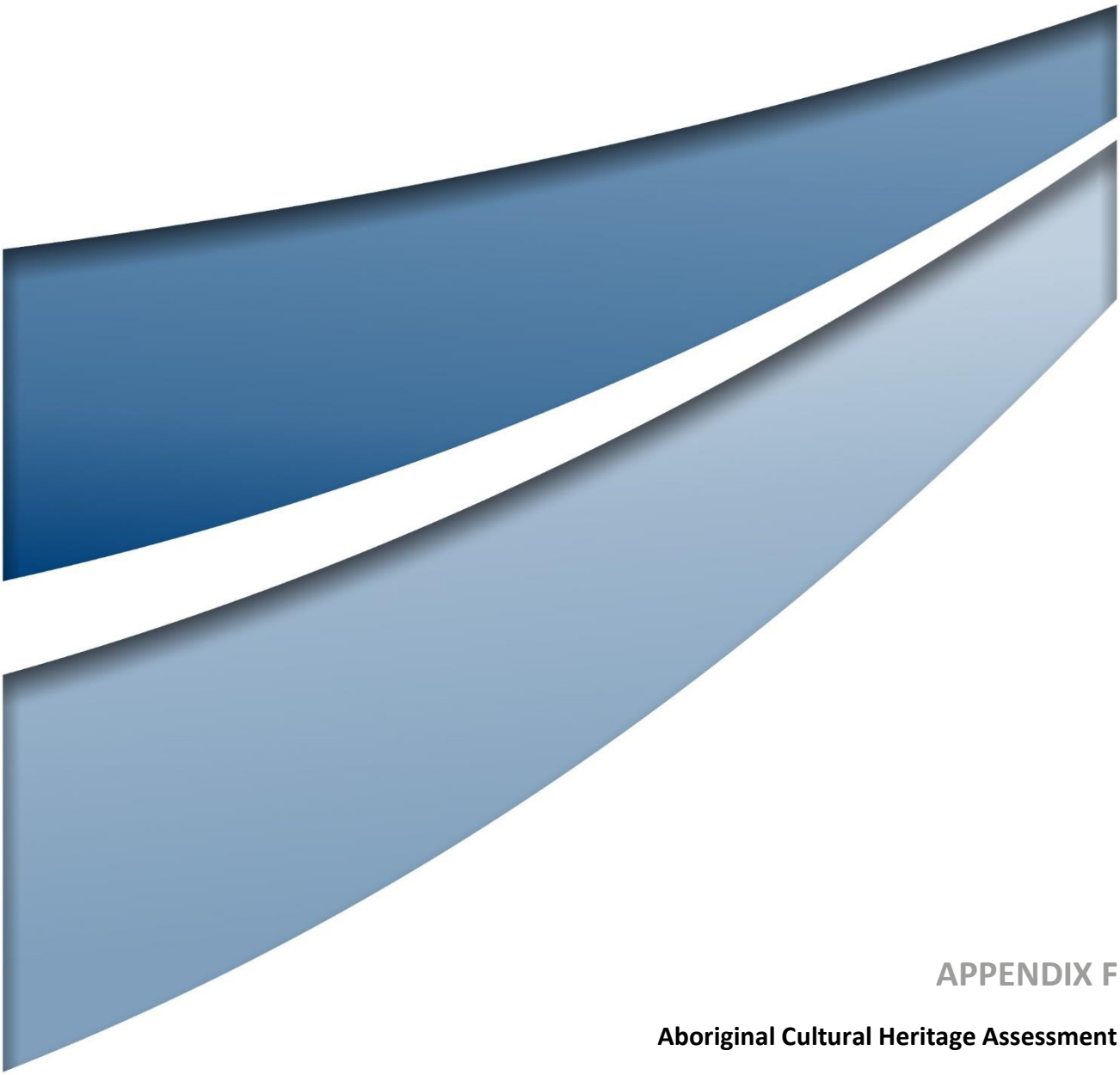


APPENDIX F

Aboriginal Cultural Heritage Assessment

Silver City Energy Storage Project Broken Hill, New South Wales

Aboriginal Cultural Heritage Assessment Report

Report to Umwelt (Australia)

v. 3.0 June 2024



Lantern Heritage

shining a light on people and place



Lantern Heritage Pty Ltd
PO Box 7039
TATHRA
NSW 2550

ACN: 620 582 658
ABN: 30 620 582 658
Phone: (02) 6494 1801
Mobile: 0447 746 050
Email: info@lanternheritage.com.au
Web: www.lanternheritage.com.au

Project Client
Client name
Umwelt (Australia)
75 York Street
TERALBA NSW 2284

Project Name
Silver City Energy Storage Project Broken Hill, NSW.
Aboriginal Cultural Heritage Assessment

Project Reference Number
128-174

Local Government Area
City of Broken Hill

Report Authors
Jo Dibden, Christine Gant-Thompson, Elle Lillis and Amy Tabrett

Version	Date	Reviewer(s)	Notes
0.1	17 March 2023	Simon Greenwood	Internal review
1.0	March 2023	Penelope Williams (Umwelt)	Initial review
1.1	March 2023	Lantern Heritage	Feedback from AR incorporated
2.0	11 April 2023	Penelope Williams/ Lantern Heritage	2nd and 3rd client review and edits
2.0	13 April 2023	All RAPs	For review and comment
2.1	05 July 2023	BHLALC/Lantern Heritage	RAP comments incorporated/addressed
2.2	February 2024	HNSW	HNSW comments addressed
2.3	March 2024		Update of report with revised disturbance area
2.4	May 2024		BHLALC April 2024 workshop feedback incorporated
3.0	June 2024		Update of report with 2nd revision of disturbance area
3.0	22 July 2024	Penelope Williams (Umwelt)	Revisions from client incorporated

EXECUTIVE SUMMARY

Project background

A-CAES NSW Pty Ltd (the Proponent), is proposing to construct the Silver City Energy Storage (SCES) Project (the Project) which will use advanced compressed air energy storage (A-CAES) technology to provide large-scale, long duration energy storage at Broken Hill, NSW.

The proposed SCES facility is located approximately 3 kilometres (km) northeast of Broken Hill within the Broken Hill City local government area (Figure 1). The Project is State Significant Development (SSD) and approval is sought via an application under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The proposed Project consists of several components:

- the SCES facility which will utilise a portion of the pre-existing mine shaft and underground workings at the Potosi Mine approximately 3km northeast of Broken Hill. The SCES facility includes a 300 Mega Litre (ML) water reservoir, creek diversion and underground cavern for the storage of compressed air;
- a water pipeline connecting the existing Stephens Creek Water Pipeline to the SCES facility and
- a 16km long 220kV transmission line connecting the SCES facility to the TransGrid Broken Hill substation off Pinnacles Road, southwest of Broken Hill.

These project components have the potential to impact Aboriginal cultural heritage.

The Proponent commissioned Umwelt Pty Ltd (Australia) to prepare an Environmental Impact Statement (EIS) for the Project. Umwelt Pty Ltd commissioned Lantern Heritage Pty Ltd (Lantern Heritage) to prepare an Aboriginal cultural heritage assessment (ACHA) for the Project.

Field survey results

Archaeological field surveys of the Project Area were undertaken in two phases, Phase 1 during August 2022 and Phase 2 (following Project Area update) in February 2023. The surveys were completed by representatives from Lantern Heritage and Broken Hill Local Aboriginal Land Council (BHLALC).

Forty-four (44) Aboriginal sites were identified during the Phase 1 survey with a further twenty-one sites identified during the Phase 2 survey. Parts of the Project Area have been subject to prior survey associated with separate development assessment, therefore the total of sixty-five (65) sites recorded during both survey phases associated with the Project includes previously recorded and newly recorded sites.

During survey it was noted that the Project Area was subject to varying levels of disturbance from erosional forces and activities such as vegetation clearing, vehicle tracks, mining and rubbish dumping.

The initial Phase 1 assessment recommended a program of archaeological test excavation at seven test zones within four highly archaeologically sensitive landforms. The aim of testing was to determine the nature, extent and archaeological significance of each test zone.

Test excavation results

A total of seventy (70) test pits were excavated within seven test zones in February 2023 in accordance with the Office of Environment and Heritage Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales 2010.

Fifteen (15) of the seventy (70) test pits contained artefacts, and sixty-nine (69) artefactual specimens were recovered. Sixty-two (62) of these specimens (89.9%) were recovered from eleven pits within a 40m by 5m area in the southern end of testing zone 6 (see Appendix 4). Subsurface artefacts were not located in the test pits excavated in test zones 2, 9 or 10.

Excavation confirmed that there are various levels of disturbance throughout the Project Area and that subsurface integrity was highly variable within each test zone. The subsurface potential of all test zones was revised to low with the exception of zones 4 (moderate) and zone 6 (moderate-high at southwest end).

Excavation showed that the surface artefact scatters on the plain and flats within the Project Area are likely located on lag surfaces subject to deflation or aeolian processes resulting in a loss of topsoil. Despite the variability of subsurface archaeological deposits, a program of surface salvage conducted with participation of RAPs recognised by the BHLALC is recommended prior to construction. The recommended approach is a program of staged subsurface salvage within sites of moderate-high or greater scientific value and landforms with high archaeological sensitivity.

Aboriginal sites/objects identified within Project Area likely to be impacted by the Project

Direct impacts will result from the proposed works to following 34 sites located within the Disturbance Area. The remainder of recorded sites outside the disturbance area will not be impacted.

AHIMS #	Site Name	AHIMS #	Site Name
23-5-0170	Broken Hill (ACAES) AFT 1	23-5-0183	Broken Hill (ACAES) AFT 44
23-5-0177	Broken Hill (ACAES) AFT 13	23-5-0154	FD-IF16
23-5-0178	Broken Hill (ACAES) AFT 14	23-5-0123	PM-Q6
23-5-0179	Broken Hill (ACAES) AFT 15	23-5-0122	PM-Q5
23-5-0180	Broken Hill (ACAES) AFT/HTH 16	23-5-0121	PM-Q4
23-5-0169	Broken Hill (ACAES) AFT 18	23-5-0063	BH1-48
23-5-0168	Broken Hill (ACAES) AFT 19	23-5-0112	FD-G001
23-4-0697	Broken Hill (ACAES) AFT 20	23-5-0153	FD-IF7
23-4-0682	South airports regency area isolated artefacts	23-5-0156	FD-IF14
23-4-0698	Broken Hill (ACAES) AFT 22	23-5-0125	PM-G02
23-4-0699	Broken Hill (ACAES) AFT 23	23-5-0139	FD-IF02
23-4-0700	Broken Hill (ACAES) AFT 25	23-5-0171	Broken Hill (ACAES) AFT 3
31-1-0723	Broken Hill (ACAES) AFT/HTH 26	23-5-0172	Broken Hill (ACAES) AFT 4
23-4-0701	Broken Hill (ACAES) AFT 28	31-1-0725	Broken Hill (ACAES) AFT 41

AHIMS #	Site Name	AHIMS #	Site Name
23-4-0702	Broken Hill (ACAES) AFT 29	23-5-0185	Broken Hill (ACAES) AFT 53
23-4-0640 duplicate of 23-4-0641	Kanandah 1	23-5-0131 duplicate of 23-5- 0132	PM-IF6
23-5-0152	FD-IF18	23-5-0186	Broken Hill (ACAES) HTH 52

Viewshed analysis of potential impacts on views to and from the Pinnacles was completed for the Project. The results of this analysis show that whilst it is undeniable that the proposed transmission line will be visible around the southern margins of Broken Hill, these views will not have a significant impact on the views to and from the Pinnacles or their aesthetic values.

Consultation

A draft copy of this report was forwarded to all Registered Aboriginal Parties (RAPs) for their review and comment prior to submission. No formal feedback was received from three of the five RAPs with Wilyakali Aboriginal Corporation referring to correspondence from BHLALC. As requested by BHLALC an additional 28 days was provided to review the draft report. BHLALC provided written feedback on 13 June 2023.

Lantern completed a number of changes to the draft reports based on feedback from BHLALC and the ACHAR was finalised and submitted with the EIS for exhibition.

On 6 April 2024 a meeting was held between the Proponent and BHLALC. Lantern was unable to attend this meeting. The workshop discussed the Heritage NSW submission received following exhibit of the EIS and Lantern's changes to the report to address Heritage NSW's submission and previous changes requested by BHLALC in 2023. A number of additional changes were requested at this workshop by BHLALC. Lantern addressed these changes.

This ACHAR has been revised to address the submission received from Heritage NSW during the exhibition period of the EIS and to capture the revised disturbance area proposed as an amendment to the Project. The project area has been revised to refine the extent of disturbance associated with the transmission line (however does not propose any change to the location of the infrastructure) and to accommodate the refined SCES Facility layout and provide sufficient space for temporary construction activities (laydown areas and vehicle man overing). The revised disturbance area is ~58 ha (previously ~46 ha).

Conclusion and recommendations

While avoidance of impacts to sites is the preferred mitigation measure, this is not possible in all cases. Where impacts to sites are unavoidable surface collection of artefacts and movement away from harm is the preferred strategy. A phased salvage approach is recommended at four sites with moderate-high or greater scientific value and in 19 landforms with high archaeological sensitivity. This targeted salvage approach is based on the results of test excavation and the extensive disturbance to the Project Area's sediment deposits from a range of previous activities.

The location for salvage excavations will be targeted using a geoarchaeological approach to archaeological prospection, based on borehole survey and deposit modelling. This approach provides a rapid and scientifically rigorous means of understanding site formation processes and the distribution of archaeologically sensitive sediments across large areas (Goldberg and Macphail, 2006; Historic England, 2015; Carey et al., 2017), such as the present Project Area.

Results of the borehole survey will allow a more accurate assessment of the archaeological potential across the entirety of the Project Area and will inform further stages of salvage excavation as detailed in Section 10.

Based on the investigations undertaken for the current proposal the following recommendations are made:

1. Preparation and implementation of a Cultural Heritage Management Plan (CHMP) in consultation with the Wilyakali Aboriginal Corporation and BHLALC RAPs, Heritage NSW and the Department of Planning and Environment.
2. That a program of staged salvage (surface and subsurface), following the stages outlined in Section 10.3 of the ACHAR is completed with participation of RAPs recognised by the BHLALC and the Wilyakali Aboriginal Corporation prior to construction. The salvage program comprises surface salvage of artefacts across the Disturbance Area and subsurface salvage within sites of moderate- high or greater scientific value and landforms with high archaeological sensitivity.
3. The final location of collected artefacts must be determined through consultation with RAPs recognised by BHLALC and the Wilyakali Aboriginal Corporation and Requirement 26 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECWW 2010b).
4. That prior to construction commencing, all contractors associated with the Project receive cultural heritage inductions delivered by a representative of BHLALC or Wilyakali Aboriginal Corporation.
5. In the event that Ancestral remains, or suspected Ancestral remains, are encountered during any of the proposed construction activities or salvage actions, all work must stop and the procedures outlined in the Salvage Methodology be implemented (Section 10).

How this report relates to the Archaeological Report

ACHAR section	ACHAR Heading	Corresponding AR section	AR page #	AR Heading
1	Project overview	1	1	Project overview
2	Landscape Context	3	9	Landscape context
3	Ethnohistoric context	n/a	-	-
4	Archaeological context	4	19	Archaeological context
5	Field methods	5	43	Survey field methods
5.1	Summary of field survey results	6.3	62	Site descriptions
		6.9	142	Summary of test excavation
		6.10	143	Test excavation conclusion
		Appendix 5 of AR	277	Test excavation report
6	Consultation process	n/a	-	-
7	Analysis and discussion	7	147	Analysis and discussion

ACHAR section	ACHAR Heading	Corresponding AR section	AR page #	AR Heading
8	Scientific values and significance assessment	8	148	Scientific values and significance assessment
9	The proposed activity	2	6	Description of the project
9.3	Potential harm to Aboriginal objects	9	150	Impact assessment
9.4	Assessment of harm	9	153	Impact assessment
11	Summary and recommendations	10	192	Summary and recommendations

TABLE OF CONTENTS

EXECUTIVE SUMMARY III

1 PROJECT OVERVIEW 1

1.1 Introduction 1

1.2 Location of Project Area 1

1.3 Legislative Framework 2

1.3.1 Aims and Objectives 2

1.3.2 Report restrictions and copyright 2

2 LANDSCAPE CONTEXT 5

2.1 Geological context 5

2.2 Landscapes, hydrology and geomorphology 11

2.2.1 Barrier Ranges Landscape 11

2.2.2 Barrier Downs landscape 11

2.2.3 Summary 12

2.3 Land-use history 14

2.4 Natural resources and features 14

3 ETHNOHISTORIC CONTEXT 15

3.1 Review of historic and ethnohistorical accounts 15

3.2 Post-contact history 15

3.3 Summary 16

4 ARCHAEOLOGICAL CONTEXT 17

4.1 AHIMS search results 17

4.2 NSW State Heritage Register and Inventory search results 25

4.3 Archaeological investigations of the Project Area 25

4.4 Summary of previous archaeological investigations 25

4.5 Predictive Model 26

4.6 Summary of predictive statement 27

4.7 Predictive statement for the Project Area 28

4.8 Predictive mapping from Aboriginal Site Decision Support Tool 29

5 FIELD METHODS 33

5.1 Summary of field survey results 33

5.2 Summary of test excavation results 47

5.3 Test excavation conclusion 48

5.4 Landform Sensitivity Mapping 48

5.4.1 Limitations of sensitivity map model 49

6 CONSULTATION PROCESS 55

6.1 Overview 55

6.2 Stage 1 55

6.3 Stage 2 and 3 56

6.4 Field investigation: Site Survey 57

6.5 Aboriginal community meetings – 2022 57

6.6 Field Investigation: Archaeological Test Excavation Program 58

6.7 Stage 4 58

6.8 Meeting with Broken Hill LALC – 6 April 2024 61

6.9 Update on revised disturbance area 65

6.10 Meeting with Broken Hill LALC – 22 June 2024 65

7 ANALYSIS AND DISCUSSION 66

7.1 Regional context 66

7.2 Predictive model review 66

8 SCIENTIFIC VALUES AND SIGNIFICANCE ASSESSMENT 67
8.1 Social or Cultural Values 67
8.2 Historic Values 67
8.3 Scientific / Archaeological Values 68
8.4 Aesthetic Values 70
8.5 Statement of Significance 71
9 THE PROPOSED ACTIVITY 72
9.1 Overview 72
9.2 The Proposed Activity 72
9.3 Potential Harm to Aboriginal Objects 72
9.4 Assessment of Harm 73
9.4.1 Impacts on cultural heritage values 74
9.4.2 Direct harm 74
9.4.3 Indirect harm 74
9.5 Summary 80
10 MANAGEMENT AND MITIGATION MEASURES 81
10.1 Aboriginal Cultural Heritage Management Plan 81
10.2 General Impact Mitigation and Management Strategies 82
10.3 Staged Salvage Procedures 82
10.4 Justification for any likely harm 87
10.5 Ecologically Sustainable Development 87
10.6 Aboriginal Inputs 88
11 SUMMARY AND RECOMMENDATIONS 103
12 GLOSSARY 105
13 REFERENCES 107
14 APPENDIX 1 – ARCHAEOLOGICAL REPORT 112
15 APPENDIX 2 – ABORIGINAL CONSULTATION 113
16 APPENDIX 3 – CULTURAL HERITAGE VALUES AND SIGNIFICANCE ASSESSMENT BY SITE 158
17 APPENDIX 4 – VIEWSHED ANALYSIS OF VISUAL IMPACTS OF PROJECT ON THE PINNACLES 168
18 APPENDIX 5 – HEARTH SALVAGE METHODOLOGY 172
Samples 172

LIST OF FIGURES

Figure 1: Location of the SCES Project Area, east of the City of Broken Hill, NSW. 3

Figure 2: Proposed activities associated with Silver City Energy System (SCES) Project (supplied by Umwelt - March 2023) 4

Figure 3: Basement geological context of the Project Area [NSW seamless geology dataset 2022]. 6

Figure 4: Cenozoic sediments surrounding the Project Area [NSW seamless geology dataset 2022]. 7

Figure 5: Sediments surrounding the Project Area Section 1 [NSW seamless geology dataset 2022]. 8

Figure 6: Sediments surrounding the Project Area Section 2 [NSW seamless geology dataset 2022] 9

Figure 7: Sediments surrounding the Project Area Section 3 [NSW seamless geology dataset 2022] 10

Figure 8: Mitchell landscapes and hydrology of the Project Area (Mitchell, 2002) 13

Figure 9: Previously recorded site types in close proximity to the Project Area at southern end 22

Figure 10: Previously recorded site types in close proximity to the Project Area at the northern end 23

Figure 11: ASDST mapping showing moderate-high archaeological sensitivity of Project Area based on all types of archaeological features (black represents high sensitivity and white represents low sensitivity). 30

Figure 12: ASDST mapping showing survey priorty areas based on all types of archaeological features (red represents high sensitivity and green represents low sensitivity) 31

Figure 13: Alluvium mapping showing areas of predicted higher sensitivity for possible burial environs within the Project Area. 32

Figure 14: Corrected datum and location of previously recorded AHIMS Aboriginal sites/objects. 40

Figure 15: Location of Aboriginal sites/objects in relation to the Project Area Map 1. 41

Figure 16: Location of Aboriginal sites/objects in relation to the Project Area Map 2. 42

Figure 17: Location of Aboriginal sites/objects in relation to the Project Area Map 3. 43

Figure 18: Location of Aboriginal sites/objects in relation to the Project Area Map 4. 44

Figure 19: Location of Aboriginal sites/objects in relation to the Project Area Map 5. 45

Figure 20: Location of Aboriginal sites/objects in relation to the Project Area Map 6. 46

Figure 21: Test excavation locations and locations where artefacts were recovered in Test Zone 9 and Test Zone 11. 50

Figure 22: Test excavation location and locations where artefacts were recovered in Test Zone 6. 51

Figure 23: Test excavation location and locations where artefacts were recovered in Test Zone 5. 52

Figure 24: Test excavation location and locations where artefacts were recovered in Test Zone 4. 53

Figure 25: Test excavation locations and if applicable, locations where artefacts were recovered in Test Zone 2 and Test Zone 10. 54

Figure 26: Location of sites and sensitive landforms where salvage activities proposed – sheet 1 90

Figure 27: Location of sites and sensitive landforms where salvage activities proposed – sheet 2 91

Figure 28: Location of sites and sensitive landforms where salvage activities proposed – sheet 3 92

Figure 29: Location of sites and sensitive landforms where salvage activities proposed – sheet 4 93

Figure 30: Location of sites and sensitive landforms where salvage activities proposed – sheet 5 94

Figure 31: Location of sites and sensitive landforms where salvage activities proposed – sheet 6 95

Figure 32: Location of sites and sensitive landforms where salvage activities proposed – sheet 7 96

Figure 33: Location of sites and sensitive landforms where salvage activities proposed – sheet 8 97

Figure 34: Location of sites and sensitive landforms where salvage activities proposed – sheet 9 98

Figure 35: Location of sites and sensitive landforms where salvage activities proposed – sheet 10 99

Figure 36: Location of sites and sensitive landforms where salvage activities proposed – sheet 11 100

Figure 37: Location of sites and sensitive landforms where salvage activities proposed – sheet 12 101

Figure 38: Location of sites and sensitive landforms where salvage activities proposed – sheet 13 102

LIST OF TABLES

Table 1: Summary of AHIMS search results 17

Table 2: Overview of previously recorded site types within the Project AHIMS search area 21

Table 3: Previously recorded AHIMS sites located within 100m the Project Area 24

Table 4: Summary of predictive model for landforms that may occur in the study area 26

Table 5: Inventory of sites from north to south with notes on features recorded during the current survey 34

Table 6: Summary of site types located during field survey 38

Table 7: Spatial distribution of all sites by landform 39

Table 8: Summary of feedback received on the draft ACHAR and actions and responses arising from that feedback 59

Table 9: Summary of feedback received on the ACHAR and actions and responses arising from that feedback. 62

Table 10: Summary of Scientific Significance for sites located within the Project Area. 69

Table 11: Proposed impacts to Aboriginal archaeological sites based on the Broken Hill ACEAS Project Area 2024 plan modifications 75

1 PROJECT OVERVIEW

1.1 Introduction

A-CAES NSW Pty Ltd. (the Proponent) is proposing the Silver City Energy Storage (SCES) Project (the Project) which will use Hydrostor's advanced compressed air energy storage (A-CAES) technology to provide large-scale, long duration energy storage at Broken Hill, NSW.

The Project Area is located on the outskirts of Broken Hill, extending in a linear curve commencing c. 3km northeast of the inland city and terminating c. 2km southwest of the city limits (Figure 1). The Project is classified as a State Significant Development (SSD), the Secretary's Environmental Assessment Requirements (SEARs) were issued on 30 September 2022 (SSD-47065463).

The Project proposes to utilise existing infrastructure and underground mining areas at Potosi Mine approximately 3km northeast of Broken Hill and includes construction of transmission line (overhead with two in ground sections), access roads, the SCES facility and associated buffers, creek diversion, underground cavern and a 300ML water reservoir with associated above ground pipeline (Figure 2). These activities have the potential to impact Aboriginal cultural heritage. The activity area for the purposes of this assessment is defined as the proposed disturbance area and the activity is the Project.

Umwelt (Australia) Pty. Ltd. has been commissioned by the Proponent to prepare an Environmental Impact Statement (EIS). In order to determine the possible impact(s) the Project may have on places and objects of Aboriginal cultural heritage; Umwelt have commissioned Lantern Heritage Pty. Ltd. to prepare an Aboriginal cultural heritage assessment (ACHA) for the Project.

This report documents the Aboriginal cultural heritage and archaeological assessment (ACHAR) undertaken for the proposed activity, including background research, field survey and consultation with Registered Aboriginal Parties (RAPs). It has been prepared as part of an Environmental Impact Statement (EIS) for the project. The ACHAR details the overall assessments of cultural significance and potential impacts to Aboriginal cultural values.

This report has been prepared in accordance with the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH 2011) and the Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS, 2013). It is supported by the Silver City Energy Storage Project Archaeological Report (AR) (Appendix 1).

This ACHAR has been revised to address the submission received from Heritage NSW during the exhibition period of the EIS and to capture the revised disturbance area proposed as an amendment to the Project. The project area has been revised to refine the extent of disturbance associated with the transmission line (however does not propose any change to the location of the infrastructure) and to accommodate the refined SCES Facility layout and provide sufficient space for temporary construction activities (laydown areas and vehicle man overing). The revised disturbance area is ~58 ha (previously ~47 ha).

1.2 Location of Project Area

The Project Area as shown on Figure 1, is located within the Broken Hill LGA in the parishes of Picton, Soudan, Nadbuck, Naradin and Bolaira, County of Yancowinna.

The Project Area is located on gentle to moderate slopes rising to ridges of rock outcrops, relief ranging from c.30 to 200m, dissected by trellised drainage patterns including main tributaries to Willa Willyong Creek in the north, Acacia Creek and Kellys Creek in the south (see Figure 1). Willa Willyong, a semi-permanent creekline, runs northeast-southwest before heading east to north-east towards the artificial dam, Stephens Creek Reservoir. Kellys Creek and Acacia Creek,

similarly semi- permanent watercourses, run in a south westerly direction eventually joining Pine Creek to the south.

The Project Area encompasses all aspects of the Project. All ground disturbance activities associated with the Project will be contained within the Proposed Disturbance Area associated with the conceptual layout.

1.3 Legislative Framework

The Project is State Significant Development (SSD) and the SEARs was issued on 30 September 2022.

The SEARs require:

- an assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological test excavations (if required); and provide evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)

Aboriginal heritage is regulated by the NSW Heritage Division within Department of Planning and Environment (DPE), under the overriding ethos of the International Council on Monuments and Sites (ICOMOS) Burra Charter. As the Project is SSD under Part 4 of the EP&A Act, the Project is exempt from obtaining permits under the National Parks and Wildlife Act 1974 (NP&W Act).

1.3.1 Aims and Objectives

This ACHAR has been prepared to support the EIS for the Project. The assessment detailed in this report documents potential harm from the Project to Aboriginal objects. This report sets out which impacts are avoidable, and which are not, and where applicable, recommendations to reduce the extent and severity of harm to Aboriginal objects. It includes actions to be taken before, during and after an activity to manage and protect Aboriginal objects where harm cannot be avoided.

1.3.2 Report restrictions and copyright

This report is to remain confidential until consultation is complete and some information may remain confidential by request on the grounds of cultural heritage as noted below.

In accordance with BHLALC report review and feedback (refer to Table 8), it is recommended culturally sensitive information is not to be shared or published without BHLALC agreement.

This report is protected by copyright under the Australian Copyright Act 1968. A-CAES NSW Pty Ltd. and Umwelt (Australia) Pty. Ltd. own the copyright to this report. However, intellectual property resides with Lantern Heritage Pty. Ltd. This document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission.

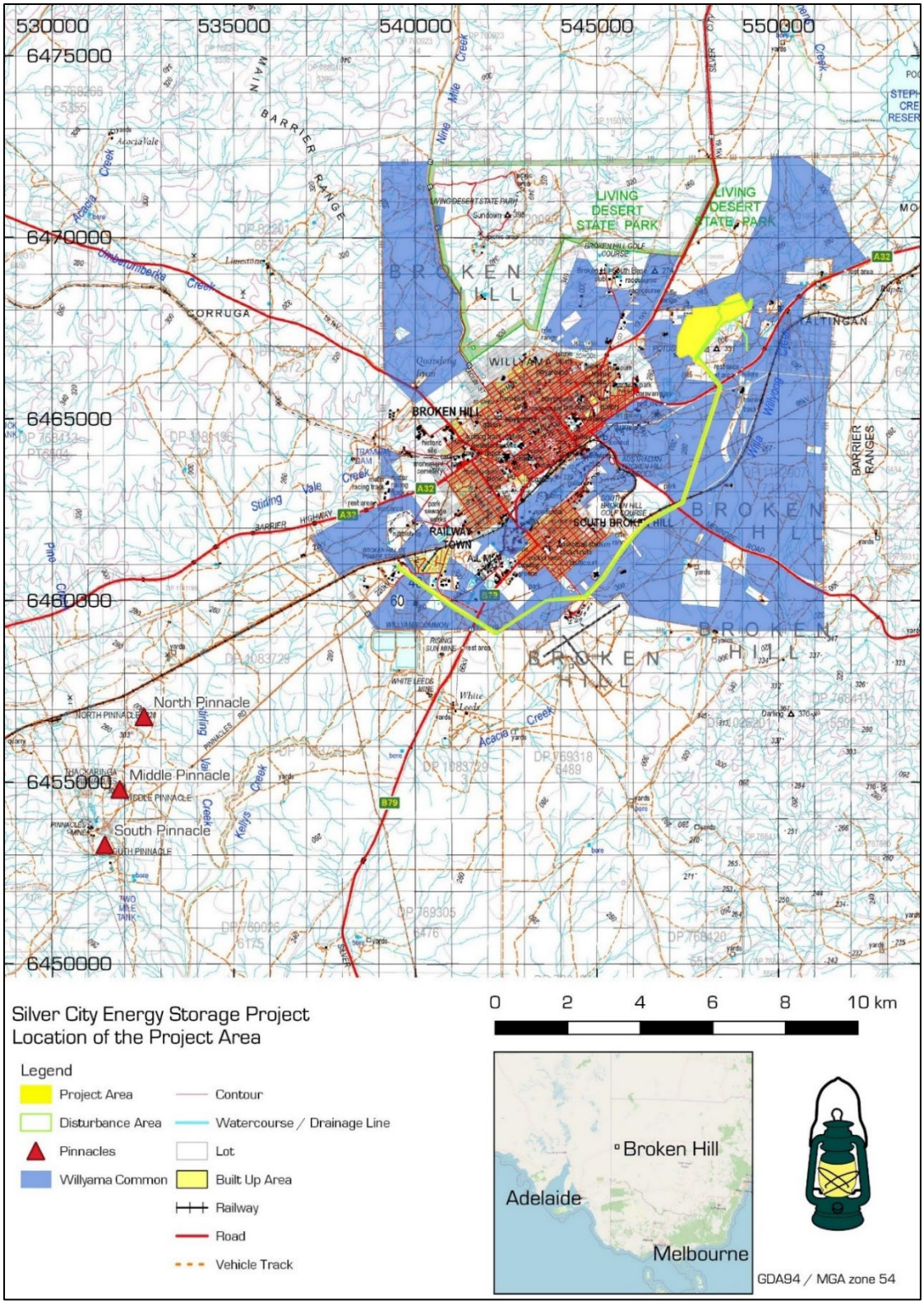


Figure 1: Location of the SCES Project Area, east of the City of Broken Hill, NSW.

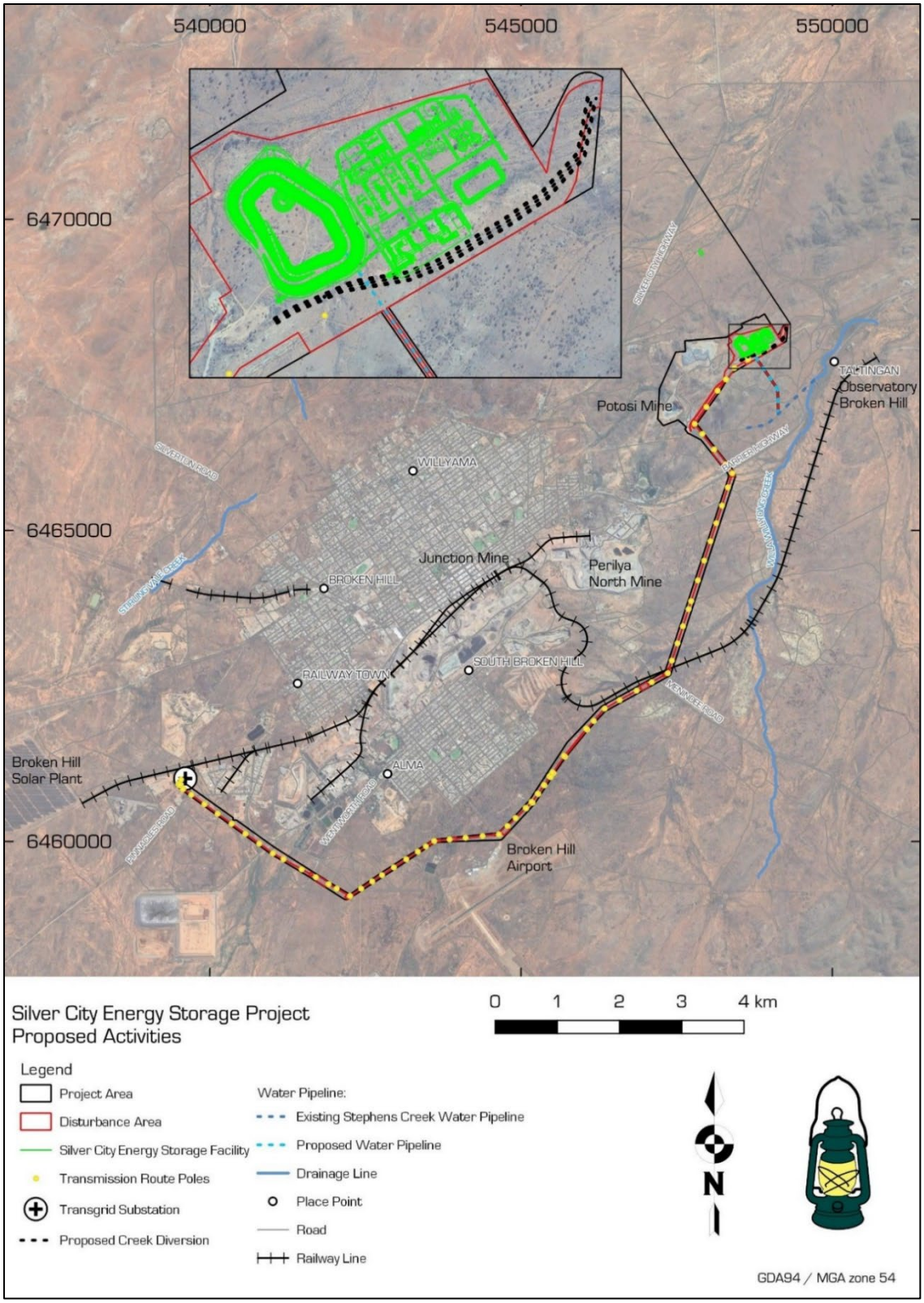


Figure 2: Proposed activities associated with Silver City Energy System (SCES) Project (supplied by Umwelt - March 2023)

2 LANDSCAPE CONTEXT

The Project Area is located within the Broken Hill Complex bioregion, which generally has a hot dry climate, occupying about 4.8% of NSW, and is bounded by the Murray-Darling Depression and Darling Riverine Plains bioregions in the south, and the Simpson-Strzelecki Dunefields and Mulga Lands bioregions in the north and east respectively (NPWS NSW, 2003: 41). The extremely complex geology of the Project Area and surrounding region is the dominant control on topography, and the contrast between ancient, exposed rock surfaces and layered Cenozoic sediments is a primary factor affecting the both the detection of archaeological sites in different parts of the landscape, and the approaches that are necessary to understand archaeological potential and site formation processes in the Australian arid zone (Holdaway and Fanning 2014). Unpredictable climatic conditions and the intensive nature of historic disturbance are also important factors (Douglass 2010: 48).

2.1 Geological context

The basement rocks of the Project Area are part of the Curnamona Province, a 300 km-wide, near- circular area of (late) Palaeoproterozoic (2.5–1.6 Ga) to Mesoproterozoic (1.6–1 Ga) basement rocks that stretches across the northeast of South Australia and west of New South Wales (Conor and Preiss 2008). These ancient rocks are largely obscured by younger sediments, but outcrops are present in the Project Area (Figure 3; Figure 4). These geological features are known as the Willyama inliers (Stevens et al. 2008) and consist of very ancient metasediments (gneiss, schists, amphibolite, granites and pegmatites) with north-east trending structural features that determine the topography of the Barrier Ranges (Figure 4). These rock formations contain raw materials that were as useful to Aboriginal communities for tool manufacture (Holdaway et al. 2008), as they were attractive to miners seeking rare and precious ores in the historic period. Overlying these ancient basement rocks are complex, Cenozoic sedimentary sequences (Figure 4).

The Project Area is situated in NSW's arid zone, where rainfall is extremely limited. Irregularity in precipitation, a defining feature of Australia's arid zone (Holdaway and Fanning 2014), means that these sediments may be reworked by flood events and either contain little archaeology - as flood events and environmental processes remove artefacts from dynamic landscape settings - or contain archaeological evidence from multiple periods that have either accumulated gradually in a stable landform context, been forcibly combined by extreme weather events, or gradually intermingled through erosive processes (Douglass 2010). Historic disturbance related to mining and agriculture have had a range of impacts on these sediments, further complicating any assessment of archaeological potential within the Project Area. Figures 5 – 7 show the recorded distribution of sedimentary deposits throughout the Project Area. Quaternary alluvial and colluvial deposits are the most likely to retain relatively intact archaeological remains.

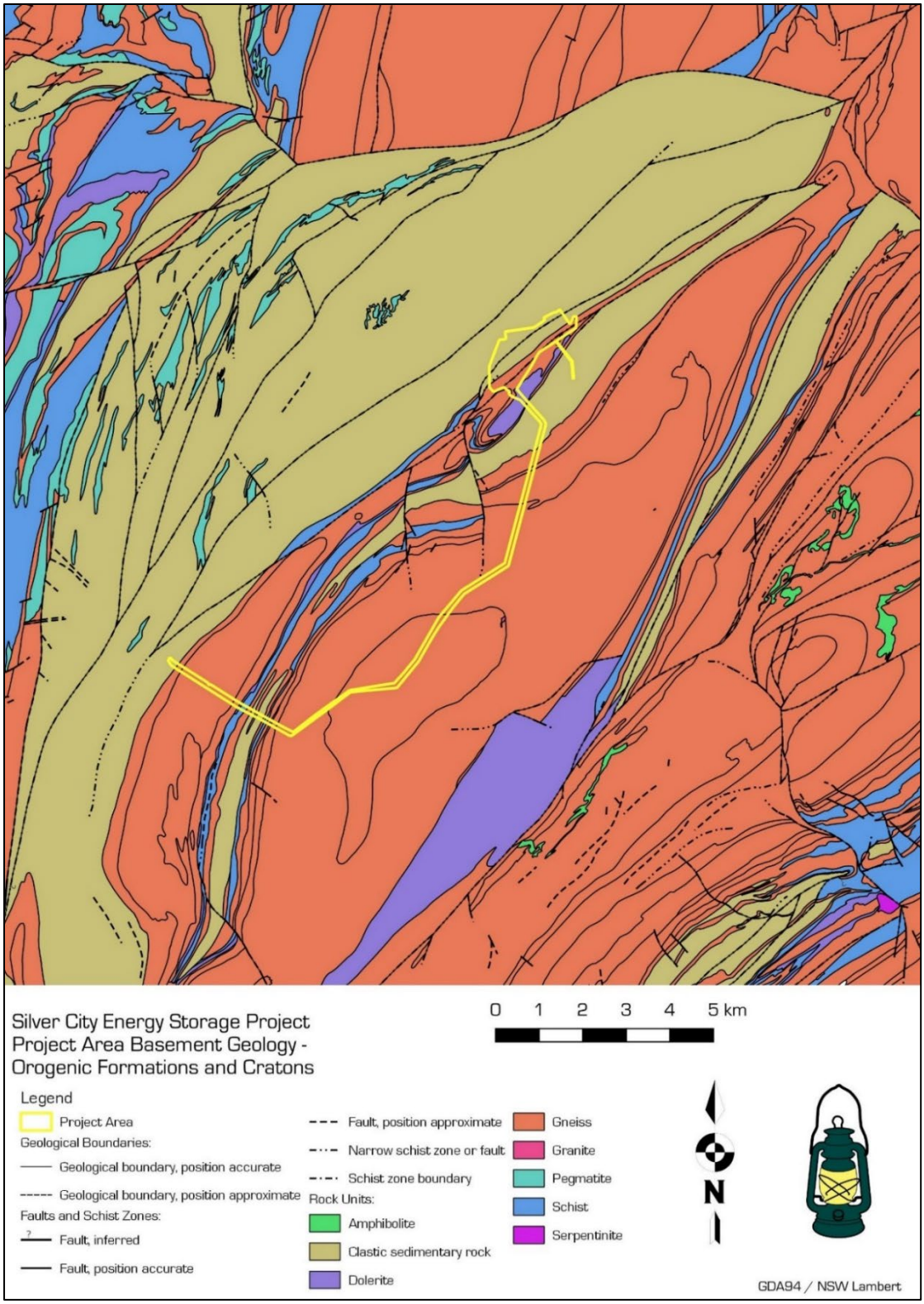


Figure 3: Basement geological context of the Project Area [NSW seamless geology dataset 2022].

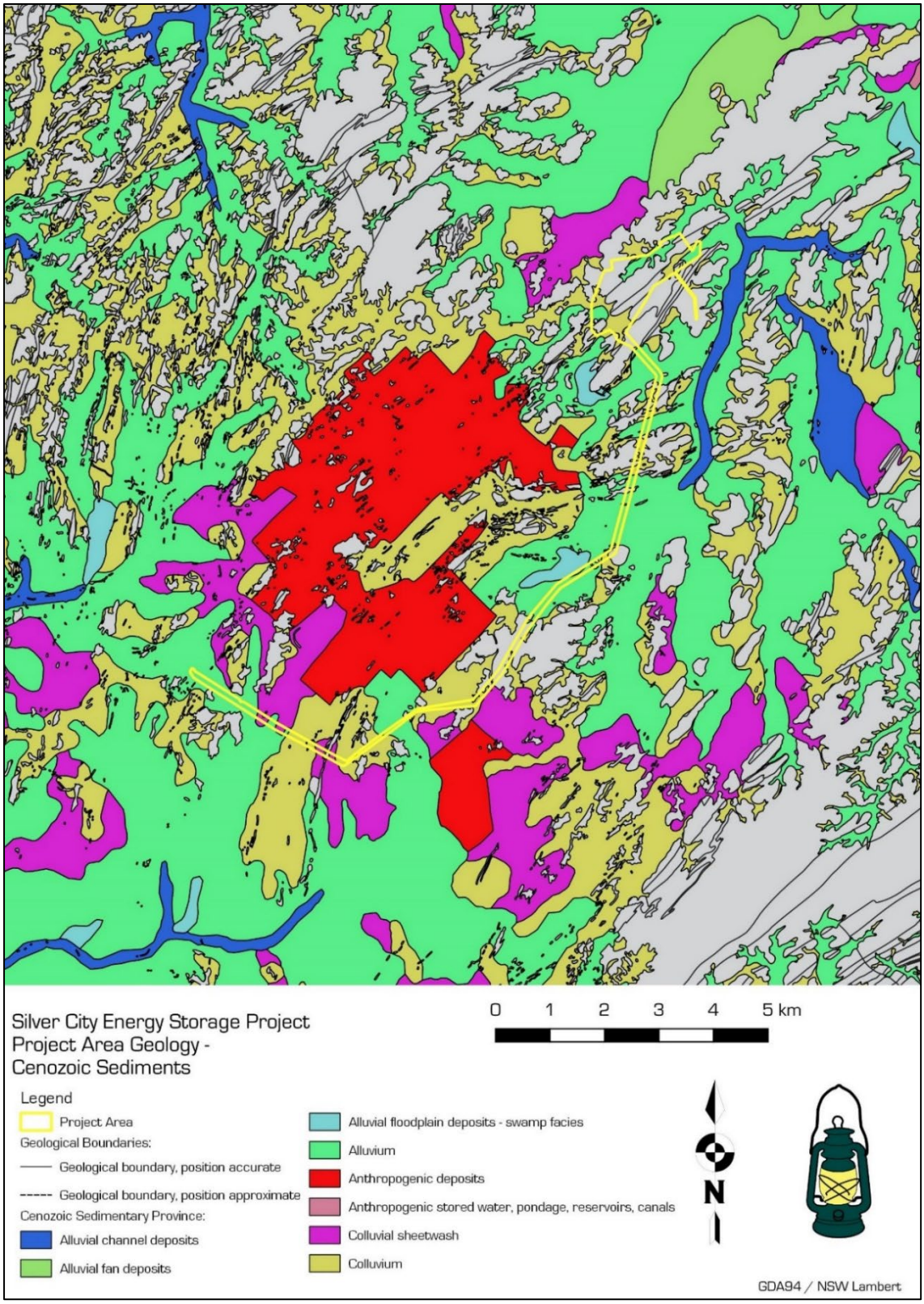


Figure 4: Cenozoic sediments surrounding the Project Area [NSW seamless geology dataset 2022].

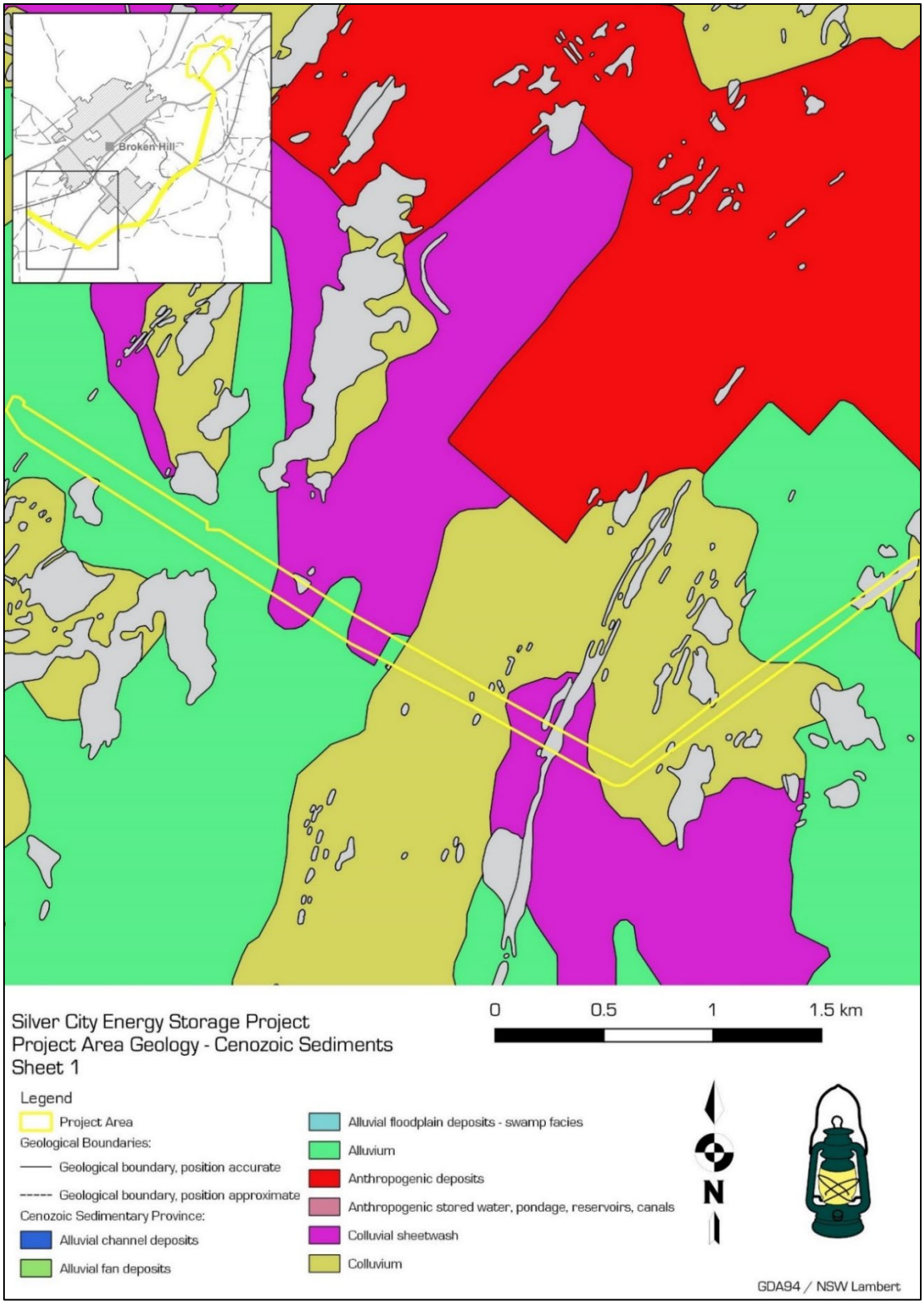


Figure 5: Sediments surrounding the Project Area Section 1 [NSW seamless geology dataset 2022].

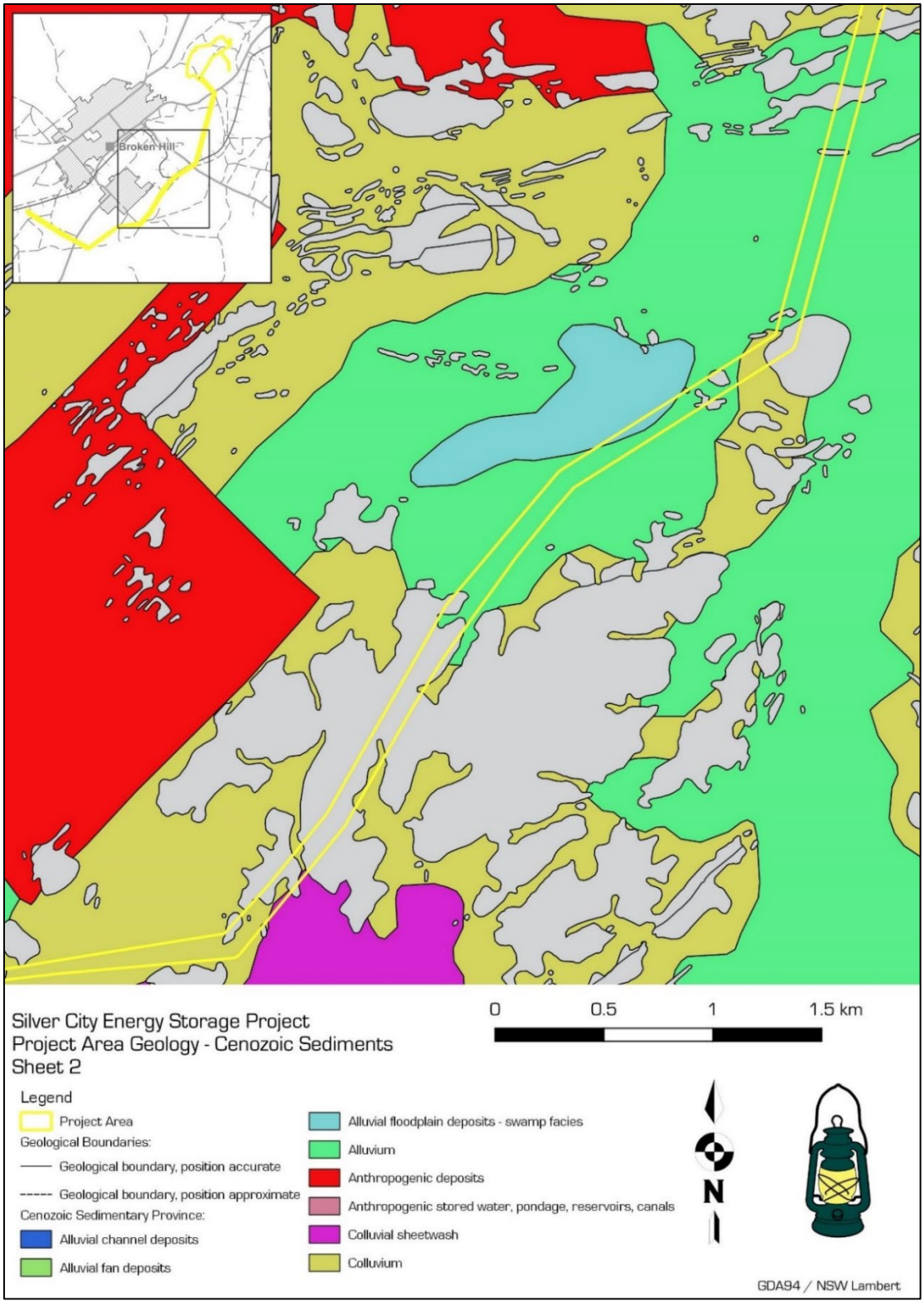


Figure 6: Sediments surrounding the Project Area Section 2 [NSW seamless geology dataset 2022]

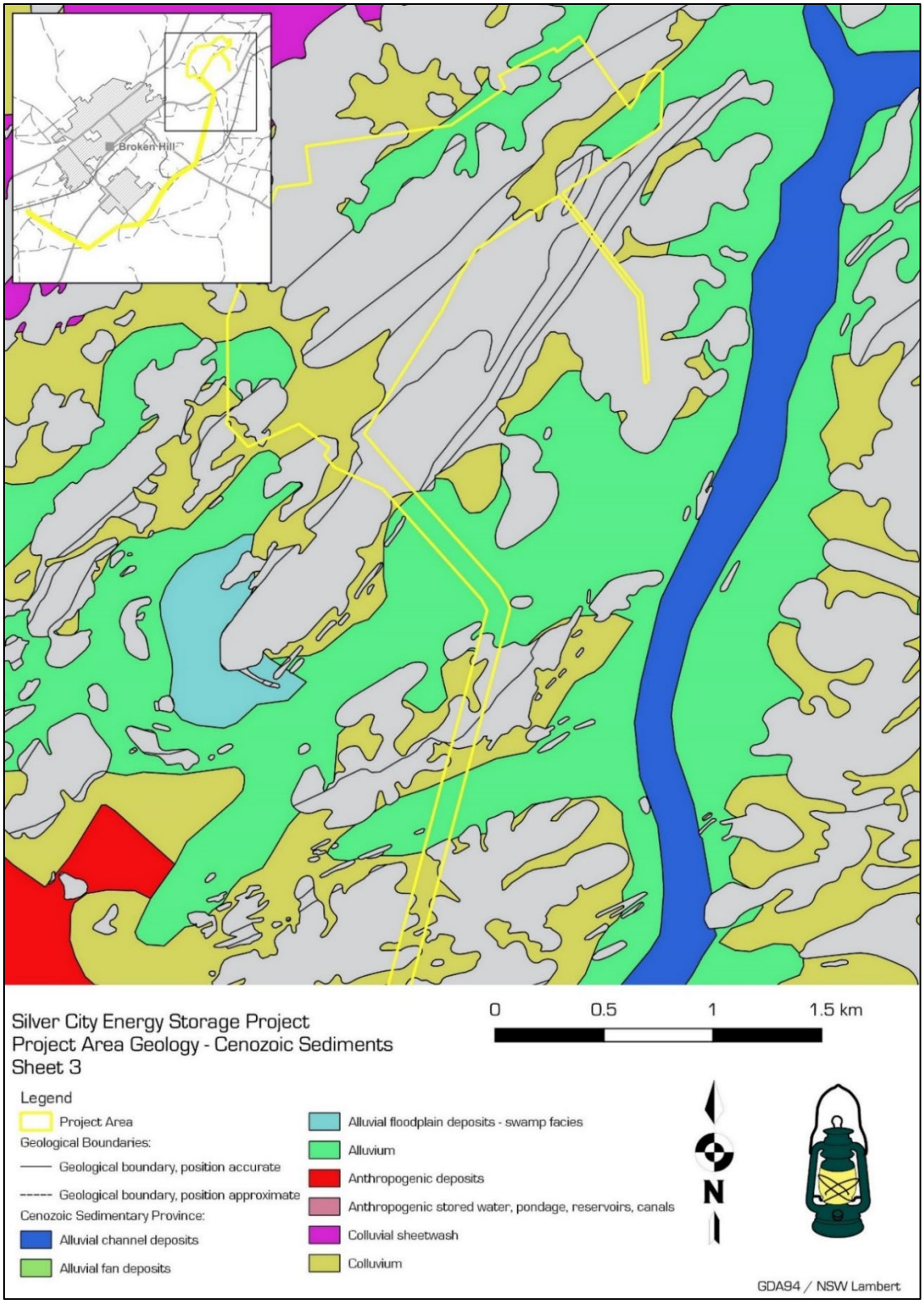


Figure 7: Sediments surrounding the Project Area Section 3 (NSW seamless geology dataset 2022]

2.2 Landscapes, hydrology andgeomorphology

Within the Project Area, Mitchell (2002) identifies two distinct Mitchell landscapes that roughly correspond to each of these contrasting geological substrates (Figure 8). Broadly speaking, the Barrier Ranges landscape is formed on the exposed areas of basement rock, while the Barrier Downs landscape is formed on the areas of Cenozoic deposit.

2.2.1 Barrier Ranges Landscape

The Barrier Ranges Mitchell landscape, which in the Project Area corresponds to the Barrier land system (State Government of NSW and Department of Planning and Environment 1991), is formed on densely dissected ranges of lower to middle Proterozoic metamorphic rocks and steep, partly bevelled, asymmetric strike ridges on associated dipping upper Proterozoic quartzite, sandstone and shales.

Localised relief ranges from 30 to 200m and watercourses form trellised drainage patterns in strike valleys (Figure 8), which are narrow and incised in higher relief country. These drainage tracts are associated with reddish brown and yellowish-brown texture-contrast soils and contain coarse sands in channels.

Rock outcrops are common and lithosols are found on steep upper slopes. Red texture-contrast soils form on colluvially active lower slopes of metamorphic rock, while shallow, poorly-sorted reddish- brown sands form on calcareous sandstone. Erosional processes are dominated by minor to moderate watersheeting, rilling and gullying of drainage lines, with limited scald formation in lower relief areas and valley bottoms.

Vegetation on Rocky crests with little soil support scattered mulga (Acacia aneura), dead finish (Acacia tetragonophylla), black bluebush (Maireana pyramidata) and bottlewashers (Enneapogon sp.). Upper slopes carry mulga, black bluebush, pearl bluebush (Maireana sedifolia), bladder saltbush (Atriplex vesicaria), copperburr (Sclerolaena sp.) and grasses. Thorny saltbush (Rhagodia spinescens), prickly wattle (Acacia victoriae), belah (Casuarina cristata) and black bluebush are present on lower slopes. Alluvial flats support black bluebush, bladder saltbush, belah, prickly wattle, copperburr, bottlewashers, Sida sp. and grasses.

2.2.2 Barrier Downs landscape

The Barrier Downs Mitchell landscape (Mitchell, 2002), corresponding to the Nine Mile land system within the Project Area (State Government of NSW and Department of Planning and Environment 1991), is a complex ecosystem formed on the low strike ridges of rock outcrop, slopes and outwash areas of the Barrier Ranges. It consists of steeply rolling lowlands on pre-Cambrian dolomite, calcareous shale with steeply dipping Devonian sandstone and conglomerate. Drainage patterns in this landscape occurs through channels incised up to 3m deep and 50m wide. These are associated with sand or clay levees up to 50 m wide (State Government of NSW and Department of Planning and Environment 1991).

Within the Project Area lithosols or shallow calcareous sandy loams are found on ridges Mitchell (2002), while contour banded slopes are characterised by alternating stony red desert loams and stone-free red clays or solonized brown soils on long slopes. Dunes of deep clayey sand are common, while stony, reddish-brown calcareous sandy loams are found along drainage tracts and alluvial flats with brown self-mulching cracking clays.

Ridges are populated with scattered mulga (Acacia aneura), prickly wattle (Acacia victoriae), low bluebush (Maireana astrotricha), scattered black bluebush (Maireana pyramidata), dead finish (Acacia tetragonophylla), some pearl bluebush (Maireana sedifolia) and isolated harlequin fuchsia (Eremophila duttonii). Slopes are populated with isolated mulga and needlewood (Hakea *leucoptera*) with scattered shrubs; local stands of dense low bluebush, contour banded bladder saltbush (*Atriplex vesicaria*), cabbage-tree wattle (*Acacia cana*), belah (*Casuarina cristata*), and pearl bluebush (*Maireana sedifolia*), with local clumps of moderately dense belah (*Casuarina*

cristata) and mulga, abundant bottlewashers (*Enneapogon sp.*) and copperburr (*Sclerolaena sp.*). Flats are populated with copperburr, thorny saltbush (*Rhagodia spinescens*) and grasses and drainage lines with prickly wattle, western boobialla (*Myoporum montanum*), sandalwood (*Santalum lanceolatum*), rosewood (*Alectryon oleifolium*), belah (*Casuarina cristata*), white cypress pine (*Callitris glaucophylla*) and black box (*Eucalyptus largiflorens*).

2.2.3 Summary

The Project Area is situated in an extremely complex environment in terms of geology, geomorphology, pedology and hydrology. The dynamic, varied and complex nature of deposits that are likely to be encountered, along with the extensive historic impacts that can be anticipated, make it difficult to accurately assess the archaeological potential of specific areas within the Project Area based on a background environmental study. A number of general observations can, however, be made:

- Stratified archaeological sites and materials are most likely to be encountered in undisturbed areas of quaternary alluvium and colluvium.
- The drainage systems that operate within the Project Area mean that associated sediments are most likely to be encountered in lower-lying areas that correspond with the Barrier Downs Mitchell Landscape.
- Higher areas are likely to be associated with the outcropping basement rocks that form the foothills of the barrier ranges, with thin soils and steeply incised, trellised drainage channels. In these areas it is most likely that stone quarries and surface scatters will be encountered, probably accumulated due to erosional and deflationary processes.

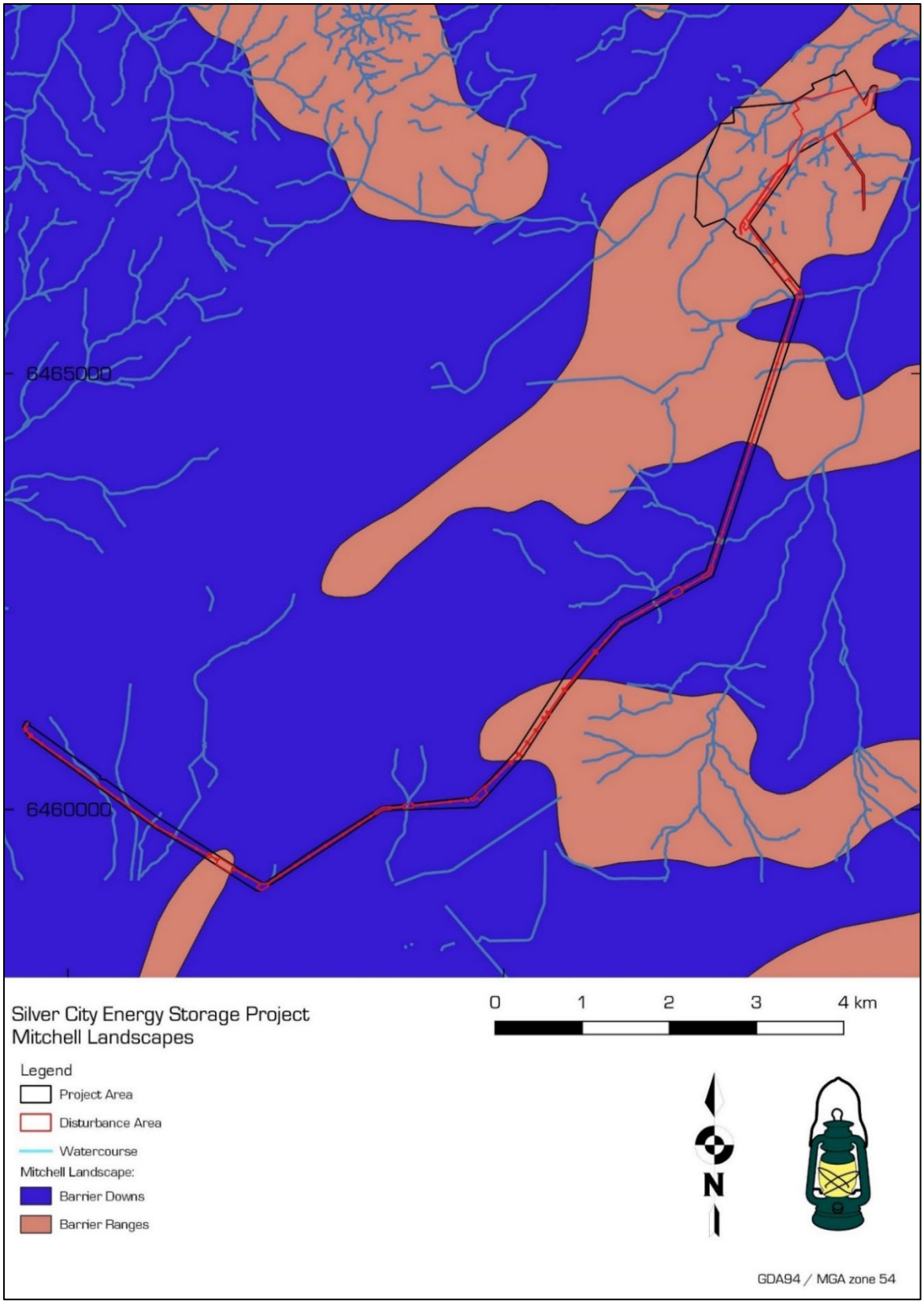


Figure 8: Mitchell landscapes and hydrology of the Project Area (Mitchell, 2002)

2.3 Land-use history

Early colonial settlement of far western NSW took place along the major waterways, which coincided with locations that the majority of Aboriginal groups concentrated their activities. By the 1870's, most of these far west Aboriginal tribal groups were dispossessed of their traditional lands and losing resource gathering rights, with only the most arid dwelling Aboriginal people traditionally subsisting (NPWS 2003).

During the 1860's and 1870's, colonial station owners employed local Aboriginal men as stockmen and shearers and the Aboriginal women as domestic helpers (HO and DUAP 1996). Colonial settlement in the region restricted the traditional Aboriginal way of life and forced reliance on missions and stations in order to exist.

As detailed in Section 3, a combination of timber clearing (to fuel steam trains and use as mine props) and heavy stocking rates associated with colonial settlement as well as low rainfall resulted in major reduction in ground cover causing significant and widespread erosion in the region (colossal losses of the characteristic red soils of the far west) (HO and DUOP 1996; NSW NPWS 1991).

Following the discovery of silver and lead lodes at Mount Gipps in 1883, Broken Hill was established as the major township in the Broken Hill Complex bioregion by 1885 (NPSW 2003). The 1920's saw the development of several new mines in the region boosting Broken Hill's population growth and at the same time, placing pressure on the town's water supply (water had to be transported from the Darling River) (NPWS 2003; NSW NPWS 1991). The prior and existing incidence of extensive mining activities within and near to the Project Area have caused changes to the terrain within the immediate area at the Potosi Mine and surrounding the Project Area, having an associated effect on the archaeological resource.

The Project Area has been subject to numerous prior impacts including vegetation clearance, livestock grazing, construction of main roads and recreational trails, mineral mining and construction of associated infrastructure. The degree of impacts vary greatly along the length of the Project Area, with greatest impacts within the Potosi Mine located at the northern end and at the far southwestern end in areas of many braided tracks, buried water pipes and a high voltage transmission line corridor. Areas of minimal previous impacts include the low strike rocky ridges.

2.4 Natural resources and features

The Project Area falls within land that has been occupied by Aboriginal peoples for thousands of years prior to colonial settlement in the area. Aboriginal populations utilised both bodies of water and land resources for a variety of uses including food, medicines and raw materials. It is also likely fire management techniques were used on local vegetation.

Aboriginal people thrived on the seasonal food resources available across the semi-arid regions of NSW. Small tubers were in season during spring, summer and autumn, with wattle seeds plentiful in July and August. Lizards, birds and large grazing marsupials such as wallabies and kangaroos were hunted throughout the year. Within the Project Area, there are a number of drainage lines that would have provided intermittent water sources that supplemented the more reliable water from Willa Willyong Creek and tributaries of the Darling River. Within the Darling River catchments a variety of aquatic resources including nardoo, waterfowl, fish, turtles and crayfish were harvested (NPWS 2003).

While the vegetation throughout the Broken Hill region has undergone substantial change during the past 150-200 years, the undulating lowlands, ridges of rock outcrop, sandplains and outwash areas would have provided a variety of resources for tools, habitation and food. Traditionally, Wilyakali (aka Wiljakali) people occupied the lands around Broken Hill (HO and DUAP 1996) and also participated in annual journey to the Menindee Lakes to visit the Barkindji people (NPWS 2003).

3 ETHNOHISTORIC CONTEXT

Aboriginal occupation of Australian extends back well into the Pleistocene. Current theories place the arrival of humans to Sahul between 47,000 years before present (BP) and 65,000 BP (O'Connell and Allen 2004, 2015; Allen and O'Connell 2014; Clarkson et al., 2017, O'Connell et al., 2018). While debate continues regarding the earliest arrival in Australia, there is general agreement that all environmental zones across the continent were colonised by around 35,000 BP (Mulvaney and Kamminga 1999). Since that time, there has been substantial climatic variation, which has influenced choices people made regarding the locations they lived.

The Project Area is within close proximity to the modern township of Broken Hill. Hearths located at Stephens Creek, close to Broken Hill, were tested by Martin and O'Donnell (1995) produced dated to 600 BP and 5,830 BP, with hearths located in Broken Hill dating to 6,00 0 BP which display early occupation within the region (Niche et al. 2017). Lake Yantara located c.250km north of Broken Hill contained archaeological evidence yielding dates of some 25,000 years ago (Dury and Langford- Smith 1970). Human burials analysed within the western New South Wales (NSW) suggested that approximately 90% of burials analysed date to the last 2,000 years (Dibden 2014; Niche et al. 2017).

On a broader scale, evidence for the earliest of Aboriginal occupation within western NSW holds a date range of 45,000 years, located at Menindee Lakes and at Lake Victoria, with a date of 21,000 years. At the local level, Broken Hill contains dates for hearths at 6,000 years (Cupper and Duncan 2006).

3.1 Review of historic and ethnohistorical accounts

The area that encompasses Broken Hill was occupied by Aboriginal people for thousands of generations prior to colonisation. The principal group to occupy the area around Broken Hill were the Wilijakai or Wiljaali, whom have been recorded to meet with the Barkindji on Menindee Lakes in the Darling Riverine Plains bioregion each year (HO & DUAP 1996:192). The language group for Broken Hill region is Wilyakali. This Aboriginal group focussed inland on the arid centre, rather than the Murray-Darling system. The arid lands experienced periods of drought, and water management was controlled with the utilisation of wells and tanks to conserve water, constructing bark roofs to slow the effects of evaporation (HO & DUAP 1996:193).

Broken Hill has been recorded as being a place of 'convergence of several important myths' (Martin 1993:3) and forms part of The Dreaming track of the Marnbi that starts within South Australia in the Flinders Ranges and traverses through Broken Hill, The Pinnacles and through north-western New South Whales, ending in Queensland at Mt Isa (Niche et al. 2017:207).

The Pinnacles (see Figure 1) are located 8km southwest of the Project Area, which forms part of this dreaming. Marnbi's path is recognised by the white quartz and black rocks that scatter and form part of the outcrops. The Pinnacles were formed when Marnbi sat three times when injured and very sick (Niche et al. 2017, Warrell 1995). It has been recorded that Aboriginal people did not camp at The Pinnacles, but 'liked to have it in their sights', due to the landform's cultural importance (Niche et al. 2017:207, Martin 1999). The Pinnacles, that include all three formations, are listed in the State Heritage Register through the Pinnacles register and are considered sacred.

3.2 Post-contact history

Before mining and settlement began in the Broken Hill region, the flora was diverse and included saltbush and bluebush, mulga and belah trees on the hills and ridges, and river gums along the more permanent water course (Solomon 1988). The first recorded interactions between non-Indigenous people and Aboriginal people in the far western region of NSW occurred during one of Charles Sturt's expedition during the 1830s (Hope and Gottshutzke 1998). The Broken Hill

Township was developed the Broken Hill Paddock on Mt Gipps Station around 1883, following three station workers pegging a mineral lease in this paddock (Migration Heritage Centre 2010).

An intensified pastoral industry since the 1860's began as pastoralists sought new grazing land further west of the Darling River (Niche 2017) – utilising scarce timber, water and other resources for feed and the construction of dwellings, yards, fence posts etc - coupled with the introduction of destructive exotic species, and the grazing of stock, caused ever increasing impacts (Witter 2004; Witter 2021; Gerritsen 1981). Colonisation was a catastrophic disruption to established natural regimes and traditional cultural practices and has resulted in environmental degradation throughout the region.

Aboriginal groups who lived in the arid plains were able to maintain their traditional ways of life longer than groups who lived in more temperate riparian environments. But even in arid areas, disruption of traditional mobility patterns and foodways by colonising agriculturalists meant that in Aboriginal communities were forced into stations omissions during times of drought. These processes saw traditional lifeways heavily modified in the area by the 1880's (HO&DUAP 1996: 193)

Gold was first discovered in the Barrier Ranges in the 1860s, and the decade after 1875 was a critical period for mineral exploration in the area (HO & DUAP 1996: 198). Broken Hill was situated on a large lode of high quality silver ore, and a smelter was constructed at the site in 1886 (HO & DUAP 1996: 199). By 1891 20,000 people lived in the town and it had become the third largest conurbation in the state. The population continued to rise, slowly, to 30,000 by the 1960s, but the percentage of people employed in mining gradually decreased.

Despite the isolation of the remote semi-arid region of the unincorporated area, colonisation and the direct impacts on the environment were swift and lasting. The mineral discoveries at Broken Hill in the 1880's brought large volumes of people to the region and increase in demand for food fuel and transport. The areas surrounding Broken Hill were denuded of native trees and shrubs, the timber used to fuel the steam-driven equipment, mine shoring and domestic heating, and opening up areas for grazing, depleted the sensitive landscape (Witter 2004).

The effects of colonisation dramatically impacted people in the region and more broadly, and directly restricted the movement of Aboriginal people within the region, disrupting traditional land use practices.

3.3 Summary

Aboriginal peoples' occupation of the far western region of NSW is dated at least 25,000 years ago as shown by the archaeological evidence relating to the Lake Yantara site c.250km north of Broken Hill (Dury and Langford-Smith 1970).

While there is some ethnohistorical information available relating to the far western region of NSW, information relating to the places where different activities took place is limited. However, it is likely that the preferred occupation areas would have taken the form of temporary camps used on a seasonal basis, located on alluvial plains or the interface of lower gentle slopes and plains. These preferred site locations would be near to water sources with generally easterly or northerly aspects for warmth of sun and shelter from prevailing winds during the colder months. The landscape was undoubtedly well known to generations of people, in particular the Wilyakali people whose traditional lands include Broken Hill, and it is established that associations extended to spiritual attachments (i.e, Marnbi dreamtime).

4 ARCHAEOLOGICAL CONTEXT

An extensive site search was conducted via AHIMS on the 6th June 2022 (AHIMS Search ID. #688761). The search was conducted in GDA, Zone 54, utilising a search area defined by a GIS Shape File to include the Project Area with a buffer of 2km (Appendix 1 in AR).

4.1 AHIMS search results

One hundred and six (106) Aboriginal sites or objects were listed as being present within the AHIMS search area (Table 1). Of these, 24 are sites previously recorded within or less than 100 metres from the Project Area (see Table 3). Figure 9 illustrates the locations of these sites relative to the southern end of the Project Area and Figure 10, the northern end.

Table 2 provides an overview of the previously recorded sites within or adjacent to the Project Area according to site types and features.

The majority of sites are artefact scatters (87). Other site types include 13 quarries, three Potential Archaeological Deposits (PAD) and one each of resource/gathering site, hearth, and ceremonial sites. The mapping in Figure 9 and Figure 10 shows that sites tend to be clustered along sources of freshwater near to current residential and commercial infrastructure. The occurrence of sites adjacent to these areas is a reflection of archaeological investigations undertaken as part of the approval process for the associated developments.

Table 1: Summary of AHIMS search results

AHIMS	Site Name	Site Type/Features
23-5-0121	PM-Q4	Stone Quarry
23-5-0153	FD-IF7	Artefact Scatter
23-5-0063	BH1-48	Artefact Scatter
23-5-0014	Royal Flying Doc. Mast	Artefact Scatter
23-5-0030	Roy. Fly. Doc. Mast 19	Artefact Scatter
23-5-0136	FD-IF05	Artefact Scatter
23-4-0637	Mawsons Quarry Isolated Find 1	Artefact Scatter
23-4-0132	South Broken Hill	Artefact Scatter
23-5-0122	PM-Q5	Stone Quarry
23-5-0131	PM-IF6	Artefact Scatter
23-5-0157	Access track to railway artefact scatter	Artefact Scatter
23-5-0134	FD-IF08	Artefact Scatter
23-5-0148	FD-IF09	Artefact Scatter
23-5-0064	BH1-49	Artefact Scatter

AHIMS	Site Name	Site Type/Features
23-5-0024	Roy. Fly. Doc. Mast 13	Artefact Scatter
23-5-0025	Roy. Fly. Doc. Mast 12	Artefact Scatter
23-5-0029	Roy. Fly. Doc. Mast 17	Artefact Scatter
23-5-0028	Roy. Fly. Doc. Mast 16	Artefact Scatter
23-5-0143	FD05	Artefact Scatter
23-5-0066	BH1-54	Artefact Scatter
23-4-0626	Broken Hill Solar - Site #11	Artefact Scatter
23-4-0088	AS9	Artefact Scatter-Destroyed
23-4-0089	AS10	Artefact Scatter-Destroyed
23-4-0085	AS6	Artefact Scatter
23-4-0112	AS2	Stone Quarry
23-5-0132	PM-G04	Artefact Scatter
23-5-0123	PM-Q6	Stone Quarry
23-5-0119	PM-Q2	Artefact Scatter
23-5-0150	FD-IF13	Artefact Scatter
23-5-0114	PM-IF1	Artefact Scatter
23-5-0015	Royal Flying Doc. Mast	Artefact Scatter
23-5-0145	FD-IF07	Artefact Scatter
23-5-0128	FD01	Artefact Scatter/PAD
23-4-0636	Mawsons Quarry Ab. Quarry 1	Stone Quarry
23-5-0141	FD08	Artefact Scatter
23-5-0110	FD07	Artefact Scatter
23-5-0146	FD-IF19	Artefact Scatter
23-5-0127	PM-Q7	Stone Quarry
23-5-0125	PM-G02	Artefact Scatter
23-5-0062	BH1-47	Artefact Scatter
23-5-0147	FD-IF10	Artefact Scatter
23-5-0018	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0019	Royal Flying Doc. Mast;	Artefact Scatter

AHIMS	Site Name	Site Type/Features
23-5-0130	PM-SC10	Artefact Scatter
23-5-0135	FD-IF06	Artefact Scatter
23-5-0137	FD-IF04	Artefact Scatter
23-5-0065	BH1-51/53	Artefact Scatter
23-5-0115	PM-IF3	Artefact Scatter
23-5-0144	FD02	Artefact Scatter/PAD/Aboriginal Ceremony and Dreaming
23-4-0639	Mawsons Quarry Open Site	Artefact Scatter
23-4-0641	Kanandah 2	Artefact Scatter
23-4-0090	AS12	Stone Quarry-Destroyed
23-4-0084	AS5	Artefact Scatter-Destroyed
23-5-0120	PM-Q3	Stone Quarry
23-5-0140	FD-IF01	Artefact Scatter
23-5-0126	PM-G03	Artefact Scatter
23-5-0113	PM-SC7	Artefact Scatter
23-5-0017	Royal Flying Doc Mast	Artefact Scatter
23-5-0020	Royal Flying Doc. Mast	Artefact Scatter
23-5-0013	Royal Flying Doc. Mast	Artefact Scatter
23-5-0108	FD06	Artefact Scatter/PAD
23-5-0142	FD03	Artefact Scatter/PAD
23-5-0116	PM-IF4	Artefact Scatter
23-4-0093	AS14	Stone Quarry-Destroyed
23-4-0111	AS11	Artefact Scatter-Destroyed
23-4-0691	BESS-AS1-21	Artefact Scatter
23-5-0139	FD-IF02	Artefact Scatter
23-5-0111	PM-SC5	Artefact Scatter
23-5-0151	FD-IF15	Artefact Scatter
23-5-0152	FD-IF18	Artefact Scatter
23-5-0107	PM-SC1	Artefact Scatter

AHIMS	Site Name	Site Type/Features
23-5-0021	Royal Flying Doc. Mast	Artefact Scatter
23-5-0149	FD-IF11	Artefact Scatter
23-5-0097	Taltingan	Artefact Scatter
23-4-0638	Mawsons Quarry Open Site 2	Artefact Scatter
23-4-0107	AS13	Stone Quarry-Destroyed
23-4-0092	AS15	Artefact Scatter-Destroyed
23-4-0087	AS8	Artefact Scatter-Destroyed
23-4-0086	AS7	Artefact Scatter-Destroyed
23-4-0082	AS3	Aboriginal Resources and Gathering
23-4-0081	AS1	Stone Quarry
23-5-0156	FD-IF14	Artefact Scatter
23-5-0118	PM-Q1	Artefact Scatter
23-5-0022	Royal Flying Doc. Mast	Artefact Scatter
23-5-0023	Roy. Fly. Doc . Mast 11	Artefact Scatter
23-5-0026	Roy.Fly.Doc. Mast 14	Artefact Scatter
23-5-0129	PM-SC9	Artefact Scatter
23-5-0109	FD04	Artefact Scatter
23-4-0640	Kanandah 1	Artefact Scatter
23-4-0091	AS16	Stone Quarry
23-4-0078	PML.23	Artefact Scatter
23-5-0096	BM 259	Artefact Scatter
23-5-0075	PML20	Artefact Scatter
23-5-0112	FD-G001	Artefact Scatter/Hearth
23-5-0061	BH1-45/46	Artefact Scatter
23-5-0154	FD-IF16	Artefact Scatter
23-5-0098	Willa Willyong Creek	Artefact Scatter
23-5-0016	Royal Flying Doc. Mast	Artefact Scatter
23-5-0027	Roy. Fly. Doc. Mast 15	Artefact Scatter
23-5-0124	PM-G01	Artefact Scatter

AHIMS	Site Name	Site Type/Features
23-5-0117	PM-IF5	Artefact Scatter
23-5-0155	FD–IF12	Artefact Scatter
23-4-0682	South airports regency area isolated artefacts	Artefact Scatter
23-4-0083	AS4	Stone Quarry
23-5-0138	FD-IF03	Artefact Scatter
23-5-0076	PML13	Artefact Scatter

Table 2: Overview of previously recorded site types within the Project AHIMS search area

Site types	Total
Resource and gathering	1
Artefact scatter (existing and destroyed)	87
Artefact scatter/Hearth	1
Artefact scatter/PAD	3
Ceremonial	1
Quarry (existing and destroyed)	13

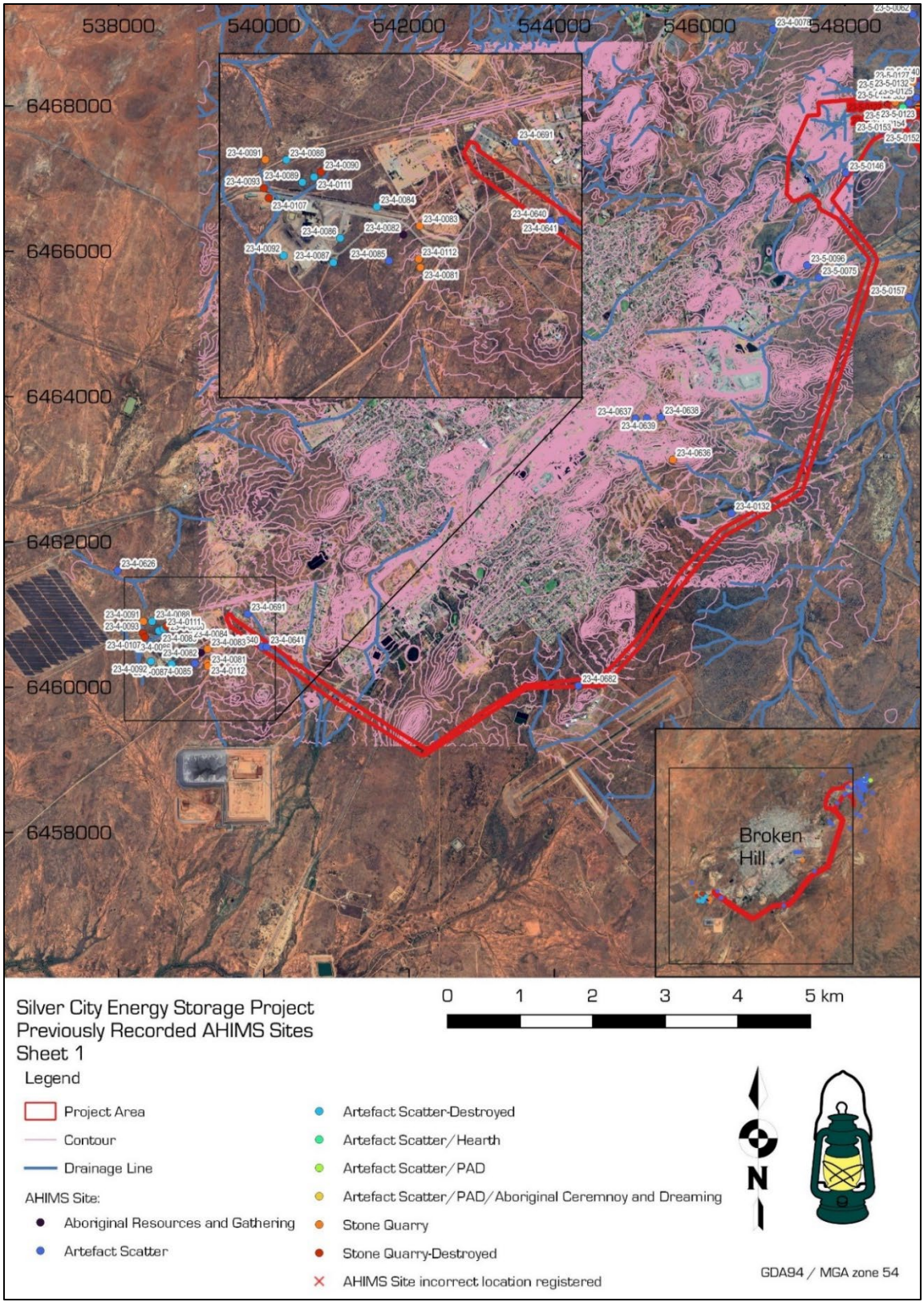


Figure 9: Previously recorded site types in close proximity to the Project Area at southern end

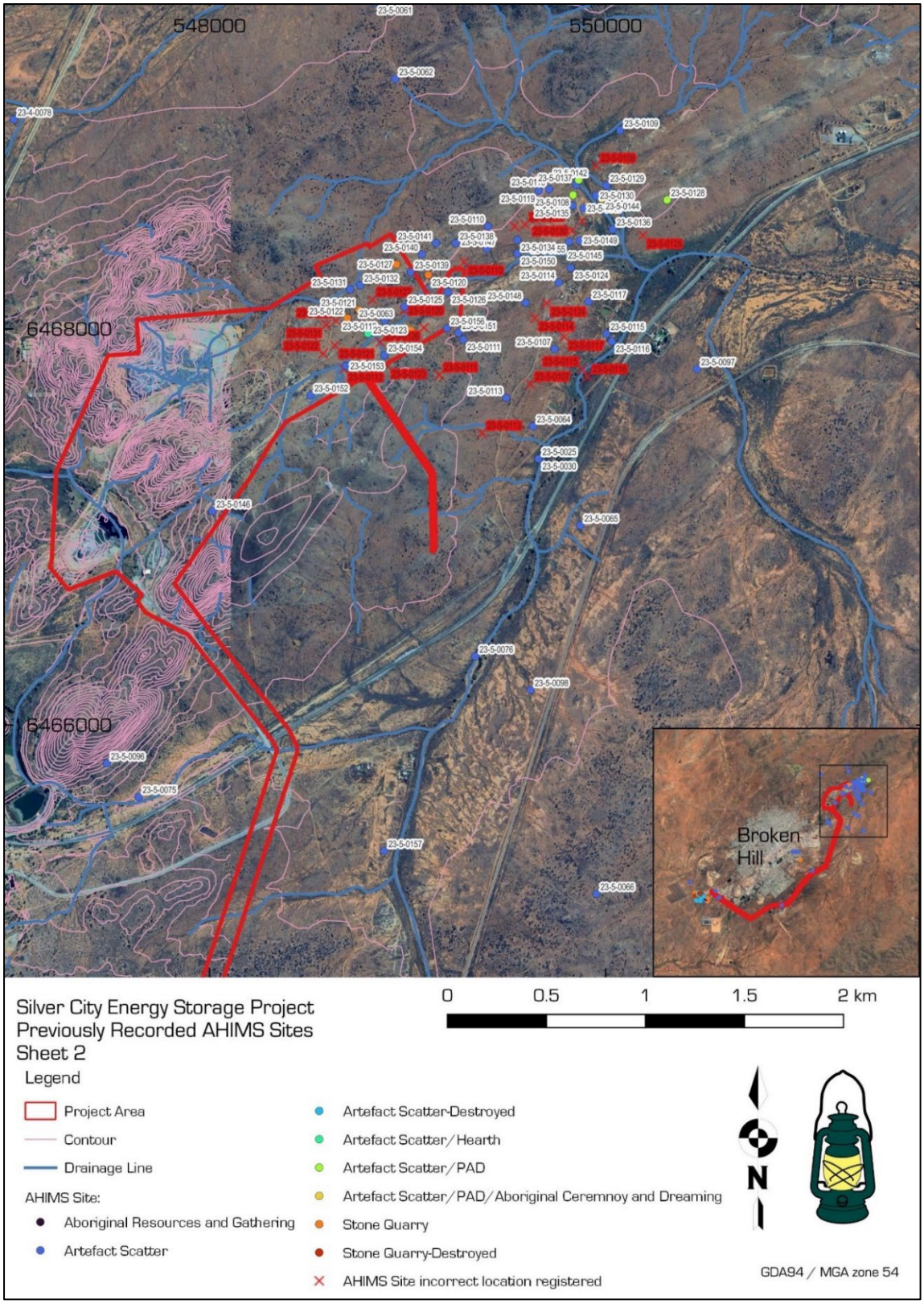


Figure 10: Previously recorded site types in close proximity to the Project Area at the northern end

Of the sites recorded in the AHIMS search there are 24 previously recorded sites located either within, or less than 100m from the Project Area (Table 3). Of these, twenty one (21) are within the Project Area.

Table 3: Previously recorded AHIMS sites located within 100m the Project Area

Site ID	Site name	Site Type
Sites inside the Project area		
#23-4-0640	Kanandah 1	Artefact Scatter
#23-4-0641	Kanandah 2	Artefact Scatter
#23-4-0682	South airports regency area isolated artefacts	Artefact Scatter
#23-5-0146	FD-IF19	Artefact Scatter
#23-5-0122	PM-Q5	Stone Quarry
#23-5-0121	PM-Q4	Stone Quarry
#23-5-0125	PM-GO2	Artefact Scatter
#23-5-0063	BH1-48;	Artefact Scatter
#23-4-0132	South Broken Hill	Artefact Scatter
#23-5-0139	FD-IF02	Artefact Scatter
#23-5-0131	PM-IF6	Artefact Scatter
#23-5-0127	PM-Q7	Stone Quarry
#23-5-0112	FD-G001	Artefact Scatter/Hearth
#23-5-0153	FD-IF7	Artefact Scatter
#23-5-0120	PM-Q3	Stone Quarry
#23-5-0152	FD-IF18	Artefact Scatter
#23-5-0126	PM-GO3	Artefact Scatter
#23-5-0156	FD-IF14	Artefact Scatter
#23-5-0140	FD-IF01	Artefact Scatter
#23-5-0123	PM-Q6	Stone Quarry
#23-5-0154	FD-IF16	Artefact Scatter
Sites located within 100m of Project Area		
#23-5-0151	FD-IF15	Artefact Scatter
#23-5-0141	FD-IF18	Artefact Scatter
#23-5-0110	FD-IF18	Artefact Scatter

4.2 NSW State Heritage Register and Inventory search results

The Australian Heritage Database (AHD) contains information about natural, historic and Aboriginal places of World and National heritage significance. The NSW State Heritage Inventory (SHI) is a database that contains sites listed on the NSW State Heritage Register, on Schedule 5 of Local Environmental Plans (LEP) and registered Aboriginal Places. Searches of the SHI and AHD were completed on 7th March 2023 (Appendix 1). The results of the SHI search has shown that an Aboriginal place (SHR/LEP/S170) is listed as approximately 8km southwest of the Project Area.

The registered Aboriginal place (The Pinnacles/SHR/LEP/S170) is part of the Dreaming track of the Marnbi and its story is important to Aboriginal people from many regions as it is a story that extends across three different states. Culturally, the Pinnacles are a significant cultural site in the Broken Hill area to the Wilyakali, Paakantyi and Adnyamathanha peoples. Cultural knowledge identifies the Pinnacles themselves as only one aspect of sacred land. Sacred land also includes a wider area of land, including the Pine and Stirling Vale Creeks, and certain rock outcroppings and trees (BHLALC pers. comm). The location of the Pinnacles is shown on Figure 1.

4.3 Archaeological investigations of the Project Area

This section is a redacted version of archaeological investigations as requested by BHLALC.

A model to predict the location of Aboriginal sites within Willyama Common was completed as part of an assessment of land capability and significance assessment (Appleton 2000). The Willyama Common surrounds the City of Broken Hill and contains the currently Project Area. While some sites had been recorded within the area, a survey had not been conducted of the entire commons. Indeed, this was considered impractical and not cost effective for the survey. Instead, a preliminary predictive model which was developed and tested with targeted survey. The results of this survey were then used to refine the predictive model (Appleton, 2000).

Appleton's field survey of Willyama Common targeted creek and drainage depression areas, as these areas had increased visibility and exposure compared to surrounding areas. The survey identified 28 sites: 16 artefact scatter sites, six isolated artefacts, three campsite sites, two artefact scatters with knapping floors, and one campsite with artefact scatter. A separate archaeological assessment is required prior to any development within the Common (Appleton, 2000).

OzArk (2008) undertook both an Aboriginal and historic heritage assessment of the proposed 340 ha Flying Doctor Project study area adjacent to the northwest boundary of the current Project Area.

A pedestrian survey was conducted in transects over the study area located at the Potosi Mine located approximately 9km northeast of Broken Hill. This assessment identified 22 Aboriginal heritage sites, and five historic heritage sites. Historic heritage was preliminarily assessed as locally significant and comprised of primarily mining structures and associated dumps. Aboriginal sites consisted of eight hearth and artefact scatter complexes, six quarry sites, five isolated artefacts, and three hearth sites. One previously recorded isolated artefact was also located within the study area however this was unable to be relocated (OzArk, 2008).

In terms of mitigation measures, the report recommended avoiding disturbance to Aboriginal sites where possible. If sites could not be avoided, then an AHIP is required prior to the start of works. (OzArk, 2008).

4.4 Summary of previous archaeological investigations

There has been a considerable amount of research into the Aboriginal occupation of western NSW over the last 50 years. Investigations have found evidence for Aboriginal occupation of this

region from the Pleistocene, Holocene and recent periods. In general, these investigations found that archaeological evidence represents multiple phases of intermittent use over long periods of time with Aboriginal people moving into an area when resources were easily available and then moving on to another location.

According AHIMS only 10 of the 106 sites listed within the search area have been destroyed by a range of developments. This review of previous archaeological reports shows that the majority of investigations are associated with development of utilities and infrastructure such as water, roads, railways and electricity. There has been limited test excavation within the local Broken Hill area, with surface artefact collection and analysis forming the most common mitigation measures. Many of the previous assessments recommend avoidance of inadvertent impacts to sites through fencing.

The Living Deserts SP is unique in the local area as it provides a conservation area for cultural and natural values while carefully managing impacts from visitor facilities such as walking tracks, carparks, campgrounds and 4WD tracks.

4.5 Predictive Model

Known archaeological sites immediately surrounding the Project Area are confined to a limited range of site types, dominated by artefact scatters, hearths and stone resource quarries (Table 1). In the wider region a range of site types have been discovered (Section 4.3.1), including a stone arrangement (Witter 1987) and burials (Bowler et al. 2003). This means that while we may expect to encounter stone artefacts, hearths or stone quarries, the potential to discover a wider range of cultural heritage sites persists.

By understanding the geomorphological and ecological heritage of the Project Area, we can appreciate the factors that may have influenced the occupation of this area by Aboriginal inhabitants in the past. In undulating upland landscapes like many areas throughout the Project Area, slope gradient is a key factor influencing the location of campsites (inferred from open artefact scatters) (Bulbeck and Boot 1990). Where flats or low spurs sit close to water sources, we can assume a relatively high likelihood of encountering isolated artefact, artefact scatters and/or hearths indicative of past occupation (Section 6.2.2).

Archaeological evidence will often indicate more permanent or repeated occupation occurs on major creeks and rivers and the further from these significant water sources, the more likely sites will be smaller and less complex i.e. one-off occupation sites. It is highly likely major tributaries to Willa Willyong Creek at the northern end and Kelly Creek and Acacia Creek at the southern end of the Project Area may be foci for repeated or long duration occupation. However, environmental factors profoundly affect the detection of archaeological sites. For example, the amount of ground surface exposure, together with erosional features that expose subsoils, will often dictate the likelihood of identifying the presence of stone artefacts during survey (Goldberg and Macphail 2006). This means that the distribution of archaeological sites that are detected may reflect these processes of site degradation, rather than patterns of occupation in the past. A key example of this is the extent of prior historic impacts affecting the distribution of old-growth vegetation. We know that where trees of 150 years old or more persist, there is a likelihood of finding cultural modifications (i.e. scarring), but the impacts of historic settlement have removed such trees from across the Project Area.

Burials are more common in lake and alluvial environments and in association with midden, sand dunes, lunettes, bordering dunes and other soft or sandy sedimentary soils. Burials will be rare in rangeland environments such as the Barrier Ranges (Gilding and DiMaria 2011 in Niche 2017:61).

The archaeological potential for Aboriginal heritage to occur in the Project Area, by site type, is summarised in Table 4.

Table 4: Summary of predictive model for landforms that may occur in the study area

Landscape type	Landform	Potential Sites	Archaeological potential
Undulating upland	Rock outcrops	Quarries, resource gathering sites	High
	Exposed crests	Isolated artefacts, artefact scatters, ceremonial sites	High
	Steep slopes	Isolated artefacts, artefact scatters	Low
	Moderate slopes	Isolated artefacts, artefact scatters	Low
	Gentle slopes overlooking water courses	Isolated artefacts, artefact scatters, PAD	High
Alluvial valley	Flats and plains	Isolated artefacts, artefact scatters, hearths	High
	Flats and plains adjacent to water courses	Burials	Low – where soft sediments are available but could occur anywhere

4.6 Summary of predictive statement

This section summarises the known and possible site types and site features that might occur within the Project Area, their associated activities, the occupation or material evidence and the physical setting or landscape they might be associated with. The predictions are based on the synthesis of Sections 2, 3 and 4.

In terms of Aboriginal heritage, there are sections of the proposed Project corridor that have been disturbed by the cumulative impact of land surface modification such as vegetation clearance, historic mining, recreational use and service easements. However, there are also parts of the Project Area where there are minimal to no impacts.

Sites within western NSW tend to be within 1km of a reliable more permanent or temporary water source Cupper 2007 (in Niche 2017). Rangelands such as the Project Area are often thought to be less archaeologically sensitive due to the limited and ephemeral nature of the water sources (Cupper 2007:14 in Niche 2017). The Project Area has a number of temporary water sources, mostly located in the lower-lying areas that correspond with the alluvial flats.

Stone artefacts and hearths will comprise the majority of Aboriginal sites within the Project Area with hearth sites occurring more frequently in proximity to low-lying areas where water may be present. The extensive historic impacts and the dynamic nature of the deposits make it difficult to predict the archaeological potential of specific areas within the Project Area accurately.

Culturally modified trees may occur where mature age trees are present, however, due to historic timber getting associated with Broken Hill township and mining, it is likely these site types have not survived. Burials will be rare in rangeland environments like those mostly found at the northern end of the Project Area. However, burials may occur anywhere and will be more often found in association with sandy or soft sedimentary soils like the alluvial deposits that are present in select locations within the Project area.

Highly deflated undulating uplands, like those within the Project Area, generally preserve a limited range of Aboriginal sites. These site types are generally restricted to isolated artefacts and artefact scatters that are likely to have been affected by colluvial/alluvial movements and post-formation processes such as land use. Ceremonial places may occur across the landscape and RAP assistance is sought to identify any such places in or near the project area. Important symbolic activities, such as conducting ceremonies and creating rock art, are known to be associated with rocky upland landscapes. In addition, there is also potential for rock outcrops of material suitable for stone tool manufacture.

4.7 Predictive statement for the Project Area

Predications regarding location of different site types and site features that might occur within the Project Area are:

Isolated artefacts – are found across the entire landscape. These finds can occur in any location as Aboriginal people traversed the country for thousands of years. Isolated finds may end up in a recorded location as a result of humans, erosion or depositional forces. These sites are likely to occur in the Project Area, and three isolated artefacts have previously been identified within the Project Area.

Stone artefact scatters – representing a camping or activity location, these sites are identified by a concentration of stone flakes. They are a common site type as they are more likely to survive in the archaeological record. Artefact scatters will occur across the landscape, usually in association with a resource such as permanent water. Low-gradient landforms close to major water sources were a preferred location for camping. As the Project Area is in close proximity to a number of water sources, artefact scatters are likely to occur on areas of low gradient close, however, may be present in most landforms within the Project Area.

Potential Archaeological Deposit (PAD) – buried archaeological materials, or soils and sediment thought to contain buried archaeological materials, can occur in locations where past activity created sediment deposition, or where soil and sediment aggradation has been an active geomorphological process. Paradoxically, PADs are most likely to be observed where erosive processes are active, e.g. where sediment exposures reveal the stratigraphy of the subsurface environment.

Scarred/Culturally modified trees – display evidence of human modification and manipulation. They require the presence of mature native trees and are likely to be found in any area that supports old- growth stands. Broken Hill has a history of mass tree clearing following colonial settlement of the area. As such, it is unlikely that mature trees persist in the local region. No scarred trees have been recorded near the Project Area.

Hearths/ovens – indicate locations where a fire was lit for one-off (hearth) or multiple uses (oven) and are identified by presence of charcoal, local stone (mainly gneiss with some quartz) or more rarely, burnt termite mound clay (used as heat retainers). Hearths are recorded either in isolation or in association with other Aboriginal cultural features such as camp sites. Ovens are generally larger than hearths and often include other materials such as bone. Hearths or ovens have been recorded in and near the Project Area with many affected by erosion. There is a high potential for this site type to be recorded in the Project Area.

Ceremonial places – are found in isolated locations throughout the landscape. The preferred location of these places will vary from region to region. A ceremonial site (AHIMS 23-5-014) was recorded during the AHIMS search.

Landscape features and natural sacred sites – can be found anywhere. The Pinnacles are one such site located within 8km of the Project Area. The song line is on such landscape feature which is linked the Marnbi Dreamtime Story. Quartz outcrops and black outcrops are considered landscape features associated with this story and are found within the Project Area. There is a high potential for this site type to be recorded in the Project Area.

Rock Art – are likely to be located wherever suitable rock surfaces are found.

Quarries – are likely to be located where outcrops of rocks exist that are useful for stone tool manufacture. Quartz quarries are often recorded during surveys in the Broken Hill area and represent intensive exploitation of the good quality quartz with many milky or translucent quartz reefs heavily unutilised. Stone and procurement sites are likely to be present in the Project Area.

Burials – are likely to be found in lake and alluvial environments and in association with midden, sand dunes, lunettes, bordering dunes and other soft or sandy sedimentary soils. Burials will be rare in rangeland environments such as the Barrier Ranges, however, they may occur anywhere. Aboriginal burials in the region are also known to have occurred in trees (usually Box Trees). They may occur in the Project Area where soft sediments are available (refer Figure 13).

Shell middens – show evidence of shell discard after people have collected, eaten and discarded shellfish. Middens may also contain other cultural material including stone artefacts, other faunal remains, human burials, or charcoal from cooking and other remnants of hearths such as heat retainer stones. In the region middens will be dominated by freshwater mussel shell. They are unlikely to be found in upland areas, however, shell midden may be found near to more permanent water sources, such as those in the Project Area.

4.8 Predictive mapping from Aboriginal Site Decision Support Tool

This section provides an overview of the predictive modelling available through the Aboriginal Site Decision Support Tool (ASDST). The ASDST is a modelling tool that was developed in order to provide a set of spatial GIS layers combined with analytical techniques that provide visual and quantitative information regarding the distribution of Aboriginal site features across the landscape and associated accumulated impacts (Ridges 2006; SGNSW & DPIE 2021). The modelling provides GIS layers for likely areas where artefacts, rock art, burials, earth mounds, grinding grooves, hearths, shell middens, stone quarries and culturally modified trees are located. In addition, the ASDST provides GIS layers relating to accumulated impacts, model reliability and survey priority.

For the purposes of this assessment the ASDST modelling has been used to review the accuracy of the predictive model described above. Maps showing results of the ASDST modelling follow with basic interpretation of the modelling below:

- Figure 11 shows the general level of archaeological sensitivity in the area, and suggests that portions of the Project Area is in a moderate to high sensitivity zone; and
- Figure 12 indicates the Project Area is part of an area of moderate to high survey priority.

This means that the Project Area would benefit from on-ground assessment.

- Figures 13 indicates the distribution of alluvium in the Project Area which is an indicator of predicted higher sensitivity for subsurface Aboriginal objects (including burials) and archaeological deposit to be present.

Overall, these results are consistent with the predictive model presented above and suggest that Aboriginal sites are most likely to be encountered, especially at the northern and southern end, close to narrow drainage tracts associated with more permanent water sources, Willa Willyong Creek and Acacia Creek. It is important to note that the ASDST modelling is based on imperfect data and incomplete datasets.

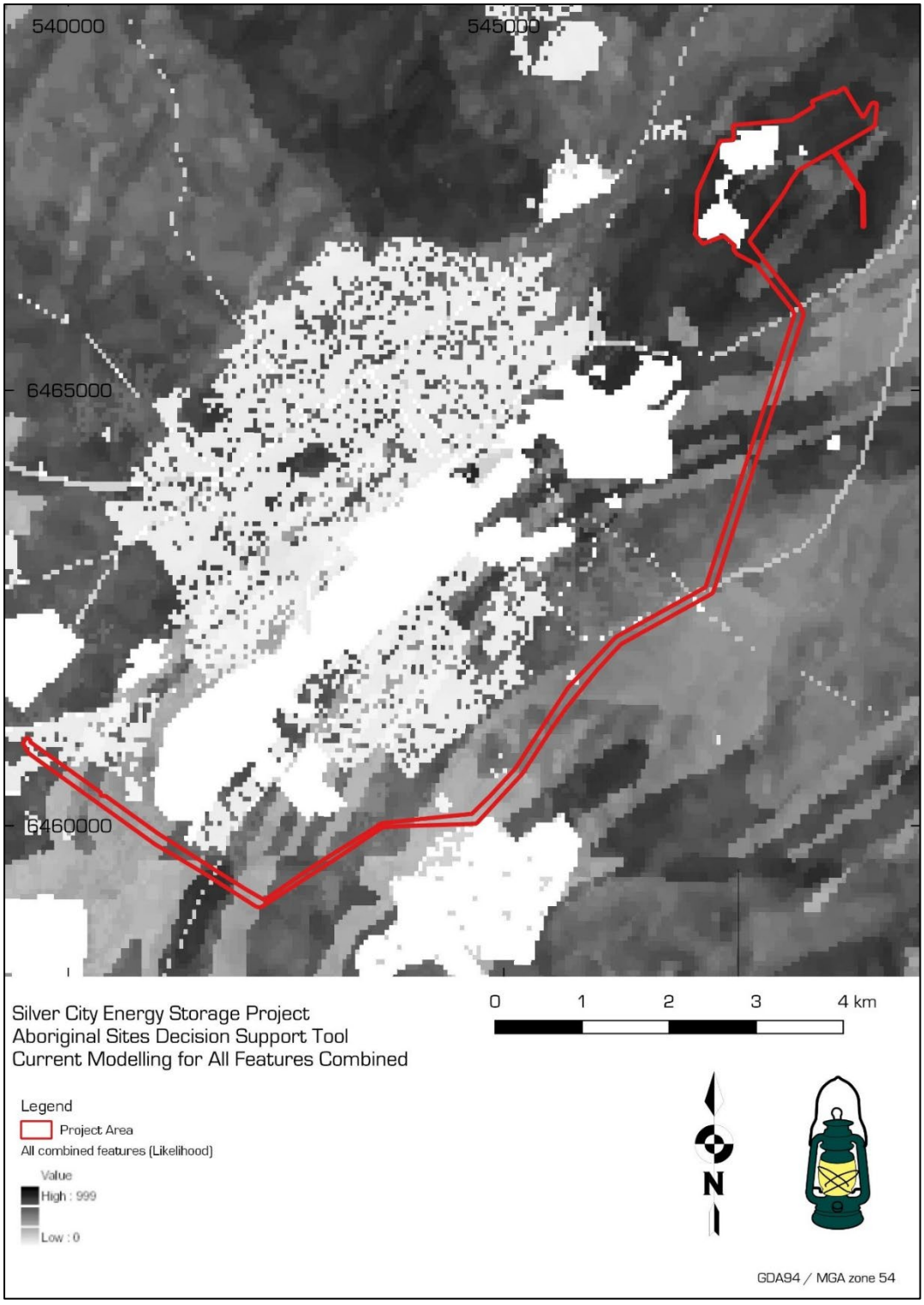


Figure 11: ASDST mapping showing moderate-high archaeological sensitivity of Project Area based on all types of archaeological features (black represents high sensitivity and white represents low sensitivity).

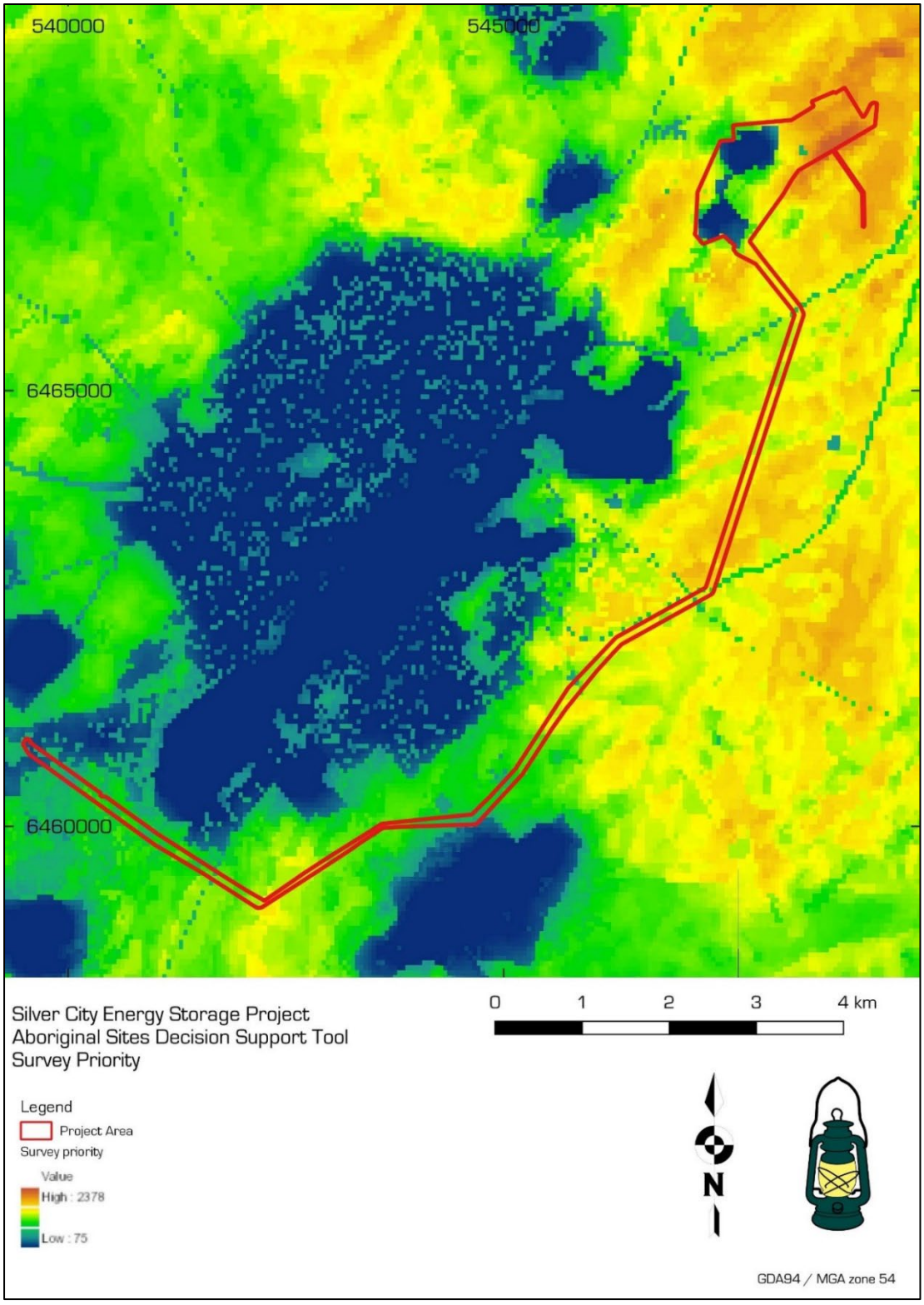


Figure 12: ASDST mapping showing survey priorty areas based on all types of archaeological features (red represents high sensitivity and green represents low sensitivity).

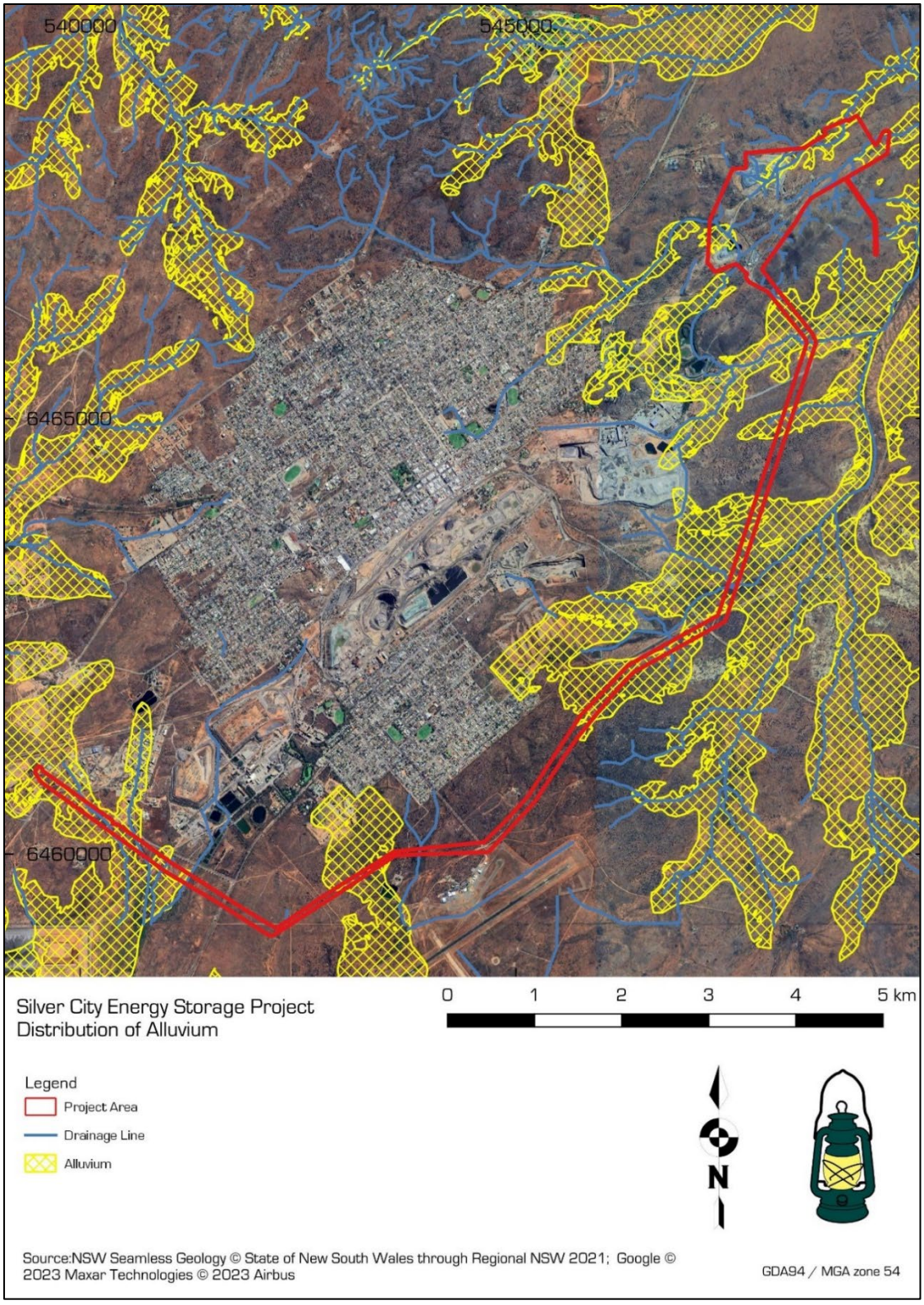


Figure 13: Alluvium mapping showing areas of predicted higher sensitivity for possible burial environs within the Project Area.

5 FIELD METHODS

As detailed in Section 5 and Section 6 of the Archaeological Report (Appendix 1) field survey and test excavation of the Project Area was conducted in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects* in NSW.

Phase 1 field survey was conducted over seven days from the 10th through to the 17th August 2022 by Glenn van der Kolk and Bec Parkes from Lantern Heritage in partnership with RAP Broken Hill Local Aboriginal Land Council (BHLALC). Abishai White and Raymond O'Donnell (Jnr) represented BHLALC for Phase 1 survey.

The Phase 2 visual inspection was conducted over three days on the 1st, 2nd and 9th February 2023. Phase 2 survey was undertaken of areas that were not included in Phase 1 survey (refer Figure 18 in Section 6.1 of AR). Phase 2 survey was conducted by Simon Greenwood, Elle Lillis, Jo Dibden and Rebecca Vartto from Lantern Heritage in partnership with Broken Hill LALC representatives Ricky Menz, Raymond O'Donnell (Snr) and Raymond O'Donnell (Jnr).

5.1 Summary of field survey results

Forty four (44) Aboriginal sites were identified during the phase 1 survey with a further twenty-one (21) sites identified during the phase 2 survey. The total of sixty-five (65) sites recorded in both phases includes previously recorded and newly recorded sites. Site features identified during the survey include stone artefact scatters, heat retainer hearths, stone quarries and potential archaeological deposits (PAD). While no human burials were identified during the investigations, the presence of such site types cannot be discounted.

Of the previously recorded sites located within the Project Area, two hearth features and six artefact scatters could not be relocated during either survey. Additionally, within the AHIMS search area a number of AHIMS sites with incorrect datums were discovered. During field survey and desktop research for this project the corrected locations for 26 of these sites was determined. These corrected AHIMS site locations and datums are shown in Figure 14.

As shown in Figures 14 – 20, the presence of Aboriginal objects was confirmed across most landform types within the Project Area, however only a small number of Aboriginal sites were recorded on crest and upper slope landforms (Table 5). This is likely due to the terrain and exposure to harsh environmental conditions in these areas resulting in unappealing conditions for people to spend extended periods of time. When and if these areas were accessed, it is likely to have been for a specific purpose such as accessing quartz outcrops for the manufacture of stone tools.

By contrast there was a much larger number of Aboriginal sites recorded near to water sources, and at the interface of lower slopes and plains. In addition, a large percentage of sites were also recorded on landforms associated with sheltered hillsides and perennial freshwater environments such as tributaries to Willa Willyong Creek (Tables 6 and 7). These field survey results support the predictive model, which indicates there is a high likelihood of finding cultural material in landforms easily accessible to resources.

The Project Area traverses sections of highly disturbed lands such as the local rifle range, formal and informal vehicle tracks and previous mine test sites. Although artefacts were observed in areas of high-disturbance during the current study, the potential for in situ subsurface artefacts in these previously impacted areas is negligible. Subsurface archaeological potential is the likelihood of an area containing contextualized Aboriginal archaeological sites of significant density. The archaeological potential of sites recorded within the Project Area varied from very low in areas of rocky terrain and/or high disturbance to high in areas with deep soil deposits.

As a result of the Phase 1 field survey, Lantern Heritage recommended a program of test excavation across four sample landforms considered to have moderate-high or greater archaeological sensitivity, with one exception, test zone 2 of moderate archaeological potential.

Table 5: Inventory of sites from north to south with notes on features recorded during the current survey.

Site name/Site ID	Feature(s)	Archaeological Potential	Landform
FD-IF01/AHIMS #23-5-0140	Artefact	could not be relocated	Crest
Broken Hill (ACAES) AFT 13/AHIMS #23-5-0177	Artefact	low	Flat
Broken Hill (ACAES) AFT12/AHIMS #23-5-0176	Artefact	low	Flat
Broken Hill (ACAES) AFT/HTH 1/AHIMS #23-5-0170	Artefact	low	Flat
Broken Hill (ACAES) AFT 17/AHIMS #23-5-0181	Artefact	moderate	Flat
Broken Hill (ACAES) AFT 8/AHIMS #23-5-0173	Artefact	moderate	Flat
FD-IF16/AHIMS #23-5-0154	Artefact	low-moderate	Open depression
FD-IF7/AHIMS #23-5-0153	Artefact	moderate	Open depression
FD-IF14/AHIMS #23-5-0156	Artefact	could not be relocated	Plain
Broken Hill (ACAES) AFT 14/AHIMS #23-4-0178	Artefact	high	Plain
Broken Hill (ACAES) AFT 40/AHIMS #31-1-0726	Artefact	low	Plain
Broken Hill (ACAES) AFT 53/AHIMS #23-5-0185	Artefact	low-moderate	Plain
Broken Hill (ACAES) AFT 54/AHIMS #23-5-0184	Artefact	low-moderate	Plain

Site name/Site ID	Feature(s)	Archaeological Potential	Landform
Broken Hill (ACAES) AFT 22/AHIMS #23-4-0698	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 28/AHIMS #23-4-0701	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 35/AHIMS #23-4-0710	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 34/AHIMS #23-4-0711	Artefact	low-moderate	Plain
Broken Hill (ACAES) AFT 23/AHIMS #23-4-0699	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 25/AHIMS #23-4-0700	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 29/AHIMS #23-4-0702	Artefact	moderate	Plain
Broken Hill (ACAES) AFT 44/AHIMS #23-5-0183	Artefact	low	Ridge
FD-IF03/AHIMS #23-5-0138	Artefact	could not be relocated	Slope
FD08/AHIMS #23-5-0141	Artefact	moderate-high	Slope
FD-IF19/AHIMS #23-5-0146	Artefact	could not be relocated	Slope (Lower)
Broken Hill (ACAES) AFT 49/AHIMS #23-5-0189	Artefact	low-moderate	Slope (lower)
Broken Hill (ACAES) AFT 50/AHIMS #23-5-0188	Artefact	low-moderate	Slope (lower)
FD-IF02/AHIMS #23-5-0139	Artefact	could not be relocated	Slope (Upper)
Broken Hill (ACAES) AFT 45/AHIMS #23-5-0182	Artefact	low	Slope (Upper)

Site name/Site ID	Feature(s)	Archaeological Potential	Landform
Broken Hill (ACAES) AFT 48/AHIMS #23-5-0190	Artefact	low	Slope (Upper/Mid)
Broken Hill (ACAES) AFT 42/AHIMS #23-4-0706	Artefact	low	Slope (Upper/Mid)
Broken Hill (ACAES) AFT 30/AHIMS #23-4-0703	Artefact	low	Slope (Upper/Mid)
Broken Hill (ACAES) AFT 43/AHIMS #23-4-0705	Artefact	low	Slope (Upper/Mid)
Broken Hill (ACAES) AFT 31/AHIMS #23-4-0704	Artefact	low	Steep Mid and upper slope
FD-IF18/AHIMS #23-5-0152	Artefact	could not be relocated	Open depression
Broken Hill (ACAES) AFT 38/AHIMS #23-4-0707	Artefact	low	Plain
Broken Hill (ACAES) AFT 36/AHIMS #23-4-0709	Artefact	low-moderate	Plain
Broken Hill (ACAES) AFT 41/AHIMS #31-1-0725	Artefact	low	Slope (Lower)
Broken Hill (ACAES) AFT 11/AHIMS #23-5-0175	Artefact	low	Slope (Steep mid slope to gentle lower slope)
Broken Hill (ACAES) AFT 18/AHIMS #23-5-0169	Artefact	high	Flat
Broken Hill (ACAES) AFT 3/AHIMS #23-5-0171	Artefact	moderate-high	Open depression
Broken Hill (ACAES) AFT 4/AHIMS #23-5-0172	Artefact	moderate-high	Open depression
Broken Hill (ACAES) AFT 46/AHIMS #23-5-0192	Hearth & artefact	low-moderate	Flat

Site name/Site ID	Feature(s)	Archaeological Potential	Landform
Broken Hill (ACAES) AFT/HTH 51/AHIMS #23-5-0187	Hearth & artefact	low-moderate	Plain
Broken Hill (ACAES) AFT/HTH 52/AHIMS #23-5-0186	Hearth & artefact	low-moderate	Plain
Broken Hill (ACAES) AFT/HTH 16/AHIMS #23-5-0180	Hearth & artefact	low-moderate	Flat
PM-IF6/AHIMS #23-5-0131	Hearth & artefact	Moderate-high	Open depression
South airports regency area isolated artefacts/AHIMS #23-4-0682	Hearth & artefact	moderate	Plain
Broken Hill (ACAES) HTH 26/AHIMS #31-1-0723	Hearth & artefact	moderate	Plain
Broken Hill (ACAES) HTH 27/AHIMS #31-1-0724	Hearth & artefact	moderate	Plain
Kanandah 1/AHIMS #23-4-0640	Hearth & artefact	moderate-high	Plain
Broken Hill (ACAES) AFT/HTH 37/AHIMS #23-4-0708	Hearth & artefact	moderate	Plain
Broken Hill (ACAES) AFT/HTH 10/AHIMS #23-5-0174	Hearth & artefact	moderate	Slope (gentle lower)/Open Depression
BH1-48/AHIMS #23-5-0063	Hearth & artefact	moderate	Slope (Lower)/Open Depression
Broken Hill (ACAES) AFT/HTH 19/AHIMS #23-5-0168	Hearth & artefact	moderate	Slope (very gentle)
Broken Hill (ACAES) AFT/HTH 15/AHIMS #23-5-0179	Hearth & artefact; Rock arrangement/ mound	moderate	Plain
Broken Hill (ACAES) AFT 20/AHIMS #23-4-0697	Artefact; Rock arrangement	moderate	Plain/Slope (Lower)

Site name/Site ID	Feature(s)	Archaeological Potential	Landform
Broken Hill (ACAES) HTH 47/AHIMS #23-5-0191	Hearth	low-moderate	Flat
PM-G02/AHIMS #23-5-0125	Hearth	could not be relocated	Open depression
PM-G03/AHIMS #23-5-0126	Hearth	low	Plain
Broken Hill (ACAES) HTH 39/AHIMS #31-1-0727	Hearth	moderate	Plain
PM-Q7AHIMS /AHIMS #23-5-0127	Quarry	moderate	Crest
PM-Q4/AHIMS #23-5-0121	Quarry	very low	Crest
PM-Q5/AHIMS #23-5-0122	Quarry	low	Slope
PM-Q3/AHIMS #23-5-0120	Quarry	low	Slope

Table 6: Summary of site types located during field survey

Site type	Number	%
Hearth	4	6%
Hearth & artefact	13	20%
Artefact	42	65%
Quarry	4	6%
Stone Arrangement	2	3%
Total	65	100%

Table 7: Spatial distribution of all sites by landform

Landform	# of sites	% of sites in landscape
Headland - crest	13	24%
Crest	8	15%
Backdune	15	28%
Coastal plain	3	6%
Creek banks/ drainage	2	4%
Gully	1	2%
Rock Platform	9	17%
Saddle	1	2%
Simple slope	2	4%
Total	54	100%

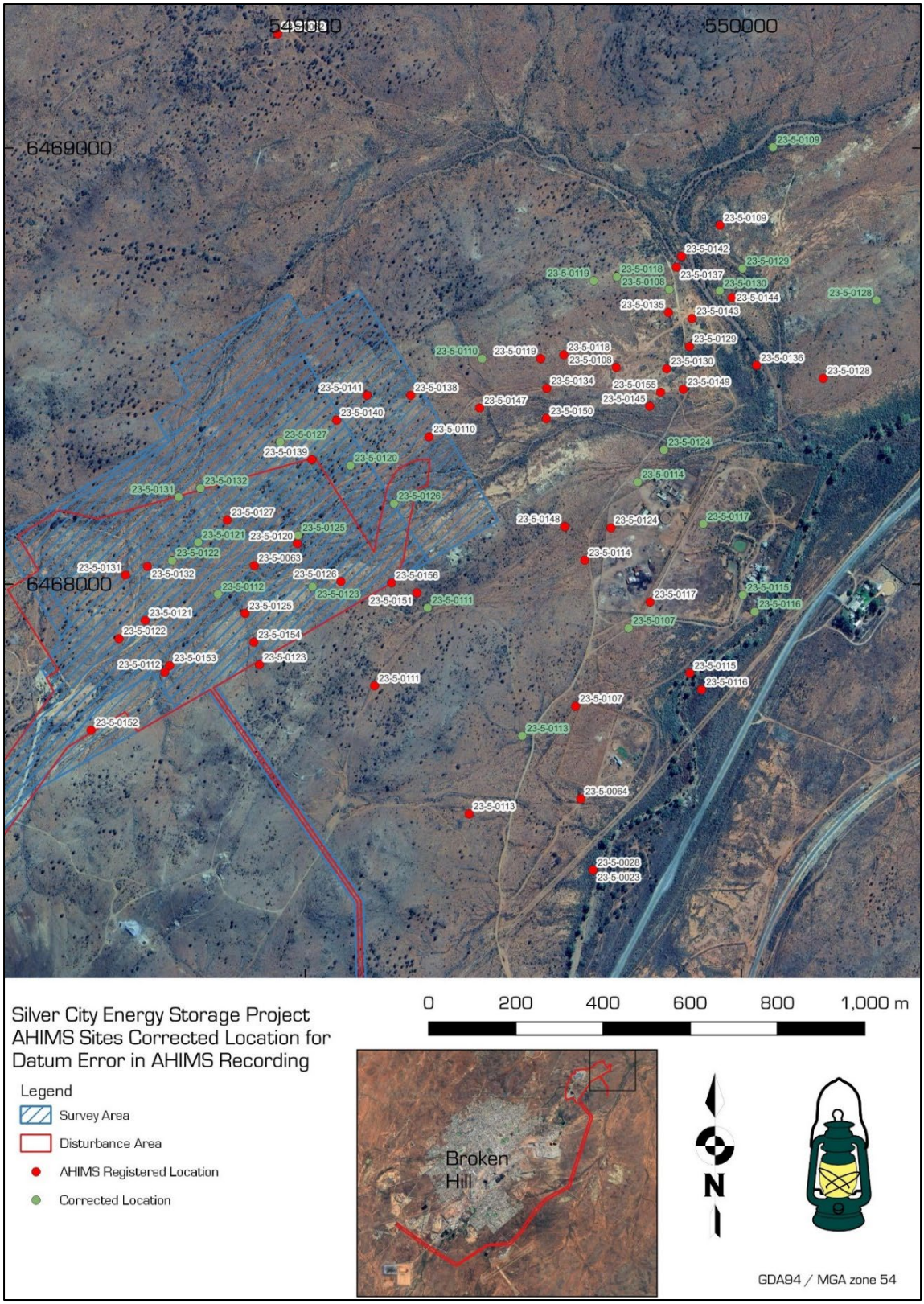


Figure 14: Corrected datum and location of previously recorded AHIMS Aboriginal sites/objects.

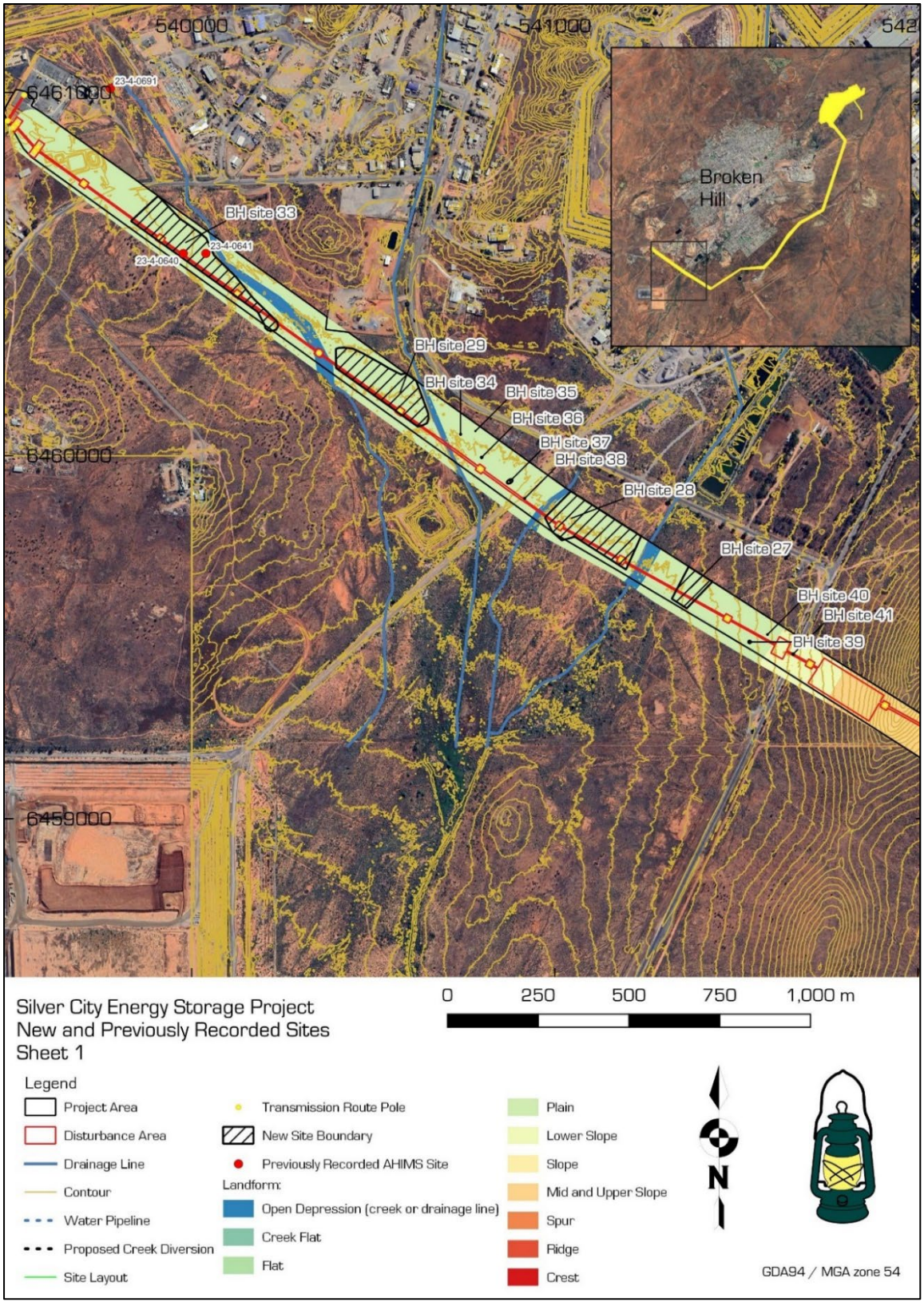


Figure 15: Location of Aboriginal sites/objects in relation to the Project Area Map 1.

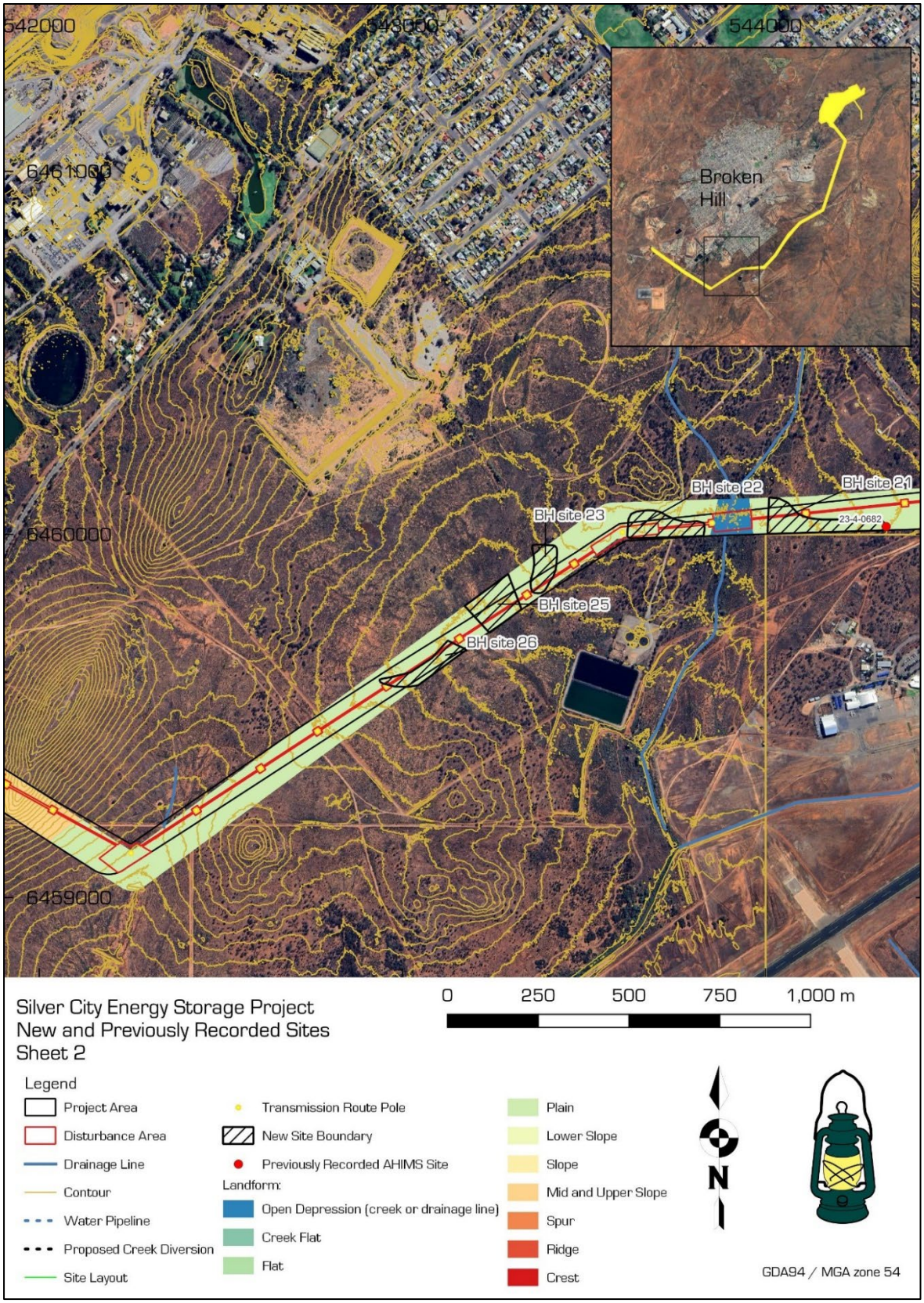


Figure 16: Location of Aboriginal sites/objects in relation to the Project Area Map 2.

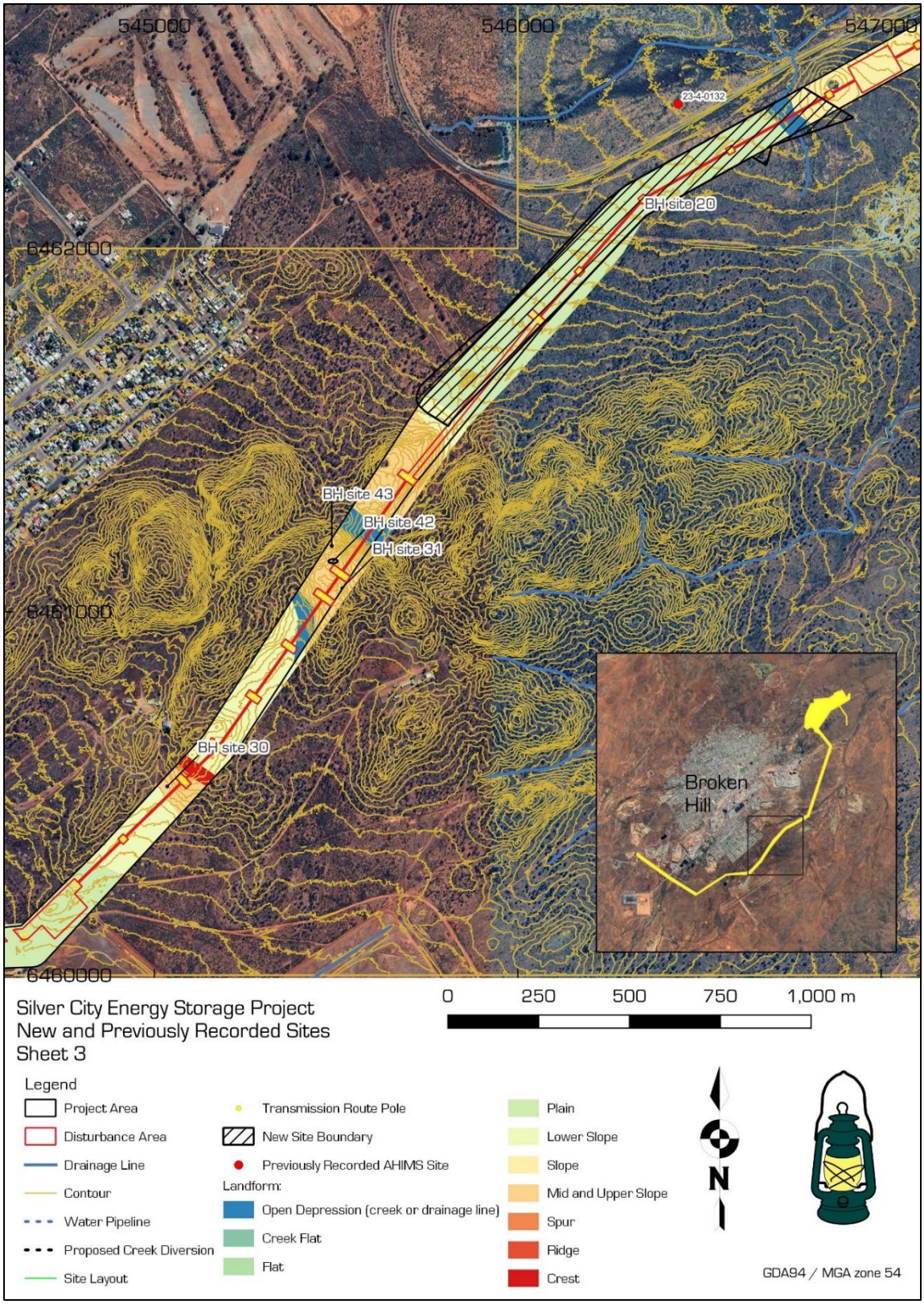


Figure 17: Location of Aboriginal sites/objects in relation to the Project Area Map 3.

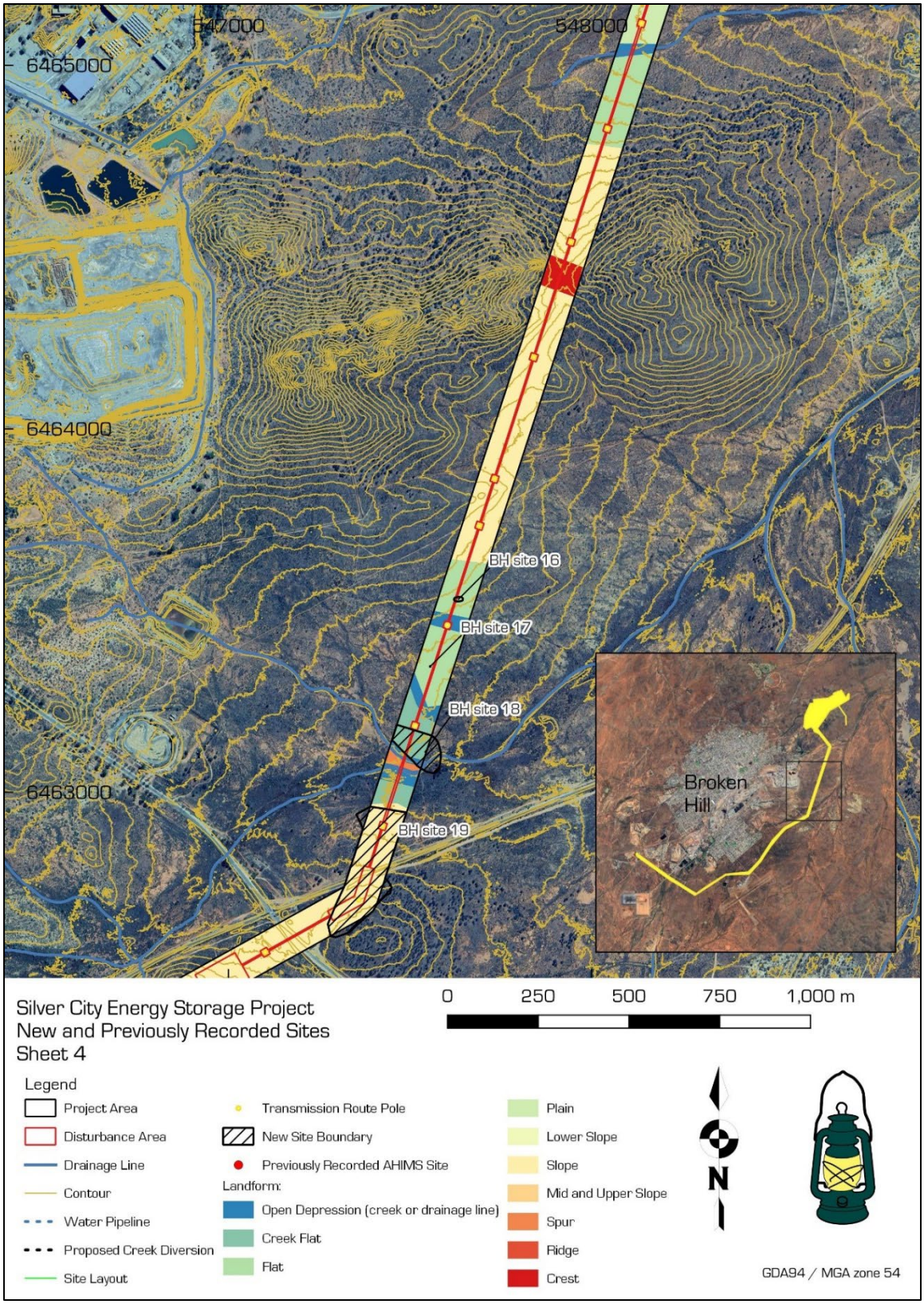


Figure 18: Location of Aboriginal sites/objects in relation to the Project Area Map 4.

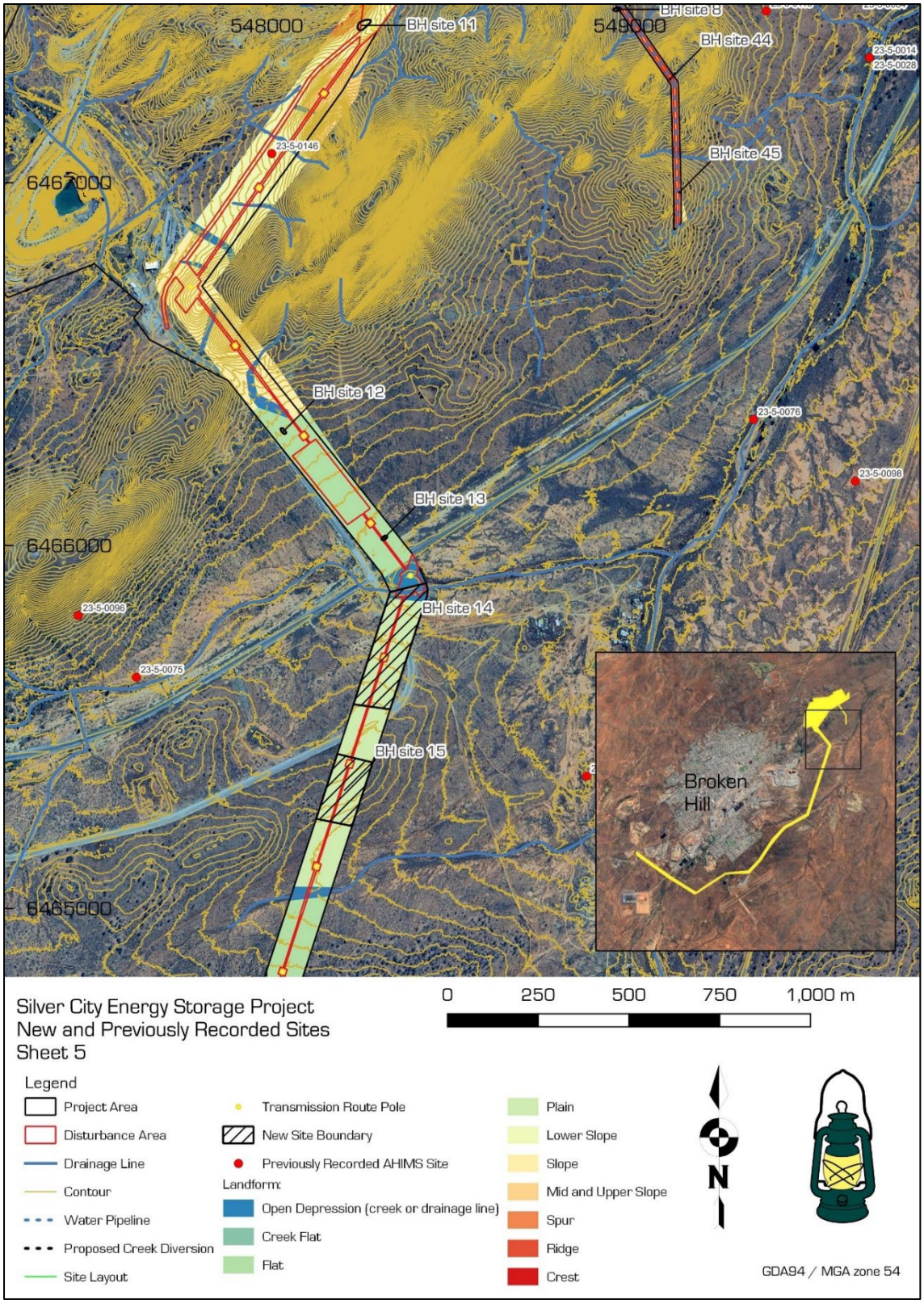


Figure 19: Location of Aboriginal sites/objects in relation to the Project Area Map 5.

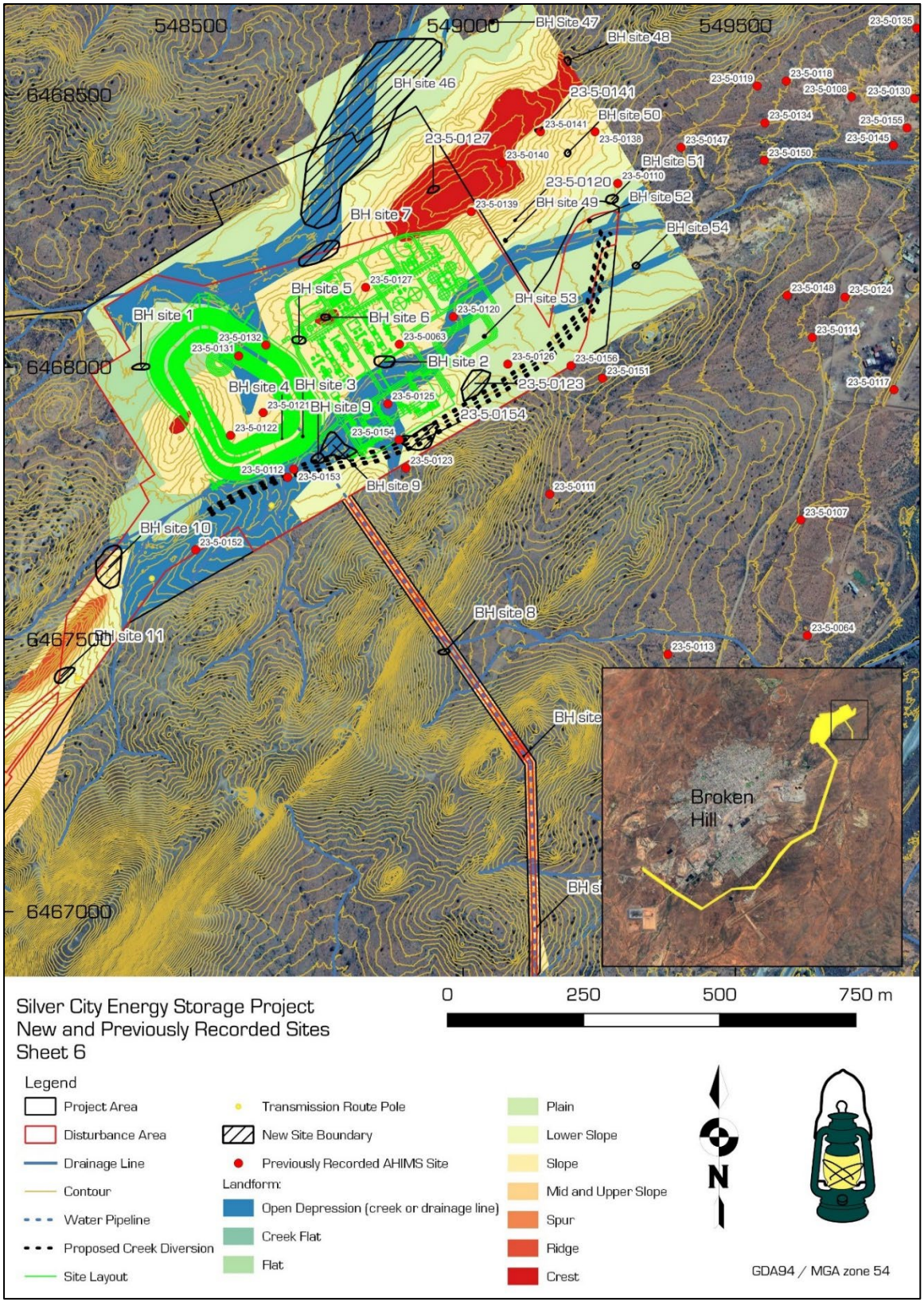


Figure 20: Location of Aboriginal sites/objects in relation to the Project Area Map 6.

5.2 Summary of test excavation results

As detailed in Appendix 6 of AR, Lantern Heritage undertook an archaeological test excavation program in February 2023. The test excavation methods followed the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b)*. Lantern were assisted in the field by representatives from Broken Hill LALC (Raymond O'Donnell (Jnr), Abishai White, Ricky Menz and Regan O'Donnell).

The overall objectives of the testing program were to:

- collect information about the nature, extent, and integrity of subsurface archaeological deposit in order to assess the significance of the deposits and develop appropriate mitigation methods, and
- determine whether additional salvage excavation may be required prior to construction.

A total of seventy (70) test pits were excavated across seven test zones within four high archaeologically sensitive landforms as shown in Figures 22 - 26 and table below.

Landform	Test Zone	Tested sites
plains, leading to/from shallow, ephemeral creeks	2, 9 and 11	#23-5-0131, #23-5-0640 and Hill (ACAES) AFT 28 (#23-4-0701)
plains leading to/from undulating terrain with rocky, granitic outcrops	6	BH AFT 20 (#23-4-0697)
plains leading to/from deeply incised, second order ephemeral creek lines	4 and 5	BH AFT 14 (#23-5-0178) and BH AFT 18 (#23-5-0169)
open depression, deeply incised, third order creek line	10	#23-5-0153

The presence of subsurface artefacts was confirmed at four test zones – Zones 4, 5, 6 and 11 – and within three of the four landforms identified for testing, including:

- plains, leading to/from shallow, ephemeral creeks;
- plains leading to/from undulating terrain with rocky, granitic outcrops; and
- plains leading to/from deeply incised, second order ephemeral creek lines.

Fifteen of the seventy pits contained artefacts, and 69 artefactual specimens were recovered. Sixty- two (62) of these objects (89.9%) were recovered from eleven pits within a 40m by 5m area in the southern end of testing zone 6 (see Appendix 6 of AR). Subsurface artefacts were not located in the test pits excavated in plains leading to/from shallow ephemeral creeks at test zones 2 and 9, nor at the open depression, deeply incised, third order creek line landform in test zone 10.

Despite the small size of the assemblage recovered during the test excavations, it was possible to draw some inferences regarding raw material use, reduction methods and techniques and

post depositional processes from the artefact analysis. The dominant proportion of artefacts recovered were quartz, a local, easily accessible material for knapping.

The artefacts show low to medium evidence of damage as a result of post-depositional site disturbance, but no evidence of movement down through the soil profile, which suggests that minimal site disturbance has occurred. While the results of the artefact analysis largely conform with the results of previous archaeological investigations in the region, the lack of retouched implements and diversity of raw material types within the assemblage means that it is difficult to draw any conclusions about how the archaeology in the Project Area fits within its regional context.

5.3 Test excavation conclusion

Results of the test excavation program indicate that the archaeological sensitivity model used to target particular landforms for investigation was reasonably effective. Excavation showed that there are various levels of disturbance throughout the Project Area and that subsurface integrity was highly variable within each test zone. The subsurface potential of all zones was revised to low with the exception of zones 4 (moderate) and zone 6 (moderate-high at southwest end). The revised subsurface potential of these zones as shown in Table 40 of the AR is factored into the subsurface archaeological sensitivity mapping below.

5.4 Landform Sensitivity Mapping

Based on the synthesis of the evidence collected during field survey and test excavation, a subsurface archaeological sensitivity model has been developed for the Project (Figures 29 to 41 in section 10). This model uses site patterning and site location predictions to create a visual image of predicted subsurface archaeological deposits.

To determine this potential, the sensitivity model considers the following:

- Landforms with recorded subsurface artefacts from test excavation;
- Areas representing transition of plain/drainage landforms to a lower slope landform;
- Landforms with potential for deeper deposits (such as an open depression),
- Landorms within 900m of water
- Landforms associated with alluvial deposits (see Figure 13); The model then discounts:
- Landforms with recorded shallow or zero soil deposits based on field survey and test excavation.
- Landforms with recorded absence of subsurface artefacts and/or highly disturbed subsurface deposits based on test excavation.
- Landforms located on a heavily disturbed Anthropogenic area (ie mine, road, dam, transmission line or railway).

The identification of high sensitivity areas within the Project Area is defined based on the combination of each of these characteristics.

The model identifies 19 landforms within the Project Area of predicted higher sensitivity for subsurface Aboriginal objects. These areas are shown by blue hatching on Figures 29 to 41 in section 10.

These high sensitivity areas are associated with variations in landform and relief that indicate likely areas of sediment accumulation and/or open depressions which may indicate areas where

provisional water could be found. As such, these landforms have a higher potential to contain subsurface archaeological deposit.

The results of the test excavation site discovery rates simulations indicate that the likelihood of discovering any sites with the pits excavated was extremely low. As discussed in the Test Excavation Report (Appendix 6 - AR), the fact that some sites were discovered implies that the predictive model used to target particular landforms for investigation was reasonably effective.

As such, the subsurface archaeological sensitivity model indicates both known and predicted subsurface archaeological sensitivity based on the background research and the results of the test excavation to date. As discussed above, the subsurface potential of five of the seven test zones with revised to low following text excavation.

It is recommended that landforms with predicted high archaeological sensitivity and sites with moderate-high, or greater, archaeological potential are investigated further as part of a staged salvage program.

5.4.1 Limitations of sensitivity map model

The model is based on an interpretation of test excavation results, geological and topographic mapping, and field observations, and has not been verified. The model is for subsurface archaeological sensitivity only, as surface sites are already known areas of sensitivity already recorded across the Project Area. The model may be improved by further archaeological investigations.

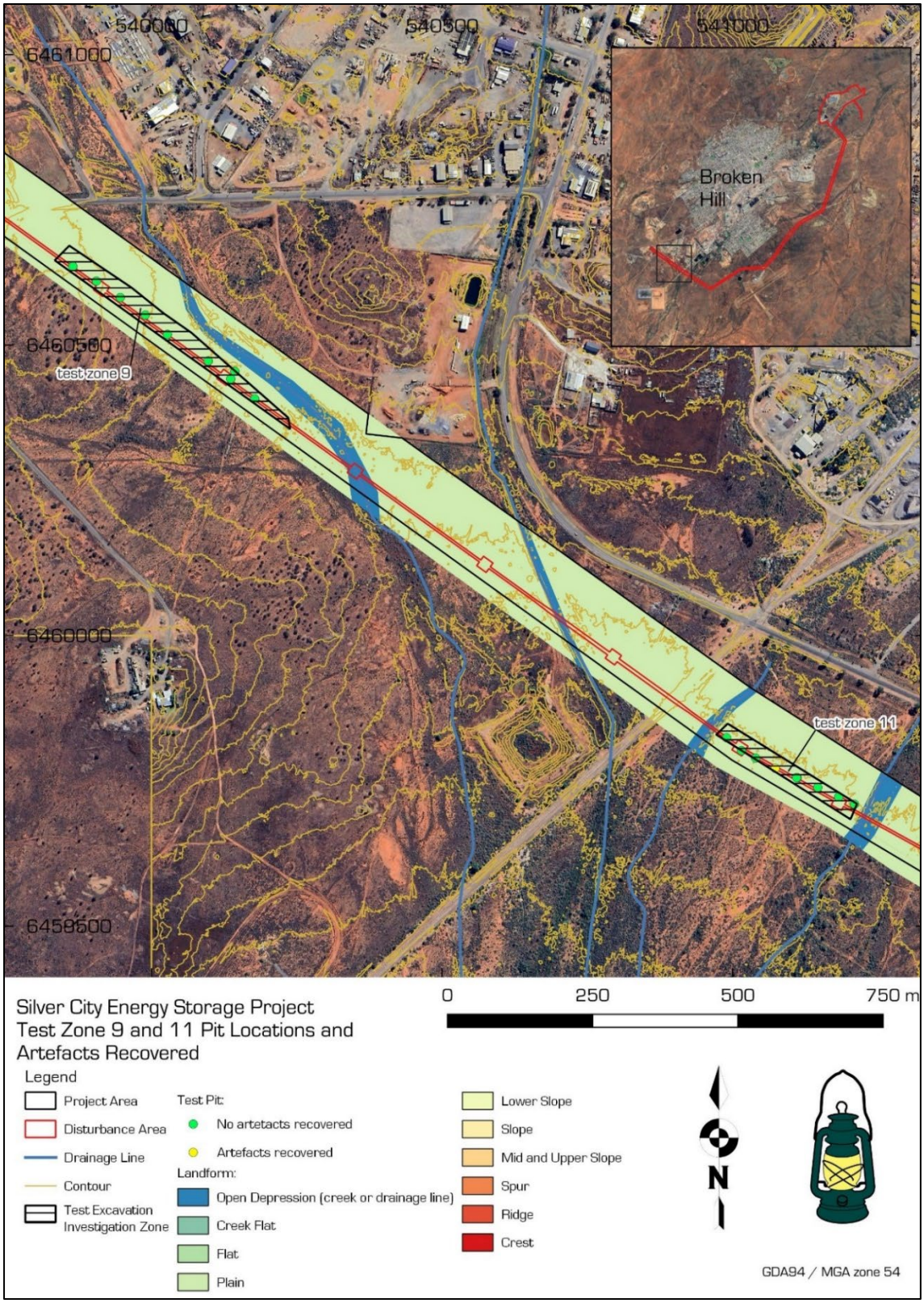


Figure 21: Test excavation locations and locations where artefacts were recovered in Test Zone 9 and Test Zone 11.

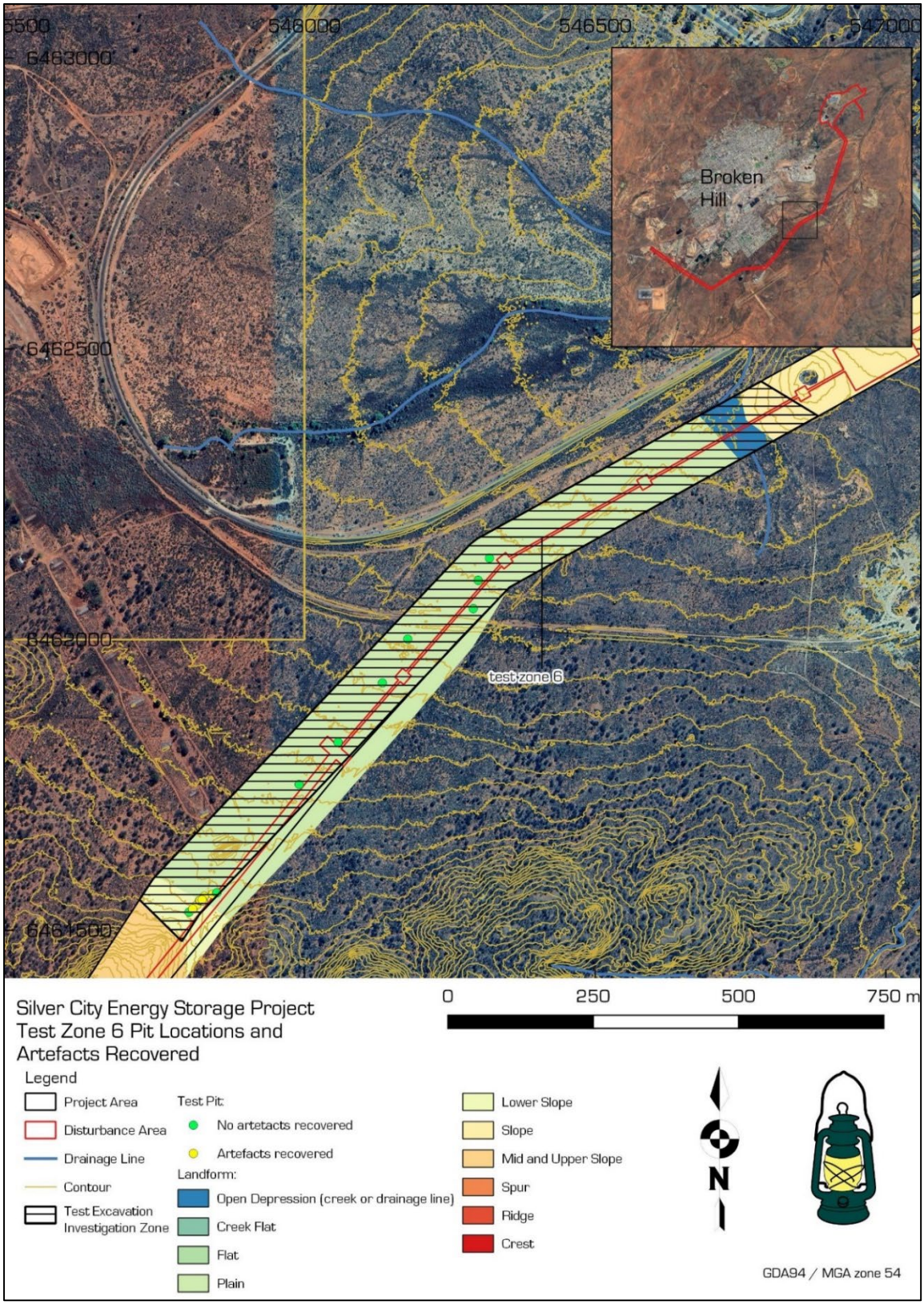


Figure 22: Test excavation location and locations where artefacts were recovered in Test Zone 6.

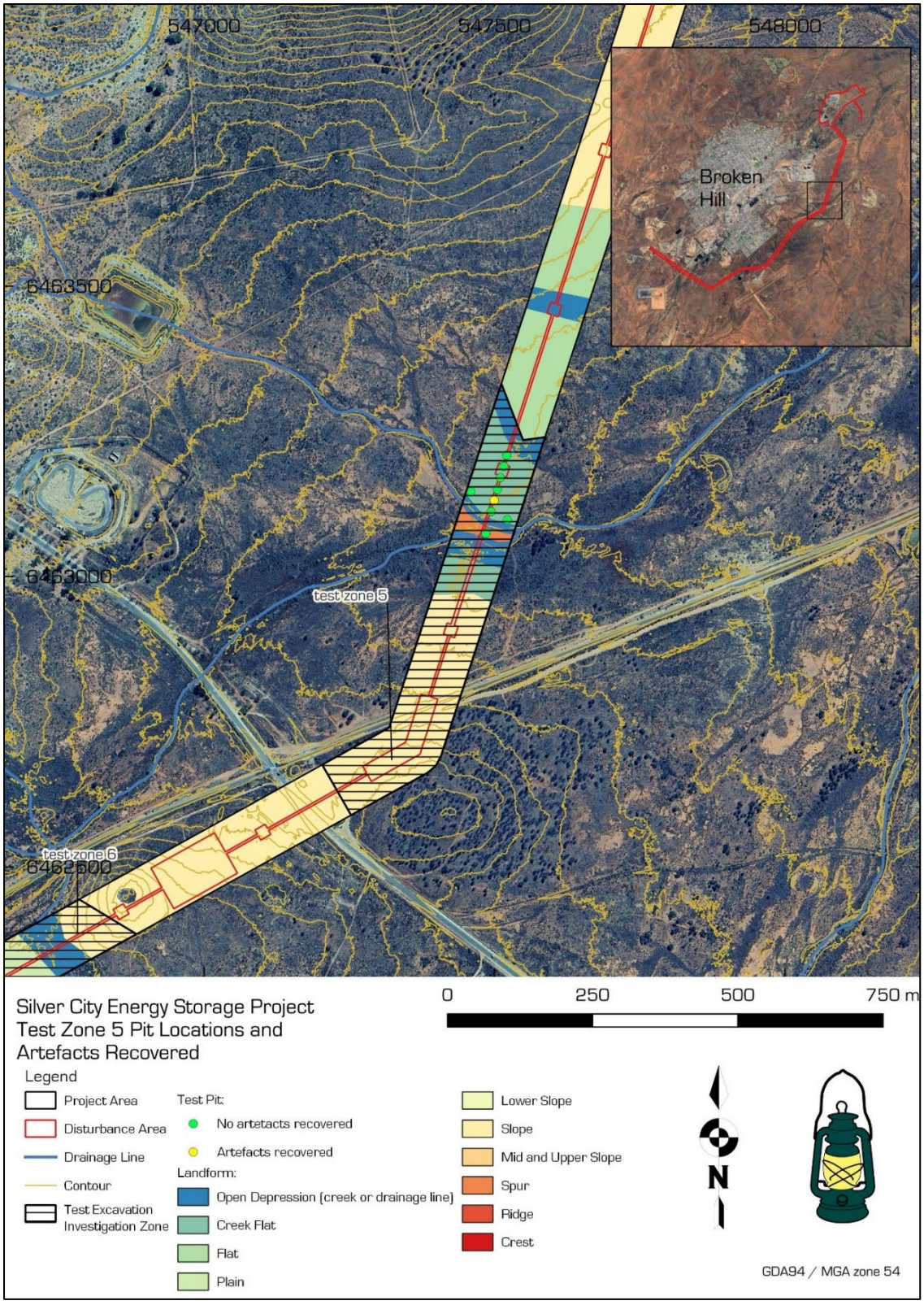


Figure 23: Test excavation location and locations where artefacts were recovered in Test Zone 5.

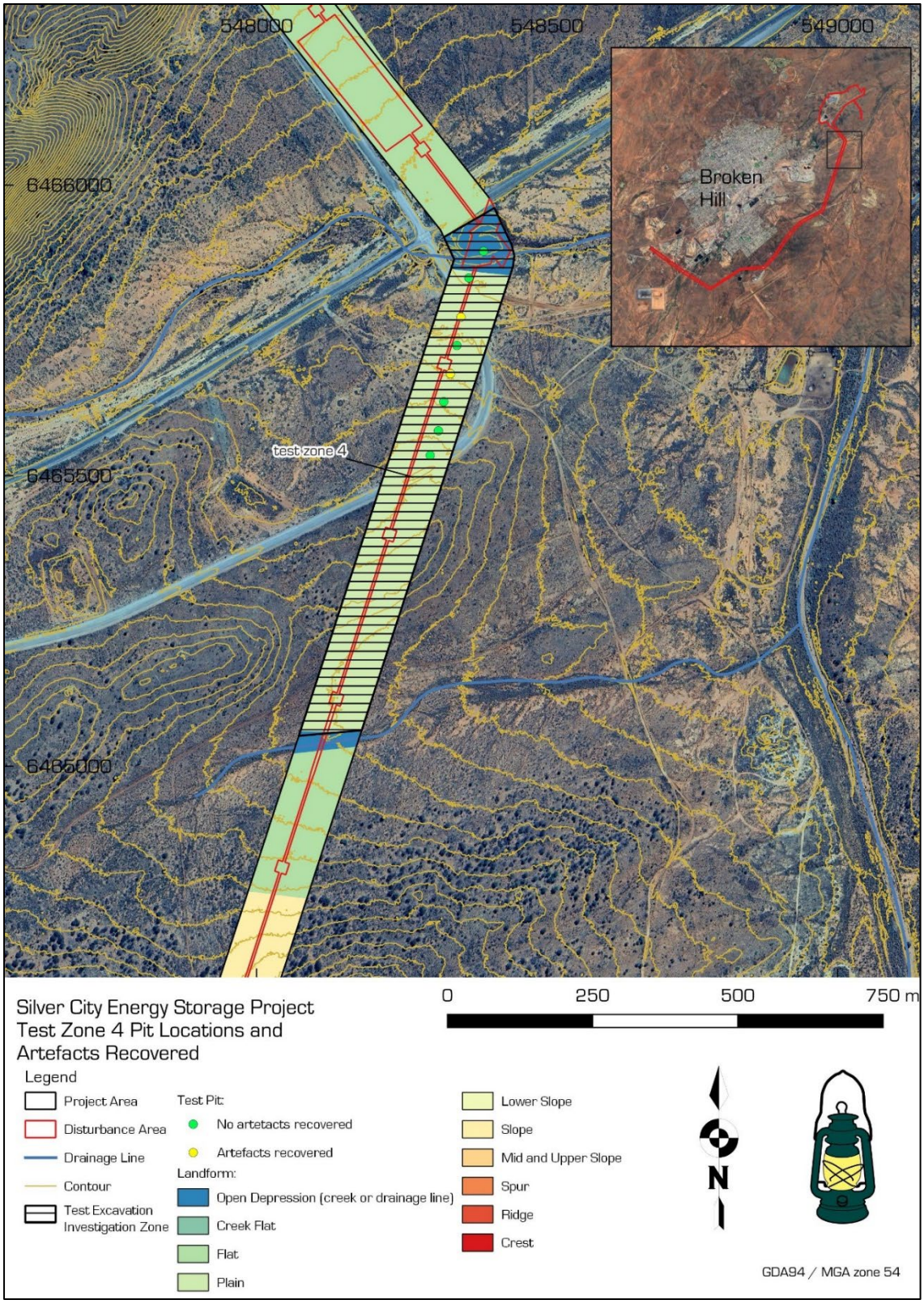


Figure 24: Test excavation location and locations where artefacts were recovered in Test Zone 4.

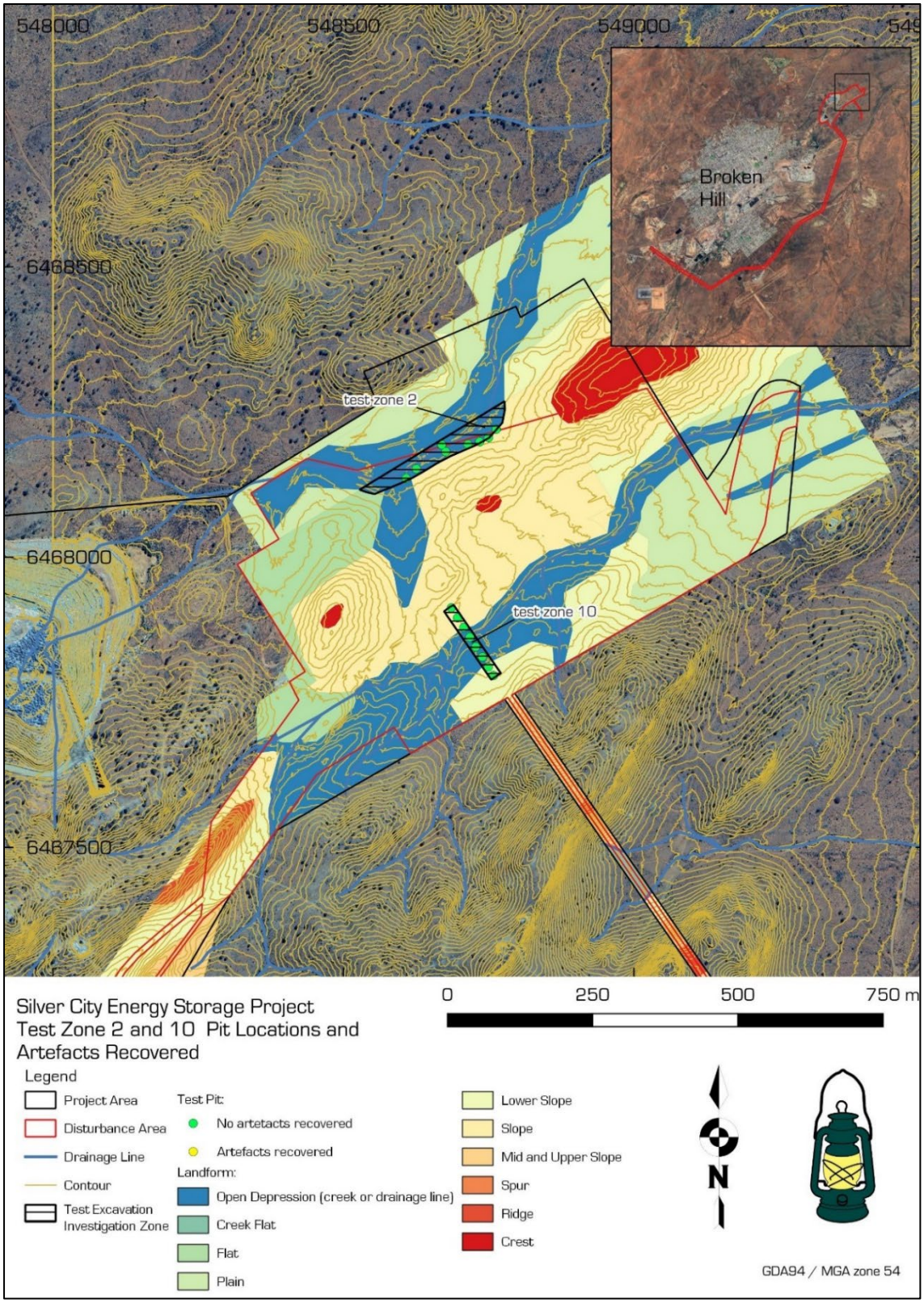


Figure 25: Test excavation locations and if applicable, locations where artefacts were recovered in Test Zone 2 and Test Zone 10.

6 CONSULTATION PROCESS

6.1 Overview

The NSW OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* was implemented by Lantern Heritage at the commencement of the project. The consultation process started in June 2022 with the Phase 1 field survey of the Project Area in August 2022 following community consultation. Summaries of the various stages in the consultation process are provided below, together with inputs received to date by Registered Aboriginal Parties (RAPs). Examples of correspondence and notifications sent out to Aboriginal groups and individuals are provided in Appendix 2 together with a summary log of all consultation.

The Aboriginal consultation stages included in Section 6 give opportunities to RAPs to provide culturally appropriate information relevant to the Project Area. These main phases of contribution opportunities with registered Aboriginal people are specified below:

Request for cultural information: As shown in Appendix 2, letters were sent out to the RAPs identified in Section 6.2 informing them of the Project proposal and asking them for any information about cultural significance on the proposed Project Area and an opportunity to provide feedback on proposed methodology(s). All Registered Aboriginal Parties were given until 9th August 2022, however as previously mentioned, it was made clear in the letters that information and other inputs would be welcome at any stage throughout the project. No cultural information contributions were provided during this stage.

Aboriginal community meetings: Following on from a project information session between Hydrostor and BHLALC, an additional Aboriginal community meeting was organized to create further opportunity for registered Aboriginal parties to provide cultural information. The planned meeting did not progress due to RAP availability issues and no other comments were received from RAPs.

Onsite visits: During fieldwork investigations and in accordance with the methodology(s), opportunities were given to site officers to provide information that will enable the cultural significance of Aboriginal objects and/or places on the proposed project area to be determined. Following the field investigations in particular prior to test excavation and following completion of investigations at each site, an onsite meeting was held between field archaeologists and BHLALC field representatives. These daily infield meetings provided all parties an opportunity to give input in the placement of test pits and potential management options following testing outcomes. No site specific inputs were provided by RAPs during the field work program. Overall, the infield RAP consensus revealed the Project Area continued to be an area utilised by Aboriginal people and considered part of a broader culturally valuable area.

6.2 Stage 1

The first stage (1a) of the consultation process involved the identification of potential stakeholders and invitations to register an interest in the program. This initially involved letters (refer to Appendix 2) sent out to the following organisations on 2nd June 2022:

- Office of the Registrar Aboriginal Land Rights Act 1983 (Office of the Registrar ALRA); Aboriginal Cultural Heritage Regulation Team, Heritage NSW – Queanbeyan;
- Native Title Services Corp (NTS Corp);
- National Native Title Services (NNTS); Geospatial search request Local Land Services; (LLS) (no longer wish to supply information)
- Broken Hill Local Aboriginal Land Council;
- Broken Hill Shire Council;

Newspaper advertisements (refer to Appendix 2) were also placed in the: Barrier Truth ran on 8th June 2022;

Following receipt of advice from the above agencies, invitations to register for the project were sent out to the following groups, organisations and individuals (Stage 1b) on the 21st June 2022:

The closing date for initial registrations of interest was 6th July 2022.

Organisation	Name	Email/ Post	Registered
Barkandji Native Title Determinants (c/o NTSCorp)	Badger Bates	E	
Broken Hill LALC		E	
Mutawintji Board of Management	Brett Norman (Chair)	RP	
Corroboree Aboriginal Corporation	Director: Marilyn Carroll-Johnson	E	
Gary Pappin	Gary Pappin	RP	
Menindee Aboriginal Elders Council		RP	
Mutawintji LALC		RP	
Pappin Family Aboriginal Corporation		RP	
Wakool Indigenous Corporation		E	
Wilyakali Aboriginal Corporation (via 3rd party)	Maureen and Dulcie O'Donnell	E	

At the conclusion of Stage 1B of the consultation process, registrations of interest were received from the following groups and individuals (RAPs):

- Broken Hill LALC - Joanne O'Donnell
- Barkandji - via NTSCorp
- Wilyakali - Maureen O'Donnell (Communication was difficult to establish and we considered her registered as a courtesy. Consultation was done via 3rd Party and Lantern Heritage was advised that Maureen was unwell).
- Two undisclosed parties who requested anonymity

The Mutawintji Board of Management responded, nominating the Broken Hill LALC and the Barkandji Prescribed Body Corporate (PBC) and knowledge holders for the Project Area. Stage 1 letters were resent to the nominated organisations using updated contact details provided by the Board of Management.

The details of registering Aboriginal parties and/or individuals (except where the group or individual sought anonymity) were provided to the Broken Hill LALC and Heritage NSW – Southern Branch, as per the direction of the Heritage NSW letter (ref: Doc22/439029).

6.3 Stage 2 and 3

Each of the RAPs that confirmed their interest in the project (see above) were then contacted again by letter with more detailed information relating to the Project, the proposed field survey

methodology, including anticipated timelines, and details of known Aboriginal sites in and around the Project Area. These letters were sent out on the 13th July 2022 (refer to Appendix 2).

RAPs were invited to provide feedback, in writing, in person or over the phone, in order to:

- Identify, raise and discuss their cultural concerns, perspectives and assessment requirements;
- contribute to the research methodology and culturally appropriate information gathering
- provide information regarding the cultural significance of Aboriginal objects and/or places in the proposed project area; and
- have input into the development of any cultural heritage management options.

The formal closing date for feedback was the 9th August 2022 However, it was made clear in the letters that information and other inputs would be welcome at any stage throughout the Project. Furthermore, options were made available for providing restrictions on any information provided, so as to ensure that culturally sensitive information is not circulated inappropriately. Options were also provided for delivering and handling information that might relate to specific women's/men's business through appropriate gendered channels.

6.4 Field investigation: Site Survey

On 29 July 2022 invitations to participate in a survey were sent to the following RAPs.

- Broken Hill LALC - Joanne O'Donnell; and
- Barkandji (via NTSCorp).

Phase 1 site survey was conducted over 7 days from 10 August 2022 with participation from Broken Hill Local Aboriginal Land Council (BHLALC) representatives: Abishai White and Raymond O'Donnell (Jnr). Topics discussed during the fieldwork included, but were not limited to, the traditional use/function of the site and broader landscape, the significance of the Aboriginal cultural heritage, proposed impacts of the Project, management strategies and the potential for subsurface distribution of stone artefacts.

During site survey, opportunities were given to site officers to provide information that enabled the cultural significance of Aboriginal objects and/or places on the proposed project area to be determined

Feedback indicated that the Project Area is part of a broader landscape of high cultural significance that may have been directly associated with other places of cultural significance in the area, such as traditional resource areas, occupation camps and ceremony sites.

6.5 Aboriginal community meetings – 2022

On 28 September 2022 an in-person meeting was held between Paul Rasmussen (Hydrostor) and the Broken Hill LALC Board Members. Paul provided an information session on the Project and answered general questions about the operation of the Project. The Board raised issues around access agreements and development of the Cultural Heritage Management Plan. These items were discussed and the Board expressed their preference to communicate directly with Hydrostor about refinement of powerline alignments.

As a result of this meeting A-CAES NSW is developing an Indigenous Participation Plan (IPP), to be implemented as part of the Project. The IPP will being developed in consultation with Broken Hill Local Aboriginal Land Council (BHLALC), the Wilyakali and Barkindji Aboriginal Corporations and the Department of Education, Skills, and Employment as part of A-CAES NSW's broader engagement with the Broken Hill community. The IPP aims to investigate options for prioritising the employment of local Indigenous people and commit to the implementation of specific procurement actions to ensure the local and regional Aboriginal community continue to have the opportunity to be involved in the Project through the construction and operational phases.

In addition, Hydrostor are also proposing an agreement with the Broken Hill Local Aboriginal Land Council (BHLALC) that represents the interests of the whole Aboriginal community in and around the Broken Hill Region. A long-term program of tertiary scholarships (TAFE and University) for Aboriginal students; a cultural heritage awareness training program (internal and external); a social housing program and co-development of shared facilities on BHLALC land.

Following on from the meeting with Broken Hill LALC, a subsequent invitation was sent to RAPs to participate in an on-line meeting to discuss the findings of the Phase 1 field survey. The following groups were invited

- Broken Hill LALC - Joanne O'Donnell;
- Barkandji (via NTSCorp);
- 2 anonymous RAPs.

The proposed online meeting did not proceed due to lack of availability.

6.6 Field Investigation: Archaeological Test Excavation Program

On the 15th December 2022 a test excavation methodology was sent out to RAPs. The response time for feedback on the methodology was extended by five days to allow for Christmas shutdown and stated as 23 January 2023. The methodology was sent to the five RAPs.

The methodology was sent to Heritage NSW on the same day. Correspondence was received from one of the anonymous RAPs confirming they had no issue with the methodology.

Response from Renee Powell to advise that Aunty Maureen O'Donnell had sadly passed away. Alternative contacts were sought and letters sent but no response was received, however Wilyakali were represented via the Broken Hill LALC.

The test excavation program and Phase 2 survey was conducted over 7 days from 1 February 2023 with participation from Broken Hill LALC representatives: Raymond O'Donnell (Jnr), Abishai White, Ricky Menz and Regan O'Donnell.

During the test excavation program and following completion of investigations at each site, an onsite meeting was held between field archaeologists and BHLALC field representatives. These daily infield meetings provided all parties an opportunity to give input in the placement of test pits and potential management options following testing outcomes. No site specific inputs were provided by RAPs during the field work program. Overall, the infield RAP consensus revealed the Project Area continued to be an area utilised by Aboriginal people and considered part of a broader culturally valuable area.

6.7 Stage 4

Draft copies of this ACHAR and the accompanying archaeological report were sent out to each of the RAPs on 13th April 2023. The deadline for providing comments on the draft report was 11th May 2023. However, Broken Hill LALC requested additional time and a response was received on 16th June 2023 (See also Appendix 2). This report has been updated in response to BHLALC feedback.

The BHLALC response following review of the draft ACHAR has provided further cultural information expanding the LALC's knowledge of the indigenous values of the area. The potential management options provided by BHLALC have been carefully considered and where feasible, incorporated into the mitigation strategies. Management options have also taken into account how Aboriginal people can continue their association with identified Aboriginal heritage values.

A summary of feedback received from RAPs together with responses and actions arising from that feedback, are provided below in Table 8. These responses and actions were addressed by Lantern prior to submission of EIS for exhibition.

Table 8: Summary of feedback received on the draft ACHAR (prior to submission for exhibition) and actions and responses arising from that feedback.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC	Request for further information and clarification on documentation on how Aboriginal people were considered in development of mitigation and management strategies.	Section 6 expanded and updated with additional details provided regarding the consultation process.
	Recommend ACHMP be developed before construction.	Agreed and recommendations updated to reflect this.
	Recommend that cultural inductions facilitated by the Wilyakali Aboriginal Corporation be a requirement for all construction and facility workers.	Agreed and recommendations updated to reflect this.
	Recommend that staged salvage be implemented at all impacted sites	Agreed and recommendations updated to clarify this.
	Recommend formal acknowledgement that any and all testing and salvage samples and data is collected on behalf of the BHLALC and Wilyakali people, this includes all reports. Such data is not to be shared or published without prior approval from both the BHLALC and Wilyakali people.	Noted and report updated as follows: Copyright section 1.3.2 A meeting was held to relay Proponent's reporting obligations to BHLALC.
	Recommend that any references to Aboriginal community protocols specify either "Broken Hill Aboriginal community", or "BHLALC in consultation with Wilyakali people".	Noted and implemented as requested.
	Recommend the following wording with regards to gender specific cultural material "Men and Women material will be managed in a cultural appropriate way in accordance with Wilyakali protocols."	Noted and implemented as requested.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC continued	Recommend that the auger survey be RAP monitored.	Agreed and recommendations updated to reflect this.
	Recommend that decisions regarding final placement of salvage pits be made in consultation with RAPs recognised by the BHLALC.	Agreed and recommendations updated to reflect this.
	Recommend that references to "community monitoring" specify BHLALC or RAP monitoring.	In accordance with the recommendation above, this has been further specified as follows "monitoring by RAPs recognised by the BHLALC).
	Recommend cross referencing to the AR be facilitated through a table with relevant page numbers. Noted that the reports were difficult to read.	Noted and implemented on Page 82 of this report
	Provided clarification around appropriate ways to reference culturally significant places and stories.	That information and advice has been implemented as requested.
	Dispute the assessment that the proposed mitigation measures will mean that "cumulative impacts will be low and within acceptable limits".	Additional discussion/clarification provided in Section 10.5
	Invitation to discuss the BHLALC's recommendations with the BHLALC Board.	An online meeting was held prior to submission to discuss the letter provided by BHLALC and the responses documented in this table.
	Expressed disappointment regarding the documentation of local Aboriginal history and the process for gathering information relating to Wilyakali historical local land use.	Noted, additional information regarding Wilyakali historical land use would be welcome. However, this information has not been provided – refer to more detailed discussion of consultation above on Sections 6.3-6.6.
	Questioned the assessment of prior and cumulative impacts on the archaeological record and cultural heritage of the region.	Additional discussion/clarification provided in Section 10.5

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC continued	Provided clarification on the organisation/persons recognised as knowledge holders within the BHLALC Boundary.	This information is noted and gratefully received. The organisation/persons identified by the BHLALC are the ones that will be directly involved in activities "on Country". However, it is also noted that there is a legislated requirement to consult with all Registered Aboriginal Parties. So under the current legislative framework, consultants and proponents are not authorised to exclude a RAP from the consultation process.
Wilyakali Aboriginal Corporation	Refer to correspondence from BHLALC.	Refer to responses to comments from BHLALC.
Barkandji	No formal feedback.	NA
Anonymous RAP 1	No formal feedback.	NA
Anonymous RAP 2	No formal feedback.	NA

6.8 Meeting with Broken Hill LALC – 6 April 2024

A workshop between Hydrostor and BHLALC to discuss the project and revised AR and ACHAR was held in Broken Hill on Saturday 6 and Sunday 7 April 2024. Lantern was unable to attend.

The workshop discussed the Heritage NSW submission and the Lantern's changes to the ACHAR and AR as requested by BHLALC in 2023. A number of additional changes were requested at this workshop by BHLALC as detailed in Table 9 below and in the letter included in Appendix 2. . Lantern addressed these changes as shown in Table 9,

Table 9: Summary of feedback received on the revised ACHAR (following HNSW review) and actions and responses arising from that feedback.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC	The archaeologists (Lantern) did a poor job of consulting the Broken Hill LALC	Lantern was unable to attend the meetings with BHLALC and Hydrostor. We followed the consultation guidelines as required and have made major changes to the format of reports and recommendations based on feedback from BHLALC. In addition, Lantern provided BHLALC with an additional 28 days to review the draft report.
	The Wilyakali Aboriginal Corporation and the Broken Hill LALC were the only participating RAPs	Agree that these two RAP groups were the only two participating in the fieldwork. However, as stated in Table 8, it is a requirement under the current legislation that any RAP group for the project cannot be excluded from the consultation process.
	Broken Hill LALC concerned that other RAPs were disclosed information when two of these RAPs were themselves undisclosed	As stated above, any RAPs registered for the project cannot be excluded from the consultation process. BHLALC did not advise Lantern that there was confidential information included in the report.
	The Cultural Heritage Management Team and the Sites Officers facilitated the archaeological survey but were not to be relied upon for authoritative consultation	Lantern considers that field survey and report reviews can both contribute to the consultation process.
	Section 10.3.5 of the ACHAR to refer only to the Wilyakali Aboriginal Corporation and the Broken Hill LALC and the rest of the document updated the same way wherever RAPs referred to.	Noted and implemented as requested.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC cont'd	The Cultural Heritage Management Plan must specify a location for artefact storage	Noted and updated in Section 10.3.1
	Broken Hill LALC has raised concerns about the difficulty of reading and cross-referencing reports, this is noted and will be passed on to the archaeologists	As requested previously, a table that cross references the AR and ACHAR was added to Page 82 of this report
	The review of Sections 4.2 and 4.3 of the ACHAR is intended to address the initial lack of local Aboriginal history as requested by Heritage NSW., Broken Hill LALC to provide any further input following review. The following revised Sections in ACHAR V2.3: Section 4.3; Section 4.3.1; Section 4.3.1.1; Section 4.3.1.2; Section 4.3.1.3; Section 4.3.1.4; Section 4.3.2; Section 4.3.2.1 Are not accepted by BHLALC. The following revised Sections in ACHAR V2.3: Section 4.3.2.2; Section 4.3.3 Are accepted by BHLALC.	Changes to Section 4 (Archaeological context) updated as requested by BHLALC.
	Section 4.2.1: Pinnacles referencing to be approved by Wilyakali.	No approval from Wilyakali received. This section is unchanged.
	With respect to minimization of harm, this term is used in NSW State Government guidance material, it is agreed that wherever possible harm must be avoided rather than minimized. To be incorporated into the ACHMP.	Noted and implemented.
	The review of Section 10.5 of the ACHAR is intended to address the initial lack of discussion on cumulative impact, Broken Hill LALC to provide any further input following review	No further input on Section 10.5 received from BHLALC.
	Report to be updated to change "Metz" to "Menz"	Noted and updated.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC continued	Section 10.3.4 The term "unusually" requested to be removed from reference to triggers to start open-area salvage.	This change not implemented as one of the triggers for starting open-area excavation is identification of an area of 'unusually' high density artefact scatter relative to the local area.
	Section 3.1 page 21 Updated wording "The three major language groups for Broken Hill region include Barkindji, Mayyankapa and Nyiimpaais is Wilyakali. These Aboriginal groups focused inland on the arid centre"	Noted and updated.
	Section 3.1 page 21 Removal of: The dreamtime of Natchie (Rainbow serpent) that created the Darling, Darling River Anabranches, and the River Murray, and to which other ancestral beings travelled through from the Anabranch using lakes to reach Pine Creek and the Pinnacles (Niche et al. 2017,207; Martin 1999). Stephens Creek, located near Broken Hill, contains waterholes and upper reaches that have long association with spiritual and ceremonial ways of life (Martin 1999)	Noted and updated.
	Section 10.3 Update wording to include Broken Hill: Enable the recovered cultural material to be repatriated to site in accordance with Broken Hill Aboriginal community protocols.	Noted and updated.

RAP	Feedback/Comment	Response/ Action from Lantern
Broken Hill LALC continued	Section 10.3.2 Update wording: Within sites of moderate-high or greater archaeological scientific value and landforms with high archaeological sensitivity a RAP monitored borehole survey should be conducted in accordance with the Aboriginal Cultural Heritage Management Plan	Noted and updated
	Section 10.3.5 Inclusion of: Cultural Monitoring procedure will be determined by the BHLALC and Wilyakali when developing the Aboriginal Cultural Heritage Management Plan.	Noted and updated

6.9 Update on revised disturbance area

On 20 June 2024 Lantern sent emails to the RAPs with an update on the revised disturbance area for the project. The email also included links to community feedback pages for the project.

One anonymous RAP replied to say they will 'check out' the revised disturbance area. No further correspondence was received.

NTSC Corp responded on behalf of Barkandji requesting further information on the proposed ACHMP and mitigation measures. Lantern informed NTSC Corp that the ACHMP has not been drafted yet as it will be developed post approval. In relation to the mitigation measures, Lantern advised NTSC Corp that the proposed mitigation measures were included in the ACHAR sent to Barkandji on 13 April 2023. No further correspondence was received.

6.10 Meeting with Broken Hill LALC – 22 June 2024

On 5 June 2024, the BH LALC was provided written advice regarding the proposed amendments to the Project and the minor changes to the disturbance area.

The BH LALC was also provided a direct link to the Project Community Portal with detailed information regarding the proposed amendment.

The BH LALC CEO advised the information and link would be shared with the Board.

On 22 June 2024, the Board (consisting of 5 members) were taken to site and the proposed project amendments visually shown and explained.

The attending Board members did not raise any concerns.

7 ANALYSIS AND DISCUSSION

7.1 Regional context

The ethnohistorical accounts and histories for the Broken Hill region indicate that the Project Area has been utilised by Aboriginal people right through to the twentieth century. This area is recognised as a place of continued importance to Aboriginal people today and provides tangible links to Dreamtime stories.

Within the Project Area evidence of Aboriginal occupation primarily comprises flaked stone artefacts made from white quartz, and hearth remains. The knapped stone artefacts recovered from the test excavations are consistent with their local context in terms of raw materials and site types. The Project Area and its immediate vicinity contain many low-density artefact scatters and isolated finds similar to those found during excavation. The majority of artefacts recovered were quartz suggesting that Indigenous people were utilising local, easily accessible material for most of their knapping, such as the quartz outcrop quarries recorded at AHIMS sites #23-5-0122 and #23-5-0123.

While the AHIMS database shows that artefacts in the region have been found made from silcrete and chert, it is unlikely that the lack of these materials in the test excavation artefact assemblage is archaeologically significant. Rather it is more likely that the sample of artefacts recovered was too small to adequately reflect the diversity of the subsurface assemblages in terms of materials used or presence of retouched implements. It is also likely that the diversity of artefacts has been reduced within the Project Area by the impact of private citizens collecting artefacts from surface lag deposits. This lack of diversity is also evident in the distinct lack of edge ground and ground surface tools recorded in the Project Area when compared to artefact assemblages reported in nearby archaeological surveys.

The lack of retouched implements and diversity of raw material types within the assemblage means that it is difficult to draw any conclusions about how the archaeology in the Project Area fits within its regional context.

7.2 Predictive model review

Based on the results of previous investigations and the survey and excavation conducted by Lantern, it is predicted that the location and size of sites tends to reflect the nature of nearby water resources. That is, landforms within the Project Area closer to drainage features are likely to be characterised by more diverse and extensive artefact scatters and hearth features than those at a greater distance to water.

The uplands within the Project Area comprised rocky low relief hills and slopes, many with reef and boulder outcrops of white quartz. A number of these higher quality quartz outcrops showed signs of raw material extraction and were recorded as Aboriginal quarry sites. No cultural information in relation to the Marnbi Dreamtime story has been provided by RAPs, however, this does not mean it doesn't exist as there are various reasons and/or restrictions regarding passing on of knowledge.

The predictive statement presented in Section 4.7 suggests that Aboriginal burial sites in western NSW are most likely found in lake and alluvial environments and in association with features such as midden, lunettes and other soft or sandy sedimentary soils and will be rare in rangeland environments such as the Barrier Ranges. The Project Area has a combination of aggrading and eroding soils which result in removal and burial of past ground surfaces. The results of this study's subsurface archaeological testing found that high numbers of visible surface artefacts did not always indicate the presence of subsurface archaeological deposits. Although no burial sites were located during this investigation, due to the presence of soft, sandy alluvial deposits across the Project Area (Figure 13), the potential for burials is considered low.

8 SCIENTIFIC VALUES AND SIGNIFICANCE ASSESSMENT

This section details a full assessment of all cultural heritage values for the Project Area. It has been compiled in accordance with the processes outlined in the Burra Charter (ICOMOS 2013). Each of the sub-sections below provides an overview of how different cultural heritage values are defined in the Burra Charter, followed by discussion of how these values apply to the Project Area and the site assessed during field survey. This is followed by statements of significance for the part of the site where impacts are anticipated.

8.1 Social or Cultural Values

Within the Burra Charter Practice Note on *Understanding and Assessing Cultural Significance* (AICOMOS 2013b: 4) Social Value is defined as follows:

Social value refers to the associations that a place has for a particular community or cultural group and the social or cultural meanings that it holds for them.

Within the context of assessing Aboriginal cultural heritage, spiritual values are often closely tied to social values. Within the Burra Charter Practice Note on *Understanding and Assessing Cultural Significance* (AICOMOS 2013b: 4) Spiritual Value is defined as follows:

> *Spiritual value refers to the intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual value may also be reflected in the intensity of aesthetic and emotional responses or community associations, and be expressed through cultural practices and related places.*

The qualities of the place may inspire a strong and/or spontaneous emotional or metaphysical response in people, expanding their understanding of their place, purpose and obligations in the world, particularly in relation to the spiritual realm.

The term spiritual value was recognised as a separate value in the Burra Charter, 1999. It is still included in the definition of social value in the Commonwealth and most state jurisdictions. Spiritual values may be interdependent on the social values and physical properties of a place.

Anthropological research published by Lindy Warrell in 1995 demonstrates the ongoing connection of contemporary Aboriginal communities to the Broken Hill area in general and the Pinnacles specifically. Located approximately 8km southwest of the Project Area, the Pinnacles are three distinctive rocky peaks and is a significant site to the Wilyakali people.

During the consultation process RAPs indicated that the Project Area is part of a broader landscape of cultural significance utilised for foraging activities. The Project Area contains Archaeological sites that establish a link to these traditional cultural activities. The various sites recorded within the Project Area and the broader landscape of Broken Hill are assessed as being of high Aboriginal cultural value.

8.2 Historic Values

Within the Burra Charter Practice Note on *Understanding and Assessing Cultural Significance* (AICOMOS 2013b: 3) Historic Value is defined as follows:

Historic value is intended to encompass all aspects of history—for example, the history of aesthetics, art and architecture, science, spirituality and society. It therefore often underlies other values. A place may have historic value because it has influenced, or has been influenced

by, an historic event, phase, movement or activity, person or group of people. It may be the site of an important event. For any place the significance will be greater where the evidence of the association or event survives at the place, or where the setting is substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of such change or absence of evidence.

The Project Area contains historic values relating to early exploration of central Australia and mining activities from the late 19th century. The City of Broken Hill (including the majority of the Project Area) is registered on the National Heritage List in recognition of the city's mining operations and contribution to the development of Australia as a modern country. Evidence of small-scale mining activities are visible within the Project area. The Project Area is considered to have low-moderate historic values as part of the landscape that contributes to the overall heritage value the City of Broken Hill.

8.3 Scientific / Archaeological Values

Within the Burra Charter Practice Note on *Understanding and Assessing Cultural Significance* (AICOMOS 2013b: 3-4) Scientific Value is defined as follows:

Scientific value refers to the information content of a place and its ability to reveal more about an aspect of the past through examination or investigation of the place, including the use of archaeological techniques. The relative scientific value of a place is likely to depend on the importance of the information or data involved, on its rarity, quality or representativeness, and its potential to contribute further important information about the place itself or a type or class of place or to address important research questions. To establish potential, it may be necessary to carry out some form of testing or sampling. For example, in the case of an archaeological site, this could be established by a test excavation.

The assessed scientific values for the identified sites within the Project Area have been determined on the basis of the sites' rarity, representativeness, and archaeological potential. Table 41 contains a summary of scientific significance for sites located within the Project Area. The site by site analysis of scientific significance is included in Appendix 3.

Forty-nine (49) sites located within the Project Area are assessed as having low scientific value at a local level. These sites have demonstrated low potential to inform the broader understanding of Aboriginal occupation of the semi-arid region east of Broken Hill. These sites retain limited research potential and are comprised of low to very low artefact density or scatter hearth retainers. These sites are representative of the most common site types found in the local area and there are likely to be many other similar examples within the region.

Six sites have low-moderate scientific values. Within the Project Area these sites are low density artefact scatters, that form part of a broader complex of sites within the immediate area. Each of these sites is assessed as having moderate integrity (subsurface potential) and is considered a typical example of the most common site types found within far western NSW. These sites have low- moderate potential to add to our knowledge of Aboriginal occupation of the local area. These sites have a relatively higher rarity and representative value than sites of low-moderate significance.

Four sites are assessed as having moderate scientific significance. Within the Project Area these sites contain artefact scatters, quarry and/or hearth features with low to moderate site integrity (subsurface potential). These sites may contribute to our understanding of Aboriginal occupation in the local area through their association with other archaeological sites, landscape features or other areas of heritage value. In addition, features such as a relatively large and/or diverse stone artefact assemblage mean that these sites have a relatively higher rarity and representative value than sites of low-moderate significance.

Seven sites are assessed as having moderate-high scientific values. These sites contain artefact scatters with hearths and elements such as stone features and have varying degrees of moderate to moderate-high site integrity (subsurface potential). These sites are part of a broader complex of sites within the immediate area and have relatively higher representative and rarity value than sites of moderate significance. Further investigation of these sites may contribute to our understanding of Aboriginal occupation within the Broken Hill region, in particular through their relationship with other sites, landscape features or other areas of heritage value.

Table 10: Summary of Scientific Significance for sites located within the Project Area*.

Scientific Significance	# of sites	Name of sites (AHIMS #)
Low	49	FD-IF19 (#23-5-0146), BH AFT/HTH 1(#23-5-0170), PM-Q4 (#23-5-0121), FD-IF16 (#23-5-0154), PM-G02 (#23-5-0125), BH AFT 3 (#23-5-0171), BH AFT 4 (#23-5-0172), PM-G03 (#23-5-0126), BH AFT 11 (#23-5-0175), BH AFT 12 (#23-5-0176), BH AFT 13 (#23-5-0177), BH AFT/HTH 16 (#23-5-0180), BH AFT 17 (#23-5-0181), PM-Q3 (#23-5-0120), PM-Q7 (#23-5-0127), BH AFT 30 (#23-4-0703), BH AFT 31 (#23-4-0704), BH AFT 34 (#23-4-0711), BH AFT 35 (#23-4-0710), BH AFT 36 (#23-4-0709), BH AFT/HTH 37 (#23-4-0709), BH AFT 38 (#23-4-0707), BH HTH 39 (#31-1-0727), BH AFT 40 (#31-1-0726), BH AFT 41 (#31-1-0725), BH AFT 42 (#23-4-0706), BH AFT 43 (#23-4-0705), BH AFT 44 (#23-5-0183), BH AFT 45 (#23-5-0182), BH HTH 47 (#23-5-0191), BH AFT 48 (#23-5-0190), BH AFT 49 (#23-5-0189), BH AFT 50 (#23-5-0188), BH HTH 52 (#23-5-0186), BH AFT 53 (#23-5-0185), BH AFT 54 (#23-5-0184), BH AFT 23 (#23-4-0699), FD-IF01 (#23-5-0140), FD-IF03 (#23-5-0138), FD-IF18 (#23-5-0152), PM-Q5 (#23-5-0122), FD-IF14 (#23-5-0156), PM-Q6 (#23-5-0123), FD-IF02 (#23-5-0139), PM-IF6 (#23-5-0131); FD-IF7 (#23-5-0153) BH AFT 18 (#23-5-0169), BH AFT 28 (#23-4-0701), Kanandah 1 (#23-4-0640)
Low- Moderate	6	BH AFT 8 (#23-5-0173), BH AFT/HTH 15 (#23-5-0179), BH AFT/HTH 16 (#23-5-0180),BH AFT 25 (#23-4-0700), BH AFT 29 (#23-4-0702), BH AFT/HTH 51 (#23-5-0187)
Moderate	4	BH AFT 22 (#23-4-0698), BH HTH 27 (#31-1-0724), BH AFT 14 (#23-4-0178);BH AFT/HTH 19 (#23-5-0168)

Scientific Significance	# of sites	Name of sites (AHIMS #)
Moderate- High	7	BH AFT/HTH 10 (#23-5-0174), BH HTH 26 (#31-1-0723), FD08 (#23-5-0141), BH AFT 46 (#23-5-0192); BH1-48 (#23-5-0063), South airports regency area isolated artefacts (#23-4- 0682), BH AFT 20 (#23-4-0697),

* This table updated from the exhibited version. Of the five sites with multiple features that were originally assessed as having low significance, two of these were revised to low-moderate or moderate. Of the remaining three sites: one site was incorrectly named as having artefacts and hearth, when it only had hearth features (#23-5-0186). The name has been updated to BH HTH 52 throughout the reports and with AHIMS. Sites BH AFT/HTH 1 and BH AFT/HTH 37 remain at low significance as they both contain 'possible dispersed hearth features' in highly deflated soils with low potential for in situ deposits.

8.4 Aesthetic Values

Within the Burra Charter Practice Note on *Understanding and Assessing Cultural Significance* (AICOMOS 2013b: 3) Aesthetic Value is defined as follows:

Aesthetic value refers to the sensory and perceptual experience of a place— that is, how we respond to visual and non-visual aspects such as sounds, smells and other factors having a strong impact on human thoughts, feelings and attitudes. Aesthetic qualities may include the concept of beauty and formal aesthetic ideals. Expressions of aesthetics are culturally influenced.

Aesthetic values within the Project Area are most identifiable in terms of the overall landscape. So, while the identified sites may not be important in terms of the aesthetics of the archaeological deposits within them, or particular Aboriginal objects that are present, the vistas from those sites located on crests and in valleys are an important component of their aesthetic values.

The overall aesthetic value of sites within the Project Area is assessed to be moderate. However, the aesthetic values at the southern end of the Project Area are considered moderate to high in any location where the Pinnacles are visible. As part of the Marnbi Dreamtime story, a view to the Pinnacles is important to the local Barkinji people who 'like to have them in their sight' (Martin 1999).

The potential impacts of the Project on the aesthetic values of the Pinnacles is considered to be negligible based on viewshed analysis as shown in Appendix 4. The direct intervisibility analysis between individual pole locations and each of the Pinnacles (Figure 3 in Appendix 4) shows that only transmission poles located at the southwestern end of the project will be visible from the Pinnacle. Of the total 69 transmission poles only 21 will be visible from the Pinnacles. Of these, seven will be visible from two of the peaks and only two poles will be visible from all three peaks. The transmission poles will not block any view of the Pinnacles.

While it is undeniable that the Project will have visual impacts around the southern margins of Broken Hill, these impacts will not have a significant impact on views to a and from the Pinnacles. The landscape on the southwest side of Broken Hill has been heavily disturbed by mining and other industrial activities such as a solar power farm, mining operations, the rubbish tip and railway lines. Within this highly modified industrial vista, the addition of transmission poles is considered to have a negligible impact on the aesthetic values of the Pinnacles.

8.5 Statement of Significance

The following statement of significance has been compiled on the basis of the Aboriginal consultation undertaken for this report, together with the research and accompanying archaeological analysis documented in the Archaeological Report at Appendix 1.

The Project Area has low-moderate historic values as part of the landscape surrounding the national heritage listed City of Broken Hill. It has high to very high Aboriginal cultural values as a landscape that links to the Dreamtime and provides ongoing connection to Country. The Project Area has moderate aesthetic values due to the visual links to the Pinnacles and it has moderate scientific values as an area that can contribute to our understanding of Aboriginal occupation in the Broken Hill region.

9 THE PROPOSED ACTIVITY

9.1 Overview

Previous human activities across the Project Area have caused varying degrees of observable disturbance to the land's surface. A consideration of these likely historic impacts to archaeological sites located in the Project Area is included in Section 2.3.

Broken Hill region was subjected to a high degree of tree clearance during the early mining days as the majority of machinery was steam powered. The introduction of stock to the region continued the demise of native vegetation as high stocking rates and droughts changed the local biota.

9.2 The Proposed Activity

Activities resulting in disturbance associated with the Project are summarised below:

- Construction of overhead/inground transmission line ranging in height:
- monopoles (max 30m in height) with access/maintenance access tracks;
- temporary hardstand pad at each monopole site;
- approximately 750 metres of inground power line with 20m easement, buried cable to mitigate firing range risk;;
- Construction of the SCES facility within a 700 x 300m above ground site (including associated buffers) which includes:
- Construction of creek diversion;
- Construction of 250,000 cubic metre underground cavern (cavern will utilise part of existing underground mining area and excavated material will be utilised to build proposed water reservoir);
- Construction of a 300 ML surface water reservoir, and
- Construction of above ground water pipeline

9.3 Potential Harm to AboriginalObjects

The Project includes the construction of a transmission line and the SCES facility (and associated infrastructure) (see Figure 2). The potential impacts associated with these works are described in detail below.

9.3.1 SCES Facility and Associated Infrastructure

9.3.1.1 Construction of the SCES facility and associated works

Excavation of soil will have an impact on any surface, Aboriginal objects and subsurface archaeological deposits. Movement of machinery during these activities will have an impact on Aboriginal objects located on the surface of the associated disturbance area. Any stockpiling of materials or laydown areas for machinery and implements may have a crushing impact on Aboriginal objects.

9.3.1.2 Construction or Formation of Environmental Infrastructure for Creek Diversion

The environmental infrastructure required to divert an existing channel and the excavation of a new channel and levees has the potential to damage or displace Aboriginal objects. This range of works will result in major ground disturbance, and as such have the potential to directly harm any Aboriginal objects present in this area. Sites not currently impacted by water flows may now be impacted from the modification of the natural flood plain water catchment movements.

9.3.1.3 Construction of 300ML surface water reservoir

Removal of vegetation, trees and topsoil followed by excavation of soil deposits to create a 300ML above ground water reservoir. Excavation of soil will have an impact on any surface, Aboriginal objects and subsurface archaeological deposits. Movement of machinery during these activities will have an impact on Aboriginal objects located on the surface. Any stockpiling of materials may have a crushing impact on Aboriginal objects. Following construction works, appropriate erosion and sediment control measures will be implemented and maintained. This range of works will result in major ground disturbance, and as such have the potential to directly harm any Aboriginal objects present in this area.

9.3.1.3.1 Proposed above ground water pipelines

Placement of the proposed above ground water pipeline has the potential to damage or displace Aboriginal objects that may be present on the surface where the supports for the pipeline are laid. However, impacts are considered to be minor and limited in area.

9.3.2 Proposed Transmission Line

9.3.2.1 Construction of Overhead Transmission Line

Placement of transmission access/maintenance tracks (informal single lane) and approximately 15.5 km of overhead transmission lines and monopoles within a 25m to 50m easement across the Project area. The full easement will not be disturbed, disturbance will be limited to the pole locations and establishment of access tracks in some locations. Works will include drilling of bore holes for each transmission pole which has the potential to damage or displace Aboriginal objects. In addition, installation of a temporary hardstand at each pole location is required. This range of works will result in ground disturbance, and as such have the potential to directly harm any Aboriginal objects present in this area.

9.3.2.2 Construction of Underground Power Line

Placement of approximately 750 metres of inground powerline within a 20m easement between Pole 29-30 at mid-section of the Project Area to mitigate firing range risk. In this section, the transmission line crosses an existing outdoor firing range. To prevent inadvertent risk from stray bullets hitting the overhead transmission line, the line will be buried instead. Disturbance within the section of underground power line will be limited to the transmission line works. Proposed activities include the use of a large machine to dig a trench for the power cable and this action has the potential to damage or displace Aboriginal objects. This range of works will result in major ground disturbance, and as such have the potential to directly harm any Aboriginal objects present in this area.

9.4 Assessment of Harm

As outlined above, various aspects of the Project have the potential to result in direct and/or indirect harm to Aboriginal objects. The Project involves the construction of the SCES facility, inground power line, overhead transmission lines and associated access tracks. The Proponent plans to use low impact construction methods to limit ground disturbance activities within highly sensitive locations as far as practicable.

While direct impacts are anticipated at many of the of sites within the Project Area, the degree of harm to the majority of these sites will be partial only and will result in partial losses of value. The areas of direct or indirect impact are largely restricted to the existing Willyama Common[1] areas that have already been disturbed through long term recreational use, pastoral use and/or mining activities. Outside of the proposed layout and associated disturbance area, the archaeological resource of this section of the Willyama Common will not be impacted by the Project.

The proposed impacts and degree of harm to each site within the Project Area is summarised in Table 10.

9.4.1 Impacts on cultural heritage values

Overall, given that the Project will potentially result in direct and indirect impacts to a number of identified archaeological sites, the greatest loss of values will be in relation to social/cultural and archaeological/scientific research potential. As discussed in Section 8.2, potential impacts on historic values will be moderate, especially at the northern end of the Project Area as key changes to the existing landscape and setting are due to the ground disturbing activities.

Impacts to aesthetic values will be negligible across the Project Area and limited mostly to the southwestern end of the Project Area where the Pinnacles are visible. However, the addition of transmission poles within an already heavily modified industrial landscape is considered to have negligible impact to the aesthetic values of the Pinnacles.

Impacts to the social and cultural values from the Project will be limited in nature. Aboriginal people retain strong cultural links to country and the Project will result in minor increases to loss of cultural heritage significance. The Project Area contains landscapes which have high to moderate archaeological value because they may reveal important details about Aboriginal occupation in this area, especially as the availability of water changed from late Pleistocene to the present. The Project Area may also provide information on stone tool production and distribution.

9.4.2 Direct harm

Thirty-four (34) Aboriginal archaeological sites will be impacted by the Project. Of these, fifteen (15) are located wholly within the Disturbance Area, resulting in a total loss of value. The remaining nineteen (19) sites extend beyond the Disturbance Area and will be only partially impacted. Direct harm results from surface disturbance activities such as the installation of the SCES facility and associated infrastructure, waterpipe and above and below ground transmission lines. These activities are anticipated to cause either total or partial losses of heritage values at affected sites. The activities within the Project Area that may cause harm to Aboriginal objects or areas of cultural value are described above in Section 9.2.

While direct impacts are anticipated to be part of the Project, the degree of harm to nineteen (19) sites will be partial only, and will result in a partial loss of value only. The proposed impacts and degree of harm to each site within the Project Area is summarised in Table 11.

9.4.3 Indirect harm

The remainder of Aboriginal sites surveyed are located outside the Disturbance Area and may be indirectly impacted by the proposed activities outlined in Section 9.2. The activities that may result in indirect impacts include but are not limited to:

[1] The Willyama Common surrounds the City of Broken Hill with the boundary shown on Figure 1

- Sandy or rocky deposits may become eroded from an increase in vehicle traffic associated with the transmission line. This may result in erosion of the soil deposit that would expose or move previously protected Aboriginal objects.
- Risk of changes to site drainage and surface water flows resulting from changes to landform disturbing site features located in the immediate area.

Table 11: Proposed impacts to Aboriginal archaeological sites based on the Broken Hill ACEAS Project Area 2024 plan modifications.

Site Name	AHIMS site ID	Proposed Impacts	Type/Degree of harm	Consequences
Broken Hill (ACAES) AFT 1	23-5-0170	SCES facility disturbance area	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 8	23-5-0173	Outside Project Area	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT/HTH 10	23—5-0174	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 11	23-5-0175	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 13	23-5-0177	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 14	23-5-0178	Transmission Line easement; 1 x monopole and temporary hardstand pad	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 15	23-5-0179	Transmission Line easement; 1 x monopole and temporary hardstand pad	direct/partial	partial loss of value
Broken Hill (ACAES) AFT/HTH 16	23-5-0180	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 18	23-5-0169	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 19	23-5-0168	Transmission Line easement; 2 x monopoles; and temporary hardstand pads	direct/partial	partial loss of value

Site Name	AHIMS site ID	Proposed Impacts	Type/Degree of harm	Consequences
Broken Hill (ACAES) AFT 20	23-4-0697	Transmission Line easement; 6 x monopoles, and temporary hardstand pads; inground power line section with 20m easement, buried cable	direct/partial	partial loss of value
South airports regency area isolated artefacts	23-4-0682	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 22	23-4-0698	Transmission Line easement and temporary hardstand pad	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 23	23-4-0699	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 25	23-4-0700	Transmission Line easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT/HTH 26	31-1-0723	Transmission Line easement, 1 x monopole and temporary hardstand pad	direct/partial	partial loss of value
Broken Hill (ACAES) AFT/HTH 27	31-1-0724	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 28	23-4-0701	Transmission Line easement; 2 x monopoles and temporary hardstand pads	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 29	23-4-0702	Transmission Line route/1 x monopole and temporary hardstand pad	direct/partial	partial loss of value
Kanandah 1	23-4-0640 (duplicate of Kanandah 2 23-4-0641)	Transmission Line easement; 2 x monopoles and temporary hardstand pads	direct/partial	partial loss of value

Site Name	AHIMS site ID	Proposed Impacts	Type/Degree of harm	Consequences
Broken Hill (ACAES) AFT /HTH 37	23-4-0708	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) HTH 39	31-1-0727	Transmission Line easement	indirect/none proposed	no loss of value
FD-IF16	23-5-0154	Creek diversion easement/ SCES facility disturbance area	direct/whole	total loss of value
PM-Q6	23-5-0123	Creek diversion easement/ SCES facility disturbance area	direct/whole	total loss of value
FD-IF18	23-5-0152	Transmission Line easement	direct/partial	partial loss of value
FD-IF19	23-5-0146	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 44	23-5-0183	Above Ground waterpipe easement	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 45	23-5-0182	Outside Project Area	indirect/none proposed	no loss of value
PM-Q5	23-5-0122	SCES facility disturbance area	direct/whole	total loss of value
PM-Q4	23-5-0121	SCES facility disturbance area	direct/whole	total loss of value
BH1-48	23-5-0063	SCES facility disturbance area	direct/whole	total loss of value
FD-G001	23-5-0112	SCES facility site	direct/whole	total loss of value
FD-IF7	23-5-0153	Creek diversion easement/ SCES facility disturbance area	direct/whole	total loss of value

Site Name	AHIMS site ID	Proposed Impacts	Type/Degree of harm	Consequences
FD-IF14	23-5-0156	SCES facility disturbance area	direct/whole	total loss of value
PM-GO2	23-5-0125	SCES facility disturbance area	direct/whole	total loss of value
FD-IF02	23-5-0139	SCES facility disturbance area	direct/whole	total loss of value
PM-IF	23-5-0131 (duplicate of PM-G04 23-5-0132)	SCES facility disturbance area	direct/partial	partial loss of value
Broken Hill (ACAES) AFT 3	23-5-0171	SCES facility disturbance area	direct/whole	total loss of value
Broken Hill (ACAES) AFT 4	23-5-0172	SCES facility disturbance area	direct/whole	total loss of value
Broken Hill (ACAES) AFT 31	23-4-0704	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 34	23-4-0711	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 36	23-4-0709	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 38	23-4-0707	Outside Project Area	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 41	31-1-0725	Transmission Line easement	direct/whole	total loss of value
Broken Hill (ACAES) AFT 53	23-5-0185	SCES facility disturbance area	direct/whole	total loss of value
PM-GO3	23-5-0126	Outside Project Area	indirect/none proposed	no loss of value
PM-Q3	23-5-0120	Outside Project Area	none	no loss of value
PM-Q7	23-5-0127	Outside Project Area	none	no loss of value

Site Name	AHIMS site ID	Proposed Impacts	Type/Degree of harm	Consequences
FD-IF01	23-5-0140	Outside Project Area	none	no loss of value
FD-IF03	23-5-0138	Outside Project Area	none	no loss of value
FD08	23-5-0141	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 42	23-4-0706	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT12	23-5-0176	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 17	23-5-0181	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 30	23-4-0703	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 35	23-4-0710	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 40	31-1-0726	Transmission Line easement	indirect/none proposed	no loss of value
Broken Hill (ACAES) AFT 43	23-4-0705	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 46	23-5-0192	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 47	23-5-0191	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 48	23-5-0190	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 49	23-5-0189	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 50	23-5-0188	Outside Project Area	none	no loss of value
Broken Hill (ACAES) AFT 51	23-5-0187	Outside Project Area	none	no loss of value
Broken Hill (ACAES) HTH 52	23-5-0186	Creek diversion easement	direct/whole	total loss of value
Broken Hill (ACAES) AFT 54	23-5-0184	Outside Project Area	none	no loss of value

9.5 Summary

Thirty- four (34) are located within the proposed Disturbance Area and will be directly harmed by the proposed activities. The range of harm will result in either partial loss of value (19 sites) or total loss of value (15 sites). The remaining recorded sites are located outside the Disturbance Area and can be avoided by the proposed activities.

10 MANAGEMENT AND MITIGATION MEASURES

Without careful management and mitigation, the impacts from the Project have the potential to produce widespread disturbance to the archaeological deposits present within the Project Area ranging from subsurface disturbance associated with the SCES facility and transmission line poles through vehicle movement during construction and maintenance. This is in part due to the nature of the archaeological sites and subsurface deposits in the area: the subsurface deposits are typically shallow (<500mm deep), and test excavation has shown that artefact scatters are often in the upper 200mm, making them very vulnerable to disturbance. This vulnerability makes the effective mitigation of damage or destruction to scientifically and culturally/socially valuable sites in this area particularly important.

In NSW, the process of determining a scientifically or socially valuable site involves following the Burra Charter (Australia ICOMOS 2013) framework for conserving and managing places of cultural significance, along with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)*. Both documents recommend 'a cautious approach to change: do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained" (Australia ICOMOS 2013: 1).

Cultural heritage sites faced with harmful impacts therefore need to be managed in a way that avoids harm, or where harm cannot be avoided, minimises it wherever possible. Minimising the harm to a site might include partial conservation/avoidance, or it might involve carefully documenting the site and collecting or salvaging its artefacts. It is not often possible to preserve or salvage all sites or potential archaeological deposits at risk of impact from development so in these cases archaeologists use predictive models and cultural heritage significance assessments (including consultation with RAPs) to guide decisions about which sites should be the focus of harm mitigation or management strategies.

Mitigation and management strategies will focus on landforms with high archaeological sensitivity and existing sites with predicted moderate-high or greater scientific value. This targeted approach is based on the results of test excavation and the extensive disturbance to the Project Area's sediment deposits from a range of previous activities (vegetation clearance, mining, grazing and long- term recreational activities), In particular, salvage excavations will be targeted using a geoarchaeological approach to archaeological prospection, based on borehole survey and deposit modelling. This approach provides a rapid and scientifically rigorous means of understanding site formation processes and the distribution of archaeologically sensitive sediments across large areas (Goldberg and Macphail, 2006; Historic England, 2015; Carey et al., 2017), such as the present Project Area.

The importance of the artefacts and landscape features to local Aboriginal people has also been considered in the development of these mitigation and management strategies, through the consultation process documented above in Section 6. Cultural monitoring is recommended in areas of extensive ground disturbance with predicted higher sensitivity for subsurface Aboriginal objects as described in section 10.3.5.

10.1 Aboriginal Cultural Heritage Management Plan

Preparation of an Aboriginal Cultural Heritage Management Plan (ACHMP) in consultation with the BHLALC and/or Wilyakali recognised RAPs and relevant Government Agencies, will be prepared prior to the commencement of construction. The ACHMP will incorporate the following mitigation and management strategies and staged salvage recommendations.

10.2 General Impact Mitigation and Management Strategies

A number of general impact mitigation and management strategies can be employed during the construction of the Project to minimise the harm to the area's cultural heritage. While installation of fencing around site boundaries is often used to prevent inadvertent impacts to sites during construction this is not considered practical for this project. This is based on the location of the disturbance area within the Willyama Common which is open to the public. It is possible that if sites are fenced off they will attract attention of artefact collectors and/or fences may become a hazard for recreational vehicles. The general impact mitigation strategies recommended comprise:

1. Avoiding and conserving known sites wherever possible through inclusion of site boundaries on construction maps. However, if impacts cannot be avoided, then surface artefacts should be moved to a location outside the disturbance area in collaboration with Broken Hill LALC and/or Wilyakali recognised RAPs.

2. Where disturbance is unavoidable, ensure that a program of staged archaeological surface and subsurface salvage is completed with an aim to save a representative sample of information for future generations of the Aboriginal Community.

3. Construction vehicles will be restricted to the proposed disturbance corridor to avoid impacting known sites or areas of high archaeological sensitivity outside this area;

4. All parties involved in construction must be provided with detailed maps of site boundaries; and

5. The construction workforce must undergo a cultural heritage induction facilitated by the Wilyakali Aboriginal corporation to communicate the importance of protecting cultural heritage, and the legal, ethical, social and practical issues involved.

10.3 Staged Salvage Procedures

The test excavations and survey across the Project Area revealed a complex range of deposits, sediments and soils. These archaeological sites have wide-ranging and spatially varied levels of archaeological sensitivity and include areas with extensive site complexes and high to very high subsurface archaeological potential. The draft staged salvage procedure is provided below. Figure 29 to Figure 41 illustrate the location of sites and sensitive landforms where staged salvage activities are proposed. Note that the detailed staged salvage program will be developed during the preparation of the ACHMP following Project approval in consultation with the BHLALC and/or Wilyakali recognised RAPs and relevant government agencies

This section provides an overview of field methods and recording procedures for surface collection and subsurface salvage excavations. (Note: any changes to the proposed impacts would be managed according to these procedures.) All cultural material will be managed in consultation with the BHLALC.

The primary aims of the staged salvage works are to:

1. Collect surface Aboriginal objects from all sites within the disturbance area ensuring that those objects are not directly impacted or damaged by the proposed works;

2. Recover a representative sample of cultural material from the area disturbed in order to:

    - Determine patterns of Aboriginal occupation and site use including information relating to diet, technology and procurement and use of resources;

    - Establish knowledge of the depth, nature and composition of archaeological deposits to further inform future management of the Project Area;

- Recover samples for dating in order to establish a chronology of site formation and/or use; and
- Enable the recovered cultural material to be repatriated to site in accordance with Broken Hill Aboriginal community protocols.
- Any testing results and assessment reports is to be owned by the BHLALC on behalf of the Wilyakali people and cannot be shared or published without prior approval from both the BHLALC and the Wilyakali Aboriginal Corporation.

10.3.1 Salvage Stage 1

Where disturbance will impact surface artefacts, Stage 1 Salvage will comprise surface collection of artefacts by BHLALC and/or Wilyakali recognised RAPs and archaeologists, Material associated with Men's and Women's business will be managed in a culturally appropriate way in accordance with Wilyakali protocols. Artefacts will be recorded in-situ in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (2010)*, and moved to a location chosen by BHLALC and Wilyakali Aboriginal community for repatriation or safekeeping.

Stage 1 Surface Salvage to be completed at the following 34 sites:

- #23-4-0640 (Kanandah 1)/duplicate AHIMS #23-4-0641 (Kanandah 2) (AR pg 93)
- #23-5-0183 (Broken Hill (ACAES) AFT 44) (AR pg 104)
- #23-4-0682 (South airports regency area isolated artefacts) (AR pg 83)
- #23-5-0122 (PM-Q5) (AR pg 59)
- #23-5-0121 (PM-Q4) (AR pg 60)
- #23-5-0125 (PM-G02) (AR pg 109)
- #23-5-0139 (FD-IF02) (AR pg 117)
- #23-5-0131 (PM-IF-6)/duplicate AHIMS #23-4-0132 (South Broken Hill) (AR pg 61)
- #23-5-0112(PM-SC6) (AR pg 55)
- #23-5-0063 (BH1-48) (AR pg 55)
- #23-5-0152 (FD-IF18) (AR pg 106)
- #23-5-0178 (Broken Hill (ACAES) AFT 14) (AR pg 72)
- #23-5-0179 (Broken Hill (ACAES) AFT 15) (AR pg 74)
- #23-5-0180 (Broken Hill (ACAES) AFT/HTH 16) (AR pg 75)
- #23-5-0169 (Broken Hill (ACAES) AFT 18) (AR pg 77)
- #23-5-0168 (Broken Hill (ACAES) AFT 19) (AR pg 78)
- #23-4-0697 (Broken Hill (ACAES) AFT 20) (AR pg 79)
- #23-4-0698 (Broken Hill (ACAES) AFT/HTH 22) (AR pg 84)
- #23-4-0699 (Broken Hill (ACAES) AFT 23) (AR pg 85)
- #23-4-0700 (Broken Hill (ACAES) AFT 25) (AR pg 86)
- #31-1-0723 (Broken Hill (ACAES) HTH 26) (AR pg 87)
- #23-5-0185 (Broken Hill (ACAES) AFT 53) (AR pg 132)

- #23-5-0153 (FD-IF7) (AR pg 65)
- #23-5-0154 (FD-IF16) (AR pg 114)
- #23-5-0156 (FD-IF14) (AR pg 117)
- #23-5-0171 (Broken Hill (ACAES)
- AFT 3) (AR pg 57)
- #23-5-0172 (Broken Hill (ACAES)
- AFT 4) (AR pg 58)
- #23-5-0123 (PM-Q6) (AR pg 109)
- #23-4-0701 (Broken Hill (ACAES) AFT 28) (AR pg 89)
- #23-4-0702 (Broken Hill (ACAES) AFT 29) (AR pg 90)
- #23-5-0170 (Broken Hill (ACAES) AFT 1) (AR pg 53
- #31-1-0725 (Broken Hill (ACAES) AFT 41) (AR pg 101)
- #23-5-0177 (Broken Hill (ACAES) AFT 13) (AR pg 71)
- #23-5-0186 (Broken Hill (ACAES) HTH 52) (AR pg 131)

10.3.2 Salvage Stage 2 (followed by Stage 3 and/or Stage 4 where applicable)

Within sites of moderate-high or greater archaeological scientific value and landforms with high archaeological sensitivity a RAP monitored borehole survey should be conducted in accordance with the ACHMP.

Borehole survey, using a hand auger, is a low-impact method that allows rapid, scientific assessment of the subsurface environment (Deposit Modelling) across large areas, in advance of test or salvage excavation (Goldberg and Macphail, 2006; Historic England, 2015; Carey et al., 2017). Borehole survey is designed to augment, rather than replace, traditional excavation. It is a method of effectively targeting that excavation to ensure that all deposits of archaeological potential are assessed and can be considered the gold standard of archaeological prospection strategies. Borehole survey is carried out by a geoarchaeologist with specialist knowledge in archaeological site formation processes and archaeological prospection of non-architectural archaeological sites (Karkanas and Goldberg, 2018a,b; French, 2003).

This method will allow a more accurate assessment of the archaeological potential across the entirety of the Project Area, better informing decisions around the precise sites of infrastructure placement. This is important, because the variability of deposits within the Project Area and the spatially varied extent of modern disturbance are complicating factors that are likely to make test pit placement and the interpretation and synthesis of stratigraphic data from those test pits problematic.

Stage 2 salvage should be conducted at the following four sites and within the 19 landforms of high archaeological sensitivity as shown in Figure 29 to Figure 41

- #31-1-0723 (Broken Hill (ACAES) HTH 26 (AR pg 92)
- #23-5-0063 (BH1-48) (AR pg 60)
- #23-4-0682 (South airports regency area isolated artefacts) (AR pg 88)
- #23-4-0697 (Broken Hill (ACAES) AFT 20) (AR pg 85)

10.3.3 Salvage Stage 3

Stage 3 salvage will occur in locations with intact subsurface archaeological deposits as identified in Stage 2. One or more 1x1 m salvage pits will be excavated following standard procedures, including sediment sieving and soil profile recording to ensure that the stratigraphic integrity of excavated assemblages is maintained. Decisions about the final placement of salvage pits will be made in consultation with the RAPs, recognised by the BHLALC and/or Wilyakali, selecting a

location with maximum potential for intact deposits with archaeological material, within the footprint of proposed impacts. The total number of pits excavated during this phase is estimated to be between 20 and 60. Artefacts will be recorded, analysed and repatriated following excavation in accordance with the Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (2010).

10.3.4 Salvage Stage 4

Stage 4 comprises open-area salvage excavation based on results Stage 2 salvage and Stage 3 salvage.

Based on the results of Stage 3 salvage, the locations for open-area (Stage 4) excavation will be identified by the following archaeological triggers:

- a high density of artefacts (relative to local area);

1. unusual/exotic stone artefact materials (relative to the local area);
2. unusual stone artefact types (e.g., ground edged axes), or a cluster of retouched implements indicating a cache or focused production event;
3. evidence of some other unusual or unique cultural or subsistence practice; or
4. features such as hearths or datable material following methodology in Appendix 3.

Open-area excavation will continue up until a representative sample of each site is achieved, including characterisation and understanding of stratigraphy, site formation processes and composition of cultural material. Where open-area excavation includes hearth features, the methodology in Appendix 5 will be followed.

Dating samples will be taken under the following conditions:

1. if hearth stones are found which appear to be relatively undisturbed (OSL of surface immediately under hearth, or charcoal sample from within hearth if preserved);
2. if subsurface deposits containing undisturbed/intact/in situ artefact lenses are found, the sediments at the base of each lens will be sampled for OSL.
3. if faunal remains associated with an apparently intact subsurface lens of artefacts, the remains will be recorded and a sample sent for radiocarbon dating.

Excavation will be terminated within a given excavation area either upon salvage of the entire area of proposed disturbance, retrieval of a representative sample of the excavation area, or the entire site is recovered, whichever constraint is deemed suitable based on the size and characteristics of the site. All decisions regarding when to terminate excavation in a given excavation area will be undertaken in consultation between the BHLALC and/or Wilyakali recognised RAPs and the archaeologists participating in the fieldwork.

10.3.5 Cultural monitoring

Cultural monitoring by Broken Hill LALC and/or Wilyaklai recognised RAP representative/s is recommended for areas of extensive ground disturbing works such as the underground cable and select locations within the SCES facility disturbance area. These locations comprise greater impacts compared to other discrete activities such as monopole installation or hardstand construction. The zones of cultural monitoring within these areas will be refined based on results of Stage 2 salvage with monitoring and will focus on predicted higher sensitivity for subsurface Aboriginal objects (including burials) and archaeological deposit zones with intact subsurface deposits of moderate-high or greater scientific value, The aim of cultural monitoring in these locations is to recover and/or record buried Aboriginal objects or features.

In addition, monitoring by Broken Hill LALC and/or Wilyakali recognised representative/s will act as a form of mitigation against impacts to Aboriginal cultural values within the project area and allow the community an opportunity to connect with Country.

Cultural Monitoring procedure will be determined by the BHLALC and Wilyakali when developing the ACHMP.

10.3.6 Avoidance of inadvertent impacts

The following 13 sites are located outside the disturbance area and should be included in project mapping to prevent inadvertent impacts. However, if impacts cannot be avoided, then surface artefacts should be moved to a location outside the disturbance area in collaboration with Broken Hill LALC and/or Wilyakali recognised RAPs. The surface collection, recording and movement of artefacts will be completed in accordance with salvage methodology outlined in Section 10.3.1:

- #23-5-0173 Broken Hill (ACAES) AFT 8 (AR pg 63)
- #23-5-0175 Broken Hill (ACAES) AFT 11 (AR pg 69)
- #31-1-0724 Broken Hill (ACAES) AFT/HTH 27 (AR pg 8)
- #23-4-0708 Broken Hill (ACAES) AFT /HTH 37 (AR pg 97)
- #31-1-0727 Broken Hill (ACAES) HTH 39 (AR pg 99)
- #23-5-0146 FD-IF19 (AR pg 106)
- #23-5-0182 Broken Hill (ACAES) AFT 45 (AR pg 105)
- #23-4-0704 Broken Hill (ACAES) AFT 31 AR pg 92
- #23-4-0707 Broken Hill (ACAES) AFT 38 (AR pg 98)
- #23-5-0181 Broken Hill (ACAES) AFT 17 (AR pg 76)
- #23-4-0703 Broken Hill (ACAES) AFT 30 (AR pg 91)
- #31-1-0726 Broken Hill (ACAES) AFT 40 (AR pg 100)
- #23-5-0126 PM-G03 (AR pg 110)

10.3.7 Photographic recording

Three potential quarry sites are located within the SCES Facility disturbance area and will be directly impacted by the proposed works. As described in Section 4 of the AR, quartz outcrops in the Broken Hill area are part of the Marnbi Dreaming track and represent important places associated with the journey of the bronze-wing pigeon (Marnbi) as it travelled north from the Flinders Ranges and through the area around Broken Hill and The Pinnacles (Werrell 1995). Management/mitigation strategies for these outcrops should be discussed with the Broken Hill LALC or Wilyakali recognised RAP representative/s and at a minimum a photographic record should be made of the following sites prior to start of works:

- #23—5-0123 (PM-Q6) (AR pg 109)
- #23-5-0122 (PM-Q5) (AR pg 59)
- #23-4-0121 (PM-Q4) (AR pg 60)

10.3.8 No further mitigation required

No further mitigation measures are recommended for the following nineteen sites:

- #23—5-0174 (Broken Hill (ACAES) AFT/HTH 10) (AR pg 67)
- #23-4-0711 (Broken Hill (ACAES) AFT 34) (AR pg 94)
- #23-4-0709 (Broken Hill (ACAES) AFT 36) (AR pg 96)
- #23-5-0120 (PM-Q3) (AR pg 107)
- #23-5-0127 (PM-Q7) (AR pg 112)
- #23-5-0140 (FD-IF01) (AR pg 117)
- #23-5-0138 (FD-IF03) (AR pg 117)
- #23-5-0141 (FD08) (AR pg 113)
- #23-4-0706 (Broken Hill (ACAES) AFT 42) (AR pg 102)
- #23-5-0176 (Broken Hill (ACAES) AFT12) (AR pg 70)
- #23-4-0710 (Broken Hill (ACAES) AFT 35) (AR pg 95)
- #23-4-0705 (Broken Hill (ACAES) AFT 43) (AR pg 103)
- #23-5-0192 (Broken Hill (ACAES) AFT 46) (AR pg 118
- #23-5-0191 (Broken Hill (ACAES) AFT 47) (AR pg 124)
- #23-5-0190 (Broken Hill (ACAES) AFT 48) (AR pg 125)
- #23-5-0189 (Broken Hill (ACAES) AFT 49) (AR pg 126)
- #23-5-0188 (Broken Hill (ACAES) AFT 50) (AR pg 127)
- #23-5-0187 (Broken Hill (ACAES) AFT 51) (AR pg 129)
- #23-5-0184 (Broken Hill (ACAES) AFT 54) (AR pg 133)

10.4 Justification for any likelyharm

The proposed works associated with the construction of the Project will provide a renewable source of energy for the city of Broken Hill and surrounding region.

While the proposed works will result in direct harm to 34 Aboriginal sites, the majority of harm is discrete in nature and limited to areas that have already been disturbed by a variety of previous and on-going land use activities. The exception are the 13 sites located within the SCES facility area where the proposed construction will result in direct and extensive harm. The sites to be impacted by Project represent a very small proportion of the entire NSW semi-arid region.

It is considered that harm to the archaeological resource within the Project Area can be justified with the application of a commensurate level of mitigation through archaeological investigation of those landforms assessed to be of high archaeological sensitivity and containing sites with moderate- high or above scientific value.

10.5 Ecologically Sustainable Development

The works associated with the Project have been developed with ecological sustainability in mind. Every effort has been made to ensure the sustainability of the land and surrounding environment are conserved for future generations.

The economic consequences of the Project include secure electricity supply, increased revenue for the greater Broken Hill region with potential for increased local employment opportunities. A-CAES NSW is developing an Indigenous Participation Plan (IPP), to be implemented as part of the Project. The IPP will being developed in consultation with Broken Hill Local Aboriginal Land Council (BHLALC), the Wilyakali and Barkindji Aboriginal Corporations and the Department of Education, Skills, and Employment as part of A-CAES NSW's broader engagement with the Broken Hill community. The IPP aims to investigate options for prioritising the employment of local Indigenous people and commit to the implementation of specific procurement actions to ensure the local and regional Aboriginal community continue to have the opportunity to be involved in the Project through the construction and operational phases.

In addition, A-CAES NSW are also proposing an agreement with the Broken Hill Local Aboriginal Land Council (BHLALC) that represents the interests of the whole Aboriginal community in and around the Broken Hill Region. A long-term program of tertiary scholarships (TAFE and University) for Aboriginal students; a cultural heritage awareness training program (internal and external); a social housing program and co-development of shared facilities on BHLALC land.

Cumulative impacts are the repeated, incremental and combined impacts of one or more activities on the environment, including cultural heritage values. Taken in context with other proposed projects and existing development in the Broken Hill region, the Project would have some effect on the cumulative impact on Aboriginal cultural heritage of the local area and region. Existing impacts in the local area include mining, vegetation clearance, recreational vehicle use and construction of the Broken Hill airport. These existing impacts represent considerable ground surface modification, and based on the investigations detailed in the investigations to date, it is reasonable to suggest that there are moderate levels of previous disturbance to the archaeological record and the cultural heritage of the region.

In terms of aesthetic values, viewshed analysis in Appendix 4 indicates that there will be negligible impact to the values of the Pinnacles from the project. While it is undeniable that the proposed transmission line will be visible around the southern margins of Broken Hill, these views will not have a significant impact on views to and from the Pinnacles.

For the most part, the potential impacts of the Project involve limited harm to a moderate number of low value archaeological sites. This is not considered a significant cumulative impact because there are similar archaeological sites of similar value within the greater Broken Hill region. While some areas of high and moderate archaeological sensitivity will be impacted by the Project, the proposed salvage program will mitigate this harm.

10.6 Aboriginal Inputs

Inputs have been sought from all of the RAPs regarding the proposed impacts and options for mitigating and/or avoiding harm. During the course of test excavation on-site feedback was sought from Raymond O'Donnell Jnr, Abishai White, Regan O'Donnell and Ricky Menz representing Broken Hill Local Aboriginal Land Council. These participating RAPs agreed that the proposed development would have some impacts and would therefore, result in a loss of cultural heritage significance.

A number of concerns were raised following distribution to RAPs of the draft ACHAR in regard to the extent of impacts or proposed mitigation. Each concern raised by BHLALC has been given careful consideration and where achievable, included into final methodology for implementation.

Below is a summary of how key potential management options provided by BHLALC have been taken into account and incorporated into the mitigation strategies where practicable.

- Sites identified as gender specific will be managed in a culturally appropriate way in accordance with Wilyakali protocols;

- Where applicable, monitoring is to be only undertaken by RAPS recognised by the BHLALC and/ or Wilyakali;
- Any recovered cultural material is to be repatriated to site in accordance with Broken Hill Aboriginal community protocols;
- All cultural material will be managed in consultation with BHLALC on behalf of the Wilyakali people.
- No culturally sensitive data from archaeological investigations will be shared or published without BHLALC and Native Title holders agreement;
- Cultural inductions facilitated by the Wilyakali Aboriginal Corporation be a requirement for all workers involved in works with potential to interact with or impact on heritage values; and
- Overall, the proposed impacts to the area's cultural heritage values is considered cumulative in nature. As such, a mitigation procedure has been developed with a number of stages commensurate with the level of impact and the significance of the site.

Additional feedback was gathered and incorporated into the report from a workshop held with BHLALC and the Proponent on April 06 & 07, 2024, summary of the feedback is included in Table 9.

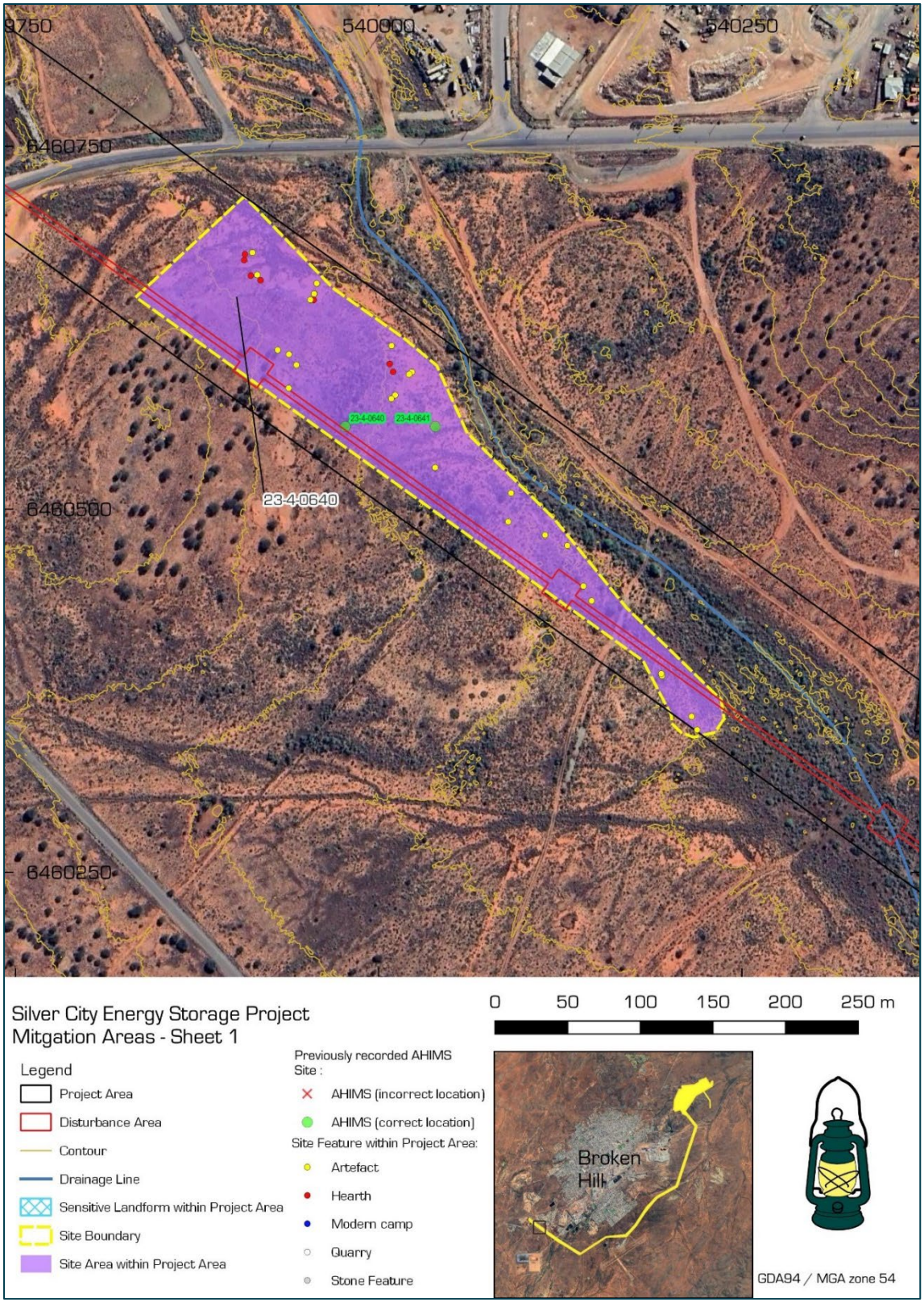


Figure 26: Location of sites and sensitive landforms where salvage activities proposed – sheet 1

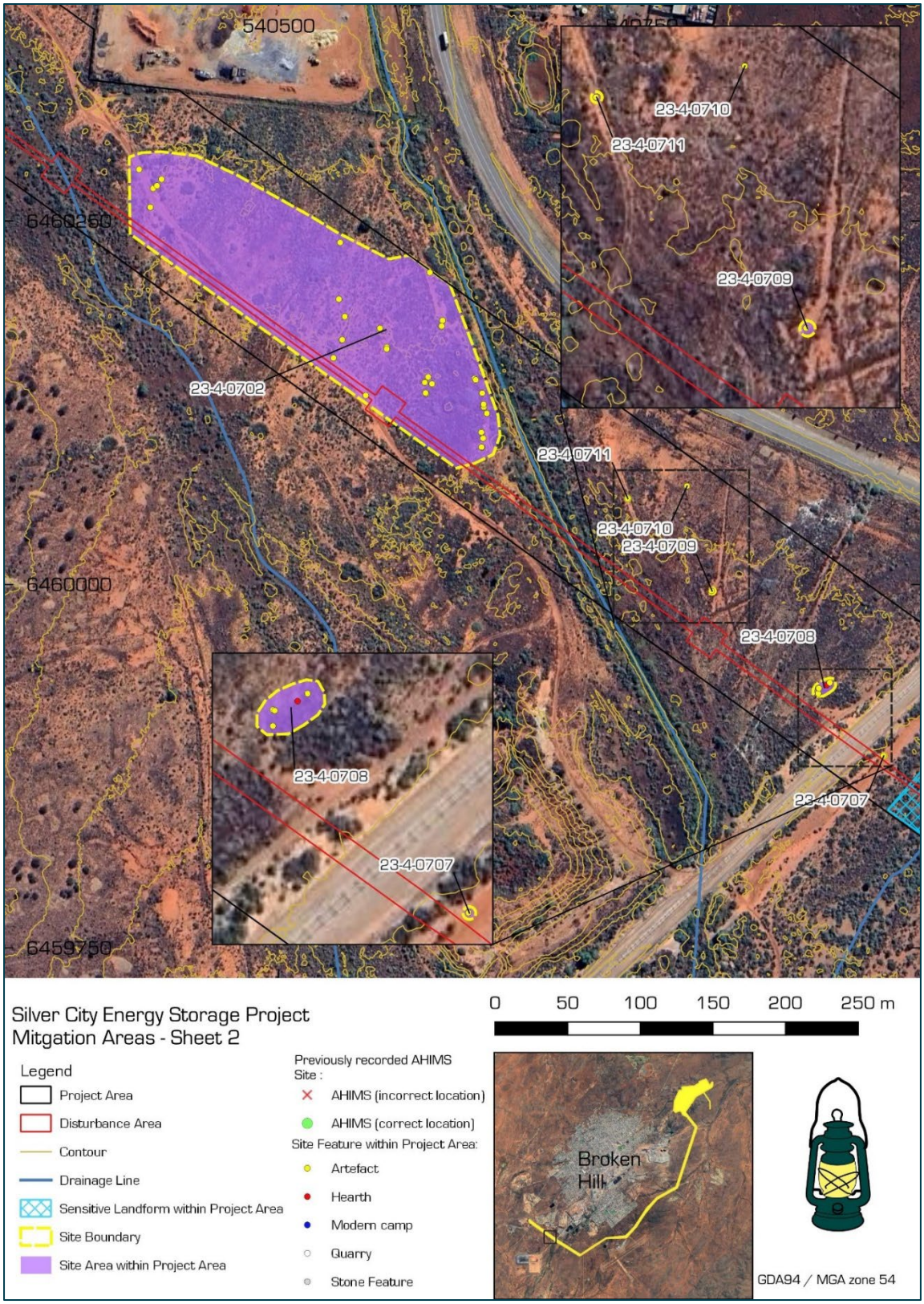


Figure 27: Location of sites and sensitive landforms where salvage activities proposed – sheet 2

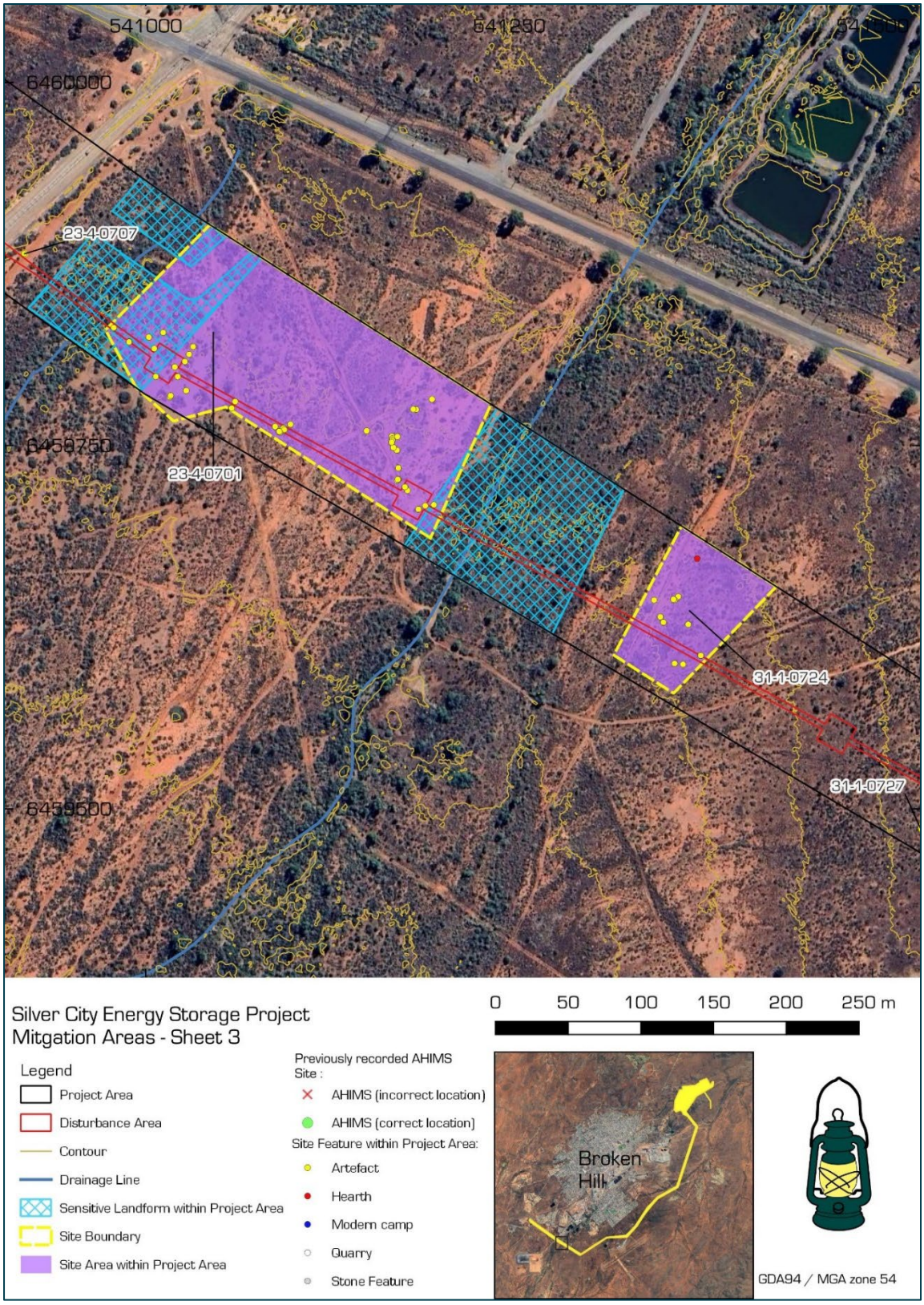


Figure 28: Location of sites and sensitive landforms where salvage activities proposed – sheet 3

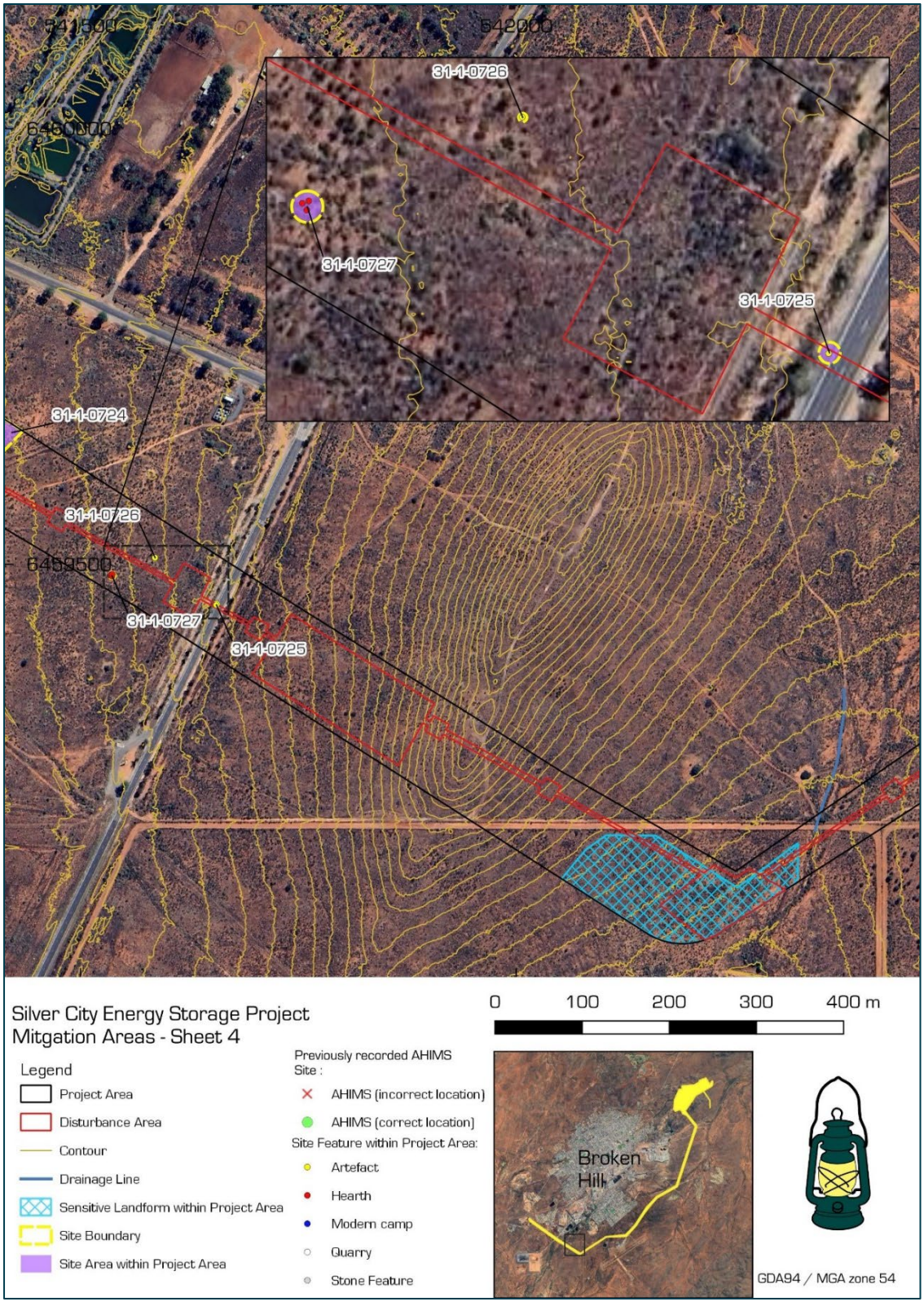


Figure 29: Location of sites and sensitive landforms where salvage activities proposed – sheet 4

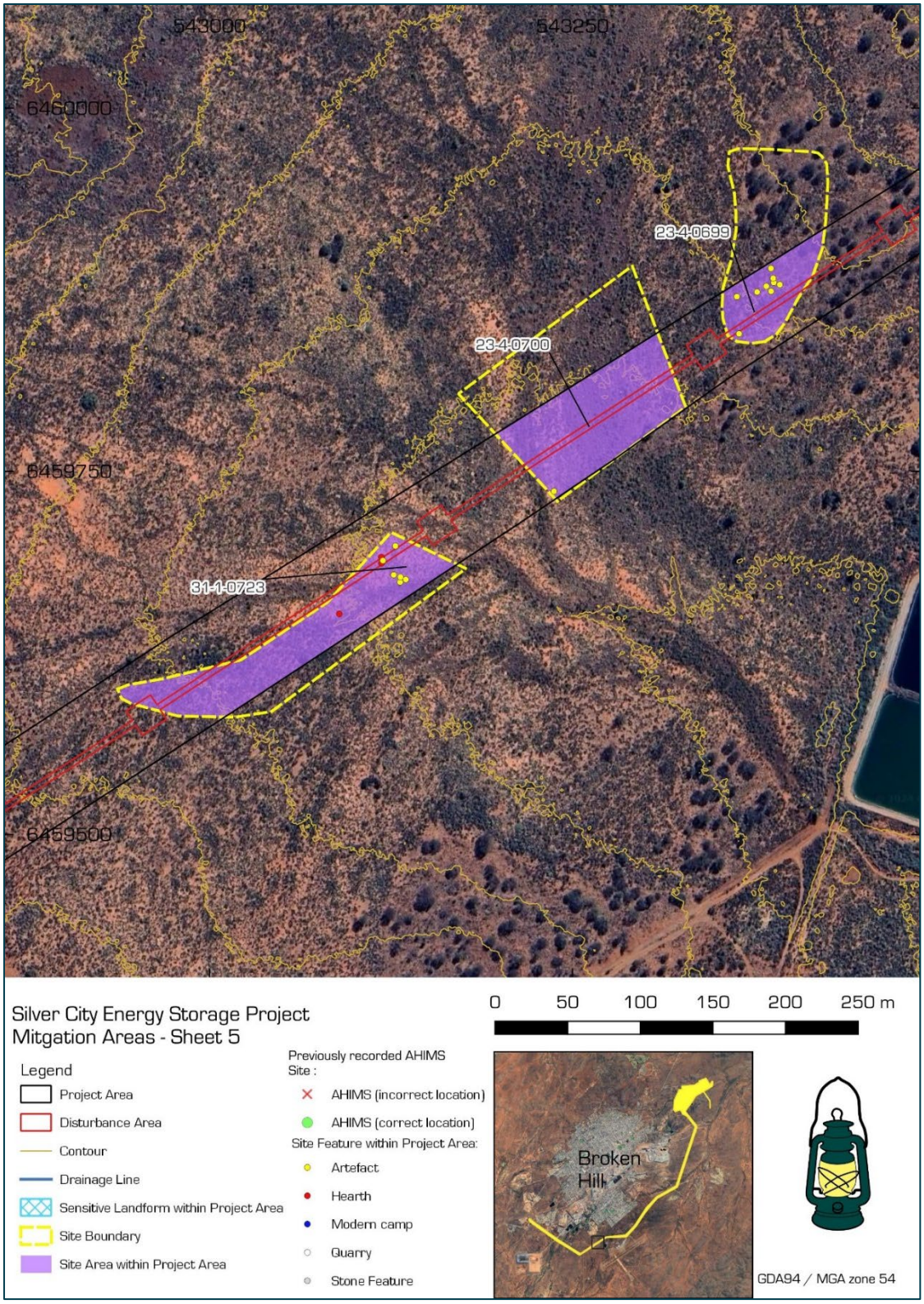


Figure 30: Location of sites and sensitive landforms where salvage activities proposed – sheet 5

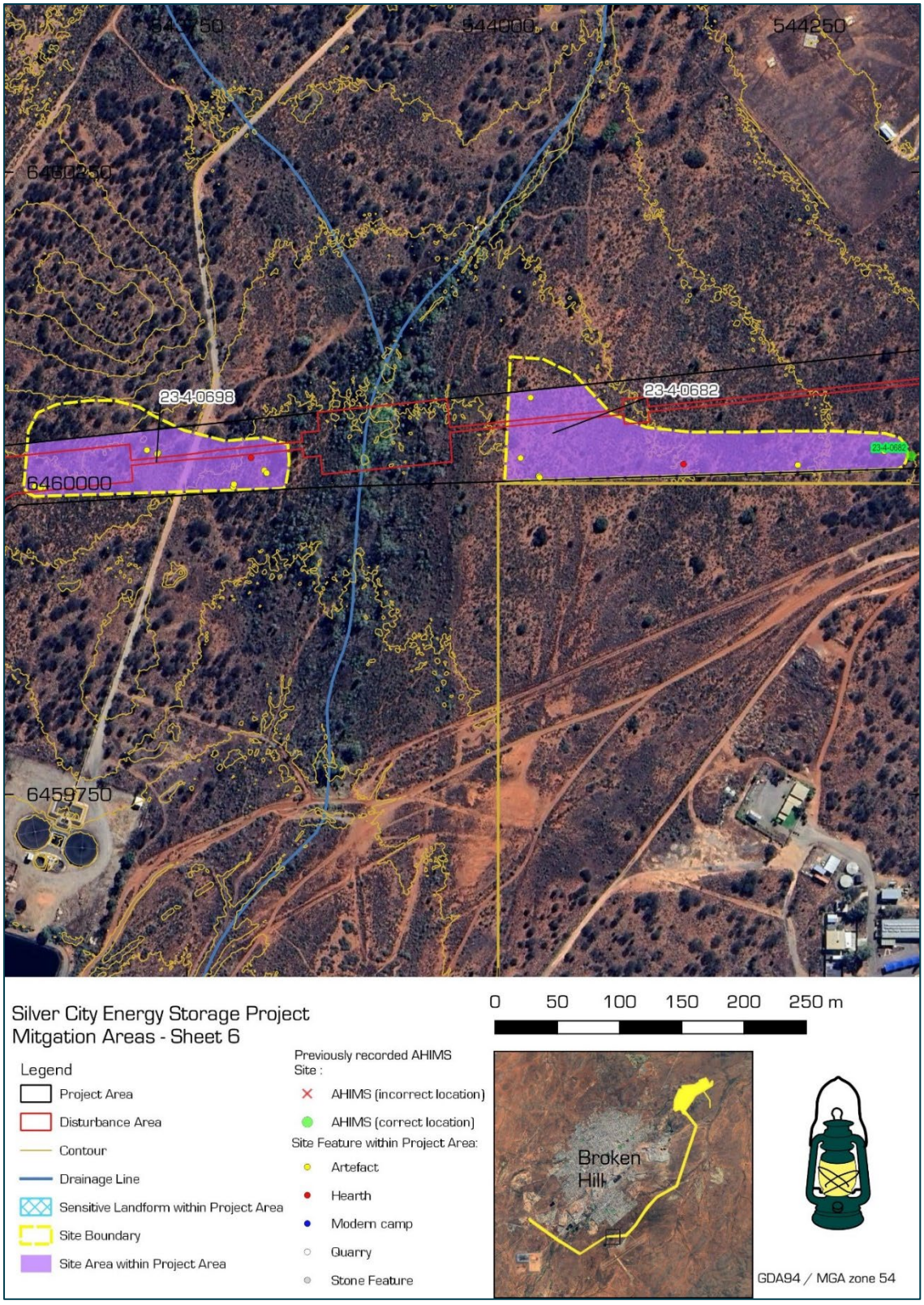


Figure 31: Location of sites and sensitive landforms where salvage activities proposed – sheet 6

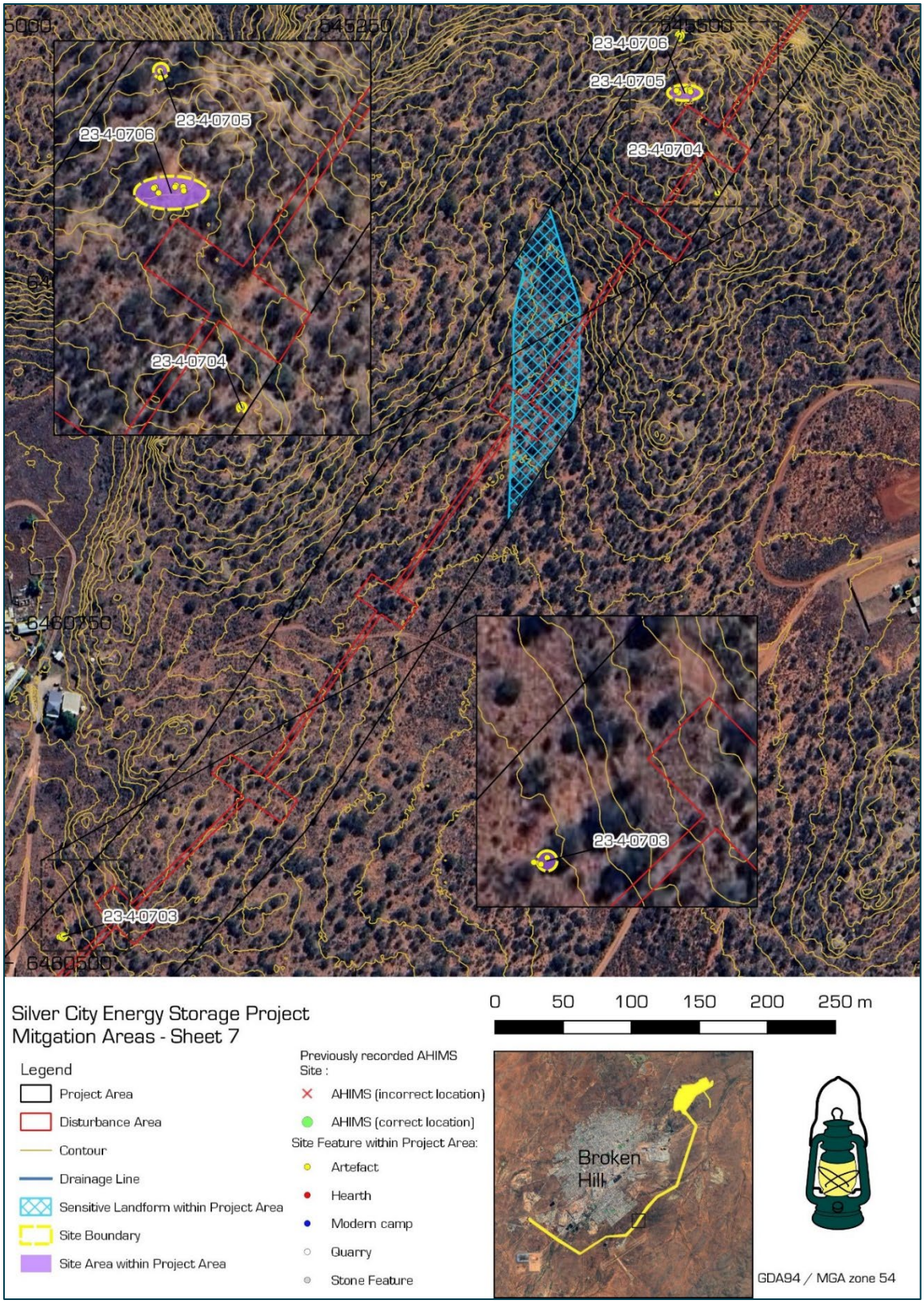


Figure 32: Location of sites and sensitive landforms where salvage activities proposed – sheet 7

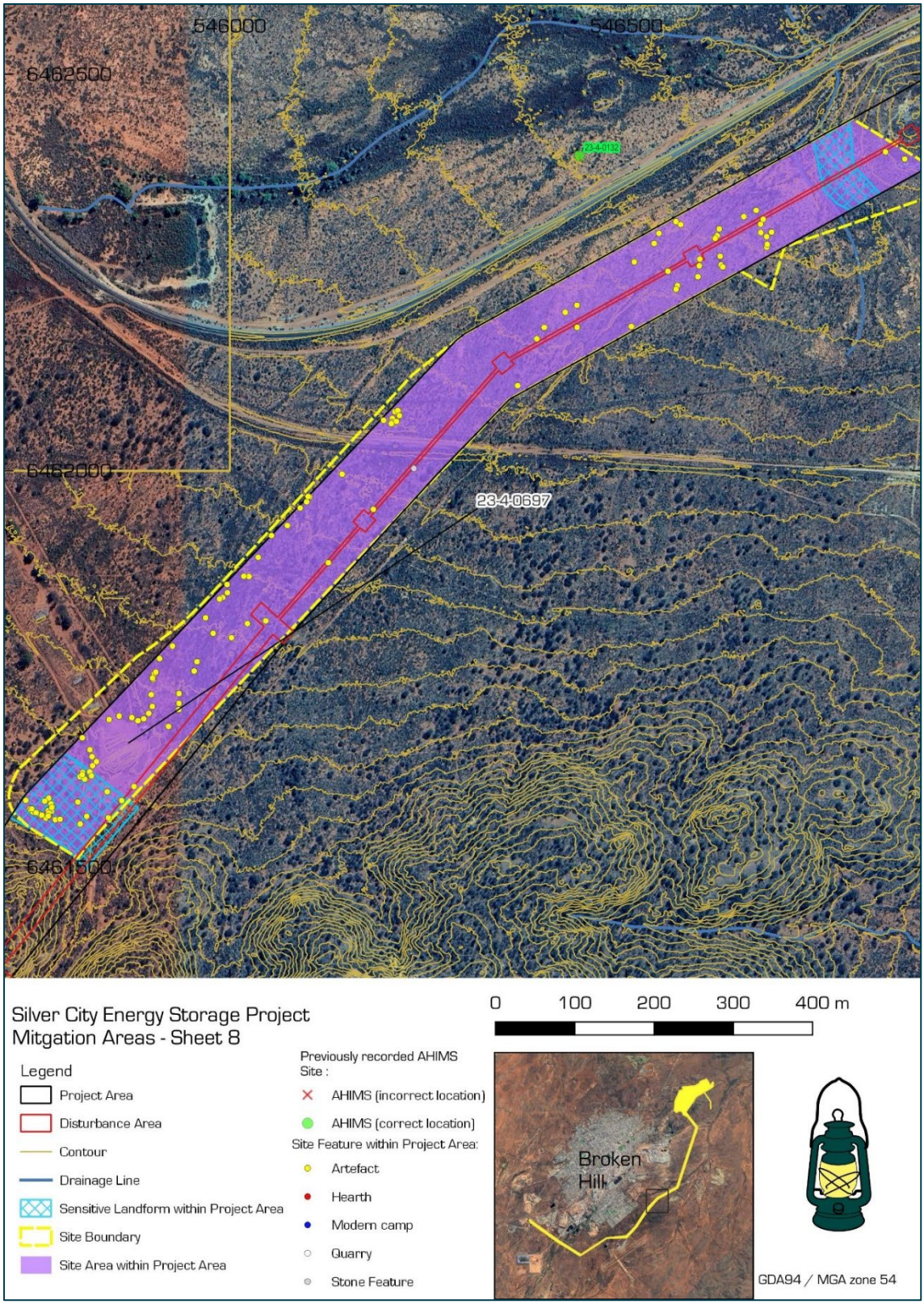


Figure 33: Location of sites and sensitive landforms where salvage activities proposed – sheet 8

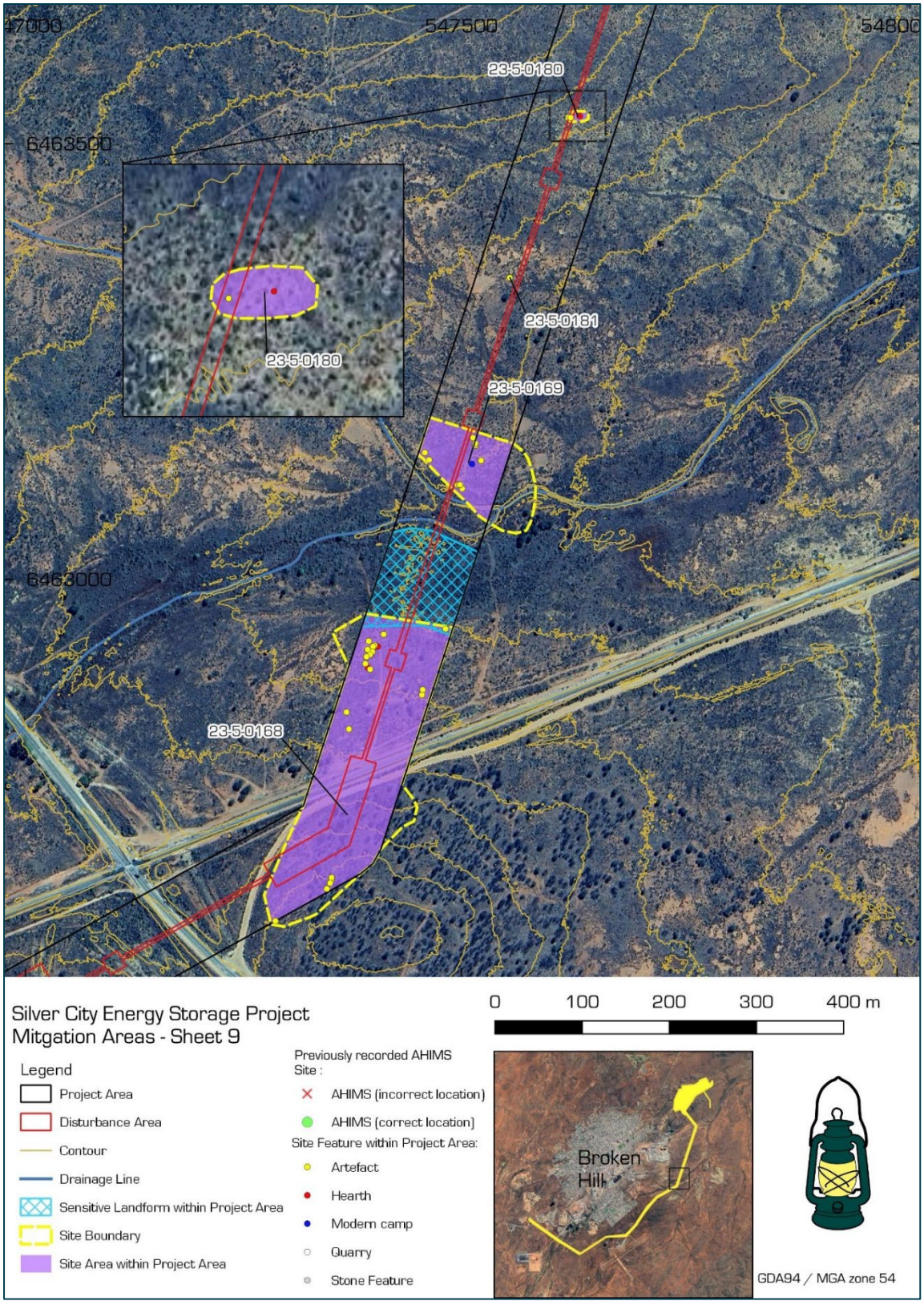


Figure 34: Location of sites and sensitive landforms where salvage activities proposed – sheet 9

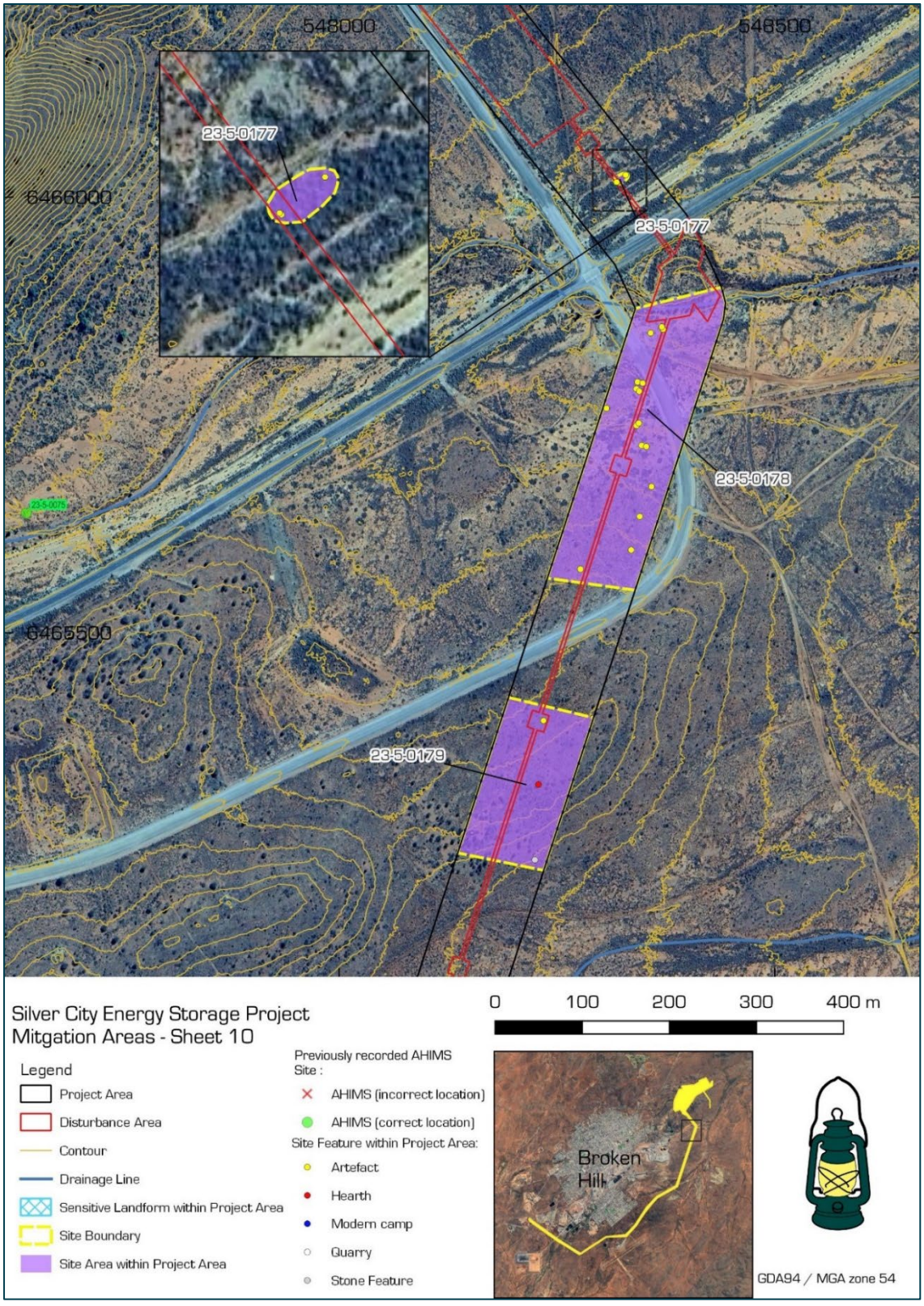


Figure 35: Location of sites and sensitive landforms where salvage activities proposed – sheet 10

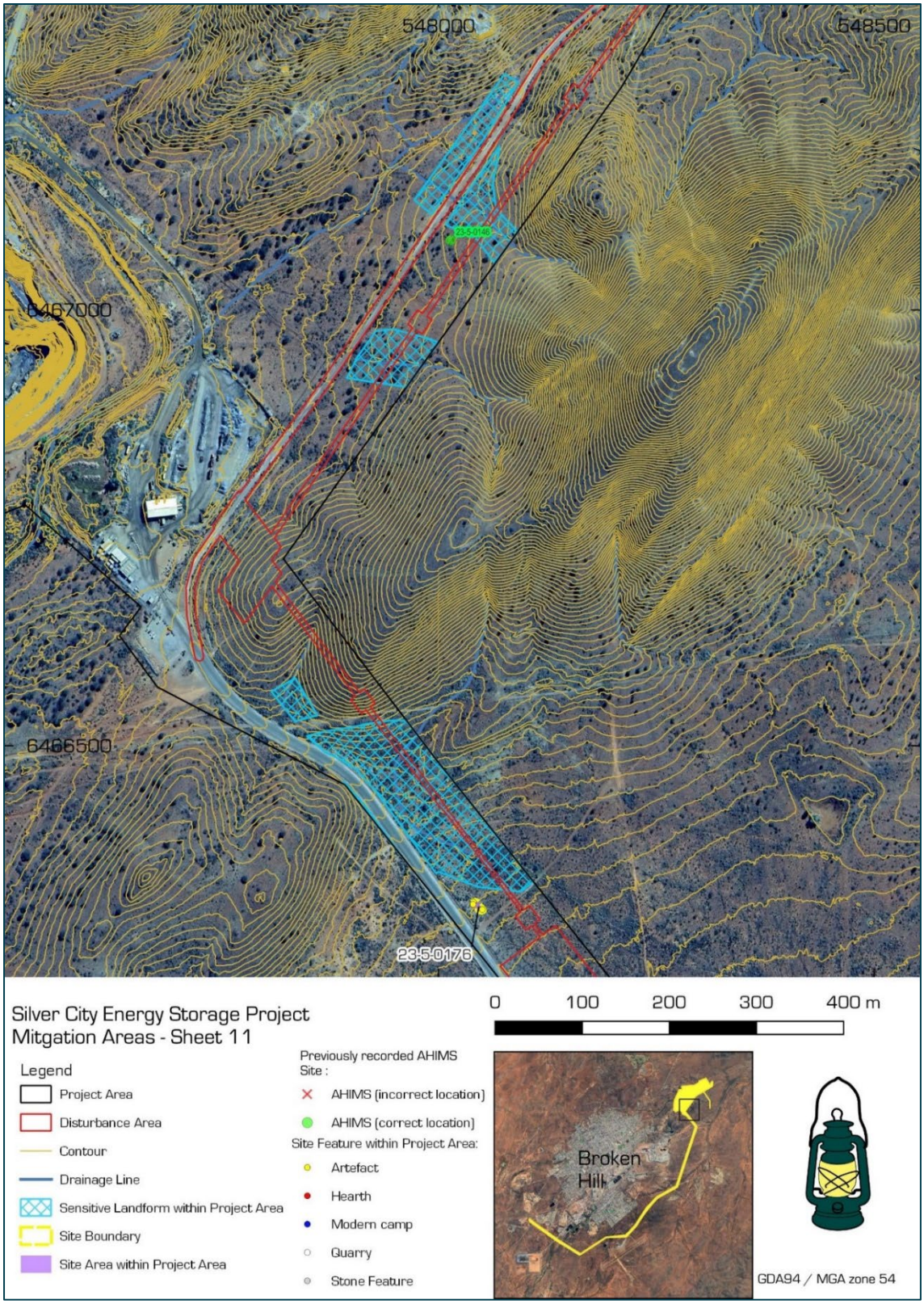


Figure 36: Location of sites and sensitive landforms where salvage activities proposed – sheet 11

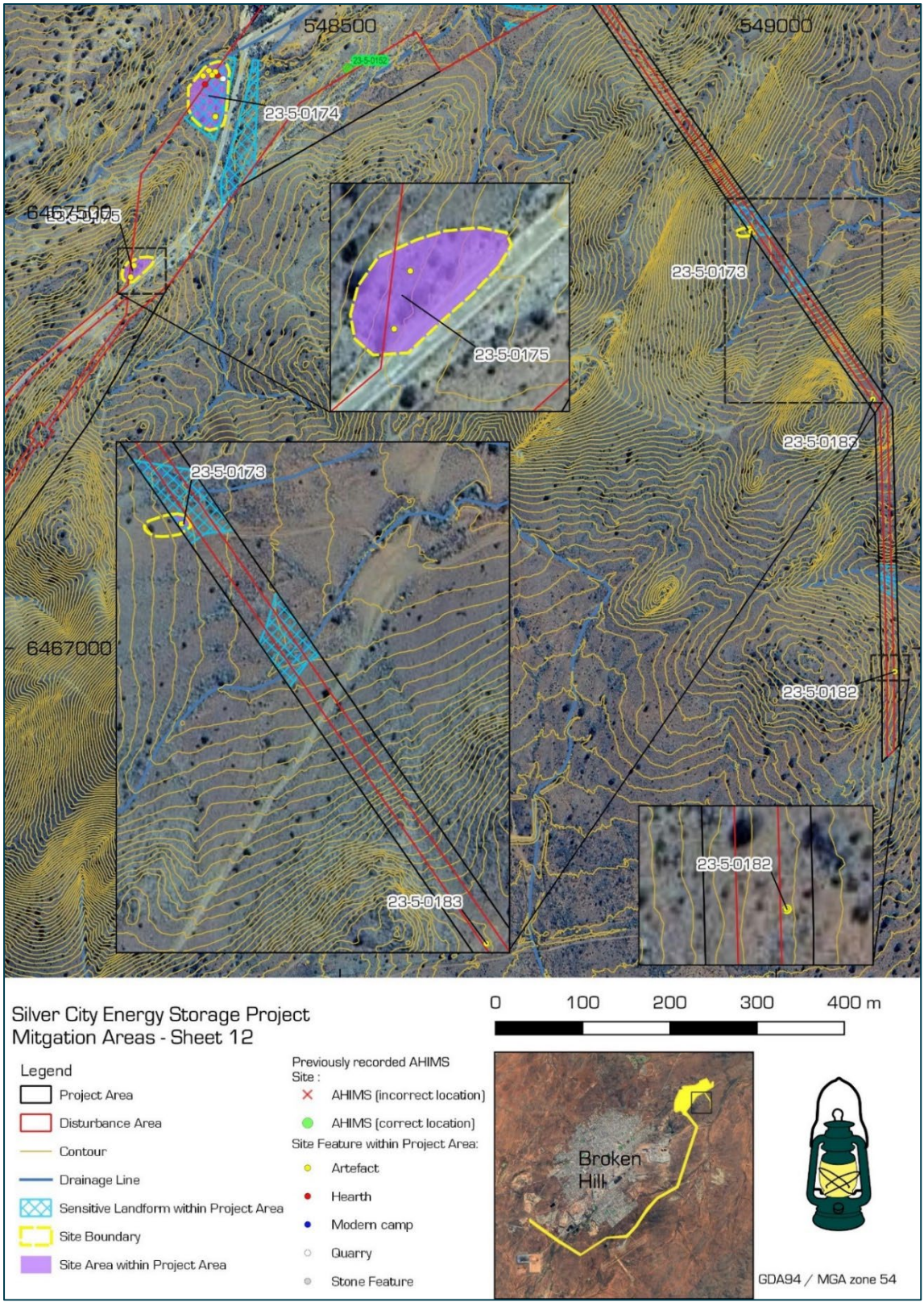


Figure 37: Location of sites and sensitive landforms where salvage activities proposed – sheet 12

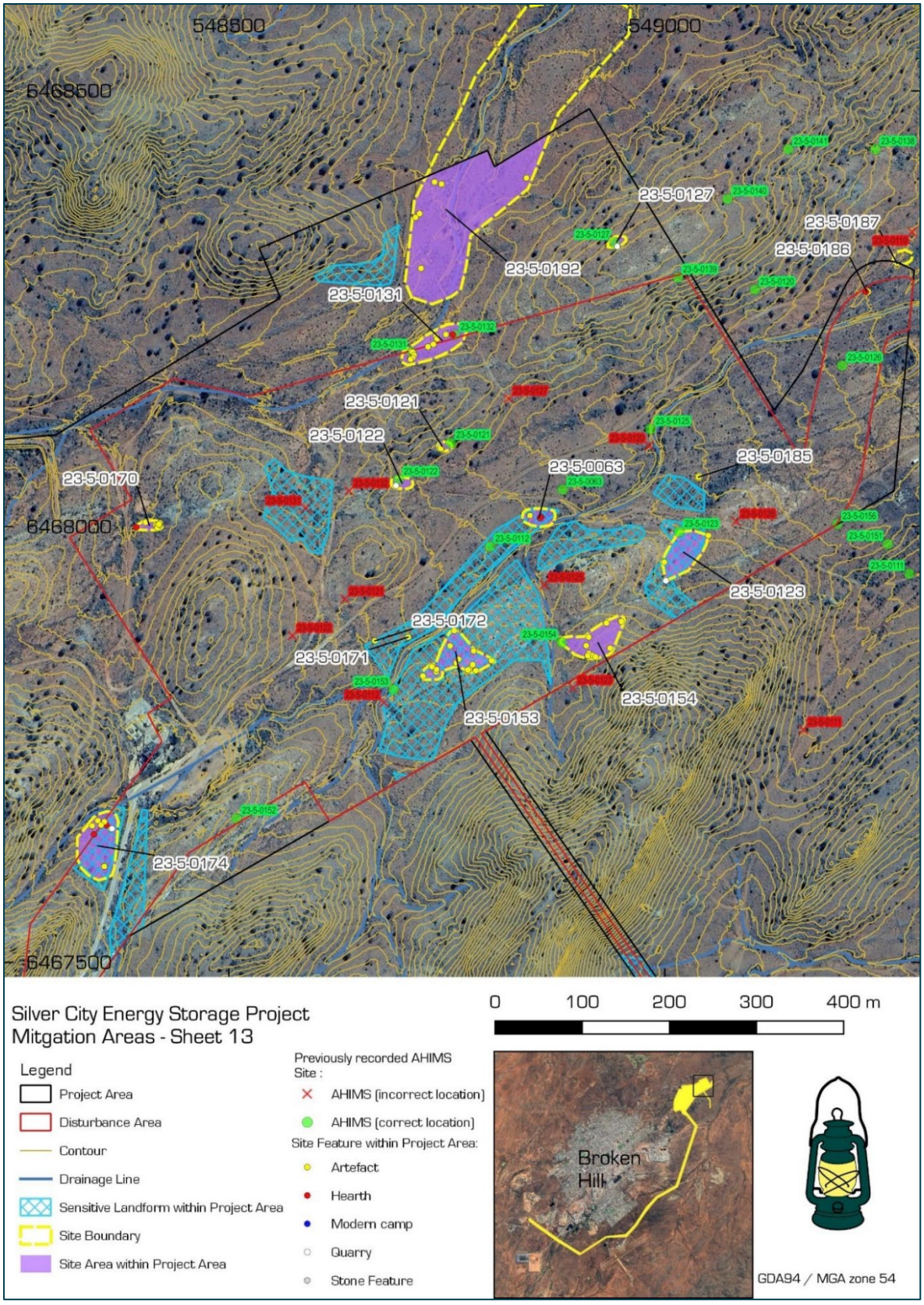


Figure 38: Location of sites and sensitive landforms where salvage activities proposed – sheet 13

11 SUMMARY AND RECOMMENDATIONS

The archaeological assessment of the Project Area comprised background research, two phases of field survey and a program of subsurface sampling across four archaeologically sensitive landforms.

Direct impacts will result from the proposed works to following 34 sites located within the Disturbance Area:

AHIMS #	Site Name	AHIMS #	Site Name
23-5-0170	Broken Hill (ACAES) AFT 1	23-5-0183	Broken Hill (ACAES) AFT 44
23-5-0177	Broken Hill (ACAES) AFT 13	23-5-0154	FD-IF16
23-5-0178	Broken Hill (ACAES) AFT 14	23-5-0123	PM-Q6
23-5-0179	Broken Hill (ACAES) AFT 15	23-5-0122	PM-Q5
23-5-0180	Broken Hill (ACAES) AFT/HTH 16	23-5-0121	PM-Q4
23-5-0169	Broken Hill (ACAES) AFT 18	23-5-0063	BH1-48
23-5-0168	Broken Hill (ACAES) AFT 19	23-5-0112	FD-G001
23-4-0697	Broken Hill (ACAES) AFT 20	23-5-0153	FD-IF7
23-4-0682	South airports regency area isolated artefacts	23-5-0156	FD-IF14
23-4-0698	Broken Hill (ACAES) AFT 22	23-5-0125	PM-G02
23-4-0699	Broken Hill (ACAES) AFT 23	23-5-0139	FD-IF02
23-4-0700	Broken Hill (ACAES) AFT 25	23-5-0171	Broken Hill (ACAES) AFT 3
31-1-0723	Broken Hill (ACAES) AFT/HTH 26	23-5-0172	Broken Hill (ACAES) AFT 4
23-4-0701	Broken Hill (ACAES) AFT 28	31-1-0725	Broken Hill (ACAES) AFT 41
23-4-0702	Broken Hill (ACAES) AFT 29	23-5-0185	Broken Hill (ACAES) AFT 53
23-4-0640 duplicate of 23-4-0641	Kanandah 1	23-5-0131 duplicate of 23-5- 0132	PM-IF6
23-5-0152	FD-IF18	23-5-0186	Broken Hill (ACAES) HTH 52

While avoidance of impacts to sites is the preferred mitigation measure, this is not possible in all cases. Where impacts to sites are unavoidable surface collection of artefacts and movement away from harm is the preferred strategy. A phased salvage approach is recommended at four sites with moderate-high or greater scientific value and in 19 landforms with high archaeological sensitivity. This targeted salvage approach is based on the results of test excavation and the extensive disturbance to the Project Area's sediment deposits from a range of previous activities.

The location for salvage excavations will be targeted using a geoarchaeological approach to archaeological prospection, based on borehole survey and deposit modelling. This approach provides a rapid and scientifically rigorous means of understanding site formation processes and the distribution of archaeologically sensitive sediments across large areas (Goldberg and Macphail, 2006; Historic England, 2015; Carey et al., 2017), such as the present Project Area.

Results of the borehole survey will allow a more accurate assessment of the archaeological potential across the entirety of the Project Area and will inform further stages of salvage excavation as detailed in Section 10.

Based on the investigations undertaken for the current proposal the following recommendations are made:

1. Preparation and implementation of a Cultural Heritage Management Plan (CHMP) in consultation with the BHLALC and/or Wilyakali recognised RAPs, Heritage NSW and the Department of Planning and Environment.

2. That a program of staged salvage (surface and subsurface), following the stages outlined in Section 10.3 is completed prior to construction with surface salvage occurring across the disturbance area. Subsurface salvage is recommended within sites of moderate-high or greater scientific value and landforms with high archaeological sensitivity.

3. The final location of collected artefacts must be determined through consultation with the BHLALC and/or Wilyakali recognised RAPs and Requirement 26 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECWW 2010b).

4. That prior to construction commencing, all contractors associated with the Project receive cultural heritage inductions delivered by a representative of Broken Hill LALC or RAP (s).

5. In the event that Ancestral remains, or suspected Ancestral remains, are encountered during any of the proposed construction activities or salvage actions, all work must stop and the procedures outlined in the Salvage Methodology be implemented (Section 10).

12 GLOSSARY

Aboriginal site	A place where Aboriginal activity has occurred and/or a place associated with Aboriginal tradition. Aboriginal sites include locations where archaeological evidence is present and/or places of intangible heritage value, where Aboriginal tradition or oral history indicate the place has meaning or significance to the Aboriginal community.
archaeological sensitivity	A location or landform where archaeological sites or deposits are likely to occur. Such locations may include areas of identified PAD or may correspond to areas for which insufficient information is available regarding the nature and integrity of deposits to identify clear areas of archaeological potential.
archaeological site	A place where physical evidence of human activity is present on the surface (e.g. artefacts, modified trees, middens, earthworks or other structural features) and/or within subsurface deposits.
archaeological deposit	A subsurface deposit containing artefacts or other evidence/features (e.g. fire places, middens or post holes) of human activity.
archaeological visibility	Usually expressed as a percentage, this refers to the extent to which the archaeological deposits, or PAD, are visible during survey.
artefact	An object made, modified or transported (manuport) by humans.
geomorphology	The study of the nature and origin of landforms – i.e. the ways in which the landscape was formed through processes of weathering and erosion.
historical site	A place where human activity has occurred and is associated with non- Aboriginal occupation. Such places may be archaeological sites with physical evidence of activity and/or locations associated with historical events. Historical sites that contain evidence of contemporaneous Aboriginal and non-Aboriginal activity are commonly referred to as post contact sites.
manuport	A natural object that has been removed from its original location by humans (e.g. a rock that has been transported to an area where it does not occur naturally).
midden	An area of refuse. Middens contain items created (e.g. stone artefacts, bottles or ceramics), or used (e.g. shell and bone from meals) by humans. Middens can occur on both Aboriginal and historical sites.

post contact site	A place containing evidence of contact between Aboriginal people and non- Aboriginal people (e.g. an Aboriginal site with artefacts of European manufacture, or European artefacts modified by Aboriginal people) and/or a place associated with interactions between Aboriginal and non-Aboriginal people (e.g. a massacre site).
potential archaeological deposit	PAD: An area or landform predicted to contain archaeological deposits.
scarred tree	A scarred tree, also referred to as a culturally modified tree, is a tree that shows evidence of human activity. This is usually evidenced in the form of a scar where bark has been removed (either an absence of bark of an area of regrowth bark). It may also include modifications to the heartwood (e.g. carving or axe marks). Bark removal and tree carving was practiced by both Aboriginal and non- Aboriginal people. Usually the nature of the scar, the extent of regrowth and the broader context of the tree will provide clues to the origin of the scar (e.g. a surveyor's blaze versus bark removal for a shield or coolamon).
stone artefact	A stone/rock, or piece thereof, that has been modified by humans. It generally refers to portable chipped/flaked, ground or pecked items (Clarkson and O'Connor 2013: 153).

13 REFERENCES

Allen, H., 1974. The Bagundji of the Darling Basin: Cereal Gatherers in an Uncertain Environment.

World Archaeology 5, 309–322.

Allen, H., 1972. Where The Crow Flies Backwards: Man and Land in the Darling Basin.

Doctor of Philosophy. The Australian National University.

Allen, J., O'Connell, J. F., 2014. Both half right: updating the evidence for dating first human arrivals in Sahul. Australian Archaeology 79: 86–108.

Appleton, J., 1996. The Archaeological Investigation of the BHEI 96AGS-BH1 Seismic Survey Line, Mundi Mundi Plain to Redan Creek, in the Broken Hill Region, Western NSW. Unpublished Report for Australian Geological Survey Organisation.

Australia ICOMOS, International Council on Monuments and Sites, 2013a. The Burra Charter: the Australia ICOMOS charter for places of cultural significance 2013.

Australia ICOMOS, International Council on Monuments and Sites, 2013b. The Burra Charter Practice Notes: Understanding and assessing cultural significance 2013.

Beckett, J., Hercus, L., Martin, S., Colyer, C., 2008. Mutawintji: Aboriginal Cultural Association with Mutawintji National Park. Office of the Registrar, Aboriginal Land Rights Act 1983, Glebe, NSW.

Bowdler, S., O'Connor, S., 1979. Archaeological Reconnaissance at Lake Yantara, North West NSW

Bowler, J.M., Harvey, J., Olley, J.O., Prescott, J.R., Roberts, R.G., Shawcross, W., Spooner, N.A., 2003. 'New Ages for Human Occupation and Climatic Change at Lake Mungo, Australia', Nature 421: 837–840.

Buchan, R., 1975. Archaeological Survey of the Natural Gas Pipeline Route: Yalda Downs to the Silver City Hwy

Bulbeck, D. & Boot, P., 1990. Stromlo Forest Cultural Resource Survey and Conservation Plan. Report to ACT Forests, ACT Parks and Conservation Service

Central West Archaeological and Heritage Services, 1996. An Archaeological Survey for the Proposed Barrier Highway Bridge Works and Associated Sidetrack Construction, Thackarainga Creek, Approximately 44 Kilometres West of Broken Hill, NSW. A report to Hoynes Wheeler and Thorne Pty Ltd. Central West Archaeological and Heritage Services Pty Ltd.

Clarkson, C., Z. Jacobs, B. Marwick, R. Fullagar, L. Wallis, M. Smith, R. G. Roberts, E. Hayes, K. Lowe,

X. Carah, S. A. Florin, J. McNeil, D. Cox, L. J. Arnold, Q. Hua, J. Huntley, H. E. A. Brand, T. Manne, A. Fairbairn, J. Shulmeister, L. Lyle, M. Salinas, M. Page, K. Connell, G. Park, K. Norman, T. Murphy, & C. Pardoe 2017. Human occupation of northern Australia by 65,000 years ago. Nature 547, 306.

Colquhoun G.P., Hughes K.S., Deyssing L., Ballard J.C., Folkes C.B, Phillips G., Troedson A.L. & Fitzherbert J.A. 2021. New South Wales Seamless Geology dataset (Single Layer), version 2.1 [Digital Dataset]. Geological Survey of New South Wales, Department of Regional NSW, Maitland

Conor, C. H., & Preiss, W. V., 2008. Understanding the 1720–1640 Ma Palaeoproterozoic Willyama Supergroup, Curnamona Province, Southeastern Australia: implications for tectonics, basin evolution and ore genesis. Precambrian Research 166(1-4), 297-317.

Department of Environment, Climate Change and Water (DECCW), 2010a. Code of Practice for archaeological investigation of Aboriginal objects in New South Wales, Sydney, N.S.W.: DECCW.

Department of Environment, Climate Change and Water (DECCW), 2010b. Aboriginal cultural heritage: consultation requirements for proponents 2010: Part 6 National Parks and Wildlife Act 1974, Sydney, N.S.W.: DECCW.

Department of Environment, Climate Change and Water, 2010c. Aboriginal cultural heritage: consultation requirements for proponents 2010 Part 6 National Parks and Wildlife Act 1974. Dept. of Environment, Climate Change and Water NSW, Sydney.

Dibden, J. 2008. Silverton Wind Farm NSW Stage 1. Aboriginal Heritage and Non Indigenous Heritage Assessment. Vol. 1. A report to ngh environmental on behalf of Silverton Wind Farm Developments.

Discover Broken Hill (2024). 'The Living Desert and Sculptures'. Discover Broken Hill. Accessed 18 March 2024. URL: www.discoverbrokenhill.com.au/the-living-desert-and-sculptures/

Doelman, T. 2005. 'Quarrying Masses of Information: An Approach to the Recording and Interpretation of a Quarry Assemblage', Archaeology in Oceania, 40(2): 50–61.

Douglass, M.J., 2010. The archaeological potential of informal lithic technologies: a case study of assemblage variability in western New South Wales, Australia (Doctoral dissertation, ResearchSpace@ Auckland).

Dow, E.B., 1938. Aboriginal Ceremonial Cairns near Broken Hill. Oceania 9, 30–36.

Erskine, J., 2001. White Lady Rock (Ngamatja): A Report on the Aboriginal Cultural Significance for Declaration as an Aboriginal Place.

Fanning, P. C., 1999. Recent landscape history in arid western New South Wales, Australia: a model for regional change. Geomorphology 29(3/4):191-209.

Fanning, P.C., Holdaway, S.J., 2001. Stone artefacts scatters in Western NSW, Australia: Geomorphiv Controls on Artifact Size and Distribution. Geoarchaeology 16(6):667-686.

Fanning, P. C., Holdaway, S. J., & Rhodes, E. J., 2008. A new geoarchaeology of Aboriginal artefact deposits in western NSW, Australia: establishing spatial and temporal geomorphic controls on the surface archaeological record. Geomorphology, 101(3), 524–532.

Gaffney, C., & Gater, J., 2003. Revealing the buried past: Geophysics for archaeologists.

Cambridge University Press.

Gay, L., 2001. Mineral Separation Plant, Broken Hill, NSW: Aboriginal and Non-Aboriginal Heritage Assessment. A Report to Resource Strategies on Behalf of BeMaX Resources NL.

Gerritsen, J., 1981. Tibooburra – corner country. Tibooburra Press, Tibooburra.

Goldberg, P., Macphail, R.I., 2006. Practical and theoretical geoarchaeology. John Wiley & Sons.

Heritage Office (HO) and Department of Urban Affairs and Planning (DUAP) 1996. Regional Histories: Regional Histories of New South Wales. DUAP, Sydney.

Historic England, 2015. Geoarchaeology: Using earth sciences to understand the archaeological record. https://historicengland.org.uk/images- books/publications/geoarchaeology-earth-sciences-to-understand-archaeological- record/

Holdaway S.J., Fanning P.C., and Shiner J.I., 2005. Absence of evidence or evidence of absence? Understanding the chronology of indigenous occupation of western New South Wales, Australia. Archaeology in Oceania 40: 33–49.

Holdaway, S., Shiner, J., Fanning, P., Douglass, M., 2008. Assemblage formation as a result of raw material acquisition in western New South Wales, Australia. Lithic Technology 33(1), 73-85.

Holdaway, S. J., Fanning P.C., 2014. Geoarchaeology of Aboriginal Landscapes in semi-arid Australia CSIRO.

Hope, J. and Gottshutzke, T. 1998.

Johnson, D. 2009. The Geology of Australia, Cambridge: Cambridge University Press.

Johnston, H. (1992) An Archaeological Survey of the Mount Gipps to Tibooburra 33kV Transmission Line: A Report to the Darling Electrical Construction Agency (DECA), Broken Hill. Adelaide: National Heritage Studies Pty Ltd, p. 104.

Johnston, H., Witter, D.C., 1996. Cultural Resources Database for the Murray. Summary Report of Stage III. A report to the Murray Darling Basin Commission.

Lowe, K. M., Shulmeister, J., Feinberg, J. M., Manne, T., Wallis, L. A., Welsh, K., 2016a. Using soil magnetic properties to determine the onset of Pleistocene human settlement at Gledswood Shelter 1, northern Australia. Geoarchaeology 31(3), 211-228.

Lowe, K. M., Mentzer, S., Wallis, L. A., Shulmeister, J., 2016b. A multi-proxy study of anthropogenic sedimentation and human occupation of Gledswood Shelter 1: Exploring an interior sandstone rockshelter in Northern Australia. Archaeological and Anthropological Sciences 10(2): 279±304

Lowe, K., 2020. Geophysical investigations in relation to the Wild Dog Fence Extension Project, NSW Report prepared for Lantern Heritage Pty Ltd

MacIntyre-Tamwoy, S., 2006. Aboriginal Archaeological Sites on the Pinnacles Mine & Pastoral Lease, near Broken Hill, NSW, Stage 1- Cultural Heritage Management Archaeological Management Plan. A Report to Pinnacles Mines Pty Ltd.

Martin, S., 1998. The Pinnacles Archaeological Survey, Broken Hill, NSW. A Report for the NSW NPWS.

Martin, S., 2003. Preliminary Archaeological Survey of the Proposed Pinnacles Railway Siding Development, Near Broken Hill, NSW A Report to Melinda Fletcher Consulting.

Martin, S., 2005. Destruction of Site May 2003 Addendum. Preliminary Archaeological Survey of the Proposed Pinnacles Railway Siding Development, Near Broken Hill, NSW. A Report to Melinda Fletcher Consulting.

McIntyre, M. 1977 Report of a Survey of Archaeological Sites along the Red Cliffs/Broken Hill Transmission Line

McLeod, K., Benton, J., Lovell, C., 2017. Broken Hill North Mine: Historic and Aboriginal Heritage Assessment and Statement of Heritage Impact. A report to R W Corkery & Co Pty Ltd. OzArk Environmental and Heritage Management Pty Ltd.

Migration Heritage Centre, 2010. Objects Through Time. https://www.migrationheritage.nsw.gov.au/exhibition/objectsthroughtime/broken-hill-mosque-collection/index.html, accessed 17 march 2023.

Mitchell, 2002. Descriptions for 2002. (Mitchell) Mitchell landscapes, NSW: Department of Environment and Climate Change.

Mulvaney, J. Kamminga, J., 1999. Prehistory of Australia. Allen and Unwin: St Leonards.

Niche, 2017. River Murray to Broken Hill Pipeline: Aboriginal Cultural Heritage Assessment 3 of 4 Chainage 111500 to Chainage 157000, Combah. Report prepared for WaterNSW.

NSW NPWS 1991. An Outdoor Museum: Historic places in the NSW National Parks and Wildlife Service Estate. NSW National Parks and Wildlife Service, Hurstville.

NSW NPWS 2003. The bioregions of NSW, their biodiversity, conservation and history, Hurstville: NSW Parks and Wildlife service.

O'Connell, J. F, Allen, J., 2004. Dating the colonization of Sahul (Pleistocene Australia–New Guinea): a review of recent research. Journal of Archaeological Science: 31: 835–853.

O'Connell, J. F., Allen, J., 2015. The process, biotic impact, and global implications of the human colonization of Sahul about 47,000 years ago. Journal of Archaeological Science: 56: 73–84

O'Connell, J.F., J. Allen, M. A. J. Williams, C. S, M, Turney, N. A. Spooner, J. Kamminga, G. Brown, Cooper, A., 2018. When did Homo sapiens first reach Southeast Asia and Sahul? Proceedings of the National Academy of Sciences, 6 August 2018, 201808385; DOI: 10.1073/pnas.1808385115

Oakes, G., 2021. Broken Hill Battery Energy Storage System Project: Aboriginal Cultural Heritage Assessment Report. A Report to AGL Energy Ltd. AECOM Australia (AECOM) Pty Ltd.

Oakes, G., 2022. Broken Hill Battery Energy Storage System Project Modification: Aboriginal Cultural Heritage Assessment Report. AECOM Australia Pty Ltd.

OzArk Environmental & Heritage Management Pty. Ltd. 2008. Flying Doctor Project Broken Hill: Heritage Assessment. A Report to R W Corkery & Co., Pty. Ltd.

Ridges, M. 2010. Aboriginal Sites Decision Support Tool (ASDST). Statewide product outline and technical summary. Department of Environment, Climate Change and Water NSW, Sydney.

Ridges, M. 2006. The Material Component of the Aboriginal Cultural Landscape: Mapping Country Through Predictive Modelling. In Proceedings of the 12th ANZSYS Conference—Sustaining Our Social and Natural Capital, Katoomba, NSW Australia (pp. 105-113).

Shiner, J.I., 2003. Archaeological Investigations on Pine Point and Langwell Stations, Western NSW. A Report to the Broken Hill Local Aboriginal Land Council and the NSW National parks & Wildlife Service.

Shiner, J.I., 2006. Artefact discard and accumulated patterns in stone artefact assemblage composition in surface archaeological deposits from Pine Point and Langwell Stations, western New South Wales. The Rangeland Journal, 28(2).

Shiner J., Stradwick, J., 2017. Project to reintroduce extinct mammals to Sturt National Park. ACHM.

Shiner J., Holdaway S., Allen H., Fanning P., 2005. Stone artefact assemblage variability in late Holocene contexts in western New South Wales: Burkes Cave, Stud Creek and Fowlers Gap. In: 'Lithics down under: Australian perspectives on lithic reduction, use and classification': 67–80. (Eds C. Clarkson and L. Lamb). (British Archaeological Reports: Oxford.)

Smith, M.A., 2013. The Archaeology of Australia's Deserts. Cambridge University Press, New York.

Smith, L.R., 1980. The Aboriginal population of Australia. ANU Press.

Solomon, R.J., 1988. The richest lode : Broken Hill 1883-1988. Hale and Ironmonger, Sydney. State Government of NSW and Department of Planning, Industry and Environment (DPIE), 2021.

Aboriginal Sites Decision Support Tool, ASDST Survey Priority Derived Model | Anzlic_Dataset | SEED (nsw.gov.au).

State Government of NSW and Department of Planning and Environment, 1991. Landsystems of NSW (compiled by P.J. Walker). Soil Conservation Service of NSW Technical Report No. 25.

State Library of NSW. 2021. Squattocracy. [online] Available at: >http://www.sl.nsw.gov.au/stroies.australian-agricultural-and-rural-life/squattocracy> {Accessed 1 March 2023].

Stevens, B. P. J., Page, R. W., & Crooks, A., 2008. Geochronology of Willyama Supergroup metavolcanics, metasediments and contemporaneous intrusions, Broken Hill, Australia. Australian Journal of Earth Sciences, 55(3), 301-330.

Sutherland, J., Cotter, M., Benton, J., 2012. Aboriginal Archaeological Assessment: Proposed Solar Project in Broken Hill. A Report to Sinclair Knight Merz. OzArk Environmental & Heritage Management Pty Ltd.

Warrell, L. 1995 Three Pointy Little Hills: The Story of Marnbi at the Pinnacles. A report to NSW National Parks and Wildlife Services.

Witter, D. 1987. 'Interim Report on the Stephens Creek Survey'.

Witter, D.C. 1989. Stephens Creek Archaeological Survey.

Witter, D.C. (2004) 'Regional variation of the archaeology in western New South Wales', The *Rangeland Journal*, 26(2), p. 129. Available at: https://doi.org/10.1071/RJ04009.

14 APPENDIX 1 – ARCHAEOLOGICAL REPORT

A copy of the Archaeological Report is saved as a separate document.

15 APPENDIX 2 – ABORIGINAL CONSULTATION

Consultation Log- Broken Hill ACAES facility

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
2/6/2022	Lantern Heritage PTY LTD	From: Glenn Merrick (Assistant Business Manager) To: NTSCorp Heritage Branch OEH Queanbeyan Office of the Registrar Aboriginal Land Rights Act 1983 (NSW) Local Land Services Broken Hill Council Broken Hill LALC NNTT	A letter was sent to the Agencies to nominate knowledge holders for the Project Area and a Geospatial search request sent to NNTT. Closing date 17/6/2022	Email sent
3/6/2022	NNTT	Melanie Dunstan	response from geospatial request	email received
8/6/2022	Barrier Truth	Bev Atkins (Lantern Heritage Pty Ltd, Office Manager)	Lantern Heritage sent a request to publish the Public Notice on the Barrier Truth closing date 24/6/2022	Notice was published on 8/6/2022
9/6/2022	Broken Hill Shire		BH Shire Council responded to stage 1 consultation letter with a consultation matrix containing names and organisations as possible contacts. Need to check relevant names off against Heritage list	email received
14/6/2022	Heritage NSW	Barry Gunther	List of RAPs received: Wilyakali Aboriginal Corporation; Pappin Family Aboriginal Corporation; Gary Pappin; Wakool Indigenous Corporation; Barkandji #8 Native Title Determinants; Badger Bates; Broken Hill LALC; Chair, Mutawintji Board of Management; 2 Anonymous group; Menindee Aboriginal Elders Council; Mutawintji LALC; Wilyakali Aboriginal Corporation	email received

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
21/6/2022	Lantern Heritage PTY LTD	From: Glenn Merrick (Assistant Business Manager)To: Wilyakali Aboriginal Corporation Pappin Family Aboriginal Corporation Mutawintji Board of Management Mutawintji LALC Menindee Aboriginal Elders Council Gary Pappin Wakool Indigenous Corporation Anonymous group Broken Hill LALC Barkandji #8 Native Title Determinants Badger Bates	Consultation letter 1b was email to 4RAPs and registered mail to 6 RAPs	response due by 6/7/2022
26/6/2022	Anonymous	Anonymous	expressed interest in the consultation process REQUESTED INFORMATION NOT BE DISCLOSED	email received
29/6/2022	Anonymous	Anonymous	expressed interest in the consultation process REQUESTED INFORMATION NOT BE DISCLOSED REQUESTED CORRESPONDENCE NOT BE RELEASED	email received
5/7/2022	Mutawintji Board of Management	Kristy Bennett Joint Management Officer West Branch, West Darling Area NSW National Parks and Wildlife Service	The Board suggested that Broken Hill Local Aboriginal Land Council and the Barkandji PBC be contacted.	email received

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
11/7/2022		From: Glenn Merrick (Assistant Business Manager) To: BHLALC and Barkandji PBC (via NTSCorp)	reminder emails sent to BHLALC and Barkandji NT group as no acknowledgement or expression of interest has been received	emails sent
12/07/2022	BH LALC	Joanne O'Donnell	registration of interest	email received
13/07/2022	NTSCorp	Sandy Chalmers	Sandy said Barkandji CEO has recently finished, as had the NTS lawyer representing Barkandji. He was appreciative of the follow up call and will register interest on behalf of Barkandji	phone call to NTSCorp
13/07/2022	NTSCorp	Sandy Chalmers	registration of interest on behalf of Barkandji Native Title Group Aboriginal Corporation RNTBC. Please copy all correspondence to information@ntscorp.com.au and it will be forwarded to the appropriate Barkandji contacts.	email received
13/07/2022	Lantern Heritage PTY LTD	From: Glenn Merrick (Assistant Business Manager) To: 2 anonymous groups, BHLALC and Barkandji	stage 2/3 mailout sent	emails sent

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
18/07/2022	Wilyakali	Maureen o'Donnell	Telephone conversation with Maureen O'Donnell who advised that she had just returned from a long stint in hospital so did not receive the mailout. Maureen gave me a contact (see below) and expressed Wilyankali's interest in the consultation process.	phone conversation
18/07/2022	Maari Ma Health Aboriginal Corporation	Renee Powell (Maari Ma 0880829 888)	Spoke to Renee Powell who who will print out the consultation documents and get them delivered to Maureen	phone conversation
18/07/2022	Maari Ma Health Aboriginal Corporation	Renee Powell (Maari Ma 0880829 888) renee.powell@maarima.com.au	emailed stage 1 and 2/3 documents	emails sent
26/07/2022	Lantern Heritage PTY LTD	From: Glenn Merrick (Assistant Business Manager) To: BHLALC and OEH (Joanne O'Donnell, OEH mailbox (resent with CC to CEO& Chair of BHLALC)	Notification of Stage 1 respondents as per Heritage NSW letter Doc22/439029	emails sent
29/07/2022	Lantern Heritage PTY LTD	From: Glenn van der Kolkj (Project Manager) To: Broken Hill LALC and NTSCorp (for Barkandji)	Request to provide Cultural Heritage Officers to participate in the survey	emails sent
2/08/2022	Lantern Heritage PTY LTD	From: Glenn Merrick (Assistant Business Manager) To: Broken Hill LALC and NTSCorp (for Barkandji)	Follow up phone calls to BH LALC and NTSCorp, left messages with both	phone calls made

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
2/08/2022	BHLALC	Jenny Geerdlink CEO	Jenny advised that she only has three officers at the moment and they are booked up until September	Phone call received
3/08/2022	BHLALC	Joanne O'Donnell	Confirmed 2 x RAPs are available. Confirmation email will be sent shortly	Phone call received
4/08/2022	Lantern Heritage PTY LTD	From: Glenn van der Kolkj (Project Manager) To: NTSCorp (for Barkandji)	Follow up email to NTSCorp seeking confirmation of delivery of request for Cultural Heritage Officers for field work	email sent
12/8 2022	Lantern Heritage PTY LTD	Bec Parkes (Director) site visit to Barkandji PBC office in Broken Hill	introduction and contact with reception. Acquired business cards for CEO and Project Officer	visit
28/09/2022	Lantern Heritage PTY LTD	From: Glenn van der Kolkj (Project Manager) To: BHLALC and Barkandji and 2 undisclosed RAPs	Invitation to participate in field survey results on-line meeting. The meeting did not proceed due to lack of availability.	email sent
15/12/2022	Lantern Heritage PTY LTD	From Glenn Merrick to all RAPs	Sent test excavation methodology	emails sent
15/12/2022	Lantern Heritage PTY LTD	From Glenn Merrick to Heritage NSW	Sent test excavation methodology	email sent
21/12/2022	Re: Wilyakali	Renee Powell on behalf of Maureen O'Donnell	Advised that Auntie Maureen has passed away	email received
21/12/2022	Re: Wilyakali	Renee Powell on behalf of Maureen O'Donnell	reply to Renee	email sent

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
6/01/2023	Anonymous	Anonymous	"We have reviewed (methodology) and do not foresee any issues"	email received
9/01/2023	BH LALC	Joanne O'Donnell	Phone conversation with Joanne O' Donnell to establish a new point of contact for Wilyakali- advised to contact Glen O'Donnell and Dulcie O'Donnell glenodonnell@gmail.com odonnelldulcie@gmail.com	phone conversation
9/01/2023	Wilyakali	Dulcie O'Donnell and Glen O'Donnell	Email to request new point of contact	email sent
16/01/2023	BHLALC & Barkandji	Sandy Chalmers NTSCorp and Joanne O'Donnell BH LALC	Email seeking availability for fieldwork in early Feb	emails sent
17/01/2023	BH LALC	Joanne O'Donnell	locked in field workers for Feb test excavation	email received
13/04/2023	Lantern Heritage PTY LTD	From: Jo Dibden (Project Manager) To: Woka, Corroboree, BHLALC and Barkandji (via NTSCorp) Wilyakali ; forwarded reports to Dulcie and Glen O'Donnell on behalf of Wilyakali	AR and ACHAR sent for review - comment due by the Thursday 11th May 2023.	email sent
27/5/2023	Hydrostor		Meeting between Hydrostor and BHLALC to review project	In person meeting
16/06/2023	BH LALC	Joanne O'Donnell	Response provided to AR and ACHAR review in letter dated 13 June 2023.	Email received

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
3/4/2024	Lantern Heritage PTY LTD		Updated ACHAR and AR addressing BHLALC comments provided	Email sent
6 and 7/4/2024	Hydrostor		Meeting between Hydrostor and BHLALC to review project	In person meeting
6/6/2024	Umwelt	Penelope Williams	Letter and ACHAR containing comments from BHLALC meeting with Hydrostor sent to Lantern	Email sent
20/6/2024	Lantern Heritage	Majella Hammersley	Project update including revised disturbance area sent to all RAPs.	Email sent
22/6/2024	Hydrostor		Meeting between Hydrostor and BHLALC to discuss ACHMP. On site meeting with BHLALC board members. The attending Board members did not raise any concerns.	In person meeting
26/6/2024	Anonymous	Anonymous	Response to project update email:,. Thanks – will check it out.	Email received.
26/6/2024	Barkandji	NTSC Corp - Zoe Robertson	Response to project update email Thank you for your email. You discuss proposed Aboriginal Cultural Heritage management and mitigation measures in your email, however NTSCORP does not have record of any previous information sent to us in relation to this project. Can you please advise whether Barkandji PBC have received a copy of the proposed Aboriginal Cultural Heritage management and mitigation measures you discuss?	Email received
2/7/2024	Lantern Heritage	Majella Hammersley	Response to NTSC Corp email of 26/6/2024	Email sent

Date	Organisation	Contact Name/s	Consultation type / Comment	Method
			Thanks for getting in touch. We have had limited communication from Barkanji about this project to date and it is good to hear from you. There are two answers to your question: 1. Barkanji have not seen the Aboriginal Cultural Management plan yet as it will be prepared post project approval. 2. The mitigation measures were included in the draft ACHAR sent to Barkanji on 13 April 2023. There have been some minor changes to these measures following consultation and the revised mitigation measures are attached for your reference. Please get in touch if you have any questions.	

Sample Stage 1A letter sent to the main Agencies and Local Councils to nominate knowledge holders for Project

Lantern Heritage Pty Ltd

PO Box 7039
Tathra
NSW 2550

ACN: 620 582 658
ABN: 30 620 582 658

Phone: (02) 64 94 1801
Email: info@lanternheritage.com.au
Web: www.lanterheritage.com.au

02 June 2022

Broken Hill LALC
84 Oxide St
Broken Hill NSW 2280
E: admin@bhlalc.org.au

Dear Sir/Madam,

To seek Aboriginal knowledge holders to assist Lantern Heritage to prepare a Cultural Heritage Assessment Report for the Silver City Energy Storage Project at Broken Hill, NSW.

Energy Estate Pty. Ltd. and Hydrostor Australia Holdings Pty. Ltd. (the Proponent), as a joint venture, are proposing the Silver City Energy Storage (SCES) Project (the Project) which will use advanced compressed air energy storage (ACAES) technology to provide large-scale, long duration energy storage at Broken Hill, NSW. The Project proposes to partly utilise pre-existing mine infrastructure at the Potosi Mine approximately 3km northeast of Broken Hill, and includes construction of a transmission line, the ACAES facility and associated buffers, underground cavern and deposition of excavated material within an established mine site, and a 300ML water reservoir.

The proposed activity is assessed as State Significant Development (SSD) and therefore an Aboriginal Cultural Heritage Assessment Report (ACHAR) is required to support the Environmental Impact Statement (EIS). As such, the Proponent and its consultants are implementing the *Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010)*. The purpose of community consultation is to assist Heritage NSW in the identification, assessment and management of Aboriginal objects or places.

The Proponent is seeking the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places within the project area for the SCES project.

Aboriginal people identified by your agency will be notified of the Project and invited to participate in the assessment process as described in OEH's requirements. Please forward the details of relevant Aboriginal people to info@lanternheritage.com.au before 17th June 2022.

Yours Sincerely,

Glenn Merrick

Glenn Merrick
Assistant Business Manager
Lantern Heritage Pty Ltd

Lantern Heritage Pty Ltd

PO Box 7039
Tathra
NSW 2550

ACN: 620 582 658
ABN: 30 620 582 658

Phone: (02) 64 94 1801
Email: consultation@lanternheritage.com.au
Web: www.lanterheritage.com.au

21 June 2022

Barkandji #8 Native Title Determinants
Badger Bates c/o
NTSCorp PO Box 2105
107 Gaffney Lane, Broken Hill NSW 2880
Ph: Phone: 02 9310 3188
E: information@ntscorp.com.au; barkandjiceo@gmail.com

Dear Badger,

To seek Aboriginal knowledge holders to assist Lantern Heritage to prepare a Cultural Heritage Assessment Report for the Silver City Energy Storage Project at Broken Hill, NSW.

Energy Estate Pty. Ltd. and Hydrostor Australia Holdings Pty. Ltd. (the Proponent), as a joint venture, are proposing the Silver City Energy Storage (SCES) Project (the Project) which will use advanced compressed air energy storage (ACAES) technology to provide large-scale, long duration energy storage at Broken Hill, NSW. The Project proposes to partly utilise pre-existing mine infrastructure at the Potosi Mine approximately 3km northeast of Broken Hill, and includes construction of a transmission line, the ACAES facility and associated buffers, underground cavern and deposition of excavated material within an established mine site, and a 300ML water reservoir.

The proposed activity is assessed as State Significant Development (SSD) and therefore an Aboriginal Cultural Heritage Assessment Report (ACHAR) is required to support the Environmental Impact Statement (EIS). As such, the Proponent and its consultants are implementing the *Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010)* The purpose of community consultation is to assist Heritage NSW in the identification, assessment and management of Aboriginal objects or places.

The Proponent is seeking the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places within the project area for the SCES project.

To be involved in the consultation process or to nominate another organisation responses must be received by **6th July 2022**.

To register your interest to be consulted about this project, please contact: consultation@lanternheritage.com.au

The contact details for more detailed information regarding this Project are:

Penelope Williams
Senior Environmental Planner
E: pwilliams@umwelt.com.au

Yours Sincerely,

Glenn Merrick

Glenn Merrick
Assistant Business Manager Lantern Heritage Pty Ltd

Copy of the advertisement placed in the Barrier Truth, (running 8/6/2022)

Public Notice

Energy Estate Pty Ltd and Hydrostor Australia Holdings Pty Ltd (the proponent), as a joint venture, are proposing to develop, construct and operate the 200MW Silver City Energy Storage (SCES) Project, which will use advanced compressed air energy storage (ACAES) technology to provide large-scale long duration energy storage at Broken Hill, NSW.

The Project proposes to partly utilise pre-existing mine infrastructure at the Potosi Mine approximately 3km northeast of Broken Hill and includes construction of a new 220kV transmission line and establishment of associated easements. In addition, the facility will construct and utilise a 300ML water reservoir and underground caverns within the existing Potosi Mine footprint. The proposed activity is being assessed as State Significant Development (SSD) and therefore an Aboriginal Cultural Heritage Assessment Report (ACHAR) is required to support the Environmental Impact Statement (EIS). As such, the Proponent and its consultants are implementing the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010). The purpose of this community consultation is to assist Heritage NSW in the identification, assessment and management of Aboriginal objects or places. Registrations of interest are invited from Aboriginal people/organisations who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or places in the vicinity of Broken Hill, NSW. The closing date for registrations of interest is 24/6/2022. Registrations can be made in writing or over the telephone through Lantern Heritage: PO Box 7039 Tathra, NSW 2550 info@lanternheritage.com.au (02) 6494 1801 Further information regarding the proposed works can be obtained via the above email address or telephone number.

Sample email letter sent to RAPs for stage 2/3 of the Aboriginal Consultation.

Lantern Heritage Pty Ltd

PO Box 7039

Tathra
NSW
2550

ACN: 620 582 658

ABN: 30 620 582 658

Phone: (02) 6494 1801

Email: consultation@lanternheritage.com.au
Web: www.lanterheritage.com.au

13 July 2022

Joanne O'Donnell
Broken Hill LALC

E: joanne@bhlalc.org.au ceo@bhlalc.org.au chairperson@bhlalc.org.au Dear

Joanne,

Re: Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Silver City Energy Storage Project at Broken Hill,NSW.

Thank you for your registration of interest in the Aboriginal consultation process regarding the Silver City Energy Storage (SCES) Project (the Project), Broken Hill, NSW. This letter provides details of:

- the proposed works;
- the impact assessment process; and
- previously recorded sites;

It is also the next stage in ongoing consultation with all registered Aboriginal parties to:

- identify, raise and discuss their cultural concerns, perspectives and assessment requirements;
- contribute to the research methodology and culturally appropriate information gathering;
- provide information regarding the cultural significance of Aboriginal objects and/or places in the proposed project area; and
- have input into the development of any cultural heritage management options.

Proposed works

Energy Estate Pty. Ltd. and Hydrostor Australia Holdings Pty. Ltd., as a joint venture under A-CAES Pty Ltd (the Proponent), are proposing the Silver City Energy Storage (SCES) Project (the Project) which will use advanced compressed air energy storage (A-CAES) technology to provide large-scale, long duration energy storage at Broken Hill, NSW. The Project proposes to partly utilise pre-existing mine infrastructure at the Potosi Mine approximately 3km northeast of Broken Hill, and includes construction of a transmission line, the SCES facility (including associated buffers, underground cavern and deposition of excavated material within an established mine site), and a 300ML water reservoir.

The proposed activity is assessed as State Significant Development (SSD) and therefore an Aboriginal Cultural Heritage Assessment (ACHA) Report is required to support the Environmental Impact Statement (EIS). As such, the Proponent and its consultants are implementing the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010). The purpose of community consultation is to assist in the identification, assessment and management of Aboriginal objects or places.

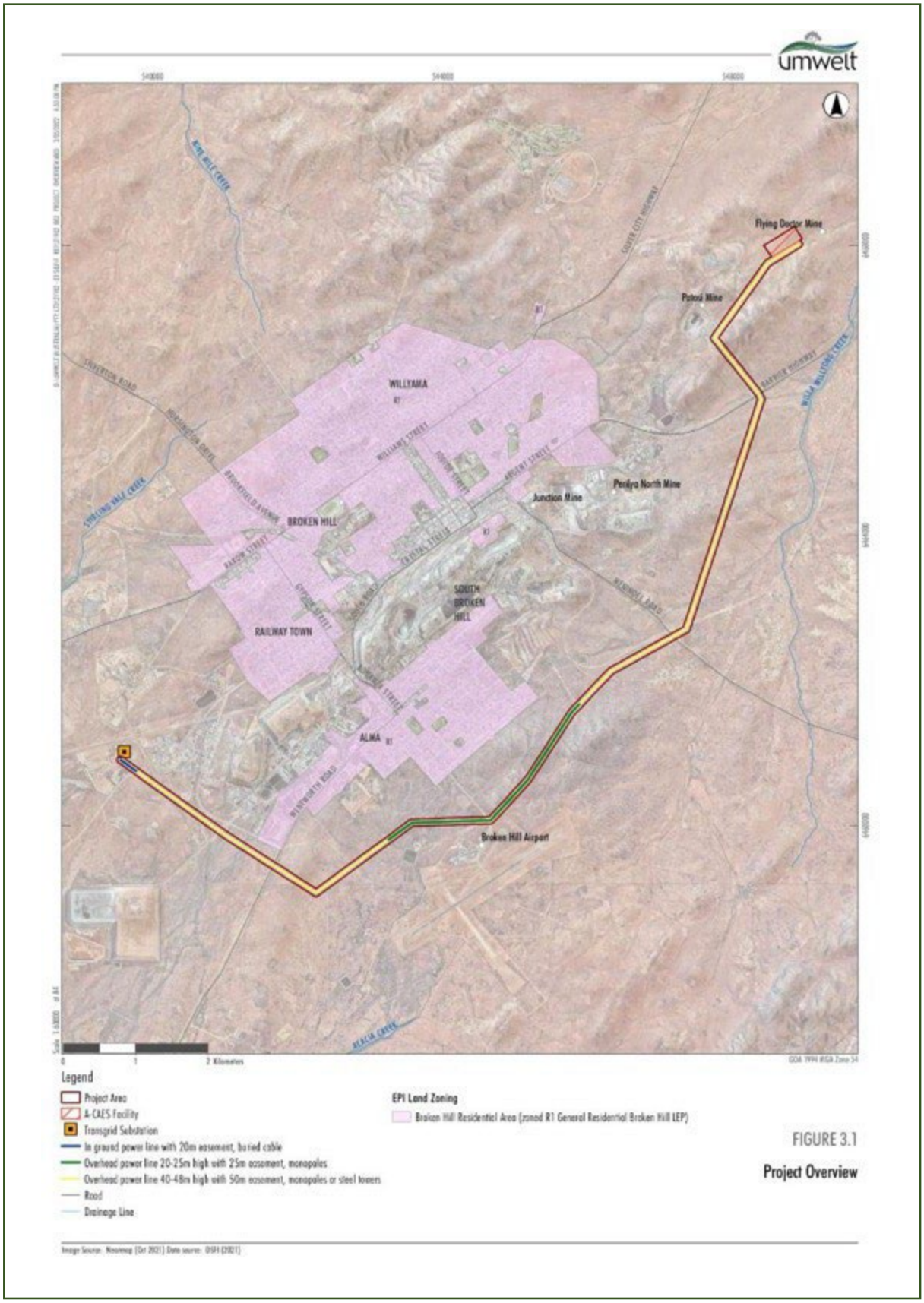


Figure 1 depicts the approximate location of the Project Area associated with the ACHA.

Lantern Heritage Pty Ltd has been commissioned by the Proponent to undertake the Aboriginal cultural heritage assessment for the proposed works and is managing the Aboriginal consultation process.

The proposed works include:

- construction of a transmission line,
- construction of the ACAES facility and associated buffers, underground cavern and deposition of excavated material within an established mine site, and
- construction of a 300ML water

reservoir The contact details for the

Proponent are as follows:

Proponent Name	A-CAES NSW Pty Ltd
Postal Address	Level 11 Constitution Avenue, Canberra ACT 2603
ABN	86 644 102 858
Nominated Contact	Dean A. Comand

Assessment process

The assessment process for the project will be conducted in accordance with the guidelines set out in the following Heritage NSW publications:

- Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales
- Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales;
- Guide to Investigating, Assessing and reporting on Aboriginal Cultural heritage in NSW; and
- Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.

It will involve background research to identify all known Aboriginal sites in and around the areas of the proposed works, and a review of existing reports and publications to establish a predictive model of Aboriginal site location.

A detailed investigation and impact assessment of the Project Area will include an onsite survey with Registered Aboriginal Parties. The investigation and assessment will aim to:

- review the condition and extent of all known Aboriginal sites within the
- project area; identify any previously unrecorded Aboriginal objects and/or areas of archaeological potential;
- identify non-archaeological places of Aboriginal
- cultural value; and identify any heritage constraints to the proposed works.

The extent of the onsite survey area is depicted in Figure 2.

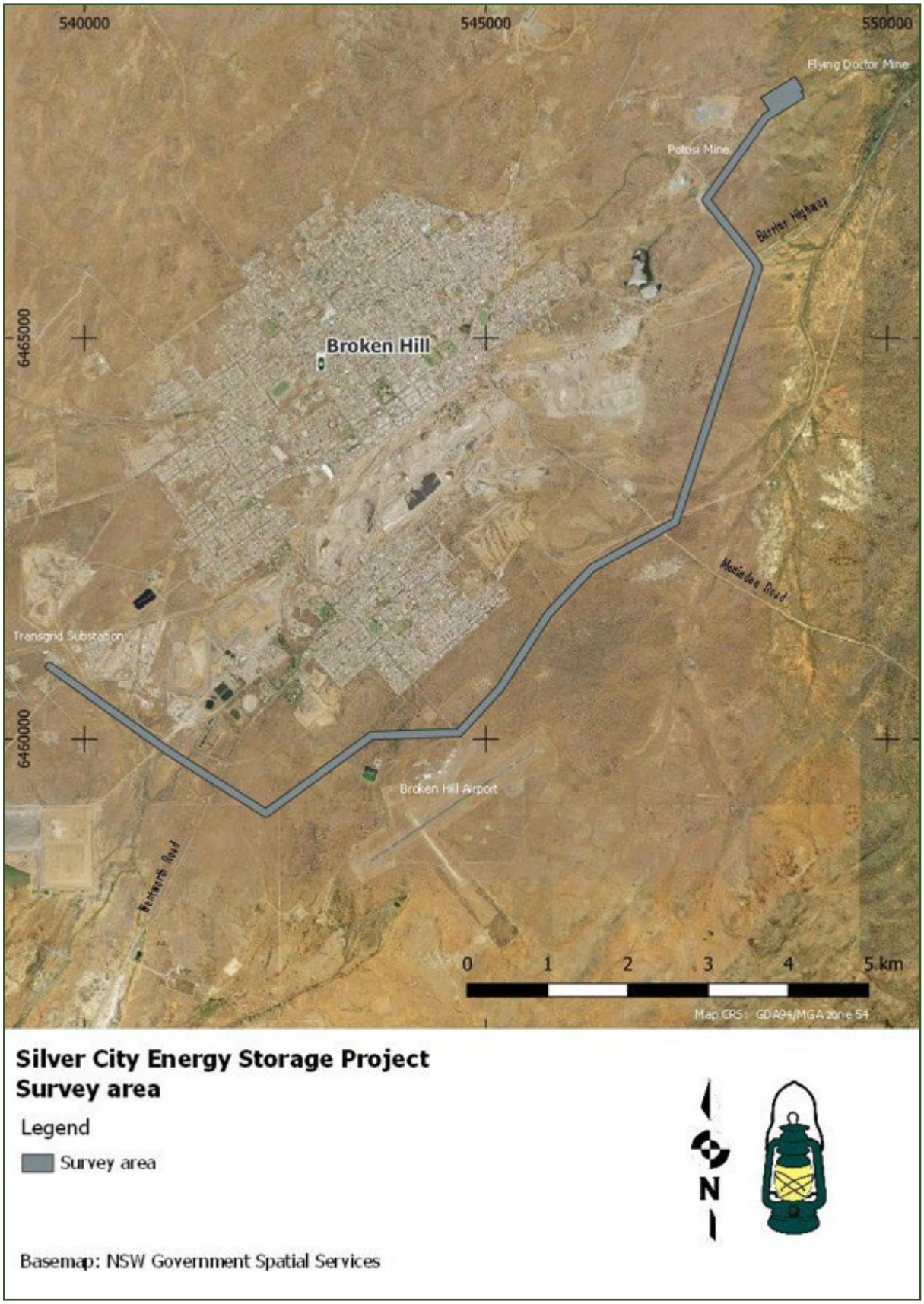


Figure 2: Survey Area for the Broken Hill SCES A-CAES project.

Ongoing consultation will be undertaken with all registered Aboriginal parties in order to gather information regarding Aboriginal cultural values in and around the proposed project areas. Opportunities will be provided throughout the assessment process for registered Aboriginal parties to contribute information in writing, in person, or via the telephone, regarding cultural values and preferred options for managing those cultural values and mitigating potential impacts.

This letter is the next stage in that consultation process. All registered Aboriginal parties are invited to:

- contribute to culturally appropriate information gathering and the research methodology;
- provide information that will enable the cultural significance of Aboriginal objects and/or places within the proposed project areas to be determined; and
- have input into the development of any cultural heritage management options.

You are invited to contact Lantern Heritage at any stage during the project, via the contact details provided below, to ask any questions, or provide cultural information, feedback and recommendations regarding the proposed works and long-term management strategies.

Contact Person: Glenn van der Kolk, Lantern Heritage **Postal Address:** PO Box 7039, Tathra, NSW 2550 **Email:** consultation@lanternheritage.com.au

If there are any concerns about the cultural sensitivity of information provided, or if for any reason you wish to place restrictions on access to information provided (e.g. information that should not be provided to the public, or information specific to women's/men's business), Lantern Heritage will undertake all necessary measures to ensure that your information remains confidential. Furthermore, in the event that you have concerns or information relating to a women's site, Lantern Heritage has a female archaeologist who you will be put in contact with.

Following completion of the field survey, an Aboriginal Cultural Heritage Assessment Report (ACHAR) will be prepared which documents the results of the background research, field survey and Aboriginal consultation process. The report will also include a detailed significance assessment of all known Aboriginal objects and/or places, an assessment of potential impacts from the proposed works, and strategies for minimisation and management of potential impacts.

Copies of the draft report will be provided to all registered Aboriginal parties. You will then have at least 28 days to provide feedback/comment on the draft report. All contributions, comments and recommendations made by registered Aboriginal parties will be incorporated into the final version of the ACHAR. The ACHAR will then be submitted to Heritage NSW and will accompany the EIS.

The proposed timeline for the Project, including key timing for contributions from registered Aboriginal parties, is as follows:

July 2022 Undertake background research. Gather information about cultural significance.

Commence preparation of draft ACHAR.

Registered Aboriginal parties have an opportunity to provide feedback on the project and/or identify any cultural concerns or assessment requirements.

Registered Aboriginal parties are invited to contact Lantern Heritage with information regarding Aboriginal objects, places and associated cultural values relevant to the project areas. **The official closing date for contributions regarding**

All comments and feedback on the draft ACHAR will be incorporated and addressed into the final version of the report, which will be submitted with the EIS in mid-November.

Previously recorded sites

An extensive site search of the Aboriginal Heritage Information Management System (AHIMS) resulted in one hundred and six (106) sites listed within the search area. Eleven (11) previously recorded sites may be located within the Project Area. Figure 3 shows the sites recorded within and near the Project Area. A summary of the AHIMS extensive search results is listed in Table 1 and an overview of the site types in the search area is listed in Table 2.

Table 1: Summary of AHIMS search results.

AHIMS	Site Name	Site Type/Features
23-5-0121	PM-Q4	Stone Quarry
23-5-0153	FD-IF7	Artefact Scatter
23-5-0063	BH1-48;	Artefact Scatter
23-5-0014	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0030	Roy. Fly. Doc. Mast 19;	Artefact Scatter
23-5-0136	FD-IF05	Artefact Scatter
23-4-0637	Mawsons Quarry Isolated Find 1	Artefact Scatter
23-4-0132	South Broken Hill	Artefact Scatter
23-5-0122	PM-Q5	Stone Quarry
23-5-0131	PM-IF6	Artefact Scatter
23-5-0157	Access track to railway artefact scatter	Artefact Scatter
23-5-0134	FD-IF08	Artefact Scatter
23-5-0148	FD-IF09	Artefact Scatter
23-5-0064	BH1-49;	Artefact Scatter
23-5-0024	Roy. Fly. Doc. Mast 13;	Artefact Scatter

23-5-0025	Roy. Fly. Doc. Mast 12;	Artefact Scatter
23-5-0029	Roy. Fly. Doc. Mast 17;	Artefact Scatter
23-5-0028	Roy. Fly. Doc. Mast 16;	Artefact Scatter
23-5-0143	FD05	Artefact Scatter
23-5-0066	BH1-54;	Artefact Scatter
23-4-0626	Broken Hill Solar - Site #11	Artefact Scatter
23-4-0088	AS9	Artefact Scatter-Destroyed
23-4-0089	AS10	Artefact Scatter-Destroyed
23-4-0085	AS6	Artefact Scatter
23-4-0112	AS2	Stone Quarry
23-5-0132	PM-G04	Artefact Scatter
23-5-0123	PM-Q6	Stone Quarry
23-5-0119	PM-Q2	Artefact Scatter
23-5-0150	FD-IF13	Artefact Scatter
23-5-0114	PM-IF1	Artefact Scatter
23-5-0015	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0145	FD-IF07	Artefact Scatter
23-5-0128	FD01	Artefact Scatter／PAD
23-4-0636	Mawsons Quarry Ab. Quarry 1	Stone Quarry
23-5-0141	FD08	Artefact Scatter

23-5-0110	FD07	Artefact Scatter
23-5-0146	FD-IF19	Artefact Scatter
23-5-0127	PM-Q7	Stone Quarry
23-5-0125	PM-GO2	Artefact Scatter
23-5-0062	BH1-47;	Artefact Scatter
23-5-0147	FD-IF10	Artefact Scatter
23-5-0018	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0019	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0130	PM-SC10	Artefact Scatter
23-5-0135	FD-IF06	Artefact Scatter
23-5-0137	FD-IF04	Artefact Scatter
23-5-0065	BH1-51／53;	Artefact Scatter
23-5-0115	PM-IF3	Artefact Scatter
23-5-0144	FD02	Artefact Scatter／PAD／Aboriginal Ceremony and Dreaming
23-4-0639	Mawsons Quarry Open Site	Artefact Scatter
23-4-0641	Kanandah 2	Artefact Scatter
23-4-0090	AS12	Stone Quarry-Destroyed
23-4-0084	AS5	Artefact Scatter-Destroyed
23-5-0120	PM-Q3	Stone Quarry

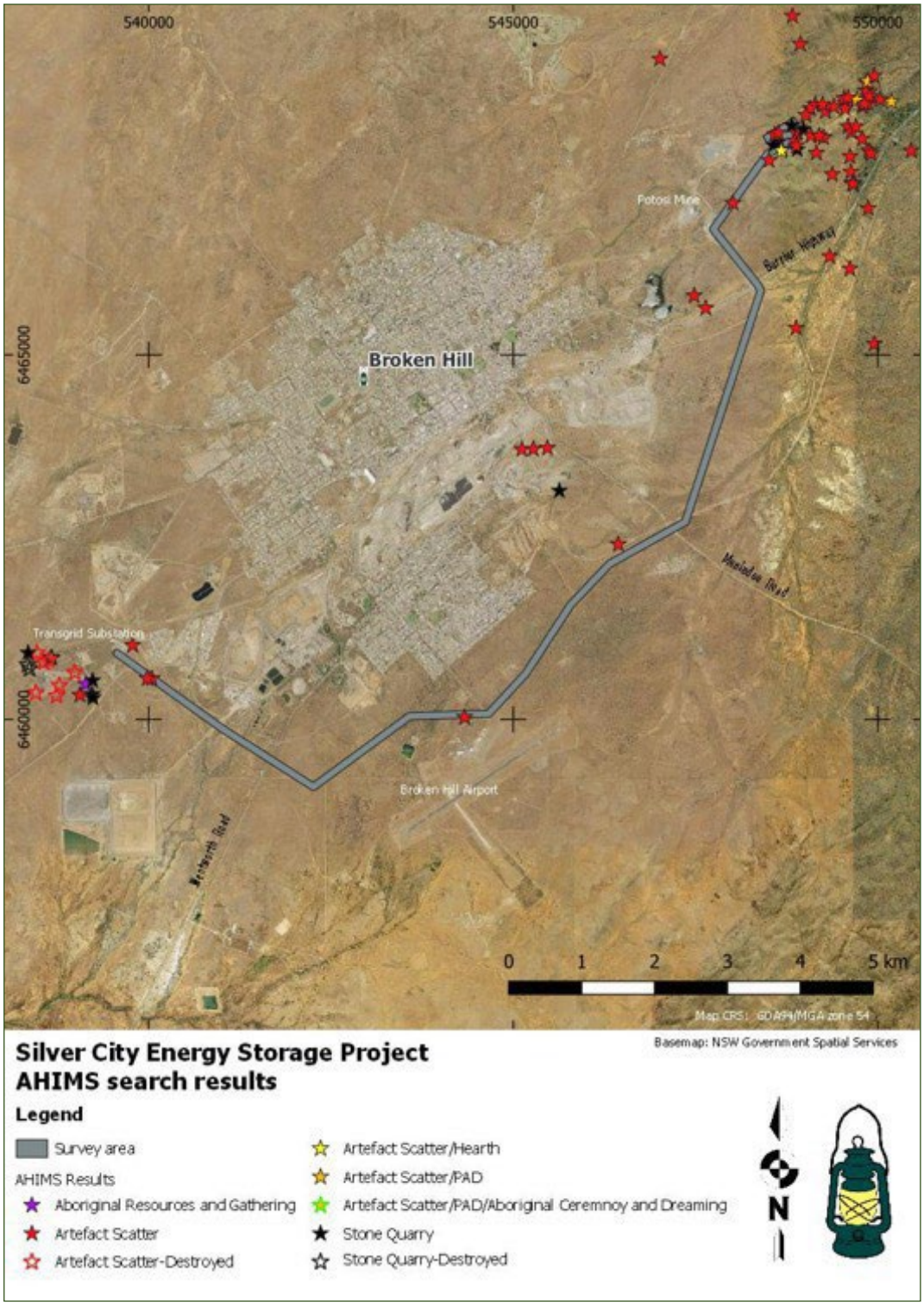
23-5-0140	FD-IF01	Artefact Scatter
23-5-0126	PM-GO3	Artefact Scatter
23-5-0113	PM-SC7	Artefact Scatter
23-5-0017	Royal Flying Doc Mast;	Artefact Scatter
23-5-0020	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0013	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0108	FD06	Artefact Scatter/PAD
23-5-0142	FD03	Artefact Scatter/PAD
23-5-0116	PM-IF4	Artefact Scatter
23-4-0093	AS14	Stone Quarry-Destroyed
23-4-0111	AS11	Artefact Scatter-Destroyed
23-4-0691	BESS-AS1-21	Artefact Scatter
23-5-0139	FD-IF02	Artefact Scatter
23-5-0111	PM-SC5	Artefact Scatter
23-5-0151	FD-IF15	Artefact Scatter
23-5-0152	FD-IF18	Artefact Scatter
23-5-0107	PM-SC1	Artefact Scatter
23-5-0021	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0149	FD-IF11	Artefact Scatter
23-5-0097	Taltingan	Artefact Scatter

23-4-0638	Mawsons Quarry Open Site 2	Artefact Scatter
23-4-0107	AS13	Stone Quarry-Destroyed
23-4-0092	AS15	Artefact Scatter-Destroyed
23-4-0087	AS8	Artefact Scatter-Destroyed
23-4-0086	AS7	Artefact Scatter-Destroyed
23-4-0082	AS3	Aboriginal Resources and Gathering
23-4-0081	AS1	Stone Quarry
23-5-0156	FD-IF14	Artefact Scatter
23-5-0118	PM-Q1	Artefact Scatter
23-5-0022	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0023	Roy. Fly. Doc . Mast 11;	Artefact Scatter
23-5-0026	Roy.Fly.Doc. Mast 14;	Artefact Scatter
23-5-0129	PM-SC9	Artefact Scatter
23-5-0109	FD04	Artefact Scatter
23-4-0640	Kanandah 1	Artefact Scatter
23-4-0091	AS16	Stone Quarry
23-4-0078	PML.23	Artefact Scatter
23-5-0096	BM 259	Artefact Scatter
23-5-0075	PML20	Artefact Scatter
23-5-0112	FD-G001	Artefact Scatter / Hearth

23-5-0061	BH1-45／46;	Artefact Scatter
23-5-0154	FD-IF16	Artefact Scatter
23-5-0098	Willa Willyong Creek	Artefact Scatter
23-5-0016	Royal Flying Doc. Mast;	Artefact Scatter
23-5-0027	Roy. Fly. Doc. Mast 15;	Artefact Scatter
23-5-0124	PM-GO1	Artefact Scatter
23-5-0117	PM-IF5	Artefact Scatter
23-5-0155	FD–IF12	Artefact Scatter
23-4-0682	South airports regency area isolated artefacts	Artefact Scatter
23-4-0083	AS4	Stone Quarry
23-5-0138	FD-IF03	Artefact Scatter
23-5-0076	PML13	Artefact Scatter

Table 2: Overview of previously recorded site types within the AHIMS search area.

Site types	Total
Resource and gathering	1
Artefact scatter (existing and destroyed)	87
Artefact scatter／Hearth	1
Artefact scatter／PAD	3
Ceremonial	1



Quarry (existing and destroyed) 13

Lantern Heritage would once again like to thank you for your registration of interest in this project. We look forward to working with you in the coming months and encourage you to get in touch with any information you may have, relevant to the Project, or any concerns you have about cultural heritage values within the Silver City Energy Storage study area.

Please feel free to contact Lantern Heritage at any time with any questions you may have regarding this project.

Yours Sincerely,



Bec Parkes BA Hons, PhD, MAAICA, MAICOMOS Director / Principal Archaeologist

Lantern Heritage Pty Ltd

Sample email letter sent to RAPs with test excavation methodology attached. 15/12/2022

Att: Barkandji Native Title Group Aboriginal Corporation c/o Sandy Chalmers

Dear Sandy,

Thank you for your ongoing involvement in the Aboriginal consultation process for the proposed Broken Hill ACAES facility. Please find attached test excavation methodology for your perusal and feedback if required. We have added 5 days to the normal 28 day period to allow for the Christmas break and as such the closing date for feedback on this methodology is **23 January 2023.**

We hope you have a safe and happy Christmas and New Year and look forward to working with you in 2023.

Kind Regards

Glenn

Glenn Merrick

Assistant Business Manager

Mob: 0436 479 888

Lantern Heritage Pty Ltd

PO Box 7039, Tathra NSW 2550

3/15 Bega St, TATHRA NSW 2550

E: glenn_m@lanternheritage.com.au

W:www.lanternheritage.com.au

Available Monday to Thursday

Test excavation methodology sent 15/12/2022

Example email responses to Stage 1A and 1B letters

From: joanne@bhlalc.org.au

To: Consultation

Cc: ceo@bhlalc.org.au; chairperson@bhlalc.org.au

Subject: RE: Broken Hill ACAES facility -stage 1 consultation

Date: Tuesday, 12 July 2022 9:53:09 AM Attachments: image003.png image001.png

Dear Glenn,

Please accept this email as the Broken Hill Local Aboriginal Land Council (BHLALC) request to be listed as a Registered Aboriginal Party for the Silver City Energy Storage (SCES) Project (the Project).

Broken Hill Local Aboriginal Land Council (BHLALC) has a long standing commitment to fostering the best interest/s of Aboriginal Culture & Heritage within its boundaries.

Under the Aboriginal Land Rights Act 1983 (ALRA 83), BHLALC has particular statutory obligations in relation to "Protecting and Conserving" Aboriginal Culture & Heritage.

Legislation;

Section 52.4 of the ALRA 83, advises the following;

A Local Aboriginal Land Council has the following functions in relation to Aboriginal culture and heritage:

(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law,

(b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area.

There are two Aboriginal organisations that the Broken Hill LALC recommend you contact or list as RAP's for this project those being;

1. Wilyakali Aboriginal Corporation – 94 Ryan Street Broken Hill NSW 2880 contact the Chairperson Maureen O'Donnell 0427 185283
2. Barkandji Native Title Group Aboriginal Corporation RNTBC email: barkandjiceo@gmail.com

Your sincerely Joanne O'Donnell

On behalf of the Broken Hill Local Aboriginal Land Council

Example email responses to Stage 2/3 Letters None received

Email sent to RAPs for review of ACHAR and AR Reports

From: Jo Dibden
To: joanne@bhlalc.org.au; ceo@bhlalc.org.au; chairperson@bhlalc.org.au
Cc: Penelope Williams; Consultation; Lantern MGT team
Subject: Draft ACHAR and AR reports for the Broken Hill A-CAES project for review
Date: Thursday, 13 April 2023 2:47:49 PM

Dear RAP

I hope this email finds you well.
Please find below the links to the draft copies of the Broken Hill A-CAES Project ACHAR and AR, as well as a folder comprising additional AR Appendices.
Following your review of the report, and if required, please provide me with your written or oral comment by Thursday 11th May 2023 using the contact details below.

Please Note - Culturally Sensitivity and Gender Sensitive Information: We understand that there may be situations where RAPs may have information about a project which is culturally or gender sensitive. If RAPs wish to provide cultural information which they do not want to be made public or which is gender sensitive, provision can be made to record this information as confidential as part of the reporting process but without inclusion in the public versions of the report/s.

ACHAR:
https://www.dropbox.com/s/2ar1fflopcewrmn/ACHAR_DRAFT_Broken%20Hill%20ACAES%20%23174_RAP_13April2023.pdf?dl=0

AR:
https://www.dropbox.com/s/h7z0uulvi1ly7pa/AR_%20DRAFT_Broken%20Hill%20ACAES%20%23174_RAP_13April2023.pdf?dl=0

Additional AR Appendices:
https://www.dropbox.com/sh/cy5yto6tjqksmfk/AAA3_2DklwR30ICq5P1K9T4ia?dl=0

Thank you for your time.

Kindest regards,

Jo Dibden
Lead Archaeologist
Work days: Monday to Thursday
Lantern Heritage Pty Ltd
PO Box 7039
TATHRA NSW 2550
ph: (02) 6494 1801

Response from Broken Hill LALC

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL
84 Oxide Street. PO Box 392, BROKEN HILL NSW 2880
Telephone: 08 8087 7413 / 8087 7310
Email: admin@bhlalc.org.au

Tuesday, 13 June 2023

Ms. Jo Dibden
Lead Archaeologist
Lantern Heritage Pty Ltd
PO Box 7039
TATHRA NSW 2550

Via email: consultation@lanternheritage.com.au

Dear Ms. Dibden,

The Board and the representatives of Broken Hill Local Aboriginal Land Council (BHLALC) met on 27th May 2023 to review the Silver City Energy Storage Project Broken Hill, New South Wales Aboriginal Culture Heritage Assessment report.

The comments and recommendation received from the workshop held on the 27th May 2023 were presented to the Board on the same day for endorsement.

The Broken Hill Local Aboriginal Land Council do not support the project due to impact this will have on culture and heritage, flora and fauna and the unknown disturbance this will cause on historical landmarks and understand that regardless of this statement the project will go ahead as it is considered a State significant project.

Notwithstanding the above statement the BHLALC will approve the Culture Heritage Assessment Report once amendments have been made and further clarification or a response has been received.

BHLALC Recommendations resulting from the summary of recommendation outlined in the ACHAR on page 84 and 85:

1. Page 76 of the ACHAR
"The importance of the artefacts and landscape features to local Aboriginal people has also been considered in the development of these mitigation and management strategies."

The BHLALC request further information and clarification on documentation on how Aboriginal people were considered.

2. Page 149 of the AR
Numbering of table in error, table heading should be 42 not 41.

3. Page 76 of the ACHAR
The BHLALC does not support section 10.2 without ACHMP being developed before construction.

4. Page 77 of the ACHAR section 10.2 d

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL
84 Oxide Street. PO Box 392, BROKEN HILL NSW 2880
Telephone: 08 8087 7413 / 8087 7310
Email: admin@bhlalc.org.au

Change the paragraph to read: All construction and facility workers ~~should~~ **must** undergo a cultural heritage induction **facilitated by the Wilyakali Aboriginal Corporation** to communicate the importance of protecting cultural heritage, and the legal, ethical, social and practical issues involved.

5. Page 77 of the ACHAR
Change the wording from "sites with moderate-high, or greater, archaeological potential (see figure 23); and" **to all sites (see figure 23); and**

6. Page 77 of the ACHAR
Referencing to any testing of salvaged samples data collected is to be collected on behalf of the BHLALC and the Wilyakali people. Any testing results and assessment reports is to be owned by the BHLALC on behalf of the Wilyakali people and cannot be shared or published without prior approval from both the BHLALC and the Wilyakali Aboriginal Corporation.

7. Page 77 of the ACHAR
The reference to Aboriginal community protocols should be either Broken Hill Aboriginal community protocols or protocols developed by the BHLALC in consultation with Wilyakali people.

8. Page 78 of the ACHAR
The following sentence is considered culturally sensitive information and not appropriate to be included in the report and the BHLALC request that the following sentence be removed from the report: "the following being sensitive to the connection between Aboriginal men and crystal quartz: only men will handle artefacts made from this material."

Recommended change: Men and Women material will be managed in a cultural appropriate way in accordance with Wilyakali protocols.

9. Page 79 of the ACHAR Stage 2
Recommended change to the first paragraph "an auger survey should be employed." Recommended change **a RAP monitored** auger survey should be employed.

10. Page 79 of the ACHAR Stage 3
Recommended change: Decisions about the final placement of salvage pits will be made in consultation with the RAPs **recognised by the BHLALC**, selecting a location with maximum potential for intact deposits with archaeological material, within the footprint of proposed impacts.

11. Page 79 of the ACHAR Stage 4
First bullet point - remove the words "An unusually high" and change to: a density of artefacts.

12. Page 80 of the ACHAR Stage 5 (2nd paragraph)
Recommended change: ~~Community~~ BHLALC or RAP monitoring.

13. Page 80 of the ACHAR
Bulleted points showing 21 sites. Referencing the page numbers would have assisted in referring to the AR or a table could have been referenced to make it easier on the reader.

14. Page 31 of the ACHAR
Any reference to the Bronzewing Pigeon story is to be removed from the report;

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL
84 Oxide Street. PO Box 392, BROKEN HILL NSW 2880
Telephone: 08 8087 7413 / 8087 7310
Email: admin@bhlalc.org.au

Recommended change: Culturally, the Pinnacles are a significant cultural site in the Broken Hill area to the Wilyakali, Paakantyi and Adnyamathanha peoples. ~~They are also associated particularly with the Bronzewing Pigeon Dreaming story~~. The Pinnacles, located approximately 8km southwest of the Project Area, are a declared Aboriginal Place, however it consists of a very restricted area, with limited inclusion of land outside The Pinnacles themselves, despite cultural knowledge identifying the hills as only one aspect of sacred land. Sacred land also includes a wider area of land, including the Pine and Stirling Vale Creeks, and certain rock outcroppings and trees.

Page 64 of the ACHAR

Please remove the referencing of the Marnbi dreamtime story: Anthropological research published by Lindy Warrell in 1995 demonstrates the ongoing connection of contemporary Aboriginal communities to the Broken Hill area in general and the Pinnacles specifically. Located approximately 8km southwest of the Project Area, the Pinnacles are three distinctive rocky peaks ~~that form part of the Marnbi (bronze winged pigeon) Dreamtime story. In the Barkinji version of this story, feathers (white quartz) and droppings (black rock) from the injured fell in the Broken Hill area. These mineral deposits form the Pinnacles and these types of rock outcrops are seen within the Project Area and have the potential to form a physical connection to the Dreamtime.~~ and is a significant site to the Wilyakali people.

Page 83 of the ACHAR 10.5 (last paragraph)

The following paragraph was considered insensitive and the BHLALC request that it be removed from the report "Overall the cumulative impact of this project on Aboriginal cultural heritage is considered to be low and within acceptable limits, based on implementation of the proposed mitigation measures detailed in Section 9.1."

Additional recommendations.

The BHLALC would like to invite the Archaeologist to meet with the BHLALC Board to discuss the recommendations outlined in this letter.

The BHLALC would like to inform Lantern Heritage that the reports were difficult to read and the referencing back and forward between reports and pages was quite difficult.

The BHLALC was disappointed that there was little to no local Aboriginal history content included in either report other than the EOI for RAPS to disclose information. The BHLALC felt that no effort had been made to include Wilyakali historical local land use which could have been incorporated into section 4.3 Material Evidence of Aboriginal Land Use.

Any referencing to minimise the harm needs to be reworded as the BHLALC opinion is that there is never any good reason to justify any harm to any sites.

There is nothing mentioned in the ACHAR under section 10.5 on the cumulative loss of Wilyakali culture and access to land and the impact that has had on the Wilyakali people and the BHLALC members. Other than a reference to "it is reasonable to suggest that there are moderate levels of previous disturbance to the archaeological record and the cultural heritage of the region" The

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL
84 Oxide Street. PO Box 392, BROKEN HILL NSW 2880
Telephone: 08 8087 7413 / 8087 7310
Email: admin@bhlalc.org.au

BHLALC consider the sentence to be culturally insensitive and would have wished for the loss of Wilyakali culture and heritage to be included in the ACHAR and what the current project proposal impact would have on the Broken Hill Aboriginal community and Traditional Owners.

10.6 Aboriginal Inputs

The referencing to Aboriginal inputs needs to be made clearer as the Sites Officer's engaged to conduct site surveys and site monitoring for test excavation are engaged to ensure culture and heritage is protected and to report back to the BHLALC for the Board to be able to make informed decisions. If the Archaeologist wanted Aboriginal input an invitation could have been sent out on site so the governing body of the RAP's could have been consulted and included in the input.

The BHLALC only recognise the following organisation/persons who are knowledge holders within the BHLALC boundary:

1. Broken Hill Local Aboriginal Land Council
2. Wilyakali Aboriginal Land Council
3. Barkandji Native Title
4. Malyangapa Native Tile
5. Wilyakali Elders or are Wilyakali knowledge holders

All BHLALC recommendations are to remain confidential unless approval has been provided for any of the contents to be published.

I trust this assists you as you move forward on this project. I can be contacted via email at chairperson@bhlalc.org.au or via mobile on 0438 095 821 if you have any further queries.

Yours sincerely

Jarred Menz
Chairperson
Broken Hill Local Aboriginal Land Council

6-7April 2024: Hydrostor and BH LALC meeting notes and letter

BROKEN HILL LOCAL ABORIGINAL LAND COUNCIL
84 OXIDE STREET .P.O.BOX 392, BROKEN HILL NSW 2880
TELEPHONE: 08 80 877413/80 877310 FAX: 08 80 877708
EMAIL: wwalalc@iinet.net.au

Date: 06 & 07 April 2024

Location: Broken Hill: Musicians Club conference room
Attendees:

- Broken Hill Local Aboriginal Land Council (BH LALC) Board: Mrs. Joanne O'Donnell (Board Assistant); Jarred Menz (Chairperson); Glen O'Donnell, Dulcie O'Donnell, Shelby Jones, Tameka O'Donnell, Christopher O'Donnell, Teeka-Lee Trindall, Miss Joanne ODonnell (Board Member), and Kym Bugmy.
- Hydrostor (HYD): Paul Rasmussen; Martin Becker; Kristel Ross

Purpose: Workshop for the review and provide feedback on Aboriginal Cultural Heritage Assessment Report (ACHAR) V2.3 for the Silver City Project and the report revisions in line with the submission from Heritage NSW.

Reference Documents:

1. Letter from BH LALC to LANTERN dated 13-June-2023;
2. Aboriginal Cultural Heritage Assessment Report (ACHAR) V2.1 July 2023;
3. Aboriginal Cultural Heritage Assessment Report (ACHAR) V2.3 March 2024;
4. Archaeological Report (AR) V2.1 July 2023

The minutes and notes taken from the workshops held on the 6th & 7th April 2024 are included in the following pages 2-8.

Yours sincerely,

Jarred Menz
Chairperson

pg. 1

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
Items as per Letter from BH LALC date 13-June-2024				
1	Page 76 of the ACHAR. Section 10 "The importance of the artefacts and landscape features to local Aboriginal people has also been considered in the development of these mitigation and management strategies." The BHLALC request further information and clarification on documentation on how Aboriginal people were considered.	Addressed, updated Section 10. "The importance of the artefacts and landscape features to local Aboriginal people has also been considered in the development of these mitigation and management strategies, through the consultation process documented above in Section 6. Cultural monitoring is recommended in areas of extensive ground disturbance with predicted higher sensitivity for subsurface Aboriginal objects as described in section 10.3.5. Site specific mitigation measures are described in Table 43 of Archaeological Report (Appendix 1)."	ACHAR to be updated to reflect the fact that only the Wilyakali Aboriginal Corporation and the Broken Hill LALC were consulted and provided responses. Noted. HYD to update ACHAR V2.4	Confirmed & accepted
2	Page 149 of the AR Numbering of table in error, table heading should be 42 not 41	Table numbering corrected.	Correction made as per request.	Confirmed & accepted
3	Page 76 of the ACHAR Section 10.2 The BHLALC does not support section 10.2 without ACHMP being developed before construction.	Section 10.2 mitigation strategies section updated.	Section 10.2 will refer to only the Wilyakali Aboriginal Corporation and the Broken Hill LALC and requires a ACHMP to be developed. Noted. HYD to update ACHAR V2.4	Accepted
4	Page 77 of the ACHAR section 10.2 d. Change the paragraph to read: All construction and facility workers ~~should~~ must undergo a cultural heritage induction facilitated by the Wilyakali Aboriginal Corporation to communicate the importance of protecting cultural heritage, and the legal, ethical, social and practical issues involved.	Section 10.2 d updated. "Construction and facility workers involved in construction must undergo a cultural heritage induction facilitated by the Wilyakali Aboriginal corporation to communicate the importance of protecting cultural heritage, and the legal, ethical, social and practical issues involved"	Correction made as per request	Confirmed & accepted
5	Page 77 of the ACHAR Change the wording from "sites with moderate-high, or greater, archaeological potential (see figure 23); and" to all sites (see figure 23); and	Section 10.3 updated. "Collect surface Aboriginal objects from all sites within the disturbance area ensuring that those objects are not directly impacted or damaged by the proposed works;"	Correction made as per request	Confirmed & accepted

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
6	Page 77 of the ACHAR Referencing to any testing of salvaged samples data collected is to be collected on behalf of the BHLALC and the Wilyakali people. Any testing results and assessment reports is to be owned by the BHLALC on behalf of the Wilyakali people and cannot be shared or published without prior approval from both the BHLALC and the Wilyakali Aboriginal Corporation.	Noted and report updated as follows: Copyright section 1.3.2 A meeting was held to relay Proponent's reporting obligations to BHLALC.	Needs to be changed to ensure ownership of information stays with Wilyakali Aboriginal Corporation and the Broken Hill LALC Noted. HYD to update ACHAR V2.4	Accepted
7	Page 77 of the ACHAR The reference to Aboriginal community protocols should be either Broken Hill Aboriginal community protocols or protocols developed by the BHLALC in consultation with Wilyakali people.	Reference to Broken Hill Aboriginal community protocols included.	Correction made as per request	Confirmed & accepted
8	Page 78 of the ACHAR The following sentence is considered culturally sensitive information and not appropriate to be included in the report and the BHLALC request that the following sentence be removed from the report: "the following being sensitive to the connection between Aboriginal men and crystal quartz: only men will handle artefacts made from this material." Recommended change: Men and Women material will be managed in a cultural appropriate way in accordance with Wilyakali protocols.	Noted and reference updated. "Material associated with Men's and Women's business will be managed in a culturally appropriate way in accordance with Wilyakali protocols"	Correction made as per request	Confirmed & accepted
9	Page 79 of the ACHAR Stage 2 Recommended change to the first paragraph "an auger survey should be employed." Recommended change a RAP monitored auger survey should be employed.	Noted and Section 10.3.2 updated. "RAP monitored borehole survey should should be conducted in accordance with the Aboriginal Cultural Heritage Management Plan."	RAP needs to change to Wilyakali Aboriginal Corporation and the Broken Hill LALC Noted HYD to update ACHAR V2.4	Confirmed and accepted
10	Page 79 of the ACHAR Stage 3 Recommended change: Decisions about the final placement of salvage pits will be made in consultation with the RAPs recognised by the BHLALC, selecting a location with maximum potential for intact deposits with archaeological material, within the footprint of proposed impacts.	Noted and Section 10.3.3 "Decisions about the final placement of salvage pits will be made in consultation with the RAPs, recognised by the BHLALC, selecting a location with maximum potential for intact deposits with archaeological material, within the footprint of proposed impacts."	Change to Wilyakali Aboriginal Corporation and the Broken Hill LALC Noted HYD to update ACHAR V2.4	Confirmed and accepted

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
11	Page 79 of the ACHAR Stage 4 First bullet point - remove the words "An unusually high" and change to: a density of artefacts.	-	Section 10.3.4 The term "unusually" wasn't removed; to be removed. Noted HYD to update ACHAR V2.4	Accepted
12	Page 80 of the ACHAR Stage 5 (2nd paragraph) Recommended change: ~~Community~~ BHLALC or RAP monitoring.	Noted and Section 10.3 Stage 5 Salvage removed. New section included "Cultural Monitoring" Updated to: "Cultural monitoring by Broken Hill LALC or other RAP representative/s..."	Change to Wilyakali Aboriginal Corporation and the Broken Hill LALC Noted HYD to update ACHAR V2.4	Confirmed and accepted
13	Page 80 of the ACHAR Bulleted points showing 21 sites. Referencing the page numbers would have assisted in referring to the AR or a table could have been referenced to make it easier on the reader.	Noted and updated with page numbers.	Correction made as per request	Confirmed & accepted
14	Page 31 of the ACHAR Any reference to the Bronzewing Pigeon story is to be removed from the report; Recommended change: Culturally, the Pinnacles are a significant cultural site in the Broken Hill area to the Wilyakali, Paakantyi and Adnyamathanha peoples. ~~They are also associated particularly with the Bronzewing Pigeon Dreaming story.~~ The Pinnacles, located approximately 8km southwest of the Project Area, are a declared Aboriginal Place, however it consists of a very restricted area, with limited inclusion of land outside The Pinnacles themselves, despite cultural knowledge identifying the hills as only one aspect of sacred land. Sacred land also includes a wider area of land, including the Pine and Stirling Vale Creeks, and certain rock outcroppings and trees.	Noted and reference to the Bronzewing Pigeon story removed.	Section 4.2 and 4.3 to be reviewed by BHLALC and updated based on BH LALC review comments.	ACHAR V 2.3 reviewed sections 4.2 and 4.3. Confirmed and accepted Section 4.2: removal of the Bronzewing Pigeon Dreaming story. The following revised Sections in ACHAR V2.3: Section 4.3; Section 4.3.1; Section 4.3.1.1; Section 4.3.1.2; Section 4.3.1.3; Section 4.3.1.4; Section 4.3.2; Section 4.3.2.1 Section 4.3.2.2; Section 4.3.3 Are not accepted or approved by BH LALC.

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
15	Page 64 of the ACHAR Please remove the referencing of the Marnbi dreamtime story: Anthropological research published by Lindy Warrell in 1995 demonstrates the ongoing connection of contemporary Aboriginal communities to the Broken Hill area in general and the Pinnacles specifically. Located approximately 8km southwest of the Project Area, the Pinnacles are three distinctive rocky peaks ~~that form part of the Marnbi (bronze winged pigeon) Dreamtime story. In the Barkinji version of this story, feathers (white quartz) and droppings (black rock) from the injured fell in the Broken Hill area. These mineral deposits form the Pinnacles and these types of rock outcrops are seen within the Project Area and have the potential to form a physical connection to the Dreamtime.~~ and is a significant site to the Wilyakali people.	Noted and reference to the Bronzewing Pigeon story removed.	Section 4.2 and 4.3 to be reviewed by BHLALC and updated based on BH LALC review comments.	ACHAR V 2.3 reviewed sections 4.2 and 4.3. Confirmed and accepted Section 4.2: removal of the Bronzewing Pigeon Dreaming story. The following revised Sections in ACHAR V2.3: Section 4.3; Section 4.3.1; Section 4.3.1.1; Section 4.3.1.2; Section 4.3.1.3; Section 4.3.1.4; Section 4.3.2; Section 4.3.2.1 Section 4.3.2.2; Section 4.3.3 Are not accepted or approved by BH LALC.
16	Page 83 of the ACHAR 10.5 (last paragraph) The following paragraph was considered insensitive and the BHLALC request that it be removed from the report "Overall the cumulative impact of this project on Aboriginal cultural heritage is considered to be low and within acceptable limits, based on implementation of the proposed mitigation measures detailed in Section 9.1."	Noted and Section 10.5 updated to address cumulative impact. "The Project would have some effect on the cumulative impact on Aboriginal cultural heritage of the local area and region.	Correction made as per request	Confirmed & accepted
BH LALC April 06 & 07 Workshop - ACHAR Comments / Amendments				
17	Section 3.1 page 21 Updated wording "The ~~three major~~ language group~~s~~ for Broken Hill region ~~include Barkindji, Mayyankapa and Nyiimpaais~~ is Wilyakali. ~~These~~ This Aboriginal group~~s~~ focussed inland on the arid centre"	NA	Noted Updated in Section 3.1 into the ACHAR V2.4	Accepted

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
18	Section 3.1 page 21 Removal of: The dreamtime of Natchie (Rainbow serpent) that created the Darling, Darling River Anabranches, and the River Murray, and to which other ancestral beings travelled through from the Anabranch using lakes to reach Pine Creek and the Pinnacles (Niche *et al.* 2017,207; Martin 1999). Stephens Creek, located near Broken Hill, contains waterholes and upper reaches that have long association with spiritual and ceremonial ways of life (Martin 1999)	NA	Noted Updated in Section 3.1 into the ACHAR V2.4	Accepted
19	Section 10.3 Update wording to include Broken Hill: Enable the recovered cultural material to be repatriated to site in accordance with Broken Hill Aboriginal community protocols.	NA	Noted Updated in Section 10.3 into the ACHAR V2.4	Accepted
20	Section 10.3.2 Update wording: Within sites of moderate-high or greater archaeological scientific value and landforms with high archaeological sensitivity a RAP monitored borehole survey should ~~should~~ be conducted in accordance with the Aboriginal Cultural Heritage Management Plan	NA	Noted Updated in Section 10.3 into ACHAR V2.4	Accepted
21	Section 10.3.5 Inclusion of: Cultural Monitoring procedure will be determined by the BHLALC and Wilyakali when developing the Aboriginal Culture and Heritage Management Plan.	NA	Noted Updated in Section 10.3.5 ACHAR V2.4	Accepted
BH LALC April 06 & 07 Workshop - General Consultation Comments				

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
22	The archaeologists (LANTERN) did a poor job of consulting the Broken Hill LALC	NA	Broken Hill LALC has completed consultation with the Project in lieu of archaeologist consultation. Only two participating active RAPS being the BHLALC and Wilyakali were involved in providing any input . The consultation process was very limited to only receiving information from the BHLALC Site Officers and not the BH elders and BHLALC Board. The additions added are from post meeting that the BHLALC have had with Hydrostor and not Lantern. Noted. HYD to provide feedback to LANTERN on consultation process.	Accepted
23	The Wilyakali Aboriginal Corporation and the Broken Hill LALC were the only participating RAPs	NA	Noted.	Accepted
24	Broken Hill LALC concerned that other RAPs were disclosed information when two of these RAPs were themselves undisclosed	NA	Noted. HYD to provide feedback to LANTERN	Accepted
25	The Cultural Heritage Management Team and the Sites Officers facilitated the archaeological survey but were not to be relied upon for authoritative consultation	NA	Noted. HYD to provide feedback to LANTERN	Accepted
26	Section 10.3.5 of the ACHAR to refer only to the Wilyakali Aboriginal Corporation and the Broken Hill LALC and the rest of the document updated the same way wherever RAPs referred to.	NA	Noted. Incorporated into the ACHAR V2.4	Accepted
27	The Cultural Heritage Management Plan must specify a location for artefact storage	NA	Noted. HYD to ensure the ACHMP to be developed in conjunction with BHLALC and Wilyakali Aboriginal Corporation; location for artefact storage to be defined.	Accepted
28	Broken Hill LALC has raised concerns about the difficulty of reading and cross-referencing reports, this is noted and will be passed on to the archaeologists		Noted HYD to provide feedback to LANTERN.	Accepted

Item	Item details	Lantern Update / Response	Workshop Notes / Actions	BH LALC Response
29	The review of Sections 4.2 and 4.3 of the ACHAR is intended to address the initial lack of local Aboriginal history as requested by Heritage NSW., Broken Hill LALC to provide any further input following review		Broken Hill LALC to review sections 4.2 and 4.3.	ACHAR V 2.3 reviewed sections 4.2 and 4.3. Confirmed and accepted Section 4.2: removal of the Bronzewing Pigeon Dreaming story. The following revised Sections in ACHAR V2.3: Section 4.3; Section 4.3.1; Section 4.3.1.1; Section 4.3.1.2; Section 4.3.1.3; Section 4.3.1.4; Section 4.3.2; Section 4.3.2.1 Section 4.3.2.2; Section 4.3.3 Are not accepted or approved by BH LALC.
30	With respect to minimization of harm, this term is used in NSW State Government guidance material, it is agreed that wherever possible harm must be avoided rather than minimized	NA	Noted. Will be incorporated into the Aboriginal Cultural Heritage Management Plan – workshop with BH LALC scheduled for Jun 22, 2024.	Accepted.
31	The re-write of sections 10.5 of the ACHAR is intended to address the initial lack of discussion on cumulative impact, Broken Hill LALC to provide any further input following review	NA	Broken Hill LALC to review Section 10.5	Accepted.
32	Report to be updated to change "Metz" to "Menz"	NA	Noted. Correct spelling of name noted, and rectified in ACHAR V2.4.	Accepted.
33	Section 2.3 Land Use Disappointed in the level of detail contained in the section.		-	Will be covered in the development of CHMP and Cultural Heritage Awareness training.

Example of email sent to RAPs advising them of change to project disturbance area sent 20 June 2024

Silver City Energy Storage Project at Broken Hill, NSW

Consultation <consultation@lanternheritage.com.au>
Thu 6/20/2024 12:45 PM
To: [redacted]
Dear [redacted]

The Silver City Project will be submitting an Amendment Report to the NSW Department of Planning, Housing and Infrastructure (DPHI) along with the Submissions Report. As part of the development of the Submissions Report Hydrostor have commenced detailed design and refined the layout of the proposed Silver City Energy Storage Facility which has resulted in a change to the disturbance area. The changes to the disturbance area are contained within the area surveyed and the proposed Aboriginal Cultural Heritage management and mitigation measures remain unchanged.

Feel free to call Penelope Williams (Umwelt, Principal Environmental Consultant) if you would like any further information. Pen's number is 0415 880 165.

As part of the process, Hydrostor have also developed a Broken Hill Community Survey to seek feedback regarding the amendments being sought within the submission. A link to the survey is provided below should you wish to provide feedback in relation to the Project.

This link Silver City Energy Storage Centre takes you to the Silver City page on the Hydrostor website, where you then scroll down to the 'Broken Hill Community Survey'.

This link Silver City Project Broken Hill Community Survey takes you directly to the survey.

This information will also be placed on the Broken Hill City Council Facebook page.

Thanks

Majella Hammersley

Lantern Heritage Pty Ltd
PO Box 7039
TATHRA NSW 2550
ph: (02) 6494 1801
e: consultation@lanternheritage.com.au
w: www.lanternheritage.com.au

Lantern Heritage
shining a light on people and place

16 APPENDIX 3 – CULTURAL HERITAGE VALUES AND SIGNIFICANCE ASSESSMENT BY SITE

The table below includes statements regarding the cultural significance of particular sites where provided by the RAPs. It will be updated where necessary following RAP review.

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
SCES facility disturbance area	BH (ACAES) AFT 1	2350170	Artefact and hearth	low	6	1	low	low	none		hearth outside disturbance area
Transmission Line easement	BH (ACAES) AFT 11	2350175	Artefact	low	2		low	low	none		
Transmission Line easement	BH (ACAES) AFT 13	2350177	Artefact	low	3		low	low	none		
Transmission Line easement; 1 x monopole and temporary hardstand pad	BH (ACAES) AFT 14	2350178	Artefact	moderate	10		moderate	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.
Transmission Line easement; 1 x monopole and temporary hardstand pad	BH (ACAES) AFT 15	2350179	Artefact and hearth and rock mound	moderate	3	1	low-moderate	low	none		

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
Transmission Line easement	BH (ACAES) AFT/HTH 16	2350180	Artefact and hearth	low to moderate	1	1	low-moderate	low	none		
Transmission Line easement	BH (ACAES) AFT 18	2350169	Artefact	low	4		low	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.
Transmission Line easement; 2 x monopoles; and temporary hardstand pads	BH (ACAES) AFT 19	2350168	Artefact and hearth	moderate	7	1	moderate	low	none		
Transmission Line easement; 6 x monopoles, and temporary hardstand pads;inground	BH (ACAES) AFT 20	2340697	Artefact and stone feature	moderate-high swend	2-10/ m2		low	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
powerline section with 20m easement, buried cable											
Transmission Line easement	South airports regency area isolated artefacts	2340682	Artefact and hearth	moderate to high	2	1	low	low	none		
Transmission Line easement and temporary handstand pad	BH (ACAES) AFT22	2340698	Artefact	moderate	2/m2		moderate	low	none		
Transmission Line easement	BH (ACAES) AFT23	2340699	Artefact	moderate	1/m2		low	low	none		

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
Transmission Line easement	BH (ACAES) AFT 25	2340700	Artefact	moderate	1/m 2		low-moderate	low	none		
Transmission Line easement, 1 x monopole and temporary handstand pad	BH (ACAES) AFT/HTH 26	31-1-0723	Artefact and hearth	moderate to high	1/m 2	1	low	low	none		
Transmission Line easement	BH (ACAES) AFT/HTH 27	31-1-0724	Artefact and hearth	moderate	1/m 2	1	moderate	low	none		hearth outside disturbance area
Transmission Line easement, 2 x monopoles and temporary handstand pads	BH (ACAES) AFT 28	2340701	Artefact	low	1/m 2		low	low	none		
Transmission Line easement, 1 x monopole and temporary	BH (ACAES) AFT 29	2340702	Artefact	moderate	8		low-moderate	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
handstand pad											
Transmission Line easement; 2 x monopoles and temporary handstand pads	Kanandah 1	2340640 (duplicate of Kanandah 2 234-0641)	Artefact and hearth	low	10	remains of several	low	low	none		No recorded hearths are located within the proposed Project Area
Transmission Line easement	BH (ACAES) AFT /HTH37	2340708	Artefact and hearth	low	>3	1	low	low	none		
Transmission Line easement	BH (ACAES) HTH39	31-1-0727	Hearth	low	0	1	low	low	none		
Creek diversion easement/ACAES facility disturbance area	FDIF16	2350154	Artefact	moderate	1		low	low	none		

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
Creek diversion easement; AC AES facility disturbance area	PMQ6	2350123	Stone quarry	low			low	low	none		limited diagnostic features; this site has high cultural significance to the Aboriginal community for it's association to the Mambi Dreamtime story
Transmission Line easement	FDIF18	2350152	Artefact	low	1		low	low	none		Site was unable to be relocated during fieldwork. This information is based on AHIMS site card
Transmission Line easement	FDIF19	2350146	Artefact	low	1		low	low	none		Site was unable to be relocated during fieldwork. This information is based on AHIMS site card
Above Ground waterpipe easement	BH (ACAES) AFT 44	2350183	Artefact	low	1		low	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.
Outside Project Area	BH (ACAES) AFT 45	2350182	Artefact	low	1		low	low	none		
SCES facility disturbance area	PMQ5	2350122	Stone quarry	low			low	low	none		limited diagnostic features; this site has high cultural significance to the Aboriginal community for it's association to the Mambi Dreamtime story
SCES facility disturbance area	PMQ4	2350121	Stone quarry	low	2		low	low	none		limited diagnostic features; this site has high cultural significance to the Aboriginal community for it's association to the Mambi Dreamtime story

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
SCES facility disturbance area	BH1-48	235-0063/ associated with 235-0112/FD-G001	Artefact and hearth	moderate to high	2	1	low	low	none		
Creek diversion easement/ ACAES facility disturbance area	FDIF7	2350153	Artefact	low	4		low	low	none		
SCES facility disturbance area	FDIF14	2350156	Artefact	low	1		low	low	none		Site was unable to be relocated during fieldwork. This information is based on AHIMS site card
SCES facility disturbance area	PMG02	2350125	Hearth			1	moderate	low	none		Site was unable to be relocated during fieldwork. This information is based on AHIMS site card
SCES facility disturbance area	FDIF02	2350139	Artefact	low	1		low	low	none		Site was unable to be relocated during fieldwork. This information is based on AHIMS site card
SCES facility disturbance area	PMF6	2350131 (duplicate of PMG04 23-5-	Artefact and hearth	low	11	1	low	low	none		This site contains crystal quartz artefacts. During fieldwork, the RAPs noted crystal quartz is highly culturally significant to Aboriginal men and women are not allowed to touch these items.

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
		0132)									
SCES facility disturbance area	BH (ACAES) AFT 3	2350171	Artefact	low	1		low	low	none		
SCES facility disturbance area	BH (ACAES) AFT 4	2350172	Artefact	low	1		low	low	none		
Transmission Line easement	BH (ACAES) AFT 31	2340704	Artefact	low	1		low	low	none		
Transmission Line easement	BH (ACAES) AFT 41	31-1-0725	Artefact	low	1		low	low	none		
SCES facility disturbance area	BH (ACAES) AFT 53	2350185	Artefact	low	2		low	low	none		
Transmission Line easement	BH (ACAES) AFT 17	2350181	Artefact	low	1		low	low	none		
Transmission Line easement	BH (ACAES) AFT 30	2340703	Artefact	low	1		low	low	none		

Impact Area	Site Name	Site ID	Site Features	Subsurface	Artefact	Hearth	Scientific / Research	Aesthetic Value	Historic Value	Social Value	Statement of Cultural Significance and Value
Transmission Line easement	BH (ACAES) AFT40	31-1-0726	Artefact	low	1		low	low	none		
Creek diversion easement	BH (ACAES) HTH52	2350186	Hearth	low		1	low	low	none		

17 APPENDIX 4 – VIEWSHED ANALYSIS OF VISUAL IMPACTS OF PROJECT ON THE PINNACLES

Given the spatial proximity to the highly significant Aboriginal Place, The Pinnacles, this assessment has also taken into consideration the potential impacts on views to and from The Pinnacles.

A visibility analysis has been undertaken in QGIS Version 3.36.0 utilising the Visibility Analysis plugin (Refer to Figures 1 to 3). The analysis was undertaken with reference to the Digital Elevation Model, the locations of the three summits of The Pinnacles, and the proposed Transmission Pole locations for the Project.

The first step in the analysis was to establish how much of the Project Area is visible for someone standing atop the peak of each of The Pinnacles (Figure 1). This analysis also serves to demonstrate the degree to which one or more of the Pinnacles are visible from the ground within the Project Area. As shown in this map, the vast majority of the study area is not actually visible from the Pinnacles, and where there is intervisibility, that view is typically to and from just one of the three peaks in any given location. In summary, the Project Area is not prominent in the viewshed from The Pinnacles, nor are there many locations along the Project Area from which the Pinnacles can be seen.

A secondary step in the analysis was to factor in the height of the transmission poles (Figure 2). This is a critical step in understanding the degree to which the built infrastructure might be visible from the Pinnacles and the subsequent impacts the Project's transmission line might have on views of the Pinnacles. As shown in this map, less than 50% of the Project's infrastructure will be within the potential viewshed of the Pinnacles. Moreover, when considering this analysis with the overall visibility of the Project Area, it becomes apparent that there are only 10-15 poles that would potentially be visible in their entirety (ie from ground to top of the pole). This reinforces the fact that most of the infrastructure will not be visible from the Pinnacles, and even where it is visible, this will typically only consist of the uppermost elements of the transmission line.

An analysis of direct intervisibility between individual pole locations and each of The Pinnacles (Figure reveals that only 21 of the 69 poles will be visible from The Pinnacles, seven will be visible from two of the peaks and only two poles will be visible from all three Peaks. This map also shows the placement of the proposed transmission line in relation to the outskirts of Broken Hill and the industrial area on the southwestern limits of the city.

Essentially, the visibility analysis demonstrates that less than a third of the transmission poles will be visible from the Pinnacles, and only 15-20% of the transmission poles might be fully visible from the Pinnacles. Furthermore, the transmission poles will be seen against the backdrop of an existing urban and industrial vista, in which context the Project infrastructure will result in a very minor change to views from The Pinnacles.

Similarly, the visibility analysis demonstrates that there will be minimal impacts on views of the Pinnacles. The intervisibility with the Project Area is such that the Project only has the potential to impact views across a 60 degree arc from the northeast (ie views to the southwest from locations at or northeast of the Project Area). This comprises a small percentage of the potential locations form which The Pinnacles can be viewed. Moreover, there will be very few locations from which the full height of the Project infrastructure will be visible whilst viewing the Pinnacles, let alone locations where the Project infrastructure would dominate such a view.

In summary, whilst it is undeniable that the Project will have visual impacts around the southern margins of Broken Hill, these impacts will not have a significant impact on views to and from The Pinnacles or their aesthetic values.

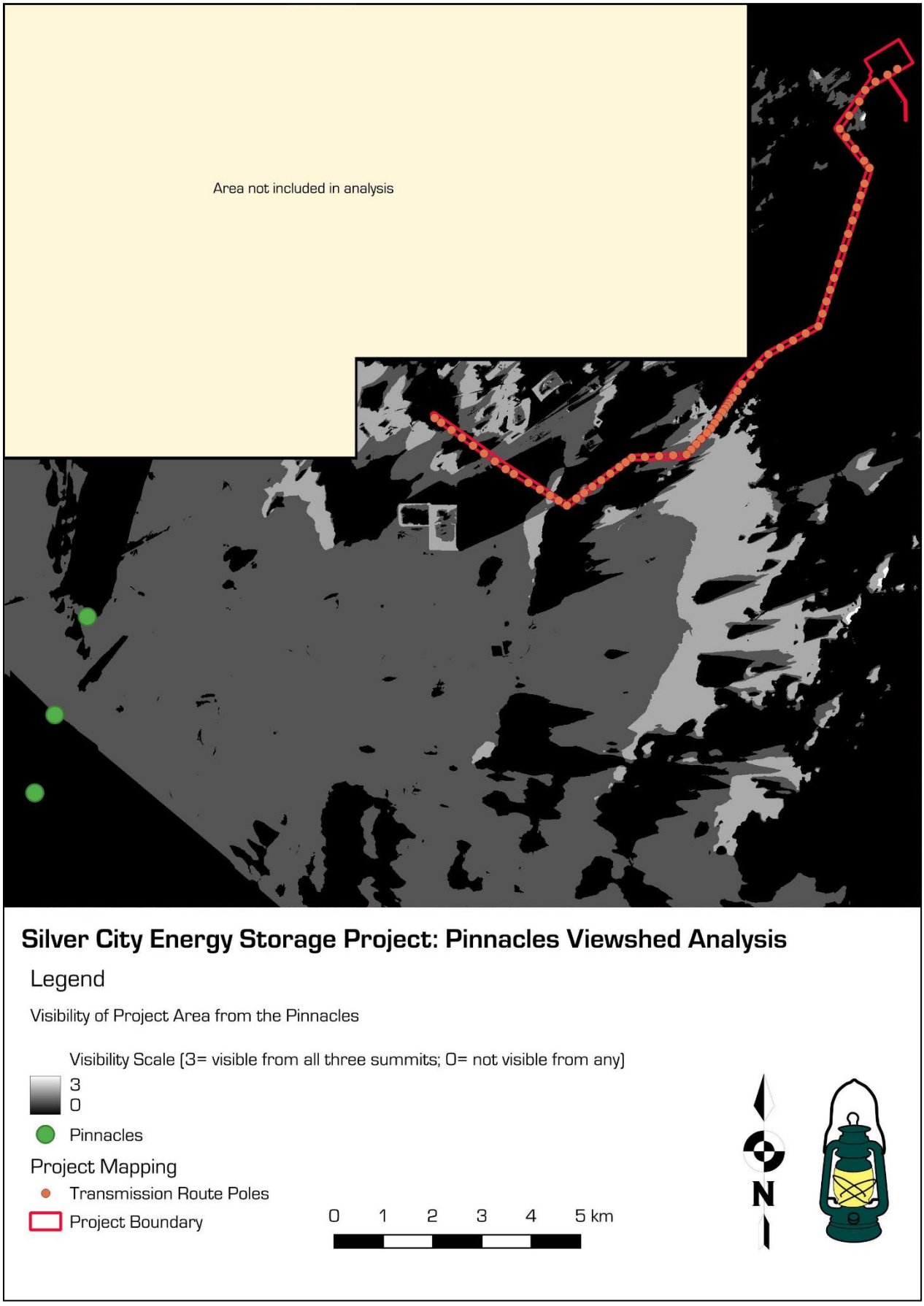


Figure 1: Visibility of Project Area from the Pinnacles.

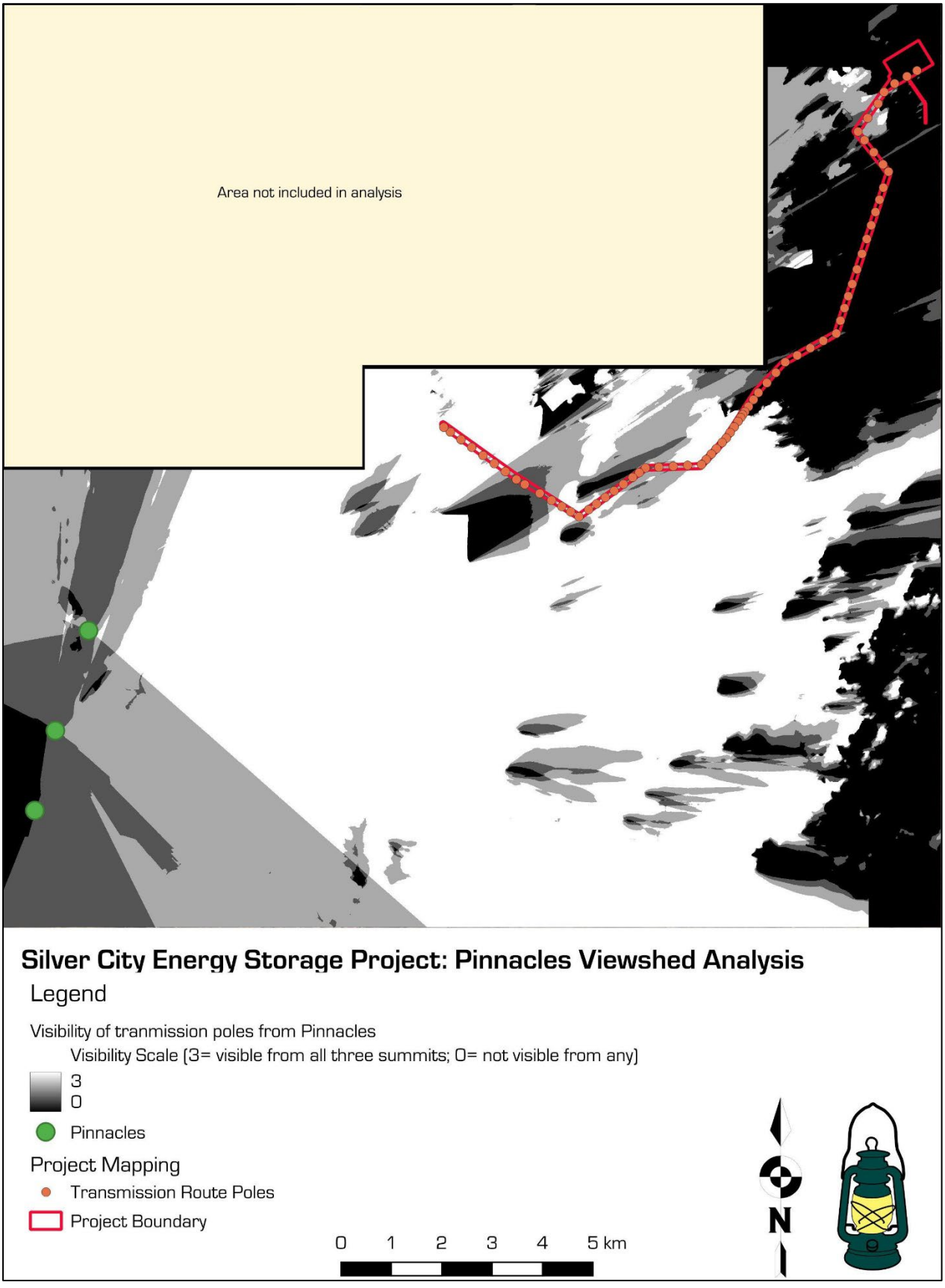


Figure 2: Visibility transmission poles from the Pinnacles.

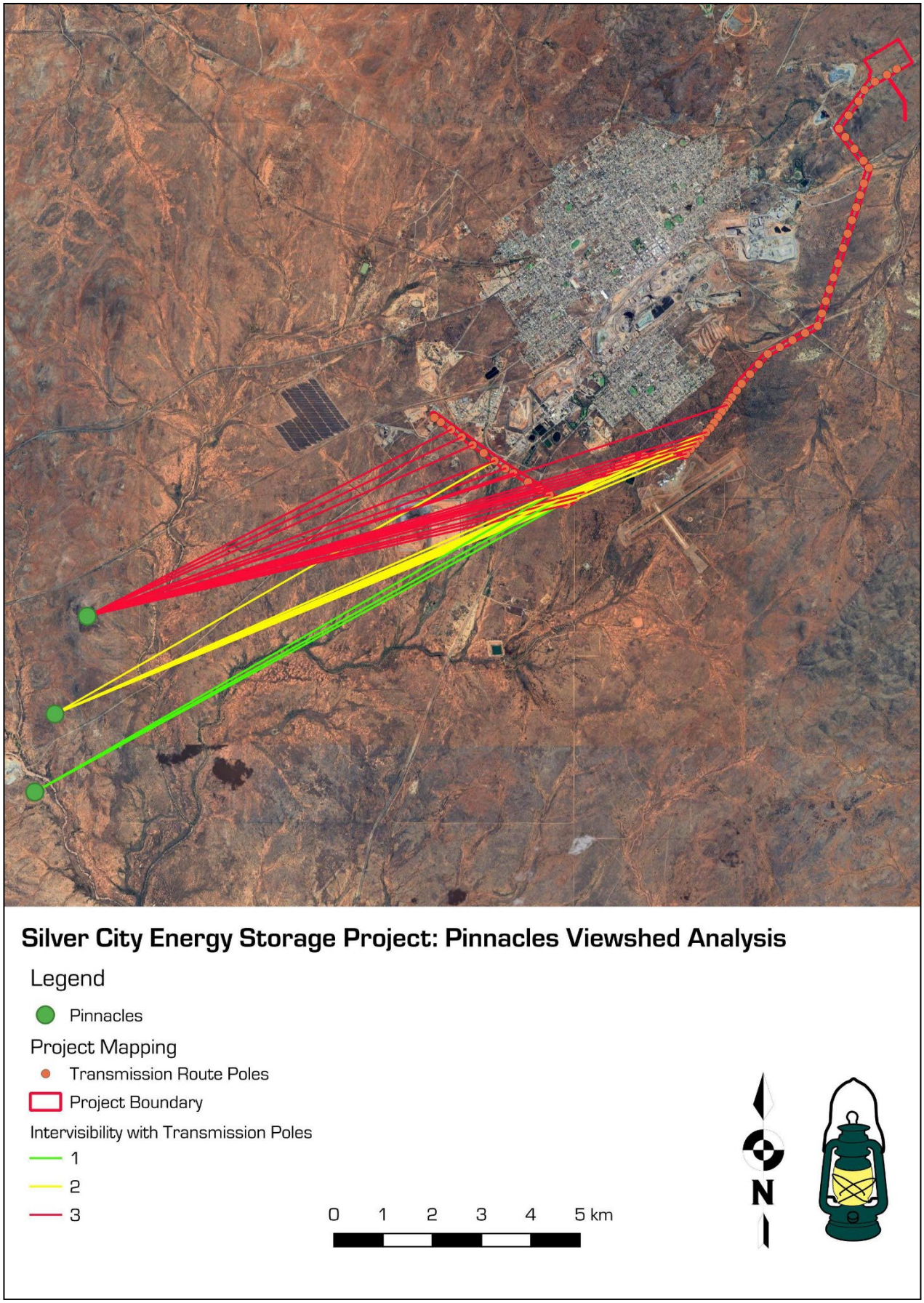


Figure 3: Intervisibility with transmission poles from the Pinnacles.

18 APPENDIX 5 – HEARTH SALVAGE METHODOLOGY

A different approach to excavation is proposed for intact hearth sites versus broader areas of PAD associated with artefact scatters.

Hearths may be abundant within the landscape but very few are undisturbed and capable of providing scientific information. Therefore, it is necessary to investigate whether or not they occur intact within the deposit. Excavation of those hearths predicted to contain datable material will follow the methodology developed by Holdaway et al (2000, 2002) in the Studd Creek study area as follows:

i. Divide the hearth into four quadrants using string lines.

ii. Select one quadrant to start excavation.

iii. Using a hand trowel, gradually excavate the selected quadrant down in stratigraphic units, or where stratigraphic layers are indistinct, in spits no greater than 5cm in depth.

iv. Continue to excavate until the entire quadrant is removed and/or datable material is encountered.

v. Record the exposed sections.

vi. There are then three options that can be implemented depending upon RAP preferences for the hearth:

   a. Continue salvage of the remaining three quadrants following the same manner outlined above;

   b. Lift a portion of the hearth for later analysis; or

   c. Cease salvage and backfill the salvaged quadrant(s) with the excavated material.

The option to lift a portion of the hearth as a single block enables a sample to be set aside for laboratory analysis (palaeomagnetic studies, OSL) and/or educational purposes (e.g. as a display item). The decision as to whether or not to lift a hearth would made by the RAPs in consultation with Lantern.

In the event that a portion of a hearth is lifted out as a block for future analysis or display, detailed recording would be undertaken of the feature prior to removal (e.g. plan drawings, photography). The hearth would be lifted in a pre-prepared box on which all the details of the hearth are recorded (site, date, height/depth, location within the excavation, orientation etc). The hearth would be stabilised within the box with plaster of paris, with a suitable impermeable barrier between the hearth and the plaster.

Samples

Samples will be collected during excavation for the purposes of characterising deposits, obtaining samples for radiometric dating (e.g. charcoal, wood, bone, shell and/or OSL), reference examples of background materials such as gravels. A minimum of a single representative set of sediment samples will be collected from at least one grid square in each excavation area. Additional samples will be collected as required to characterise individual features/deposits.

All samples will be recorded on the relevant excavation recording form. All samples will be labelled in accordance with the standard protocols for bagging finds.