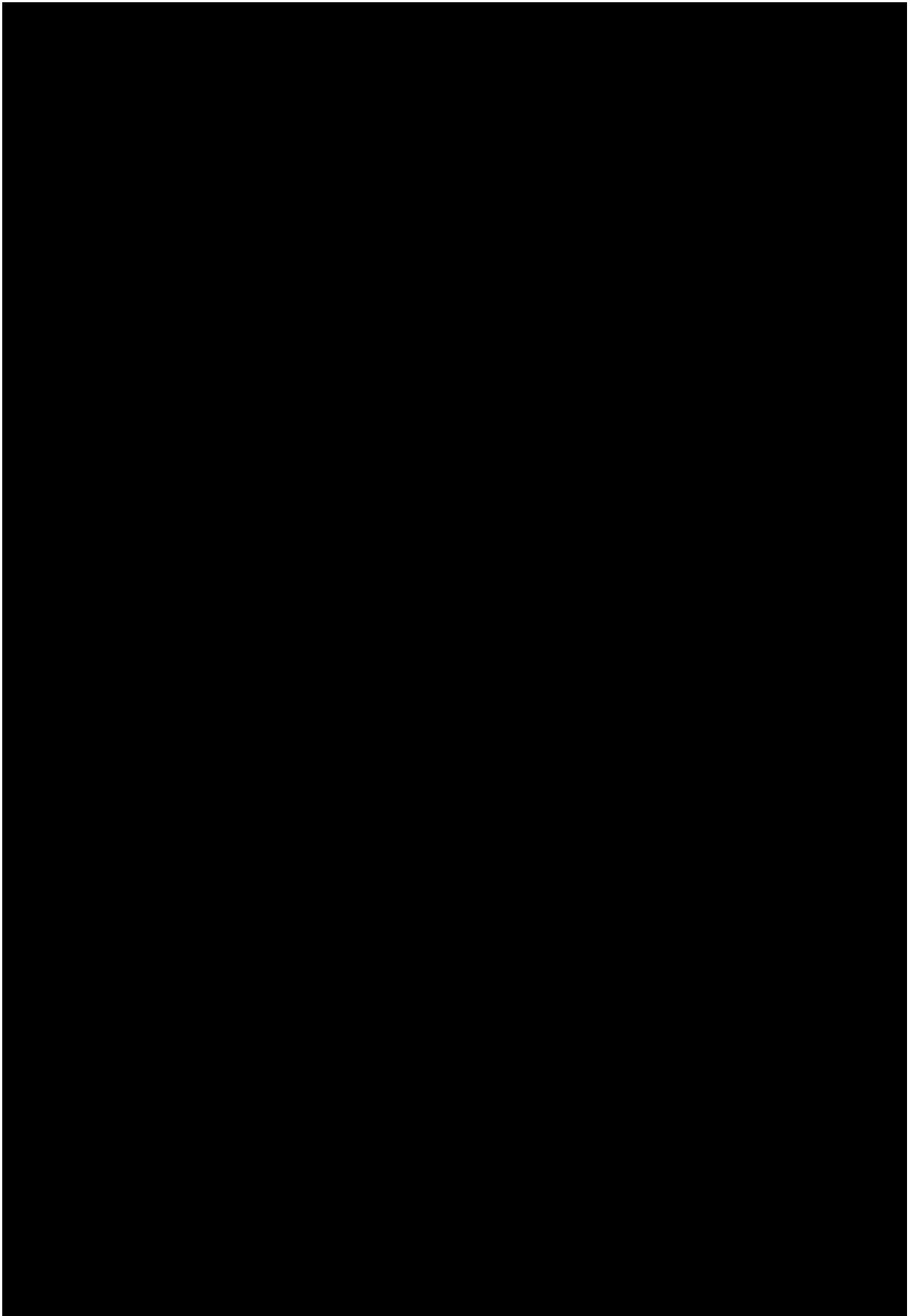


Figure 12: Location of YTOF CS 1 (background © Google 2014).



Analysis and discussion

Disturbance levels

The current survey area has variable levels of ground disturbance. Sections of the survey area which border major public roads are the primary examples of extensive modification, while sections that are within private agricultural land retain relatively unmodified ground surfaces.

The construction of the Illawarra Highway, Princes Highway and Motorway, Tongarra Road, Croome Road and the East West Link has resulted in disturbance to localised sectors of the study area (Survey Units 2, 3 and 5). Sections of Survey Unit 6 have been modified and disturbed through the construction of driveways, roads, buildings and truck weighing stations associated with the quarrying companies who use the land. Other disturbances throughout all survey units are primarily related to agricultural activities including unsealed vehicle tracks, preparation of fields for crops, modification of creeks, and construction of dams, houses and other structures.

The main water courses within the study area, including Duck Creek, Macquarie Rivulet and their unnamed tributaries, have been subject to partial modification. The terrace immediately to the south of Macquarie Rivulet has been subject to extensive disturbance through the construction of an industrial development (Survey Unit 3).

Other localised disturbances within the study area have resulted from the construction of houses and the installation of utilities such as an underground gas pipeline and overhead transmission lines. Localised dumping of rubbish and mounding of earth was noted in Survey Unit 1. Low-lying flat areas adjacent to the drainage channels within the study area are prone to flooding.

Archaeological potential

Archaeological potential is closely related to the levels of ground disturbance in the area. Other factors are also taken into account when assessing archaeological potential, such as whether artefacts were located on the surface, and whether the area is within a sensitive landform unit according to the predictive statements for the area.

One previously recorded Aboriginal site was located within the current survey area (AHIMS site # 52-5-0473). Four new Aboriginal sites were identified during the current survey (YTOF AS 1, YTOF AS 2, YTOF IF 2 and YTOF IF 3). One area of PAD was previously identified as likely to continue into the current survey area (YTOF PAD 1) and was extended as a result of the current survey. Four new areas of PAD were recorded during the current survey (YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7). One cultural site (YTOF CS 1) was recorded during the current survey.

AHIMS site # 52-5-0473 was unable to be inspected during the current survey as it is located within private property and the owner did not grant access. However, analysis of aerial imagery and the AHIMS

site cards indicates that a house has been constructed over the site. The site is likely impacted or destroyed.

Site YTOF AS 1 is an artefact scatter site recorded on an exposure within a narrow reserve on the northern margin of the East West Link. The site comprises two artefacts within a partially disturbed local context, on a low lying flat. The artefacts may have eroded out of the underlying deposit, however it is likely that they were washed in during the flooding events which frequently affect the area. Due to the disturbed context and probability that the artefacts are not *in situ*, YTOF AS 1 is therefore assessed as having low archaeological potential.

Site YTOF AS 2 is an artefact scatter site recorded on an exposure near the southern boundary of the Transgrid property. The site comprises two artefacts in a minimally disturbed context. However, in a broader context the landform is not indicative of there being subsurface archaeological deposits. Furthermore, the site is over a kilometre from nearest fresh water sources. YTOF AS 2 is therefore assessed as having low archaeological potential.

YTOF IF 2 is an isolated find located on an exposure within private property in the south-western corner of the project area. The site is low lying and was water logged at the time of survey. It is likely that the artefact has been subject to disturbance and the landform is not indicative of there being subsurface archaeological deposits. YTOF IF 2 is therefore assessed as having low archaeological potential.

YTOF IF 3 is an isolated find, also located within private property in the south-western corner of the project area. The singular artefact is located in the bank of a modified drainage channel and is unlikely to be *in situ*. YTOF IF 3 is therefore assessed as having low archaeological potential.

One area of PAD was identified during the original survey (YTOF PAD 1). The area of this PAD was extended as a result of the current assessment. Because of the sensitivity of the locality (very gentle slope less than 200 metres from a creek) and low level of ground disturbance, there is potential for subsurface artefacts to be present within YTOF PAD 1. This assessment is supported by the findings of AMBS (2006) that eight of 24 archaeological sites identified within the WDRA were located on hill slopes. Further, during test excavations within the WDRA it was determined that the highest number of artefacts was retrieved from a single test pit in a slope landform context. YTOF PAD 1 has been assessed as having a high archaeological potential.

YTOF PAD 4 is located on a lower slope within private property located in the south-western corner of the project area. Minor disturbances associated with agricultural activity were observed across the PAD, however it is likely that subsurface deposits remain intact. This combined with the position of the PAD on a lower slope and immediately adjacent a tributary of the Macquarie Rivulet has informed an assessment of YTOF PAD 4 as having moderate archaeological potential.

YTOF PAD 5 is located within RMS property in the south-eastern corner of the project area. The PAD is situated on a terrace and lower slope at the confluence of two small ephemeral creeks. An area of

approximately 30 x 30 metres within the PAD has been modified by the construction of a dam. However, other subsurface impacts are minimal. Due to the elevated landform and proximity to freshwater, YTOF PAD 5 is assessed as having high archaeological potential.

YTOF PAD 6 is located on a terrace landform within an area of known archaeological sensitivity (Comber 2010). As such, YTOF PAD 6 is assessed as having high archaeological potential.

YTOF PAD 7 is located within private property in the north-western corner of the project area. The PAD is situated on a slightly elevated, flat to gently undulating landform that sweeps west towards a tributary of Duck Creek. Landform context, proximity to a tributary of Duck Creek and minimal subsurface impacts indicate that YTOF PAD 7 has a high archaeological potential,

No culturally modified trees were observed during the current survey. No specific areas for burials were identified during the current survey. As burials have the potential to occur across the landscape, further stakeholder consultation during Stage 3 of the PACHCI should include a request for cultural information relating to the study area, including any knowledge of potential burial locations.

Significance Assessment

Archaeological significance refers to the archaeological or scientific importance of a landscape, site or area. This is characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance would be discussed by the Aboriginal groups during ongoing Aboriginal consultation for the project and would be detailed in the Cultural Heritage Assessment Report during Stage 3 of the RMS PACHCI.

Site YTOF AS 1

Site YTOF AS 1 is an artefact scatter site in a disturbed context. Such sites have low representativeness and rarity within the local/regional context. Accordingly, site YTOF AS 1 has been assessed as having low archaeological significance.

Site YTOF AS 2

Site YTOF AS 2 is an artefact scatter site in a partially disturbed context. The site does not have ready access to reliable freshwater sources. The site has low representativeness and rarity within the local/regional context. Accordingly, site YTOF AS 2 has been assessed as having low archaeological significance.

Site YTOF IF 2

Site YTOF IF 2 is an isolated find in a partially disturbed context. The area is low lying and prone to flooding. The site has low representativeness and rarity within the local/regional context. Accordingly, site YTOF IF 2 has been assessed as having low archaeological significance.

Site YTOF IF 3

Site YTOF IF 3 is an isolated find located on the bank of small, modified drainage channel. The area is low lying and prone to flooding. The site has low representativeness and rarity within the local/regional context. Accordingly, site YTOF IF 3 has been assessed as having low archaeological significance.

PADs

Of the four identified PADs, three have been assessed as having high archaeological potential (YTOF PAD 5, PAD 6 and PAD 37). YTOF PAD 4 has been assessed as demonstrating moderate archaeological potential. All four PADs present high research potential. The identified PAD areas have the potential to provide information on the nature of occupation in the area and enable a comparative analysis with other sites in the vicinity. The archaeological values, representative and rarity values cannot be accurately determined until the results of further archaeological investigation are known. The significance of PADs is therefore unknown.

The significance of cultural sites, such as YTOF CS 1, can only be assessed by Aboriginal stakeholders and therefore does not form part of this assessment of archaeological significance.

A summary of the significance values of each recorded site and PAD within the current study area is outlined in Table 6.

Table 6: Summary of archaeological significance values

Site name	Research Potential	Scientific / Archaeological Value	Representative Value	Rarity Value	Overall Significance
YTOF AS 1	Low	Low	Low	Low	Low
YTOF AS 2	Low	Low	Low	Low	Low
YTOF IF 2	Low	Low	Low	Low	Low
YTOF IF 3	Low	Low	Low	Low	Low
YTOF PAD 4	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 5	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 6	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 7	High	Unknown	Unknown	Unknown	Unknown

Impact assessment

An impact assessment cannot yet be made as there are no development plans available. Once a concept design has been developed an updated impact assessment would be undertaken.

Mitigation Measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of an area, which is based on the research potential, rarity, representativeness and educational value. In general the significance of a site would involve the following mitigation measures:

- Low archaeological significance – No further investigations required.
- Moderate archaeological significance – Conservation where possible. If conservation was not practicable further archaeological investigation would be required such as salvage excavation or surface collection.
- High archaeological significance – Conservation as a priority. Comprehensive salvage excavations may be required.

YTOF AS 1, YTOF AS 2, YTOF IF 2 and YTOF IF 3 have been assessed as demonstrating low archaeological significance therefore no further archaeological investigations are required.

The archaeological significance of the four PADs (YTOF PAD 4, PAD 5, PAD 6 and PAD 7) is at present unknown. If impacts to the PADs cannot be avoided by the proposed development, test excavation under the OEH Code of Practice would be undertaken in order to determine whether sub-surface Aboriginal objects are present in each area. The purpose of these excavations would be to assess the significance of the PADs, not to mitigate against impacts.

If a PAD area was found to be of a low archaeological significance, there would be no Aboriginal heritage constraints on the proposed development in that area.

If a PAD area was found to have a moderate archaeological significance it is likely that there would be no constraints on the proposed development in that area, but that archaeological excavations would be recommended to mitigate against any proposed impacts.

If a PAD area was found to be of high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding the future management of the area, such as conservation where possible. It is therefore important to understand the nature of the buried archaeological deposits within the PAD areas before further recommendations are made.

Recommendations

The following findings and recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- *Roads and Maritime Services procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) (November 2011).
- The results of the 2013 PACHCI Stage 2 archaeological survey report (Artefact Heritage 2013).
- The results of background research and additional (recent) survey.
- The likely impacts of the proposed development.

The findings and recommendations incorporate those made in the 2013 PACHCI Stage 2 archaeological survey report by Artefact Heritage (2013: 66-67).

It was found that:

- One artefact scatter site (AHIMS site 52-5-0473) was located within the current survey area. Though property access was not available at the time of survey, analysis of aerial imagery and the AHIMS site cards indicates that a house has been constructed over the site. The site is likely to have been impacted or destroyed.
- Four newly recorded Aboriginal sites (YTOF AS 1, YTOF AS2, YTOF IF 2 and YTOF IF 3- AHIMS # pending) were recorded within the current survey area. All four sites were assessed as having low significance.
- Four areas of PAD were identified within the current survey area (YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7). One area of PAD, identified during previous survey, was extended (YTOF PAD 1) (Artefact Heritage 2013). YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7 were assessed as having high archaeological potential. YTOF PAD 4 was assessed as having moderate archaeological potential. All four PADs were assessed as having high research potential and unknown significance.

It is therefore recommended that:

- If site 52-5-0473 was to be impacted by the proposed works (including access, lay down and compound areas) no further archaeological investigations would be required at this site.

- If sites YTOF AS 1, YTOF AS2, YTOF IF 2 and YTOF IF 3 were to be impacted by the proposed works (including access, lay down and compound areas) no further archaeological investigations would be required at these sites.
- If the PAD areas (YTOF PAD 4, PAD 5, PAD 6 and PAD 7) were to be impacted by the proposed works (including access, lay down and compound areas), test excavation under the OEH Code of Practice would be necessary (unless the project had been approved as an SSI). Test excavations would be required to inform an assessment of archaeological significance. If the test excavations show that a PAD area has low archaeological significance, there would be no constraints on impacts in that area. If an area of PAD was shown to have a moderate archaeological significance, further mitigation measures such as salvage excavation may be recommended before impacts were to occur in that area. If an area of PAD was shown to have high archaeological significance, this would inform the decisions made during Stage 3 of the RMS PACHCI regarding future management of that area.
- If impacts are proposed to the recorded Aboriginal sites and/or areas of PAD, including test excavations under the OEH Code of Practice, Stage 3 PACHCI, including comprehensive Aboriginal consultation, would be initiated by RMS. An Aboriginal Cultural Heritage Assessment Report (ACHAR) would be prepared as part of the Stage 3 PACHCI.
- If Aboriginal objects are located at any stage outside areas where test excavations are being undertaken work should stop immediately and the RMS *Unexpected Archaeological Finds Procedure* (2011) would be followed. If human remains are located during any works associated with the project within the study area the RMS *Unexpected Archaeological Finds Procedure* (2011) would be followed.
- If the project design should change or if areas not surveyed are added to the scope of proposed works, further archaeological assessment would be required.

If you have any queries regarding this assessment and recommendations, please do not hesitate to contact me.

Yours sincerely,



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9.5 Appendix F: PACHCI Stage 2 third addendum to ASR



artefact

29 July 2015

Peter Rand
Technical Director- Environment
Hyder Consulting Pty Ltd
Locked Bag 6503
North Sydney NSW 2060

Dear Peter,

Re: Third addendum to the PACHCI Stage 2 archaeological survey report for the Albion Park Rail Bypass Project

Artefact Heritage prepared an archaeological survey report (ASR) in 2013 as part of Stage 2 of the Roads and Maritime Services (Roads and Maritime) Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI) of the proposed Albion Park Rail Bypass Project (previously referred to as the Yallah to Oak Flats Road Upgrade). Following finalisation of that document in June 2013, Roads and Maritime engaged Artefact Heritage to prepare a first addendum to that investigation in March 2014. The first addendum concerned properties within the project area that were not accessible for the original investigation, as well as an addition to the project area that incorporates the Croome Regional Sporting Complex.

A second addendum to the PACHCI stage 2 ASR report was prepared for Hyder Cardno Joint Venture (HCJV) on behalf of Roads and Maritime by Artefact Heritage in October 2014. The second addendum provided an Aboriginal heritage assessment of a number of additional areas identified as part of the development of the preferred option of the Albion Park Rail Bypass.

Further additional areas have since been identified as part of the preferred option of the Albion Park Rail Bypass. This third addendum addresses these previously unassessed areas.

The aim of this investigation is to identify Aboriginal sites or areas of archaeological potential within the additional areas, and to assess the archaeological significance of any sites recorded. An Aboriginal Heritage Information Management System (AHIMS) database search has been undertaken to ascertain whether there are any recorded sites within the additional areas, and whether any sites have been recorded within or adjacent to the remainder of the original project area since the initial investigation. A ground survey was conducted within the additional current survey areas. This third addendum report is to be read in conjunction with the PACHCI Stage 2 ASR (Artefact Heritage 2013), the first addendum report (Artefact Heritage March 2014) and the second addendum report (Artefact Heritage October 2014). This third addendum will be included as an appendix to the original PACHCI Stage 2 ASR document.

1.1 The proposal and current survey area

This addendum report deals with several additions to the Albion Park Rail Bypass project area. The additional areas investigated for this report are referred to in this report as the 'current survey area'.

Table 1 details the terminology used in this report.

Table 1: Definition of terminology used throughout this report

Term	Description
Project area	The project area encompasses the Albion Park Rail Bypass project as a whole.
Current survey area	Refers to additional areas investigated for the current PACHCI Stage 2 addendum report.
Original survey area	Refers to the areas surveyed as part of the original Stage 2 PACHCI report (Artefact Heritage 2013).
First addendum survey area	Refers to the areas surveyed as part of the first addendum report, (Artefact Heritage March 2014).
Second addendum survey area	Refers to the areas surveyed as part of the second addendum report, (Artefact Heritage October 2014).

1.2 Objectives of addendum

This letter report outlines the following information:

- Description and analysis of the identified Aboriginal sites within the current survey area.
- An updated AHIMS search.
- Development of a significance assessment and impact assessment for Aboriginal sites located within the current survey area.
- Management and mitigation measures for any Aboriginal sites or areas of archaeological potential located within the current survey area.

Further details of the proposal, including environmental and archaeological context of the local area, Aboriginal histories of the area, and predictive modelling are outlined in the original PACHCI Stage 2 ASR (Artefact Heritage 2013).

1.3 Aboriginal stakeholder consultation

Aboriginal stakeholder consultation throughout the preparation of this document was conducted by Jeffrey Nelson, Roads and Maritime Aboriginal Cultural Heritage Officer.

As the current project area is located within the boundaries of the Illawarra Local Aboriginal Land Council (ILALC), representatives of ILALC were invited to take part in the site surveys. Troy Tungai of ILALC and Jeffrey Nelson of Roads and Maritime participated in the survey conducted on the 4 June 2015. Craig Tungai of ILALC participated in the survey conducted on the 11 June 2015.

Figure 1: The current survey area shown in blue



1.4 Legislative context

This letter report addendum was prepared in accordance with the following NSW legislation and legislative guidelines:

National Parks & Wildlife Act (1974)

The *National Parks & Wildlife Act 1974* (the NP&W Act) provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 90. Aboriginal objects are afforded automatic statutory protection in NSW whereby it is an offence to:

'...damage, deface or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service (now the OEH).'

The Act defines an Aboriginal 'object' as:

'...any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons of non-Aboriginal European extraction, and includes Aboriginal remains'.

The Act was recently amended (2010), with the legislative structure for seeking permission to impact on heritage items modified. An s90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and may only be granted by OEH if the conditions of the 'due diligence guidelines', and/or an 'archaeological investigation' have been met. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

As the project will be assessed as State Significant Infrastructure (SSI) no permit would be required under the Act.

The Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (the EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The overall project area falls within the boundaries of the Wollongong and Shellharbour Local Government Areas and is covered by the Wollongong Local Environmental Plan (LEP) 2009 and the Shellharbour LEP 2013.

It is assumed that the proposal will be assessed under Part 5.1 of the EP&A Act, which establishes an assessment and approval regime for SSI. Part 5.1 applies to development that is declared to be SSI by a State Environmental Planning Policy (SEPP). Section 115ZG of the EP&A Act specifies that approvals or permits under section 90 of the NPW Act 1974 are not required for approved SSI.

1.5 Investigators and contributors

This report was written by Claire Rayner (archaeologist). Dr Sandra Wallace (principle archaeologist) provided management input and reviewed the report.

1.6 Aboriginal Heritage Information Management System (AHIMS) search

The locations of Aboriginal sites are considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal, be removed from this report if it is to enter the public domain.

A search of the Office of Environment and Heritage (OEH) AHIMS was carried out on the 3 June 2015 with the following parameters and results:

[REDACTED]	
[REDACTED]	
Buffer	50 m
Number of sites	110
AHIMS Search ID	175825

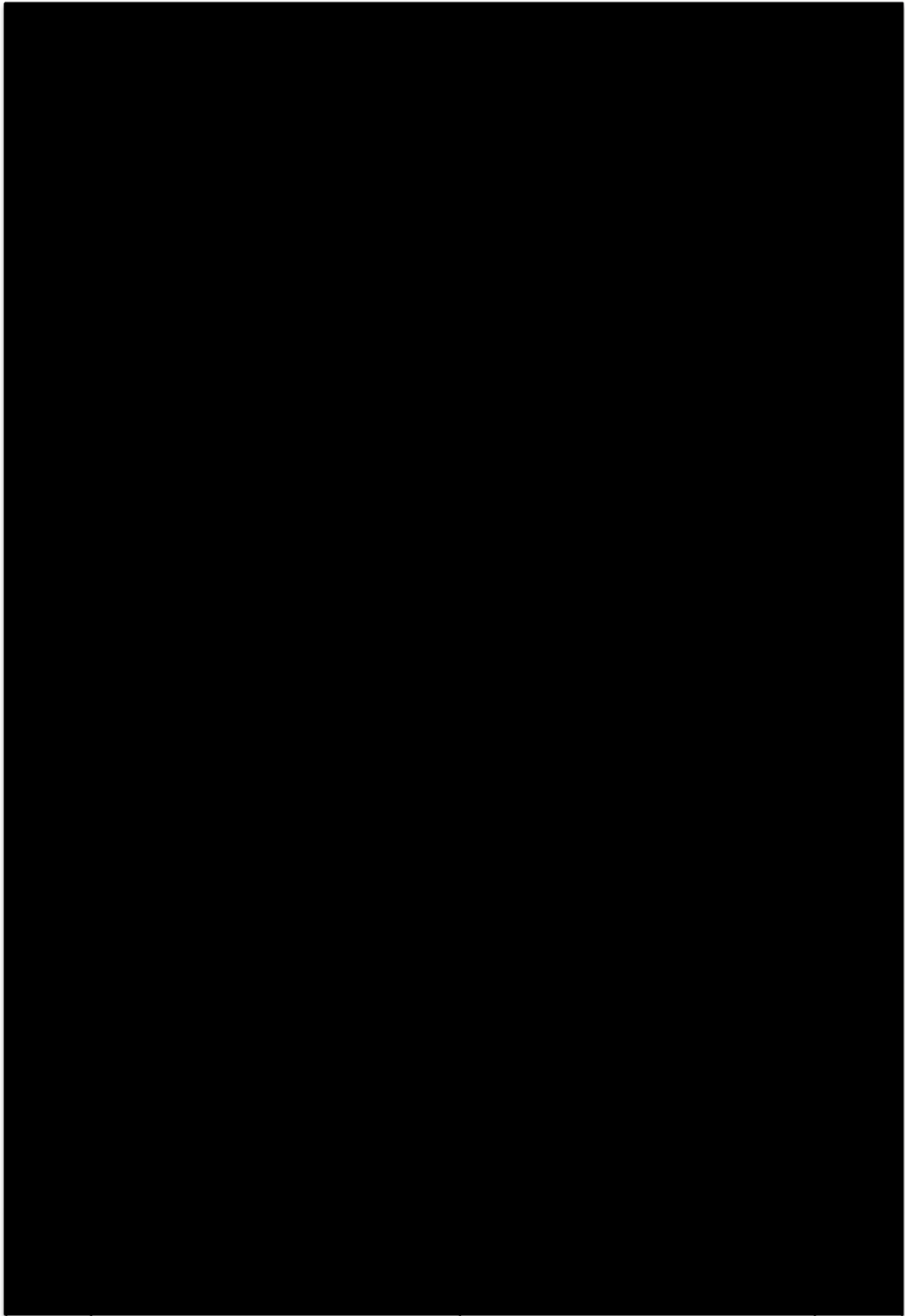
Three earlier AHIMS searches were carried out to reflect the original PACHCI Stage 2 survey area (23 April 2013), the first addendum survey area (20 February 2014) and the second addendum survey area (10 July 2014). The AHIMS search encompasses the entire project area in order to give context to the current survey area. The search returned a total of 110 previously recorded Aboriginal sites. The distribution of recorded sites within the search area is shown in Figure 2.

The frequency of recorded site types is summarised in Table 2. Of the 110 sites previously recorded in the AHIMS site register search area, Artefact sites are the most frequent (n=78). The remaining site types include Shell with Artefact (n=15); Shell (n=7); Potential Archaeological Deposit (PAD) (n=5); Modified Tree (n=2); and Modified Tree with Artefact (n=1). Figure 2 illustrates that the majority of sites are located within 200 metres of water sources such as Duck Creek, Macquarie Rivulet, Marshall Mount Creek and their tributaries, or close to the shores of Lake Illawarra. Site distribution is also a reflection of the pattern of archaeological assessments undertaken in relation to development activities.

Table 2: Frequency of site features from AHIMS data

Site Feature	Frequency	Percentage
Artefact	78	70
Artefact, PAD	2	2
PAD	5	4
Shell	7	7
Shell, artefact	15	14
Modified tree	2	2
Modified tree; artefact	1	1

Figure 2: AHIMS Extensive Search Results



1.7 Previous subsurface investigations in the local area

Comber (2010)

Comber (2010) conducted test and salvage excavations at Lot 107 and 108, DP 1076242 (currently 17 and 19 Larkins Lane, respectively). The properties are located along the Marshall Mount spur crest which runs approximately southwest-northeast. An Aboriginal site (WDRA_AS_09) was recorded adjacent to the properties in 2006 by AMBS. WDRA_AS_09 was recorded as a high density open campsite and Comber (2010) postulated that it was likely to continue as subsurface deposit into Lots 107 and 108. AMBS noted that oral history indicates that the spur crest was used as an access route to an important ceremonial place located on Mount Marshall west of the excavations (AMBS 2006:108).

Excavation of Lots 107 and 108 yielded a total of 119 stone artefacts. The assemblage is characterised as a low density deposit, with chert being the predominant raw material (52%). Quartz (33%) and silcrete (15%) stone artefacts were also present (Comber 2010:52). Artefacts retrieved from each trench ranged in number from $n = 0$ to $n = 6$. Flaked pieces were the most common artefact type. Of 119 artefacts retrieved, only six examples of retouch and only two cores were retrieved (Comber 2010:26).

Biosis Research 2007

Biosis Research (2007) undertook an archaeological assessment along a proposed gas pipeline route near the Tallawarra Power Station, at Yallah NSW. The survey area crosses the northern portion of the current survey area from west to east near Duck Creek. Two areas of PAD and surface artefacts were identified to the west of the current survey area. No sites or areas of PAD were identified along the pipeline route within, or to the east of, the current survey area. The two areas of PAD - Tallawarra Pipeline 1 (AHIMS site 52-5-0471) and Tallawarra Pipeline 2 (AHIMS site 52-5-0472) - were subject to a program of test excavation. Thirty-six 1.0 x 0.5 metre test pits were excavated, totaling an area of 18 square metres. A total of 136 artefacts were recovered – nine from Tallawarra Pipeline 1 (seven percent of the excavated assemblage) and 127 from Tallawarra Pipeline 2 (93 percent of the excavated assemblage). The predominant raw material is silcrete (43 percent), with other common raw materials including chert, quartz and volcanics. Manufacturing debris including flakes, cores and angular fragments comprised 96 percent of the assemblage (Biosis Research 2007: 21-24).

The majority of the artefacts recovered by the excavations were from two locations within Tallawarra Pipeline 2. These locations were both associated with locally elevated positions close to the aggraded channel of Duck Creek. It was suggested that these areas were more frequently occupied and utilised than is indicated by the background scatter elsewhere. It was determined that a main function of the area appears to have been stone tool production. The overall low numbers of artefacts from other areas possibly indicates that occupation of those locations was of low intensity. The area may have been used intermittently to access local wetland sources (Biosis Research 2007: 29-30). It was concluded that the findings are comparable with site predictive models for the Illawarra region, where artefact scatters are the common site types and are usually located on level, well-drained ground, close to water sources and wetlands such as Duck Creek (Biosis Research 2007: 30).

1.8 Survey methodology

The survey area was divided into five survey units, each containing multiple landform units (Table 3). The same survey methodology used during the original and subsequent addendum surveys was employed (Artefact Heritage 2013: 25, 27). A map of survey units is shown in Figure 3.

A sample survey of all survey units was undertaken. A sample survey is acceptable under the OEH Code of Practice with justification. Justification regarding each survey unit is as follows:

Survey unit 1

A sample survey was utilised in survey unit 1 as ground surface visibility across the majority of the unit was nil due to dense grasses, some stands of trees and shrubs and water obscuring the ground surface as a result of recent heavy rain. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material. Some areas of survey unit 1 were inaccessible due to dense thickets of weeds.

Survey unit 2

A sample survey was utilised in survey unit 2 as ground surface visibility across the majority of the unit was nil due to dense grasses, as well as stands of shrubs and trees. Ground surface exposures were small and infrequent. Portions of the unit had been subject to extensive disturbance and modification (discussed further below). All observed exposures were investigated for Aboriginal cultural material.

Survey unit 3

A sample survey was utilised in survey unit 3 as ground surface visibility across the majority of the unit was nil due to extremely dense grasses which were waist-high in some areas. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

Survey unit 4

A sample survey was utilised in survey unit 4 as ground surface visibility across the majority of the unit was nil due to dense grasses. Ground surface exposures were small and infrequent. All observed exposures were investigated for Aboriginal cultural material.

1.9 Survey results

1.9.1 Effective survey coverage

Although mostly cleared of original vegetation, the landforms within the current survey area (flats, slopes and terraces) were covered in dense grass that limited ground surface visibility to zero, except in infrequent areas of exposure. Infrequent areas of surface visibility were observed in vehicle tracks, animal tracks, exposures around tree bases, exposures in areas of disturbance, and odd patches of erosion on slopes (Plate 9). Vegetation was impenetrable or extremely dense in some sections of the current survey area and these were not surveyed (Plate 1). Visibility and exposure levels have been taken into consideration in determining the effective coverage area on this survey (Table 2 and Table 3).

Table 3: Survey coverage

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective coverage area (m ²)	Effective coverage (%)
1	Flat, terrace, open depression, slope	282,735	5	5	707	0.25
2	Flat, terrace, open depression, slope	53,418	5	5	133	0.25
3	Flat, terrace, slope	133,785	5	5	334	0.25
4	Flat, slope	59,961	5	5	149	0.25

Table 4: Landform survey coverage

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Flat	158,362	396	5	1	1
Terrace	122,330	305	5	1	1
Open depression	85,632	214	5		
slope	163,305	408	5		

Figure 3: Survey Units



1.9.2 Survey observations

Survey Unit 1

Survey Unit 1 is the northernmost survey unit illustrated in pink in Figure 3. The central portion of this survey unit was not accessible due to dense thickets of weeds alongside the steep embankments that line the highway (Plate 1Plate 2). The eastern and western portions of the current survey area are located within paddocks used for grazing livestock. These paddocks demonstrate low levels of disturbance.

The western portion of the survey unit is characterised by slopes, terraces and flat landforms (Plate 3). Duck Creek runs to the south west of the current survey area and an incised gully bounds the current survey area to the west. The eastern portion Survey Unit 1 is located within similar landform units (Plate 4). A drainage line that has been dammed in various places runs through the southern portion of the survey unit to the south east.

Ground surface visibility throughout Survey Unit 1 was generally nil due to grass and vegetation cover. Infrequent exposures were observed along vehicle tracks and animal tracks. Some localised dumping of rubbish and household goods was observed in Tallawarra lands, immediately adjacent to the eastern margin of the Princes Highway.

No previously recorded sites were located within Survey Unit 1. One area of PAD, (YTOF PAD 8) was identified 15 metres south west of the western boundary of Survey Unit 1.

Plate 1: Dense thickets of weeds along the Princes Highway in Survey Unit 1



Plate 2: Central portion of Survey Unit 1



Plate 3: Western portion of Survey Unit 1



Plate 4: Eastern portion of Survey Unit 1



Plate 5: Tea Tree



Survey Unit 2

Survey Unit 2 consists of seven odd shaped polygons along both sides of the Princes Highway (Figure 3). Some portions of the survey unit were not accessible for survey due to dense thickets of weeds and safety concerns associated with the steep embankments of the motorway (Plate 6). This section of the current survey area is heavily disturbed by the construction of roads, housing, rail and agricultural and commercial activities (Plate 7).

The landforms in this survey unit consist of gentle slopes and flats with some modifications that are mostly likely related to agricultural activity and the construction of the Princes Highway and Princes Motorway. The Macquarie Rivulet crosses the southern portion of the survey unit running in an east to west direction (Plate 8).

Ground surface visibility throughout the survey unit was generally low (5 percent) due to grass and vegetation cover. Infrequent exposures were observed along drainage channels, erosion scours, some vehicle tracks and animal tracks (Plate 9).

There are no previously recorded sites within Survey Unit 2. There are no newly recorded sites within Survey Unit 2.

Plate 6: Dense vegetation along the Princes Highway in Survey Unit 2



Plate 7: Disturbance associated with warehouses along Yallah Road



Plate 8: Macquarie Rivulet



Plate 9: Rare exposures with high visibility within Survey Unit 2



Survey Unit 3

Survey Unit 3 includes long, narrow stretches of land either side of the Illawarra Highway within private property, currently used for agricultural purposes and an area of Shellharbour Council land south of Tongarra Road. Landforms throughout the survey unit include terraces and gently undulating terrain. Large expanses of floodplain occur in the central portion of the survey unit (Plate 10). The Macquarie Rivulet runs parallel to the Illawarra Highway, bounding the survey unit along the north western border. Frazers Creek bounds the survey unit to the northeast and south west (Plate 11).

Visibility throughout Survey Unit 3 was generally nil due to dense grass coverage (Plate 12). Occasional stands of trees occur throughout the survey unit, however, vegetation has been largely cleared and the land used for grazing and crop production. Infrequent exposures were observed along animal tracks, vehicle tracks and at the base of trees (Plate 13).

No previously recorded sites were located within Survey Unit 3. One area of PAD, (YTOF PAD 9) was identified 15 metres north of the northern boundary of the survey unit within the Shellharbour City Council land.

Plate 10: Swamp area in the central portion of Survey Unit 3



Plate 11: View towards Macquarie Rivulet across ploughed field within Survey Unit 3



Plate 12: Poor visibility due to dense vegetation in Survey Unit 3



Plate 13: Area of exposure in Survey Unit 3



Survey Unit 4

Survey Unit 4 consists of parcels of land along the East West Link in the southern portion of the current survey area. The survey areas are located within the road reserve as well as on private properties currently used to stable and graze horses. Landforms within Survey Unit 4 include flat areas and slopes. Various unnamed low order watercourses run across the survey unit.

Ground surface visibility was generally low across the survey unit (Plate 14). This was mainly due to dense grasses, thickets of weeds and dense leaf litter. Infrequent areas of exposure occurred in areas of erosion and vehicle and animal tracks (Plate 15). Upon inspection these exposures were found not to contain Aboriginal artefacts.

Disturbance was noted in the areas of Survey Unit 4 that line the East West Link road. These include artificial embankments and drainage channels (Plate 16). The southern portion of the current survey area demonstrates low levels of disturbance limited to temporary shelter structures and some concrete slabs (Plate 17).

A scarred tree (YTOF ST 1) was identified 50 metres south of the southern boundary of Survey Unit 4 (Plate 18 and Plate 19). The tree was recorded and will be registered with AHIMS. The tree is located outside the current survey area and will not be impacted by the proposed works.

Plate 14: Low ground surface visibility caused by dense grass within Survey Unit 4



Plate 15: Area of exposure within Survey Unit 4



Plate 16: Artificial drainage channel in Survey Unit 4



Plate 17: Area of concrete within southern portion of Survey Unit 4



Plate 18: YTOF ST 1 located 50 metres south of Survey Unit 4



Plate 19: Context of YTOF ST 1 located 50 metres south of Survey Unit 4



1.9.3 Summary of results

No previously recorded Aboriginal sites are located within the current survey area.

Two areas of PAD (YTOF PAD 8 and YTOF PAD 9) were identified within the current survey area.

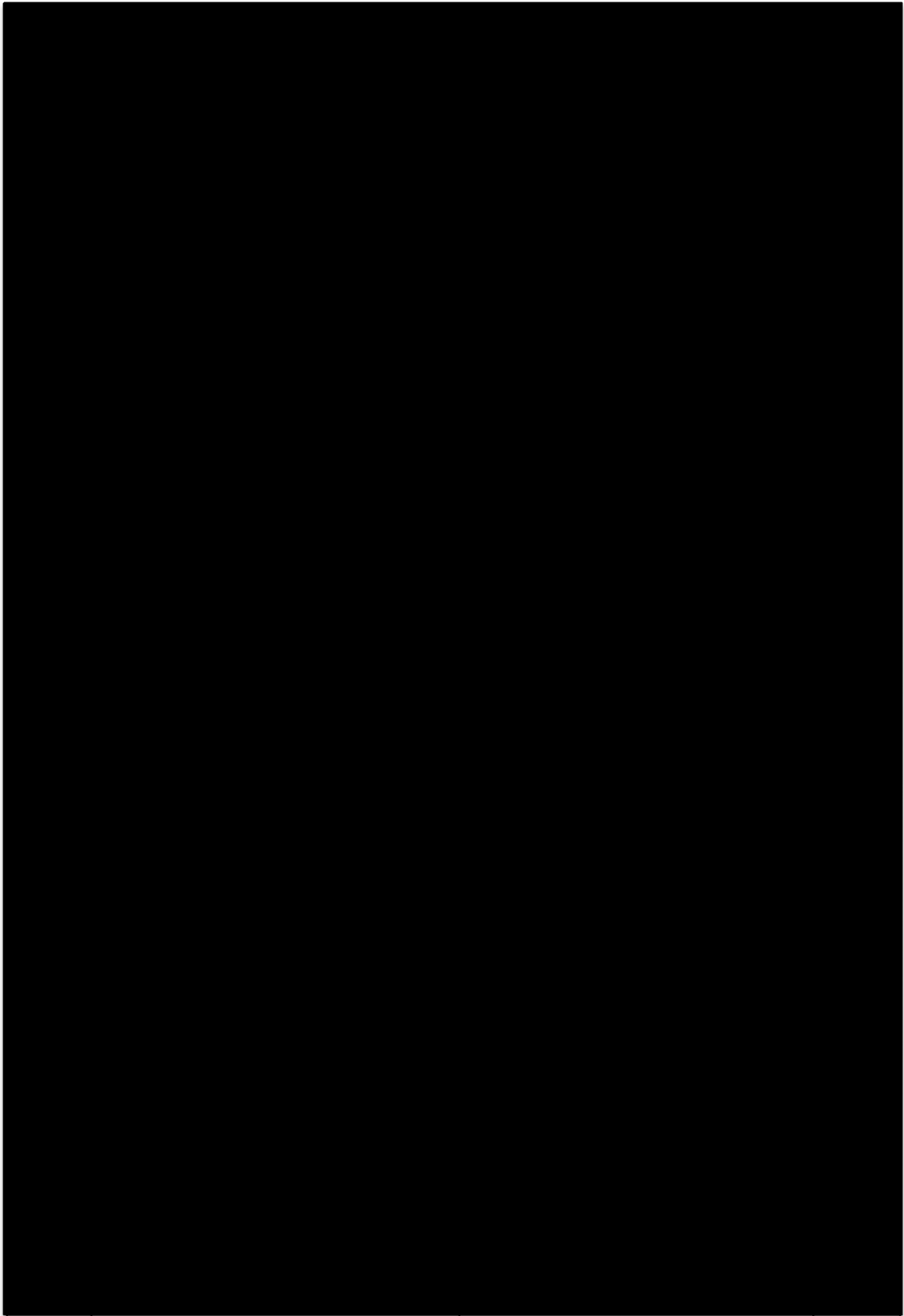
One scarred tree (YTOF ST 1) was identified outside the current survey area.

Table 5 and Figure 4 below summarises the site and PAD recorded during the current survey. Details and descriptions of the site and PADs are given below.

Table 5: Summary of survey findings

Site name	Feature	Survey unit	landform
YTOF PAD 8	PAD	N/A	Lower slope
YTOF PAD 9	PAD	N/A	Terrace
YTOF ST 1	Scarred tree	N/A	Slope

Figure 4: Survey Results



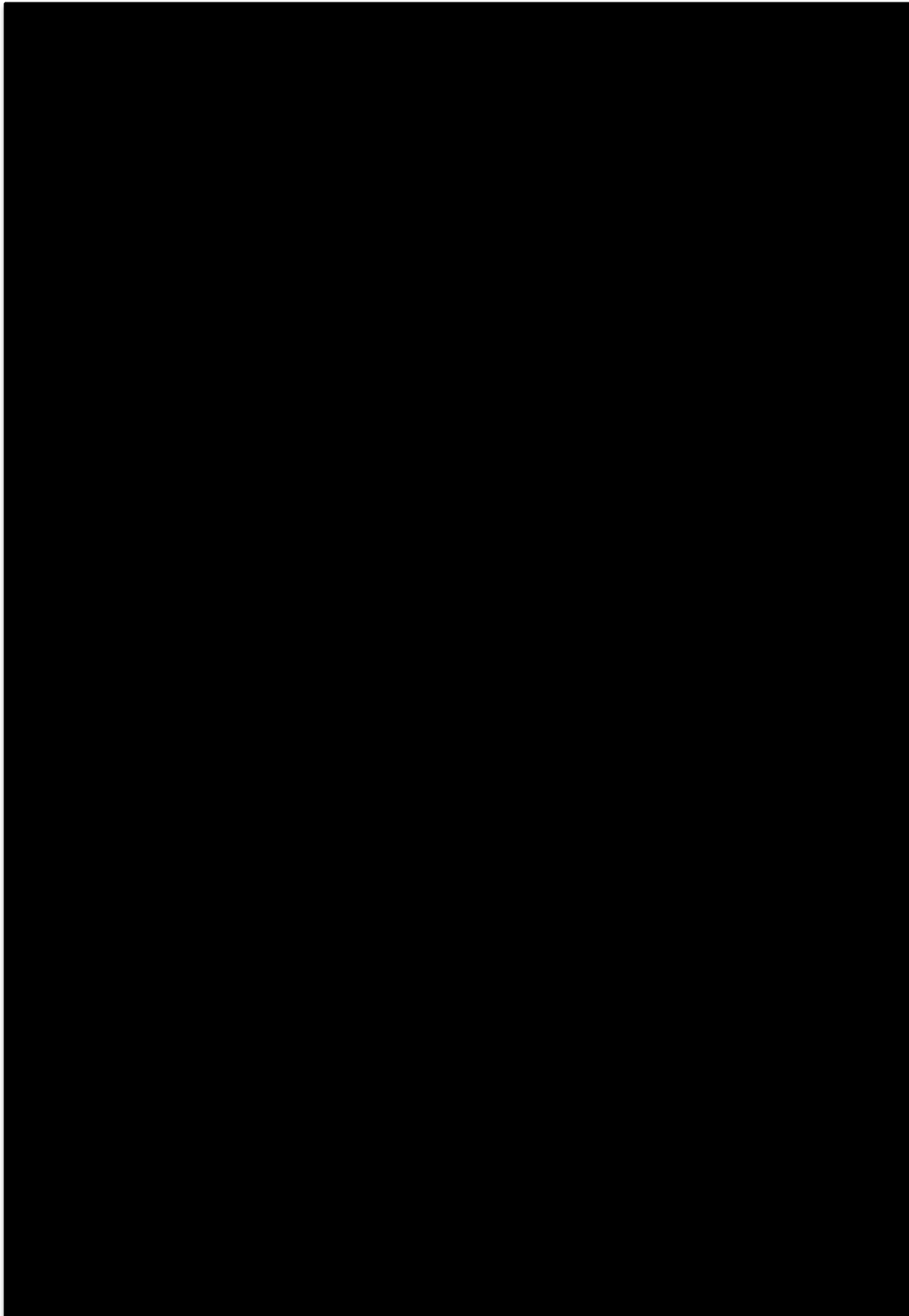
YTOF PAD 8

Landform:	flat
Coordinates:	
Site type:	PAD
Site Area:	100 x 100 metres

Site YTOF PAD 8 is an area of PAD located within Survey Unit 1 (Figure 5). The PAD encompasses a lower slope landform that extends towards a tributary of Duck Creek (Figure 5). Previous excavations along Duck Creek to the south of the PAD have identified high artefact concentrations and knapping floors (Biosis 2010). Duck Creek is located approximately 50 meters south east of YTOF PAD 8. Minor disturbances and modifications throughout the site are associated with agricultural activities. It is likely that the integrity of subsurface deposits remain intact.

Plate 20: View south towards YTOF PAD 8 and Duck Creek

Figure 5: Location of YTOF PAD 8



YTOF PAD 9

Landform: Terrace

Coordinates: [REDACTED]

Site type: PAD

Site Area: 100 x 100 metres

Site YTOF PAD 9 is an area of PAD located within Survey Unit 3 within the Shellharbour City Council land (Figure 6). The PAD is located on a raised terrace landform just east of Frasers Creek (Plate 21 and Plate 22). The site features very little evidence of disturbance.

Previous excavations along Frasers Creek in similar contexts have revealed intact archaeological deposits containing stone artefacts (Artefact Heritage 2015). Given the low level of disturbance in the area surrounding YTOF PAD 9 and its proximity to Frasers Creek it is considered likely that the area contains intact subsurface deposits.

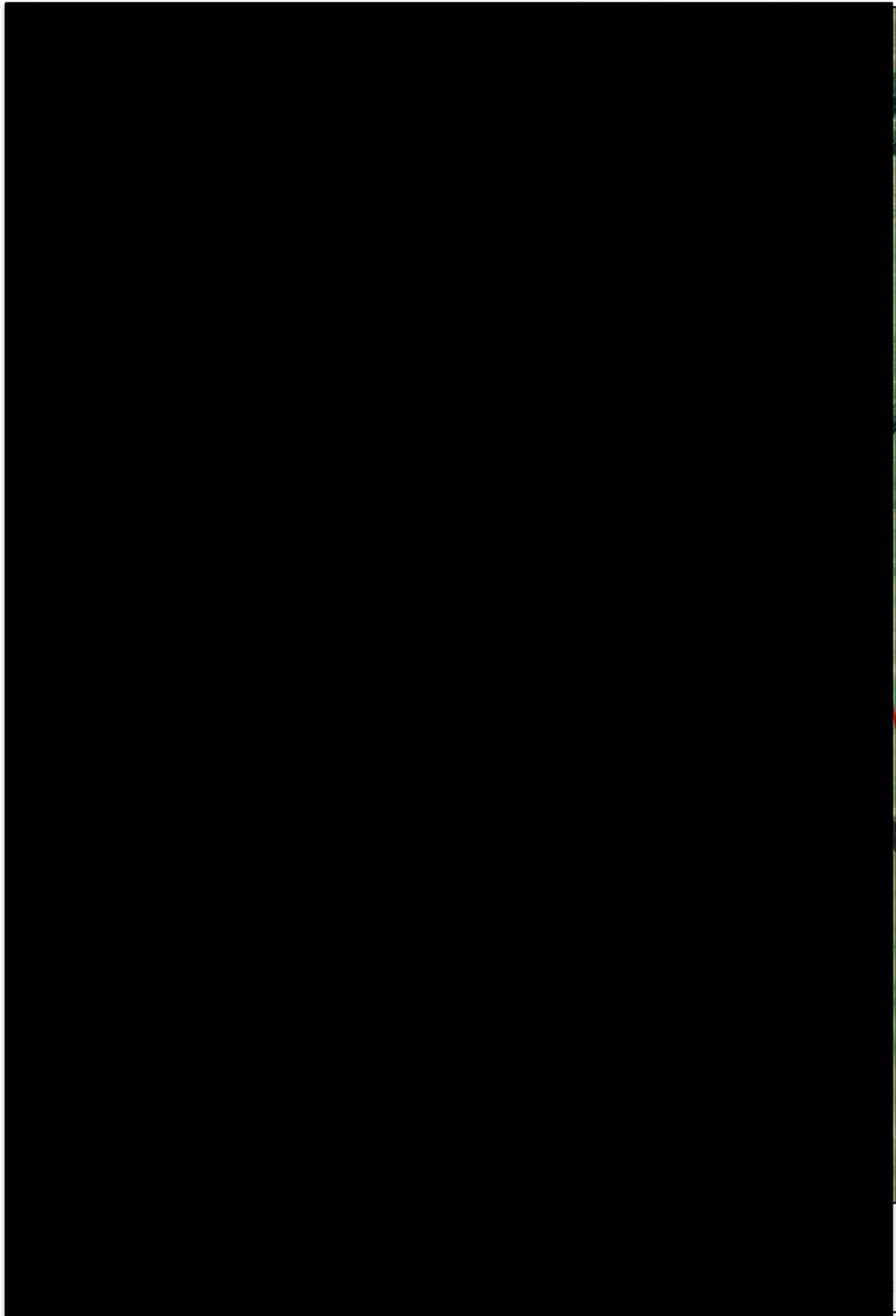
Plate 21: View of YTOF PAD 9 west towards Frasers Creek



Plate 22: View of YTOF PAD 9 south



Figure 6: Location of YTOF PAD 9



YTOF ST 1

Landform: Terrace

Coordinates: [REDACTED]

Site type: Scar Tree

Site Area: 5 x 5 metres

Site YTOF ST 1 is a scarred tree located 50 metres south of the southern boundary of Survey Unit 4. The scar measures 169 centimetres by 27 centimetres located on a mature Eucalypt with a circumference of 285 centimetres. A second Eucalypt with similar scarred features is located adjacent to the scarred tree. These markings were found to be irregular in nature and therefore are more likely to be the result of natural processes rather than cultural activities. Both of the trees are considered to be culturally significant to the Aboriginal representatives present at the time of survey. Therefore a five metre buffer around the coordinate taken at the site includes both trees. The trees are situated within a cleared paddock that exhibits very low levels of disturbance.

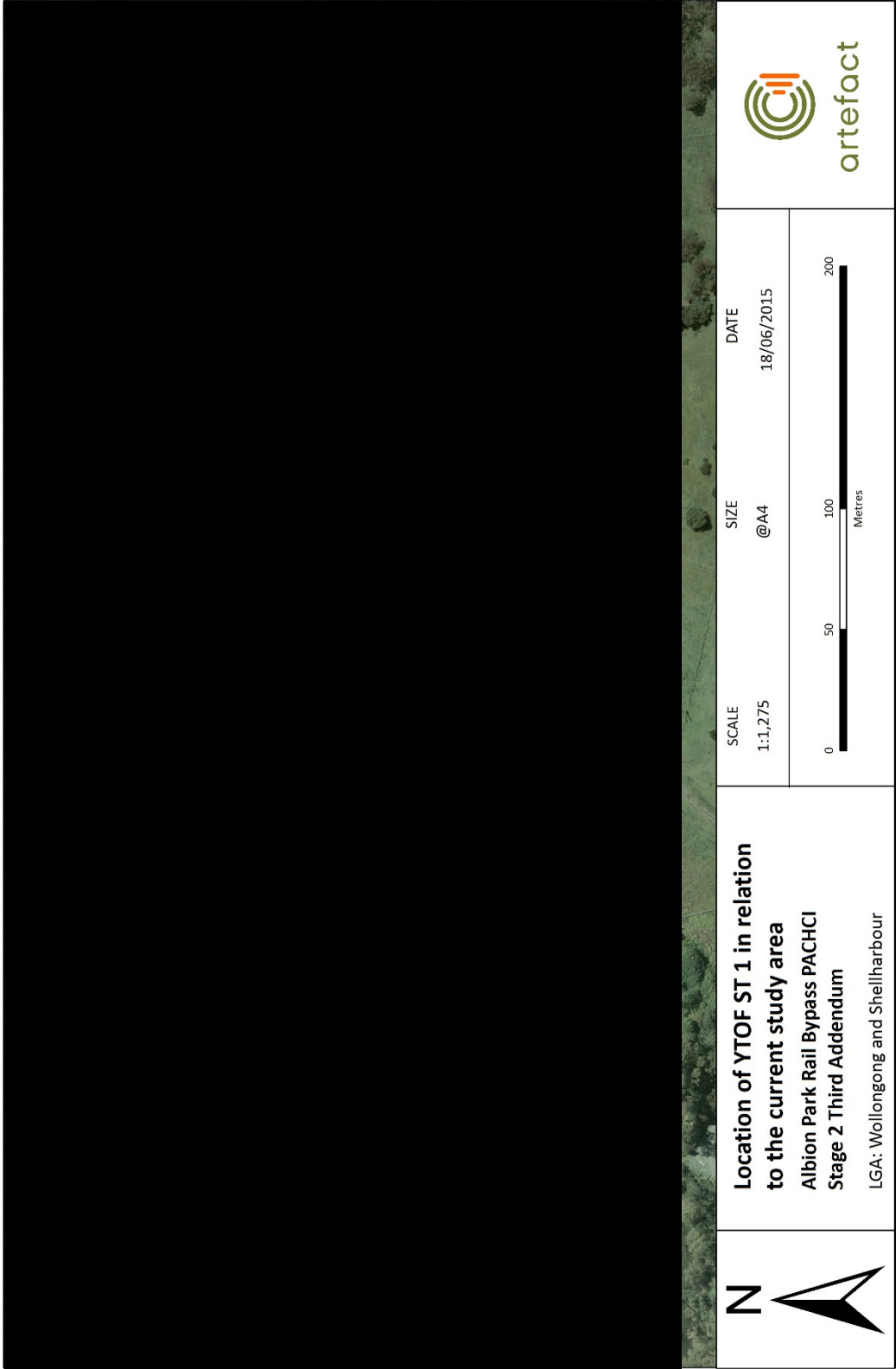
Plate 23: YTOF ST 1 Detail of scar



Plate 24: YTOF ST 1 Context, scarred tree is located on the right



Figure 7: Location of YTOF ST 1



1.10 Analysis and discussion

1.10.1 Levels of disturbance

Disturbance was evident throughout the current survey area to varying degrees. Large portions of the current survey area are located within various road easements which feature extensive disturbance in the form of artificial embankments and drainage channels. This has resulted in the introduction of foreign fill materials in some areas of Survey Unit 2.

The construction of the Illawarra Highway, Princes Highway and Motorway, Tongarra Road, Croome Road and the East West Link has resulted in disturbance to localised sectors of the current survey area (Survey Units 1, 2, and 4). Other disturbances throughout all survey units are primarily related to agricultural activities including unsealed vehicle tracks, preparation of fields for crops, modification of creeks, and construction of dams, houses and other structures. The main water courses within the current survey area, including Duck Creek, Macquarie Rivulet and their unnamed tributaries, have been subject to partial modification.

Other localised disturbances within the current survey area have resulted from the construction of houses and the installation of utilities such as an underground gas pipeline and overhead transmission lines. Localised dumping of rubbish and mounding of earth was noted in Survey Unit 1. Low-lying flat areas adjacent to the drainage channels within the current survey area are prone to flooding.

Areas located away from the road corridors generally exhibited less evidence of disturbance. This was found to be the case in Survey Unit 1 in the eastern portion of the survey unit where YTOF PAD 8 was recorded. The Shellharbour City Council land south of Tongarra road in Survey Unit 3 also demonstrated little disturbance as well as the southern portion of Survey Unit 4.

1.10.2 Archaeological potential

Archaeological potential is closely related to the levels of ground disturbance in the area. Other factors are also taken into account when assessing archaeological potential, such as whether artefacts were located on the surface, and whether the area is within a sensitive land form unit according to the predictive statements for the area.

Previous archaeological assessments within the local area indicate that there is potential for intact archaeological deposits to be located along land bordering Duck Creek and the Macquarie Rivulet and their associated tributaries (Biosis 2010, Artefact Heritage 2015). The surrounding undulating floodplain has been assessed as having low archaeological potential. Previous studies comparing the distribution of artefacts across these areas and those close to permanent water sources support this view. Artefacts are found to occur in higher densities in close proximity to creeks.

Much of the current survey area has been subject to high levels of disturbance and modifications related to the construction of roads, rail, residential and industrial areas and agriculture. The areas in which YTOF PAD 8 and YTOF PAD 9 are located have been subject to these disturbances to a much lower degree.

The location of YTOF PAD 8 in close proximity to Duck Creek and an area of high artefact density previously investigated by Biosis (2010) indicates that YTOF PAD 9 is deemed to be of high archaeological potential.

The location of YTOF PAD 9 in an area of low disturbance near Frazers Creek and considering the results of previous investigations along this water course, this area is considered to be of moderate archaeological potential.

1.11 Significance assessment

Archaeological significance refers to the archaeological or scientific importance of a landscape, site or area. This is characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance would be discussed by the Aboriginal groups during ongoing Aboriginal consultation for the project and would be detailed in the Cultural Heritage Assessment Report prepared under Stage 3 of the Roads and Maritime PACHCI.

YTOF PAD 8 has been assessed as having high archaeological potential whilst YTOF PAD 9 is assessed as having moderate archaeological potential. These PADs represent high research potential. The identified PAD areas can provide information on the nature of occupation in the area enabling a comparative analysis with other sites in the vicinity. The archaeological values, representative values and rarity values cannot be accurately determined until the results of further archaeological investigation are known. The significance of the PADs is therefore unknown. Table 6 summarises the significance of the sites below.

Table 6: Summary of archaeological significance values

Site name	Research Potential	Scientific / Archaeological Value	Representative Value	Rarity Value	Overall Significance
YTOF PAD 8	High	Unknown	Unknown	Unknown	Unknown
YTOF PAD 9	High	Unknown	Unknown	Unknown	Unknown

1.12 Impact assessment

YTOF ST 1 is located outside the current survey area and will not be impacted by the proposal.

Following the current survey, Roads and Maritime revised the boundaries of the project area to avoid impact to YTOF PAD 8 and YTOF PAD 9. YTOF PAD 8 and YTOF PAD 9 will not be impacted.

Figures 8 and 9 show the revised project area boundary in relation to YTOF PAD 8 and YTOF PAD 9.

Table 7: Summary of impacts

Site name	Type of harm	Degree of harm	Consequence of harm
YTOF PAD 8	None	None	No loss of value
YTOF PAD 9	None	None	No loss of value
YTOF ST 1	None	None	No loss of value

1.13 Mitigation measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of an area, which is based on the research potential, rarity, representativeness and educational value. In general the significance of a site would involve the following mitigation measures:

- Low archaeological significance – No further investigations required.
- Moderate archaeological significance – Conservation where possible. If conservation was not practicable further archaeological investigation would be required such as salvage excavation or surface collection.
- High archaeological significance – Conservation as a priority. Comprehensive salvage excavations may be required.

The majority of the current survey area has been heavily impacted by infrastructure, residential and commercial construction and agricultural activities. The central portion of the current survey area is extremely flood prone. As areas of archaeological potential at YTOF PAD 8 and YTOF PAD 9 have been removed from the project area, the remainder of the current survey area is considered to be of low archaeological potential and as such there are no heritage restraints to the proposed works within these areas.

If there are changes project area boundary to include impacts to YTOF PAD 8 and YTOF PAD 9, test excavation under the OEH Code of Practice should be undertaken in order to determine the nature, extent and significance of those areas. The results of test excavation would inform archaeological significance and appropriate mitigation and management measures.

Figure 8: Revised project area boundary in relation to YTOF PAD 8

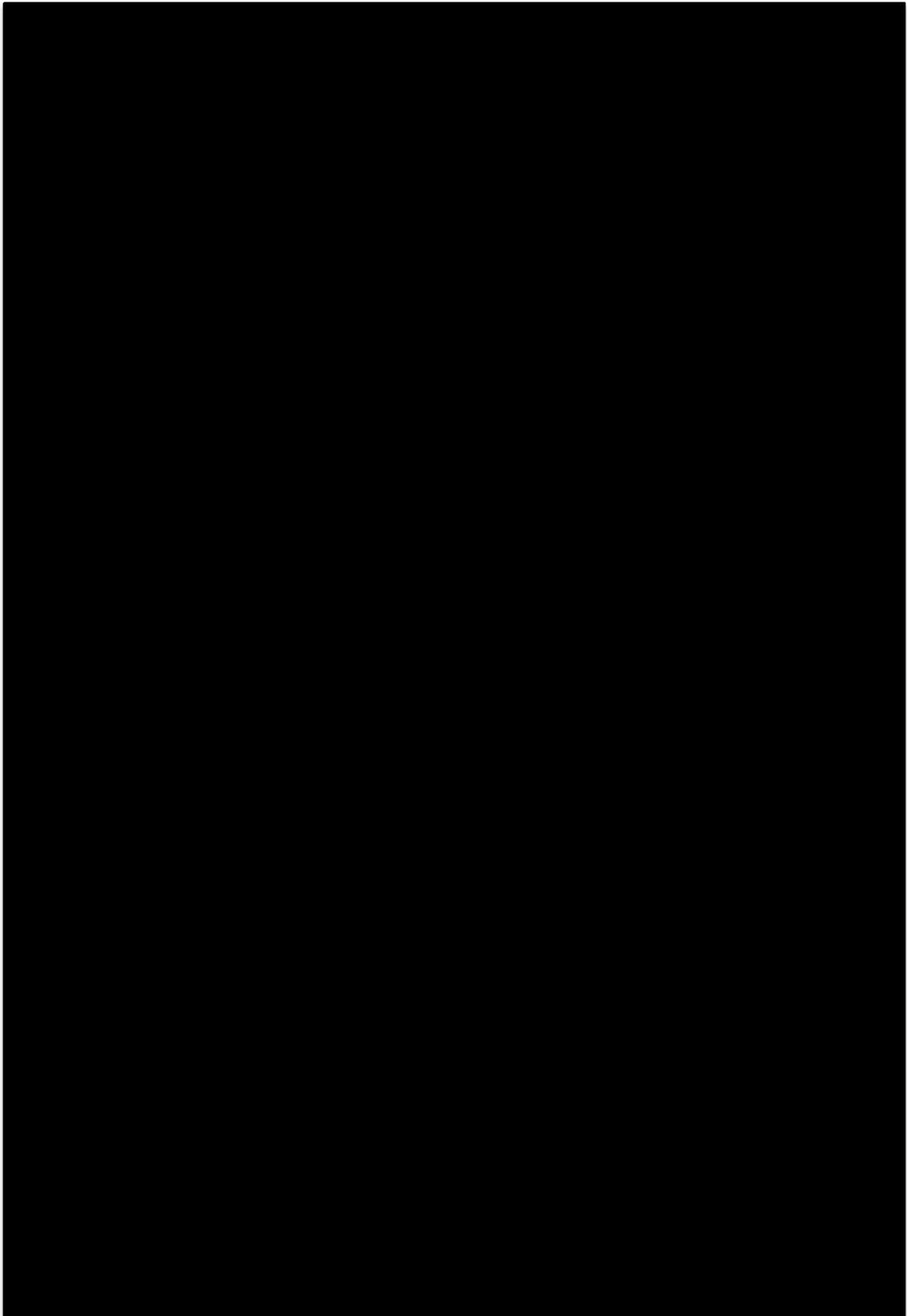
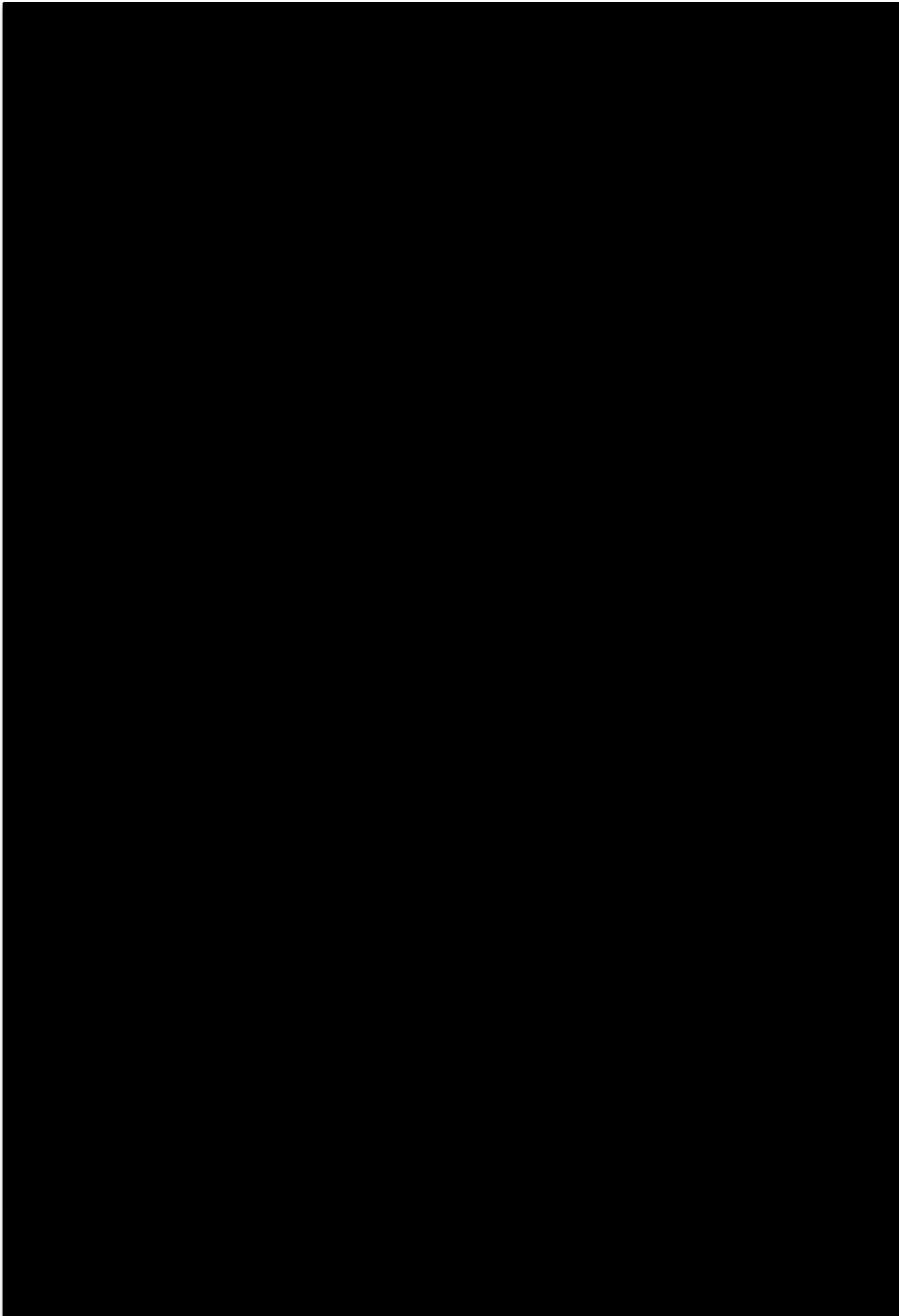


Figure 9 Revised project area boundary in relation to YTOF PAD 9



1.14 Recommendations

The following findings and recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- *Roads and Maritime Services procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) (November 2011).
- The results of the 2013 PACHCI Stage 2 archaeological survey report (Artefact Heritage 2013).
- The results of background research and additional (recent) survey.
- The likely impacts of the proposed development.
- The findings and recommendations incorporate those made in the 2013 PACHCI Stage 2 archaeological survey report by Artefact Heritage (2013: 66-67).

It was found that:

- Two areas of PAD are located outside the project area and will not be impacted (YTOF PAD 8 and YTOF PAD 9).
- One scarred tree was recorded outside the southern boundary of the project area (YTOF ST 1).

It is therefore recommended that:

- If the project boundary is modified to include scarred Tree YTOF ST 1, Stage 3 PACHCI, including comprehensive Aboriginal consultation, would be required.
- If the project boundary is modified to include YTOF PAD 8 and YTOF PAD 9, archaeological test excavation under Stage 3 of the PACHCI would be required to inform an assessment of archaeological significance and guide future management and mitigation measures for those areas.
- If Aboriginal objects or human remains are found at any stage during works, work should stop at that location and the *Roads and Maritime Unexpected Archaeological Finds Procedure* (2015) would be followed.
- If the current survey area boundaries are adjusted to include areas not surveyed, further PACHCI Stage 2 archaeological assessment would be required.

If you have any queries regarding this assessment and recommendations, please do not hesitate to contact me.

Kind Regards,



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9.6 Appendix G: Test Excavation Methodology

Albion Park Rail Bypass PACHI Stage 3

Archaeological Test Excavation
Methodology

Report to Hyder Cardno Joint Venture
(HCJV) on behalf of Roads and Maritime
Services



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1.0 INTRODUCTION AND BACKGROUND

Roads and Maritime Services proposes to construct a road bypass of Albion Park Rail (previously referred to as the Yallah to Oak Flats Road upgrade). The Hyder Cardno Joint Venture (HCJV) has been engaged by Roads and Maritime to manage the preparation of all investigations and documentation required for an Environmental Impact Statement (EIS).

Artefact Heritage was engaged by Roads and Maritime in 2013 to prepare an archaeological survey report (ASR) as part of Stage 2 of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI) for the project. Following finalisation of that document in June 2013, Roads and Maritime engaged Artefact Heritage to prepare a first addendum to that investigation in March 2014. The first addendum concerned properties within the study area that were not accessible for the original investigation, as well as an addition to the study area that incorporates the Croome Regional Sporting Complex.

As part of final options development for the Albion Park Rail Bypass, HCJV, on behalf of Roads and Maritime, identified a number of additional areas which require Aboriginal heritage investigation outside the previous boundaries of the project area. This includes the possible location of road interchanges and widening of the originally proposed corridor to accommodate alignment alterations. As such, HCJV engaged Artefact Heritage to prepare a second addendum PACHCI Stage 2 ASR for those additional areas.

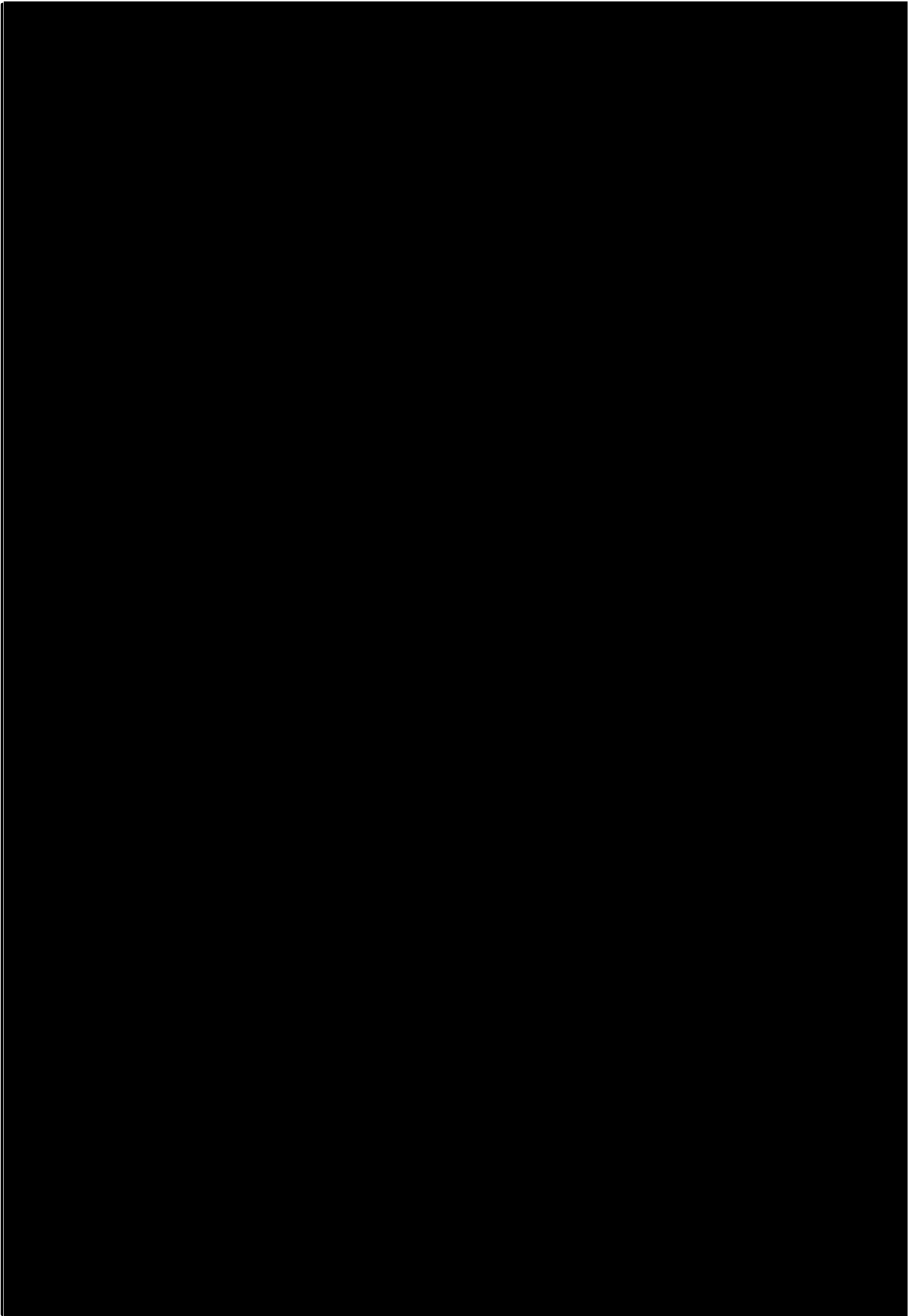
The identified areas of Potential Archaeological Deposit (PAD) and Aboriginal sites are shown in Figure 1. The ASR recommended that further archaeological investigation, including test excavation, should take place where there will be impacts to identified PADs and/ or Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) site number 52-5-0484/ 52-5-0512 (duplicate recording).

Since completion of PACHCI Stage 2 investigations, Roads and Maritime has continued with concept design for the Albion Park Rail Bypass. In addition to the concept design, Roads and Maritime has advised HCJV that in addition to the proposed motorway, there will be a number of ancillary facilities during road construction, including compound sites and stockpile locations. In preparation of this archaeological test excavation methodology, HCJV has indicated to Artefact Heritage that the following PADs and Aboriginal site will be impacted by the proposed motorway, ancillary facilities, realignment of Yallah Road, and relocation of some parts of the Croome Road Sporting Complex:

- YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7.
- Aboriginal site 52-5-0484/52-5-0512.

The aim of this document is to outline the proposed methodology for archaeological test excavation of those areas in accordance with Stage 3 of the PACHCI.

Figure 1: Overview of areas proposed for archaeological test excavation



2.0 LEGISLATIVE CONTEXT

The *National Parks and Wildlife Act 1974* (NPW Act), administered by OEH, provides statutory protection to all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under section 90. The NPW Act was amended in 2010, and as a result the legislative structure for seeking permission to impact on heritage items has changed. A section 90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and may only be granted by OEH if the conditions of the 'due diligence guidelines', and / or an 'archaeological investigation' have been met.

The PACHCI Stage 2 investigations of the project area by Artefact Heritage have recommended that further archaeological investigation is required across areas of PAD identified as having high archaeological potential and AHIMS site 52-5-0484/52-5-0512 only where impacts will occur from the proposal. The aim of archaeological test excavation as part of Stage 3 PACHCI investigations is to assess the significance of each impacted area in order to inform the preparation of an Aboriginal Cultural Heritage Assessment Report (CHAR) and guide finalisation of the concept design and placement of ancillary facilities.

2.1.1 Archaeological test excavation guidelines

It is the intention of Roads and Maritime to lodge an application to Department of Planning and Environment for project approval as State Significant Infrastructure (SSI) under Part 5.1 of the EP&A Act 1979. It is proposed that SSI application would be submitted in late 2014 during PACHCI Stage 3 investigations.

Prior to issue of the Secretaries Environmental Assessment Requirements (SEARs) of the Albion Park Rail Bypass project, archaeological test excavation will be conducted in accordance with the OEH 'Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales' (2010) [referred to as the 'OEH code of practice']. The OEH code of practice prescribes guidelines for archaeological test excavation without an Aboriginal Heritage Impact Permit (AHIP), and outlines the amount of excavation allowed in a particular area, the size of the test pits, and the way that they are excavated.

3.0 ABORIGINAL STAKEHOLDER CONSULTATION

Comprehensive Aboriginal stakeholder consultation in accordance with the Roads and Maritime PACHCI and the OEH 'Aboriginal cultural heritage consultation requirements for proponents' (2010) is being conducted by Roads and Maritime.

Artefact Heritage has been informed that the following Aboriginal stakeholders have registered for the Albion Park Rail Bypass project:

- South West Rocks Aboriginal Corporation
- Sheryl Davis
- National Koori Site Management
- Kullila Site Consultants
- Three Ducks Dreaming Surveying and Consulting
- Gunnamaa Dream'n
- Anthony Moore
- Illawarra Local Aboriginal Land Council
- Leanne Tungai
- Craig Tungai
- Illawarra Aboriginal Corporation
- James Davis

Roads and Maritime will forward this archaeological test excavation methodology to registered Aboriginal stakeholders for a 28 day review period. An Aboriginal Focus Group (AFG) meeting will be scheduled during the 28 day review period to provide all registered Aboriginal stakeholders the opportunity to discuss the project and test excavation methodology with representatives of Artefact Heritage, Roads and Maritime Services and HCJV.

4.0 BACKGROUND CONTEXT

A comprehensive summary of background information for the project is provided in the PACHCI Stage 2 ASR and two addendum reports prepared for the project. These documents are attached with this document. A summary of pertinent background information is included below.

4.1 Environmental context

Much of the study area crosses through the floodplain associated with Duck Creek and Macquarie Rivulet. The land at the very northern end of the study area rises up moderately into the hill slopes of Mount Brown. South of this, the terrain flattens out towards the floodplain. The area immediately to the north and west of where the study area crosses Macquarie Rivulet is gently undulating. The east-west stretch of the study area runs along the northern basal slopes of Wentworth Hills and Signal Hill, which are drained by Horsley Inlet and its tributaries. Overall, the landform units within the study area range from alluvial flats and creek terraces, to gentle and moderate hill slopes and gullies. The study area presents an opportunity to investigate a variety of landform units across a large area.

4.2 Aboriginal histories of the locality

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The study area is located within the Dharawal language group area (Attenbrow 2010: 34). The Dharawal language group was largely coastal and is thought to have extended from the Shoalhaven River in the south, to Botany Bay in the north and then inland to Camden (Attenbrow 2010: 34). The Dharawal language group was bordered to the north in the Botany Bay – southern Sydney region by the Darug and to the west in the Mittagong – Moss Vale region by the Gundungurra. The study area falls within the territory of the Dharawal-speaking Wodi Wodi people. Tindale (1974) described the territory of the Wodi Wodi as extending from north of the Shoalhaven River at Nowra to Wollongong and inland to Moss Vale.

The area covered by the Dharawal language included a variety of landscape and resource types, including coastal and estuarine environments, rolling hills and creeks bordering the coastal environment, and the large sandstone escarpment and plateau. Sullivan (cited in Rich 1988: 23) suggested that the boundary between the Gundungurra and the Dharawal was the divide between the coastal and inland river systems, which runs on an approximate south-west to north-east line east of Wingello, Bundanoon, Robertson and Mittagong. Movement across these different terrain types and resource areas may have been dictated by the season or purpose (DEC 2005: 8). Additionally, exchange with people from surrounding language groups included Gundungarra and Wiradjuri people travelling to the coast to exchange foods and raw materials, whilst the Dharawal and Awabakal (Central Coast region) shared ceremonies (DEC 2005: 8).

Long-term areas of interaction and 'travel corridors' for movement between different language groups may have existed where there were shared boundaries. Laila Haglund has suggested that the Campbelltown area in south-west Sydney may have represented the intersection between the boundaries of the Dharawal, Darug and Gundungurra, and that the Narellan Valley may have been part of a 'travel corridor' facilitating movement between the north-western Sydney and the Illawarra (JMcD CHM 2007: 21 after Haglund 1989).

Early interaction between the Dharawal and the British was intermittent and brief. The earliest sighting of British people by the Dharawal would most likely have been when they saw sailing ships along the coast. The records of Captain Cook and several of his crew document seeing numerous fires and occasional Aboriginal people on the coastline in the Illawarra region (Organ 1993: 46). Organ (1993: 49) documents an anonymous exploration journal attributed to surveyor George William Evans, which recorded an overland expedition north from Jervis Bay via Wollongong in 1812. The exploration party encountered several groups of Aboriginal people, and at one point exchanged some of their possessions with one of the groups for oysters (Organ 1993: 49).

Several of the early British settlers in the Illawarra documented large gatherings of Aboriginal people, including a reference by Navin (1994: 8) that Robert James, a local resident of the area, recorded a camp of around 100 Aboriginal people on the banks of American Creek at Mount Kembla. In 1836 a group of around 200 Aboriginal people were observed in the Illawarra area as they were preparing to travel to Cowpastures in south-west Sydney (Griffin 1986: 6 cited in AMBS 2010: 33).

A variety of flora and fauna resources were utilised in the Illawarra region for subsistence, personal ornament and tool requirements. The variety of subsistence resources in the Illawarra included marine, estuarine, freshwater and hinterland flora and fauna. Early British records documented torchlight spearing of bream and consumption of whale meat (Organ 1993: 262). The consumption of whale was documented as an important event linked to the spirits of their ancestors (Organ 1993: 262). Cabbage trees were used for various purposes, including utilisation of the fibre (Organ 1993: 155), used to make bridges over creeks and for food (AMBS 2010: 35). Other plant species utilised for food and tools included bats-wing tree, grass tree, Gynerium lily, various *Eucalypt* sp., mat-rush, sticky hop bush, *Melaleuca* and black wattle (AMBS 2010: 35).

4.3 Previous archaeological investigations

A number of archaeological investigations have been carried out within and around the project area. These have generally been associated with large land releases and the development of infrastructure to service these precincts. The following summary of previous investigations focuses on sub-surface archaeological investigations which have been conducted in the area.

Extensive archaeological assessment and preliminary sub-surface excavation have occurred within the West Dapto Release Area (WDRA), located across gently undulating farming land between the Princes Highway and the Illawarra Escarpment. The WDRA covers a planned residential release area, and extends over a large area stretching from Yallah in the south to Kembla Grange in the north. The WDRA has been subject to an archaeological assessment with sample field survey and test excavation (AMBS 2006), a preliminary Sydney Water Aboriginal heritage desktop assessment that covered both the WDRA and surrounding area, including the current study area (AMBS 2010), and sub-surface investigation in specific release areas (AHMS 2011).

A total of 136 test pits were excavated across the WDRA by AMBS (2006), sampling the main landform units within the study area – slope, alluvial flat, drainage channels and crest. The number of artefacts recovered totalled 425, and these were retrieved from just over half of the test pits (n=75). The highest number of artefacts retrieved (n=146) came from a single test pit in a slope landform context. Artefacts were recovered from all creek catchments (AMBS 2010: 38).

The majority of artefacts (n=353) were recovered from the upper 20 cm of deposit. The total assemblage comprised a range of raw materials, with chert being predominant (n=176). Quartz was the next most frequent material (n=100), followed by silicified wood (n=51), quartzite (n=41), silcrete (n=38), silicified tuff (n=13) and fine-grained siliceous (n=6). Broken flakes were the most frequent artefact type (n=209), followed by flakes (n=112), flaked pieces (n=82) and cores (n=22). Twenty-nine artefacts displayed modification or retouching. Usewear was identified on five artefacts, and evidence for both retouch and usewear was identified on one artefact (AMBS 2010: 39).

Biosis Research (2007) undertook an archaeological assessment along a proposed gas pipeline route near the Tallawarra Power Station, at Yallah NSW that includes a portion of the current project area near Duck Creek. Biosis identified two areas of PAD, and surface artefacts were identified to the west of the current study area. No sites or areas of PAD were identified along the pipeline route within, or to the east of, the current project area. The two areas of PAD - Tallawarra Pipeline 1 (AHIMS site 52-5-0471) and Tallawarra Pipeline 2 (AHIMS site 52-5-0472) - were subject to a program of test excavation. Thirty-six 1.0 x 0.5 metre test pits were excavated, totalling an area of 18 square metres. A total of 136 artefacts were recovered – nine from Tallawarra Pipeline 1 (seven percent of the excavated assemblage) and 127 from Tallawarra Pipeline 2 (93 percent of the excavated assemblage). The predominant raw material is silcrete (43 percent), with other

common raw materials including chert, quartz and volcanics. Manufacturing debris including flakes, cores and angular fragments comprised 96 percent of the assemblage (Biosis Research 2007: 21-24).

Very few (if any) artefacts were recovered from within many of the test pits, and it is concluded that this distribution represents background scatter. Relatively higher densities were recovered from two areas within Tallawarra Pipeline 2, both associated with locally elevated positions close to the aggraded channel of Duck Creek. It was suggested that these areas were more frequently occupied and utilised than is indicated by the background scatter elsewhere. It was determined that a main function of the area appears to have been stone tool production. The overall low numbers of artefacts possibly indicates that sites were occupied at a low level of intensity, and the area may have been used intermittently to access local wetland sources (Biosis Research 2007: 29-30). It was concluded that the findings are comparable with site predictive models for the Illawarra region, where artefact scatters are the common site types and are usually located on level, well-drained ground, close to water sources and wetlands such as Duck Creek (Biosis Research 2007: 30).

Godden Mackay Logan (GML) conducted archaeological test excavation of PAD SUFA 3 at Lot 12 Ashburton Drive, Albion Park (GML 2012). The PAD area is located on a spur between two second order creeks, approximately 1.5 kilometres to the southwest of the current project area. Thirty-five test pits were excavated, each of 0.50 x 0.50 metres. The total excavation area comprised 8.75 square metres (0.044 percent of the PAD). A total of 54 artefacts were recovered across the 35 test pits. Eleven test pits contained no artefacts. The highest number of artefacts recovered from one test pit was nine, while the remaining test pits contained between one and three artefacts (GML 2012: 25-27). The assemblage included three retouched tools; two artefacts with possible usewear; a broken core; a bipolar flake; 11 complete flakes; seven proximal broken flakes; eight cone-split broken flakes; 11 medial and five distal flake fragments; and five flaked pieces (GML 2012: 30). The most common raw material was fine-grained siliceous, followed by chalcedony, petrified wood, chert and silcrete, most of which can be found within the local area. The uneven soil depths and presence of certain stratigraphic layers across the site reflected the erosional hill slope landform the study area is located on (GML 2012: 34-35). It was concluded that the artefacts of the PAD appear to be part of background scatter as opposed to a concentrated camp site. The PAD has low potential for additional scientific information, and low significance based on scientific value (GML 2012: 54-55).

5.0 AREAS FOR ARCHAEOLOGICAL TEST EXCAVATION

The PACHCI Stage 2 investigations prepared by Artefact Heritage recommended further archaeological investigation should take place at Aboriginal site 52-5-0484/52-5-0512 and at identified areas of PAD where those items will be impacted by the concept design and placement of ancillary facilities. For a full list and discussion of all Aboriginal sites and PADs identified with the project area, refer to the PACHCI Stage 2 reports attached with this document.

The following PADs and Aboriginal site recommended for archaeological test excavation by PACHCI Stage 2 investigations will be impacted by the proposed motorway as prepared by Roads and Maritime and shown in Figure 1:

- YTOF PAD2
- Aboriginal site 52-5-0484/52-5-0512

Roads and Maritime has indicated that the following PADs recommended for archaeological test excavation by PACHCI Stage 2 investigations will be impacted by ancillary facilities, such as compound and stockpile locations:

- YTOF PAD 3
- YTOF PAD 4
- YTOF PAD 5
- YTOF PAD 7

Roads and Maritime has indicated that YTOF PAD 1 will be impacted by relocation of portions of the Croome Road Sporting Complex.

Roads and Maritime has indicated that YTOF PAD 6 will be impacted by realignment of Yallah Road.

Refer to the attached PACHCI Stage 2 reports for a full overview of the recorded attributes and photographs of YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD5, YTOF PAD6, YTOF PAD7, and Aboriginal site 52-5-0484/52-5-0512.

6.0 AIMS OF TEST EXCAVATION

The archaeological field surveys conducted during preparation of the PACHI Stage 2 investigation noted that surface visibility was generally very low across the project area due largely to dense grass cover. Due to the lack of surface visibility in most areas, landform observations and information from previous archaeological investigations were used to inform the selection of areas of PAD. The representative landform for each of the impacted PADs and site subject to this test excavation methodology is listed in Table 1.

Table 1: Impacted PADs and Aboriginal site and associated landforms

Table heading	Table heading
YTOF PAD 1	Slope overlooking Frazers Creek floodplain
YTOF PAD 2	Terrace landform adjacent to Frazers Creek
YTOF PAD 3	Slope overlooking Frazers Creek floodplain
YTOF PAD 4	Terrace on Frazers Creek floodplain
YTOF PAD 5	Terrace and lower slope landform at the confluence of two unnamed watercourses
YTOF PAD 6	Terrace and slope landform adjacent to an unnamed tributary of Duck Creek
YTOF PAD 7	Flat and associated low-lying rise overlooking Duck Creek
AHIMS site 52-5-0484/52-5-0512	Crest landform overlooking Macquarie Rivulet

The selection of areas of PAD within the project area provides a representative sample of different landforms over a long, relatively linear area, and presents the opportunity to further investigate these areas and add to the corpus of archaeological information for the region. Areas of PAD that will be investigated in accordance with this test excavation methodology includes key landforms within the project area, including crest landform (AHIMS site 52-5-0484/52-5-0512), raised areas associated with watercourses (YTOF PAD 1, YTOF PAD 3, YTOF PAD 6 and YTOF PAD 7), terrace landform (YTOF PAD 2 and YTOF PAD 4), and a raised area at the confluence of two watercourses (YTOF PAD 5).

Previous surface and sub-surface archaeological investigations in the area have identified some particularly high concentrations of artefacts (AHIMS site 52-5-0484/52-5-0512) on a crest landform overlooking Macquarie Rivulet, as well as lower density background scatters interspersed with higher artefact concentrations across slope and crest landforms in the local area. Archaeological test excavation as outlined in this methodology will further investigate the distribution of Aboriginal objects in sub-surface contexts across the project area and provide more information on Aboriginal land use patterns.

In accordance with the OEH code of practice, the aims of archaeological test excavation are:

- To adequately identify the extent of YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6, YTOF PAD 7 and AHIMS site 52-5-0484/52-5-0512.
- To assess the scientific significance of each of YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6, YTOF PAD 7 and AHIMS site 52-5-0484/52-5-0512 following an assessment of test excavation results.

- To provide an opportunity for registered Aboriginal stakeholders to comment on the Aboriginal cultural heritage values of the site.
- To provide the proponent with recommendations on opportunities to avoid impact and future requirements for further archaeological investigation where required.

7.0 EXCAVATION METHODOLOGY

Archaeological test excavation would be conducted at each location with the aim of testing the extent and nature of potential sub-surface Aboriginal objects.

The basis of the test excavation would be hand excavated 50 centimetre x 50 centimetre excavation units. These would be spaced out on transects oriented to adequately test the extent of potential sub-surface Aboriginal objects at each location. A brief description of the proposed number and orientation of test pits at each location is outlined below and shown in Figures 2 – 9.

7.1 YTOF PAD 1

Roads and Maritime has advised that YTOF PAD 1 will be impacted by relocation of parts of the Croome Sporting Complex from the motorway alignment. Test excavation of YTOF PAD 1 will involve the excavation of approximately 26 excavation units distributed on a 15 metre grid.

7.2 YTOF PAD 2

The motorway will impact approximately 35 metres of the southwestern corner of YTOF PAD 2. An additional 30 metre area bordering the concept design is also likely to be impacted, including 10 metres for ancillary construction works and a 20 metre buffer area. The remaining eastern portion of YTOF PAD2 will not be impacted under the current concept design.

Test excavation at YTOF PAD 2 will involve the excavation of approximately 14 excavation units distributed on a 15 metre grid.

7.3 YTOF PAD 3

Roads and Maritime has advised that YTOF PAD 3 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation of YTOF PAD 3 will involve the excavation of approximately 44 excavation units distributed on a 15 metre grid.

7.4 YTOF PAD 4

Roads and Maritime has advised that YTOF PAD 4 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation of YTOF PAD 3 will involve the excavation of approximately 19 excavation units distributed on a 15 metre grid.

7.5 YTOF PAD 5

Roads and Maritime has advised that YTOF PAD 5 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation at YTOF PAD 5 will involve the excavation of approximately 11 excavation units distributed on a 15 metre grid. Excavation will be divided between two areas separated by a large dam, with a proposed four excavation units to the north of the dam and seven to the south.

7.6 YTOF PAD 6

Roads and Maritime has advised that YTOF PAD 6 will be impacted by realignment of Yallah Road. Test excavation at YTOF PAD6 will involve the excavation of approximately 21 excavation units distributed 15 metres apart on three parallel transects spaced 20 metres apart.

7.7 YTOF PAD 7

Roads and Maritime has advised that YTOF PAD 7 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation at YTOF PAD 7 will involve the excavation of approximately 14 excavation units distributed 15 metres apart on two parallel transects spaced 20 metres apart.

7.8 AHIMS site 52-5-0484/52-5-0512

The concept design will impact a large portion of AHIMS site 52-5-0484/52-5-0512. The distribution of excavation units across AHIMS site 52-5-0484/52-5-0512 has taken into consideration an area of dumped rubbish on the ground surface towards the northern portion of the site. Approximately 18 excavation units will be distributed 15 metres apart on three parallel transects spaced 15 metres apart. A fourth, northern transect on the northern side of the dumped rubbish will involve the excavation of four excavation units spaced 15 metres apart along the approximate alignment of the original surface finds of artefacts at the site by AMBS (2006).

Figure 2: Proposed layout of excavation units at YTOF PAD 1

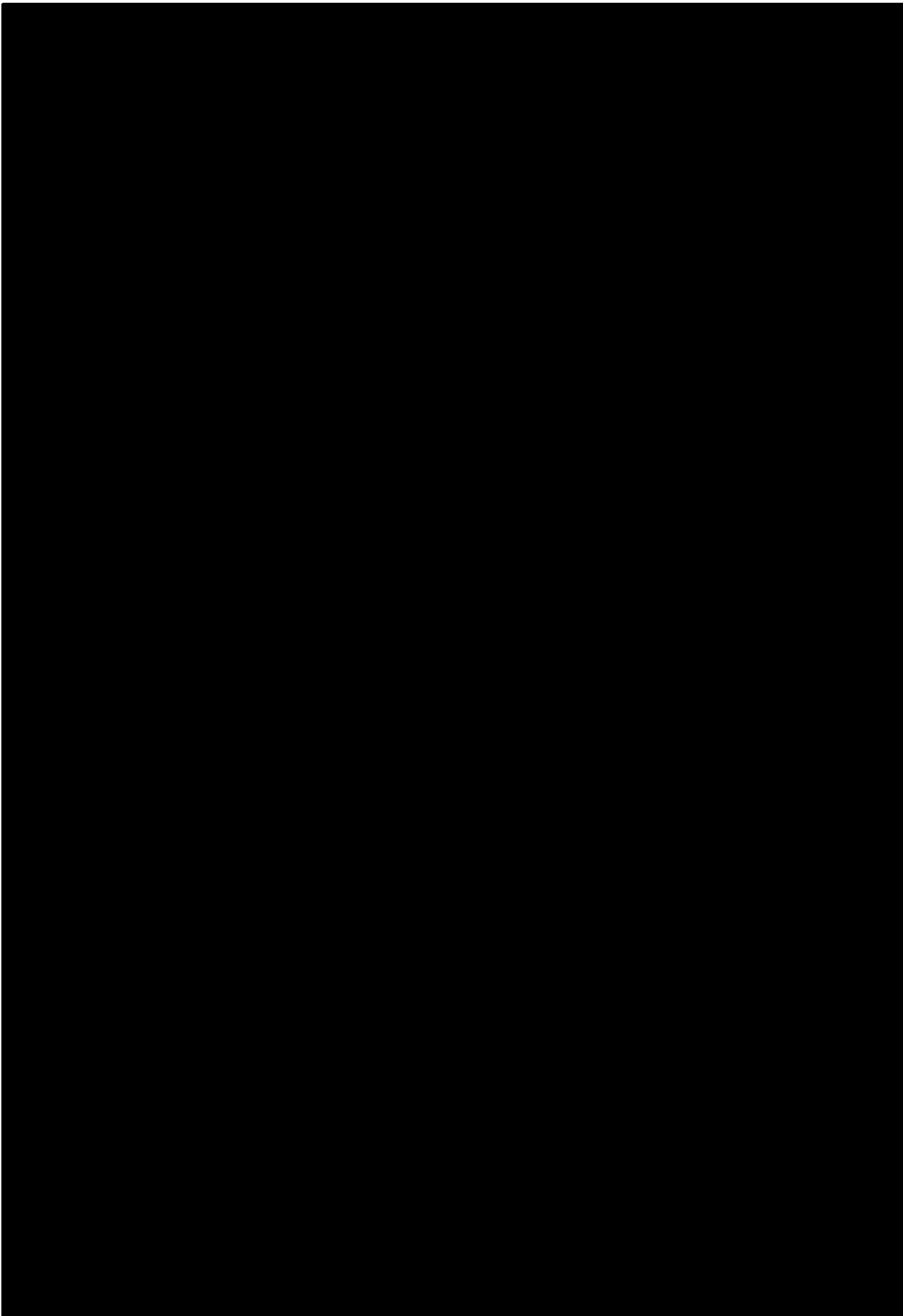


Figure 3: Proposed layout of excavation units at YTOF PAD2

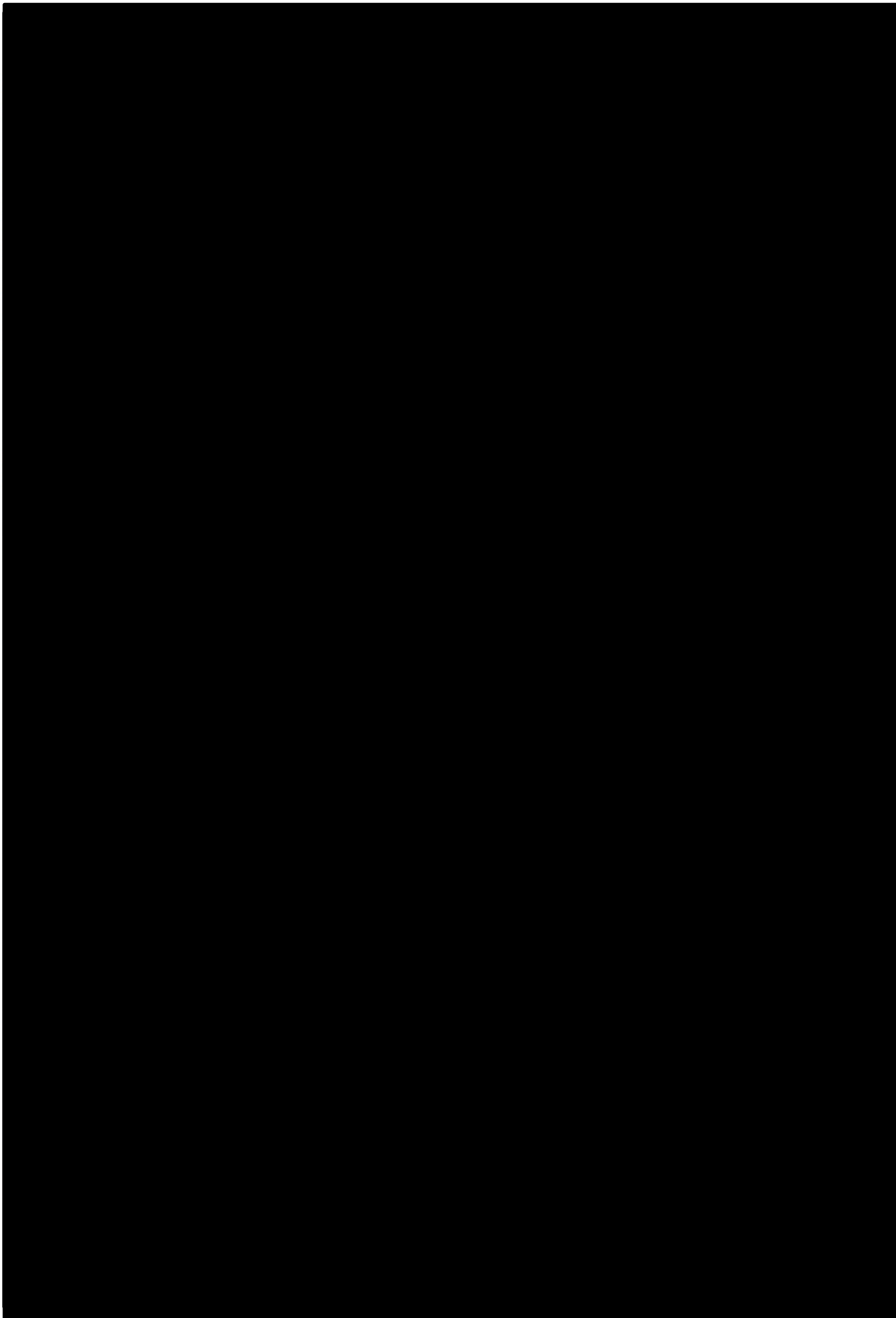


Figure 4: Proposed layout of excavation units at YTOF PAD 3

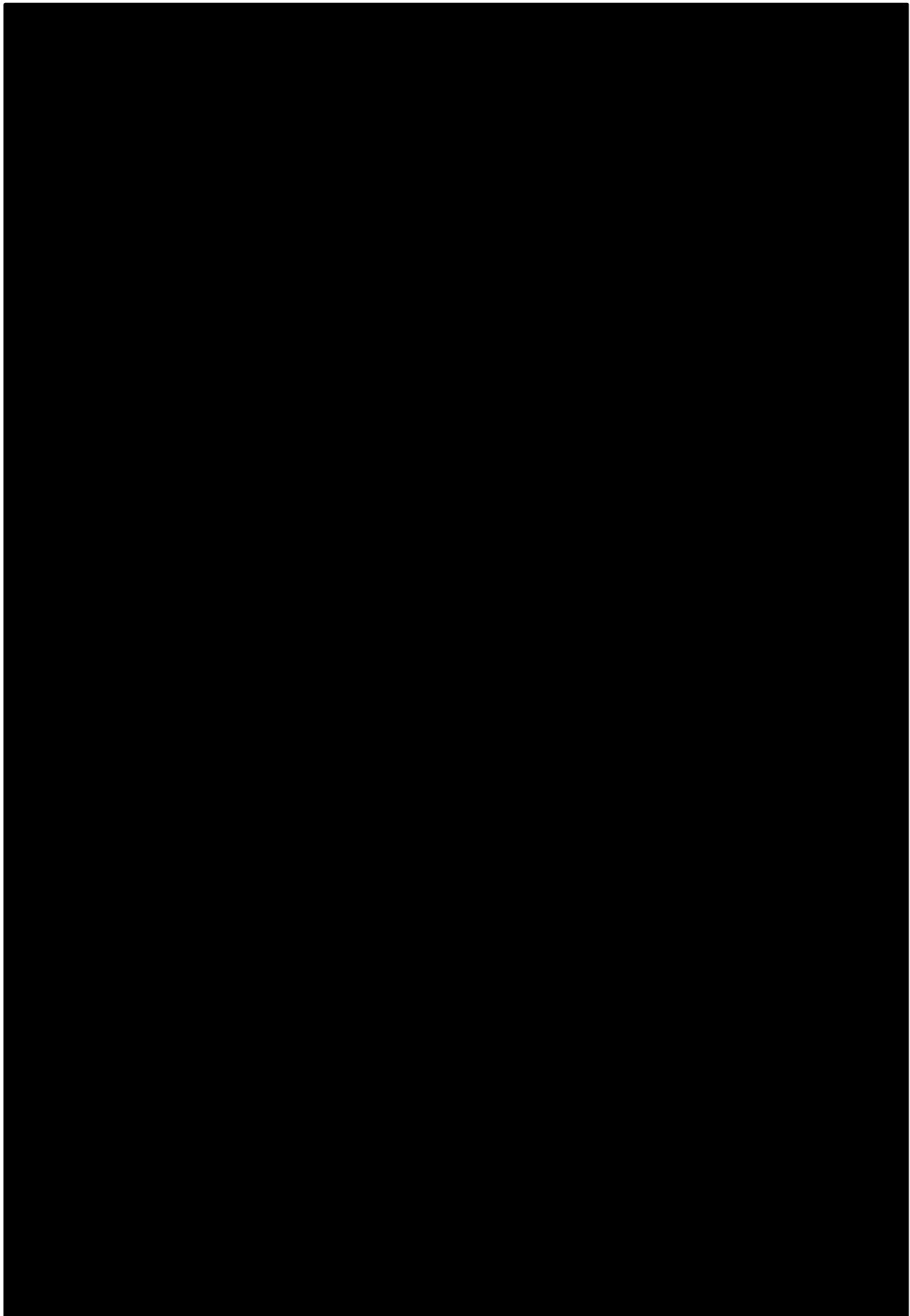


Figure 5: Proposed layout of excavation units at YTOF PAD 4

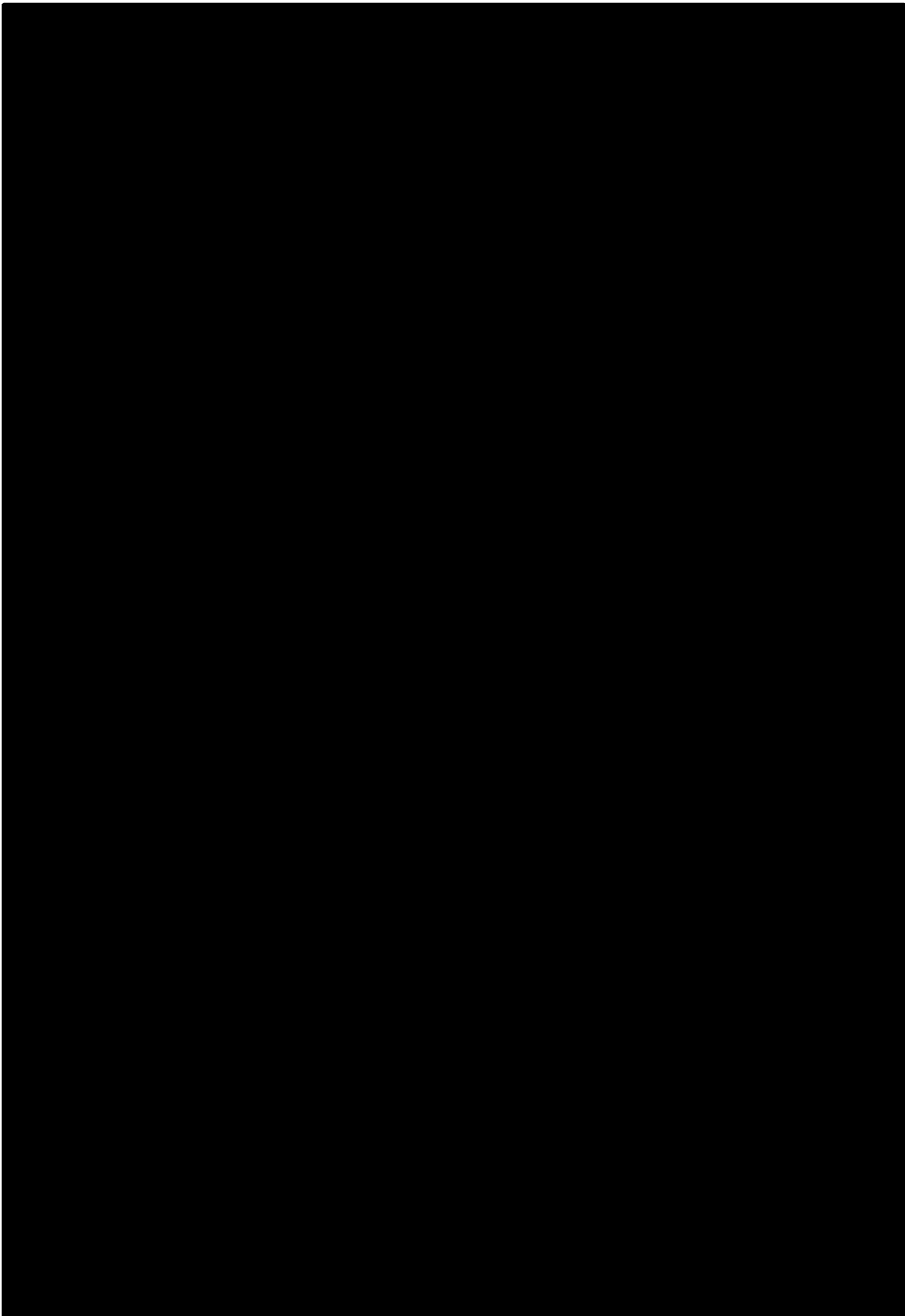


Figure 6: Proposed layout of excavation units at YTOF PAD 5

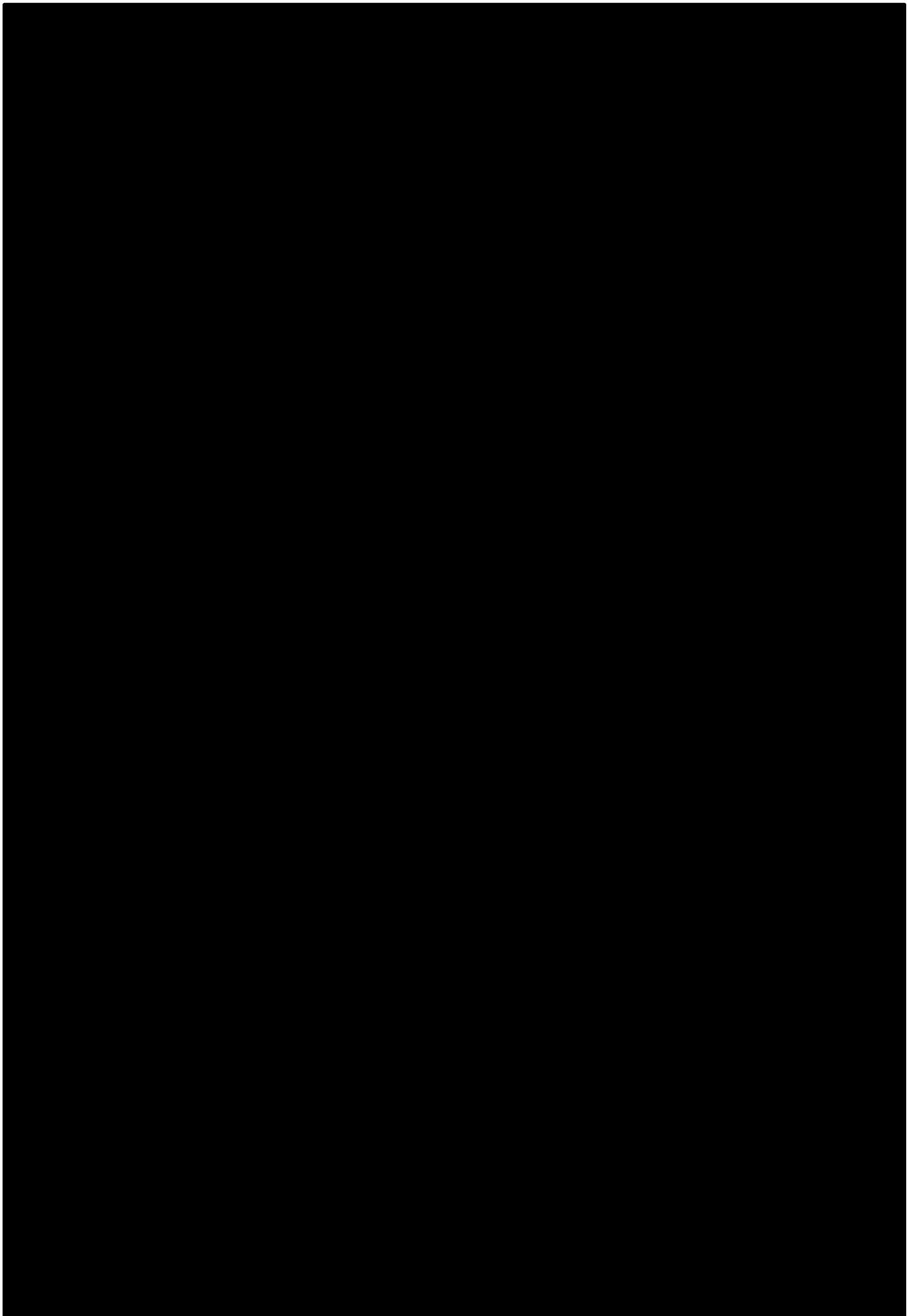


Figure 7: Proposed layout of excavation units at YTOF PAD 6

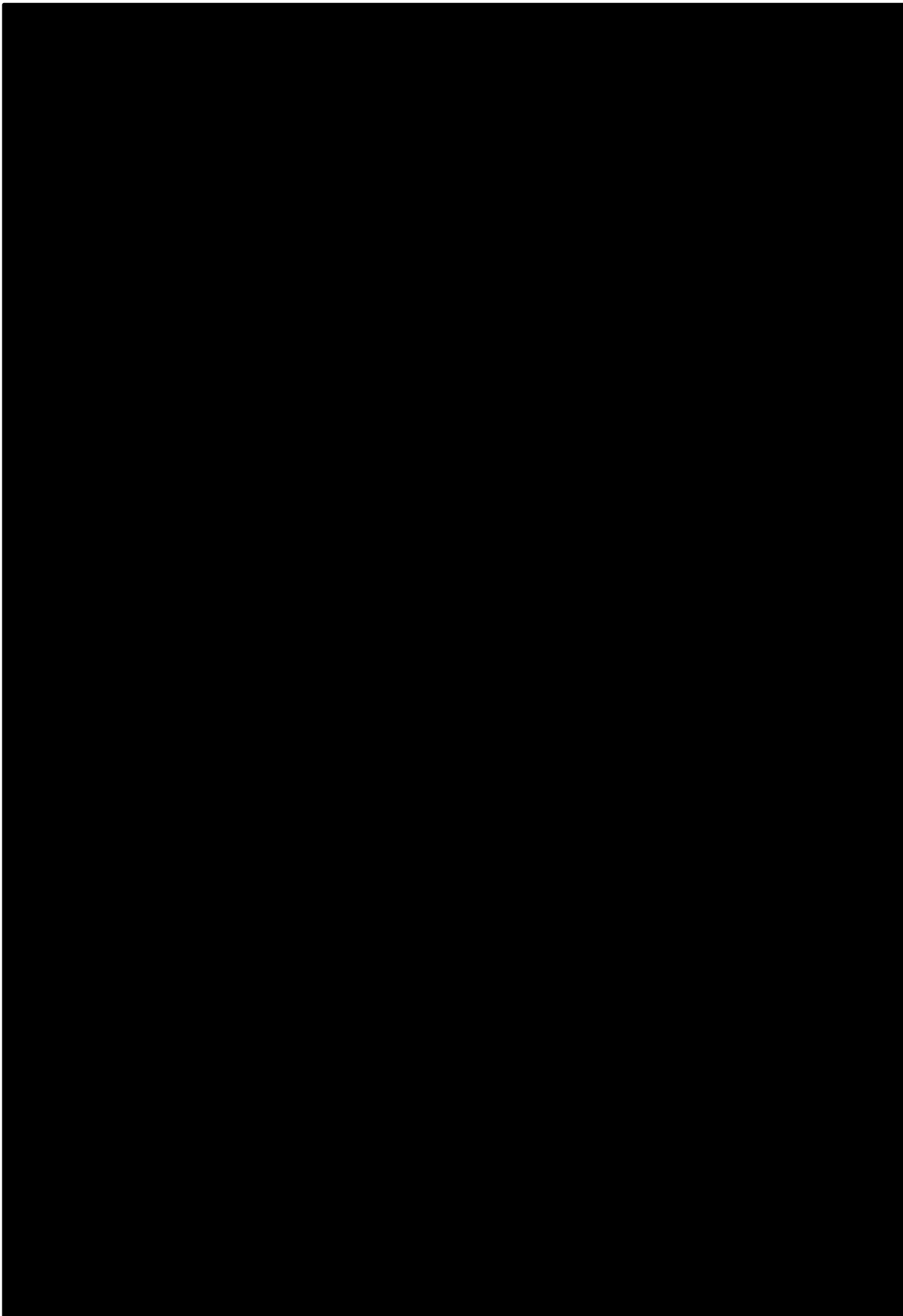


Figure 8: Proposed layout of excavation units at YTOF PAD 7

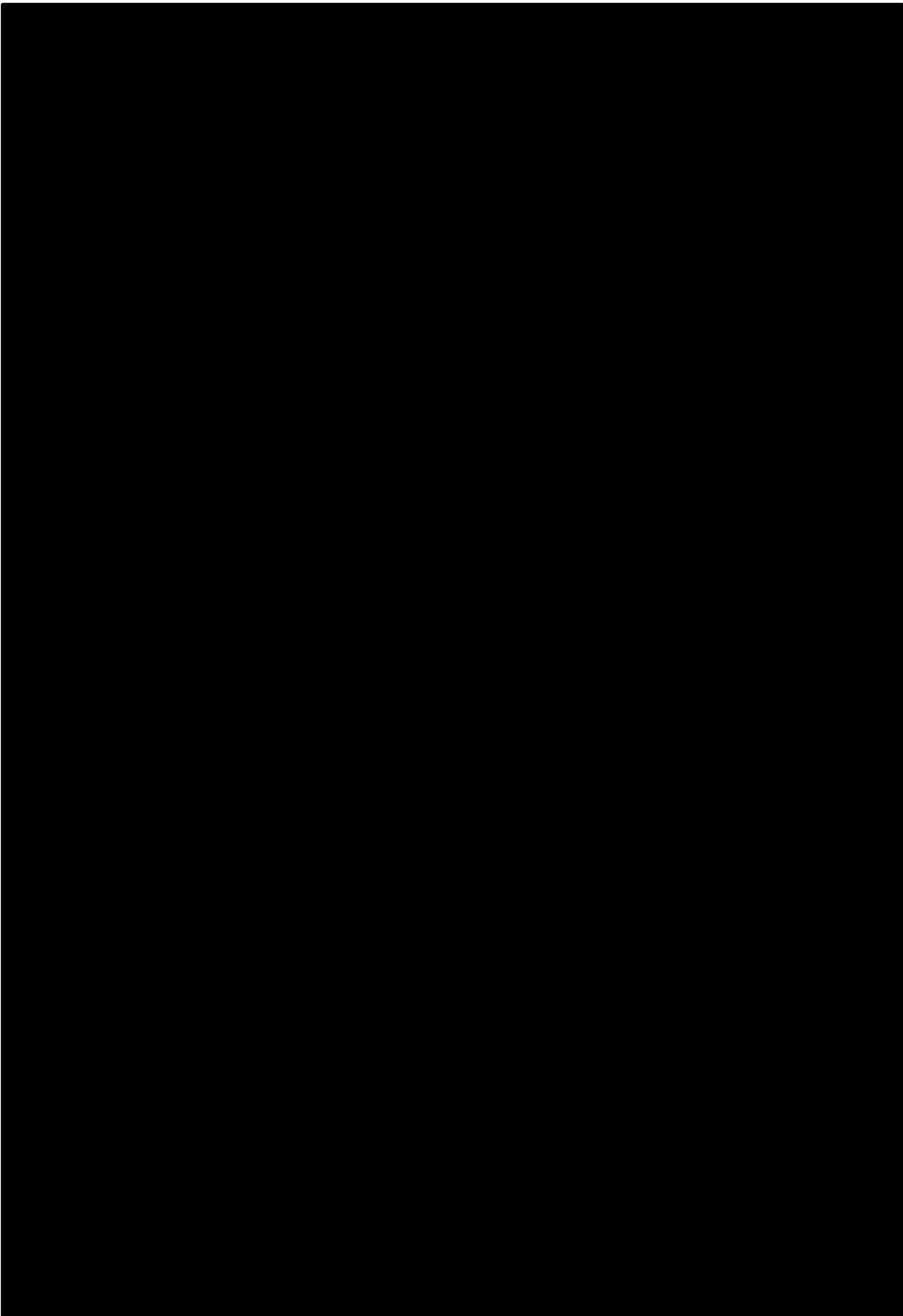
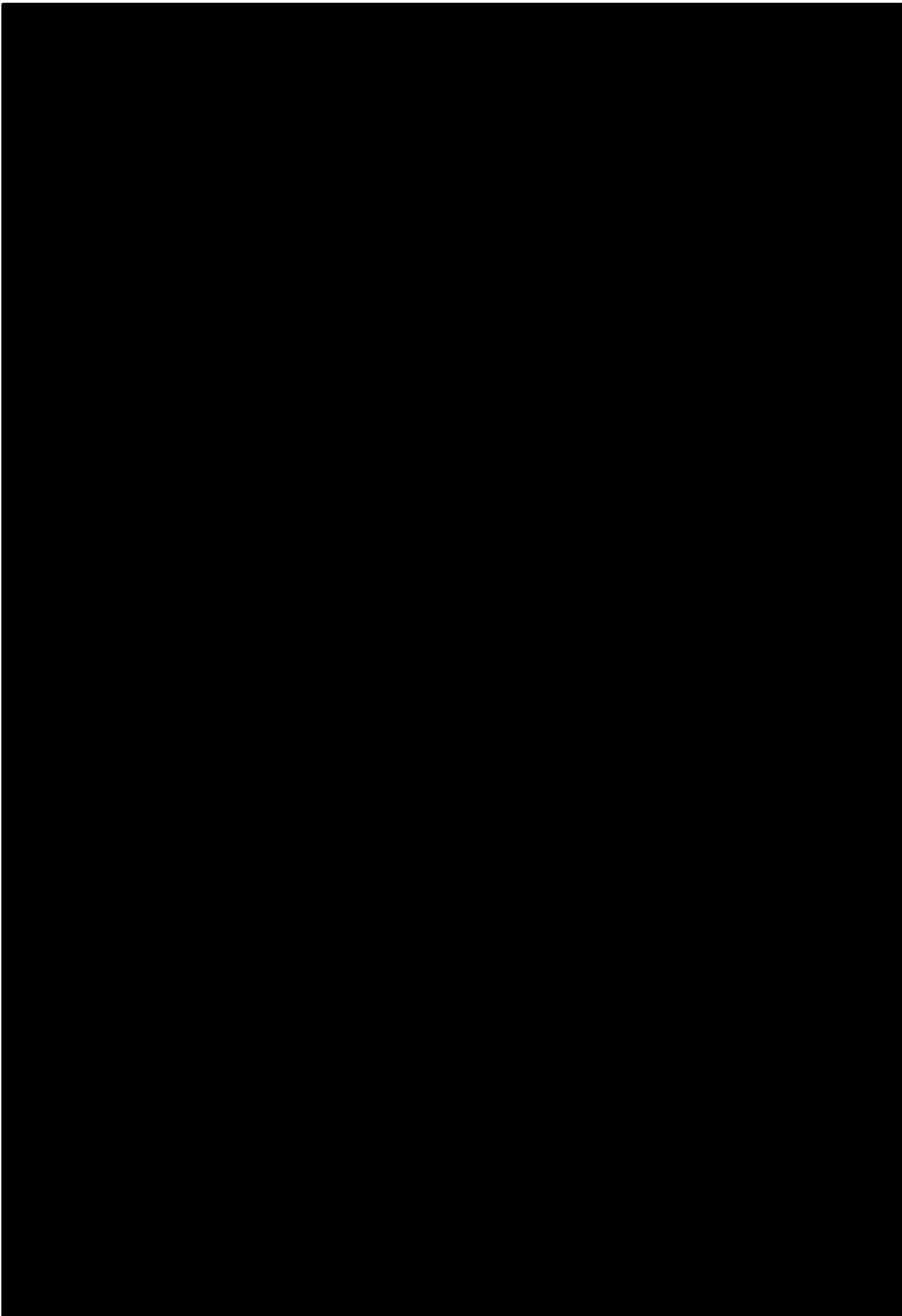


Figure 9: Proposed layout of excavation units at AHIMS site 52-5-0484/52-5-0512



7.9 Changes to number of pits excavated and timing

The proposed total number of excavation units across all locations is 171, with the total number excavation units at each location approximate only. The distribution and total number of pits shown in Figures 2 to 9 is a guide only. Examples of circumstances that may alter the timing and total number of pits at each location include the depth of deposit, hardness of deposit, any encountered areas of contamination, and access issues. It is anticipated that the test excavation would be completed in a period of 4-5 weeks.

Where there is some potential to encounter deeper deposits, such as at YTOF PAD 2, excavation would aim to determine the nature of fluvially deposited layers in those areas and whether further archaeological investigation following completion of PACHCI Stage 3. The test excavation methodology in areas of deep deposit would need to be altered to combine excavation units into a larger excavation point, such as combining four 50 centimetre x 50 centimetre excavation points to form a one metre x one metre excavation point, which would potentially reduce the areal distribution of test excavation. At no point would excavation proceed below 1.5 metres depth due to Occupation Health and Safety reasons. Any requirements for excavation below 1.5 metres would be determined following test excavation and carried out at a later stage.

The OEH code of practice outlines requirements for when enough information has been retrieved and test excavation must cease. Test excavation at each location must cease when (DECCW [now OEH] 2010: 28):

- *'Suspected human remains are encountered.*
- *Enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.'*

'Enough information' is defined by OEH (DECCW [now OEH] 2010: 28) as:

'the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance, and may include things like:

- *Locally or regionally high object density.*
- *Presence of rare or representative objects.*
- *Presence of archaeological features or locally or regionally significant deposits, stratified or not.'*

The determination of whether there is enough information to stop excavation would be made in the field following discussions between the site supervisor and Aboriginal stakeholder representatives present in the field at that time.

Archaeological test excavation will also cease where potential shell midden material is encountered. Archaeological excavation of shell midden deposits requires an AHIP.

7.10 Excavated area

Under the OEH code of practice guidelines for test excavation, no more than 0.5% of each investigated location can be excavated without an AHIP. A summary of the areal total of each area and proposed total excavation area is outlined in Table 2 below.

Table 2: Excavation area

PAD/ site name	Total square metres	Proposed excavation area (metres ²)	Proposed excavated percentage of total area
YTOF PAD 1	14503	6.5	0.04%
YTOF PAD 2	9342	3.5	0.03%
YTOF PAD 3	20804	11	0.05%
YTOF PAD 4	8398	4.75	0.05%
YTOF PAD5	10355	2.75	0.02%
YTOF PAD6	9755	5.25	0.05%
YTOF PAD7	5067	3.5	0.06%
AHIMS site 52-5-0484/ 52-5-0512	10490	5.5	0.05%

The proposed test excavation at each area will not exceed the maximum excavation area of 0.5% as outlined in the OEH code of practice.

7.11 Excavation procedure

Transects and excavation squares would be laid out using long hand-tapes, flags and pegs. An initial baseline would be laid out at each location, and trigonometry used to lay out parallel transects and offset excavation squares. A flag and peg would be placed at each point to be tested, and hand tapes and pegs used to lay out the remaining pegs at each corner of the excavation units. A datum would be established at the first excavation unit on the baseline. The location of each excavation unit would be recorded using a hand-held non-differential GPS, and the magnetic bearing of the first transect recorded using a compass. An arbitrary site grid would be established at each datum, using a number sequence such as X2000 Y2000.

In accordance with the OEH code of practice, the initial excavation unit at each location would be excavated in 5 centimetre spits. Subsequent excavation units will be excavated in 10 centimetre spits to the base of the artefact bearing deposit (with the exception of deposits deeper than 1.5 metres – see Section 7.6). Where time allows and further investigation is required for particular areas, the code of practice allows for excavation units to be combined to open an area no larger than three square metres. The location of small open area excavations at each location would be at the discretion of the supervising archaeologist in consultation with Aboriginal stakeholder representatives in the field.

A context sheet for each excavation unit would be completed in the field. Details recorded will include date of excavation, name of excavators, depth, number of buckets and soil description. Additionally, one representative section wall from each excavation unit will be scale drawn, and photographs will be recorded of each section wall and base.

All retrieved deposit from each excavation unit would be placed in buckets and transported to a sieve area using wheelbarrows. All retrieved deposit would be sieved using nested 5 mm and 3 mm sieves.

All excavation units would be back-filled with clean fill and sieve spoil (see Section 7.9) following the completion of test excavation using a rubber tracked back-hoe or similar plant.

7.12 Wet sieving

It is anticipated that all of the excavated soils will be wet sieved as opposed to dry sieving. Wet sieving will involve establishing silt fencing where necessary to stop the flow of sediment loaded water into any neighbouring watercourse. Erection of silt fencing will involve the placement of wooden stakes in the ground at set intervals to support the silt fence.

Management of sieved spoil at each location will be arranged with HCJV and Roads and Maritime, and may involve collection of some of that material and back-fill into the excavated pits using a rubber tracked back-hoe or similar plant.

7.13 Fencing off open excavation units

Arrangements for the necessity of fencing off open excavation units overnight will be discussed with HCJV and Roads and Maritime for each location. Depending on the presence of livestock or public accessibility, marking out open excavation units may require high-visibility fencing around wooden stakes or metal star pickets. Where there is no livestock or public access, a flag at one corner of the pit may suffice.

7.14 Procedure for the discovery of human remains

Under the OEH code of practice and Roads and Maritime unexpected archaeological finds procedure, archaeological test excavation must cease when suspected human remains are encountered.

In the situation where human remains or suspected human remains are identified, all work will cease at that location and procedures enacted as outlined in Appendix F of the Roads and Maritime unexpected archaeological finds procedure. This includes seeking specialist advice where clarification of the nature of skeletal remains is required, or contacting the NSW Police directly where it is immediately obvious that the remains are human. Where the skeletal material is more than 100 years old and are likely to be Aboriginal remains, OEH must be notified on the Environment Line (131 555) and no further works can proceed in that area until authorisation in writing is provided by OEH.

Hard copies of the Roads and Maritime unexpected archaeological finds procedure and the OEH code of practice will be available in the field throughout the test excavation program.

7.15 Aboriginal objects

All Aboriginal objects retrieved during the course of test excavation would be washed and placed in re-sealable bags for further analysis and recording. Once test excavation has been completed, the artefact assemblage would be recorded and stored as stipulated in the OEH code of practice. This includes recording key attributes of material, artefact type, platform type, termination type and dimensions, as well as photographic and drawn records of representative artefacts. All recorded information would be entered into a Microsoft Excel table with detail linked to the provenance of each artefact. Once entered into the Excel table, the data can be readily supplied with the test excavation report to OEH and registered Aboriginal stakeholders in both electronic and hard-copy form.

All artefacts would be given a unique number and stored in double re-sealable snap lock bags. A permanent marker will be used to record the provenance and unique number of artefacts in each bag. All artefacts would be given a unique number and stored in double re-sealable snap lock bags. A permanent marker will be used

to record the provenance and unique number of artefacts in each bag in writing on the outside of the bag and on an archival grade tag such as Dupont TM Tyvek [®] paper.

All artefacts retrieved during the test excavation program must be reburied as soon as practicable in a manner prescribed by the OEH code of practice. The exact location of reburial would be decided following the completion of the test excavation report and assessment of site extent and scientific significance. The location of the reburied artefacts must be recorded with a hand-held GPS and the coordinates forwarded to OEH on an Aboriginal Heritage Information Management System (AHIMS) site recording form.

Options for long-term management of retrieved Aboriginal objects will be discussed with registered Aboriginal stakeholders during Stage 3 of the PACHCI. Options for long-term management options may include leaving the objects at their reburial location or deposition at the Australian Museum.

8.0 REPORTING ON ABORIGINAL OBJECTS

A report detailing the results of the archaeological test excavation program would be prepared once excavation and artefact recording activities are concluded. The excavation report would be completed to the requirements outlined in the OEH code of practice requirement 11 and Stage 3 of the PACHI.

The excavation report would provide details on the established extent and scientific significance of each of the investigated PADs and Aboriginal site, and would provide recommendations regarding the necessity of further archaeological investigations.

If an investigated location is assessed as demonstrating low archaeological significance, no further archaeological investigation would be required.

If an investigation location is assessed as demonstrating moderate-high archaeological significance, further archaeological work, such as salvage excavation may be required following completion of PACHI Stage 3 investigations.

Due to the fact that an application will be made for the Albion Park Rail Bypass project to be assessed as SSI under Part 5.1 of the EP&A Act, it is anticipated that any further archaeological investigation recommended following the completion of PACHI Stage 3 investigations would not require an AHIP from OEH, and would instead be subject to approvals under Part 5.1.

8.1 Changes to proposed impacts

Where proposed impacts are revised to encompass other areas of high archaeological potential identified during PACHI Stage 2 investigations, a separate test excavation methodology and timeframes for stakeholder review as specified in the OEH code of practice and Roads and Maritime PACHI will be required.

8.2 Site recording form and site impact recording form

A site recording form will be submitted to the OEH AHIMS site register where Aboriginal objects are retrieved from any of the investigated PADs.

A site impact recording form will be submitted to the OEH AHIMS site register to document test excavation results at AHIMS site 52-5-0484/52-5-0512 and where Aboriginal objects are retrieved from any of the investigated PADs. There is not a requirement to submit a site impact recording form for any of the investigated PADs where no Aboriginal objects are retrieved.

9.0 REFERENCES

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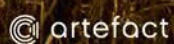
9.7 Appendix H: Archaeological test excavation report

Albion Park Rail Bypass PACHCI Stage 3



Archaeological Test Excavation Report

Report to Hyder Cardno Joint Venture
(HCJV) on behalf of Roads and
Maritime Services
April 2015



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EXECUTIVE SUMMARY

This report documents the findings of test excavations undertaken by Artefact Heritage, on behalf of Roads and Maritime Services (Roads and Maritime) and Hyder Cardno Joint Venture (HCJV), as part of the Albion Park Rail Bypass project. Test excavations were undertaken in order to inform preparation of the Aboriginal Cultural Heritage Assessment Report (CHAR).

A full overview of the project is included in the CHAR and will not be repeated in this document. The CHAR details all Aboriginal sites which were identified within the study area over the course of the archaeological survey report (ASR) investigations and subsequent two addendums which precede this archaeological test excavation report (ATER). A total of 19 Aboriginal sites are discussed in the CHAR, however this ATER concerns only the locations which were to be impacted by the proposed works and warranted test excavation, as identified in the ASR.

Of the locations identified for test excavation in the ASR, one comprised a previously recorded Aboriginal site (Aboriginal Heritage Information System [AHIMS] site # 52-5-0484/52-5-0512- a duplicate recording) and seven were areas of potential archaeological deposit (PAD) (YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7).

Prior to test excavation commencing, Roads and Maritime advised that YTOF PAD 3 would no longer be impacted by the proposed works. As such, YTOF PAD 3 was removed from the test excavation program.

Test excavation targeted AHIMS site # 52-5-0512, YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7. Test excavations of the above PADs and AHIMS site were carried out between the 10 and 27 November 2014.

The aim of archaeological test excavation as part of Stage 3 PACHCI investigations is to assess archaeological significance in order to inform the preparation of a CHAR and guide finalisation of the concept design and placement of ancillary facilities.

This ATER details the findings of the test excavations at seven locations and includes recommendations for management of Aboriginal heritage values.

All sites where Aboriginal artefacts were recovered have been designated a name reflecting an artefact scatter site type (i.e. YTOF AS 3-8) or an isolated find site type (i.e. YTOF IF 4).

Overview of findings

- No Aboriginal objects were located at YTOF PAD 7.
- Low density subsurface stone artefact scatters were identified at AHIMS site # 52-2-0512, YTOF PAD 1 (AS 3), YTOF PAD 5 (AS 6) and YTOF PAD 6 (AS 7).
- Moderate density subsurface stone artefact scatters were identified at YTOF PAD 2 (AS 4) and YTOF PAD 4 (AS 5). Stone artefact scatter sites are common in the local context (AMBS 2010 Biosis Research 2007). However, YTOF PAD 2 (AS 4) and YTOF PAD 4 (AS 5) present the opportunity to provide further information on Aboriginal activity in the region and contribute to the body of archaeological knowledge, due to the moderate densities of artefacts and specialised tools represented in the assemblages.

- Two new artefact sites were identified. YTOF AS 8 and YTOF IF 4 were located within YTOF PAD 1 and YTOF PAD 4 respectively, but were spatially and contextually distinct from the main artefact concentrations identified during test excavation at these PADs.

Recommendations

- The low density artefact scatters identified at AHIMS site # 52-2-0512, YTOF PAD 1 (AS 3, AS 8), YTOF PAD 5 (AS 6) and YTOF PAD 6 (AS 7) are common in the local context and offer little opportunity for further research. The isolated artefact identified at YTOF PAD 4 (IF 4) is an isolated artefact within a disturbed context and also requires no further investigation. No artefacts were retrieved from YTOF PAD 7. As such, no further work is recommended at these sites; # 52-2-0512, YTOF PAD 1 (AS 3 and AS 8), YTOF PAD 5 (AS 6), YTOF PAD 6 (AS 7), YTOF PAD 4 (IF 4) and YTOF PAD 7.
- If impacts cannot be avoided to YTOF PAD 2 (AS 4) and YTOF PAD 4 (AS 5), archaeological salvage excavation is recommended in order to adequately investigate the subsurface deposits at these sites.
- Roads and Maritime have advised that the proposed works will not impact YTOF PAD 3. As such, YTOF PAD 3 was not subject to test excavations. If the concept designs are altered or potential impacts identified for YTOF PAD 3, it is recommended that test excavation be undertaken prior to works commencing.
- Long term care of excavated artefacts, such as reburial, should be undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (Code of Practice) and the recommendations of registered Aboriginal stakeholders.
- A site update card would be submitted to AHIMS for AHIMS site # 52-2-0512.
- Site recording cards would be submitted to AHIMS for YTOF PAD 1 (AS 3 and AS 8), YTOF PAD 2 (AS 4) and YTOF PAD 4 (AS 5 and IF 4), YTOF PAD 5 (AS 6), YTOF PAD 6 (AS 7), YTOF PAD 4 (IF 4)

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1.0 INTRODUCTION

1.1 Introduction

Artefact Heritage was engaged by Roads and Maritime in 2013 to prepare an archaeological survey report (ASR) as part of Stage 2 of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011 (PACHCI) for the project. Following finalisation of that document in June 2013, Roads and Maritime engaged Artefact Heritage to prepare a first addendum to that investigation in March 2014. The first addendum concerned properties within the study area that were not accessible for the original investigation, as well as an addition to the study area that incorporated the Croom Regional Sporting Complex.

As part of final options development for the Albion Park Rail Bypass, HCJV, on behalf of Roads and Maritime, identified a number of additional areas which required archaeological investigation outside the previous boundaries of the project area. This includes the possible location of road interchanges and widening of the originally proposed corridor to accommodate alignment alterations. As such, HCJV engaged Artefact Heritage to prepare a second addendum PACHCI Stage 2 ASR for those additional areas.

The identified areas of Potential Archaeological Deposit (PAD) and Aboriginal sites are shown in Figure 1. The ASR recommended that further archaeological investigation, including test excavation, should take place where there will be impacts to identified PADs and/ or AHIMS sites.

The Aboriginal Cultural Heritage report (CHAR) details all Aboriginal sites which were identified within the study area over the course of the archaeological survey report (ASR) investigations and subsequent two addendums which precede this archaeological test excavation report (ATER). A total of 19 Aboriginal sites are discussed in the CHAR. However this ATER concerns only the locations which were to be impacted by the proposed works and warranted test excavation, as identified in the ASR.

Of the locations identified for test excavation in the ASR, one comprised a previously recorded Aboriginal site (Aboriginal Heritage Information System [AHIMS] site # 52-5-0484/52-5-0512- a duplicate recording) and seven were areas of potential archaeological deposit (PAD) (YTOF PAD 1, YTOF PAD 2, YTOF PAD 3, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7) which required subsurface investigation.

Test excavations targeted the above PADs and AHIMS site and were carried out between the 10 and 27 November 2014. YTOF PAD 3, which was originally included in the test excavation methodology, was excluded as Roads and Maritime advised that the location would no longer be impacted by the proposed works.

The aim of archaeological test excavation as part of Stage 3 PACHCI investigations is to assess the significance of each impacted area in order to inform the preparation of a CHAR and guide finalisation of the concept design and placement of ancillary facilities.

This ATER details the findings of the test excavations and includes recommendations for management of Aboriginal heritage values.

1.2 Study area

The study area refers to the polygon marked in yellow in Figure 1, which includes the proposed road alignment, interchanges and ancillary facilities.

1.3 Identified Aboriginal objects

Areas identified for test excavation include six PADs and one recorded Aboriginal site. The only area where Aboriginal objects have previously been identified is at AHIMS site # 52-5-0512.

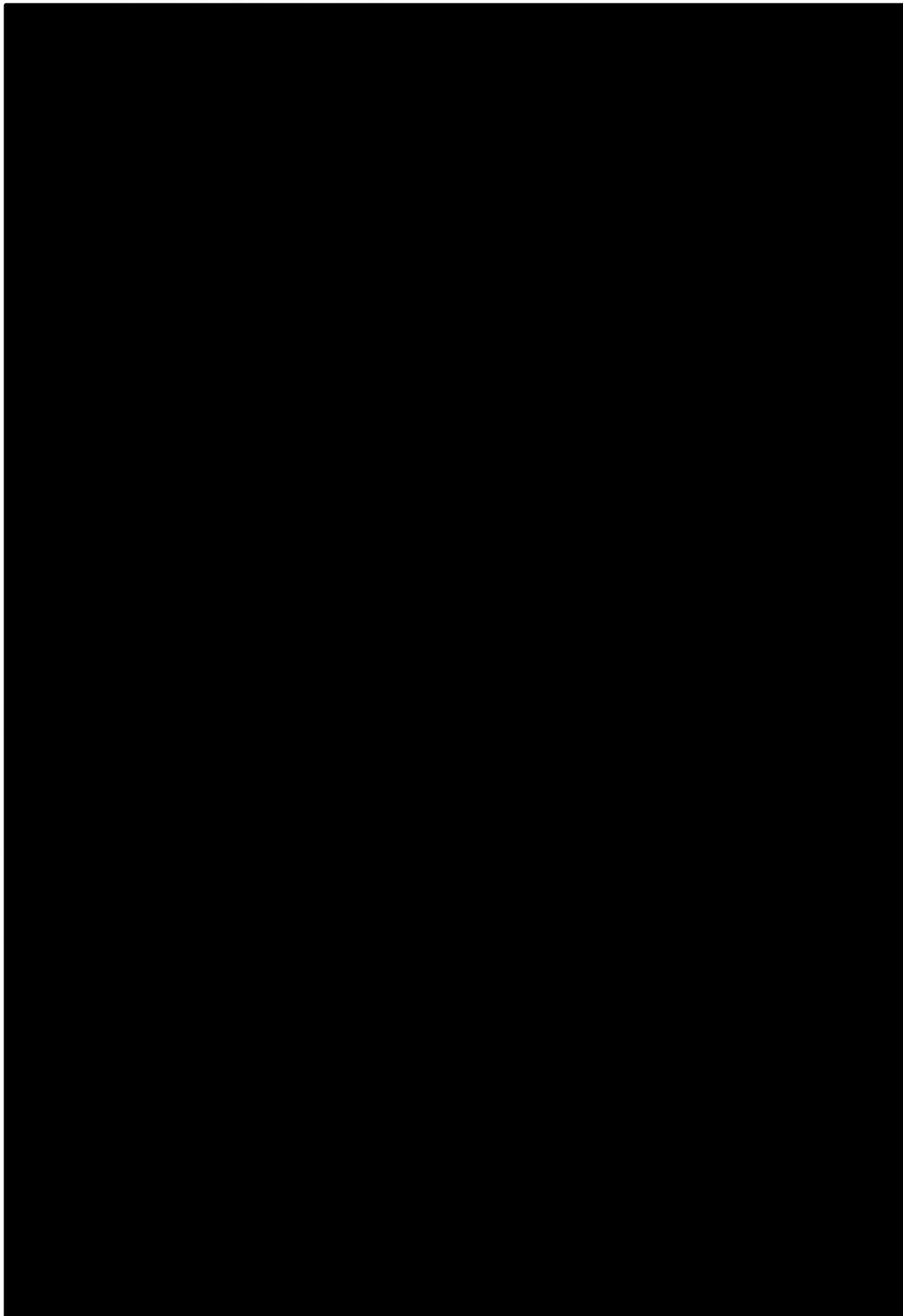
A portion of AHIMS site # 52-5-0512 is located within the study area (Figure 1 Figure 2). The site was originally recorded as WDRA_AS_09 by AMBS (2006) and registered with AHIMS as site # 52-5-0484. A duplicate entry for the site has been entered in the AHIMS database since then, site # 52-5-0512. The site is located on the Marshall Mount spur crest on an exposed area, approximately 180 square metres of ungraded access road. The assemblage comprises 89 stone artefacts including flakes, broken flakes, cores and flaked pieces (AMBS 2006). Raw materials include silcrete, chert, quartz, chalcedony, fine-grained siliceous and fine-grained volcanic. AMBS (2006) noted that A1 and A2 soils were exposed at the surface in the area. According to AMBS (2006a: Table 37) this site has high archaeological potential. The surface scatter had the highest density of those recorded within the West Dapto Release Area. The potential to contain additional surface/subsurface deposit was identified. Some impacts from vehicle use in the known site area were noted.

Since its original recording, the site has been subject to some surface disturbance, predominately related to discarded material from a car wrecking business which used to operate nearby and other dumped rubbish.

1.4 Report authorship

This report has been written by Alyce Howard (Heritage Consultant). Josh Symons (Senior Heritage Consultant) and Sandra Wallace (Director/Principal Heritage Consultant) reviewed this report and provided management input.

Figure 1: Overview of Aboriginal sites and areas of PAD within the study area



2.0 LEGISLATIVE CONTEXT

This ATER has been undertaken within the context of several items of legislation that relate to Aboriginal heritage and its protection in New South Wales.

The *National Parks and Wildlife Act 1974* (NPW Act), administered by Office of Environment and Heritage (OEH), provides statutory protection to all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under section 90. The NPW Act was amended in 2010, and as a result the legislative structure for seeking permission to impact on heritage items has changed. A section 90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and may only be granted by OEH if the conditions of the 'due diligence guidelines', and / or an 'archaeological investigation' have been met.

As part of the administration of Part 6 of the NPW Act, the OEH has developed regulatory guidelines on Aboriginal consultation, which are outlined in the *Aboriginal cultural heritage consultation requirements for proponents 2010*. In accordance with the 2010 amendment to the NPW Act guidelines have also been developed for the processes of due diligence— *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*, and for investigation of Aboriginal objects— *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (herein referred to as the Code of Practice)

The proposed works are being assessed as State Significant Infrastructure (SSI) under Part 5.1 of the *Environmental Planning and Assessment Act 1979*. As such, approval from OEH to impact Aboriginal heritage items would not be required provided that the requirements of the Secretary Environmental Assessment Requirements (SEARS) and Ministers Conditions of Approval are met.

The *Aboriginal Land Rights Act 1983* is administered by the NSW Department of Human Services - Aboriginal Affairs. This Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The *Native Title Act 1994* was introduced to work in conjunction with the Commonwealth Native Title Act. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.

2.1.1 Archaeological test excavation guidelines

Archaeological test excavation was conducted in accordance with the Code of Practice. The Code of Practice prescribes guidelines for archaeological test excavation without an AHIP, and outlines the amount of excavation allowed in a particular area, the size of the test pits, and the way that they are excavated.

3.0 ABORIGINAL STAKEHOLDER CONSULTATION

Aboriginal stakeholder consultation has been conducted by Roads and Maritime in accordance with the Roads and Maritime PACHCI and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (herein referred to as the Consultation Requirements).

Artefact Heritage has been informed that the following Aboriginal stakeholders have registered for the Albion Park Rail Bypass project:

- South West Rocks Aboriginal Corporation
- Sheryl Davis
- National Koori Site Management
- Kullila Site Consultants
- Three Ducks Dreaming Surveying and Consulting
- Gunnamaa Dream'n
- Anthony Moore
- Illawarra Local Aboriginal Land Council
- Leanne Tungai
- Craig Tungai
- Illawarra Aboriginal Corporation
- James Davis

Full details of consultation, as supplied by Roads and Maritime, is included in the CHAR.

4.0 BACKGROUND CONTEXT

A comprehensive summary of background information for the project is provided in the PACHCI Stage 2 ASR and the two addendum reports prepared for the project. A summary of pertinent background information is included below.

4.1 Environmental context

4.1.1 Landforms and hydrology

The study area crosses through the floodplain associated with Duck Creek and Macquarie Rivulet. The land at the northern end of the study area rises up moderately to meet the hill slopes of Mount Brown. South of this, the terrain flattens out towards the floodplain. The area immediately to the north and west of where the study area crosses Macquarie Rivulet is gently undulating. The east-west stretch of the study area runs along the northern basal slopes of Wentworth Hills and Signal Hill, which are drained by Horsley Inlet and its tributaries. Overall, the landform units within the study area range from alluvial flats and creek terraces, to gentle and moderate hill slopes and gullies.

The study area falls largely within the Macquarie Rivulet Catchment, which covers an area of approximately 110 square kilometres from the Illawarra Escarpment in the west, to Lake Illawarra in the east. A number of water courses transect the study area, which generally flow eastwards from the Illawarra Escarpment, and northwards from the southern elevated regions, towards Lake Illawarra. From north to south, the water courses crossed by the study area include Duck Creek and its tributaries; Macquarie Rivulet; and Frazers Creek – a tributary to Macquarie Rivulet that drains the southern portion of the Macquarie Rivulet Catchment. At the southern end, the study area turns eastwards and crosses over Frazers Creek, and the north-westwards flowing Horsley Inlet and its tributaries. The study area is mostly within a distance of 2.5 kilometres to the west and south of Lake Illawarra. These water courses provide accessible semi-permanent and permanent water sources.

4.1.2 Geology and soils

The underlying geology of the study area primarily consists of sedimentary rock of the Berry Siltstone formation, part of the Permian-aged sediments of the Shoalhaven Group. The Berry Siltstone geological unit consists of dark-grey siltstone and very fine felspathic litharenite. The Berry siltstone formation is exposed in low-lying parts of the study area, along drainage channels. This is overlain in other areas by Quaternary Alluvium - material that has been eroded from the local geological units and transported and deposited by water. It comprises gravel, swamp deposits, peat, silt, beach sand and dune sand. The east-west stretch of the study area is underlain in places by Late Permian Gerringong volcanics, which include laterite (Rose 1966; AMBS 2006a: 16-18).

The study area passes through three soil landscapes (Hazelton 1992; Hazelton and Tille 1990). The Fairy Meadow soil landscape dominates the study area, traversing the alluvial plains, floodplains, valley flats and terraces below the Illawarra Escarpment. Topography of this soil landscape is relatively flat, generally consisting of slopes less than 10 metres in height and inclined less than five percent. Soils on terraces are moderately deep (50 to 100 centimetres) Alluvial Loams and Siliceous Sands. Drainage plains include Prairie Soils and Yellow Podzolic Soils. The Fairy Meadow soil landscape is characterised by flood hazard, low wet bearing strength, topsoils that are highly permeable, and high water tables (Hazelton 1992: 97).

A small part of the northern sector of the study area, and the entire east-west stretch of the study area, passes across the Albion Park soil landscape. The very northern and eastern ends of the study area cross the Shellharbour soil landscape. Both soil landscapes are subject to localised mass

movement and are characterised by eroding soils. The Albion Park soil landscape is subject to seasonal waterlogging, whilst the Shellharbour soil landscape is subject to localised water erosion hazard. Soil depths range from shallow, at less than 50 centimetres, to deep, at over 150 centimetres (AMBS 2006a: 23).

4.2 Aboriginal histories of the locality

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The study area is located within the Dharawal language group area (Attenbrow 2010: 34). The Dharawal language group was largely coastal and is thought to have extended from the Shoalhaven River in the south, to Botany Bay in the north and then inland to Camden (Attenbrow 2010: 34). The Dharawal language group was bordered to the north in the Botany Bay – southern Sydney region by the Darug and to the west in the Mittagong – Moss Vale region by the Gundungurra. The study area falls within the territory of the Dharawal-speaking Wodi Wodi people. Tindale (1974) described the territory of the Wodi Wodi as extending from north of the Shoalhaven River at Nowra to Wollongong and inland to Moss Vale.

The area covered by the Dharawal language included a variety of landscape and resource types, including coastal and estuarine environments, rolling hills and creeks bordering the coastal environment, and the large sandstone escarpment and plateau. Sullivan (cited in Rich 1988: 23) suggested that the boundary between the Gundungurra and the Dharawal was the divide between the coastal and inland river systems, which runs on an approximate south-west to north-east line east of Wingello, Bundanoon, Robertson and Mittagong. Movement across these different terrain types and resource areas may have been dictated by the season or purpose (DEC 2005: 8). Additionally, exchange with people from surrounding language groups included Gundungarra and Wiradjuri people travelling to the coast to exchange foods and raw materials, whilst the Dharawal and Awabakal (Central Coast region) shared ceremonies (DEC 2005: 8).

Long-term areas of interaction and 'travel corridors' for movement between different language groups may have existed where there were shared boundaries. Laila Haglund has suggested that the Campbelltown area in south-west Sydney may have represented the intersection between the boundaries of the Dharawal, Darug and Gundungurra, and that the Narellan Valley may have been part of a 'travel corridor' facilitating movement between the north-western Sydney and the Illawarra (JMcD CHM 2007: 21 after Haglund 1989).

Early interaction between the Dharawal and the British was intermittent and brief. The earliest sighting of British people by the Dharawal would most likely have been when they saw sailing ships along the coast. The records of Captain Cook and several of his crew document seeing numerous fires and occasional Aboriginal people on the coastline in the Illawarra region (Organ 1993: 46). Organ (1993: 49) documents an anonymous exploration journal attributed to surveyor George William Evans, which recorded an overland expedition north from Jervis Bay via Wollongong in 1812. The exploration party encountered several groups of Aboriginal people, and at one point exchanged some of their possessions with one of the groups for oysters (Organ 1993: 49).

Several of the early British settlers in the Illawarra documented large gatherings of Aboriginal people, including a reference by Navin (1994: 8) that Robert James, a local resident of the area, recorded a camp of around 100 Aboriginal people on the banks of American Creek at Mount Kembla. In 1836 a group of around 200 Aboriginal people were observed in the Illawarra area as they were preparing to travel to Cowpastures in south-west Sydney (Griffin 1986: 6 cited in AMBS 2010: 33).

A variety of flora and fauna resources were utilised in the Illawarra region for subsistence, personal ornament and tool requirements. The variety of subsistence resources in the Illawarra included marine, estuarine, freshwater and hinterland flora and fauna. Early British records documented

torchlight spearing of bream and consumption of whale meat (Organ 1993: 262). The consumption of whale was documented as an important event linked to the spirits of their ancestors (Organ 1993: 262). Cabbage trees were used for various purposes, including utilisation of the fibre (Organ 1993: 155), used to make bridges over creeks and for food (AMBS 2010: 35). Other plant species utilised for food and tools included bats-wing tree, grass tree, Gynerium lily, various Eucalypt sp., mat-rush, sticky hop bush, Melaleuca and black wattle (AMBS 2010: 35).

4.3 Archaeological context

4.3.1 Previous archaeological investigations

A number of archaeological investigations have been carried out within and around the project area. These have generally been associated with large land releases and the development of infrastructure to service these precincts. The following summary of previous investigations focuses on sub-surface archaeological investigations which have been conducted in the area.

Extensive archaeological assessment and preliminary sub-surface excavation have occurred within the West Dapto Release Area (WDRA), located across gently undulating farming land between the Princes Highway and the Illawarra Escarpment. The WDRA covers a planned residential release area, and extends over a large area stretching from Yallah in the south to Kemplar Grange in the north. The WDRA has been subject to an archaeological assessment with sample field survey and test excavation (AMBS 2006), a preliminary Sydney Water Aboriginal heritage desktop assessment that covered both the WDRA and surrounding area, including the current study area (AMBS 2010), and sub-surface investigation in specific release areas (AHMS 2011).

A total of 136 test pits were excavated across the WDRA by AMBS (2006), sampling the main landform units within the study area – slope, alluvial flat, drainage channels and crest. The number of artefacts recovered totalled 425, and these were retrieved from just over half of the test pits (n=75). The highest number of artefacts retrieved (n=146) came from a single test pit in a slope landform context. Artefacts were recovered from all creek catchments (AMBS 2010: 38).

The majority of artefacts (n=353) were recovered from the upper 20 cm of deposit. The total assemblage comprised a range of raw materials, with chert being predominant (n=176). Quartz was the next most frequent material (n=100), followed by silicified wood (n=51), quartzite (n=41), silcrete (n=38), silicified tuff (n=13) and fine-grained siliceous (n=6). Broken flakes were the most frequent artefact type (n=209), followed by flakes (n=112), flaked pieces (n=82) and cores (n=22). Twenty-nine artefacts displayed modification or retouching. Usewear was identified on five artefacts, and evidence for both retouch and usewear was identified on one artefact (AMBS 2010: 39).

Biosis Research (2007) undertook an archaeological assessment along a proposed gas pipeline route near the Tallawarra Power Station, at Yallah NSW that includes a portion of the current project area near Duck Creek. Biosis identified two areas of PAD, and surface artefacts were identified to the west of the current study area. No sites or areas of PAD were identified along the pipeline route within, or to the east of, the current project area. The two areas of PAD - Tallawarra Pipeline 1 (AHIMS site 52-5-0471) and Tallawarra Pipeline 2 (AHIMS site 52-5-0472) - were subject to a program of test excavation. Thirty-six test pits were excavated, totalling an area of 18 square metres. A total of 136 artefacts were recovered – nine from Tallawarra Pipeline 1 (seven percent of the excavated assemblage) and 127 from Tallawarra Pipeline 2 (93 per cent of the excavated assemblage). The predominant raw material is silcrete (43 per cent), with other common raw materials including chert, quartz and volcanics. Manufacturing debris including flakes, cores and angular fragments comprised 96 percent of the assemblage (Biosis Research 2007: 21-24).

Very few (if any) artefacts were retrieved from many of the test pits, and it is concluded that this distribution represents background scatter. Much higher densities were recovered from two areas within Tallawarra Pipeline 2, both associated with locally elevated positions close to the aggraded channel of Duck Creek. It was suggested that these areas were more frequently occupied and utilised than is indicated by the background scatter elsewhere. It was determined that a main function of the area appears to have been stone tool production. The overall low numbers of artefacts possibly indicates that sites were occupied at a low level of intensity, and the area may have been used intermittently to access local wetland sources (Biosis Research 2007: 29-30). It was concluded that the findings are comparable with site predictive models for the Illawarra region, where artefact scatters are the common site types and are usually located on level, well-drained ground, close to water sources and wetlands such as Duck Creek (Biosis Research 2007: 30).

Godden Mackay Logan (GML) conducted archaeological test excavation of PAD SUFA 3 at Lot 12 Ashburton Drive, Albion Park (GML 2012). The PAD area is located on a spur between two second order creeks, approximately 1.5 kilometres to the southwest of the current project area. Thirty-five test pits were excavated, each of 0.50 x 0.50 metres. The total excavation area comprised 8.75 square metres (0.044 percent of the PAD). A total of 54 artefacts were recovered across the 35 test pits. Eleven test pits contained no artefacts. The highest number of artefacts recovered from one test pit was nine, while the remaining test pits contained between one and three artefacts (GML 2012: 25-27). The assemblage included three retouched tools; two artefacts with possible usewear; a broken core; a bipolar flake; 11 complete flakes; seven proximal broken flakes; eight cone-split broken flakes; 11 medial and five distal flake fragments; and five flaked pieces (GML 2012: 30). The most common raw material was fine-grained siliceous, followed by chalcedony, petrified wood, chert and silcrete, most of which can be found within the local area. The uneven soil depths and presence of certain stratigraphic layers across the site reflected the erosional hill slope landform the study area is located on (GML 2012: 34-35). It was concluded that the artefacts of the PAD appear to be part of background scatter as opposed to a concentrated camp site. The PAD has low potential for additional scientific information, and low significance based on scientific value (GML 2012: 54-55).

Comber (2010) conducted test and salvage excavations at Lot 107 and 108, DP 1076242 (currently 17 and 19 Larkins Lane, respectively). The properties are located along the Marshall Mount spur crest which runs approximately southwest-northeast. An Aboriginal site (WDRA_AS_09) was recorded adjacent to the properties in 2006 by AMBS. WDRA_AS_09 was recoded as a high density open campsite and Comber (2010) postulated that it was likely to continue as subsurface deposit into Lots 107 and 108. AMBS noted that oral history indicates that the spur crest was used as an access route to an important ceremonial place located on Mount Marshall (west of the excavations) (AMBS 2006:108). Excavation of Lots 107 and 108 yielded a total of 119 stone artefacts. The assemblage was characterised as a low density deposit, with chert being the predominant raw material. Quartz and silcrete stone artefacts were also present (Comber 2010:52). Artefacts retrieved from each pit ranged in number from $n = 0$ to $n = 6$. Flaked pieces were the most common artefact type. Of 119 artefacts retrieved, only six examples of retouch and only two cores were retrieved (Comber 2010:26).

5.0 ARCHAEOLOGICAL TEST EXCAVATION

The archaeological test excavation program has been designed and undertaken in accordance with the Code of Practice. The Code of Practice prescribes guidelines for archaeological test excavation that may occur without an AHIP under the NPW Act. Consultation with registered Aboriginal stakeholders has been an integral part of the test excavation program.

5.1 Aims of test excavation

The archaeological field surveys conducted during preparation of the PACHCI Stage 2 investigation noted that surface visibility was generally very low across the project area due largely to dense grass cover. Due to the lack of surface visibility in most areas, landform observations and information from previous archaeological investigations were used to inform the selection of areas of PAD.

The selection of areas of PAD within the project area provides a representative sample of different landforms over a long, relatively linear area, and presents the opportunity to further investigate these areas and add to the corpus of archaeological information for the region. Areas of PAD that were investigated in accordance with this test excavation methodology included key landforms within the project area, including crest landform (AHIMS # 52-5-0512), raised areas associated with watercourses (YTOF PAD 1, YTOF PAD 6 and YTOF PAD 7), terrace landforms (YTOF PAD 2 and YTOF PAD 4), and a raised area at the confluence of two watercourses (YTOF PAD 5).

Previous surface and sub-surface archaeological investigations in the area have identified some high concentrations of artefacts (AHIMS site # 52-5-0512) on a crest landform overlooking Macquarie Rivulet, as well as lower density background scatters interspersed with higher artefact concentrations across slope and crest landforms in the local area. Archaeological test excavation further investigated the distribution of Aboriginal objects in sub-surface contexts across the project area and provided more information on Aboriginal land use patterns.

In accordance with the Code of Practice, the aims of archaeological test excavation are:

- To adequately identify the extent of YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6, YTOF PAD 7 and AHIMS site # 52-5-0512.
- To assess the scientific significance of each of YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6, YTOF PAD 7 and AHIMS site # 52-5-0512 following an assessment of test excavation results.
- To provide an opportunity for registered Aboriginal stakeholders to comment on the Aboriginal cultural heritage values of the site.
- To provide the proponent with recommendations on opportunities to avoid impact and future requirements for further archaeological investigation where required.

5.2 Excavation methodology

5.2.1 Test excavation area

Under the Code of Practice guidelines for test excavation, no more than 0.5 per cent of each investigated location can be excavated without an AHIP. A summary of the total of each area and total excavation area is outlined in Table 1 below.

Note that YTOF PAD 3, which was originally included in the test excavation methodology, was excluded from the final test excavation program, as Roads and Maritime advised that that location would no longer be impacted.

Table 1: Excavation area

PAD/ site name	Total square metres	Test excavation area (metres ²)	Excavated percentage of total area
YTOF PAD 1	14503	6.5	0.04
YTOF PAD 2	9342	7.2	0.08
YTOF PAD 4	8398	5.5	0.07
YTOF PAD5	10355	3.25	0.03
YTOF PAD6	9755	4.75	0.05
YTOF PAD7	5067	3.5	0.07
# 52-5-0512	10490	7.5	0.07

5.2.2 Test excavation layout and excavation units

Test excavation involved hand excavation of 50 x 50 centimetre excavation units. Excavation units were spaced out on transects oriented to adequately test the extent of potential sub-surface Aboriginal objects at each location. An arbitrary X-Y grid was used to identify each pit location.

5.2.3 Test excavation procedure

Transects and excavation units were laid out using long hand-tapes, flags and pegs. An initial baseline was laid out at each location, and trigonometry used to lay out parallel transects and offset excavation squares. A flag and peg would be placed at the northwest corner of each point to be tested, and hand tapes and pegs used to lay out each excavation units. A long tape was used to ensure that each excavation unit was laid out straight in line with each transect. A datum was established at the first excavation unit on the baseline. The location of each excavation unit was recorded using a hand-held non-differential GPS, and the magnetic bearing of the first transect recorded using a compass. An arbitrary site grid would be established at each datum, using a number sequence such as X2000 Y3000.

In accordance with the Code of Practice, the initial excavation unit at each location was excavated in five centimetre spits. Subsequent excavation units were excavated in 10 centimetre spits to the base of the artefact bearing deposit. Where time allows and further investigation are required, the Code of Practice allows for the combination of excavation units to form an open area no larger than three square metres. This approach was utilised at YTOF PAD 2 and YTOF PAD 4 where deeper deposits were encountered (up to one metre deep).

A context sheet for each excavation unit was completed in the field. Details recorded included date of excavation, name of excavators, depth, number of buckets and soil description. Additionally, one representative section wall from each excavation unit was scale drawn, and photographs were recorded of each section wall and base.

All retrieved deposit from each excavation unit was placed in buckets and transported to a sieve area using wheelbarrows. All retrieved deposit was sieved using nested five millimetre and three millimetre sieves.

All excavated units were fenced when left open overnight using high visibility fencing and metal star pickets. All excavation units were back-filled with clean fill and sieve spoil following the completion of test excavation using a rubber tracked posi-track.

5.2.4 Procedure for the discovery of human remains

Under the Code of Practice and Roads and Maritime unexpected archaeological finds procedure, excavation must cease should suspected human remains are encountered. In the event of the discovery of suspected human remains, work was to cease immediately and procedures enacted as outlined in Appendix F of the Roads and Maritime unexpected archaeological finds procedure.

No human remains or suspected human remains were identified during the test excavation program.

5.2.5 Aboriginal objects

All Aboriginal objects retrieved during the course of test excavation were washed and placed in re-sealable bags for further analysis and recording. Since the completion of test excavation, the artefact assemblage was recorded and has been stored as stipulated in the Code of Practice, awaiting reburial. Recording included key attributes of material, artefact type, platform type, termination type and dimensions, as well as photographic and drawn records of representative artefacts. All recorded information was entered into a Microsoft Excel table with detail linked to the provenance of each artefact. The complete artefact record is included in Appendix 1.

All artefacts have been given a unique number and stored in double re-sealable snap lock bags. A permanent marker was used to record the provenance and unique number of artefacts in each bag.

6.0 RESULTS

6.1 Timing and personnel

Twenty people participated in the test excavation program, which ran between the 10 and 27 November 2014.

Table 2: List of participants in test excavations

Name	Organisation
Josh Symons	Artefact Heritage
Alyce Howard	Artefact Heritage
Stacey Kennedy	Artefact Heritage
Claire Rayner	Artefact Heritage
Cornelia De Rochefort	Artefact Heritage
Zvonka Stanin	Artefact Heritage
Miles Robson	Artefact Heritage
Phoebe Heddell	Artefact Heritage
Alana Colbert	Artefact Heritage
Adrian French	Artefact Heritage
James McGuinness	Artefact Heritage
Sarah McGuinness	Artefact Heritage
Jodie Stewart	Workforce International
Pamela Glover	Workforce International
James Davis	Wodi Wodi Elders
Lee-roy Boota	Workforce International
Joshua Marijancevic	Workforce International
Clayton Stewart	Workforce International
Cohen Blair	Workforce International
Kerryanne Maher	National Koori Site Management

6.2 AHIMS site # 52-5-0512

The concept design for the proposed works will impact a large portion of AHIMS site # 52-5-0512. Thirty excavation units were distributed at 15 metre intervals on five parallel transects, each spaced 15 metres apart. A further three excavation units were placed to the northern side of the site, adjacent to an area of dumped rubbish in order to sample the northern end of the site. These additional

excavation units, as well as those on the northern transect, were situated so as to sample the approximate alignment of the original surface finds of artefacts at the site by AMBS (2006).

6.2.1 Soils, disturbance and features

The soil profile is relatively uniform across AHIMS site # 52-5-0512. A thin A horizon consisted of brown silty clay with dense grass roots and some bioturbation (displacement of and changes to the texture of sediment caused by animals and plants). The B horizon comprised a light to medium clay with some gravel inclusions. Gravel inclusions increase with depth. In some excavation units the A horizon has an abrupt boundary with a C horizon of siltstone bedrock at approximately 15-30 cm.

6.2.2 Artefact assemblage

A total of 16 artefacts were retrieved from AHIMS site # 52-5-0512. Chert was the predominant raw material (n=5), followed by silcrete, quartz and quartzite (n=3 of each). Single artefacts of each IMT¹ and basalt were also retrieved.

Half the total assemblage comprised complete flakes (n=8), however angular fragments (n=3), distal flake fragments (n=2), proximal flake fragments (n=2) and a core (n=1) were also retrieved. The core was a small chert multi-platform core, with three complete flake scars evident and two partial scars. One of the complete scars was a blade scar. All platforms were flaked.

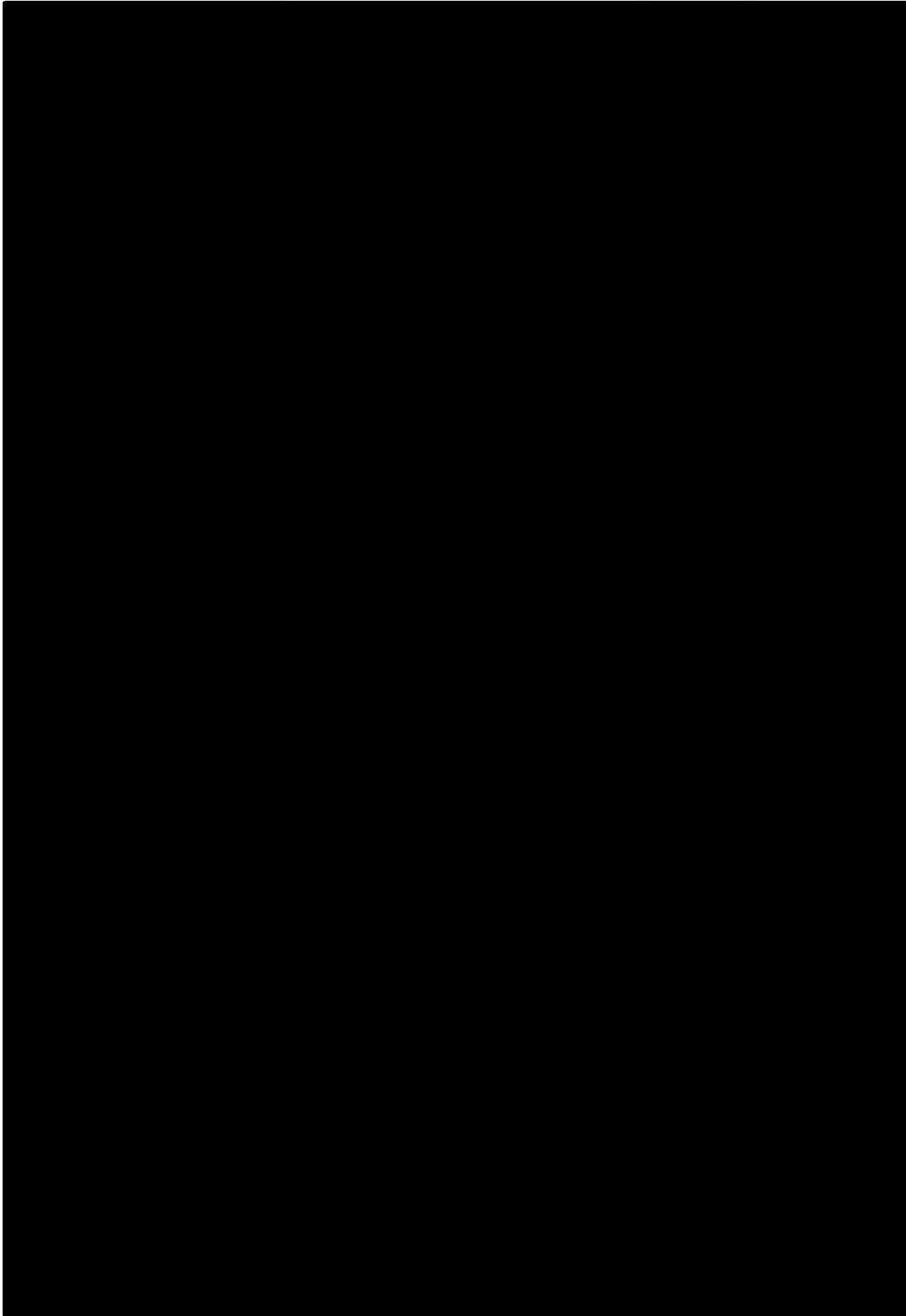
One quartz blade flake was retrieved from AHIMS site # 52-5-0512. Four fragmentary flakes exhibit parallel arises and margins.

The assemblage at AHIMS site # 52-5-0512 demonstrates a very low proportion of cortex (81 per cent of the artefacts retrieved have zero per cent cortex).

Comber (2010) conducted test and salvage excavations at Lot 107 and 108, DP 1076242 (currently 17 and 19 Larkins Lane, respectively) (Figure 2). The assemblage was characterised as a low density deposit, with chert being the predominant raw material. Quartz and silcrete stone artefacts were also present (Comber 2010:52). Artefacts retrieved from each pit ranged in number from n = 0 to n = 6. Flaked pieces were the most common artefact type. Of 119 artefacts retrieved, only six examples of retouch and only two cores were retrieved (Comber 2010:26).

¹ The characterisation of the raw material 'mudstone' differs between authors, depending on which classificatory system the author prescribes to. This study uses the term IMT as per Corkill (1999) and Hughes *et al* (2011), acknowledging that while some of this material may have tuffaceous origins, distinction between tuff and indurated mudstone cannot accurately be made without petrological analyses.

Figure 2: AHIMS site # 52-5-0512 test excavation results



6.3 YTOF PAD 1

Roads and Maritime advised that YTOF PAD 1 will be impacted by relocation of parts of the Croom Sporting Complex. Test excavation of YTOF PAD 1 involved the excavation of 26 excavation units distributed on a 15 metre grid.

6.3.1 Soils, disturbance and features

YTOF PAD 1 is a long, narrow area comprising 26 test excavation units, spanning the entire length. The soil profile across the PAD consists of an A1 horizon of loose brown silty loam with frequent grass roots and minor bioturbation. The boundary between A1 and A2 was distinct in the central and southern portions of the PAD, becoming more diffuse in the northern excavation units. Intermittent gravel and charcoal inclusions were noted throughout the PAD. The A2 horizon comprised light brown to grey compact clay, becoming more compact with depth. The B horizon was investigated only insofar as to confirm that it continued and was culturally sterile. The B horizon comprised compacted mottled clay and was found to be culturally sterile.

6.3.2 Artefact assemblage

A total of thirteen artefacts were retrieved from YTOF PAD 1. IMT was the predominant raw material (n=4), followed by silcrete (n=3), chalcedony (n=3), quartzite (n=2) and quartz (n=1).

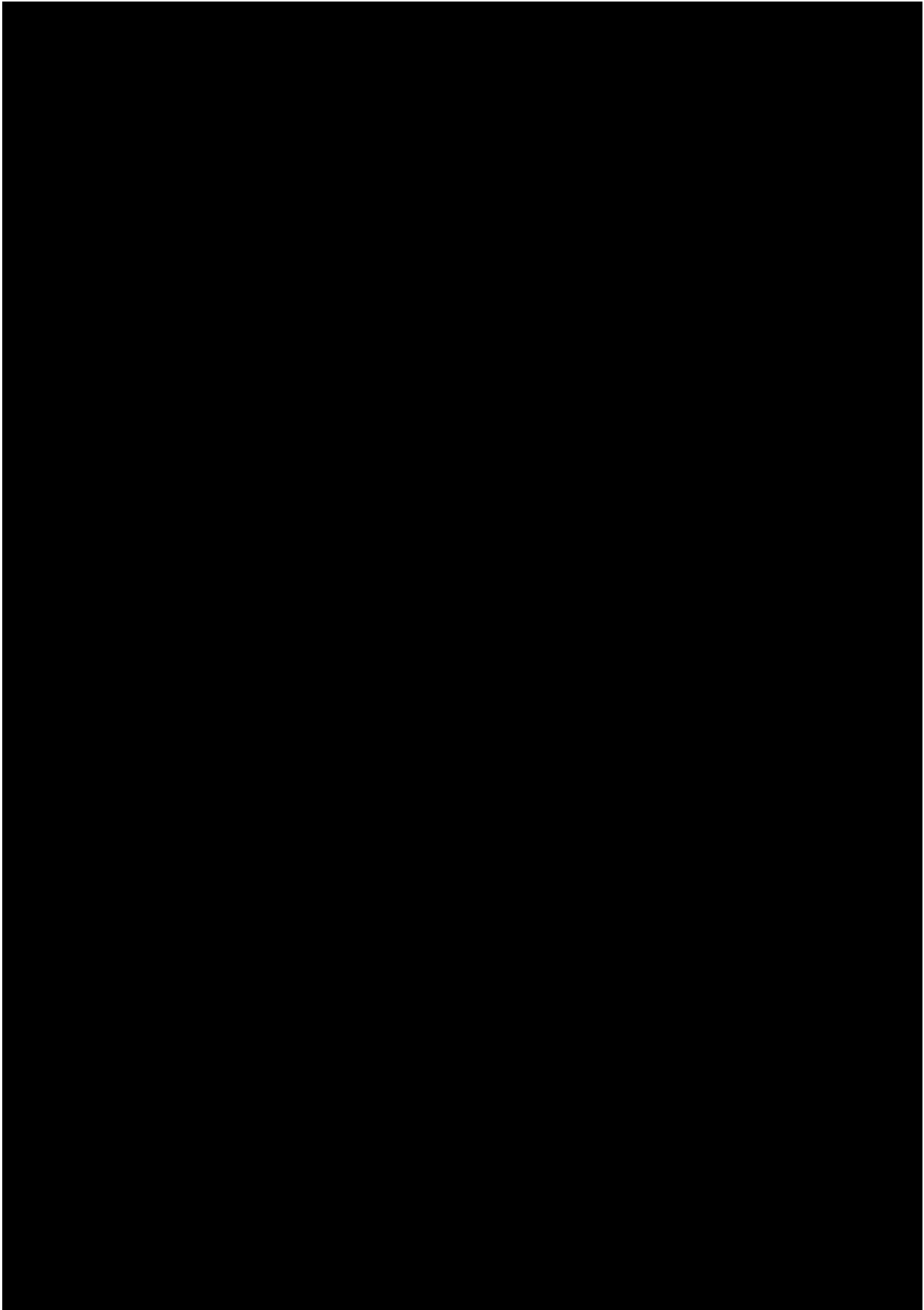
The assemblage was largely comprised of complete flakes (n=8), however distal flake fragments (n=3), medial flake fragments (n=1) and angular fragments (n=1) were also retrieved.

No cores were retrieved from YTOF PAD 1. Three fragmentary flakes exhibit parallel arises and margins.

The assemblage at YTOF PAD 1 demonstrates a very low proportion of cortex (92 per cent of the artefacts retrieved have zero per cent cortex).

The distribution of artefacts at YTOF PAD 1 indicates that two distinct sites are present. The northern site is a concentration of eleven artefacts, separated spatially from the two artefacts identified in the southern section of YTOF PAD 1.

Figure 3: YTOF PAD 1 test excavation results



6.4 YTOF PAD 2

The proposed works will impact approximately 35 metres of the southwest corner of YTOF PAD 2. An additional 30 metre area bordering the concept design is also likely to be impacted, including 10 metres for ancillary construction works and a 20 metre buffer area. The remaining eastern portion of YTOF PAD 2 will not be impacted under the current concept design.

Test excavation at YTOF PAD 2 involved the excavation of 29 excavation units distributed on a 15 metre grid. The depth of deposit made it necessary to join together 24 of the excavation units into 1 x 1 metre pits (creating six larger pits which were able to be safely excavated at greater depths).

6.4.1 Soils, disturbance and features

Deposits across the terrace landform of YTOF PAD 2 were relatively consistent, the exception being the 1 x 1 metre pit, located immediately adjacent Frazers Creek (X4000-4000.5 Y4970-4970.5).

The 1 x 1 metre test pit closest to Frazers Creek (X4000-4000.5 Y4970-4970.5) was located on a lower slope landform, 10 metres north east of Frazers Creek. The A horizon consisted of moderately compacted grey sandy silt with frequent grass roots. The A1 horizon comprised dark grey clayey silt and fine, infrequent inclusions of charcoal and ironstone gravel. Rootlets continue into both the A1 and A2 horizons. The A2 horizon comprised loose brown silty clay with fine, infrequent inclusions of charcoal and ironstone gravel. Excavation at this location ceased at a depth of one metre as all four excavation units were found to be void of artefacts.

The remainder of the excavation units, located atop the terrace landform, contained relatively consistent deposits. The A1 horizon comprised moderately compact, dark brown clayey silt with frequent grass roots and evidence of bioturbation. The A2 horizon comprised red brown silty clay, with clay content increasing with depth. Small gravel and cobbles occurred frequently throughout the A2 horizon. Excavation ceased at one metre as no artefacts were retrieved past depths of 50 centimetres.

Only two test excavation units (X4000 Y5020 and X4000 Y5030) encountered a B horizon. These excavation units were located in the northeast section of the PAD. The B horizon comprised orange/brown medium clay with infrequent orange mottles.

6.4.2 Artefact assemblage

A total of 44 artefacts were retrieved from YTOF PAD 2. Silcrete was the predominant raw material (n=22), followed by chert (n=9), chalcedony (n=5), quartzite (n=3), quartz (n=2), basalt (n=2) and IMT (n=1).

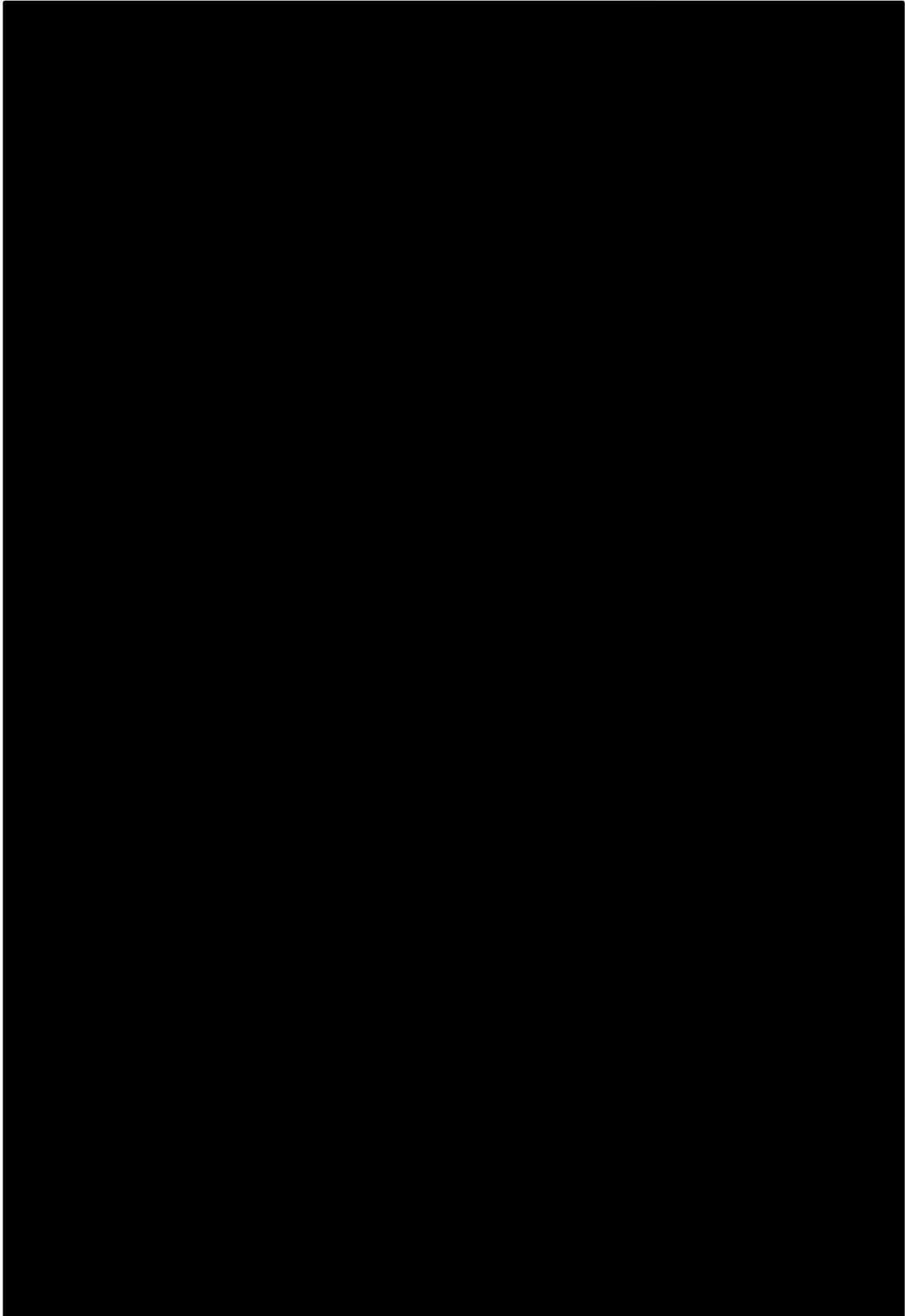
Over half the assemblage comprised complete flakes (n=25), however angular fragments (n=6), proximal flake fragments (n=5) distal flake fragments (n=3), cores (n=3) and longitudinally broken flakes (n=2) were also retrieved.

All three cores were single platform cores of different raw materials. The first single platform core was chalcedony and exhibited three complete flake scars, all struck from a flat platform. The second, IMT, also had 3 complete flake scars, struck from a flaked platform. The final single platform core retrieved from YTOF PAD 2 was silcrete, with two complete flake scars, struck from a flaked platform. Both the silcrete and chalcedony cores exhibited a small (less than ten per cent of the total surface area) of cortex.

One quartzite blade flake was present in the assemblage at YTOF PAD 2. Seven fragmentary flakes exhibited parallel margins and arises.

The assemblage at YTOF PAD 2 demonstrates a very low proportion of cortex (93 per cent of the artefacts retrieved have zero per cent cortex).

Figure 4: YTOF PAD 2 test excavation results



6.5 YTOF PAD 4

Roads and Maritime advised that YTOF PAD 4 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation of YTOF PAD 4 involved the excavation of 22 excavation units distributed on a 15 metre grid. During test excavation eight of the excavations units in the northeast section of the PAD were joined together (creating two 1 x 1 metre pits) due to deep deposits and the presence of a retouched flake and blade flakes.

6.5.1 Soils, disturbance and features

Deposits throughout the PAD varied across the landforms, from terrace to gentle slope to creek flat.

The majority of the excavation units were located on the terrace landform and featured an A1 horizon of brown grey silty clay with frequent grass roots. The A2 horizon comprised light grey/brown silty clay with infrequent inclusions of charcoal. Intrusions of localised compact orange silt/gravel were present in some excavation units. The B horizon consisted of dark brown heavy clay. Localised orange mottles occurred infrequently in the A2 horizon, becoming more frequent in the B horizon.

Excavation units located on the gentle slope leading down to the unnamed tributary of Frazers Creek had an A horizon of grey brown silty clay with frequent grass roots throughout. The A horizon has an abrupt boundary with a B horizon of dark brown medium clay with localised orange mottles.

6.5.2 Artefact assemblage

A total of 14 artefacts were retrieved from YTOF PAD 4. Silcrete was the predominant raw material (n=8), followed by quartz, IMT and chert (n=2 of each).

Complete flakes were predominant in the assemblage (n=5), however proximal flake fragments (n=3), angular fragments (n=2), distal flake fragments (n=1), medial flake fragments (n=1), a longitudinally broken flake (n=1) and a retouched complete flake (n=1) were also retrieved.

No cores were retrieved from YTOF PAD 4.

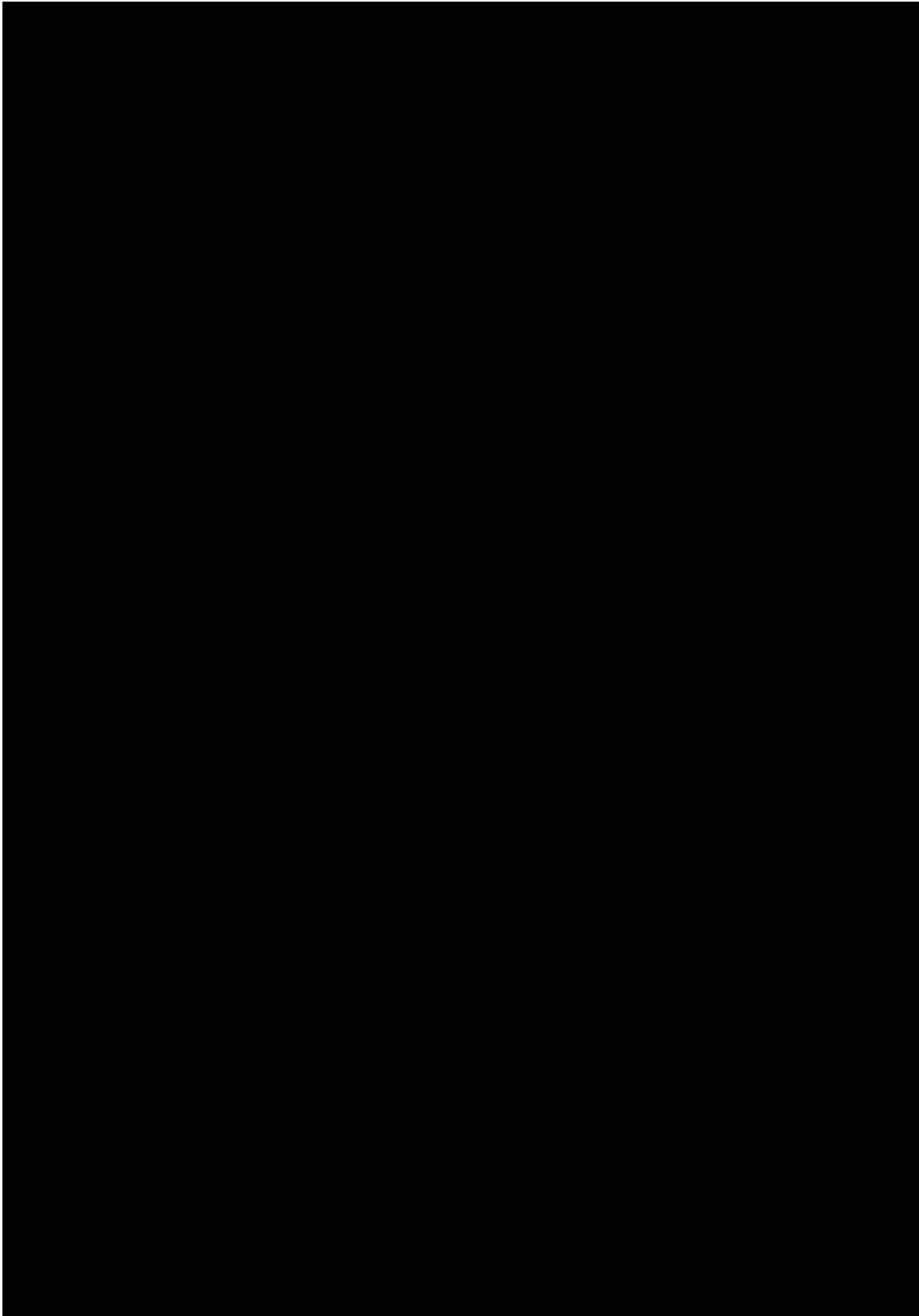
The retouched flake is a complete flake of chert, retrieved from the northeast portion of the PAD. Retouch covers approximately 80 per cent of the left lateral margin and 100 per cent of the right lateral margin.

Three silcrete blade flakes were retrieved from YTOF PAD 4. Three fragmentary flakes exhibited parallel arises and margins.

No cortex was present on any of the artefacts in the assemblage at YTOF PAD 4

The distribution of artefacts at YTOF PAD 4 indicates that two distinct sites are present. The eastern site is a concentration of thirteen artefacts, separated spatially and contextually from the isolated artefact identified in the western section of YTOF PAD 4. The isolated artefact is located on the flat, immediately adjacent to the creek bank and is likely in a disturbed context.

Figure 5: YTOF PAD 4 test excavation results



6.6 YTOF PAD 5

Roads and Maritime advised that YTOF PAD 5 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation at YTOF PAD 5 involved the excavation of 13 excavation units distributed on a 15 metre grid. Excavation was divided between two areas, separated by a large dam. As such, six excavation units were located to the north of the dam and seven to the south.

6.6.1 Soils, disturbance and features

Deposits across the PAD varied across the two areas excavated. The six excavation units north of the dam featured an A horizon of dark brown clayey silt with frequent grass root inclusions. The A1 horizon comprised of grey/brown clayey silt with grass roots and localised orange mottles. The A2 horizon comprised reddish brown clayey silt with infrequent gravel inclusions. The B horizon consisted of red/brown silty clay that varied from loose to heavy in sections, with inclusions of highly oxidised gravels.

The seven excavation units to the south of the dam were characterised by an A1 horizon of grey brown silt with frequent grass roots. The A2 horizon comprised dark brown/grey clayey silt with infrequent gravel inclusions. The B horizon consisted of mottled dark brown/yellow heavy clay.

6.6.2 Artefact assemblage

A total of eight artefacts were retrieved from YTOF PAD 5. Silcrete was the predominant raw material (n=6), followed by quartz and IMT (n=1 of each).

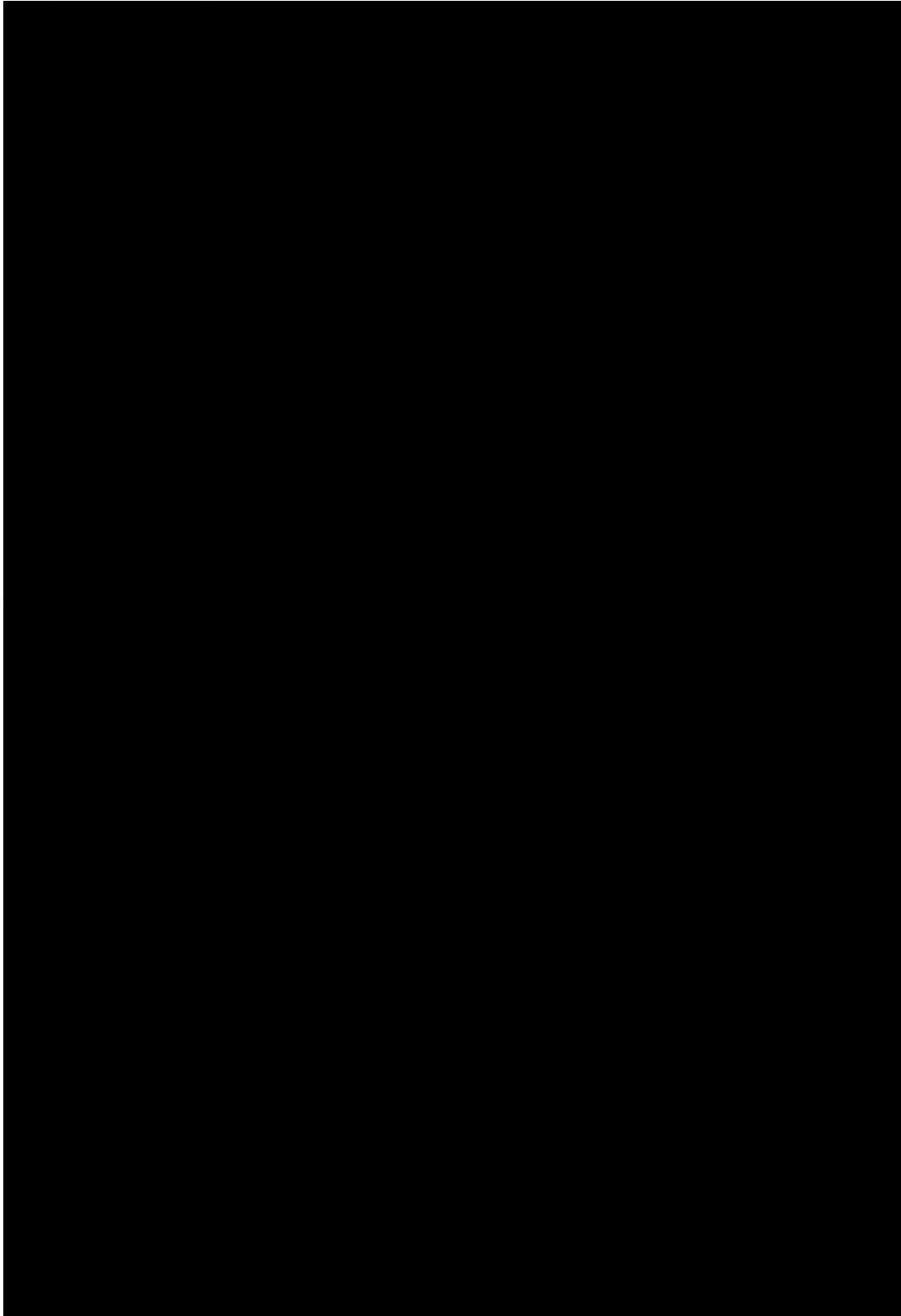
Diverse stages of the reduction processes are represented in small assemblage at YTOF PAD 5. Complete flakes (n=2), proximal flake fragments (n=2), distal flake fragments (n=1), longitudinally and transversely broken flakes (n=1), medial flake fragments (n=1) and angular fragments (n=1) were all present.

No cores were retrieved from YTOF PAD 5.

One silcrete blade flake was present in the assemblage. Two fragmentary flakes exhibited parallel arises and margins.

The assemblage at YTOF PAD 5 demonstrates a very low proportion of cortex (88 per cent of the artefacts retrieved have zero per cent cortex).

Figure 6: YTOF PAD 5 test excavation results



7.0 YTOF PAD 6

Roads and Maritime has advised that YTOF PAD 6 will be impacted by realignment of Yallah Road. Test excavation at YTOF PAD 6 involved the excavation of 19 excavation units distributed 15 metres apart on three parallel transects spaced 20 metres apart. Positioning of excavation units at YTOF PAD 6 was constrained by the presence of endangered flora (*Chorizema parviflorum*, eastern flame pea). As such, ecologists surveyed the area for excavation and all visible specimens were flagged in order to avoid impact to flame pea plants.

7.1.1 Soils, disturbance and features

Deposits across YTOF PAD 6 were relatively uniform, featuring an A1 horizon of fine sandy loam with frequent grass roots throughout. The A2 horizon comprised compact clayey sand with infrequent gravel inclusions. The boundary to a B horizon of compact grey/yellow clay with dense ironstone gravel inclusions was abrupt throughout most of the PAD. However, excavation units nearer the unnamed tributary of Duck Creek featured a more diffuse boundary between the A2 and B horizon. Infrequent charcoal fragments occurred throughout the A2 and B horizons.

7.1.2 Artefact assemblage

A total of four artefacts were retrieved from YTOF PAD 6. Raw material in the assemblage was limited to silcrete (n=3) and quartz (n=1).

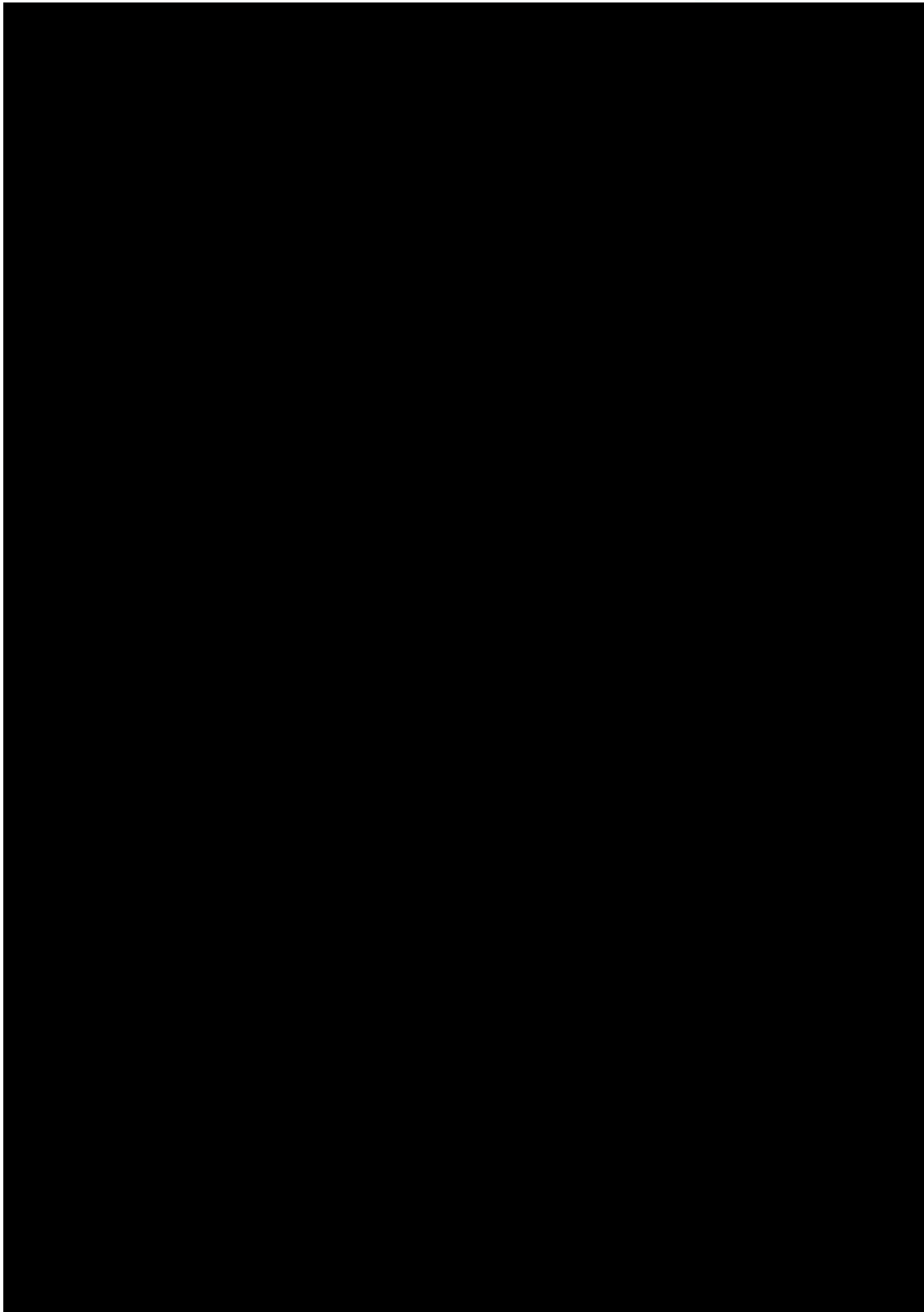
Diverse stages of the reduction processes are represented in small assemblage at YTOF PAD 6. A complete flake (n=1), proximal flake fragment (n=1), medial flake fragment (n=1) and an angular fragment (n=1) were present.

No cores were retrieved from YTOF PAD 6.

One silcrete blade flake was retrieved from YTOF PAD 6. Two fragmentary silcrete flakes exhibited parallel arises and margins.

No cortex was present on any of the artefacts in the assemblage at YTOF PAD 6

Figure 7: YTOF PAD 6 test excavation results



7.2 YTOF PAD 7

Roads and Maritime advised that YTOF PAD 7 will be impacted by ancillary facilities, including the possible location of site compound and/ or stockpiles. Test excavation at YTOF PAD 7 involved the excavation of 14 excavation units distributed 15 metres apart on two parallel transects spaced 20 metres apart.

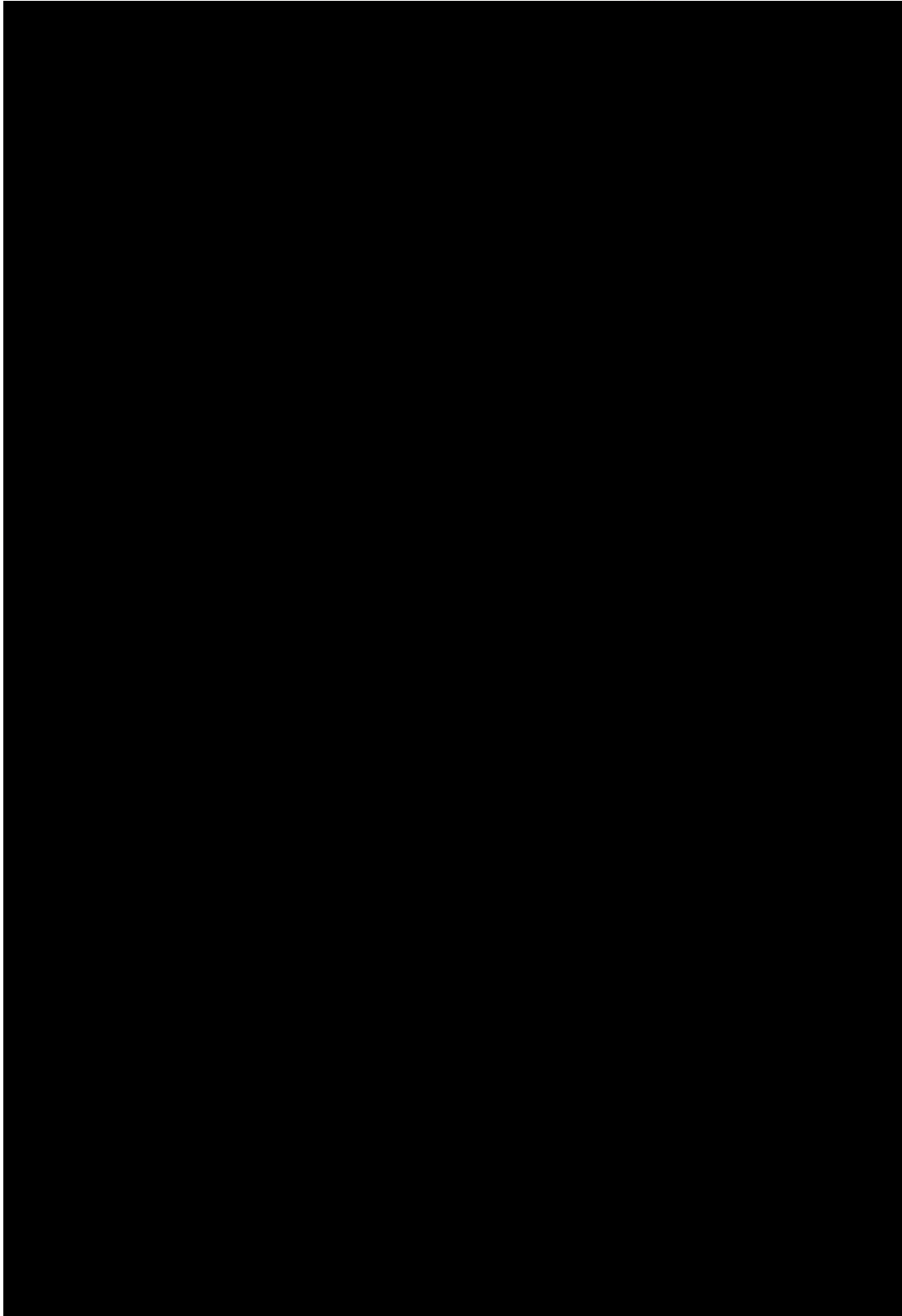
7.2.1 Soils, disturbance and features

YTOF PAD 7 is a long, narrow area located on a flat and associated low-lying rise, overlooking Duck Creek. Two transects of seven test excavation units spanned the length of the PAD. The soil profile across the PAD consists of an A1 horizon of loose brown silty loam with frequent grass roots and minor bioturbation. The boundary between the A1 and A2 horizons was distinct in the central and southern portions of the PAD, becoming most diffuse in the northernmost excavation units. The northernmost excavation units featured infrequent inclusions of coarse ironstone gravels and fragmentary charcoal. The A2 horizon was of light brown to grey compact silt, becoming more compact with depth. The B horizon was investigated only insofar as to confirm that it continued and was culturally sterile. The B horizon comprised compacted brown and orange mottled clay and was found to be culturally sterile.

7.2.2 Artefact assemblage

All test excavation units at YTOF PAD 7 were found to be void of artefacts.

Figure 8: YTOF PAD 7 test excavation results



8.0 ANALYSIS AND DISCUSSION

A total of seven locations were excavated during the test excavation program (AHIMS site # 52-5-0512, YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7). Aboriginal artefacts were identified at all locations excepting YTOF PAD 7.

The following analysis and discussion excludes YTOF PAD 7 as no artefacts were retrieved from this location.

8.1 Assemblage characteristics

Raw material varies throughout the sites; however, all sites contained artefacts of silcrete and quartz (Graph 1). Silcrete was the most abundant raw material overall, as well as the most abundant raw material within YTOF PAD 2 (50 per cent), YTOF PAD 4 (57 per cent), YTOF PAD 5 (75 per cent) and YTOF PAD 6 (75 per cent). The most abundant raw material retrieved from AHIMS site # 52-2-0512 was chert (31 per cent). The most abundant raw material retrieved from YTOF PAD 1 was IMT (31 per cent) (Graph 3).

Only YTOF PAD 1 and YTOF PAD 2 contained chalcedony artefacts. Only AHIMS site # 52-2-0512, YTOF PAD 1 and YTOF PAD 2 contained quartzite artefacts (Graph 1). Only AHIMS site # 52-2-0512 contained basalt artefacts. Chert artefacts are present in AHIMS site # 52-2-0512, YTOF PAD 2 and YTOF PAD 4 and are abundant in the assemblage at these sites.

Raw Material Abbreviations used in Graph 1:

SIL= silcrete

CH= chert

QZ= quartz

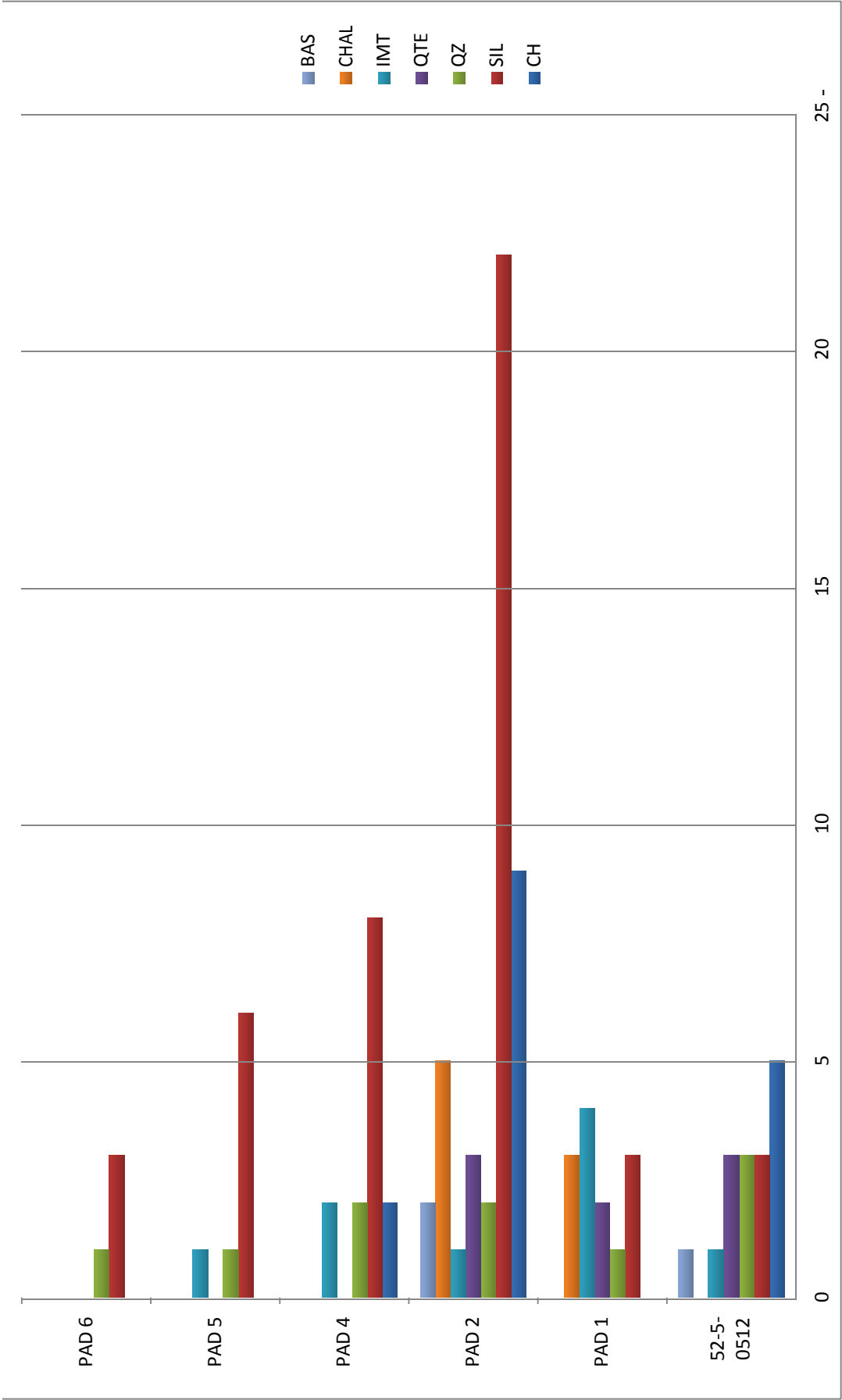
QTE= quartzite

BAS= basalt

CHAL= chalcedony

IMT= indurated mudstone tuff

Graph 1: Frequency of raw material



Graph 2 illustrates the frequency of artefact types retrieved from across each site. Complete flakes were the most abundant artefact type overall and also within AHIMS site # 52-2-0512, YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5 and YTOF PAD 6.

Only four cores were retrieved from the test excavation program. Of these, three cores were retrieved from YTOF PAD 2, and were single platform cores. The fourth core was retrieved from AHIMS site # 52-2-0512 and was a multi-platform core (Graph 2).

Only one retouched flake was retrieved from the test excavation program. The retouched flake was retrieved from YTOF PAD 4 and featured retouch along 80 per cent of the left lateral margin and 100 per cent of the right lateral margin.

Artefact type abbreviations used in Graph 2:

SPC= single platform core

MPC= multi-platform core

AF= angular fragment

LBTF= longitudinally and transversely broken flake

LBF= longitudinally broken flake

PFF= proximal broken flake

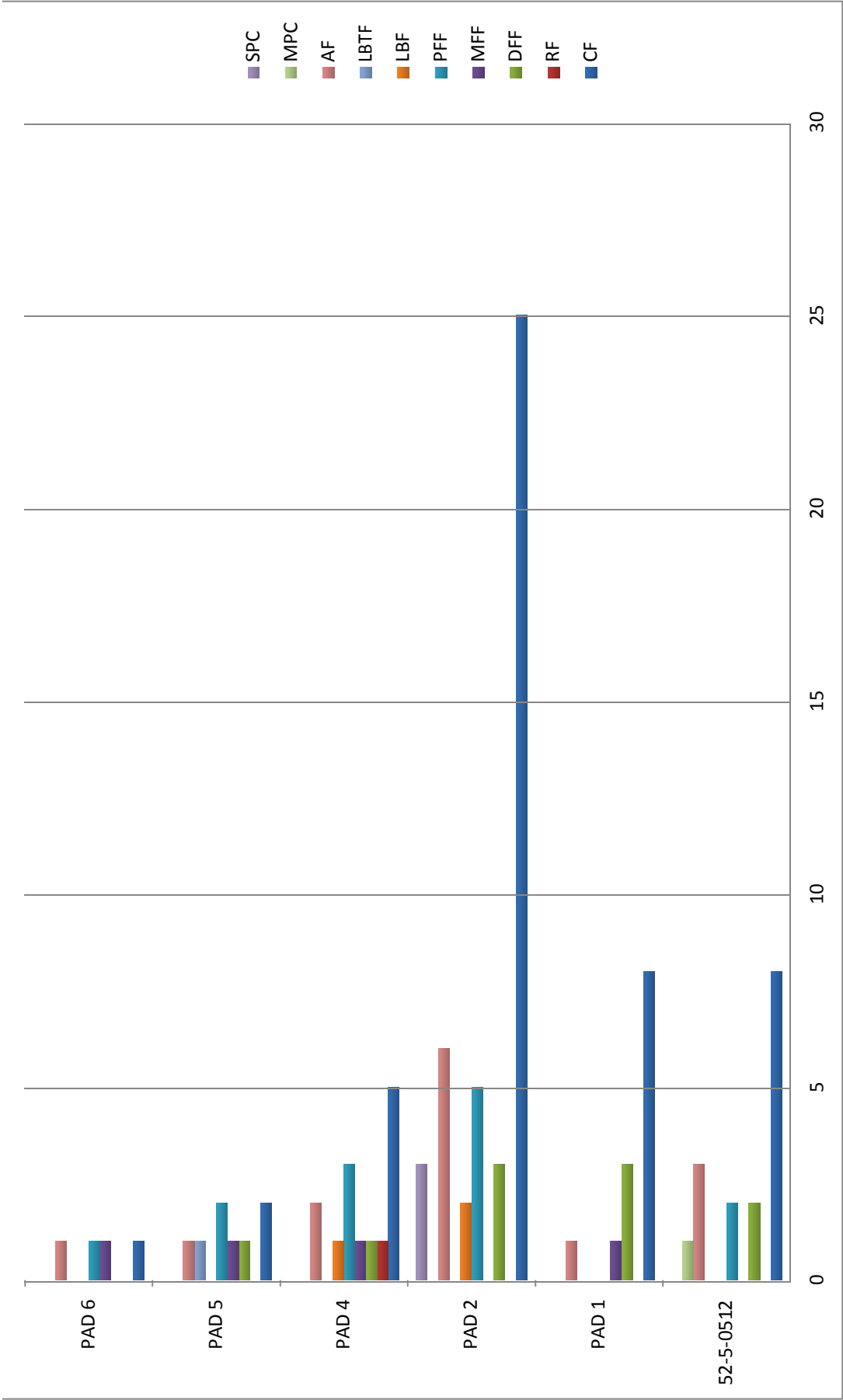
MFF= medial broken flake

DFF= distal broken flake

RF= retouched (complete) flake

CF= complete flake

Graph 2: Frequency of artefact type



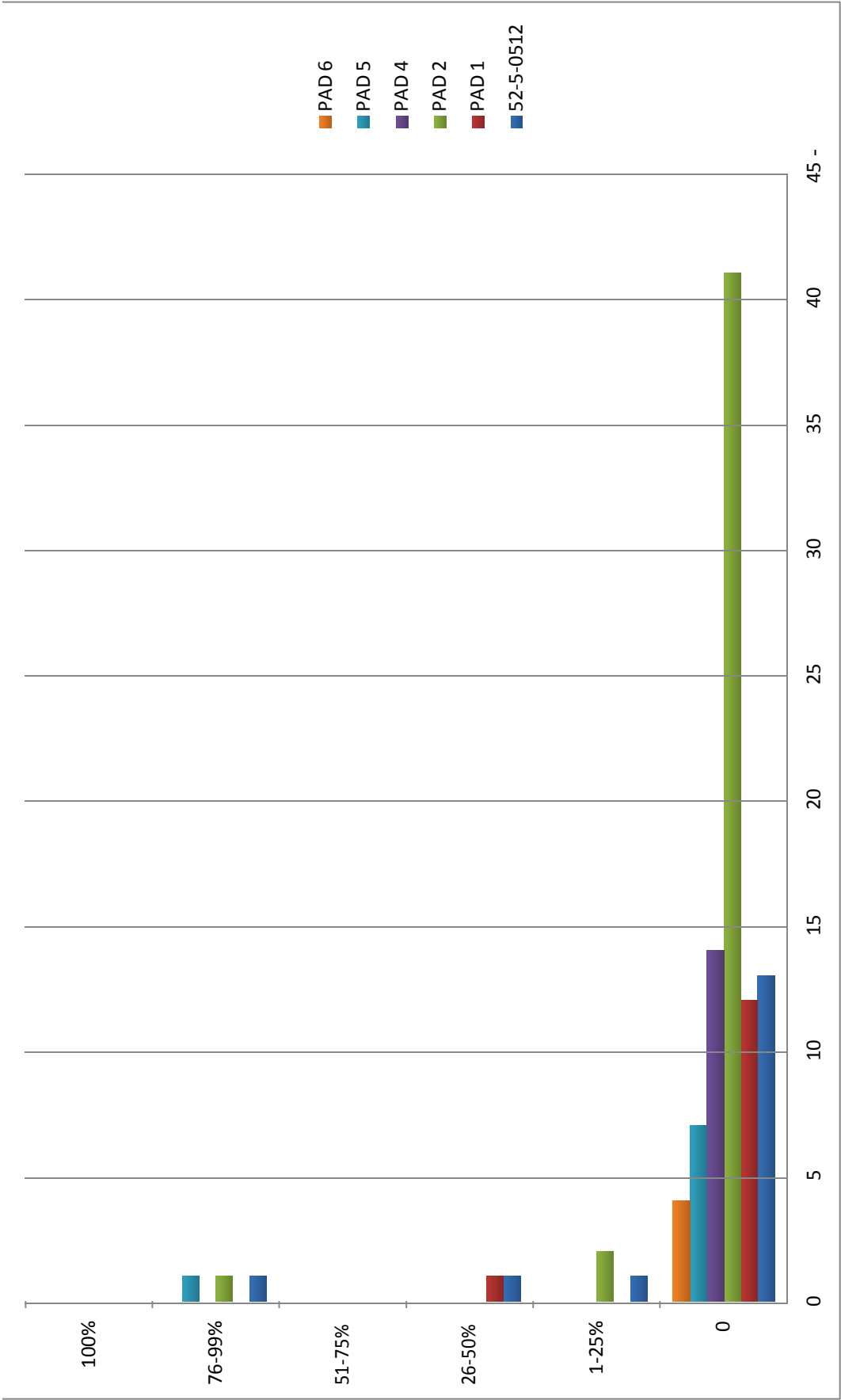
Graph 3 illustrates the proportion of cortex evident on artefacts retrieved from the test excavation program. Artefacts retaining no cortex are overwhelmingly dominant, both overall and within the assemblage of each site.

The very low proportion of cortex in assemblage overall and within each site, combined with the low number of cores retrieved, indicates that the initial reduction of raw material would have been undertaken at another location, with resultant tools and some cores being transported to these sites.

All four cores retrieved are small in size (less than 5 centimetres) which may indicate that raw material was used until almost entirely exhausted. Raw material used for cores varies, with one core of each chert, silcrete, quartz and IMT retrieved.

A total of eight artefacts were blade flakes. A further artefacts exhibited parallel margins and arises. The small chert multi-platform core, retrieved from AHIMS site # 52-2-0512, featured one blade scar.

Graph 3: Frequency of cortex (percentage cortex)



9.0 NEW SITE NAMES

A total of seven locations were excavated during the test excavation program (AHIMS site # 52-5-0512, YTOF PAD 1, YTOF PAD 2, YTOF PAD 4, YTOF PAD 5, YTOF PAD 6 and YTOF PAD 7). Aboriginal artefacts were identified at all locations, with the exception of YTOF PAD 7.

All areas of PAD where artefacts have been retrieved are now confirmed as Aboriginal artefact sites. Five sites have been renamed to reflect this (Table 3).

A further two new sites were identified as distinct sites during test excavation (YTOF AS 8 and YTOF IF 4).

The following table lists the PAD numbers and the newly allocated site numbers.

Table 3: PAD numbers and corresponding artefact site numbers

PAD	Artefact site	AHIMS site number
n/a	# 52-2-0512	Remains the same-site card updated
YTOF PAD 1	YTOF AS 3	Pending
YTOF PAD 2	YTOF AS 4	Pending
YTOF PAD 4	YTOF AS 5	Pending
YTOF PAD 5	YTOF AS 6	Pending
YTOF PAD 6	YTOF AS 7	Pending
YTOF PAD 7	n/a- void of artefacts	n/a
YTOF PAD 1	YTOF AS 8	Pending
YTOF PAD 4	YTOF IF 4*	Pending

* YTOF IF 4 is recorded as an isolated find as it is a singular artefact (Figure 5).

Figure 9: Updated overview of sites and areas of PAD within the study area

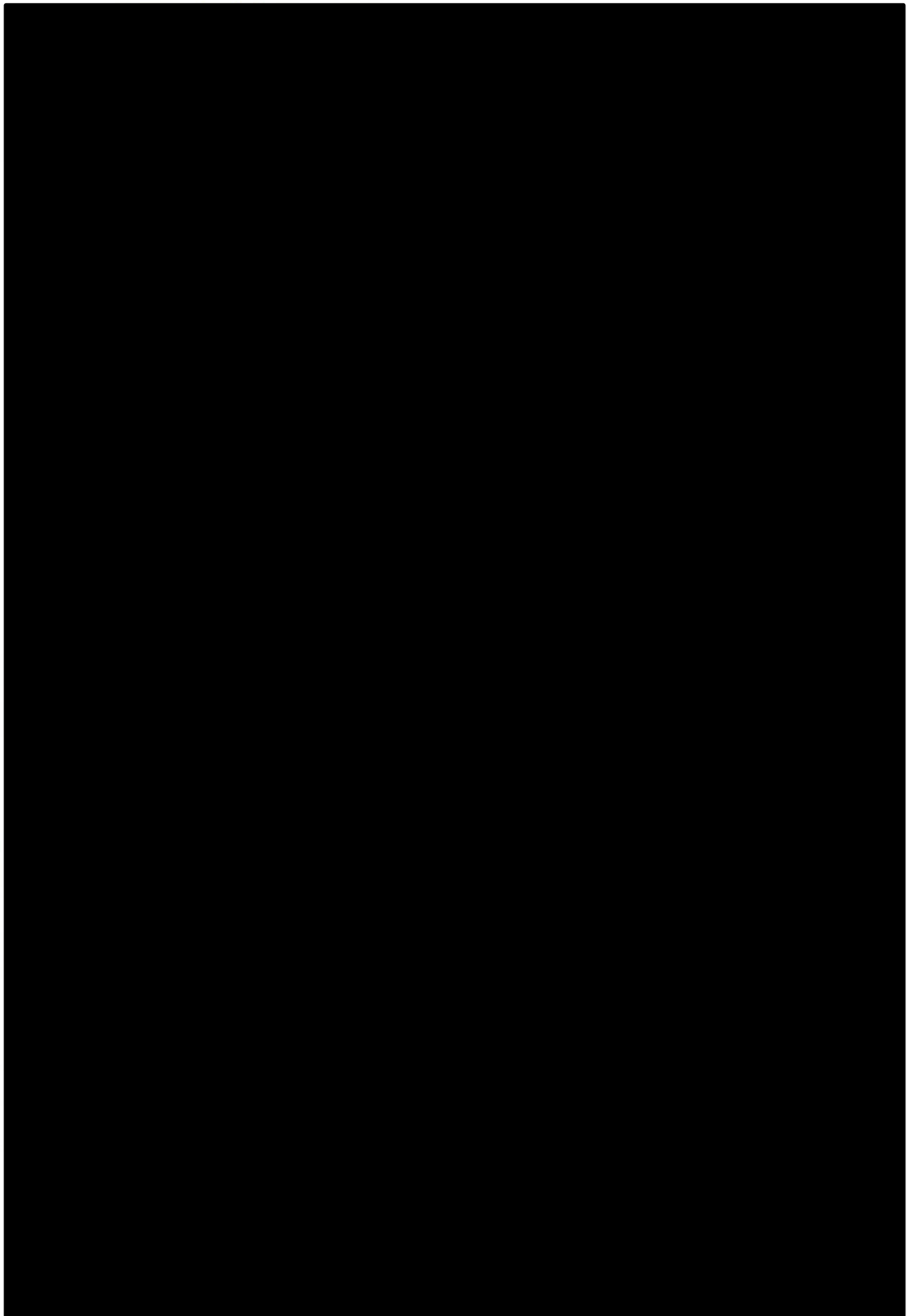


Figure 10: AHIMS site # revised site boundary

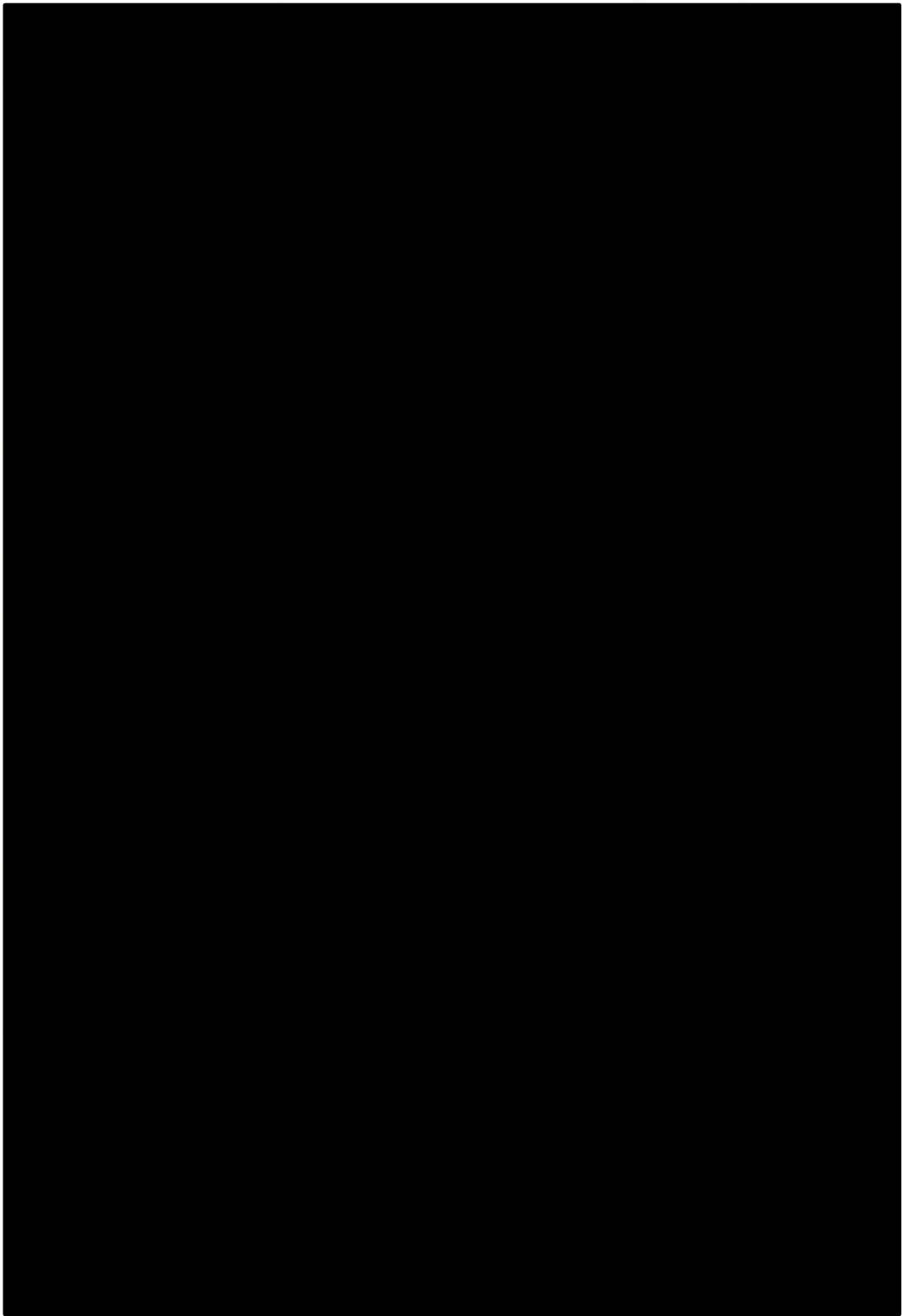


Figure 11: YTOF AS 3 and YTOF AS 8 site boundaries

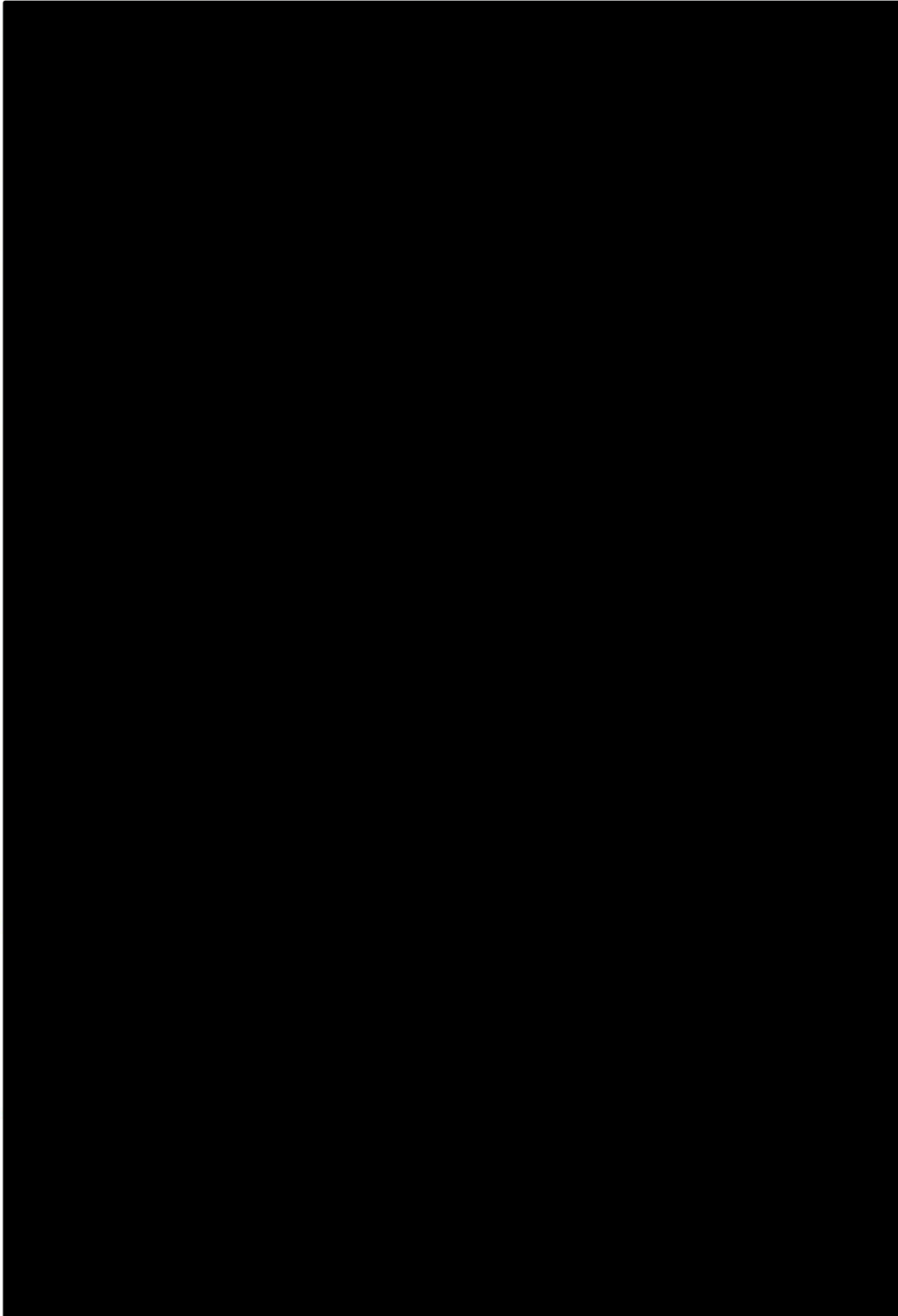


Figure 12: YTOF AS 4 site boundary

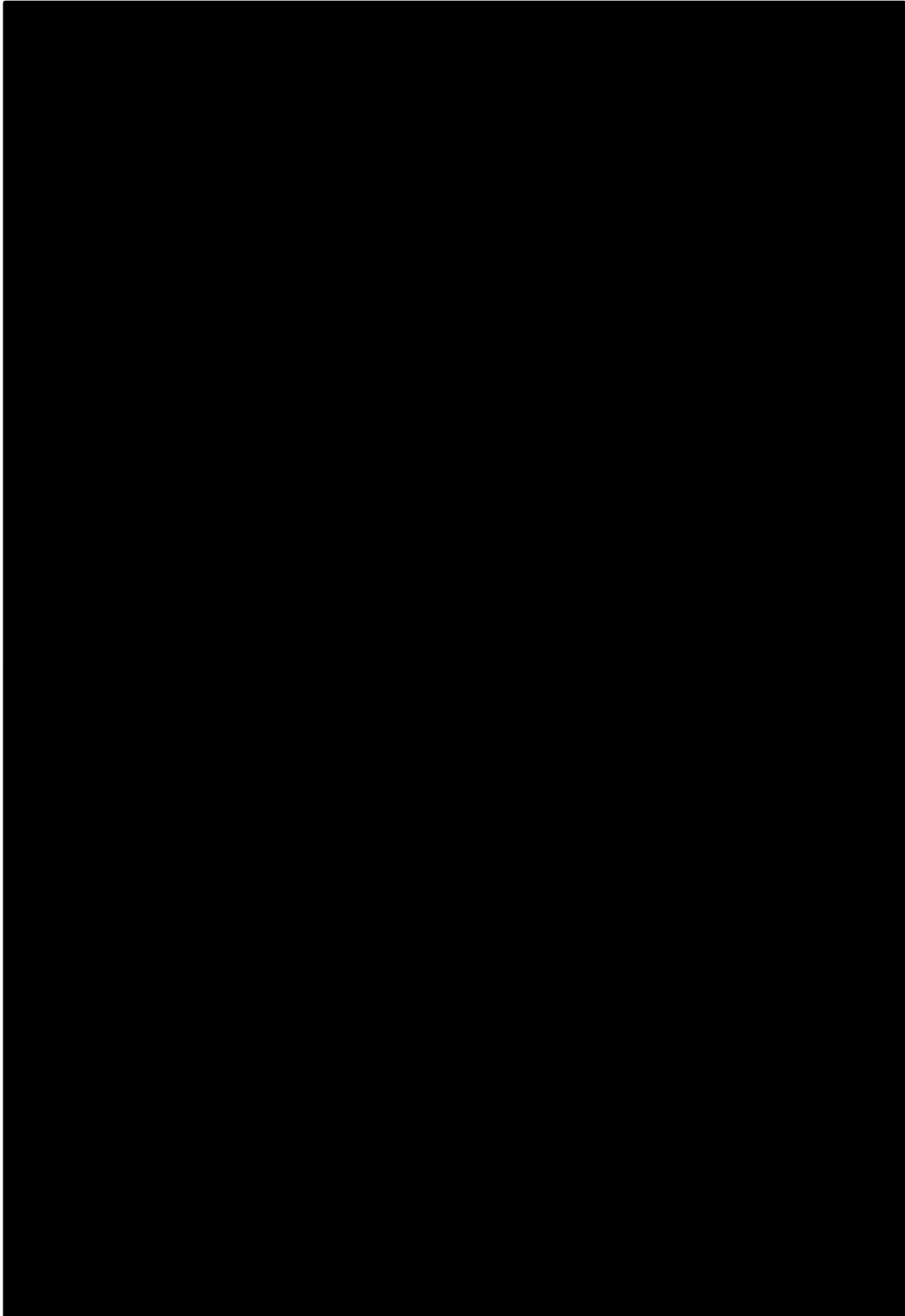


Figure 13: YTOF AS 5 and YTOF IF 4 site boundaries

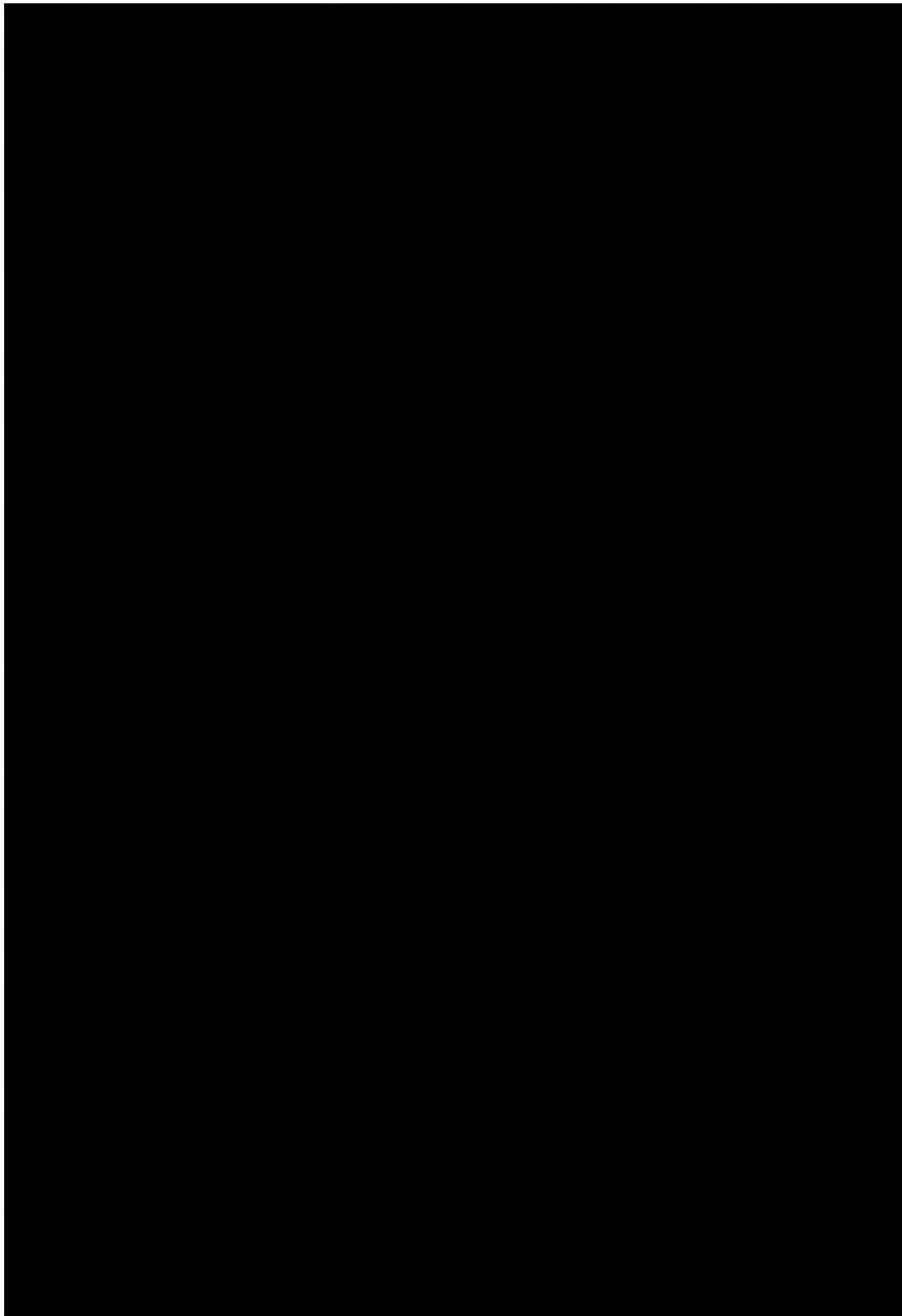


Figure 14: YTOF AS 6 site boundary

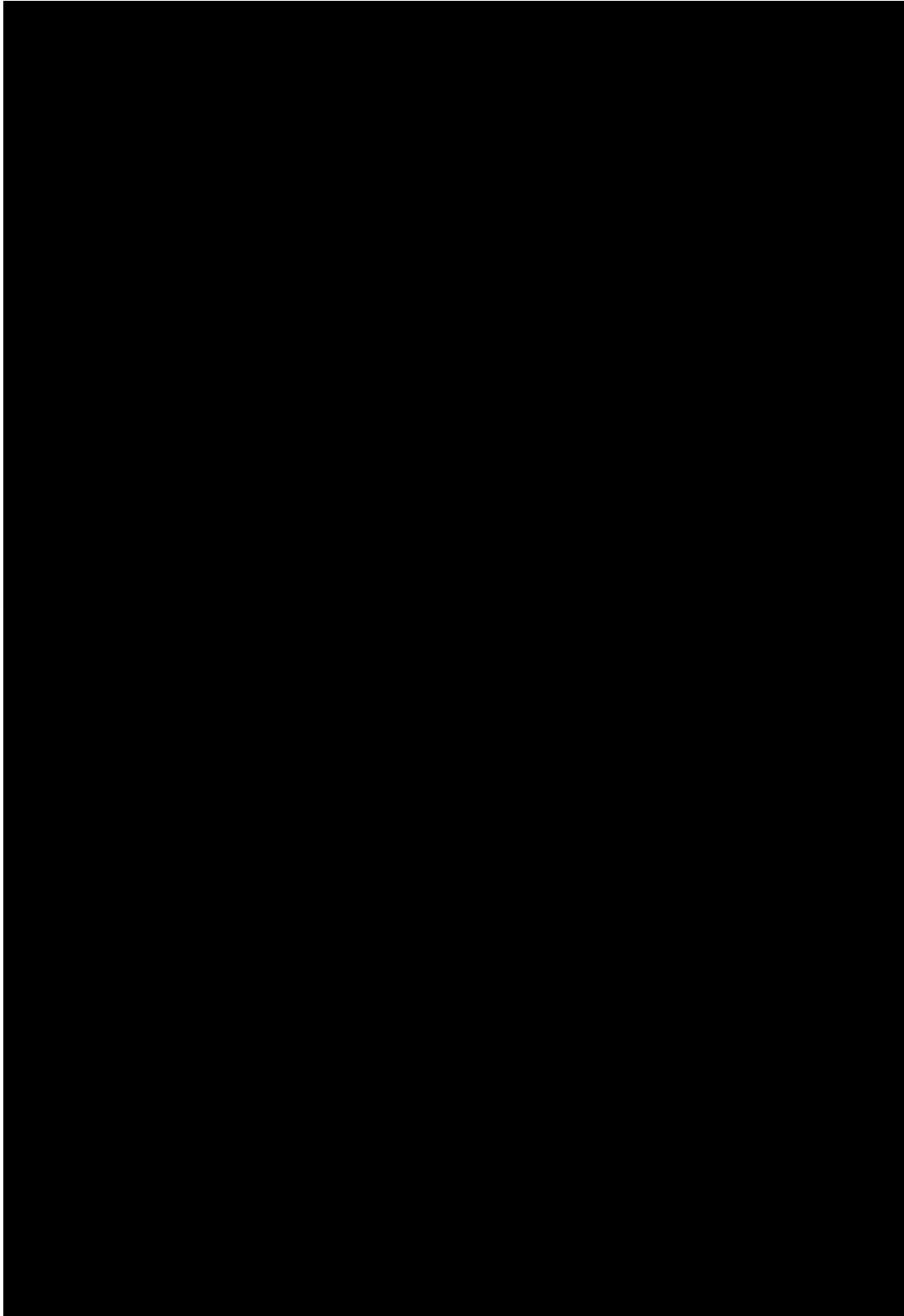
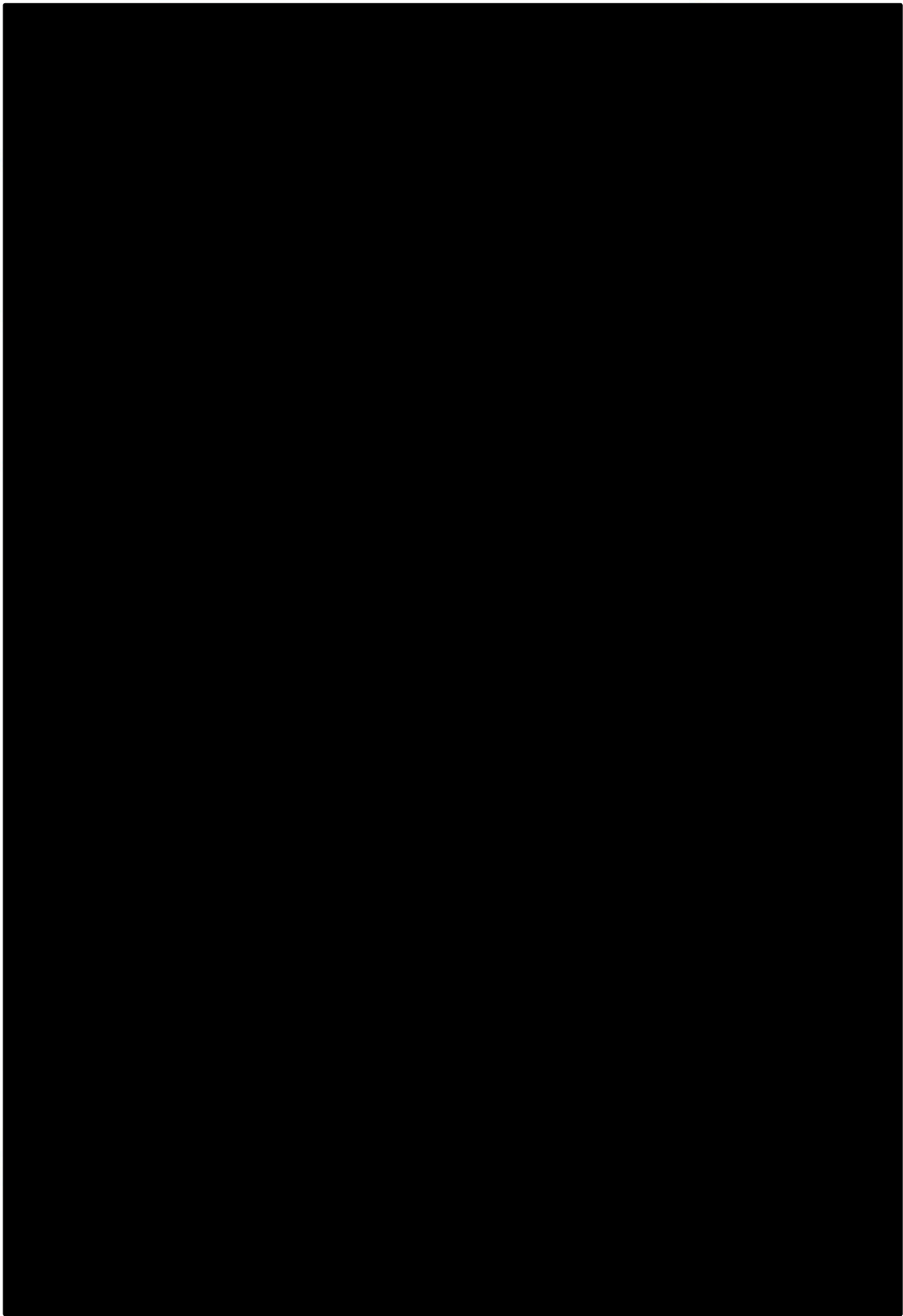


Figure 15: YTOF AS 7 site boundary



10.0 SIGNIFICANCE ASSESSMENT

10.1 Assessment criteria

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised by using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance of the study area are discussed in the CHAR.

10.2 Archaeological significance assessment

Archaeological test excavation within the study area identified a low density subsurface artefact scatter at AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 6, YTOF AS 7 and YTOF AS 8. An isolated artefact was identified at YTOF IF 4. A moderate density artefact scatter was identified at YTOF AS 4 and YTOF AS 5. YTOF PAD 7 was found to be void of artefacts.

Assessment of the scientific significance of all six artefact sites locations considered the following aspects of the test excavation results:

- A low density sub-surface stone artefact scatter identified at AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 6, YTOF AS 7 and YTOF AS 8.
- An isolated artefact identified at YTOF IF 4.
- A moderate density artefact scatter identified at YTOF AS 4 and YTOF AS 5.
- Low densities of artefacts limit the information that the site can provide about the Aboriginal occupation of the region.
- Comparable low-density sites are commonly represented within the local and regional context. Low density sites do not have high rarity or representative values.
- Moderate density sites provide the opportunity to further investigate the subsurface archaeological deposits of a site. Furthermore, few investigations in the local region have investigated sites comparable to YTOF AS 4 and YTOF AS 5.

As such, AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 6, YTOF AS 7 YTOF AS 8 and YTOF IF 4 have been assessed as demonstrating low archaeological significance. These sites demonstrate low research potential and low representative, rarity and education values.

YTOF AS 4 and YTOF AS 5 have been assessed as demonstrating moderate archaeological significance. These sites demonstrate low rarity, but moderate research potential, representative and education values. Multiple cores were retrieved from YTOF AS 4 and it also had the highest number of artefacts of any sites excavated. YTOF AS 5 produced a retouched flake as well as three blade flakes. These, along with the lack of cortical surfaces that remained on any artefacts, indicates more intensive core preparation at YTOF AS 5 than was found at other sites investigated.

Table 4: Significance assessment

Site	Research potential	Representativeness	Rarity	Education potential	Overall significance assessment
# 52-2-0512	low	low	moderate	low	low-moderate
YTOF AS 3	low	low	low	low	low
YTOF AS 4	moderate	moderate	low	moderate	moderate
YTOF AS 5	moderate	moderate	low	moderate	moderate
YTOF AS 6	low	low	low	low	low
YTOF AS 7	low	low	low	low	low
YTOF AS 8	low	low	low	low	low
YTOF IF 4	low	low	low	low	low

A revised site boundary for AHIMS site # 52-2-0512, and new site boundaries for YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4 are shown in Figure 9- Figure 15.

11.0 IMPACT ASSESSMENT

11.1 Impacts of the proposed works

Aboriginal objects have been retrieved from archaeological test excavation at AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4. These sites would be directly impacted by the proposed development (Figure 15). The assessment of impact is summarised in Table 5.

Table 5: Impact assessment

Site number/name	Type of harm	Degree of harm	Consequence of harm
# 52-2-0512	direct	partial	partial loss of value
YTOF AS 3	direct	total	total loss of value
YTOF AS 4	direct	partial	partial loss of value
YTOF AS 5	direct	total	total loss of value
YTOF AS 6	direct	total	total loss of value
YTOF AS 7	direct	total	total loss of value
YTOF AS 8	direct	total	total loss of value
YTOF IF 4	direct	total	total loss of value

12.0 MITIGATION AND MANAGEMENT

12.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved. If conservation is not practicable, measures should be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended is based on the assessed significance of the sites. The final recommendations would also be informed by cultural significance, which will be discussed by the Aboriginal community in their responses during the next stage of consultation.

12.2 Mitigation measures

AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4 have been assessed as demonstrating low archaeological significance. No further archaeological investigation is required prior to impacts taking place.

YTOF AS 4 and YTOF AS 5 have been assessed as demonstrating moderate archaeological significance. If the proposed impacts at YTOF AS 4 and YTOF AS 5 are to proceed then further archaeological investigation, such as targeted salvage excavation as part of PACHCI Stage 4, should be conducted as a mitigation measure. Targeted salvage excavation would allow for the removal of all, or a large portion of, the areas of moderate archaeological significance. Archaeological salvage will provide more information on the activities that took place at the site, and mitigate against impact to the remainder of the site area.

12.2.1 Reburial of artefacts

Further information on the long-term care and management of the retrieved artefact assemblage is included in the CHAR.

13.0 RECOMMENDATIONS

The following recommendations are based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended
- The recommendations of the ASR
- The interests of the Aboriginal stakeholder groups
- The likely impacts of the proposed development

It was found that:

- No Aboriginal objects were located at YTOF PAD 7
- Low density subsurface stone artefact scatters were identified at AHIMS site # 52-2-0512, YTOF AS 3, YTOF AS 6, YTOF AS 7 and YTOF AS 8. YTOF IF 4 is an isolated artefact. These sites are common in the local context and present little opportunity for further research
- A moderate density subsurface stone artefact scatter was identified at YTOF AS 4 and YTOF AS 5. Stone artefact scatter sites are common in the local context (AMBS 2010 Biosis Research 2007). However, YTOF PAD 2 (AS 4) and YTOF PAD 4 (AS 5) present the opportunity to provide further information on Aboriginal activity in the region and contribute to the body of archaeological knowledge, due to the moderate densities of artefacts and specialised tools represented in the assemblages.

It is therefore recommended that:

- The low density artefact scatters identified at AHIMS site # 52-2-0512, YTOF AS 3 (within the location previously designated PAD 1) and AS 8 (PAD 1), YTOF AS 6 (PAD 5), YTOF AS 7 (PAD 6) and YTOF AS 8 (PAD 1) are common in the local context and offer little opportunity for further research. The isolated artefact identified at YTOF IF 4 (PAD 4) is within a disturbed context and also warrants no further research. No artefacts were retrieved from YTOF PAD 7. As such, no further work is recommended at these sites (# 52-2-0512, YTOF AS 3 (PAD 1) and AS 8 (PAD 1), YTOF AS 6 (PAD 5), YTOF AS 7 (PAD 6), YTOF IF 4 (PAD 4) and YTOF PAD 7.
- If impacts cannot be avoided to YTOF AS 4 and YTOF AS 5, archaeological salvage excavation will be required in order to adequately investigate the subsurface deposits of these sites.
- Roads and Maritime have advised that the proposed works will not impact YTOF PAD 3. As such, YTOF PAD 3 was not subject to test excavations. If the concept designs are altered or potential impacts identified for YTOF PAD 3, it is recommended that test excavation be undertaken prior to works commencing.
- Long term care of excavated artefacts, such as reburial, should be undertaken in accordance with the Code of Practice and the recommendations of registered Aboriginal stakeholders.
- A site update card should be submitted to AHIMS for AHIMS site # 52-2-0512.
- Site recording cards should be submitted to AHIMS for YTOF AS 3, YTOF AS 4, YTOF AS 5, YTOF AS 6, YTOF AS 7, YTOF AS 8 and YTOF IF 4.

14.0 REFERENCES

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15.0 APPENDICES

15.1 Glossary

Raw Material

SIL= silcrete

CH= chert

QZ= quartz

QTE= quartzite

BAS= basalt

CHAL= chalcedony

IMT= indurated mudstone tuff

Artefact type

SPC= single platform core

MPC= multi-platform core

AF= angular fragment

LBTF= longitudinally and transversely broken flake

LBF= longitudinally broken flake

PFF= proximal broken flake

MFF= medial broken flake

DFF= distal broken flake

RF= retouched (complete) flake

CF= complete flake

Platform

CO= cortical

FL= flat

FK= flaked

FOC= focal

COL= collapsed

Additional characteristics

PA&M= parallel arises and margins

BL=blade

15.2 Stone artefact catalogue

	Site	Artefact #	Excavation Unit		Material			Artefact			Attributes		Dimensions (mm)			Cortex (%)	Weight (gm)
			X	Y	Spit	Lith	Colour	Reduction Type	Tool / Core	Notes / Observations	Platform Type	Negative Flake Scars	Size Range (mm)	Length	Width		
AHIMS Sit																	
52-5-0512		testexc	1	1050	2045	1 CH		grey	CF	0	0 FL	1	24	15	6	80	2.2
52-5-0513		testexc	2	1095	2030	1 SIL		grey	AF	0	0	0	13	9	4	40	0.3
52-5-0514		testexc	3	1095	2030	1 QZ		grey	DFF	0	0	1	11	9	4	10	0.4
52-5-0515		testexc	4	1075	2000	1 CH		green	CF	0	0 FK	2	25	15	10	0	3.2
52-5-0516		testexc	5	1075	2000	1 SIL		grey	CF	0	0 FK	3	15	6	3	0	0.25
52-5-0517		testexc	6	1065	2030	1 CH		brown	PFF	0	0 FK	1	17	15	8	0	2.1
52-5-0518		testexc	7	1050	2015	1 QZ		white	CF	BL	PA&M	2	14	5	2	0	0.1
52-5-0519		testexc	8	1035	2045	3 BAS		dark grey	CF	0	0 FK	6	25	18	5	0	1.6
52-5-0520		testexc	9	1035	2045	3 QTE		grey	AF	0	0	0	10	10	3	0	0.2
52-5-0521		testexc	10	1025	2030	1 QTE		grey	CF	0	0 PA&M	2	8	5	2	0	0.08
52-5-0522		testexc	11	1020	2045	2 QZ		white	CF	0	0 PA&M	1	11	7	3	0	0.2
52-5-0523		testexc	12	1015	2060	2 DOL		red	CF	0	0 FK	4	17	17	5	0	1.5
52-5-0524		testexc	13	1015	2060	2 SIL		grey	AF	0	0 PA&M	0	15	9	6	0	0.8
52-5-0525		testexc	14	1005	2045	1 CH		grey	MPC	BL	PA&M	0	26	19	7	0	3.8
52-5-0526		testexc	15	1005	2045	1 CH		green	DFF	0	0	3	19	11	6	0	1.3
52-5-0527		testexc	16	1000	2060	1 QTE		grey	PFF	0	0 FOC	3	9	5	1	0	0.05
	PAD1	testexc	17	2000	3180	5 MUD		yellow	DFF	0	0	2	12	9	3	0	0.4
	PAD1	testexc	18	2000	3180	5 MUD		yellow	AF	0	0	0	13	10	8	0	0.5
	PAD1	testexc	19	2000	3150	1 QZ		white	CF	0	0 FK	2	9	5	4	0	0.2
	PAD1	testexc	20	2000	3150	2 CHAL		pink	CF	0	0 CO	1	12	11	7	30	0.9
	PAD1	testexc	21	2002	3135	1 CHAL		white	CF	0	0 PA&M	3	26	12	5	0	1.5
	PAD1	testexc	22	2002	3135	1 SIL		grey	MFF	0	0 PA&M	2	14	7	3	0	0.4
	PAD1	testexc	23	2002	3135	2 MUD		yellow	DFF	0	0 PA&M	2	14	7	4	0	0.4
	PAD1	testexc	24	2000	3120	2 QTE		white	CF	0	0 FK	1	16	9	4	0	0.9
	PAD1	testexc	25	2000	3015	2 CHAL		white	CF	0	0 FOC	3	14	8	7	0	0.8
	PAD1	testexc	26	2015	3175	3 QTE		white	CF	0	0 FK	1	13	10	4	0	0.6
	PAD1	testexc	27	2015	3160	2 SIL		grey	DFF	0	0	1	22	13	6	0	1.9
	PAD1	testexc	28	2015	3010	4 SIL		grey	CF	0	0 COL	4	11	8	5	0	0.3
	PAD1	testexc	29	2015	3010	4 MUD		yellow	CF	0	0 highly weath FK	4	20	13	6	0	1.7

PAD2	test exc	30	4030	4999.5	2 CH	green	CF		0	0 COL	1		8	8	1	0	0.1
PAD2	test exc	31	4030	4999.5	8 SIL	red	CF		0	0 FOC	3		35	24	11	0	8.2
PAD2	test exc	32	4030	5000	4 SIL	grey	CF		0	0 FK	2		22	18	5	1	1.6
PAD2	test exc	33 TP3 A			2 QZ	white	CF		0	0 FOC	3		13	8	4	0	0.4
PAD2	test exc	34 TP3 B			4 CHAL	white	SPC		0	0	0		41	14	14	10	8.2
PAD2	test exc	35 TP3 B			4 SIL	grey	AF		0	0	0		8	5	3	0	0.1
PAD2	test exc	36 TP3 B			5 SIL	red	CF		0	0 FK	3		19	14	5	0	1.1
PAD2	test exc	37 TP3 D			2 SIL	red	DFF		0 PA&M	0	2		14	10	2	0	0.2
PAD2	test exc	38 TP4 A			3 CH	grey	CF		0	0 FK	3		13	11	3	0	0.4
PAD2	test exc	39 TP4 A			3 SIL	grey	CF		0	0 FK	2		19	15	6	0	0.8
PAD2	test exc	40 TP4 A			3 SIL	grey	AF		0	0	0		12	9	4	0	0.4
PAD2	test exc	41 TP4 A			4 SIL	grey	CF		0	0 FL	2		20	11	5	0	0.9
PAD2	test exc	42 TP5 A			1 CH	grey	AF		0 glass and por	0	0		14	8	6	0	0.5
PAD2	test exc	43 TP5 B			2 CHAL	pink	PFF		0 PA&M	FL	3		20	10	5	0	1.1
PAD2	test exc	44 TP5 C			3 CHAL	pink	CF		0 small ceramic fragmen		3		16	12	4	0	0.6
PAD2	test exc	45 TP6			2 SIL	red	CF		0 PA&M	FK	2		62	18	6	0	1.8
PAD2	test exc	46 TP7			1 SIL	red	PFF		0	0 FL	2		11	8	2	0	0.2
PAD2	test exc	47 TP8 A			2 SIL	grey	LBF		0	0 FK	1		21	13	5	0	1.7
PAD2	test exc	48 TP8 A			2 SIL	grey	PFF		0	0 FK	3		18	15	4	0	1
PAD2	test exc	49 TP8 A			2 SIL	grey	CF		0	0 FOC	0		14	9	3	95	0.3
PAD2	test exc	50 TP8 A			2 QTE	grey	DFF		0	0	2		11	8	4	0	0.3
PAD2	test exc	51 TP8 A			3 SIL	red	CF		0	0 FL	1		25	12	4	0	1.4
PAD2	test exc	52 TP8 B			3 MUD	yellow	SPC		0	0	0		19	10	5	0	1.1
PAD2	test exc	53 TP8 C			2 CHAL	grey	CF		0	0 FOC	4		18	12	5	0	1.1
PAD2	test exc	54 TP8 C			4 CHAL	grey	CF		0	0 FK	1		19	13	4	0	0.9
PAD2	test exc	55 TP8 D			1 CH	grey	CF		0	0 FL	1		18	11	3	0	0.5
PAD2	test exc	56 TP8 D			1 CH	grey	CF		0	0 FL	2		7	6	2	0	0.1
PAD2	test exc	57 TP8 D			1 QZ	white	CF		0	0 FL	4		8	7	4	0	0.2
PAD2	test exc	58 TP8 D			1 BAS	dark grey	LBF		0	0	2		15	5	3	0	0.2
PAD2	test exc	59 TP8 D			1 SIL	grey	AF		0	0	0		13	9	5	0	0.5
PAD2	test exc	60 TP8 D			1 CH	grey	AF		0	0	0		11	6	5	0	0.3
PAD2	test exc	61 TP8 D			2 SIL	grey	PFF		0 PA&M	FOC	1		12	6	3	0	0.2
PAD2	test exc	62 TP8 D			2 SIL	grey	CF		0 PA&M	FOC	3		16	8	4	0	0.6
PAD2	test exc	63 TP8 D			4 QTE	pink	CF		0	0 COL	1		21	17	4	0	1.8
PAD2	test exc	64 TP8 D			4 SIL	grey	CF		0	0 FL	2		18	13	6	0	1.2
PAD2	test exc	65 TP8 D			5 SIL	red	AF		0	0	0		14	11	7	0	0.9
PAD2	test exc	66 TP9			1 SIL	grey	SPC		0	0	0		30	20	16	10	10.5
PAD2	test exc	67 TP9			1 SIL	grey	PFF		0	0 FL	1		12	7	2	0	0.2

PAD2	test exc	68 TP9		3 CH	dark grey	CF		0	0 FK	2		17	11	8	0	1
PAD2	test exc	69 TP10		3 CH	grey	CF		0	0 FK	2		22	21	6	0	2.4
PAD2	test exc	70 TP10		3 SIL	grey	CF		0	0 FK	2		13	11	1.9	0	0.2
PAD2	test exc	71 TP11 A		2 BAS	dark grey	CF		0 PA&M	FOC	2		32	16	6	0	2.9
PAD2	test exc	72 TP11 A		4 QTE	white	CF	BL	PA&M	FK	2		22	7	3	0	0.5
PAD2	test exc	73 TP11 A		1 CH	grey	DFF		0	0	3		14	9	3	0	0.3
PAD4	test exc	74 3060	3970	3 SIL	red	CF		0	0 COL	3		11	10	2	0	0.4
PAD4	test exc	75 2995	3985	4 SIL	red	DFF		0	0	3		21	12	4	0	0.8
PAD4	test exc	76 3060.5	4000	1 CH	dark grey	PFF		0	0 FL	2		11	8	7	0	0.5
PAD4	test exc	77 3060.5	4000	1 QZ	white	CF		0	0 COL	1		8	6	2	0	0.1
PAD4	test exc	78 3075	4000	3 SIL	red	AF		0	0	0		16	8	5	0	0.6
PAD4	test exc	79 3075	4000	5 SIL	red	PFF		0	0 FL	2		14	9	6	0	0.6
PAD4	test exc	80 3075	4000	6 CH	red	RF		0 retouch cove	FL	1		18	16	5	0	1.7
PAD4	test exc	81 3075.5	4000.5	2 SIL	red	CF	BL	PA&M	FOC	1		18	6	3	0	0.3
PAD4	test exc	82 3060.5	4000	4 SIL	grey	MFF	BL	PA&M	0	2		10	6	2	0	0.2

15.3 Stone artefact photographs

Figure 16: Artefact numbers 14, 16, 8, 12 and 13 from AHIMS site # 52-5-0512



Figure 17: Artefact numbers 17, 20 and 21 from YTOF AS 3



Figure 18: Artefact numbers 63, 64, 45, 44, 43 and 53 from YTOF AS 4



Figure 19: Artefact numbers 86, 87, 85 and 74 from YTOF AS 5



Figure 20: Artefact numbers 88, 89 and 90 from YTOF AS 6



Figure 21: Artefact numbers 97, 92 and 99 from YTOF AS 7



15.4 Section drawings

Figure 22: AHIMS site 52-5-0512 Section Drawings

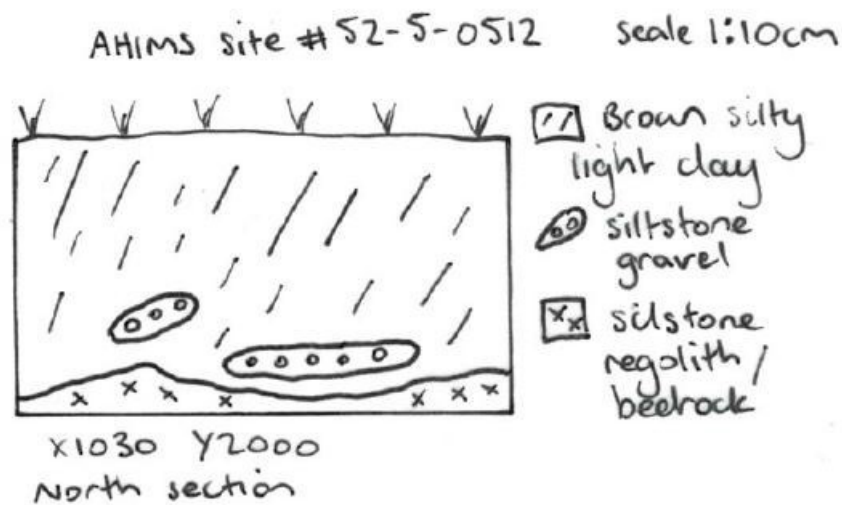


Figure 23: YTOF PAD 1 (AS 3)

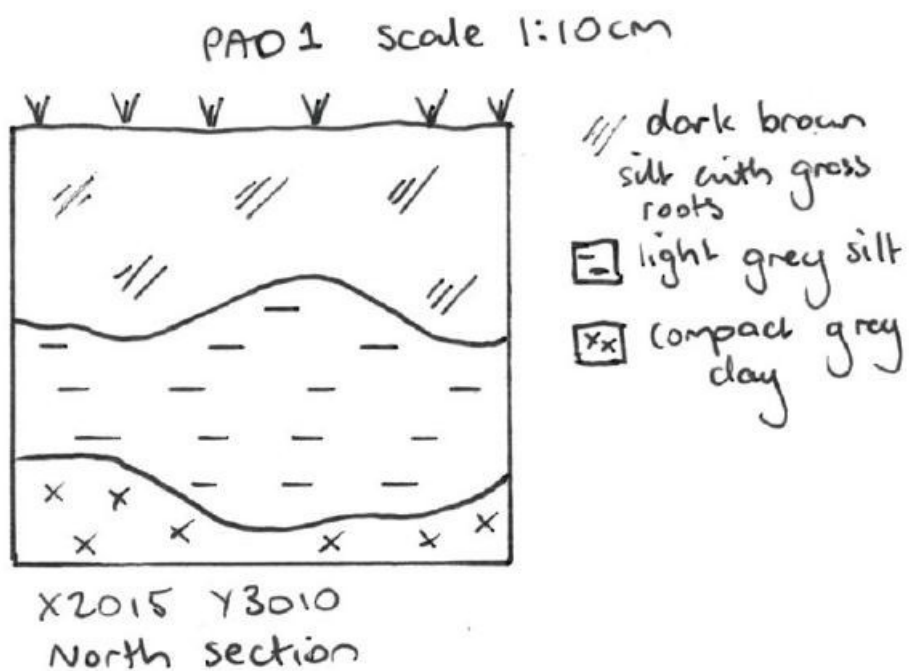


Figure 24: YTOF PAD 2 (AS 4)

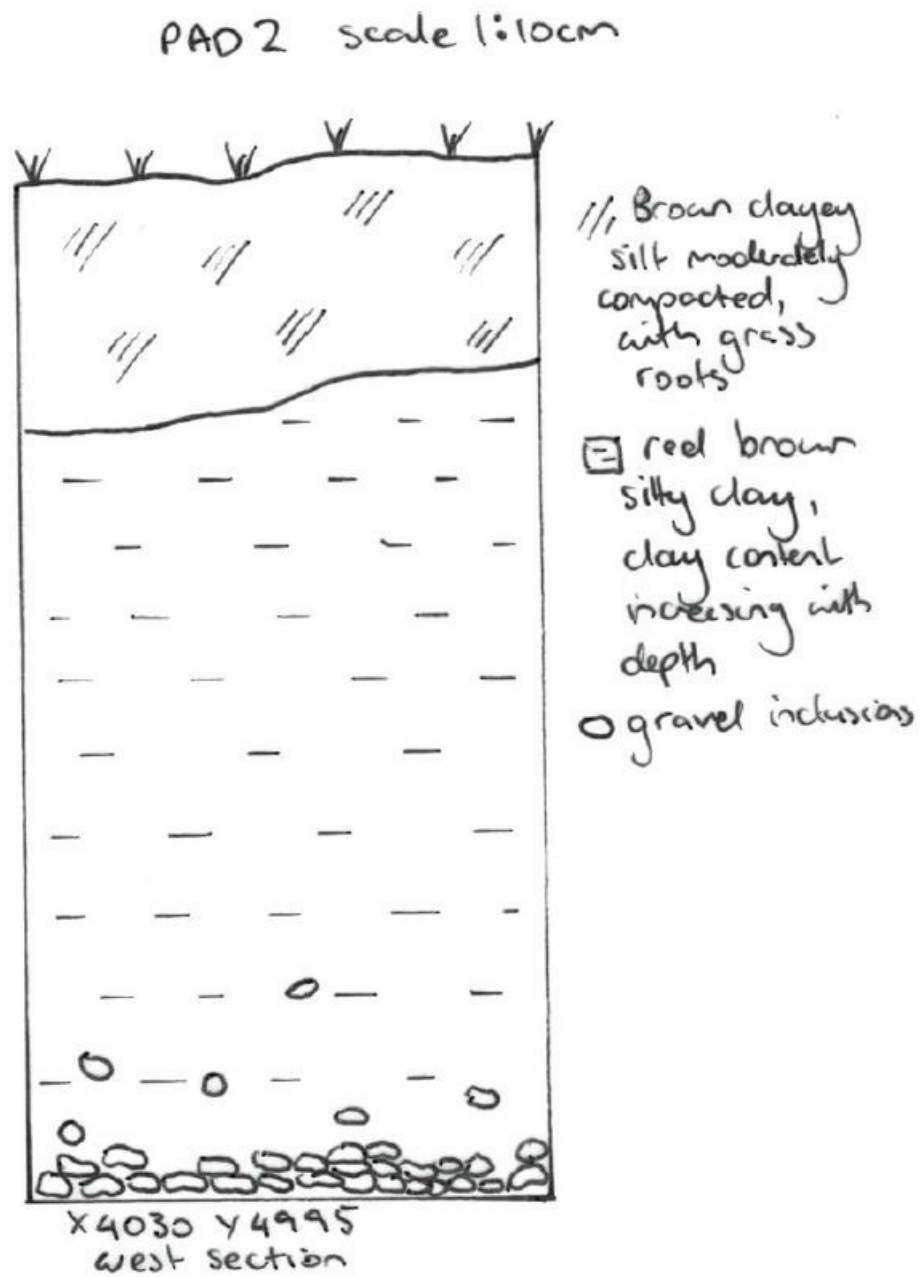


Figure 25: YTOF PAD 4 (AS 5)

PAD 4 scale 1:10cm

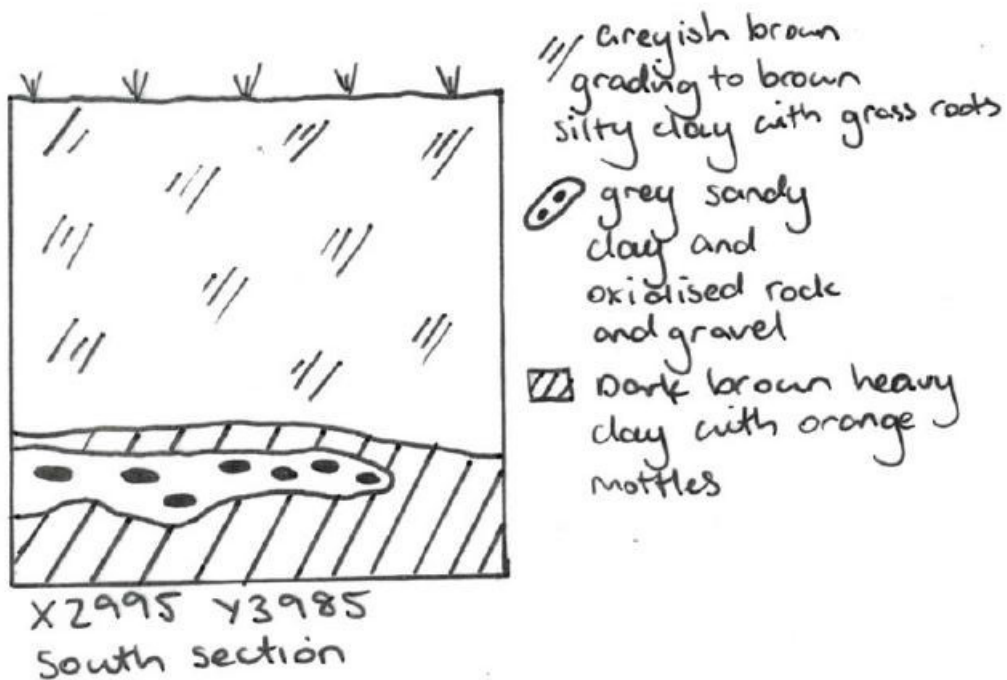


Figure 26: YTOF PAD 5 (AS 6)

PAD 5 scale 1:10cm

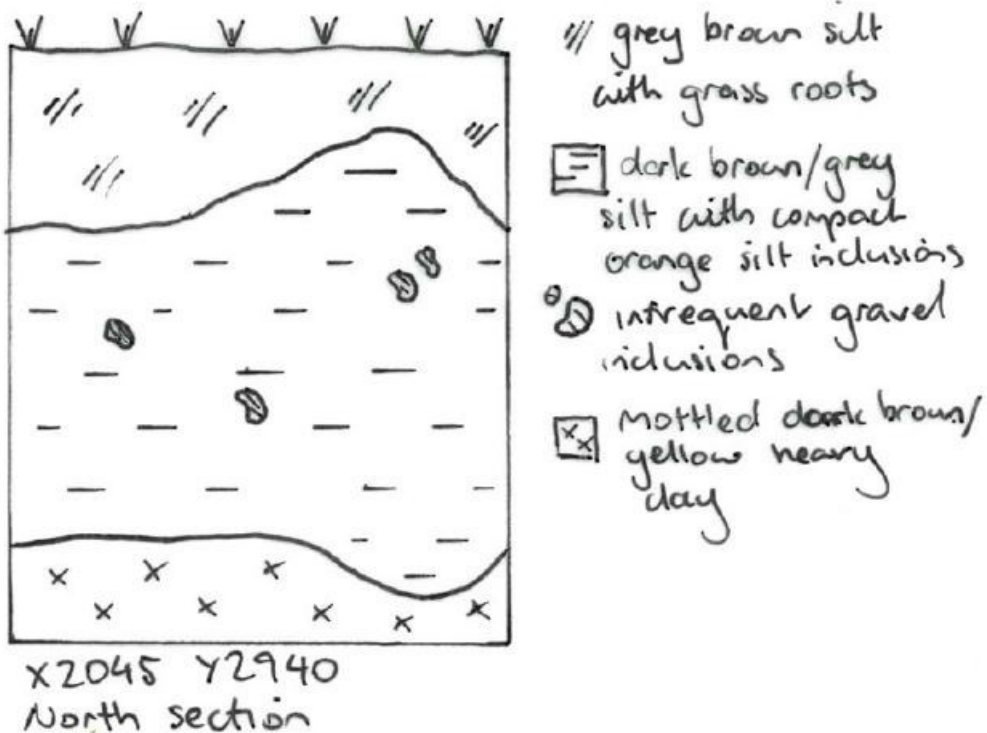


Figure 27: YTOF PAD 6 (AS 7)

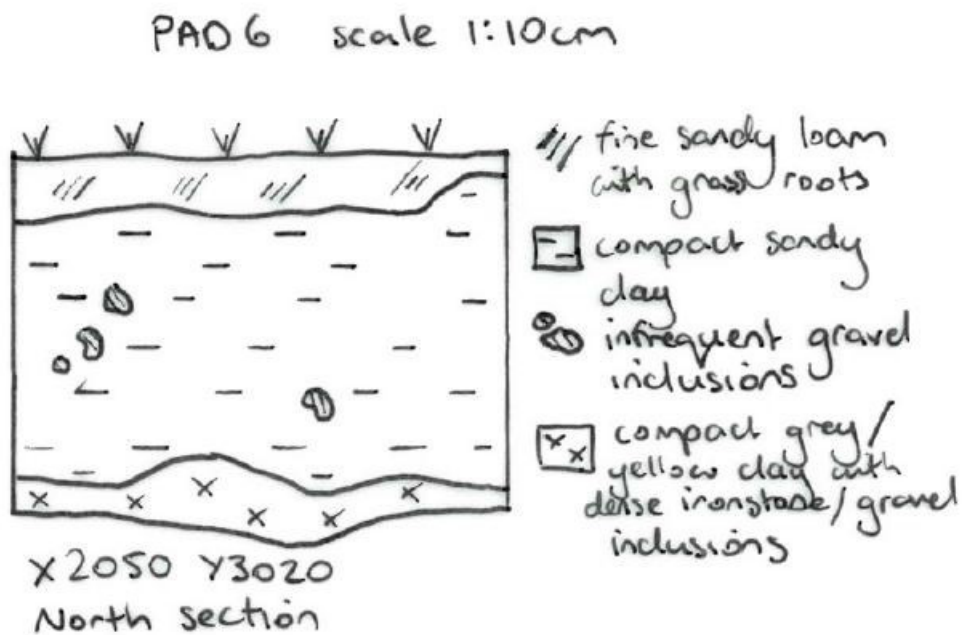
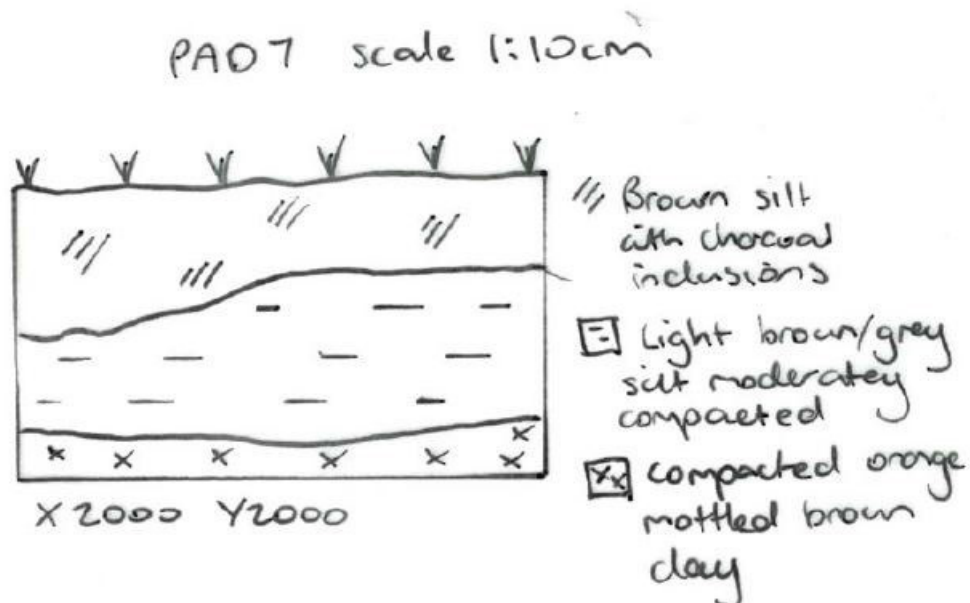


Figure 28: YTOF PAD 6 (AS 7)



9.8 Appendix I: Author information

Dr Sandra Wallace

Sandra is currently the Principal Archaeologist/Director at Artefact Heritage and has over 13 years' experience in cultural heritage management and archaeology. She has expertise across both Aboriginal and non-Aboriginal heritage and archaeology. Sandra has provided heritage advice for a variety of development projects (e.g. large scale residential subdivisions, targeted urban development, and infrastructure projects such as roads, rail and pipelines). Sandra has worked extensively with stakeholders such as Local Aboriginal Land Councils and Native Title groups to facilitate best practise heritage outcomes. Sandra has also prepared heritage assessments, statements of heritage impact, heritage management plans and technical reports on large-scale archaeological surveys and excavations. She is familiar with relevant heritage guidelines and legislation and recently sat on the independent working party for Aboriginal cultural heritage legislative reform in NSW. Sandra was also the secretary of the state chapter of the Australian Association of Consulting Archaeologists from 2012-2014.

Along with her consulting work Sandra specialises in archaeological theory and has presented papers at numerous international conferences on the topic. Routledge UK published her book, 'The Contradictions of Archaeological Theory', in 2011. Sandra has participated in the Greater Angkor Project, Cambodia; and excavations on the Canning Stock Route in Western Australia.

Josh Symons

Josh is currently a Senior Archaeologist/Heritage Consultant at Artefact Heritage. Josh has a First Class Honours degree from the University of Sydney and has over ten years' experience in Aboriginal and non-Indigenous archaeology. Josh has extensive experience providing heritage advice for a variety of development and infrastructure projects throughout NSW.

Alyce Howard

Alyce is currently an Archaeologist/Heritage Consultant at Artefact Heritage. Alyce has a B. Archaeological Science (Honours) from the Australian National University. Alyce has four years' experience in cultural heritage management in Western Australia and NSW. Alyce conducted research with the Australian National University and University of the Philippines for the Catanauan Archaeology and Heritage Project in 2009.



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