Elizabeth Enterprise Precinct – Stage 1 (SSD-19618251)

Aboriginal Cultural Heritage Assessment Report

Penrith LGA

Report to Mirvac Projects Pty Ltd

FINAL

March 2025

artefact

Artefact Heritage and Environment
ABN 73 144 973 526
Suite 56, Jones Bay Wharf
26-32 Pirrama Road
Pyrmont NSW 2009
Australia

+61 2 9518 8411
office@artefact.net.au

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Review type	Revision type
1	23 April 2020	Duncan Jones	Sandra Wallace	24 April 2020	Internal review	Draft
2	1 May 2020	Russell Hogan - Mirvac	Alyce Haast	1 May 2020	Client review	Draft
3	2 June 2020	Duncan Jones	Sandra Wallace	5 June 2020	Internal consistency review	Draft
4	13 Sep 2021	Julia McLachlan	Josh Symons	14 Sep 2021	Internal consistency review	Draft
5	10 December 2021	Duncan Jones	Duncan Jones	10 December 2021	Post-stakeholder review	Draft
6	10 November 2022	Sandra Wallace	Sandra Wallace	10 November 2022	Internal review	Draft
7	23 March 2023	Sandra Wallace	Sandra Wallace	27 March 2023	Updated masterplan	Draft
8	18 March 2024	Ryan Taddeucci	Josh Symons	11 April 2024	Updated masterplan	Draft
9	12 April 2024	Meighan Woods	Meighan Woods	29 April 2024	Client review	Draft
10	24 December 2025	Ryan Taddeucci	Ryan Taddeucci	5 February 2025	Post-stakeholder review	Draft
11	5 February 2025	Meighan Woods	Meighan Woods	6 February 2025	Client review	Final
12	3 March 2025	Ryan Taddeucci	Ryan Taddeucci	3 March 2025	Minor revisions	Final v2

Last saved:	3 March 2025
File name:	ACHAR-240066-Elizabeth Enterprise Precinct Stage 1-FINAL v2-250303
Author:	Lily Hackett & Gareth Holes
Project manager:	Ryan Taddeucci
Name of organisation:	Artefact Heritage and Environment Pty Ltd
Name of project:	Elizabeth Enterprise Precinct
Name of document:	Elizabeth Enterprise Precinct – Addendum Aboriginal Cultural Heritage Assessment Report
Document version:	Final

EXECUTIVE SUMMARY

Mirvac Projects (Mirvac) is seeking approval for a development at 1669 – 1732 and 1669a Elizabeth Drive, Badgerys Creek (the study area). The project was declared State Significant Development and was issued the Secretary's Environmental Assessment Requirements (SEARs) SSD-19618251. The proposal includes a concept masterplan, development for the study area for the proposed construction of 7 warehouses with service roads, hardstand, construction of an earth bund to form an interim evaporative basin, open space and amenity nodes.

An analysis of the AHIMS data, review of relevant archaeological reports and desktop research into the environmental character of the local and regional area was conducted to create a predictive model for Aboriginal potential within the study area. These predictions were tested through the completion of five archaeological surveys, utilising 10 survey units and a test excavation program. The combination of desktop and field investigation resulted in:

- A total of 12 Aboriginal sites have been identified within the Elizabeth Enterprise Precinct Stage 1 (SSD-19618251) study area, comprised of five artefact scatters, six isolated artefacts, and one area of PAD:
    - Elizabeth Precinct Artefact Scatter 02 (EP AS 02 - AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending) have been assessed as demonstrating **high archaeological significance**
    - Elizabeth Precinct Isolated Find 01 (EP IF 01 - AHIMS ID 45-5-5232) and Elizabeth Precinct Isolated Find 02 (EP IF 02 - AHIMS ID 45-5-5231) have been identified as demonstrating **moderate archaeological significance**
    - Elizabeth Precinct Artefact Scatter 01 (EP AS 01 - AHIMS ID 45-5-5233), Elizabeth Precinct Isolated Find 03 (EP IF 03 - AHIMS ID 45-5-5230), Elizabeth Precinct Isolated Find 04 (EP IF 04 - AHIMS ID 45-5-5331), Elizabeth Precinct Isolated Find 05 (EP IF 05 - AHIMS ID 45-5-5330), Elizabeth Precinct Isolated Find 06 (EP IF 06 - AHIMS ID 45-5-5659), and ED AFT 1 (AHIMS ID 45-5-5259) have been identified as demonstrating **low archaeological significance**
    - Elizabeth Precinct PAD 03 (EP PAD 03 - AHIMS ID 45-5-5234) has not yet been subject to testing and is of **unknown archaeological significance**
- The proposed works would impact the following identified Aboriginal sites:
    - EP IF 01 (AHIMS ID 45-5-5232)
    - EP IF 02 (AHIMS ID 45-5-5231)
    - EP IF 03 (AHIMS ID 45-5-5230)
    - EP IF 04 AHIMS ID 45-5-5331)
    - EP IF 05 (AHIMS ID 45-5-5330)
    - EP IF 06 (AHIMS ID 45-5-5659)
    - EP AS 01 (AHIMS ID 45-5-5233)
    - EP AS 02 (AHIMS ID 45-5-5236)
    - EP AS 03 (AHIMS ID 45-5-5624)
    - ED AFT 1 (AHIMS ID 45-5-5259)
    - EEP2024 AS01 (AHIMS ID pending)

- EP PAD 03 (AHIMS ID 45-5-5234) would not be impacted by the proposed works.

Based on these findings, the following recommendations are made

- It is recommended that salvage excavation of EP AS 02 (AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending) take place.
- If harm is unavoidable, the following surface artefact sites must be subject to artefact collection prior to the commencement of ground disturbing works:
    - EP AS 01 (AHIMS ID 45-5-5233)
    - EP IF 01 (AHIMS ID 45-5-5232)
    - EP IF 02 (AHIMS ID 45-5-5231)
    - EP IF 03 (AHIMS ID 45-5-5230)
    - EP IF 04 (AHIMS ID 45-5-5331)
    - EP IF 05 (AHIMS ID 45-5-5330)
    - EP IF 06 (AHIMS ID 45-5-5659)
    - ED AFT 1 (AHIMS ID 45-5-5259)
- EP PAD 03 (AHIMS ID 45-5-5234) would not be impacted by the proposed works, therefore no archaeological investigation would be required. Due to proximity to the boundary of the works area, the boundary of this site must be marked on construction and environmental site plans, and barrier fencing should be established outside of the perimeter of the site to physically protect it.
- If changes are made to the proposal that would result in impacts to areas not assessed by this report, additional Aboriginal heritage assessment would be required.
- Consultation with the RAPs would continue throughout the life of the project to facilitate involvement in the proposed salvage works, long term management of retrieved Aboriginal objects and the assessment of unexpected finds.

CONTENTS

FIGURES

TABLES

NOTE ON LANGUAGE IN QUOTES

A number of quotes used in this report come from documents written in the nineteenth and twentieth centuries by European observers. They have been included because they provide information on the lives of Aboriginal people in the region, though the language used and views expressed by these writers can be offensive and distressing.

GLOSSARY OF TECHNICAL TERMS

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ALR Act	*Aboriginal Land Rights Act 1983*
Artefact Heritage	Artefact Heritage Services Pty Ltd
ATR	Archaeological Technical Report
ATSIHP Act	*Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
BP	Before Present (that is 1950)
CHL	Commonwealth Heritage List
Code of Practice	Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales
Consultation Requirements	Aboriginal cultural heritage consultation requirements for proponents 2010
DECCW	Department of Environment Climate Change and Water (now Heritage NSW, DCCEEW)
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Diversity Conservation Act 1999*
GPS	Global Positioning System
Guide	Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)
ha	hectares
Heritage NSW, DCCEEW	Heritage NSW, Department of Climate Change, Energy, the Environment and Water
km	Kilometre
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
mm	millimetres
NPW Act	*National Parks and Wildlife Act 1974*

NTSCorp	Native Title Service Provider for Aboriginal Traditional Owners in New South Wales and the Australian Capital Territory
OEH	Office of Environment and Heritage (now Heritage NSW, DCCEEW)
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party

1.0 INTRODUCTION

1.1 Project brief

Mirvac Projects (Mirvac) is seeking approval for a development at 1669 – 1732 and 1669a Elizabeth Drive (Figure 1), Badgerys Creek (the study area). The project was declared State Significant Development and was issued the Secretary's Environmental Assessment Requirements (SEARs) SSD-19618251. The proposal includes a concept masterplan, development for the study area for the proposed construction of 7 warehouses with service roads, hardstand, construction of an earth bund to form an interim evaporative basin, open space and amenity nodes.

1.2 Description of the study area

The study area (Figure 1) is located north of Elizabeth Drive, at 1669 – 1732 Elizabeth Drive (Lot 100, DP 1283398) and 1669a Elizabeth Drive (Lot 741, DP 810111). The study area extends into a portion of the road corridors of Elizabeth Drive and Martin Road. The study area is within the Penrith Local Government Area (LGA) and the Western Sydney Priority Growth Area and the Badgerys Creek Precinct of the Western Sydney Aerotropolis. The study area is located within the boundaries of Deerubbin Local Aboriginal Land Council (LALC) and Gandangara LALC and within the Parish of Claremont within the County of Cumberland. The area north of Elizabeth Drive is within Deerubbin LALC, and the area south of Elizabeth Drive is within Gandangara LALC. Wianamatta-South Creek runs along the eastern and southeastern boundary of the study area. The study area is presently a rural property and forms part of a sub-precinct of the broader EEP.

1.3 Objectives

The objectives of this report include:

- 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 works including consideration of cumulative impacts, and measures to avoid significant impacts
- Ensure appropriate Aboriginal community consultation in the assessment process
- Identify and describe any recommended further investigations, mitigation and management measures required.

This report includes:

- A description of the scope of the project and the extent of the study area
- A description of Aboriginal community involvement and consultation with the Registered Aboriginal Parties (RAPs)
- A significance assessment of the study area, including a description of identified 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
- A description of the proposed works extent and recommended mitigation measures

1.4 Statutory framework

This report has been prepared in accordance with the following:

- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (The Guide) (OEH 2011)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (the Code of Practice) (DECCW 2010a)
- Aboriginal cultural heritage consultation requirements for proponents 2010 (Consultation Requirements) (DECCW 2010b)

1.5 Secretary's Environmental Assessment Requirements

The project was declared a State Significant Development (SSD) and was issued SEARs on 15 June 2021 (amended 31 August 2022 and 26 August 2024). The requirements specific to Aboriginal heritage, and where these are addressed in this report, are outlined in Table 1.

Table 1: SEARs requirements.

Requirements	Report reference
Heritage	
Identify and describe the Aboriginal cultural heritage values that exist across the development and document in a complete Aboriginal Cultural Heritage Assessment Report (ACHAR)	This report is an Aboriginal Cultural Heritage Assessment Report. Aboriginal cultural heritage values are identified and described in Section 5.0.
Consultation with Aboriginal parties including local Aboriginal Council must be undertaken and documented in the ACHAR	Consultation with Aboriginal parties was undertaken in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (Consultation Requirements) (DECCW 2010b). The consultation process is summarised in Section 2.0 and documentation is provided in Appendix E.
A description of the impacts on Aboriginal cultural heritage values and associated mitigation measures must be included in the ACHAR.	The impacts from the proposal are described in 7.0 Section Management and mitigation measures are outlined in Section 8.0.

1.6 Limitations and constraints

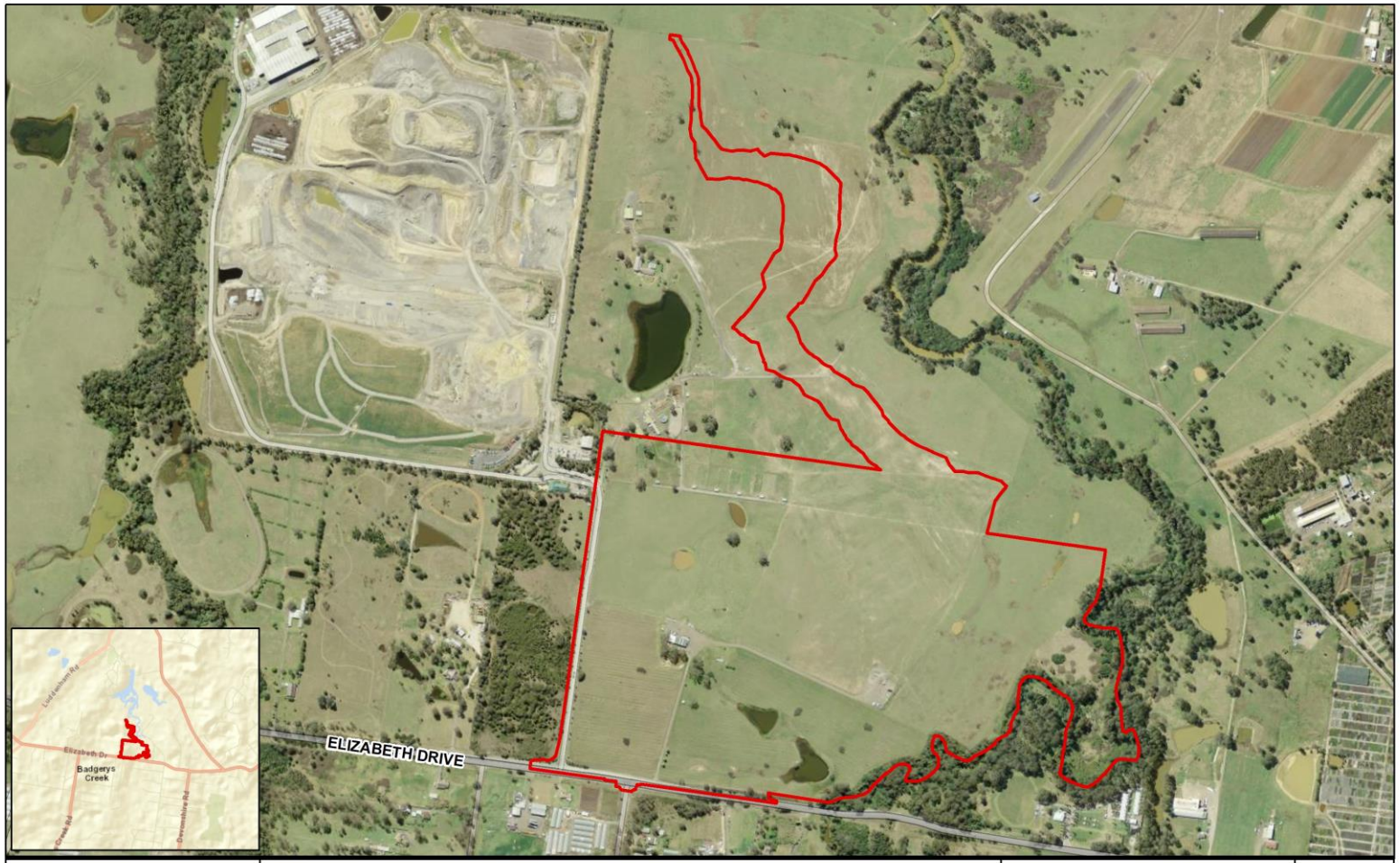
Background research completed to inform the development of this report was limited to existing and publicly accessible sources of information. The findings of archaeological assessments cited in the

report were not independently verified except where inconsistencies within the documents were identifiable.

1.7 Authorship and acknowledgements

This report was prepared by Lily Hackett (Heritage Consultant, Artefact Heritage), Katherine Douglas (Graduate Heritage Consultant), and Ryan Taddeucci (Principal, Artefact Heritage), with review and technical support provided Josh Symons (Technical Director, Artefact Heritage). Artefact would like to acknowledge the input from the Registered Aboriginal Parties (RAPs) for the project.

Figure 1: Study area



2.0 SUMMARY OF CONSULTATION

2.1 Aboriginal stakeholder consultation

Aboriginal community consultation has been completed in accordance with the Consultation Requirements (DECCW 2010a) and the *National Parks and Wildlife Regulation 2019*. A consultation log has been maintained which details all correspondence with the registered Aboriginal parties for the ACHAR. The consultation log and copies of correspondence are included in the appendices. The below consultation was complete as part of the previous ACHAR (Artefact 2022, Appendix C). Because this is an addendum ACHAR for the same project, consultation for this ACHAR will continue from Stage 4.

2.2 Stage 1: April – May 2019

2.2.1 Agency letters

In accordance with Section 4.1.2 of the Consultation Requirements, Artefact Heritage corresponded with the following organisations by email on 18 April 2019. Details of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or places within the local area were requested:

- Office of Environment and Heritage (now Heritage NSW)
- Deerubbin LALC
- The Registrar, Aboriginal Land Rights Act 1983
- National Native Title Tribunal
- NTSCORP
- Penrith City Council
- Greater Sydney Local Land Services

2.2.2 Advertisement

In accordance with Section 4.1.3 of the Consultation Requirements, an advertisement was placed in the Koori Mail and the Liverpool Leader on 24 April 2019 inviting the participation of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or places within the local area.

2.2.3 Registration of Aboriginal parties

In accordance with Section 4.1.3 of the Consultation Requirements, invitations to register an interest in the project were sent by email or letter to all those people identified on 2 May 2019. As a result of the interest letters and the advertisement, 25 individuals/organisations responded. They included the following:

- Amanda Hickey Cultural Services
- Murra Bidgee Mullangari Aboriginal Corporation
- Butucarbin Aboriginal Corporation
- Didge Ngunawal Clan

- Darug Aboriginal Land Care
- Merrigarn
- Yulay Cultural Services
- Woronora Plateau Gundangara Elders Council
- Darug Custodian Aboriginal Corporation
- A1 Indigenous Services
- Darug Land Observations
- Barking Owl Aboriginal Corporation
- Widescope
- BH Heritage Consultants
- Cubbitch Barta Native Title Claimants
- Barraby Cultural Servies
- Yurrandaali Cultural Servies
- Kawul Cultural Services
- Wurrumay Cultural Services
- Goobah
- Cullendulla
- Biamanga
- Murramarang
- Darug Aboriginal Cultural Heritage Assessments
- Deerubbin LALC

In accordance with Section 4.1.6 of the Consultation Requirements, a list of the Registered Aboriginal Parties (RAPs) was issued to Heritage and Deerubbin and Gandangara LALC on 30 May 2019.

2.3 Review of draft ACHAR methodology and test excavation methodology: November – December 2019

The draft test excavation methodology was issued to RAPs on 4 November 2019 with comments requested by 2 December 2019. The draft ACHAR methodology was issued to RAPs on 8 November 2019 with comments requested by 9 December 2019.

Comments were received from 11 RAP groups regarding the test excavation or ACHAR methodology. All comments were in general supportive of the proposed test excavation and assessment methodology. Additional comments relevant to the ACHAR methodology are summarised in Table 2 below.

Table 2: Summary of RAP review comments

Person/RAP group	Comment	Artefact response
Vicki Slater/ Kawul Cultural Services	Thanks for providing test excavation methodology	Noted

Person/RAP group	Comment	Artefact response
Paul Boyd & Lilly Carrol/ Didge Ngunawl Clan	DNC is happy with the methodology and eager for survey and test excavation. DNC have experience in area with Navin Officer and Neville Baker	Noted
Justine Coplin/ Darug Custodian Aboriginal Corporation	Support recommendations set out in the report	Noted
Ryan Johnson/ Murra Bidgee Mullangari Aboriginal Corporation	Supports ACHAR methodology	Noted
Ryan Johnson/ Murra Bidgee Mullangari Aboriginal Corporation	Supports the test excavation methodology	Noted
Glenda Chalker/ Cubbitch Barta Native Title Claimants	Requested hard copy of the test excavation methodology	Provided
Glenda Chalker/ Cubbitch Barta Native Title Claimants	Confirmed receipt of hardcopy of methodology	Noted
Glenda Chalker/ Cubbitch Barta Native Title Claimants	Provided feedback on test excavation methodology. Recommended test excavation only employ wet sieving. Noted that many colonial homesteads were built on Aboriginal Campsites. Suggested that historic heritage investigations consider the potential of Aboriginal objects being present	It is anticipated that all material excavated will be wet sieved. The area proposed to be subject to non-Aboriginal excavation has not been identified as an area of Aboriginal archaeological potential. An unexpected finds policy has been incorporated into the Non-Aboriginal testing program in the event that Aboriginal objects are recovered from test excavation.
Justine Coplin/ Darug Custodian Aboriginal Corporation	Support recommendations set out in the report. Would like surface collection to be added to the methodology	Surface collection cannot be undertaken during test excavation under the code of practice. This comment will be noted for inclusion in the ACHAR report and may be recommended as a mitigation measure
Amanda Hickey/ Amanda Hickey Cultural Services	Holds strong cultural knowledge towards the land of western Sydney. Have stories of land and significant sites throughout western Sydney. Interested in fieldwork	Noted
Lee Field/ Barraby Cultural Services	Reviewed and agreed with the proposed ACHAR assessment methodology	Noted

Person/RAP group	Comment	Artefact response
Lee Field/ Barraby Cultural Services	Supports the test excavation methodology for the project	Noted
Bo Field/ Yurrandaali Pty Ltd	Supports ACHAR methodology	Noted
Arika Jalomaki/ Yulay Cultural Services	Reviewed ACHAR methodology and supported it	Noted
Basil Smith/ Goobah	Supports the test excavation methodology for the project	Noted
Carolyn Hickey/ A1 Indigenous Services	Supports test excavation methodology and would like to be involved in field work	Noted
Carolyn Hickey/ A1 Indigenous Services	Supports assessment methodology and would like to be involved in field work	Noted

2.4 Participation in test excavation: January 2020

From the 28 January 2020, invitations to participate in fieldwork were sent out to several RAP groups who had provided feedback during the initial stages of the consultation process. Table 3 identifies the RAP representatives who participated in the test excavations.

Table 3: RAP representatives participating in test excavations.

Personnel	Organisation
Ian Davies	Barraby Cultural Services
Arika Jalomaki	Wurrumay Pty Ltd
Adam King	Didge Ngunawal Clan (DNC)
Mark Dutton	Goobah
Amanda Hickey	Amanda Hickey Cultural Services
Brayden McDougall	A1 Indigenous Services
Steven Knight	Deerubbin LALC
Shelley Weldon	Deerubbin LALC

Personnel	Organisation
Lana Wedgewood	Darug Custodian Aboriginal Corporation
Tylah Blunden	Darug Custodian Aboriginal Corporation
Rebecca Chalker	Cubbitch Barta Native Title Claimants Aboriginal Corporation
Daniel Chalker	Cubbitch Barta Native Title Claimants Aboriginal Corporation

2.5 Review of draft ACHAR: May 2020

A copy of the draft ACHAR (Artefact Heritage 2020) was sent to the RAPs on 1 May 2020 with comments due by 30 May 2020. At the end of the consultation period, three RAP groups commented on the findings. A summary of these comments is provided in Table 4 below.

Table 4. Summary of Aboriginal stakeholder comments on the draft ACHAR

Person/ RAP group	Comment	Response
Glenda Chalker/ Cubbitch Barta Native Title Claimants	Queried whether silcrete cobbles identified within ACHAR were recorded as manuports Noted that PAD 03 should not be impacted and should be fenced prior to earthworks. Noted that PAD 03 is likely to contain subsurface material. Suggests that the PAD extent is extended to the elbow of the creek. Requests clarity regarding the environmental protection area. Noted that cumulative impacts could accumulate to the total loss of Aboriginal heritage in this area. Noted preservation of PAD 03 will allow for intergenerational equity. Recommended excavated artefacts should be reburied within the PAD03 area	Silcrete cobbles identified during survey were not recorded as manuports as they were located within the portion of the study area which had been subject to landform modification associated with the placement of a large amount of fill across portions of survey unit 1. This has been further clarified in the discussion of survey unit 1 within the ACHAR PAD03 will be demarked prior to earthworks. The environmental protection area encompasses PAD 03 and is inclusive of the entire portion of the study area outside of the AHIP application area Comments on cumulative impact and intergenerational equity have been noted Artefacts are proposed to be reburied within the vicinity of PAD 03 within the environmental protection area. As PAD 03 is not located within the proposed AHIP area, actions which may result in harm to Aboriginal objects which may be located within PAD 03 cannot be undertaken.

Person/ RAP group	Comment	Response
Justine Coplin/ Darug Custodian Aboriginal Corporation	Darug Custodian Aboriginal Corporation notes that a high amount of groups were consulted, with many groups consulted not from the local area. Darug Custodian Aboriginal Corporation do not support the input of any groups who are not from the local area. Supports the remainder of the report	In accordance with Section 4.2, 4.3 and 4.4 of the Consultation Requirements, consultation must occur with all groups that express interest in the project. These concerns have been noted.
Carolyn Hickey/ A1 Indigenous Services	Has reviewed the draft ACHAR and supports the document	None required

2.6 Project update 1 and 2: November 2020 and May 2021

An update on the status of the project was issued to all RAPs on 13 November 2020. The update advised that lodgement of an AHIP application was pending the receipt of applicable development consent. On 10 May 2021, a project update was issued to all RAPs noting that the proponent was investigating alternative approval pathways.

2.7 Second RAP review of draft ACHAR report: September – October 2021

The project approval pathway was modified to be consistent with an SSD application with changes to the proposed development. SEARs for the SSD were issued on 15 June 2021 which required an ACHAR for the proposed development. As such, the ACHAR was updated to reflect these changes.

The updated ACHAR was issued to RAPs on 15 September 2021 for review and comment for a 28-day period. Comments received by RAPs during this additional 28-day review period are provided in Table 5 below.

Table 5:Summary of comments on draft revised ACHAR

Person/RAP group	Comment	Artefact response
Lilly Carroll/ Didge Ngunawal Clan	The RAP group was happy to provide cultural knowledge of the area for the project	No response required
Steven Hickey/ Widescope	The RAP group supported the recommendations outlined in the ACHAR	No response required
Basil Smith/ Goobah	The RAP group supported the findings and recommendations of the updated ACHAR	No response required

2.8 Third RAP review of draft ACHAR report: November – October 2022

Following amendment to the SEARs on 22 August 2022 and a revision to the extent of the study area, the ACHAR was updated. The updated ACHAR was issued to RAPs on 15 November 2022 for review and comment for a 28-day period. Comments received by RAPs during this additional 28-day review period are provided in Table 5 below.

Table 6:Summary of comments on draft revised ACHAR

Person/RAP group	Comment	Artefact response
Glenda Chalker, Cubbitch Barta Native Title Claimants	The RAP group requested a hard copy of the report	No response required
Basil Smith, Goobah	The RAP group asked to be kept informed	No response required
Ryan Johnson, Murra Bidgee Mullangari Aboriginal Corporation	The RAP group endorsed the recommendations in the updated ACHAR	No response required

2.9 Updates to maintain consultation: February 2024

In February 2024 an update on the status of the project was issued to all RAPs. The update provided a description of amendment to the proposed works and to re-establish consultation.

2.10 Amended test excavation methodology: September – October 2024

As a result of the amended design, a test excavation methodology was prepared and issue to the RAPs on 18 September 2024 requesting submissions by 16 October 2024. At the end of the review period two responses were received, summarised in Table 7.

Table 7:Summary of comments on draft amended test excavation methodology

Person/RAP group	Comment	Artefact response
Arika Jalomaki/ Wurrumay Pty Ltd	Read and agrees with the methodology	No response required
Lilly Carrol/ Didge Ngunawl Clan	Read and agrees with the methodology	No response required

2.11 Fourth RAP review of draft ACHAR report: December 2024 – January 2025

On 24 December 2024 a draft version of this ACHAR was issued to the RAPs requesting comment by 28 January 2025. At the end of the review period one response was received, summarised in Table 7.

Table 8: Summary of comments on draft revised ACHAR – version 4

Person/RAP group	Comment	Artefact Heritage response
Lilly Carrol/ Didge Ngunawl Clan	Happy with the methodology and submissions	No response required

2.12 Ongoing consultation

In accordance with Section 4.4.5 of the Consultation Requirements, the finalised version of this ACHAR for Elizabeth Enterprise Precinct Stage 1 (State Significant Development – 19618251) will be issued to the RAPs. Consultation with the RAPs would continue throughout the life of the project to facilitate involvement in the proposed salvage works, long term management of retrieved Aboriginal objects and the assessment of unexpected finds.

3.0 SUMMARY AND ANALYSIS OF BACKGROUND INFORMATION

Information provided in this section has been summarised from the previous phases of reporting completed by Artefact Heritage for the project. See Appendice A – C for additional information.

3.1 Historical background and land use

The historical period in New South Wales began with European land settlement in 1788 when Governor Philip claimed possession of the land now known as Australia, on behalf of the British Government. The documentary evidence relating to this period helps us to better understand the patterning of European settlement and to contextualise its material remains.

Elizabeth Drive dates from the early 1800s and was originally constructed as a 'corduroy' road, using round logs as a base. It was established to provide access to the areas' land grants and was originally known as the Orphan School Road as it extended west from the Orphan School in what is now Bonnyrigg. Its name was later changed to Mulgoa Road, in reference to its western extent, but subsequently changed again in 1952 to honour the visit of Queen Elizabeth II.

In 1809 James Badgery was granted 840 acres, which was revised to 640 following Macquarie's cancellation of the original grant and re-issuance of the grant in 1812. The grant lies between Badgerys Creek and Wianamatta-South Creek, north of Elizabeth Drive. He built the homestead and named the property Exeter Farm after the place in England near where he was born.

The European settlement at Exeter Farm resulted in the eviction of Aboriginal people within Badgerys lands although there is no reported evidence to suggest that this involved bloodshed. It is further suggested that a small Aboriginal group were permitted by Badgerys to camp on Wianamatta-South Creek (Hardy 1989: 19).

Governor Macquarie visited Exeter Farm in November 1810 on his first inspection of the interior of the colony noting in his journal that:

> *Called first at Badgery's Farm close on the left Bank of the South Creek, where I was much pleased to find a good Farm House built, a good Garden, and a considerable quantity of ground cleared*

In the 1880s Exeter Farm was subdivided as enclaves of small 30 to 40 acre leased acreages. From the 1920s under the provisions of the Soldier Settlement Act 1919 further portions of James Badgery's early grant were divided. Exeter Farm was at that time in the ownership of the Stivens family, who later sold a portion of Exeter Farm to Ern Kent. In the 1930s, Kent sold his property to Peter Nobbs, who moved into the homestead with his family to pursue dairying (Donald and Gulson 1996).

Aerial imagery from 1955 onwards indicates that the area was predominantly used for farming and animal grazing. The 1955 aerial image shows three buildings within the study area and their associated ancillary structures (Figure 2). The area appears largely cleared with a few remnant stand of trees predominately in the western portion of the site. It is clear that portions of the study area were subject to agricultural practices as is evidenced by the clear boundaries of crop rows particularly in the eastern portion of the site. Several dams are visible in the early aerial images. Land-use in the study area remains fairly static throughout the 1960s through to the 1990s. By 2002, new animal enclosures are visible in the northern portion of the study area and an additional dam is constructed within the confluence of a natural drainage channel in the southeast (Figure 3).

Between 2009 and 2011 the site underwent a considerable change with a large quantity of fill deposited in the northeast portion of the study area (Figure 4). Anecdotal evidence indicates that some landowners at this time were taking in large quantities of soil in need of disposal from other areas. To the west of the study area is a landfill site known as the Cleanaway Kemps Creek Resource Recovery Park. This landfill site was established, by Suez, in the early 1990s and was originally the site of a shale and clay quarry (Suez 2020). Select Civil contracting service has been operating the Suez Resource Recovery Park Kemps Creek since 2011 (Select Civil, 2019). The operation of the Suez Resource Recovery Park by Select Civil coincides with the importation of fill within the study area shown in the 2011 aerial image (Figure 4). By 2012, a small heavy vehicle parking area was established in the southern portion of the study area but otherwise the site remains relatively undeveloped to the present day. In 2021 Cleanaway entered into an agreement with Suez to purchase post collection waste assets in Sydney, this included the non-putrescible landfill at Kemps Creek.

Figure 2: 1955 Aerial image

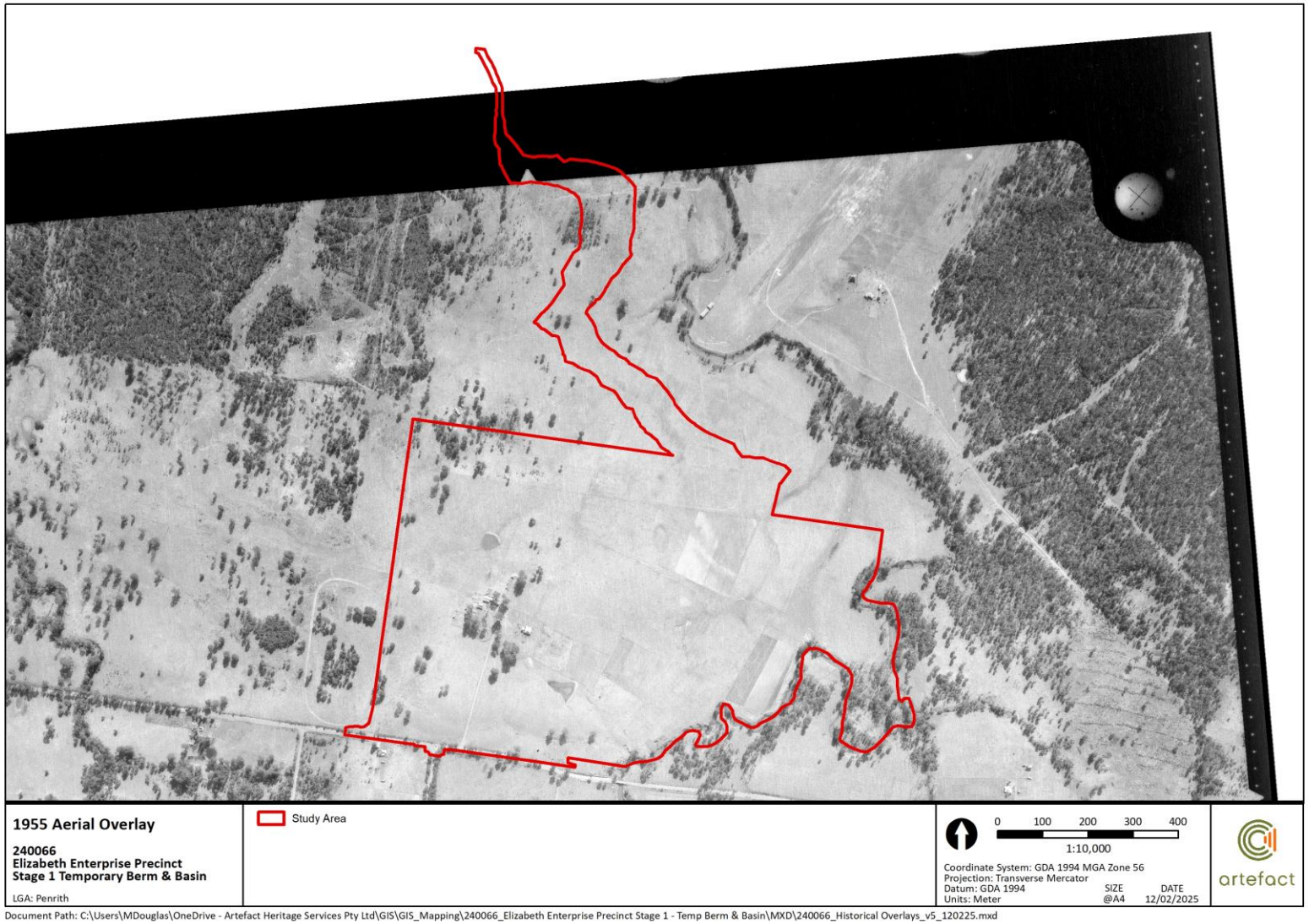


Figure 3: 2002 Aerial image

Figure 4: 2011 Aerial image

3.2 Archaeological background

A number of archaeological investigations have been completed in the vicinity of the study area. These have generally been associated with the development of infrastructure and urban release projects. The following discussion presents a review of the most recent and relevant studies and aims to provide contextual information for the current study area. These are summarised in Table 9 below.

Table 9: Previous archaeological studies near the study area

Report	Summary
Elizabeth Drive Upgrade Archaeological Survey for Aboriginal Sites (Brayshaw 1995)	Brayshaw investigated Aboriginal heritage for the Elizabeth Drive upgrade as part of the greater Sydney West Airport site. It was found that much of the Elizabeth Drive road easement had been disturbed as part of the previous road works. Several potential archaeological deposits (PADs) (Figure 5) and two artefact scatters were identified north of Elizabeth Drive. One area of PAD was identified within the study area within the southeast portion of the study area.
Environmental Impact Statement for the Second Sydney Airport (Navin Officer 1997)	An Aboriginal cultural heritage study was conducted as part of the Environmental Impact Statement for the site options of the second Sydney airport directly south of the current study area. The study identified that most site types were likely to be located in close proximity to water (within 50 m). Sites located near permanent water sources were likely to yield high artefact densities comprised of complex assemblages. A total of 110 sites were recording during this survey.
Lithic Artefact Distribution in the Rouse Hill Development Area, Cumberland Plain in NSW (White and McDonald 2010)	White and McDonald reviewed several years of systematic test excavations within the Rouse Hill Development Area (RHDA), located approximately 20km to the north east of the study area, they found that artefact density and distribution correlates with topography and stream order. Highest artefact density was found on terraces and lower slopes associated with 4th and 2nd order streams. The upper slopes were found to have sparse artefact distribution, however artefacts were still found in this landscape. Artefacts were found in all tested areas with no distinct site boundaries were identified, the report found that most of the RHDA could be regarded as a cultural landscape.
Penrith DCP 2014	The Penrith DCP is a non-statutory supporting document that compliments the provisions in the Penrith LEP 2015. The objectives of the document in relation to Aboriginal heritage is to 'preserve items and sites of Aboriginal archaeological significance located within the city of Penrith. The DCP includes a sensitivity map (Figure 6) has been created to guide whether archaeological assessment is required to be undertaken as part of a development application. The sensitivity map is based on assessment undertaken for the Aboriginal Resource Planning study completed for identifies the lands surrounding Wianamatta-South Creek and its tributaries as sensitive. This area of sensitivity includes the entirety of the current study area.

Report	Summary
Western Sydney Airport ACHAR (Navin Officer 2016)	An Aboriginal Cultural Heritage Assessment and test excavations were conducted west side of Badgerys Creek for the Western Sydney Airport. The assessment area included land directly south of the study area. 23 new Aboriginal sites were recorded. The sites included isolated artefacts, artefact scatters, and grinding grooves.
Four predictive models to describe Aboriginal lithic artefact site patterning of the Cumberland Plain (Owen, TD and Cowie DR 2017).	Owen and Cowie identified four predictive models for the distribution of Aboriginal sites within the Cumberland Plain. The first predictive model is known as the Stream Order model and was developed by White and Macdonald (2010). The stream order model identified proximity to watercourses as an important indicator of Aboriginal potential with higher order streams tending to have higher densities of artefacts. The second predictive model known as the Economic Resource model (Evans 2003), focused on the location of high value food or other resources and predicts that archaeological deposits would be formed within or adjacent to these economic zones. The third predictive model is the Activity Overprinting model developed by Baker (2000), which proposes that many Aboriginal sites are the result of repeated occupation and use of an area, and that the archaeological assemblage of one site may not be reflective of other nearby site. The final predictive model is the Domiciliary Spacing model (Memmott 2007), focuses on the internal distribution of 'domiciliary' spaces within an Aboriginal campsite and may be used in the modelling of internal site structure.
Upper South Creek Advanced Water Recycling Centre ACHAR (KNC 2021)	KNC prepared an ACHAR for new wastewater infrastructure to service the South Western and Western Sydney Aerotropolis Growth Areas. The development extended along Elizabeth Drive approximately 600m south of the study area. The ACHAR identified a number of landscape features as indicating potential for Aboriginal sites including: Raised landforms adjacent to creeks, Permanent water and Sandstone exposures. Culturally modified trees were assessed as being few in number in the local area due to the practice of tree clearance by European colonisers. It was also found that surface Aboriginal objects were not predictive of the sub surface deposits, which were different in density, nature and extent.
CSR Advanced Manufacturing Hub, ATR (Artefact 2021)	Artefact completed test excavation 2km south of the study area. A total of 32 artefacts were recovered which were interpreted as the repeated occupation by several small groups of Aboriginal people. Excavation recovered a clay ball retainer hearth which was dated to 2,056 ± 20 BP (Wk-48125). Excavation confirmed that the highest density of artefacts was found within close proximity to the creek line.

Report	Summary
Northern Gateway Phase 1 1953-2109 Elizabeth Drive, Badgerys Creek – ACHAR Update (Artefact 2022a)	The Northern Gateway Phase 1 (NGP1) project has a large study area located at closest 630m northwest of the current study area. Artefact (2022a) provided letter advice on heritage assessment steps that would be required to progress approvals of the proposal following changes to design. The proposal had previously been the subject of an ACHAR (Baker 2021) the results of which are summarised here. Baker (2021) had identified six artefact sites within NGP1, being four surface and subsurface deposits, and two surface scatters. These sites were not registered on AHIMS by Baker 2021. Sites were low density artefact deposits in the vicinity (within 300m) of Cosgroves and Oakey Creeks, interpreted by Baker (2021) as satellite camping areas where artefact density was higher, and ranging locations where artefact density was lower. Artefact (2022) recommendations were for salvage excavation and surface collection.
Western Sydney Sustainable Road Resource Center, ACHAR (Artefact 2022b)	The study area of Artefact (2022) was located 2.5km south of the current study area and was located immediately west of Wianamatta-South Creek. As at the current study area, the eastern (larger) part of the Artefact (2022b) study area was located on South Creek soils with Blacktown soils to the west. As a result of site survey, a level and slightly elevated terrace adjacent to Wianamatta-South Creek was identified as PAD. This location was not proposed to be impacted by development. Recommendations were made for the protection of the PAD.
30-40 Martin Road, Badgerys Creek, ATR (Artefact 2023b)	Artefact Heritage carried out archaeological survey and test excavation at a location adjacent to and elevated above Wianamatta-South Creek to the east, 1km south of the current study area. Similar to the study area, 30-40 Martin Road is located on Blacktown soils to the west, and South Creek soils to the east. Landform included undulating plain that was not deemed as PAD, and a level raised plateau adjacent to Wianamatta-South Creek which was defined as 30-40 Martin Rd PAD, AHIMS Site ID 45-5-5623. Land further than 200m from Wianamatta-South Creek and which was located on Blacktown Soil was not defined as part of 30-40 Martin Rd PAD, AHIMS Site ID 45-5-5623. A total of 35 lithic artefacts were retrieved, being 31 (89%) silcrete, and four (11%) mudstone. Artefact density in test pits did not correspond to proximity to Wianamatta-South Creek. The artefact assemblage consisted primarily of distal flake fragments (n=10, 28.57%) followed by complete flakes (n=9, 25.71%). No cores were identified during analysis. As a result, site 30-40 Martin Rd Artefact Scatter 01 (AHIMS ID 45-5-5663) was listed as a low-density and moderately disturbed subsurface artefact scatter that did not warrant salvage excavation. Implications of this report for the current study area include that proximity to permanent water, on raised level ground, and location on South Creek soils are not in themselves necessarily indicators of archaeological potential.

Figure 5: Area of PAD identified by Brayshaw. Location of PAD indicated by number in a circle (1995)

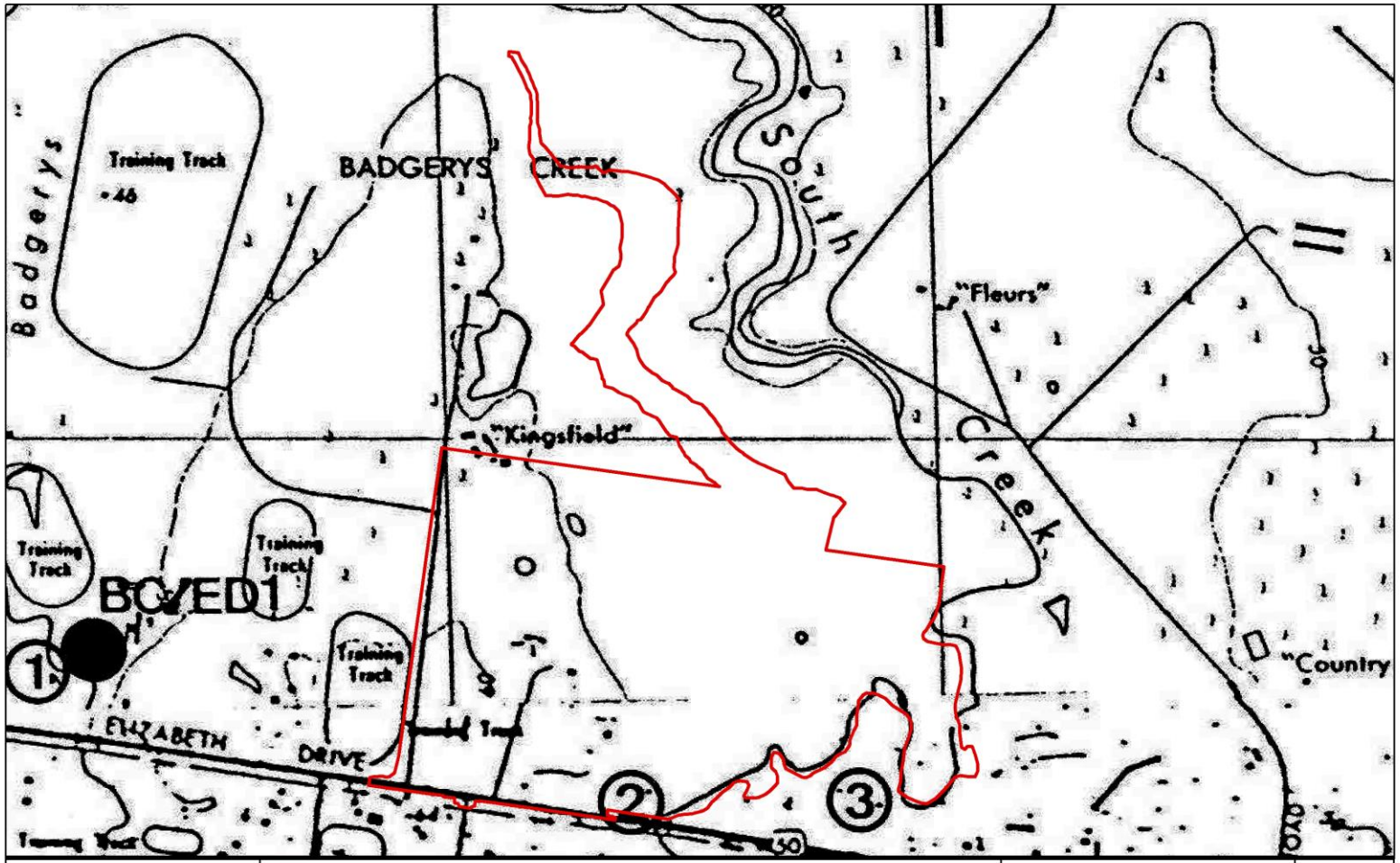
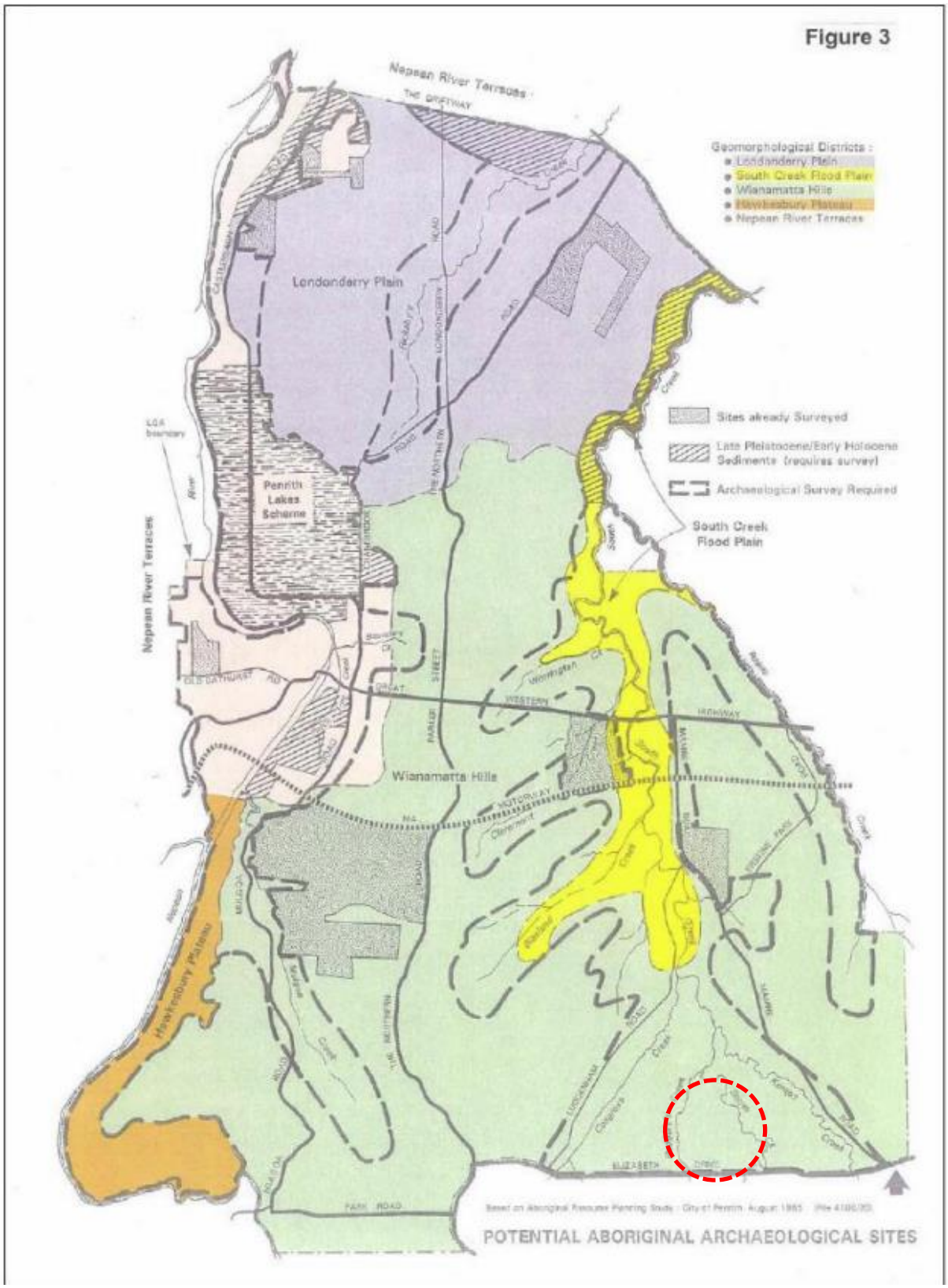


Figure 6: Potentially sensitive landscapes (illustrated by dashed line) within the Penrith LGA approximate location of current study area in red



3.3 AHIMS search

NOTE: The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on mapping below must be removed from this report if it is to enter the public domain.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on the 11 December 2024 (AHIMS search ID 959594). An area of approximately 4km x 4km surrounding the study area was included in the search. The AHIMS search provides archaeological context for the area and identifies whether any previously recorded Aboriginal sites are located within or near the study area. The parameters of the search were as follows:

GDA 1994 MGA 56	291786.0 – 295788.0 m E 6248327.0 – 6252372.0 m S
Buffer	0 m
Number of sites	69

A total of 69 Aboriginal sites were identified in the extensive AHIMS search area (Figure 7), with 12 of these sites located within the study area (Figure 8):

1. EP IF 01 (AHIMS ID 45-5-5232)
2. EP IF 02 (AHIMS ID 45-5-5231)
3. EP IF 03 (AHIMS ID 45-5-5230)
4. EP IF 04 (AHIMS ID 45-5-5331)
5. EP IF 05 (AHIMS ID 45-5-5330)
6. EP IF 06 (AHIMS ID 45-5-5659)
7. EP AS 01 (AHIMS ID 45-5-5233)
8. EP AS 02 (AHIMS ID 45-5-5236)
9. EP AS 03 (AHIMS ID 45-5-5624)
10. EP AS 04 (AHIMS ID 45-5-5625)
11. EP PAD 03 (AHIMS ID 45-5-5234)
12. ED AFT 1 (AHIMS ID 45-5-5259).

The nature and characteristics of the sites located within the study area is discussed further in Section 4.0 below.

The majority of site features recorded within the AHIMS search area (Table 10) were lithic artefacts (n=48, 69.57%) and artefacts sites with associated PADs (n=10). A Hearth, Modified Tree and Grinding Groove were identified within the search area. A large proportion of sites are clustered around water courses. However, sites are also concentrated on elevated landforms.

Table 10: Frequency of site features in AHIMS search results

Site feature	Frequency	Percentage
Artefact	48	69.57%
Artefact, PADs	10	14.49%
PAD	8	11.59%

Site feature	Frequency	Percentage
Hearth	1	1.45%
Modified Tree	1	1.45%
Grinding Groove site	1	1.45%
Total	**69**	**100.00%**

3.4 Environmental background

3.4.1 Geology and soils

The study area is located within the central portion of the Cumberland Plain, a large low-lying and gently undulating landform in the Sydney Basin. The formation of the basin began between 300 to 250 million years ago when river deltas gradually replaced the ocean that had extended as far west as Lithgow (Pickett and Alder 1997). The oldest, Permian layers of the Sydney Basin consist of marine, alluvial and deltaic deposits that include shales and mudstone overlain by Coal Measures.

The geology of the area is characterised by the Triassic Wianamatta group which consists of black to dark grey shale and laminate on top of Medium to coarse-grained quartz sandstone, very minor shale and laminate. The landform of the study area is the result of local bedrock weathering. The underlying geology is the Hawkesbury Sandstone that was laid down as river sediments and is described as medium to coarse grained quartz sandstone, this is overlain by the finer sedimentary material caps of Ashfield Shale.

The eastern section of the study area associated with the Wianamatta-South Creek floodplain contains the Wianamatta-South Creek fluvial soil landscape. This landscape usually contains floodplains, valley flats and drainage depressions of the channels on the Cumberland Plain. The soils are often very deep layered sediments over bedrock or relict soils. Plastic clays or structured loams occur in and immediately adjacent to drainage lines. red and yellow podzolic soils are most common on terraces with small areas of structured grey clays, leached clay and yellow solodic soils (Bannerman & Hazelton 1990).

The central and western portions of the study area are comprised of the Blacktown Residual soil landscape which has shallow to moderately deep hard setting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines. These nutrient-poor soils are highly erodible and hence are extremely susceptible to disturbance.

A small section of the study area (southwest) is comprised of the Berkshire Park alluvial soils. This landscape is the result of three depositional phases of Tertiary alluvial/colluvial origin. The lowest deposit is the St Marys formation, overlain by the Rickabys Creek gravel formation, which is of varying thickness and, in turn, is topped by the Londonderry Clay formation. All of these formations are derived from sandstone and clay. Erosion of the surface has led to exposure of all three formations in different locations. The soils of Berkshire Park are weakly pedal orange heavy clays and clayey sands, which are often mottled, ironstone nodules are also common. Large silcrete boulders occur in sand/clay matrix Solods, usually on flats and in small drainage lines. Lower in the landscape where drainage conditions are poor, thin layers of dark brown sandy loams and brown a-pedal sandy clay loams are the surface material. Sand may occur in splays or as slugs of sediment within drainage lines. Laterite is often exposed at or near the surface in drainage lines or on crests.

PSM consulting undertook borehole investigations on behalf of Mirvac in support of the EEP Stage 1 and Stage 2 works (PSM Consulting 2024). These works comprised of 35 Boreholes spread across Lot 100, DP 1283398 and Lot 741, DP 810111. The investigation found that a consistent sequency of topsoil up to 0.25m depth, overlying natural clay could be seen across the study area, with imported gravel fill seen between these layers, no evidence of surviving topsoil was seen beneath the imported fill, have demonstrated that the topsoil was removed prior to the deposition of fill. A review of the borehole sequence in comparison to that seen during the test excavation indicates that the 'Natural Soil' seen in the boreholes is equivalent to the archaeologically sterile B horizon seen during the test excavation (Table 11).

3.4.2 Hydrology and vegetation

The study area is located within the Upper Wianamatta-South Creek catchment associated with undulating hills and drainage lines. The study area is bordered by Wianamatta-South Creek in the east with several ephemeral first order drainage lines across the study area feeding directly into the creek line. Several additional high order creek lines are located within the vicinity of the study area including Badgerys Creek approximately 400 m west of the study area and Kemps Creek approximately 2.1 km east.

The vegetation in the study area has been impacted by urban development and land management practises. The study area would have once been covered by open Cumberland Plain Woodland, which is typical of the Wianamatta Group shale geology. Tree species would have included Forest Red Gum (Eucalyptus tereticornis), Sydney Blue Gum (E. saligna) and Grey Box (E. moluccana). The understory would likely have consisted of grass species, including spear grass, and shrub species such as blackthorn. The areas along Wianamatta-South Creek have been frequently inundated as reflected by the vegetation. Common tree species include Angophora subvelutina (broad-leaved apple), Eucalyptus amplifolia (cabbage gum) and Casuarina glauca (swamp oak). Still water species such as Eleocharis sphacelata (tall spike rush), Juncus usitatus and Polygonum spp. occur where channels are silted up. On more elevated streambanks a tall shrubland of Melaleuca spp. (paperbarks) and Leptospermum spp. (tea trees) may occur. However much of this soil landscape has been previously cleared and is now dominated by exotic species such as Rubus vulgaris (blackberry) and other weeds (eSPADE 2022).

Table 11: Comparison of soils from Geotech (PSM Consulting 2024) and Test Excavation (Artefact 2020a).

Borehole geological unit	Description	Thickness (m)	Deposit from test excavation test area 1	Description	Thickness (m)	Deposit from test excavation test area 2	Description	Thickness (m)
Topsoil	Clay, high plasticity, brown to dark brown grey, rootlets observed	0.05-0.25	A1 Horizon	Dark brown clayey loam, with grass rootlets.	0.015	A Horizon	Dark brown clayey loam, with grass rootlets.	0.038
			A2 Horizon	Orange brown clayey loam, with grass rootlets and ironstone gravels	0.01			
Fill	Clay/ gravelly clay: medium to high plasticity, pale brown to dark grey, gravel is sub rounded to angular	0.6-4.2	Not Seen			Not Seen		
Natural Soil	Clay, high plasticity brown grey to grey mottled red	1.3-8.8	B Horizon	Sticky orange brown clay	>0.1	B Horizon	Red clay	>0.02

Figure 7:AHIMS extensive search

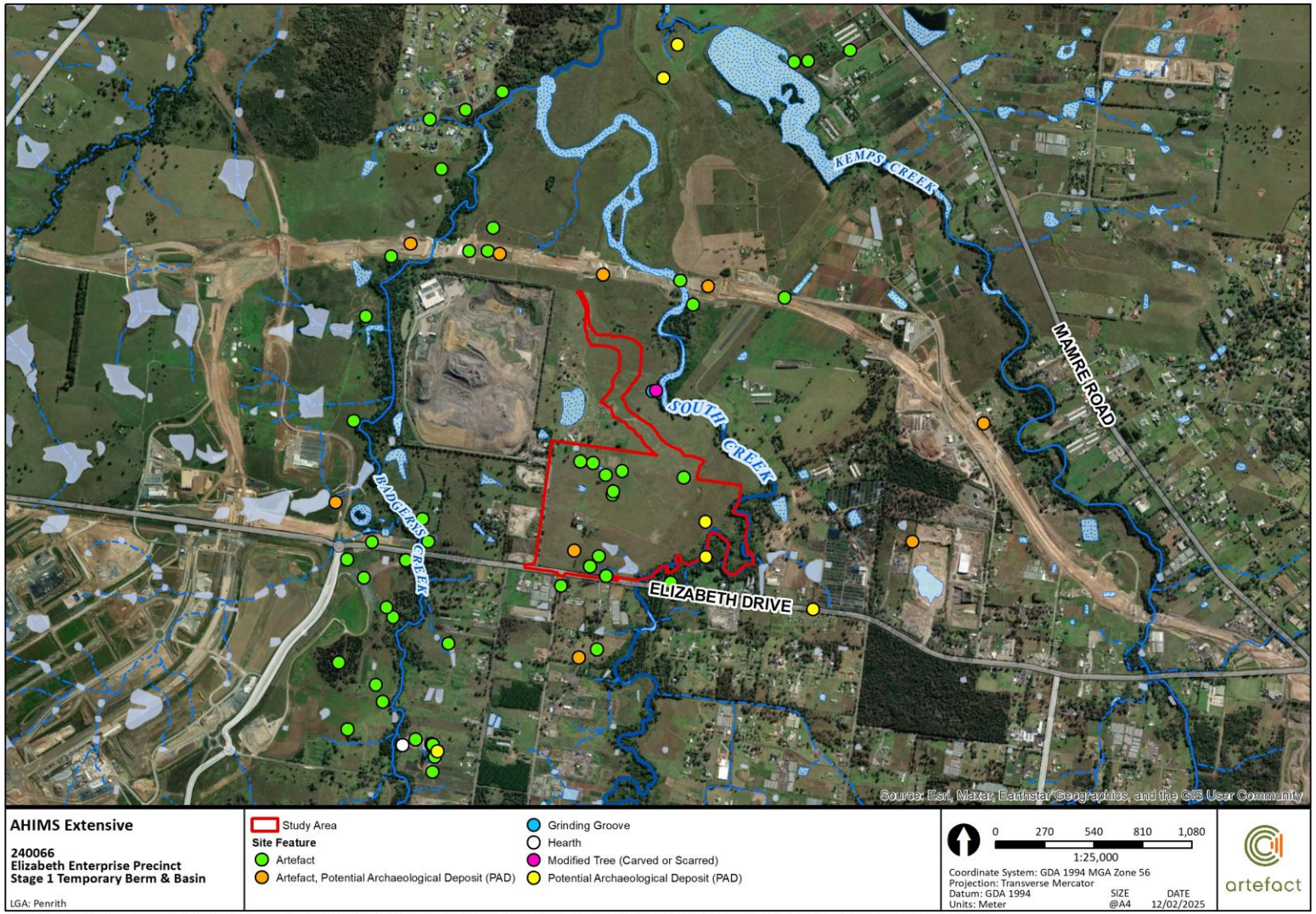


Figure 8: AHIMS detail search

3.5 Regional predictive models

Archaeological investigation across the Cumberland Plain has been comprehensive over the past 30 years, including survey, excavation and desktop analysis studies. This varied and intensive investigation has led to the development and continual refinement of a predictive model for Aboriginal occupation within the region.

Regional studies have been undertaken on the large Growth Centres of the northwest and southwest of the Cumberland Plain, west of the Sydney Basin. White and McDonald (2010) have contributed to the debate over site prediction by discussing the nature of Aboriginal site distribution, interpreted through lithic analysis of excavated sites in the Rouse Hill Development Area (White and McDonald 2010). The Rouse Hill Development Area is located about 25 km north of the current study area. The watercourses in the development area (Caddies Creek and Second Ponds Creek) derive from the same source as Wianamatta-South Creek and are of a similar stream order. The soil landscapes are also reflective of those in the current study area, the Wianamatta-South Creek Soil Landscape along the high order watercourses and associated remnant Blacktown Soil Landscape. The study gave rise to the commonly referred Stream Order Model which provides a sound basis for archaeological investigations in the Cumberland Plain. The paper provides a spatial and distributive analysis of Aboriginal objects in relation to freshwater resources and along varying landform units. The findings of this study highlighted the relationship between proximity to freshwater and landscape with archaeological evidence of Aboriginal activities. The study found that artefact densities were most likely to be greatest on terraces and lower slopes within 100 m of freshwater resources (White and McDonald 2010). The predictive model identified that ridgelines and crests located between drainage lines will contain archaeological evidence though usually representative of background scatter (White and McDonald 2010).

While White and McDonald's (2010) predictive model can be seen as an indicative model of the archaeology of the Cumberland Plain, a more recent study has been conducted by Godden Mackay and Logan (GML 2012) at the East Leppington Precinct approximately 11 km south of the current study area. The study utilised the Stream Order Model developed by White and McDonald (2010) in their investigations and three different and complementary models to explain their findings. The Stream Order Model is a regional based model and doesn't consider the small-scale intra-landform variations that can affect the predictions of this model.

Owen and Cowie (2017) describe three other models that can be used to more accurately describe archaeological probability within the landscape. The Economic Resource Model, Activity Overprinting Model and Domiciliary Spacing Model. These models were used as the basis of predictive modelling within the East Leppington precinct assessment 18 kilometres south of the current study area. Post excavation analysis considered that the combination of these models provided a good understanding of the over-arching archaeological potential of the East Leppington landscape.

The Economic Resource Model identifies locations with substantial resources (such as food and knapping sources) as economic zones. The model identifies a correlation between the relative yield of the economic zone and the distance that sites are likely to be away from the economic zone. Site locations are also considered to relate to changes in 'textures' across the landscape which may include changes in landform. Varying landforms within the influence of an economic zone can then be ranked according to their suitability for repeated occupation. Substantial creek lines are considered high resource zones due to the richness in flora and fauna. The model suggests that the evidence of Aboriginal activities will decrease with distance from theses resource rich nodes.

The Activity Overprinting Model was used to explain the density of sites at increasing distances from the creek and Domiciliary Spacing Model was used to describe the features and spatial variation of a site.

In conjunction with these models, an understanding of the soil landscape and the nature and prevalence of cultural material within these contexts is important in the predictive model process. Deposits that contain cultural material are likely to exist within the Blacktown soil landscapes however, these are deposits are generally not stratified. Blacktown soils retrieve cultural material in A Horizon deposit which generally extend approximately 300 mm below the ground surface.

Every predictive model has its limitations and constraints and should be used as a guiding factor for future investigation and as a tool to further current understanding of the cultural environment.

4.0 SUMMARY OF FIELD INVESTIGATIONS

Artefact has completed five phases of archaeological survey and two test excavation programs across the Greater Project Boundary between 2019 and 2024 (Table 12). In total 10 survey units were investigated during the surveys, defined based on landforms and scope of works (Table 12). Full reports for these studies are included as Appendices A – D.

Table 12: Summary or archaeological investigations

Assessment	Date	Scope	Report
Archaeological survey	20 March 2019	Survey to investigate area of proposed works, (survey units 1-4).	ACHAR 2022 - Appendix C
Archaeological test excavation	17 February to 6 March 2020 (13 days)	Aboriginal archaeological test excavation program of EP PAD 01 and EP PAD 02.	ACHAR 2022 - Appendix C
Supplementary archaeological survey	18 March 2019 and 9 April 2020	Survey to investigate newly registered AHIMS sites within proximity to the study area, (survey units 1-4).	ACHAR 2022 - Appendix C
Addendum archaeological survey	27 August 2021	Survey of an additional area of proposed works, (survey unit 5)	ACHAR 2022 - Appendix C
Addendum archaeological survey	31 October 2022	Survey of an additional area of proposed works, (survey unit 6).	ACHAR 2022 - Appendix C
Archaeological survey (Lot 741, DP 810111)	18 October 2023	Survey of an additional area of proposed works – Lot 741, DP 810111 (survey unit 7-10).	EEP Stage 2 ASR 2024 – Appendix B
Visual inspection	11 September 2024	Visual inspection of the Upper South Creek Advanced Water Recycling centre for Sydney Water project area, State Significant Infrastructure (SSI) 8609189. The purpose of this inspection was to verify the validity of sites located within the SSI 8609189 project area that may have been destroyed under that consent.	Aboriginal Heritage Due Diligence Report 2024 – Appendix D
Supplementary archaeological test excavation	9-16 December 2024	Aboriginal archaeological test excavation program of EEP S2 PAD 02 and EEP S2 PAD 03.	Test Excavation Report 2025 – Appendix A

4.1 Survey – March 2019

The survey resulted in the identification of four surface artefact sites and three areas of archaeological potential summarised in Table 13 below.

Table 13: Summary of archaeological features identified in each survey unit, March 2019.

Survey Unit	Aboriginal site	Site description	Assessed significance
Survey unit 1	EP AS 01 AHIMS ID 45-5-5233	Two silcrete artefacts located within a raised artificial terrace	Low
	EP IF 01 AHIMS ID 45-5-5232	Single retouched utilised piece located within a raised artificial terrace	Moderate
	EP IF 02 AHIMS ID 45-5-5231	Grey chert proximal flake fragment identified as a scraper within a raised artificial terrace	Moderate
	EP PAD 03 AHIMS ID 45-5-5660	Area of potential associated with alluvial flats directly adjacent to Wianamatta-South Creek	Unknown
Survey unit 2	EP PAD 02 AHIMS ID 45-5-5237	Area of potential associated with spur landform located above the confluence of two drainage lines	Unknown
Survey unit 3	EP PAD 01 AHIMS ID 45-5-5235	Area of potential on a raised crest landform associated with a wide ridgeline	Unknown
	EP IF 03 AHIMS ID 45-5-5230	Single platform core located within a dam wall	Low
Survey unit 4	None	None	None

4.2 Test excavation – February 2020

Archaeological test excavations were conducted within EP PAD 01 and EP PAD 02 in February 2020. Archaeological test excavation was conducted across both PADs, as it was identified they would be impacted by the proposal. This included excavation of the mapped extent of EP PAD 01 (AHIMS ID 45-5-5236) and EP PAD 02 (AHIMS ID 45-5-5235).

Excavation within Elizabeth Precinct test area 1 (EP 1 – correlating with an area focussed on the EP PAD 01) included the excavation of 58 excavation units (excavation unit = 50 centimetres by 50 centimetres) across the full extent and immediate surrounds of EP PAD 01 (AHIMS ID 45-5-5236). Elizabeth Precinct test area 2 (EP 2 – correlating with an area focussed on EP PAD 02) included the excavation of 30 excavation units across the full extent and immediate surrounds of EP PAD 02 (AHIMS ID 45-5-5235).

The test excavation program recovered 89 artefacts from a total of 22 m^2 of excavation. Two artefact concentrations were identified across the two test areas investigated. Analysis of the soil characteristics across both test excavation areas identified a continuous sub-surface deposit with similar artefact types identified across both test areas. Based on this assessment, the artefact deposit was assessed as being part of one large site extent recorded as Elizabeth Precinct Artefact Scatter

02 (AHIMS ID 45-5-5236). In addition to the subsurface artefacts recovered, two additional surface artefact sites (EP IF 04 and EP IF 05) were located within the test excavation area and archaeologically recorded. In accordance with the Code of Practice these artefacts were not collected during the test excavation program.

4.3 Survey – April 2020

During preparation of the ACHAR two AHIMS searches were conducted, the first on 18 March 2019 and the second on 9 April 2020. When the second 2020 search was undertaken, an additional Aboriginal site, Elizabeth Drive (ED) AFT 1 (AHIMS ID 45-5-5259) was identified immediately adjacent to the southern property boundary of the study area. Archaeological survey and review of the AHIMS site card determined that the extent of ED AFT 1 was limited to the Elizabeth Drive corridor, on an embankment directly to the north of Elizabeth Drive and approximately 2m to the south of the study area property fence line. Due to the presence of a newly identified Aboriginal site in close proximity to the study area, a supplementary archaeological survey was undertaken. Three orange silcrete artefacts were identified, consisting of one whole retouched flake, one partial core fragment and one flake fragment.

4.4 Survey – August 2021

An addendum archaeological survey was undertaken to inspect an additional portion of land that was not previously included within the study area boundary (survey unit 5). That area is approximately 45m wide by 800m in length on the northernmost boundary of the study area. Two artefact scatters with an area of associated archaeological potential and one isolated find were identified. The results of the August 2021 fieldwork program are summarised in Table 14, below.

Table 14: Summary of archaeological features identified in each survey unit, August 2021.

Survey Unit	Aboriginal site	Site description	Assessed significance
Survey unit 1	EP AS 03 AHIMS ID 45-5-5624	Six silcrete artefacts located on a ridge/ crest landform	High
	EP AS 04 AHIMS ID 45-5-5625	four silcrete artefacts located within an upper slope landform	High
	EP IF 06 AHIMS ID 45-5-5659	Single complete silcrete flake located within a lower gradual slope landform within a disturbed context	Low

4.5 Survey – October 2022

An addendum archaeological survey was undertaken to inspect an additional portion of land not previously included within the study area boundary. That area is approximately 495m in length and 110m in width on the southernmost boundary extending along the Elizabeth Drive and Martin Road corridors. AHIMS site 45-5-5259 is located within the survey area however none of the artefacts identified previously were identified. An artefact scatter was identified during archaeological survey (EP AS 05). EP AS 05 comprised two artefacts, one red silcrete flake and one quartz flake. The results of the October 2022 fieldwork program are summarised in Table 15, below.

Table 15: Summary of archaeological features identified in each survey unit, October 2022.

Survey Unit	Aboriginal site	Site description	Assessed significance
Survey unit 1	ED AFT 1 AHIMS ID 45-5-5259	Artefact scatter within Elizabeth Drive Road corridor, not relocated	Low
	EP AS 05 AHIMS ID 45-5-5660	Two complete flakes, one silcrete one quartz, artefacts located within disturbed road corridor	Moderate

4.6 Survey – March 2024

An archaeological survey was undertaken for the additional Lot 741, DP 810111. The full report detailing the outcome of the survey is included as Appendix B. The survey area was divided into four survey units and confirmed the presence of the registered sites inside the study area and identified five additional sites (EEP S2 IF1, EEP S2 PAD1, EEP S2 PAD2, EEP S2 PAD3 and EEP S2 PAD4). The survey re-visited the existing grinding groove site (AHIMS ID 45-5-0215) and determined that the recorded location on AHIMS was incorrect, in addition three areas of PAD, and one isolated find were identified. Whilst the original artefacts were not visible, additional artefacts were identified associated with EP AS 03 (AHIMS ID 45-5-5624) and EP AS 04 (AHIMS ID 45-5-5625). The results of the March 2024 fieldwork program are summarised in Table 16 below.

Table 16: Summary of archaeological features identified in each survey unit, March 2024.

Survey Unit	Aboriginal site	Site description	Assessed significance
Survey unit 7	EP AS 03 AHIMS ID 45-5-5624	Two silcrete artefacts located within a raised artificial terrace	High
	EP AS 04 AHIMS ID 45-5-5625	Grey chert proximal flake fragment identified as a scraper within a raised artificial terrace	High
	EEP S2 PAD2 AHIMS ID pending	Area of potential associated with alluvial flats directly adjacent to Wianamatta-South Creek	Unknown
Survey unit 8	None	None	None
Survey unit 9	EEP S2 PAD3 AHIMS ID pending	Area of potential on a raised crest landform associated with a wide ridgeline	Unknown
Survey unit 10	South Creek AHIMS ID 45-5-0215	Grinding grooves, location updated	High

Survey Unit	Aboriginal site	Site description	Assessed significance
	EP AS 03 AHIMS ID 45-5-5624	One additional silcrete core identified within vehicle track	High
	EP AS 04 AHIMS ID 45-5-5625	Two additional silcrete cores identified within vehicle track	High
	EEP S2 PAD1 AHIMS ID pending	Large PAD extending across area adjacent to the Wianamatta-South Creek	Unknown
	EEP S2 PAD4 AHIMS ID pending	Area of PAD associated with grinding grooves	Unknown
	EEP S2 IF1 AHIMS ID pending	Ground stone tool, located close to the grinding grooves	Moderate

4.7 Survey – September 2024

Concurrently with Artefact's investigation, Kelleher Nightingale Consulting Pty Ltd (KNC) prepared an ACHAR for the proposed wastewater infrastructure associated with the Upper South Creek Advanced Water Recycling centre for Sydney Water (KNC 2021). Sydney Water have established a work zone corridor on the south and western boundaries of the study area and have commenced works under the consent of State Significant Infrastructure (SSI) 8609189.

Artefact completed a visual inspection of the portions of the study area impacted by the Sydney Water works under SSI-8609189 on 11 September 2024. The inspection determined that the portions of EEP S2 PAD01 (AHIMS ID Pending), EP AS 02 (AHIMS ID 45-5-5236) and EP PAD 03 (AHIMS ID 45-5-5234) within the Sydney Water works footprint had been destroyed as a result of the works. The partial destruction of these sites occurred as a result of excavations to install services, the introduction of hardstand surfaces, the movement of plant, stockpiling of materials, and disturbance to ground surfaces and upper stratigraphic layers caused by uncontrolled runoff from the works. While it could not be found during the site inspection, based on the placement of the Sydney Water works, it is also likely that EP IF 05 (AHIMS ID 45-5-5330) has been destroyed.

4.8 Test excavation – December 2024

Archaeological test excavation was conducted in December 2024 across two test areas across the areas of archaeological potential which would be impacted by the proposal. This included excavation of the mapped extent of EEP S2 PAD 02 and EEP S2 PAD 03. The full report detailing the test excavation program is included as Appendix A.

Test excavations within EEP S2 PAD 02 have confirmed the presence of Aboriginal objects across the entire proportion of the PAD subject to archaeological investigation. As a result, the portion EEP S2 PAD 02 known to contain Aboriginal object has been identified as an artefact scatter and is henceforth referred to as EEP2024 AS01 (AHIMS ID pending). A total of four artefacts were retrieved from the 1.75 square metres that were excavated within EEP2024 AS01 (AHIMS ID pending), resulting in an artefact density of 2.29 per square metres. The concentration of artefacts was distributed between TP2, TP3 and TP4. The total weight of artefacts retrieved amounts to 8.48 grams, with the average weight of each artefact is 2.12 grams. The largest artefact was (5.52 grams) was obtained from PAD02TP4.

Test excavations within EEP S2 PAD 03 have confirmed the presence of Aboriginal objects across the entire proportion of the PAD subject to archaeological investigation. As this land encompasses, EP AS 03 (AHIMS ID 45-5-5624) and EP AS 04 (AHIMS ID 45-5-5625), the three sites have been consolidated into a single site, EP AS 03 (AHIMS ID 45-5-5624). A total of 202 artefacts were retrieved from the 5.75 square metres that were excavated within EP AS 03 (AHIMS ID 45-5-5624) resulting in an artefact density of 35 artefacts per square metre. The highest concentration of artefacts were retrieved from PAD03TP7 which yielded 29 artefacts for a density of 14.5 artefacts per square metres. The second highest concentrations of artefacts were retrieved from PAD03TP5 which yielded 28 artefacts for a density of 14 artefacts per square metre and PAD03TP8 with 25 artefacts.

4.9 Summary

These assessments have resulted in the identification of 12 sites within the study area (Figure 10):

1. EP IF 01 (AHIMS ID 45-5-5232)
2. EP IF 02 (AHIMS ID 45-5-5231)
3. EP IF 03 (AHIMS ID 45-5-5230)
4. EP IF 04 (AHIMS ID 45-5-5331)
5. EP IF 05 (AHIMS ID 45-5-5330)
6. EP IF 06 (AHIMS ID 45-5-5659)
7. EP AS 01 (AHIMS ID 45-5-5233)
8. EP AS 02 (AHIMS ID 45-5-5236)
9. EP AS 03 (AHIMS ID 45-5-5624)
10. EP PAD 03 (AHIMS ID 45-5-5234)
11. ED AFT 1 (AHIMS ID 45-5-5259)
12. EEP2024 AS01 (AHIMS ID pending).

Figure 9: Survey units

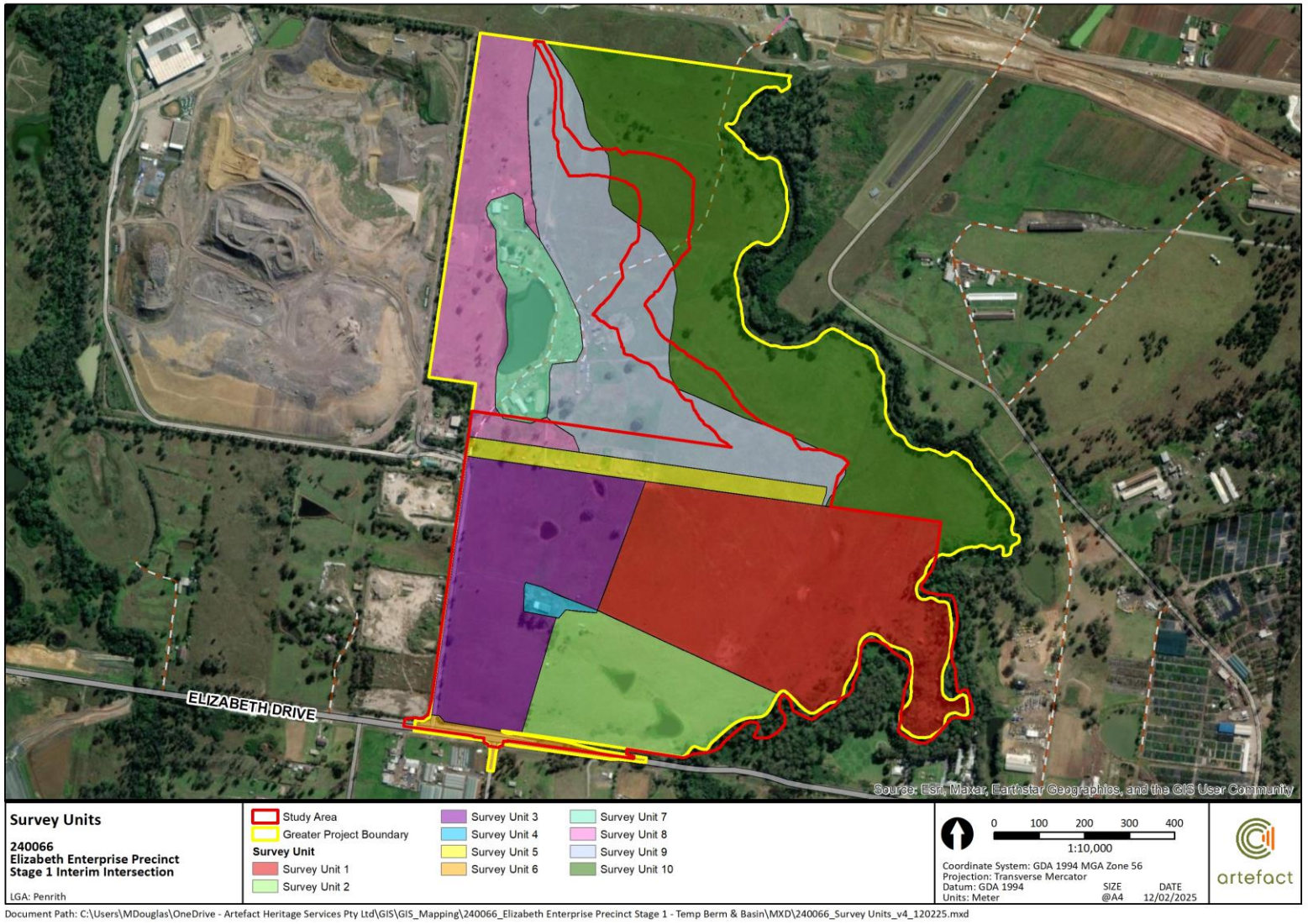
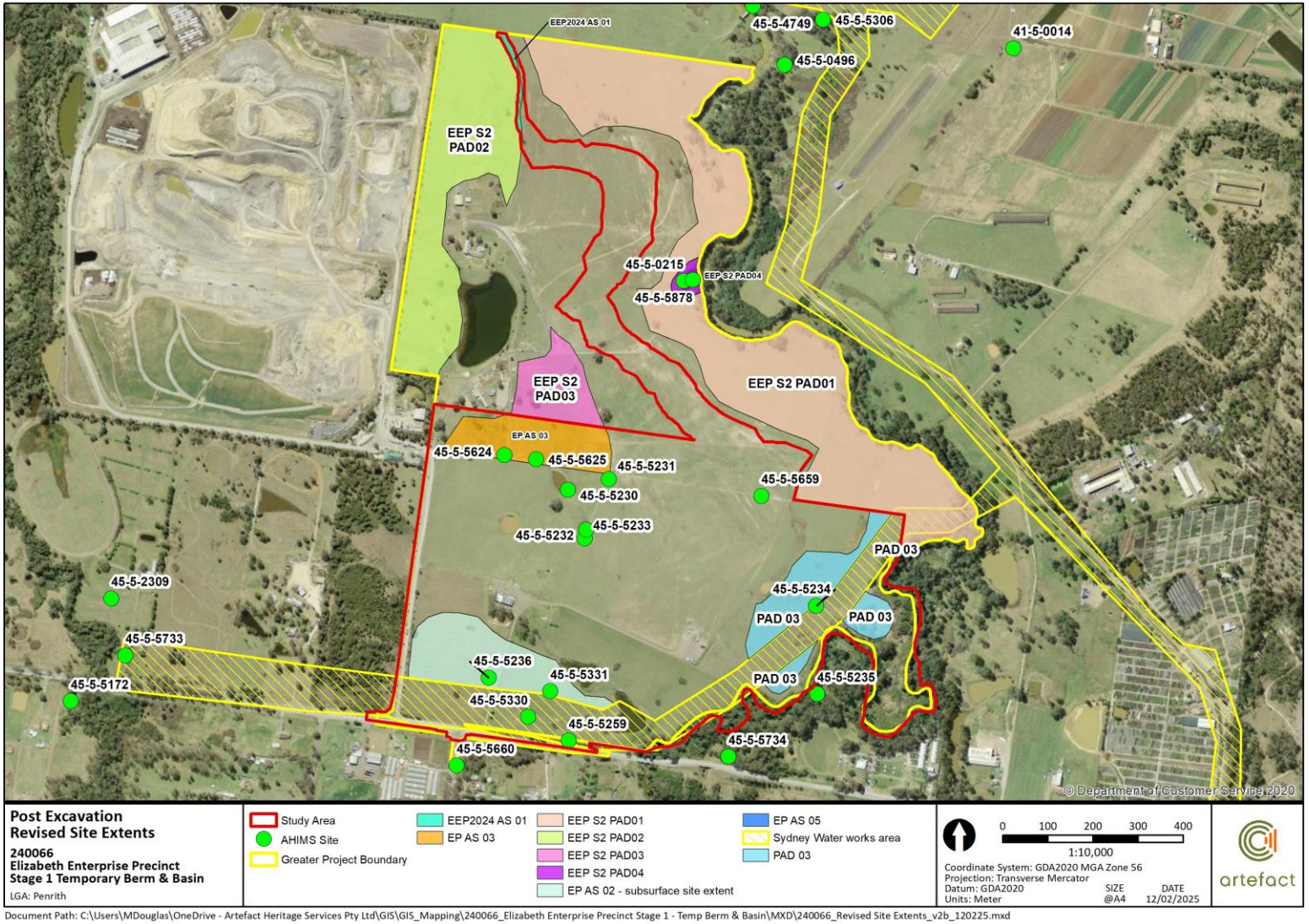


Figure 10: AHIMS Sites and PADs within greater project boundary



Document Path: C:\Users\MDouglas\OneDrive - Artefact Heritage Services Pty Ltd\GIS\GIS_Mapping\240066_Elizabeth Enterprise Precinct Stage 1 - Temp Berm & Basin\MXD\240066_Revised Site Extents_v2b_120225.mxd

5.0 CULTURAL HERITAGE VALUES

5.1 Methodology

The cultural assessment in this report includes information collected through desktop assessment, Aboriginal community consultation and fieldwork undertaken in accordance with the Consultation Requirements. This information was collected by Lily Hackett (Heritage Consultant, Artefact Heritage).

5.1.1 Cultural landscape

The World Heritage Convention of United Nations Educational, Scientific and Cultural Organisation (UNESCO) defines a cultural landscape as one which has 'powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent' (UNESCO 1991). The relationship between Aboriginal Australians and the land is conceived in spiritual terms rather than primarily in material terms (Andrews et al 2006). Aboriginal cultural knowledge has been defined as:

> *Accumulated knowledge which encompasses spiritual relationships, relationships with the natural environment and the sustainable use of natural resources, and relationships between people, which are reflected in language, narratives, social organisation, values, beliefs and cultural laws and custom (Andrews et al 2006).*

Aboriginal cultural knowledge was traditionally bequeathed through oral traditions from generation to generation. Within all Aboriginal communities there was a time of dislocation and upheaval associated with the arrival of colonial settlers. This widespread disruption resulted in much of the detailed knowledge and understanding of many of the elements of the cultural landscape being lost from the Aboriginal community, nonetheless many Aboriginal people maintain a strong connection to the land of their ancestors and collectively possess a wealth of knowledge passed down through the generations.

5.1.2 Types of values

Aboriginal people hold significant knowledge about traditional use of land before and after contact. The landscape which encompasses the study area has cultural value of importance to the Aboriginal community. The Aboriginal community collectively holds values and knowledge that relate to:

- Traditional values: these are passed down by family and community as part of ancient tradition.
- Historical values: these are passed down by family and community and relate to the eras since colonisation; these may include information gained from historical source documents.
- Contemporary values: these are values of modern importance and relevance for Aboriginal stakeholder groups.

There is often no clear separation between these values, and they collectively co-exist with equal importance in forming the value that Aboriginal people place on landscape, cultural heritage, intangible heritage, and particular landforms or parts of the landscape.

5.2 Identified Aboriginal cultural heritage values

Table 17 provides a summary of the Aboriginal cultural heritage values associated with the study area.

Table 17: Cultural heritage values identified for the study and surroundings.

Cultural heritage value	Description	Source
Archaeological evidence of Aboriginal occupation	Aboriginal people have expressed a strong view that sites and deposits associated with the archaeological record of Aboriginal occupation at Badgerys Creek were of high cultural value to Aboriginal people.	Navin Officer Heritage Consultants 2016
Undeveloped nature of Badgerys Creek	The area is regarded as having characteristics which would have made it of significance in the traditional life of Aboriginal people of the pre-colonial past and, as such it should be retained in as natural state as possible The intangible cultural values of the landscape and its surviving biota were valued for their association with traditional culture and lore, and the sense of the place and social identity derived from them.	Navin Officer Heritage Consultants 2016
Wianamatta-South Creek	Dually named Wianamatta meaning mother place in the Dharug language. Wianamatta-South Creek contains intrinsic Aboriginal cultural values. Historic record includes reference to Darug ceremonies held along banks of Wianamatta-South Creek at the Mamre estate approximately eight km north of current study area	Navin Officer Heritage Consultants 2016

6.0 SIGNIFICANCE ASSESSMENT

A significance assessment of the scientific, social, historic and aesthetic values of the study area is included below.

6.1 Significance assessment criteria

An assessment of the cultural heritage significance of an item or place is required in order to form the basis of its management. The Guide (OEH 2011: 10) provides guidelines, in accordance with the Burra Charter (Australia ICOMOS 2013) for significance assessment with assessments being required to consider the following criteria:

- Social values – does the area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Historic values – is the area important to the cultural or natural history of the local area and/or region and/or state
- Scientific values - does the area have the potential to yield information that will contribute to an understanding of the cultural and natural history of the local area and/or region and/or state
- Aesthetic values – is the area important in demonstrating aesthetic characteristics in the local area and/or region and/or state.

Scientific values should be considered in light of the following criteria:

- 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?

It is important to note that heritage significance is a dynamic value.

6.1.1 Historic value

Historic values refer to the association of the place with aspects of Aboriginal history. Historic values are not necessarily reflected in physical objects, but may be intangible and relate to memories, stories or experiences.

While the settlement of Exeter Farm resulted in the eviction of Aboriginal people within Badgerys land there is some suggestion that Badgerys permitted small Aboriginal groups to camp along Wianamatta-South Creek (Hardy 1989:19). This is supported by the presence of glass artefacts within the study area which demonstrate the use of the site by Aboriginal people in the post contact period. While the use of the site has not been identified as relating to specific Aboriginal person, story or

memory the presence of evidence for post contact use of a site is relatively rare in the local context. Consequently, the study area is considered to contain moderate historic value.

6.1.2 Aesthetic value

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.

The study area maintains aesthetic value associated with the rural undeveloped nature of the study area which exhibits a number of landscape features consistent with the precontact landscape. Of particular relevance is the western portion of the study area which affords a good outlook towards surrounding landscape features including Wianamatta-South Creek and its tributaries. The study area is considered to contain moderate aesthetic values.

6.1.3 Socio/cultural value

The Consultation Requirements specifies that the social or cultural value of a place must be identified through consultation with Aboriginal people.

No specific areas of cultural significance were identified by RAP representatives during the field survey or test excavation program. The Aboriginal objects identified across the site however, are considered to contain cultural significance as part of a wider cultural landscape and as physical evidence of the use of the area by Aboriginal people.

6.1.4 Scientific value

The study area contains 12 sites which range from low to high scientific significance. While the presence of glass artefacts demonstrate that the study area was associated with Aboriginal use in the post contact period these artefacts cannot directly associate the site with specific historical events, activities or people. Consequently, the study area is considered to contain moderate historic value. The study area maintains aesthetic value associated with the rural undeveloped nature of the study area which exhibits a number of landscape features consistent with the precontact landscape. Of particular relevance is the western portion of the study area which affords a good outlook towards surrounding landscape features including Wianamatta-South Creek and its tributaries. The study area is considered to contain moderate aesthetic values. A summary of the archaeological significance of sites identified is discussed below and presented in Table 18 below.

6.1.4.1 Elizabeth Precinct Isolated Find 01 (AHIMS ID 45-5-5232)

EP IF 01 (AHIMS ID 45-5-5232) is comprised of an isolated silcrete artefact located within a surface exposure associated with animal grazing. The artefact is comprised of a retouched utilised piece which is considered to be moderately rare within the regional context and exhibit moderate representative values as an example of the artefact type. The artefact itself is also considered to demonstrate moderate education potential. The location of the artefact indicates the artefact is located in an area which has been filled and disturbed, demonstrating limited research potential. Given the disturbed context the artefact's research potential is considered to be limited to the value of the artefact itself and subsequently considered to be low on a regional scale.

6.1.4.2 Elizabeth Precinct Isolated Find 02 (AHIMS ID 45-5-5231)

EP IF 02 (AHIMS ID 45-5-5231) is comprised of an isolated chert artefact located within a vehicle track exposure. The artefact has been retouched along its right, left and proximal margins and was identified as a scraper. The tertiary reduction of the artefact associated with the retouch identifies the object as requiring several steps in its production. It is considered to be moderately rare with the region and exhibit moderate representative values as an example of the artefact type. The artefact

itself is also considered to demonstrate moderate education potential. The location of the artefact indicates that the artefact is located with an area which has been filled and is subsequently within a disturbed context which exhibits limited research potential.

6.1.4.3 Elizabeth Precinct Isolated Find 03 (AHIMS ID 45-5-5230)

EP IF 03 (AHIMS ID 45-5-5230) is comprised of an isolated silcrete artefact located on a dam wall. The location of the artefact indicates that the artefact is located in a disturbed context which exhibits limited research potential. As a silcrete core the artefact is considered to be a common example of the artefact type in the region and therefore exhibits low rarity values. Given the relative lack of easily identified features the artefact is not considered to be a good example of its type. The artefact is therefore considered to exhibit low representative values and education potential when compared to the wider region.

6.1.4.4 Elizabeth Precinct Isolated Find 04 (AHIMS ID 45-5-5331)

EP IF 04 (AHIMS ID 45-5-5331) is an isolated silcrete proximal flake fragment located on the surface of a moderately disturbed context. As a silcrete flake, the artefact is considered to be a common example of the artefact type in the region and therefore exhibits low rarity values. The artefact is not considered to be a good example of its type based on its lack of easily identifiable features. The artefact is therefore considered to exhibit low representative values and education potential when compared to the wider region.

6.1.4.5 Elizabeth Precinct Isolated Find 05 (AHIMS ID 45-5-5330)

EP IF 05 (AHIMS ID 45-5-5330) is a silcrete isolated surface artefact located within an erosion scour within an existing drainage line landform. The site is considered to be subject to moderate disturbance associated with fluvial forces during rainfall events. Based on the site's location within a drainage line it is considered to contain limited research potential. As an isolated find, the site is considered to be common in the local region and contain low representative values. The artefact is not considered to be a good example of its type based on its lack of easily identifiable features. The artefact is therefore considered to exhibit low representative values and education potential when compared to the wider region.

6.1.4.6 Elizabeth Precinct Isolated Find 06 (AHIMS ID 45-5-5659)

EP IF 06 (AHIMS ID 45-5-5659) is comprised of an isolated chert complete flake artefact located on an informal dirt tack. The artefact is located within an area that has been subject to a largescale filling event and is considered to be within a highly disturbed context. As such, the artefact exhibits limited research potential. As a chert flake the artefact is considered to be a common example of the artefact type in the region and therefore exhibits low rarity values. The artefact is considered to be a common example of its type. The artefact is therefore considered to exhibit low representative values and education potential when compared to the wider region.

6.1.4.7 Elizabeth Precinct Artefact Scatter 01 (AHIMS ID 45-5-5233)

EP AS 01 (AHIMS ID 45-5-5233) is comprised of an artefact scatter with two silcrete artefacts located within a surface exposure associated with animal grazing. The artefacts are comprised of one complete flake and one single platform core. The location of the artefact indicates that the artefact is located with an area of fill and is subsequently within a disturbed context which exhibits limited research potential. As a silcrete core and complete flake, the artefacts are considered to be a common example of the artefact type in the region and therefore exhibit low rarity values. Given the relative lack of easily identified features the artefacts are not considered to be a good example of its type. The artefacts are therefore considered to exhibited low representative values and education potential when compared to the wider region.

6.1.4.8 Elizabeth Precinct Artefact Scatter 02 (AHIMS ID 45-5-5236)

EP AS 02 (AHIMS ID45-5-5236) is a low-density artefact scatter located across a low crest and slope landform. Artefacts associated with the site exhibit a high level of variety including a high proportion of

formal tools, the use of several raw material types and heat treatment. The assemblage is considered to be highly representative of a variety of land use which is considered to be rare in the local context. Given the variety of artefact types represented, the assemblage is considered to contain high education potential associated with the morphology of the artefact assemblage.

Glass artefacts which were worked by Aboriginal people have been identified in the test excavation assemblage. This is indicative of post-1788 Aboriginal and European contact during the early nineteenth century and is considered of high scientific significance.

Possible post-depositional disturbance from reduces the research potential of the site.

6.1.4.9 Elizabeth Precinct Artefact Scatter 03 (AHIMS ID 45-5-5624)

EP AS 03 (AHIMS ID 45-5-5624) is a high-density artefact scatter. The surface scatter has a variety of artefacts that exhibit attributes of various reduction sequences including a core and complete flakes. The assemblage is considered to be highly representative of a variety of land use which is considered to be rare in the local context. Given the variety of artefact types represented, the assemblage is considered to contain high education potential associated with the morphology of the artefact assemblage. The site is considered to be moderately disturbed associated with livestock trampling and subsequent erosion. The limited site integrity reduces the research potential for the site.

6.1.4.10 Elizabeth Precinct PAD 03 (AHIMS ID 45-5-5234)

Areas of PAD identified within the study area are assessed as demonstrating unknown archaeological significance. This assessment is due to the fact that these features are located in areas with limited surface visibility and the nature, extent and significance cannot be determined without further investigation. Further investigation would include archaeological test excavation in accordance with the Code of Practice.

6.1.4.11 Elizabeth Drive AFT 1 (AHIMS ID 45-5-5259)

ED AFT 1 (AHIMS ID 45-5-5259) is a silcrete artefact scatter located within the Elizabeth Drive road corridor. The site is located within a disturbed context associated with its location within a road reserve which has been impacted by a gas main and road construction in this location. The site card suggests that several of the artefacts are associated with a knapping floor event which would be moderately representative of sites within the wider region. However, based on the disturbed nature of the site, it is considered that the artefacts contain limited research potential and education potential. Silcrete artefact scatters are common within the wider region and subsequently the site is considered the contain low rarity values.

6.1.4.12 EEP2024 AS01 (AHIMS ID pending)

EEP2024 AS01 (AHIMS ID pending) is a low-density artefact scatter. The assemblage is considered to be highly representative of a variety of land use which is considered to be rare in the local context. Given the variety of artefact types represented, the assemblage is considered to contain high education potential associated with the morphology of the artefact assemblage. The site is considered to be moderately disturbed associated with livestock trampling and subsequent erosion. The limited site integrity reduces the research potential for the site.

Table 18: Significance assessment for sites within the study area.

Site name/ AHIMS ID	Research potential	Representative value	Rarity	Education potential	Overall significance
EP IF 01 (AHIMS ID 45-5-5232)	Low	Moderate	Moderate	Moderate	**Moderate**

Site name/ AHIMS ID	Research potential	Representative value	Rarity	Education potential	Overall significance
EP IF 02 (AHIMS ID 45-5-5231)	Low	Moderate	Moderate	Moderate	**Moderate**
EP IF 03 (AHIMS ID 45-5-5230)	Low	Low	Low	Low	**Low**
EP IF 04 (AHIMS ID 45-5-5331)	Low	Low	Low	Low	**Low**
EP IF 05 (AHIMS ID 45-5-5330)	Low	Low	Low	Low	**Low**
EP IF 06 (AHIMS ID 45-5-5659)	Low	Low	Low	Low	**Low**
EP AS 01 (AHIMS ID 45-5-5233)	Low	Moderate	Low	Low	**Low**
EP AS 02 (AHIMS ID 45-5-5236)	Moderate	High	High	High	**High**
EP AS 03 (AHIMS ID 45-5-5624)	Moderate	High	High	High	**High**
EP PAD 03 (AHIMS ID 45-5-5234)	Unknown	Unknown	Unknown	Unknown	**Unknown**
ED AFT 1 (AHIMS ID 45-5-5259)	Low	Moderate	Low	Low	**Low**
EEP2024 AS01 (AHIMS ID pending)	Moderate	High	High	High	**High**

7.0 IMPACT ASSESSMENT

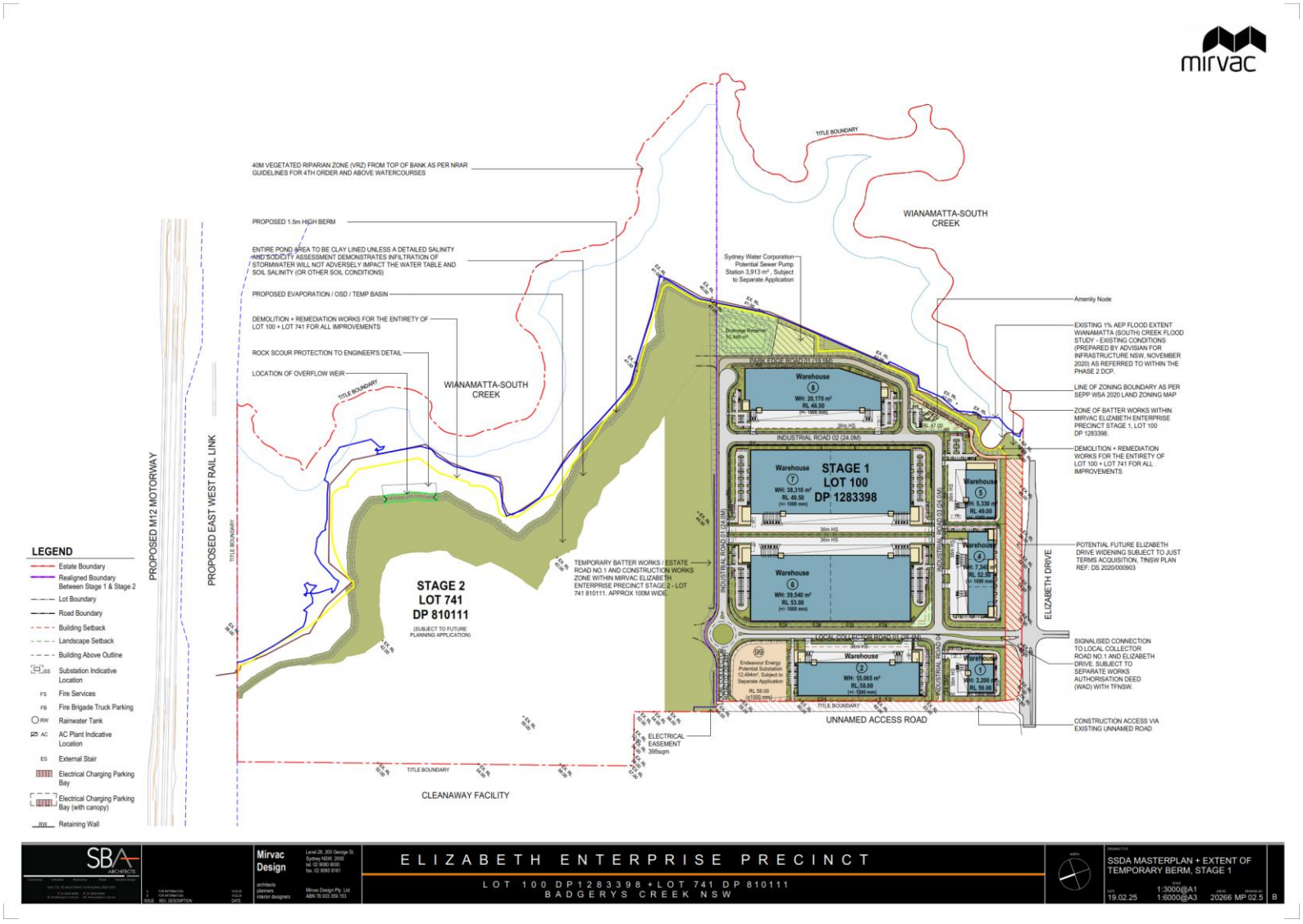
7.1 Proposed works

The Concept Plan (Figure 11) proposes and outlines the framework for the staged development of EEP Stage 1 (SSD-19618251) for an industrial estate, comprising seven (7) industrial buildings (warehouse and distribution centres or general industrial use) including ancillary offices, dock offices, café and associated infrastructure including roads, stormwater and utilities, with landscaping. The Concept Plan applies across Lot 100 DP1283398 and part Lot 741 DP81011.

The Stage 1A Development, the first development works of the EEP Stage 1 Concept Plan, comprises:

- site preparation works;
- site servicing and infrastructure works including stormwater infrastructure and road works;
- subdivision of Lot 100 DP1283398 and Lot 741 DP81011;
- construction of Warehouse 2 and Warehouse 6 for the purpose of warehouse and distribution centres or general industrial use;
- construction of hardstand areas for loading/unloading and vehicle manoeuvring;
- construction of on-site car parking;
- landscaping, including on-lot landscaping and street reserve landscaping;
- estate signage comprising a main estate entry signage and signage zones; and
- operation hours of 24 hours, 7 days a week.

Figure 11: Master plan (Mirvac, 28 February 2025)



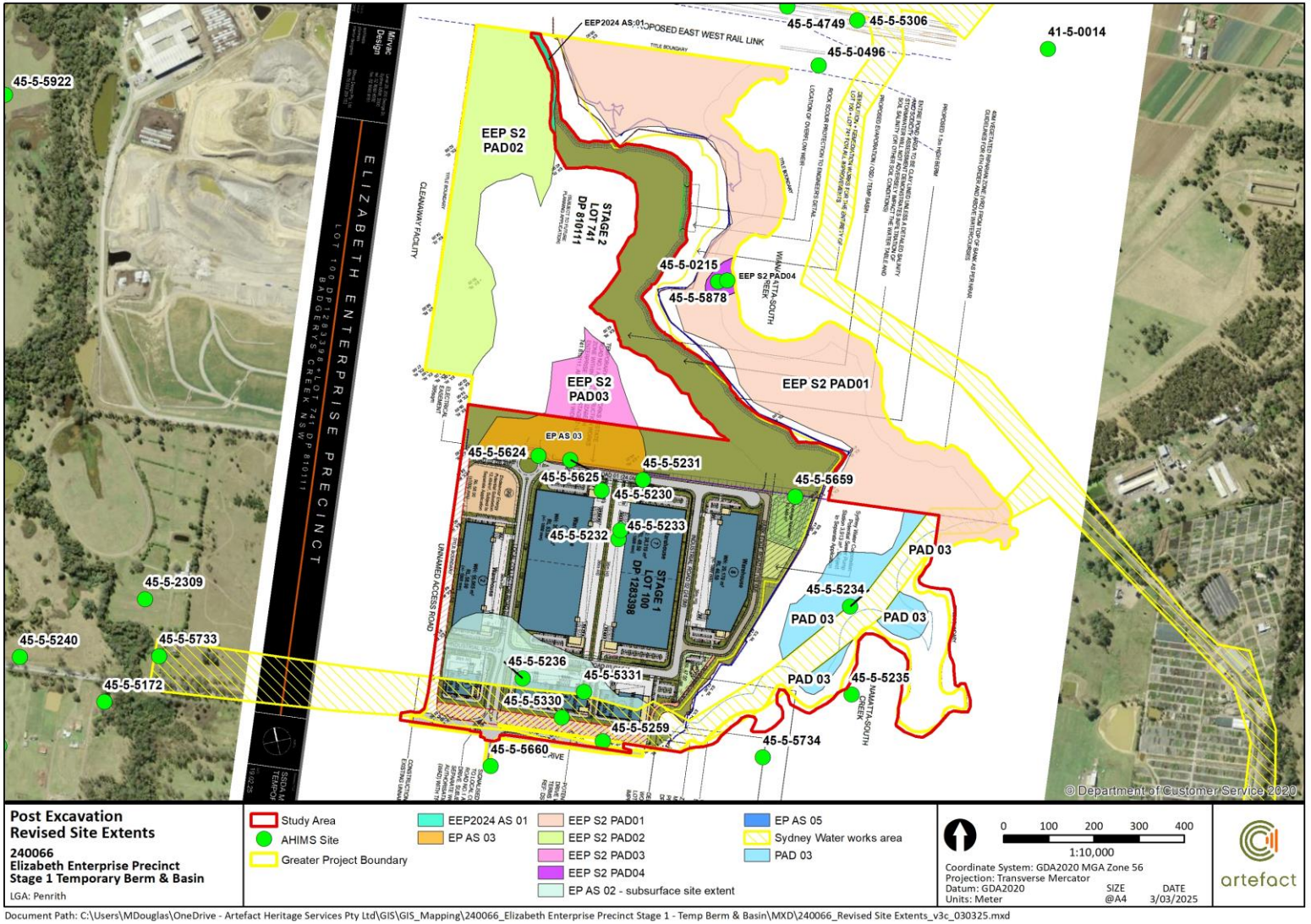
7.2 Aboriginal heritage impact

Construction of the warehouses and associated infrastructure will involve extensive ground disturbing works. No works are proposed to be carried out beyond the flood line extent adjacent to Wianamatta-South Creek, the remainder of the study area will be subject to bulk earthworks. A summary of the impacts to identified Aboriginal sites is outlined in Table 19.

Table 19: Impact assessment

Site name/ AHIMS ID	Type of harm	Degree of harm	Consequence of harm
EP IF 01 (AHIMS ID 45-5-5232)	Direct	Total	Total loss of value
EP IF 02 (AHIMS ID 45-5-5231)	Direct	Total	Total loss of value
EP IF 03 (AHIMS ID 45-5-5230)	Direct	Total	Total loss of value
EP IF 04 (AHIMS ID 45-5-5331)	Direct	Total	Total loss of value
EP IF 05 (AHIMS ID 45-5-5330)	Direct	Total	Total loss of value
EP IF 06 (AHIMS ID 45-5-5659)	Direct	Total	Total loss of value
EP AS 01 (AHIMS ID 45-5-5233)	Direct	Total	Total loss of value
EP AS 02 (AHIMS ID 45-5-5236)	Direct	Total	Total loss of value
EP AS 03 (AHIMS ID 45-5-5624)	Direct	Total	Total loss of value
EP PAD 03 (AHIMS ID 45-5-5234)	None	None	No loss of value
ED AFT 1 (AHIMS ID 45-5-5259)	Direct	Total	Total loss of value
EEP2024 AS01 (AHIMS ID pending)	Direct	Total	Total loss of value

Figure 12: Impact of the proposed works on AHIMS sites located within the study area



Document Path: C:\Users\MDouglas\OneDrive - Artefact Heritage Services Pty Ltd\GIS\GIS_Mapping\240066_Elizabeth Enterprise Precinct Stage 1 - Temp Berm & Basin\MXD\240066_Revised Site Extents_v3c_030325.mxd

7.3 Ecological Sustainable Development principles

The Guide (OEH 2011) specifies that Ecological Sustainable Development (ESD) principles must be considered when assessing harm and recommending mitigation measures in relation to Aboriginal objects.

The following relevant ESD principles are outlined in Section 3A of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*:

- Decision-making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations (the 'integration principle')
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle')
- 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').

7.3.1 The integration principle

Decision-making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations (the 'integration principle'). This ACHAR demonstrates regard for the integration principle by considering Aboriginal heritage values and impacts from the project during the planning phase of the project.

7.3.2 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'). Numerous surface and subsurface AHIMS sites are located within the study area. To ameliorate the uncertainty associated with the area of archaeological potential, archaeological test excavations have been conducted. The combination of predictive models and the results of the test excavation have been used to assess the probable nature of the archaeological record within the study area.

Investigation is ongoing and will involve test excavation to establish the significance of the any subsurface artefacts should these be found. Until test excavations have been completed and the results incorporated into this ACHAR, the precautionary principle has not been addressed.

7.3.3 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').

Further archaeological investigations through salvage excavations have been recommended to mitigate against impacts to the remaining sites within the study area provide further information about the variance in Aboriginal land use across varied landscapes in the Badgerys Creek region.

7.4 Cumulative impacts

Badgerys Creek is subject to several large development projects which will result in a substantial cumulative impact to the Aboriginal cultural heritage of the region.

The Western Sydney International Airport site at Badgerys Creek extends over approximately 1700 hectares with adjacent lands progressively scheduled for resumption and development over the next 50 years. At least 70 Aboriginal sites have been identified across the airport site with additional heritage investigation identifying additional Aboriginal objects as part of project mitigation measures (Navin Officer 2016). While effort has been made to preserve sites through environmental conservation areas and movement of topsoil, it is expected that a large portion of these sites will be impacted or relocated as part of construction.

Options assessment of the proposed M12 route resulted in the identification of a number of surface and subsurface sites through a combination of archaeological survey and test excavation. A total of 19 Aboriginal sites are located within the construction footprint of the M12 route that will be subject to impact as part of the program including several sites to the north of the current study area (Jacobs 2019).

The Elizabeth Precinct proposal would result in impact to a further 12 sites within the wider Badgerys Creek region. While resulting in a comparatively small cumulative impact when compared to the impacts of the Badgerys Creek airport site and the M12 project, the increase with never-the-less result in an increase to the cumulative destruction of Aboriginal cultural heritage in the region.

The Wianamatta-South Creek portion of the study area will not be harmed by the proposal and will not impact PAD 03 (see Table 19).

8.0 MANAGEMENT AND MITIGATION MEASURES

8.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved.

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 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 RAPs.

Mitigation measures vary depending on the assessment of archaeological significance of a particular Aboriginal site and are based on its research potential, rarity, representatives 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. SSD Conditions of Approval would be required to impact the site before work can commence
- Moderate archaeological significance – conservation where possible. If conservation was not practicable, further archaeological investigation would be required such as salvage excavations or surface collection in accordance with the SSD Conditions of Approval.
- High archaeological significance – conservation as a priority. Where all other practical alternatives have been discounted mitigation measured such as comprehensive salvage excavations in accordance with the SSD Conditions of Approval would be required.

Sites of unknown scientific value should be conserved where possible. Where conservation is not practical further investigation under the Code of Practice will be required to confirm the presence of Aboriginal objects and gather enough information to assess significance. Test excavation is not a mitigation measure, it is an investigatory action required to gather enough information to inform the development of appropriate mitigation measures.

8.2 Options to avoid or mitigate harm

It is considered unlikely that localised portions of the study area could be preserved based on the requirement for substantial cut and fill works to level the site for the proposed works.

The proposed does not include land within the 1:100 flood boundary, resulting in no harm to Elizabeth Precinct PAD 03 (see Table 19).

A summary of the recommendations is discussed below and summarised in Table 20.

Table 20: Summary of recommendations

Site name/ AHIMS ID	Recommendation
EP IF 01 (AHIMS ID 45-5-5232)	If harm is unavoidable surface collection of artefacts is recommended.

Site name/ AHIMS ID	Recommendation
EP IF 02 (AHIMS ID 45-5-5231)	If harm is unavoidable surface collection of artefacts is recommended.
EP IF 03 (AHIMS ID 45-5-5230)	If harm is unavoidable surface collection of artefacts is recommended.
EP IF 04 (AHIMS ID 45-5-5331)	If harm is unavoidable surface collection of artefacts is recommended.
EP IF 05 (AHIMS ID 45-5-5330)	If harm is unavoidable surface collection of artefacts is recommended.
EP IF 06 (AHIMS ID 45-5-5659)	If harm is unavoidable surface collection of artefacts is recommended.
EP AS 01 (AHIMS ID 45-5-5233)	If harm is unavoidable surface collection of artefacts is recommended
EP AS 02 (AHIMS ID 45-5-5236)	Site has been partially destroyed. Salvage is required to mitigate total loss of value.
EP AS 03 (AHIMS ID 45-5-5624)	If harm is unavoidable salvage of artefacts is recommended.
EP PAD 03 (AHIMS ID 45-5-5234)	No action required as site will not be impacted
ED AFT 1 (AHIMS ID 45-5-5259)	If harm is unavoidable surface collection of artefacts is recommended.
EEP2024 AS01 (AHIMS ID pending)	If harm is unavoidable salvage of artefacts is recommended.

8.2.1 Archaeological salvage

Where harm to Aboriginal sites is avoidable, SSD consent must be in place to authorise harm. Archaeological salvage of artefacts from EP AS 02 (AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending) must take place prior to authorised harm. EP AS 02 (AHIMS ID 45-5-5236) has been subject to partial impact and salvage is recommended to mitigate further loss of value.

The following surface artefact sites would be collected prior to the commencement of any ground disturbing works in the study area:

- EP IF 01 (AHIMS ID 45-5-5232)
- EP IF 02 (AHIMS ID 45-5-5231)
- EP IF 03 (AHIMS ID 45-5-5230)
- EP IF 04 (AHIMS ID 45-5-5331)
- EP IF 05 (AHIMS ID 45-5-5330)
- EP IF 06 (AHIMS ID 45-5-5659)
- EP AS 01 (AHIMS ID 45-5-5233)

- ED AFT 1 (AHIMS ID 45-5-5259)

A methodology for salvage through excavation and surface collection is included below in Section 9.0.

8.2.2 Site conservation

The current assessment has identified that EP PAD 03 (AHIMS ID 45-5-5234) would not be impacted by the proposed works. However, due to proximity to the boundary of the works area the boundary of this site would be marked on construction and environmental site plans, and barrier fencing established outside of the perimeter of the site to physically protect it.

8.3 Ongoing consultation with Aboriginal stakeholder groups

Consultation with the RAPs would continue throughout the life of the project, as necessary. Ongoing consultation with the RAPs will take place where required, namely regarding the reburial of retrieved artefacts and in the event of any unexpected Aboriginal objects being identified during works.

8.4 Changes to the project area

Advice provided within this ACHAR is based upon the most recent information provided by the proponent at the time of writing. Any changes made to the project should be assessed by an archaeologist in consultation with the RAPs. Any changes that may impact on Aboriginal sites not assessed as part of the project may warrant further investigation and result in changes to the recommended management and mitigation measures.

9.0 ARCHAEOLOGICAL SALVAGE EXCAVATION METHODOLOGY

9.1 Research questions

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

Question 1: Can salvage excavation identify the spatial extent of identified artefact concentration deposits

The study area at the Elizabeth Precinct site has been extensively farmed since the early nineteenth century. Ploughing and planting activities have repeatedly modified the soil, with ample evidence of soil mixing and vertical movement of soil horizons identified during the test excavation program. The precise extent of horizontal soil movement is less well known, and the presence of discrete areas of concentrated artefacts implies that some degree of spatial integrity of artefact distribution exists. Salvage excavation would aim to define outer boundaries of the areas of artefact concentrations in order to attempt to correlate the deposition of artefacts with Aboriginal activities in that area.

Question 2: Is there evidence of *in situ* single or overlapping knapping events?

No evidence has been identified for a single or overlapping knapping event. One of the aims of the salvage program would be to identify any whether the artefacts retrieved could have resulted from one or more knapping events. This would include 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 (i.e. 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 3: Is there further evidence of contact sites which could provide information on interaction between Aboriginal people and early European settlers?

Glass artefacts identified at the Elizabeth Precinct site have been knapped into formal stone tools and were made of early nineteenth century bottle glass. While it is known that Aboriginal people camped on Badgery's property following the appropriation of their land, direct evidence of this through glass artefactual material is comparatively rare. Should a larger assemblage of glass artefacts or repurposed European material be identified in the area near the original artefact concentrations, information regarding tool use, material selection and Aboriginal and European contact may be discernible.

Question 4: Do recovered artefacts provide microscopic evidence of manufacture and use?

Should artefacts be identified during manual archaeological excavation, opportunities to collect them without sieving exist, which would ensure that potential residues of plant material from their original use may be retained. Collection of artefacts *in situ* during excavation also limits the degree of handling of artefacts, which can allow microscopic examination of surface damage to be analysed to infer past working practices.

Use-wear and residue studies of suitably sampled stone tools may allow correlations between artefact morphologies and specific uses for these tools. These analyses may have the capacity to provide corroboration to theoretical models of tool use and human occupation at the Elizabeth Precinct site.

Question 5: How do the results of the test and salvage excavations compare to the results of other sub-surface investigations in the regional context?

Archaeological test and salvage excavation programs have been conducted at the Western Sydney International Airport site directly to the south of the study area, as well as across the Bringelly and Badgerys Creek regions in general. While these sites are located within similar undulating plain landform contexts, artefact assemblages show a high degree of diversity. Opportunities to compare and contrast excavation and artefactual information between the Elizabeth Precinct site and nearby sites would occur.

The results of test excavation would be discussed in relation to the findings of previous sub-surface investigations 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.

9.2 Excavation approach and methodology

9.2.1 Sample strategy

Salvage excavation would consist of contiguous 1m^2 excavation pits totalling up to 100m^2 of targeted manual excavation within EP AS 02 (AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending). At a minimum one test excavation pit from each site would be expanded to a 5 m x 5 m open area. The nominated pit would need to be confirmed following the SSD approval and review of site conditions as overlapping works may result in the destruction of the nominated location prior to the commencement of salvage. The selection of the pit for expansion would be based on the following:

- Highest count of Artefacts retrieved during test excavations
- Diversity of material and artefact types
- Integrity of the excavation location

The decision to cease or continue with investigations would be made by the supervising archaeologist based on the following variables:

- High density of artefacts
- 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

A salvage excavation is considered to constitute an action that will harm an Aboriginal site. Therefore, salvage excavations outside the approval boundary would be a breach of the *National Parks and Wildlife Act 1974*. To minimise the risk of excavations occurring beyond the approvals area, it is recommended that a surveyor mark the boundary of the work zone prior to the commencement of the salvage excavations.

9.2.2 Excavation procedure

All excavation would be undertaken manually, using shovels and trowels, etc, by a team of archaeologists and Aboriginal stakeholders. Excavation would occur in arbitrary 100 mm spits, which would provide vertical control, especially if a conjoin analysis is to be performed.

Excavation would continue for each excavation unit until a culturally sterile layer was reached (in this case, basal Wianamatta clay), but would not exceed a maximum depth of 1.5 m for safety reasons. All excavation unit lower horizons and vertical excavation walls would be trowel cleaned to remove all loose soil.

Each excavation pit would be given an alphanumeric label for identification purposes. All excavated pits 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.

9.2.3 Sieving and artefact recovery

All material recovered from excavation would be sieved through a 3 mm sieve mesh. Due to the high clay fraction of the soil, all material would be wet sieved wherever possible. Artefacts identified during manual excavation would not be wet sieved if they are selected for inclusion in future residue or use-wear analysis (see Section 9.2.4 below).

All recovered stone artefacts would be placed in resealable bags (excavation unit [EU] bags) labelled with the corresponding excavation unit information (site name, transect number, salvage pit ID, and spit number). An inventory of the artefacts and excavation units should be produced in the field to establish a chain of custody. The inventory would also note which excavation units contain artefacts. Artefacts may to be taken off site to be analysed in detail by relevant specialists.

9.2.4 Residue and use-wear analysis

Special attention would be given for recovering artefacts *in situ* during manual excavation. Artefacts which are identified during manual digging could be bagged individually, with adhering soil material (i.e. not dry cleaned or scrubbed) into double re-sealable specimen bags. Artefacts which would be selected for potential residue analysis would be at the discretion of the excavation supervisor. Artefacts which were recovered from wet sieving would not be sampled for residue analysis due to contamination concerns and the likelihood that water would have damaged or removed adhering sediments.

During post-excavation analysis, the excavation supervisor would select artefacts to be sampled for microscopic use-wear analysis, in coordination with the artefact analyst. Preference would be given to undertake use-wear analysis of those artefacts which were collected *in situ* with adhering sediment

(and potential residue). Residue and use-wear studies, should they be conducted, would be provided to external expert consultants for analysis.

9.2.5 Soil sampling method

Palaeo-environmental samples for potential OSL dating, radiocarbon 14C dating, pollen analysis or particle analysis will be undertaken if suitable material is identified during excavations. Any samples will be decided by the supervising archaeologist. The validity of processing samples will be analysed on site.

During salvage excavation, samples of organic material suitable for radiometric dating (charcoal, bone, shell, wood) will be collected for the dating of archaeological deposits. The number of samples sent for dating will be determined on the suitability of the sample and the significance of the site. Samples will be collected as follows:

- Samples will be collected using clean nitrile gloves and placed in clean plastic sample bags
- Samples will be removed to the relevant temporary keeping place and dried out to avoid fungal growth during transport
- Samples will be packaged within hard plastic cases for transport to a radiocarbon dating laboratory.

Investigations by a geomorphologist will be an integral part of the excavation program. Investigations by a geomorphologist will likely include auguring, and the collection of soil and sediment samples from auguring locations.

Pollen analysis samples will be taken from any suitable natural soil deposits that contain a high humic content. Samples will be collected in a resealable labelled bag. Particle analysis provides higher-level characterisation than simple visual description and would substantially increase the degree to which the stratigraphic process can be determined. Samples for particle analysis will be taken from a representative section at one test pit location (more if changes in stratigraphy are evident across testing area) at 50 mm increments. Samples will be collected in resealable labelled bag.

The procedure for the extraction of OSL samples requires that the samples are extracted in the absence of green-blue spectrums of light. Where stratigraphic layers are identified suitable for OSL dating, these samples must be extracted under a red light. A geomorphologist would be involved in the investigation process to facilitate the retrieval of samples for OSL dating.

9.2.6 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
- Do not further disturb or move the remains
- Notify NSW Police

An Aboriginal community representative must be present where it is reasonably suspected burials or human remains may be encountered. If human remains are unexpectedly encountered and they are thought to be Aboriginal, the Aboriginal community must be immediately notified.

Recording of Aboriginal ancestral remains must be undertaken, or reviewed by, a specialist physical anthropologist or other suitable qualified person.

Archaeological reporting of Aboriginal ancestral remains must be undertaken, or reviewed by, a specialist physical anthropologist or other suitable qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains of Aboriginal people rather than as scientific specimens.

9.3 Surface collection

The following surface artefact sites would be collected prior to the commencement of any ground disturbing works in the study area:

- EP IF 01 (AHIMS ID 45-5-5232)
- EP IF 02 (AHIMS ID 45-5-5231)
- EP IF 03 (AHIMS ID 45-5-5230)
- EP IF 04 (AHIMS ID 45-5-5331)
- EP IF 05 (AHIMS ID 45-5-5330)
- EP IF 06 (AHIMS ID 45-5-5659)
- EP AS 01 (AHIMS ID 45-5-5233)
- ED AFT 1 (AHIMS ID 45-5-5259).

Surface collection will be undertaken using the following method:

- Artefact collection will be undertaken by a team comprising an archaeologist and RAP representatives
- Artefact locations will be marked on the ground and recorded with a hand-held non-differential GPS prior to collection
- Collected artefacts will be catalogued on site by the team, with recorded attributes as listed for the test and salvage excavation analysis
- Artefacts will be labelled and bagged according to site, and then managed along with the assemblage recovered from the test and salvage excavation
- A short report will be completed, analysing the results of the surface collection with those of the test excavation and salvage excavation, in particular with regard to artefact density and distribution, and the character of the assemblage. The reporting may be included in the salvage excavation report
- An Aboriginal Site Information Recording Form (ASIRF) would be submitted for all sites subject to surface collection.

9.4 Post-fieldwork tasks

9.4.1 Analysis of recovered material

The post-excavation analysis would be designed to address the research objectives and specific research questions, along with other relevant questions that may arise based on the results of the excavation. Results of analysis would be presented in relation to comparative site data where possible and where useful in addressing the research questions. Post-excavation analysis may include (but not be limited to):

- Lithic Analysis: cataloguing of all cultural material recovered, including measurements, weight, raw material, reduction and tool identification. A program of conjoin analysis, and investigation of usewear/residue analysis may also be considered.
- Geomorphology: collection of soil samples during excavation, where suitable, to assist in understanding the site formation and post-depositional disturbance.
- Palaeo-environmental: this analysis can utilise the material from the geomorphological samples and should include the investigation of pollen and phytoliths to understand the past vegetation and climate of the region prior to, and during periods of Aboriginal visitation and occupation.
- Chronology: OSL and/or radiocarbon samples should be collected, where suitable, during the program and should bracket any cultural materials recovered from each open area excavation to provide a strong chronology for the deposit.

The aim of this work is to both adequately document, analyse and record the cultural deposits and assemblages for future generations, and to build upon the findings of the archaeological test excavation analysis.

It is anticipated that most, if not all, of the objects recovered from excavation will be stone artefacts. These will be analysed by a suitably qualified archaeologist. A number of standard attributes will be recorded for every artefact:

- Heat damage
- Post-depositional weathering
- Material type
- Artefact type
- Platform surface type
- Platform type
- Length in mm
- Width in mm
- Thickness in mm.

A number of additional attributes beyond those required by Heritage NSW (previously referred to as Office of Environment and Heritage) will also be recorded for each artefact, including:

- Flake fragment category (complete, proximal fragment, distal fragment etc)
- Type of cortex and amount of cortex on dorsal surfaces of flakes

- On retouched flakes, various observations of the retouched edges, including retouch type, invasiveness, height of retouch scars
- On cores, various observations including number of core rotations, the orientation of different platforms to one another, whether the core is bipolar or not
- On ground artefacts such as axe/hatchet heads or grindstones, various observations such as size of the ground area, angle of ground edges.

Photographs will be taken of a representative sample of artefacts, to create a visual record of the general types of artefacts within the assemblage. Atypical artefacts or artefacts of high significance will also be photographed. Images will be taken from several orientations, following procedures for archival-quality artefact photography (Fisher, 2009; Prokop, 1985).

Further analytical techniques might be employed on a sub-sample of artefacts if it is judged that these techniques have the potential to yield information. Further techniques might include functional analysis through examination of residues or use-wear, for example. Any such analyses would be carried out by a suitably qualified specialist.

Any Aboriginal artefacts that are not made from stone will be analysed using appropriate techniques. Analysis would conform to the requirements of the Code of Practice. Specific analysis procedures would be decided following excavation and would be made from an assessment of the types of artefacts recovered, the materials from which they are made, their condition of preservation, and the information that could be obtained from them.

9.4.2 Reporting

An Aboriginal Archaeological Salvage Excavation Report detailing the results of the archaeological excavation program would be prepared once excavation, artefact recording, and any other analytic activities are concluded. The excavation report would provide details on the established extent and scientific significance of any Aboriginal archaeological material retrieved during the excavation process. The salvage report would also address the research questions proposed in this document.

The reporting would be developed to fulfil any future development consent conditions in relation to the archaeological salvage, to provide input into management plans (if required) and any interpretive outcomes from the project. The report would be developed in accordance with Heritage NSW guidelines (as current best practice), and may include the following broad sections:

- A short summary.
- Describe Aboriginal consultation undertaken during the project.
- Provide details of the Aboriginal objects which were partially or completely harmed (i.e. recovered through the excavations) during the works.
- Provide a description of the methods and results of the any excavations.
- Comment on the effectiveness of the mitigation measures (i.e. salvage excavations).
- Comment on the effectiveness of any management plan if in place.
- The current and proposed long term location of any Aboriginal objects recovered.
- Details the results of any analysis of recovered Aboriginal objects.
- Ensure the necessary Site Impact Recording Forms are lodged with AHIMS at completion of the project.

9.4.3 Site Recording Forms

Following the completion of the salvage program, artefact analysis and reporting; a site card update or Aboriginal Site Impact Recording Form (ASIRF) will be lodge with the AHIMS database.

9.5 Temporary and long-term care and management of retrieved Aboriginal objects

The temporary repository of any retrieved artefacts will be in a locked cupboard on the premises of the archaeological consultant.

Long term management of the Aboriginal objects would involve the reburial of the artefact assemblage within portion of land that would not be disturbed by future works. Reburial will be undertaken in accordance with the Requirement 26 of the Code of Practice. The reburial will be undertaken using the following method:

- In preparation for reburial, artefacts will be placed in resealable bags labelled with excavation unit and artefact number information. Excavation unit and artefact number information will also be recorded on an archival standard label in each resealable bag.
- Copies of documentation related to the project will also be prepared for reburial including:
    - The artefact catalogue
    - A copy of the ACHAR, ATER, ASR and short report completed following surface collection
    - Copies of site cards and ASIRFs submitted to the AHIMS database following test excavation, salvage excavation and surface collection for each site
- Artefacts and reburial documentation will be sealed in an impervious container which will be labelled with permanent marker or engraved
- Reburial will be undertaken by a team comprising of an archaeologist(s) and RAP representatives
- The reburial location will be recorded using a non-differential GPS with burial site features including burial depth, location in relation to other permanent features and a photographic record maintained of the reburial.

Following reburial, a site card will be submitted for the reburial location with ASIRFs submitted for all sites which have had Aboriginal objects reburied.

10.0 CONCLUSION

The following recommendations are based on consideration of:

- Statutory requirements under the NPW Act
- The interests of the Aboriginal stakeholder groups
- The likely impacts of the project.

It was found that:

- A total of 12 Aboriginal sites have been identified within the Elizabeth Enterprise Precinct Stage 1 (SSD-19618251) study area, comprised of five artefact scatters, six isolated artefacts, and one area of PAD:
    - Elizabeth Precinct Artefact Scatter 02 (EP AS 02 - AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending) have been assessed as demonstrating **high archaeological significance**
    - Elizabeth Precinct Isolated Find 01 (EP IF 01 - AHIMS ID 45-5-5232) and Elizabeth Precinct Isolated Find 02 (EP IF 02 - AHIMS ID 45-5-5231) have been identified as demonstrating **moderate archaeological significance**
    - Elizabeth Precinct Artefact Scatter 01 (EP AS 01 - AHIMS ID 45-5-5233), Elizabeth Precinct Isolated Find 03 (EP IF 03 - AHIMS ID 45-5-5230), Elizabeth Precinct Isolated Find 04 (EP IF 04 - AHIMS ID 45-5-5331), Elizabeth Precinct Isolated Find 05 (EP IF 05 - AHIMS ID 45-5-5330), Elizabeth Precinct Isolated Find 06 (EP IF 06 - AHIMS ID 45-5-5659), and ED AFT 1 (AHIMS ID 45-5-5259) have been identified as demonstrating **low archaeological significance**
    - Elizabeth Precinct PAD 03 (EP PAD 03 - AHIMS ID 45-5-5234) has not yet been subject to testing and are of **unknown archaeological significance**
- The proposed works would impact the following identified Aboriginal sites:
    - EP IF 01 (AHIMS ID 45-5-5232)
    - EP IF 02 (AHIMS ID 45-5-5231)
    - EP IF 03 (AHIMS ID 45-5-5230)
    - EP IF 04 AHIMS ID 45-5-5331)
    - EP IF 05 (AHIMS ID 45-5-5330)
    - EP IF 06 (AHIMS ID 45-5-5659)
    - EP AS 01 (AHIMS ID 45-5-5233)
    - EP AS 02 (AHIMS ID 45-5-5236)
    - EP AS 03 (AHIMS ID 45-5-5624)
    - ED AFT 1 (AHIMS ID 45-5-5259)
    - EEP2024 AS01 (AHIMS ID pending)
- EP PAD 03 (AHIMS ID 45-5-5234) would not be impacted by the proposed works.

The following recommendations are made:

- It is recommended that salvage excavation of EP AS 02 (AHIMS ID 45-5-5236), EP AS 03 (AHIMS ID 45-5-5624) and EEP2024 AS01 (AHIMS ID pending) take place
- If harm is unavoidable, the following surface artefact sites must be subject to artefact collection prior to the commencement of ground disturbing works:
    - EP AS 01 (AHIMS ID 45-5-5233)
    - EP IF 01 (AHIMS ID 45-5-5232)
    - EP IF 02 (AHIMS ID 45-5-5231)
    - EP IF 03 (AHIMS ID 45-5-5230)
    - EP IF 04 (AHIMS ID 45-5-5331)
    - EP IF 05 (AHIMS ID 45-5-5330)
    - EP IF 06 (AHIMS ID 45-5-5659)
    - ED AFT 1 (AHIMS ID 45-5-5259)
- EP PAD 03 (AHIMS ID 45-5-5234) would not be impacted by the proposed works, therefore no archaeological investigation would be required. Due to proximity to the boundary of the works area, the boundary of this site should be marked on construction and environmental site plans, and barrier fencing established outside of the perimeter of the site to physically protect it.
- If changes are made to the proposal that would result in impacts to areas not assessed by this report, additional Aboriginal heritage assessment would be required.
- Consultation with the RAPs would continue throughout the life of the project to facilitate involvement in the proposed salvage works, long term management of retrieved Aboriginal objects and the assessment of unexpected finds.

11.0 REFERENCES

Artefact Heritage 2019a, CSR Advanced Manufacturing Hub - *Archaeological Technical Report.* Report to CSR

Artefact 2020a Elizabeth Enterprise Precinct Stage 1: Archaeological Test Excavation Report. Report to Mirvac Projects Pty Ltd.

Artefact 2020b Elizabeth Enterprise Precinct Stage 1: Archaeological Technical Report. Report to Mirvac Projects Pty Ltd.

Artefact 2023 Elizabeth Enterprise Precinct Stage 1: Aboriginal Cultural Heritage Aassessment Report. Report to Mirvac Projects Pty Ltd.

Artefact 2024 Elizabeth Enterprise Precinct Stage 2: Aboriginal Technical Report. Report to Mirvac Projects Pty Ltd

Attenbrow, Val (2010). *Sydney's Aboriginal past: investigating the archaeological and historical records. Sydney, N.S.W.*, University of New South Wales Press.

Bannerman, S. M. & Hazelton, P.A. 1990. Soil Landscapes of Penrith 1:100,000 Sheet. Soil Conservation Service of New South Wales. Sydney.

Brayshaw 1995, Elizabeth Drive Upgrade Archaeological Survey for Aboriginal Sites

Donald and Gulson 1996, A Little Bit of Country: an Oral History of Badgerys Creek, Alken Press, Sydney

Hardy, B. 1989 From the Hawkesbury to the Monaro: The story of the Badgerys Family, Kangaroo Press.

Hiscock and Attenbrow 2005, Australia's Eastern Regional Sequence revisited: Technology and change at Capertee 3. British Archaeological Reports. International Monograph Series 1397. Oxford: Archaeopress

JMcD CHM 2005, Archaeological Salvage Excavations of Eight Archaeological Landscapes in Second Ponds Creek Valley Rouse Hill Development Area

JMcD CHM 2006. Archaeological Subsurface Investigations at SEPP59 EC3/1 (#45-5-3201) and EC 3/2 (#45-5-3202) Wonderland Surplus, Old Wallgrove Road, Eastern Creek, Report to Australind

JMcD CHM 2007, Archaeological Investigation of the Turner Road and Oran Park Precincts within the South West Growth Centre, Camden, NSW. Report to APP on behalf of the Growth Centres Commission and Camden City Council

Navin Officer Heritage Consultants Pty Ltd (1997). *Aboriginal Cultural Heritage: Proposal for a Second Sydney Airport at Badgerys Creek or Holsworthy Military Area.*

Navin Officer Heritage Consultants Pty Ltd (2016*). Western Sydney Airport: Aboriginal Cultural Heritage Assessment.* Report to GHD.

Ngara Consulting 2003, Archaeological Assessment of Aboriginal Heritage: Reservoir Entry Lands: Prospect, report for Connybeare Morrison

Owen and Cowie, 2017. “Four predictive models to describe Aboriginal lithic artefact site patterning on the Cumberland Plain”. In *Journal of the Australian Association of Consulting Archaeologists* (Vol 5: 1-13).

Peterson 1976. Tribes and Boundaries in Australia. Social Anthropology Series No 10. AIAS Canberra

Pickett J. W. & Alder J. D. 1997. Layers of Time: The Blue Mountains and their Geology. New South Wales Department of Mineral Resources, Sydney

PSM Consulting 2024 Geotechnical Investigation Report EEP Stage 2.

Select Civil, 2019. Kemps Creek Resource Recovery Park. Accessed on 1 Sep 2021 at https://selectcivil.com.au/projects/kemps-creek-resource-recovery-park/

Suez, 2020. Western Sydney Aerotropolis planning package – consultation response. Accessed on 3 Sep 2021 at https://shared-drupal-s3fs.s3-ap-southeast-2.amazonaws.com/master-test/fapub_pdf/00-Western+Sydney+Aerotropolis/636%20-%20Suez%20-%20PUBLISH.PDF

Tindale 1974. Aboriginal Tribes of Australia. Their Terrain, Environmental Controls, Distribution, Limits and Proper Names. ANU Press, Canberra

Turbet, P., 2011, *First frontier: The occupation of the Sydney region 1788-1816*, Rosenberg Publishing, Kenthurst.

White, Beth and McDonald, Jo (2010). "Lithic Artefact Distribution in the Rouse Hill Development Area, Cumberland Plain, New South Wales." *Australian Archaeology* (Number 70): 29-38.

APPENDIX A – TEST EXCAVATION REPORT 2025

APPENDIX B – EEP STAGE 2 ASR 2024

APPENDIX C – ACHAR 2022

APPENDIX D – ABORIGINAL HERITAGE DUE DILIGENCE REPORT 2024

APPENDIX E – CONSULTATION RECORDS

artefact

Artefact Heritage and Environment
ABN 73 144 973 526
Suite 56, Jones Bay Wharf
26-32 Pirrama Road
Pyrmont NSW 2009 Australia
+61 2 9518 8411
office@artefact.net.au
www.artefact.net.au