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Moolarben Coal Complex, Ulan NSW
UG4 Longwalls 401-408 Extraction Plan
Aboriginal Cultural Heritage Technical Report
Local Government Area: Mid-Western Regional Council

Prepared for the Proponent: Moolarben Coal Operations Pty Ltd

Prepared by Niche Environment and Heritage | 24 November 2021

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Document control

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Executive summary

This technical report presents the results of an Aboriginal cultural heritage and archaeological assessment of Longwalls 401-408 (hereafter referred to as the Subject Area) for the Moolarben Coal Complex, in the Western Coalfields of New South Wales. This report has been prepared to support the extraction plan of Longwalls 401-408 for the secondary extractions of the approved underground mining area at UG4.

The Subject Area lies within hilly terrain comprised of simple slopes, ridge crests, plateau and first and second order drainage lines with low to steep slope gradients. In the lower elevations along drainage lines, the slopes give way to undulating country that has been historically cleared for pasture.

The Subject Area has previously been included in Aboriginal cultural heritage assessment and archaeological investigation associated with environmental assessment of Project Approval 05_0117, modifications to existing approvals, and exploration environmental assessments. These investigations have adequately characterised the Aboriginal Heritage sites that may be expected to be present. However, areas of the Subject Area contained landforms of Aboriginal heritage sensitivity that had not been previously surveyed. Additional survey was undertaken in this area during March 2021 to further inform this extraction plan.

A total of 45 Aboriginal Heritage sites are recorded in or in close proximity to LW401-408 (Table 1).

Table 1: Count of recorded Aboriginal Heritage sites within the Subject Area by Site Type

Site Type	Grand Total
Open Artefact Sites and PAD	**22**
Artefacts (Isolated Finds and Artefact Scatters)	18
Artefacts and PAD	4
Grinding Grooves and Shelters with/without grinding grooves and/or art and/or artefacts and/or PAD	**23**
Shelter	1
Shelter with Artefacts	6
Shelter with Artefacts and PAD	6
Shelter with Grinding Grooves and Artefacts	1
Shelter with Grinding Grooves, Art, Artefacts and PAD	1
Shelter with PAD	8
Grand Total	***45***

Of the above 45 sites, eight (8) Aboriginal heritage sites comprising isolated finds or open artefact scatters with/without PAD have been salvaged under existing approvals and are no longer *in situ*. The remaining 37 sites consist of the following.

- One Aboriginal Heritage site S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042) has previously been assessed as having high Scientific Significance,
- Eight (8) Aboriginal Heritage sites have been assessed to have moderate scientific significance, and twenty-eight (28) have been assessed to have low scientific significance.

Open sites containing artefact scatters and isolated finds can be potentially affected by cracking of the surface soils associated with mine subsidence movements. MSEC (2021) has concluded that it is unlikely that the artefact scatters or isolated finds themselves would be impacted by mine subsidence, however it is possible that these sites could be potentially impacted if remediation works to the surface areas around the archaeological sites was required.

MSEC (2021) assessed potential subsidence impacts to Aboriginal rock shelters and concluded that there is potential for fracturing of sandstone and subsequent rock falls which have the potential to affect grinding grooves, art, artefacts and/or PADs associated with the rock shelters. The risk of subsidence impacts to Site 280 is low to moderate consistent with the approved impacts. Large scale failure of the rock shelter is not expected to occur and the likelihood of tensile cracks coinciding with the location of the grinding grooves and art is considered to be low.

On the basis of the likely subsidence impacts as a result of secondary extraction of Longwalls 401-408 (MSEC 2021), although consistent with approved impacts it is recommended that for site S1MC280 (a rock shelter with art, artefacts and grinding grooves with high significance) be subject to detailed recording of art and salvage via surface collection and test excavation consistent with the requirements outlined in the UG4 Extraction Plan Heritage Management Plan.

For sites S1MC474 (a rock shelter with artefacts, PAD and moderate significance), S1MC475 (a rock shelter with artefacts, grinding grooves, PAD and moderate significance), and S1MC494 (a rock shelter with artefacts, PAD and moderate significance) it is recommended that baseline recording is to be completed prior to extraction and salvage via surface collection and test excavation consistent with the requirements outlined in the UG4 Extraction Plan Heritage Management Plan.

It is recommended that for sites S1MC256 (rock shelter with stone artefacts), S1MC261 (a rock shelter with artefacts and low significance), S1MC271 (a rock shelter with artefacts and moderate significance), S1MC290 (a rock shelter with artefacts and low significance), and S1MC294 (a rock shelter with artefacts and low significance), S1MC358b (a rock shelter with PAD and low significance), S1MC472 (a rock shelter with artefacts, PAD and low significance), S1MC484 (a rock shelter with artefacts and low significance), S1MC488 (a rock shelter with artefacts and low significance), and S1MC491 (a rock shelter with PAD and low significance) baseline recording is to be completed prior to extraction and salvage via surface collection consistent with the requirements outlined in the UG4 Extraction Plan Heritage Management Plan.

Site specific recommendations for all Aboriginal heritage sites within UG4 LW401-408 are provided in Table 12 within Section 8 of this document.

Table of Contents

List of Figures

List of Plates

List of Tables

1. Introduction

1.1 Introduction and background

The Moolarben Coal Complex is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfields of New South Wales (NSW) in the Mid-Western Regional Council Local Government Area (Figure 1).

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Yancoal Moolarben (YM) Pty Ltd and a consortium of Korean power companies). MCO, MCM and YM are wholly owned subsidiaries of Yancoal Australia Limited.

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 and would continue to be carried out in accordance with NSW Project Approval (05_117) (Moolarben Coal Project Stage 1) as modified and NSW Project Approval (08_0135) (Moolarben Coal Project Stage 2) as modified.

In 2007 Moolarben Coal Operations (MCO) received approval for UG4 as part of Project Approval 05_0117 for Stage 1. The approval was supported by an Aboriginal Cultural Heritage Assessment report (Hamm 2006a and Hamm 2006b) and *a Mine Subsidence Impact Assessment for the Proposed Longwall Panels LWs 1 to 14, No. 4 Underground Area* (Strata Engineering 2006) Technical Report. The assessments identified 45 Aboriginal Heritage sites across UG4 and a further 177 rock overhangs / potential rock habitation shelters have been identified along several of the cliff lines adjacent to the drainage gullies. An Aboriginal Heritage Management Plan for Stage 1 and Stage 2 has been approved and is currently implemented (MCO 2020).

Since the Stage 1 Approval in 2007 extensive additional environmental monitoring and studies have been undertaken in the Ulan Coalfields, including MCO's Underground 1 and neighbouring mining operations. The additional studies and monitoring data associated with the inter-mine data sharing have improved the understanding of the predicted underground mining impacts. This contemporary knowledge, supplemented with targeted site surveys, underpins this technical report and the refined impact predictions, performance indicators, management and monitoring measures for the UG4 LW401-408 extraction plan.

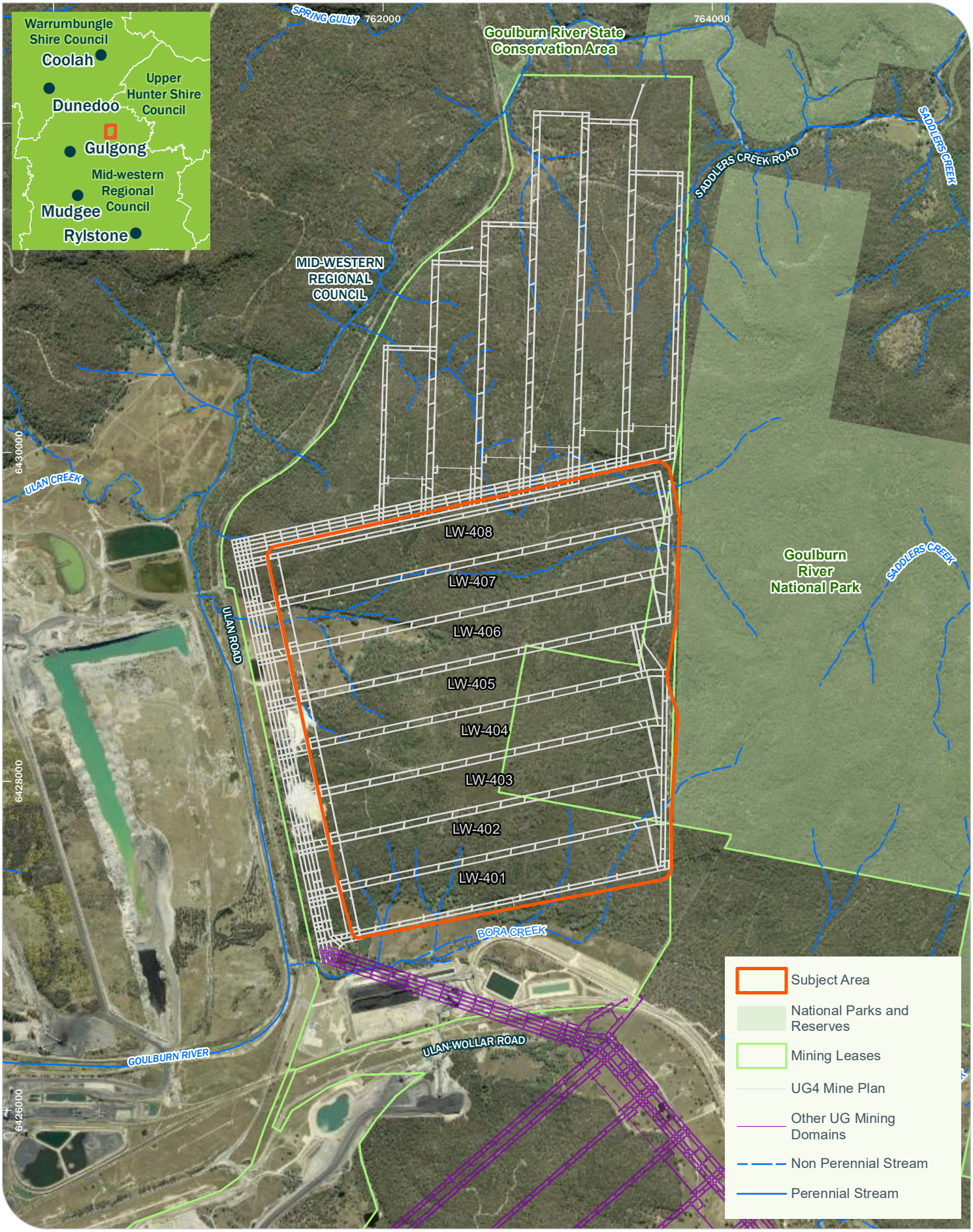
UG4 is located approximately 3 km east of the village of Ulan and is situated between the Goulburn River National Park and the existing Ulan Coal Mine. UG4 is bounded by the Goulburn River to the north, Goulburn River National Park to the east; the Gulgong to Sandy Hollow railway to the south, and the Ulan - Cassilis Road to the west (Figure 1). UG4 has been divided into two areas, (i) UG4 - South, which will be mined by the first eight longwall blocks (LWs 401-408) east to west and (ii) UG4 - North, which will be mined by LW 409-414 north to south. Access to the longwalls will be to the south of LW401. UG4 is scheduled to commence secondary workings (longwall extraction) in LW401 in 2022 from the Ulan Seam within Mining Lease (ML) 1605 and ML 1628 (Figure 2).

Niche Environment and Heritage Pty Ltd (Niche) has been commissioned by MCO to prepare an Aboriginal Cultural Heritage technical report to inform the Extraction Plan for UG4 Longwalls 401-408 at the Moolarben Coal Complex.

The objectives of this technical report were to assess the potential impacts to Aboriginal heritage values within the UG4 study area and to inform the UG4 Longwalls 401-408 Extraction Plan accordingly, by providing appropriate mitigation and management recommendations, where required, in accordance with the currently approved Moolarben Coal Complex Heritage Management Plan.

This technical report has been led by Jamie Reeves, Managing Director at Niche and prepared by Clare Anderson and Chelsea Dell Freeman, heritage consultants at Niche, in accordance with the Moolarben Coal Complex Heritage Management Plan and with consideration for the following approval conditions and guidelines:

- Project Approval 05_0117
- Moolarben Coal Complex Heritage Management Plan (MCO 2020)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment, Climate Change and Water [DECCW] 2010); and
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage [OEH] 2011).



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Regional Location of the Subject Area

UG4 LW401-408 Extraction Plan

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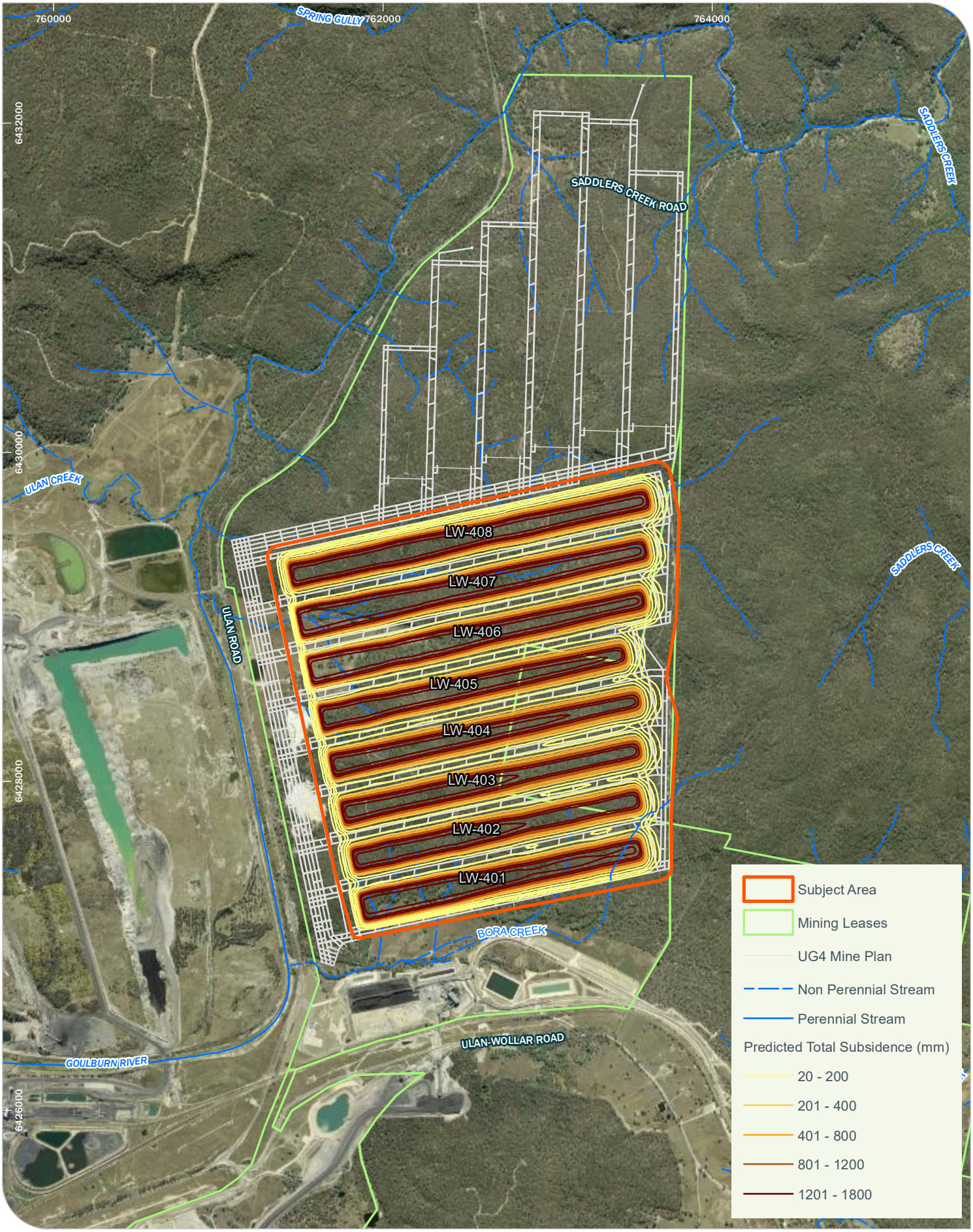
Figure 1



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Longwalls 401-408 Layout and Subject Area

UG4 LW401-408 Extraction Plan

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Figure 2

v2.0

2. Investigators and contributors

This technical report has been led by Jamie Reeves, endorsed by DPIE as a suitably qualified person, in accordance with the Moolarben Coal Complex Heritage Management Plan, with support from Clare Anderson and Chelsea Dell Freeman, heritage consultants at Niche.

Heritage surveys to inform this Aboriginal heritage technical report included the participation of representatives of the Registered Aboriginal Parties in accordance with the Heritage Management Plan.

3. Landscape context

The Subject Area is situated within the Central Tablelands region of NSW, north-east of Ulan. The topography ranges between undulating, ridge affected terrain and shallow alluvium and slope wash filled gullies and valleys (Strata Engineering 2006). Topographic relief is approximately 90 m between RL 410 m (AHD) to RL 500 m (AHD).

Ground slopes generally range between 10° and 20° on the ridges and decrease to between 0° and 10° on the ridge crests, foot slopes and in valley floor areas. Sandstone and conglomerate outcrops and cliff lines ranging from 5 m to 30 m high define the plateau / ridge crests. Slopes, ridges and valley floors are intersected by open depressions and gullies. Numerous loose boulders or talus exist on the mid-slopes and foot slopes of the ridges and cliff lines. The lithic to quartzose sandstone and conglomerate exposures are grey to orange-brown in colour, cross bedded and have low to high material strength (Strata Engineering 2006).

The slopes and ridgelines in the Subject Area are covered by re-growth woodland and native woodland vegetation, while the flats and undulating landforms have been historically cleared for pasture and heavily impacted by various agricultural activities and the development of mine related infrastructure.

The valley landscape is characterised by woodland remnants around creek line and road corridors in predominantly cleared valleys.

There are two soil landscapes as mapped by Murphy and Lawrence (1998) and depictured in Figure 3. These are further divided into land and resource units in Office and Heritage (2018), providing gradation between the footslopes and mid to upper sloped terrain present in the Subject Area.

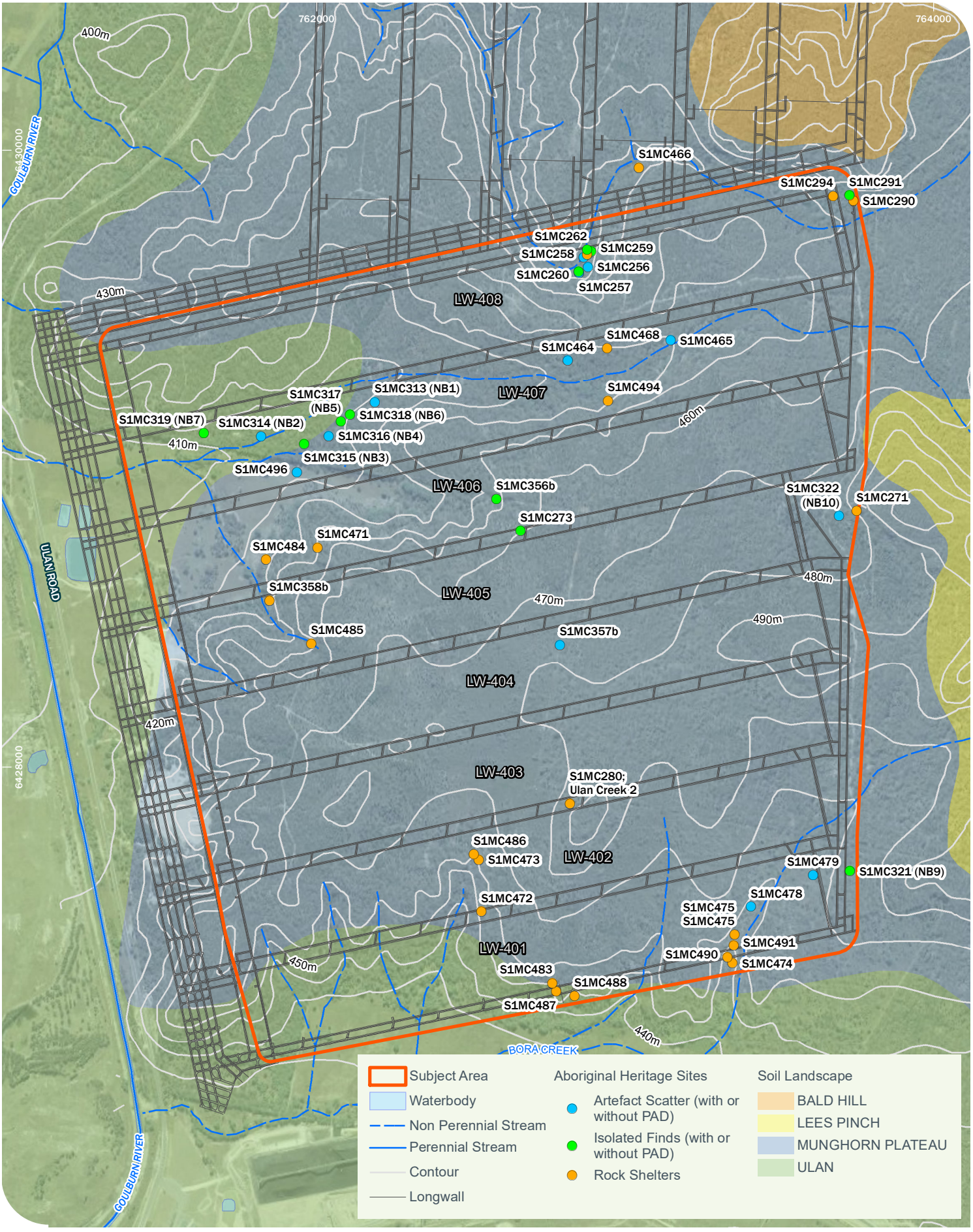
Munghorn Plateau soil landscape is typically characterised by low undulating hills forming plateaux with slopes between 3 and 10%. Soils in the Munghorn Plateau Soil Landscape include shallow siliceous sands with yellow earths and yellow podzolic soils. Rock outcrops are often present. The archaeological expectation for this soil landscape is that it may accumulate Aboriginal objects, but these will be sparse outside of rockshelters and in open contexts will be subject to post-depositional movement in the skeletal and mobile siliceous sands which erode readily.

In the Office of Environment and Heritage (2018) soil and land resource mapping, the Munghorn Plateau soil landscape is further gradated into the Munghorn Plateau, Tinagroo and Wollangambe soil and land resource units. The Tingaroo and Wollangambe soil and resource units better represent the mid and upper slopes of the Munghorn soil landscape, where rockshelters are more likely to be present than the plateaux where overhangs and pagodas are less common.

The **Ulan** soil landscape is typically found in association with low undulating rises and creek flats on slopes between 2 and 10 %. Yellow podzolic soils are present on the lower slopes and drainage lines with yellow and brown earths, earthy sands and occasional occurrences of yellow solodic soils with salt sands. The land and resource unit further distinguishes between the footslopes (Ulan Variant B, erosional soil and land resource unit) with shallow gravelly bleached leptic tensols soils and the Ulan transferal unit. The Ulan soil landscape has moderate to high levels of erosion. Generally the Ulan soil landscape has good sub-surface archaeological potential.

The Goulburn River is the primary watercourse of the Subject Area, located to the west and north of the Subject Area. The Goulburn River was diverted in 1982 over approximately 4 km, to allow for mining to

continue within the region. Bora Creek is a non-perennial third order creek that runs generally west to the Goulburn River through the southern extent of the Subject Area.



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Soil landscapes of the Subject Area
UG4 LW401-408 Extraction Plan

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Figure 3

4. Previous archaeological work

The coal mining areas around Moolarben, Wilpinjong and Ulan have been subject to continuous Aboriginal cultural heritage assessment and archaeological study since the 1980s.

4.1 Previous archaeological assessments of the Subject Area

The Subject Area has been assessed for Aboriginal heritage values during environmental assessment of major project approvals, modifications to existing approvals, and exploration environmental assessments.

Cultural heritage investigations and assessments previously conducted within the Subject Area are presented in Table 2.

Table 2: Cultural heritage investigations and assessments previously conducted within the Subject Area.

Author and Date	Report Title	Overview
Niche 2021	*Archaeological Report UG4 Additional Survey, Moolarben, NSW*	An additional survey of areas of Aboriginal cultural heritage sensitivity was conducted to inform this Extraction Plan. The survey focused on confirming the locations of known sites of high significance and investigating areas of cliff line and steep slopes in the MCO UG4 Subject Area which had not been surveyed during previous environmental assessments. The surveys were conducted in accordance with the Moolarben Coal Heritage Management Plan. Additional sites were identified, including artefact scatters with/without PAD and Shelters with/without Artefacts and/or PAD.
Niche 2019a	*Addendum to Aboriginal Cultural Heritage Assessment, Moolarben Coal Operations UG4 Ancillary Works Modification*	This assessment was an addendum to the original ACHA conducted in 2019. A survey was conducted over an additional 0.5 ha. No Aboriginal cultural heritages sites or areas of potential were identified during the survey.
Niche 2019b	*Aboriginal Cultural Heritage Assessment, Moolarben Coal Operations UG4 Ancillary Works Modification*	This assessment included a survey of the whole area of proposed modification and ranged across several different contexts including unmodified woodland, cleared areas of pasture, cleared areas of partially regrown woodland and vehicle tracks and roads. The survey resulted in the recording of four Aboriginal Heritage sites. This assessment recorded two previously recorded site, S1MC 230 and S1MC 278 and two additional sites, S1MC 460 and S1MC 461.
Niche 2016	*Moolarben UG4 Exploration Boreholes – Aboriginal Objects Due Diligence Assessment*	This due diligence assessment considered the proposed sites for 8 boreholes and associated access tracks in the UG4 area. The assessment included the partial survey of the Dewatering Bores and Access Track (South) area, but did not overlap elsewhere with other parts of the UG4 Ancillary Works Modification study area. No Aboriginal Heritage sites were found in the UG4 Ancillary Works Modification study area by this due diligence assessment.
AECOM 2014	*Aboriginal archaeological due diligence assessment for Underground 4 (UG4) south drilling works*	AECOM conducted due diligence assessment for a drilling program in the UG4 area. This due diligence assessment resulted in the recording of an open stone artefact site on the vehicle track in the Dewatering Bores and Access Track (South) area. This site is site number S1MC357.

Author and Date	Report Title	Overview
AECOM 2011	*Archaeological Collection & Excavation: Northern Borefield* *Moolarben Coal Operations, Ulan, NSW*	AECOM Australia Pty Ltd (AECOM) was commissioned by Moolarben Coal Operations Pty Ltd to conduct surface collection of 12 Aboriginal artefact scatters and excavation of two potential archaeological deposit (PAD) sites prior to impacts from the construction of a water pipeline and series of connected water boreholes within the Northern Borefield of Moolarben Coal Mine, NSW.
Hamm 2006a	*Moolarben Stage 1 Aboriginal Cultural Heritage Assessment*	This assessment included survey of a targeted sample of areas in the rocky country above the UG4 area, and extensive sampling of the lower slopes and flats where the current MCO Stage 1 open cuts and facilities are located. The survey recorded a range of Aboriginal Heritage sites within the UG4 area including isolated finds, open artefact scatters, grinding groove sites and Shelters with/without Art, Artefacts, Deposit, Grinding Grooves or PAD.
Hamm 2006b	*Response to issues raised in respect of the Moolarben Coal project Aboriginal Cultural Heritage Assessment*	In Responses to Submissions, Hamm considered the know Aboriginal Heritage site in the context of the Preferred Underground Mine Plan including the revision of the risk of subsidence impacts.

4.2 Previous survey coverage of the Subject Area

Additional survey was undertaken across UG4 in March 2021 to inform the Extraction Plan. Surveyed areas in relation to the Subject Area are shown in Figure 4.

Survey coverage across the Subject Area has been achieved consistent with the HMP, targeting all landforms site types susceptible to subsidence, including:

- Breaks of slope where boulders could be present
- Clifflines, steep slopes and ridgelines with exposed rock
- Open depressions and gullies with exposed rock.

All rock shelters, overhangs, boulders, tor like structures and drainage lines with exposed stone that were present in the survey area were inspected for evidence of past Aboriginal land use.

A small gully located within the Dronvisa Quarry Mining Lease was not surveyed in March 2021 (for safety reasons). This area is not considered to be detrimental to the survey's adequacy or effectiveness due to previous surveys' conducted by Dronvisa Pty Ltd and existing disturbance from the quarry.

4.3 Archaeological model and synthesis of Wiradjuri land use in the Subject Area

The previous archaeological work at the Ulan, Moolarben and Wilpinjong Coal Mines represents a very intensive amount of study for a relatively small area. As such a good model of past Wiradjuri land use and its archaeological traces has been developed by Kuskie (2009).

The model states that most evidence of occupation will date within the last 5,000 years though may have extended 30,000 – 40,000 years Before Present. The model determines three zones of resources: primary resource zones, secondary resource zones and a third zone that encompasses the land beyond primary and secondary resource zones (Kuskie 2009: 79-87).

Primary resource zones: areas of more abundant and diverse resource rich zones in north-east Wiradjuri territory including the junction of the higher order watercourses such as Goulburn and Talbragar Rivers would most likely be a focus of occupation. These zones may have supported nuclear and extended family base camps, community base camps and congregations of larger groups. This zone may have been subject to longer stays and more frequent occupation than other areas, such as, secondary resource zones. The model states that these zones would contain substantially higher counts and densities of artefacts, a greater range of stone materials and artefact types and a higher number of activity areas would be present.

Secondary resource zones: these are areas where resources such as watercourses, swamps and wetlands occur in proximity of higher order watercourses and associated flats and terraces. Examples of secondary resource zones in the Ulan area include higher order parts of Moolarben Creek. In the model these zones were utilised for regular but sporadic seasonal encampments of small parties, but occupations of the encampments would typically have been for short periods. Compared to the surrounding areas this resource zone will host moderately higher counts and densities of artefacts, a number of activity areas, and a relatively broad range of raw materials and artefact types (but much lesser range than sites in primary resource zones).

Outside primary and secondary zones: occupation is anticipated to be hunter gatherer activities with small parties of men, women or children. Movement across the landscape would be transitory between resource locations and may include special purpose journeys for ceremonial purpose or the procurement of stone. Utilisation of landforms such as simple slopes, ridge crests, spur crests and lower order watercourses would be far less intense than that found in primary and secondary resource zones. The evidence of this occupation would be low to very low artefact counts and densities, little range in the number of activity areas, and dates of sporadic occupation rather than continuous occupation. Evidence of stone quarries at sources may also be present.

In this model, the Subject Area contains areas within or in close proximity to secondary resource zones where Bora Creek and the unnamed tributaries flow towards and into the Goulburn River and areas that would be considered outside of primary and secondary zones.

Activities that may have occurred in the landscape include food procurement and processing, food consumption, maintenance and production of tools, the building of shelter, children's play and learning, ceremonial activity, spiritual activity, burials and social and political activity by Aboriginal people.

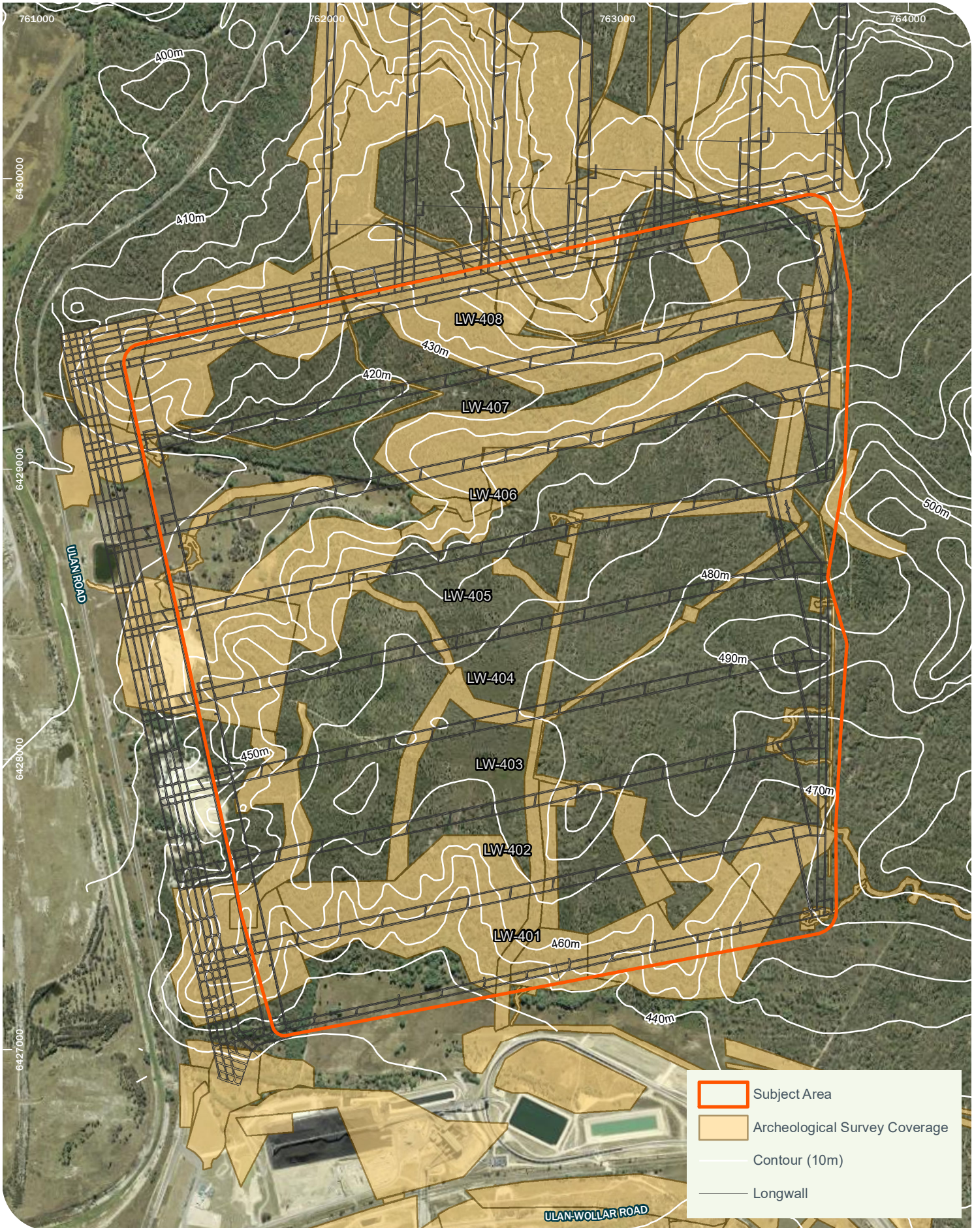
Many of these past activities in the landscape by Wiradjuri people will have left archaeological evidence that can be discovered and interpreted. For instance, food procurement and processing might be evident through the presence of usewear and residue on stone tools. The stone tools themselves are also evidence of other day-to-day activities such as the creation and use of other tools and products, which may be made from organic material that does not survive in the archaeological record. Social, cultural and cosmological aspects of life can be interpreted from rock-art and ceremonial activities may be inferred from the presence of carved trees, bora grounds and stone arrangement.

The archaeological model predicts that most stone artefacts will be made of quartz due to its ease of access and availability in the local landscape. The model hypothesises that the relative intensity of use of each of the materials will be dependent on the proximity of the original source of the stone. Most stone procurement is hypothesised to have occurred during normal daily and seasonal movement without the need for special purpose visits to raw material sources. As a result of the abundance of available local stone, the stone is less likely to exhibit intensive reduction as evidence of conservation of material.

Most stone technology will be basic and non-specific (e.g. complete and broken flakes) with low frequencies of microblade or microlithic technologies, bipolar knapping, backing and usewear.

Grinding grooves for the sharpening of ground edge axes may occur on exposed sandstone bedrock, but are unlikely to occur in high numbers within LW401-408. Where they occur in areas of hills and ridges these occurrences would most likely represent occasional activity and short-term activities.

The predicted use of this area by Wiradjuri people in the past was that it was utilised for regular but shorter visits to transitory visitation of small family groups, moving to and from primary and other secondary resource zones with special visits for ceremonial purposes and resource acquisition, for example travelling between occupation sites along the river, Bora Creek and unnamed tributaries to/from the shelter and art sites (S1MC280, S1MC287-291) and along the unnamed drainage line to the shelters sites with artefacts and the grinding groove complex at S1MC 264. Accordingly, the past traces of Wiradjuri land use are predicted to reflect this, with the area containing a moderate number of sites, and sites that contain low to moderate numbers of artefacts and features. The Subject Area has the potential to contain both open sites containing stone artefacts and rock shelters with stone artefacts, grinding grooves and art.



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Previously surveyed areas of the Subject Area
UG4 LW401-408 Extraction Plan

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Client: Moolarben Coal Operations

Figure 4

5. Aboriginal Heritage sites within LW401-408

5.1 Register searches and MCO Aboriginal Sites Database

Moolarben Coal maintains an Aboriginal Sites Database which provides an up-to-date database of all known Aboriginal Heritage sites at the Moolarben Coal Complex. The database was interrogated to provide a list of all known Aboriginal Heritage sites within the Subject Area. In addition to this, extensive Aboriginal Heritage Information Management System (AHIMS) Searches (#569300 and #569290) were conducted on 18 February 2021 (Annex 1). A summary of known Aboriginal Heritage sites by site features previously recorded in the Subject Area is presented in **Table 3**.

Table 3: Count of recorded Aboriginal Heritage sites within the Subject Area by Site Type

Site Type	Grand Total
Open Artefact Sites and PAD	**22**
Artefacts	7
Artefacts (Isolated Find)	11
Artefacts and PAD	4
Grinding Grooves and Shelters with/without grinding grooves and/or artefacts and/or PAD	**23**
Shelter	1
Shelter with Artefacts	6
Shelter with Grinding Groove, Artefact and PAD	1
Shelter with Artefacts and PAD	6
Shelter with Grinding Groove, Art, Artefact and PAD	1
Shelter with PAD	8
Grand Total	***45***

Of the 45 Aboriginal Heritage sites within the Subject Area, eight (8) Aboriginal heritage sites have been salvaged under existing approvals. Of the remaining 37 sites *in-situ,* one Aboriginal Heritage site has been assessed as having high scientific significance, a Shelter with Artefacts and Grinding Grooves, known as S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042). Eight (8) Aboriginal Heritage sites have been assessed to have moderate scientific significance and twenty-eight (28) have been assessed to have low scientific significance.

The location and a description of the remaining Aboriginal Heritage sites within the Subject Area is shown in Table 4.

Table 4: Aboriginal Heritage sites in LW401-408 (Previously identified and newly identified), excluding those that have managed under the HMP

AHIMS ID	Site Name	Site Type	Easting (GDA2020)	Northing (GDA2020)	Number of artefacts/ features
36-3-1071	S1MC256	Shelter with Artefacts	762879	6429621	23 stone artefacts
36-3-1072	S1MC257	Artefacts	762851	6429601	3 stone artefacts
36-3-1073	S1MC258	Artefacts	762866	6429653	2 stone artefacts
36-3-1074	S1MC259	Artefacts (Isolated Find)	762890	6429672	1 stone artefact
36-3-1075	S1MC260	Artefacts (Isolated Find)	762850	6429606	1 stone artefact
36-3-1076	S1MC261	Shelter with Artefacts	762877	6429661	2 stone artefacts
36-3-1077	S1MC262	Artefacts (Isolated Find)	762877	6429677	1 stone artefact
36-3-1086	S1MC271	Shelter with Artefacts	763750	6428830	8 stone artefacts
36-3-1088	S1MC273	Artefacts (Isolated Find)	762661	6428765	1 stone artefact
36-3-0042	S1MC280; Ulan Creek 2	Shelter with Art, Artefacts and Grinding Grooves	762822	6427881	8 Grinding Grooves 2 hand stencils 4 stone artefacts PAD
36-3-1104	S1MC290	Shelter with Artefacts	763740	6429836	5 stone artefacts
36-3-1105	S1MC291	Artefacts (Isolated Find)	763727	6429854	1 stone artefact
36-3-1108	S1MC294	Shelter with Artefacts	763674	6429850	1 stone artefact
36-3-1415	S1MC321(NB9)	Artefacts (Isolated Find)	763729	6427663	1 stone artefact
36-3-1416	S1MC322 (NB10)	Artefacts and PAD	763694	6428814	3 stone artefacts
36-3-3304	S1MC356b	Artefacts (Isolated Find)	762582	6428869	1 stone artefact
36-3-3305	S1MC358b	Shelter with Artefact and PAD	761847	6428540	1 stone artefact
36-3-3799	S1MC464	Artefacts	762814	6429318	28 stone artefacts
36-3-3800	S1MC465	Artefacts and PAD	763147	6429384	11 stone artefacts
36-3-3804	S1MC466*	Shelter with Artefacts and PAD	763057	6429951	21 stone artefacts (located along drainage line outside of shelter)
36-3-3801	S1MC468	Shelter with Artefacts and PAD	762941	6429358	2 stone artefacts
36-3-3802	S1MC471	Shelter with PAD	762003	6428711	-
36-3-3803	S1MC472	Shelter with Artefacts and PAD	762533	6427532	8 stone artefacts
36-3-3798	S1MC473	Shelter with PAD	762525	6427700	-
36-3-3785	S1MC474	Shelter with Artefacts and PAD	763347	6427365	8 stone artefacts
36-3-3786	S1MC475	Shelter with	763355	6427457	1 stone artefact,

AHIMS ID	Site Name	Site Type	Easting (GDA2020)	Northing (GDA2020)	Number of artefacts/ features
		Grinding Groove, Artefact and PAD			1 Grinding Groove
36-3-3796	S1MC478	Artefacts	763408	6427548	8 stone artefacts
36-3-3787	S1MC479	Artefacts and PAD	763609	6427650	5 stone artefacts
Pending	S1MC483	Shelter with PAD	762763	6427300	-
36-3-3788	S1MC484	Shelter with Artefacts	761836	6428672	1 stone artefact
36-3-3795	S1MC485	Shelter with PAD	761982	6428401	-
36-3-3789	S1MC486	Shelter with PAD	762509	6427718	-
36-3-3794	S1MC487	Shelter	762776	6427273	No cultural material
36-3-3790	S1MC488	Shelter with Artefacts and PAD	762835	6427259	1 stone artefact
36-3-3791	S1MC490	Shelter with PAD	763332	6427384	-
36-3-3792	S1MC491	Shelter with PAD	763352	6427422	-
36-3-3793	S1MC494	Shelter with Artefacts and PAD	762943	6429187	3 stone artefacts

*S1MC466 The Shelter is located outside of the Study Area for Longwalls 401-408. The extent of the site is within the Study Area, however it is unlikely that the open artefact scatters or isolated finds with associated PAD themselves would be impacted by mine subsidence (MSEC 2021)

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GDA2020 MGA Zone 55

Wiradjuri heritage sites in LW401-408

UG4 LW401-408 Extraction Plan

Niche PM: Clare Anderson
Niche Proj. #: 6525
Client: Moolarben Coal Operations

Figure 5

v2.0

5.2 Analysis and discussion

5.2.1 Site distribution

The sampling strategy proved to be effective in identifying Aboriginal Heritage sites within LW401-408 in UG4, with shelters and overhangs occurring within most cliff lines and along moderate and steep slopes within the UG4 area, as well as open artefact scatters and isolated finds occurring within the sandy soils along creeks and drainage lines.

Survey coverage is considered to have met the requirements for additional survey in accordance with the HMP.

5.2.2 Site types and frequency

Overview and comparison

A comparison of site features recorded across MCC, Ulan and Wilpinjong was undertaken. While many of the variations in site type and frequency across MCC, Ulan and Wilpinjong can be explained through the different landforms and landscapes present at each of the mines, the following statements can be made regarding the archaeological resources within UG4:

- MCC contains relatively fewer shelter sites compared with Ulan and Wilpinjong.
- S1MC280, with its specific components (Shelter with Art, Artefacts, Grinding Grooves and PAD), is a rare site type across the local area. It should be considered to have high rarity values.
- S1MC475, a Shelter with Artefacts, Grinding Grooves and PAD, represents 12.5% of the total number of sites with these components, making it uncommon in the local region.
- Grinding groove sites are relatively uncommon across MCC, Ulan and Wilpinjong.
- Open artefact sites, containing isolated finds, multiple artefacts and/or PAD are common across the local region.

Art assemblage

One Aboriginal Heritage site within UG4 contains art: S1MC 280. Two red ochre hand stencils are located at the northern end of the site. The hand stencils have not changed condition since last recorded. The shelter also contains eight grinding grooves located on a boulder at the entrance to the shelter and four stone artefacts. Charcoal is present across the floor of the shelter.

Plate 1: S1MC280 (AHIMS ID#36-3-0042) site overview photograph, taken in March 2021

Plate 2: S1MC280, hand stencils within UG4.

Plate 3: Grinding groove detail at S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042).

Plate 4: Current condition of rear of shelter at S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042).

Grinding groove features

Two Aboriginal Heritage sites within LW401-408 contain grinding grooves, one within a shelter, and one adjacent a shelter:

- S1MC280
- S1MC475

Each of these sites are uncommon to rare in the local region and contain other site features such as art, artefacts and/or PAD. Both sites contain archaeological deposit which may offer opportunities to identify subsurface Aboriginal objects and dating samples to inform an understanding of Wiradjuri land use over time. Each of the sites are connected via easily traversable terrain where other Aboriginal Heritage sites are situated, have identifiable resources such as watercourses and plant species with cultural uses and contain stone artefacts manufactured from similar raw materials. These sites have research value with scientific methods offering research opportunities to explore connectivity between sites (for example, differing grinding techniques, raw material usage, reduction strategies, cost/benefit and path analysis).

Stone artefact assemblage

Raw material types observed within LW401-408 included:

- Quartz, both crystal and milky quartz
- Tuff
- Silicified tuff
- Chert
- Fossilised wood
- Quartzite
- Fine-grained volcanic
- Sandstone

Raw materials types for stone artefacts recorded in LW401-408 are common to the MCC, Ulan and Wilpinjong assemblages.

Stone artefact types within LW401-408 included:

- Complete and broken flakes
- Tools with retouch, backing or usewear

- Cores
- Chopper/Multipurpose tool (S1MC478)

The chopper/multipurpose tool at S1MC478 represents an uncommon artefact type within the MCC assemblage.

Stone artefacts observed during surveys for LW401-408 were reduced using a variety of techniques and strategies by Aboriginal people including:

- Hand-held percussion
- Bipolar flaking and/or anvil rested
- Microblade reduction
- Elongated flake reduction
- General, non-specific reduction techniques

Rotated, exhausted cores and platform preparation flakes were noted in a variety of raw materials including chert, silicified tuff and fossilised wood, which is in line with previous observations that there are differences in the way milky quartz and non-quartz materials are worked and transported in the local area (Doelman 2018).

5.2.3 Revisiting the predictive model

The results of surveys undertaken within LW401-408 support the predictive model developed by Kuskie (2009, 2018). The material evidence within UG4 supports the hypothesis that Aboriginal people in the past utilised the UG4 landscape:

- For regular but shorter visits to transitory visitation by small family groups, moving to and from primary and other secondary resource zones with special visits for artistic and cultural maintenance purposes and resource acquisition, for example travelling between occupation sites along the river, Bora Creek (S1MC474, S1MC475), and unnamed tributaries to/from the shelter and art sites (S1MC280, S1MC287-291) and along the unnamed drainage line to the shelters sites with artefacts and the grinding groove complex at S1MC264.
- For transient movement and use outside primary and secondary zones, for example reflected by isolated and less frequent, low density stone artefact scatters such as S1MC476.

Accordingly, the past traces of Wiradjuri land use reflect this, with UG4 containing a moderate number of sites, and sites that contain low to moderate numbers of artefacts and features with a few notable exceptions (eg. S1MC264).

The Subject Area demonstrates Wiradjuri people were using shelters and overhangs within most cliff-lines and along moderate and steep slopes within the UG4 area, as well as the sandy soils along creeks and drainage lines for a range of utilitarian activities including habitation, building fireplaces, food processing (grinding), production, maintenance and discard of stone implements. The production and maintenance of stone implements was undertaken using a range of techniques including the grinding and sharpening of hatchets/axes/spears, generalised reduction strategies of other tools and specific reduction strategies such as microblade, blade and bipolar flaking. On rare occasions, rock art was produced in the Subject Area.

6. Scientific values and significance assessment

6.1 Assessment framework

The Burra Charter (Australia ICOMOS 2013) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made.

The NSW Aboriginal cultural heritage regulatory framework supports the significance assessment of Aboriginal archaeological sites and provides guidelines for this ACHA within the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) outlines two main themes in the overall Aboriginal cultural heritage significance assessment process, namely, the identification of the cultural/social significance of Aboriginal objects and/or places to Aboriginal people and the identification of the scientific (archaeological) significance to the scientific/research community. These themes encapsulate those aspects of the Burra Charter that are of particular relevance to Aboriginal objects and places.

6.1.1 Cultural significance

The Burra Charter defines cultural significance as being derived from the following values: aesthetic value, historic value, scientific value and social value however, more precise categories may be developed as an understanding of a particular place or site increases (Table 14).

Table 5: Values from which cultural significance is derived

Value type	Description
Aesthetic Value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Historic Value	Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the setting are substantially intact, than where it has been changed or evidence does not survive. However, some events or association may be so important that the place retains significance regardless of subsequent treatment
Scientific Value	The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness (conservation value), and on the degree to which the place may contribute further substantial information.
Social Value	Social or cultural value refers to the spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities and individuals can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

6.1.2 Scientific significance

The Guidelines specify that information about scientific values will be gathered through archaeological investigation carried out according to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) itself does not specify criteria for assessment of Aboriginal objects, but rather suggests to "identify the archaeological values and assess their significance." The assessment must be supportable and the assessment criteria must reflect best practice assessment processes as set out in the Burra Charter. The scientific values described in the Burra Charter were considered further by the then NSW National Parks and Wildlife Service in their *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC 1997). In lieu of specific criteria, the advice from the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC 1997) is summarised and paraphrased below to provide guidance to the assessment of scientific values.

Table 6: Criteria for assessing scientific value

Scientific value	Description
Research potential	It is the potential to elucidate past behaviour which gives significance under this criterion rather than the potential to yield collections of artefacts. Matters considered under this criterion include the intactness of a site, the potential for the site to build a chronology and the connectedness of the site to other sites in the archaeological landscape.
Representativeness	As a criterion, representativeness is only meaningful in relation to a conservation objective. Presumably all sites are representative of those in their class or they would not be in that class. What is at issue is the extent to which a class of sites is conserved and whether the particular site being assessed should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The conservation objective which underwrites the 'representativeness' criteria is that such a sample should be conserved.
Rarity	This criterion cannot easily be separated from that of representativeness. If a site is 'distinctive' then by definition, it will be part of the variability which a representative sample would represent. The criteria might best be approached as one which exists within the criteria of representativeness, giving a particular weighting to certain classes of site. The main requirement for being able to assess rarity is to determine what is common and what is unusual in the archaeological record, but also the way that archaeology confers prestige on certain sites because of their ability to provide certain information. Items may be common, uncommon or rare. The criterion of rarity may be assessed at a range of levels including local, regional, state, national, and global.
Educational potential	This criterion relates to the ability of the cultural heritage item or place to inform and/or educate people about one or other aspects of the past. It incorporates notions of intactness, relevance, interpretative value and accessibility. Where archaeologists or others carrying out cultural heritage assessments are promoting/advocating the educational value of a cultural heritage item or place it is imperative that public input and support for this value is achieved and sought. Without public input and support the educative value of the items/places is likely to not ever be fully realised.
Aesthetics	In relation to heritage places, aesthetic significance is generally taken to mean the visual beauty of the place. Aesthetic value is not inherent in a place but arises in the sensory response people have to it. The guidelines provide no expectation for archaeologists to consider aesthetic values, it is often the case that the aesthetics including the physical setting of an archaeological site or a landscape contributes to its cultural heritage significance. Examples of archaeological sites that may have high aesthetic values include rock art sites or sites located in environments that evoke strong sensory responses.

6.1.2.1 Grading scientific values

The following gradations, where a site or zone satisfies at least one criterion, have been applied to provide a measure of the archaeological values/significance for Aboriginal objects identified within the subject area, and to provide an overall assessment of the significance of each of the zones used that define the subject area.

Table 7: Criteria for grading significance

Gradation	Description
Low	The site or object contains only a single or limited number of features, and has no potential to meaningfully inform our understanding of the past beyond what it contributes through its current recording (i.e. no or low research potential). The site or object is a representative but unexceptional example of the most common class of sites or objects in the region. Many more similar examples can be confidently predicted to occur within the subject area, and in the region.
Moderate	The site or object derives value because it contains features, both archaeological and contextual, which through further investigation may contribute to our understanding of the local past. These features include, but are not limited to: the relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a relatively large assemblage of stone artefacts. The presence of a diverse artefact and feature assemblage, and connectedness with landscape features and other notable sites provide relatively higher representative and rarity values than sites of low significance.
High	The site or object has value because it contains archaeological and/or contextual features which through further investigation may significantly contribute to our understanding of the past, both locally and on a regional scale. These features include, but are not limited to: Aboriginal ancestral remains; the site's relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a very large assemblage of stone artefacts associated with other features such as oven remains or shell midden. Such sites will be relatively rare, and will be representative of a limited number of similar sites that make up this class; hence they derive high representative and rarity values.

6.2 Assessment of Scientific significance

The Registered Aboriginal Parties have stated that all landscapes and Aboriginal Heritage sites have high cultural value. This section of the report provides an assessment of scientific significance for all sites in the Subject Area, presented in Table 8, with detailed statements of scientific significance for all sites assessed as having moderate or higher scientific significance.

The recorded Aboriginal Heritage sites provide material evidence of Wiradjuri people's use of shelters and overhangs within most cliff lines and along moderate and steep slopes within the UG4 area, as well as the sandy soils along creeks and drainage lines for a range of utilitarian and artistic activities.

S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042), Shelter with Art, Artefacts and Grinding Grooves -High significance

S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042), Shelter with Art, Artefacts and Grinding Grooves is a rare, multi-component sites with two red ochre hand stencils, eight grinding grooves and four stone artefacts, located centrally above the chain pillar between Longwalls 402 and 403. The site contains jointing at 5 – 10 m spacing with some collapsed rock. Archaeological deposits of greater than 60 cm in depth and further surface stone artefacts may be present within and immediately adjacent to the shelter.

While the condition of the site appears to have deteriorated since its original recording due to: fire, which has distributed charcoal across the floor of the shelter, and non-mining induced cracking in the rear of the shelter, away from the art, it is considered to have high scientific significance on a regional scale as it is a representative example of an rare multi-component site type including art and grinding grooves. The site has high research value as it may contribute to our understanding of Aboriginal life and connectivity between sites in the region through comparative analysis of other art sites and the relationship to its internal features, sourcing studies of the ochre pigment, usewear and residue analysis of grinding grooves and polish of the boulders in the rear of the shelter and stone artefact analysis. Where dateable samples are recovered, the site has the potential to provide information regarding the chronology of Wiradjuri land use in the region.

S1MC271 (AHIMS ID#36-3-1086), Shelter with Artefacts- Moderate scientific significance

S1MC271 (AHIMS ID#36-3-1086) is a shelter with artefacts located along a ridge crest in the Munghorn Plateau. The site consists of a small rock shelter facing south, with evidence of moderate exfoliation and oxidation. The ground in front of the shelter is flat with limited animal impacts. A scatter of 8 stone artefacts are located in front of the shelter. No artefacts are evident on the shelters floor. The site type is uncommon within the Moolarben Coal Complex but is relatively common within the local region. The site is considered to have moderate scientific significance due to the number of artefacts present, the possible research value of the shelter and the connectivity in the landscape with site S1MC322, an artefact scatter and PAD.

Plate 5: S1MC271 (AHIMS ID#36-3-1086) site overview photograph (Source: Hamm 2006a).

S1MC322 (NB10) (AHIMS ID#36-3-1416), Artefacts and PAD- Moderate scientific significance

S1MC322 (NB10) (AHIMS ID#36-3-1416), consists of an artefact scatter with Potential Archaeological Deposit located on lower ridge slope within a colluvial deposit 40 m below a sandstone outcrop containing S1MC271 (AHIMS ID#36-3-1086). Three crystalline quartz flakes were recorded in disturbed context. While the site's components were recorded as having low scientific value on the AHIMS site card, S1MC322 (NB10) likely represents a continuation of S1MC271, a Shelter with eight stone artefacts (Hamm 2006, MCO

2010). S1MC322 (NB10) is considered to have moderate research value due to is connectivity in the landscape with S1MC271.

S1MC464 (AHIMS ID#36-3-3799), Artefacts- Moderate scientific significance

S1MC464 is an open artefact scatter with 28 stone artefacts. The site and its components are common and well represented in the local region. The artefact assemblage contains a diverse range of raw material types common to the Ulan and Moolarben region including quartz, tuff, chert and fossilised wood. The site has limited conservation value and other more representative sites are conserved within the Moolarben Coal Complex, Ulan Coal and Wilpinjong Coal conservation areas and within the salvaged assemblage in the Keeping Place. S1MC464, S1MC 465 and S1MC 468 have scientific value as its sandy deposits and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area. While the topsoil of the site has been disturbed through historical earthworks, vehicle movement and sheetwash, portions of the site have not been impacted by this activity and the site demonstrates connectivity due to its close proximity to rock shelter sites, connected by a drainage line that provides a short walk along recognisable landscape features to other sites, landscape features and artefacts. The sites therefore have scientific value by providing an opportunity to explore connections and relationships between artefacts, sites and landscape use across a cross section of landscapes from drainage line to rockshelter sites.

Plate 6: General photo of site S1MC 464 (AHIMS ID#36-3-3799), facing south.

Plate 7: Tuff and quartz stone artefacts at site S1MC 464 (AHIMS ID#36-3-3799).

S1MC465 (AHIMS ID#36-3-3800), Artefacts and PAD- Moderate scientific significance

S1MC465 is an open artefact scatter with Potential Archaeological Deposit comprising 11 stone artefacts and Potential Archaeological Deposit, approximately 200 m east of S1MC 464, situated on a flat between a drainage line, and a continuous exposure of sandstone, with occasional overhangs, at the break of slope.

The site type and its features are common in the local region. The artefact assemblage contains a diverse range of raw material types common to the Ulan and Moolarben region including quartz, tuff, chert and fossilised wood. The site has limited conservation value and other more representative sites are conserved within the Moolarben Coal Complex, Ulan Coal and Wilpinjong Coal conservation areas and within the salvaged assemblage in the Keeping Place. S1MC464, S1MC 465 and S1MC 468 have scientific value as its sandy deposits and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area. While the topsoil of the site has been disturbed through historical earthworks, vehicle movement and sheetwash, the site demonstrates a high degree of connectivity due to its close proximity to rock shelter sites, connected by a drainage line that provides a short walk along recognisable landscape features to other artefacts, sites and landscape features. The sites

therefore have scientific value by providing an opportunity to explore connections and relationships between artefacts, sites and landscape use across a cross section of landscapes from drainage line to rockshelter sites.

Plate 8: General photo of site S1MC 465 (AHIMS ID#36-3-3800), facing east.

Plate 9: Tuff and chert stone artefacts at S1MC 465 (AHIMS ID#36-3-3800).

S1MC466 (AHIMS ID#36-3-3804), Artefacts and PAD- Moderate scientific significance

S1MC466 is a sandstone outcrop with an open artefact scatter and Potential Archaeological Deposit. The site comprises of a shelter with limited overhang associated with an open low to moderate density artefact scatter, consisting of 21 artefacts and a Potential Archaeological Deposit visible in exposures along a sandy, incised drainage line. Deposits exposed in the creekline appear to be greater than 50 cm in depth. The drainage line connects two shelter complexes, one containing Wiradjuri cultural heritage sites S1MC 256-262 and the other containing Wiradjuri cultural heritage sites S1MC289-296. It is likely S1MC 466 forms part of a continuous artefact scatter along the drainage line, with its visible components extending over a 270 m by 60 m area. The small overhang associated with the site is located outside LW 401-408 and will not be impacted by subsidence, however the extent of the artefact scatter will be impacted by LW 401-408.

The site type and its features of site S1MC466 are uncommon within MCC but relatively common in the local region. S1MC466 has scientific value as its sandy deposits and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area. The depth of the deposit offers the potential to preserve one or more layers of occupation. The site's close proximity to rockshelter sites, connected by the drainage line which in turn flows through to S1MC 264, provide an opportunity to explore connections and relationships between artefacts, sites and landscape use across a cross section of landscapes from cliff, plateau, ridge and gully to the high significance S1MC 264 at the base of the Gully near the Goulburn River and to the Bora Creek Conservation area. The site is therefore considered to have *moderate* scientific significance.

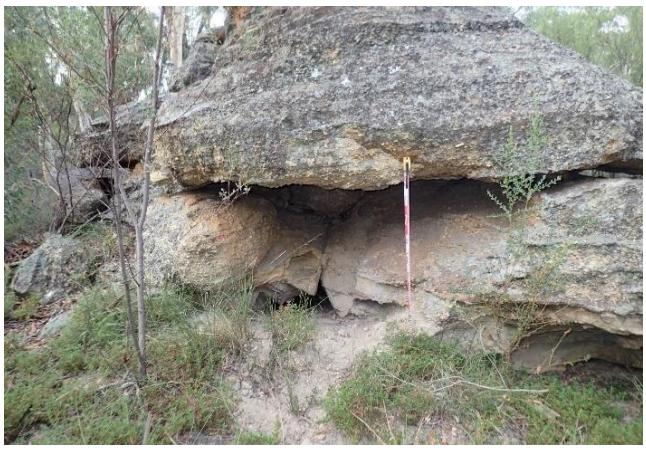

Plate 10: General photo of site S1MC 466 (AHIMS ID#36-3-3804), facing north. Sandstone outcrop with limited overhang.

Plate 11: Incised drainage line intersection at site S1MC 466 (AHIMS ID#36-3-3804).

Plate 12: S1MC 466 (AHIMS ID#36-3-3804) – stone artefacts

Plate 13: S1MC 466 (AHIMS ID#36-3-3804)- chert flake with usewear.

S1MC474 (AHIMS ID#36-3-3785), Shelter with Artefacts and PAD – Moderate scientific significance

The representatives of the Registered Parties noted that the gully, drainage line, and shelters would have been a good place for families to live, sit and work stone. The setting of this site, with its twin shelters, was noted as being pleasant and unusual by the representatives of the Registered Aboriginal Parties during the site inspection. Shelters with Artefacts (with/without PAD) represent 6% of sites recorded across MCO, Ulan and Wilpinjong. S1MC474 and S1MC475 have some conservation value due to their aesthetic appeal, distinctiveness with twin shelters, the range of the artefact assemblage and connectivity to other sites in the region. Portions of the site are in fair to good condition while other portions have been disturbed by animal burrowing. S1MC474 has scientific value as its sandy deposits and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area. the potential to preserve one or more layers of occupation. The site's close proximity to rockshelter sites, connected by the drainage line which in turn flows through to Bora Creek, provide an opportunity to explore connections and relationships between artefacts, sites and landscape use.

Plate 14: General photo of site S1MC 474 (AHIMS ID#36-3-3785), facing east. Stone artefacts eroding from dripline and visible at exposure around tree. Twin, stone floored shelter located to the south-east (right of frame)

General photo of twin shelter at S1MC 474 (AHIMS ID#36-3-3785), facing east. Stone artefacts present at front of shelter

Plate 15: S1MC474(AHIMS ID#36-3-3785) – volcanic stone core and quartz flake

Plate 16: S1MC474(AHIMS ID#36-3-3785) - chert utilised tool dorsal surface

S1MC475 (AHIMS ID#36-3-3786), Shelter with Grinding Grooves, Artefacts and PAD - Moderate

S1MC475 (AHIMS ID#36-3-3786) comprises twin shelters, one with a grinding groove and the other with a stone artefact and PAD. The representatives of the Registered Parties noted that the gully, drainage line, shelters would have been a good place for families to live, sit and work stone. The setting of this site was noted as being pleasant by the representatives of the Registered Aboriginal Parties during the site inspection. This site type and its features are uncommon within MCC and the local region. S1MC475 has scientific value as its sandy deposits and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area, particularly in respect to raw material selection. The sites close proximity to rockshelter sites, connected by the drainage line which in turn flows through to Bora Creek, provide an opportunity to explore connections and relationships between artefacts, sites and landscape use, including S1MC474 and S1MC478. The site is considered to have moderate research value.

Plate 17: Location of Grinding Groove relative to Shelter, site S1MC 475(AHIMS ID#36-3-3786), facing north-east

Plate 18: Grinding Groove at creeks edge at S1MC 475(AHIMS ID#36-3-3786)

Plate 19: General photo of site S1MC 475(AHIMS ID#36-3-3786), facing north-west towards overhang containing artefact and PAD

Plate 20: Chalcedony complete flake at shelter(north) at S1MC475(AHIMS ID#36-3-3786)

S1MC478 (AHIMS ID#36-3-3796), Artefacts, Moderate scientific significance

S1MC478 is an open artefact scatter located 70 m north-east, upstream, of S1MC475 along Bora Creek and 270 m south-west of S1MC479. Four artefacts were identified in patches of exposure along the sloped, sandy quartz creek banks, including a sandstone chopper tool with stepped retouched, a large tuff flake and two quartz complete flakes. While open artefact scatters are the most common and well represented site type in the region, the chopper/mulitpurpose tool is a relatively uncommon artefact class in the Moolarben assemblage. Archaeological deposits and further surface stone artefacts may be present along the creek banks. Bora Creek and its tributaries provide possible pathways between S1MC474, S1MC475, other recorded Aboriginal Heritage sites in the Bora Creek area and the cliff and rockshelter complex associated with S1MC289-296.The site is considered to have moderate research value because it contains an uncommon class of artefact and offers the opportunity to explore connectivity in the landscape between other Aboriginal Heritage sites through stone artefact analysis. Where dateable samples are recovered, the site has the potential to provide information regarding the chronology of Wiradjuri land use in the area. The site is therefore considered to have *moderate* scientific significance.

Plate 21: S1MC478 (AHIMS ID#36-3-3796), facing south. The drainage line flows towards S1MC475

Plate 22: S1MC478 (AHIMS ID#36-3-3796) - sandstone chopper tool, tuff flake and quartz flakes

S1MC491 (AHIMS ID#36-3-3792), Shelter with PAD -Moderate scientific significance

S1MC491 is a Shelter with PAD. The site type and its features are common in the local region. The site condition is good. The scale and depth of deposit at this location is such that where Aboriginal objects and archaeological deposit are identified, they consist of sandy deposits >40 cm and artefact assemblage may be datable through OSL/TL and provide information regarding the chronology of Aboriginal use of the UG4 area. The site's close proximity to rockshelter sites, connected by the drainage line which in turn flows through to Bora Creek, provide an opportunity to explore connections and relationships between artefacts, sites, such as S1MC474, S1MC475 and S1MC478 and landscape use

Plate 23: S1MC491 (AHIMS ID#36-3-3792), facing north-east

S1MC494 (AHIMS ID#36-3-3793), Shelter with Artefacts and PAD – Moderate scientific significance

S1MC494 (AHIMS ID#36-3-3793) located at the base of a ridge, is positioned with a creek to the north and an actively running drainage line to the west. Shelters with Artefacts (with/without PAD) are uncommon in the local area, representing 6% of the sites recorded across MCO, Ulan and Wilpinjong. A Potential Archaeological Deposit consists of a sandy deposit, approximately > 50cm in depth at the dripline. A small overhang is located immediately east of the primary deposit and contains an artefact scatter. The site is considered to have moderate research value as further investigation may increase the visibility. Where further Aboriginal objects are present, due to the potential depth and sandy nature of the deposit there is the potential that dating samples may be obtained to inform a chronology of the local area and may contribute to an understanding of Aboriginal life and use of shelter resources through a comparative analysis of stone artefacts across the local area.

Plate 24: S1MC494, overhang containing stone artefacts, primary deposit and overhang is to the west (right of this frame)

Plate 25: S1MC494 Shelter with Artefacts and PAD, stone artefacts were identified to the east (left of this frame)

Table 8: Summary of scientific (archaeological) significance for Aboriginal Heritage sites

AHIMS	Site Name	Site Type	Scientific significance rating
36-3-1071	S1MC256	Shelter with Artefacts	Low
36-3-1072	S1MC257	Artefacts	Low
36-3-1073	S1MC258	Artefacts	Low
36-3-1074	S1MC259	Artefacts (Isolated Find)	Low
36-3-1075	S1MC260	Artefacts (Isolated Find)	Low
36-3-1076	S1MC261	Shelter with Artefacts	Low
36-3-1077	S1MC262	Artefacts (Isolated Find)	Low
36-3-1086	S1MC271	Shelter with Artefacts	Moderate
36-3-1088	S1MC273	Artefacts (Isolated Find)	Low
36-3-0042	S1MC280; Ulan Creek 2	Shelter with Art, Artefacts and Grinding Grooves	High
36-3-1104	S1MC290	Shelter with Artefacts	Low
36-3-1105	S1MC291	Artefacts (Isolated Find)	Low
36-3-1108	S1MC294	Shelter with Artefacts	Low
36-3-1415	S1MC321 (NB9)	Artefacts (Isolated Find)	Low
36-3-1416	S1MC322 (NB10)	Artefacts and PAD	Moderate
36-3-3304	S1MC356b	Artefacts (Isolated Find)	Low
36-3-3305	S1MC358b	Shelter with PAD	Low
36-3-3799	S1MC464	Artefacts	Moderate
36-3-3800	S1MC465	Artefacts and PAD	Moderate
36-3-3804	S1MC466*	Shelter with Artefacts and PAD	Moderate
36-3-3801	S1MC468	Shelter with Artefacts and PAD	Low
36-3-3802	S1MC471	Shelter with PAD	Low
36-3-3803	S1MC472	Shelter with Artefacts and PAD	Low
36-3-3798	S1MC473	Shelter with PAD	Low
36-3-3785	S1MC474	Shelter with Artefact and PAD	Moderate
36-3-3786	S1MC475	Shelter with Grinding Grooves, Artefacts and PAD	Moderate
36-3-3796	S1MC478	Artefacts	Moderate
36-3-3787	S1MC479	Artefacts and PAD	Low

AHIMS	Site Name	Site Type	Scientific significance rating
Pending	S1MC483	Shelter with PAD	Low
36-3-3788	S1MC484	Shelter with Artefacts	Low
36-3-3795	S1MC485	Shelter with PAD	Low
36-3-3789	S1MC486	Shelter with PAD	Low
36-3-3794	S1MC487	Shelter	Low
36-3-3790	S1MC488	Shelter with Artefacts and PAD	Low
36-3-3791	S1MC490	Shelter with PAD	Low
36-3-3792	S1MC491	Shelter with PAD	Moderate
36-3-3793	S1MC494	Shelter with Artefacts and PAD	Moderate

* S1MC466 The shelter is located outside of the Study Area for Longwalls 401-408. The extent of the site is within the Study Area, however it is unlikely that the open artefact scatters or isolated finds associated with PAD themselves would be impacted by mine subsidence (MSEC 2021)

6.2.1 Summary of significance

Registered Aboriginal Parties have previously noted the following for UG4:

- All Aboriginal Heritage sites have high cultural value
- The presence of flora and fauna species with known traditional uses has cultural value
- The area along the Goulburn River known as “The Drip” is considered to have high cultural value as the sites in this area represent easily identified material remains and the area is ceremonially important (Hamm, 2006). During the Aboriginal Cultural Heritage Assessment for the Stage 1 project, it was noted that sites, objects and known places of cultural significance (Hands on the Rock, the Drip) within Wiradjuri country are linked together (Hamm 2006a: 82).

The Registered Aboriginal Parties who participated in surveys of UG4 noted that the landscape, with its cliff lines, slopes, plants, animals, creeks and shelters had aesthetic values to them.

No historic values were noted

The recorded Aboriginal Heritage sites provide material evidence of Wiradjuri people’s use of shelters and overhangs within most cliff lines and along moderate and steep slopes within the UG4 area, as well as the sandy soils along creeks and drainage lines for a range of utilitarian and artistic activities. One Aboriginal Heritage site has identified high scientific values, eight have moderate scientific values and 28 have low scientific values.

7. The proposed activity and impact assessment

7.1 Previous impact assessment

The current Stage 1 approval was supported by an Aboriginal Cultural Heritage Assessment report (Hamm 2006a and Hamm 2006b) and a Mine Subsidence Impact Assessment for the Proposed Longwall Panels LWs 1 to 14, No. 4 Underground Area Technical Report (Strata Engineering 2006, 2006b). The expected impacts on the Aboriginal Heritage sites and sandstone overhangs with no visible cultural material were assessed by Strata Engineering (2006), based on the following key parameters and reference to ACARP, 2002 and Shepherd and Sefton, 2001:

- The expected magnitudes of subsidence, tilt and strain (tensile or compressive).
- The length of overhang and degree of weathering impact (in the case of a rock shelter), as rated in ACARP, 2002 for cliff line instability.
- The orientation of the overhang or cliff face with respect to the principal strain direction.
- The presence of favourably orientated (i.e. strain relieving) joints and bedding partings (for the case of axe grinding grooves).
- The degree of weathering impact prior to mining.

The proposed extraction of LW401-408 was considered to have the potential to harm the Aboriginal Heritage sites in the Subject Area through subsidence induced changes to the ground surface. These changes were considered to include:

- Opening of cracks at the ground surface in soil
- Buckling and deformation of soils at the ground surface
- Slumping or mass movement of soil and rocks on steep slopes
- Cracking of rock formations
- Rock fall

A damage likelihood assessment was undertaken using a ranking system developed by Strata Engineering 2006. Based on the outcomes of the assessment of the cliffs, it was assessed that the rock shelters within the limits of extraction had a moderate to high likelihood of damage. Any shelters outside of the extraction limits would have low to very low damage likelihood.

Because the open artefact sites and isolated finds occur in open contexts, it was considered unlikely they would be impacted or harmed by changes at the ground surface due to mine subsidence. However, it is possible that sites may be harmed by any local remediation works to any subsidence effected areas.

7.2 Subsidence impact assessment

MCO propose to mine sections of the Ulan Seam using the longwall method of extraction. The longwalls will have a void width of 260 m and chain pillar width of 35 m (solid). The average longwall face extraction height is 3.0m.

The layout of longwalls is presented in Figure 2. Longwall lengths based on the Extraction Plan Layout are slightly shorter than those based on the Approved Layout.The lengths have been shortened from 10 m (LW401) to 85 m (LW405). With the exception of the shortened lengths, the longwall geometry for the Extraction Plan Layout is the same as that for the Approved Layout.

Mine Subsidence Engineering Consultants (MSEC) have prepared a subsidence report to support the Extraction Plan for Longwalls 401 to 408 (MSEC 2021). The predictions and impact assessments provided in this report have been taken from MSEC (2021).

A comparison of the maximum predicted subsidence parameters resulting from the extraction of Longwalls 401 to 408, based on the Extraction Plan Layout, with those based on the Approved Layout with a 3 m cutting height is provided in Table 9. The values are the maxima anywhere above the longwall layouts (MSEC 2021).

Table 9: Comparison of Maximum Predicted Conventional Subsidence Parameters based on the Approved Layout and the Extraction Plan Layout (taken from Table 4.3 in MSEC 2021)

Layout	Maximum Predicted Total Conventional Subsidence (mm)	Maximum Predicted Total Conventional Tilt (mm/m)	Maximum Predicted Total Conventional Hogging Curvature (km-1)	Maximum Predicted Total Conventional Sagging Curvature (km-1)
Stage 1 EA Preferred Project Report (Strata Engineering 2006b)	2440	96	> 3	> 3
Approved Layout	1900	60	> 3	> 3
Extraction Plan Layout	1900	60	> 3	> 3

It can be seen from the above table, that the maximum predicted total subsidence parameters based on the Approved Layout are the same as or less than the maximum predicted total subsidence parameters for the Stage 1 EA project approval (2006b). Whilst the specific values of the maximum curvatures are not shown, due to these representing the localised irregular movements rather than the macro (i.e. overall) movements, these parameters do not change (MSEC 2021).

Rock shelters and overhangs in the Study Area and above the extracted longwalls are predicted to be subject to similar impacts as described for minor cliffs in Section 5.6 of the subsidence report (i.e. potential for fracturing of sandstone and subsequent rockfalls) (MSEC 2021).

Open sites containing artefact scatters and isolated finds can potentially be affected by cracking of the surface soils as a result of mine subsidence movements. It is unlikely that the scattered artefacts or isolated finds themselves would be impacted by surface cracking (MSEC 2021).

Whilst it is unlikely that the scattered artefacts or isolated finds themselves would be impacted by mine subsidence, it is possible that, if remediation works to the surface areas around the Aboriginal heritage sites was required after mining, these works could potentially impact on the Aboriginal heritage sites. A discussion on surface cracking resulting from the extraction of Longwalls 401 to 408 is provided in Section 4.8 of MSEC (2021).

MSEC (2021) has calculated the potential subsidence impacts at each of the Aboriginal Heritage sites. The predictions have been provided based on the Extraction Plan Layout, as well as for the Approved Layout (LW1 to 8) for comparison.

A small number of sites will experience a change in the predicted subsidence parameters.

- S1MC258, an Artefact Scatter, would experience a decrease in the predicted sagging curvature
- S1MC294, a Shelter with Artefacts and S1MC479, an Artefact Scatter with PAD, would experience an increase in the predicted maximum subsidence, tilt and hogging curvature when compared with the predicted subsidence impacts from the approved layout.

The changes to predicted subsidence parameters are within the maximum predicted subsidence parameters of the Approved layout.

7.2.1 Performance measures

Schedule 3 of the Stage 1 Project Approval (05_0117) provides a number of subsidence impact performance measures where relevant for Aboriginal heritage and historic heritage sites:

- The Drip and Corner Gorge
- Aboriginal heritage sites 264, 282, 283, 286 and 287: Reduce the likelihood of subsidence damage to low
- S1MC280: Reduce the likelihood of subsidence damage to moderate

MSEC (2021: 29) notes that at a distance of 2.2 km or more, impacts to The Drip and Corner Gorge due to the extraction of Longwalls 401 to 408 are considered to be unlikely to occur.

S1MC264, S1MC282, S1MC283, S1MC286 and S1MC287 are located to the north of the Subject Area and are unlikely to experience impacts due to the extraction of LW401 to LW408

The locations of LW402 and LW403 were relocated so that S1MC280 was located above a pillar to reduce the likelihood of subsidence damage to moderate. The following assessment has been made by MSEC (2021: 50):

The predicted total vertical subsidence at S1MC280 is 150 mm and total tilt is 4.0 mm/m (i.e. 0.4 %, or 1 in 250). The site is unlikely to be impacted by this magnitude of tilt. The site will experience hogging curvature due to the extraction of LW402 and LW403. The maximum predicted total hogging curvature during or after the extraction of the longwalls is 0.25 km-1, which equates to a radius of curvature of 5 km. The site is located in a net tensile zone. The predicted tensile strain based on 10 times hogging curvature is 2 mm/m. Tensile strains of greater than approximately 0.5 mm/m are considered to be sufficient to result in tensile cracking of sandstone. The rock shelter is an isolated site within a small area of steep slopes at a topographical high point. The risk of subsidence impacts to S1MC280 is low to moderate consistent with the approved impacts, and includes tensile cracks and instabilities. Large scale failure of the rock shelter is not expected to occur and the likelihood of tensile cracks coinciding with the location of the grinding grooves and art is considered to be low.

8. Management, mitigation measures and recommendations

8.1 Management framework

A framework for the management of Aboriginal Heritage sites within the approved Moolarben Coal Complex has been developed as part of the Moolarben Heritage Management Plan (MCO 2020) based on sites assessed significance, site type and the nature of proposed impacts.

This management framework provides a robust system for managing subsidence impacts within LW401-408. Table 10 provides a summary of the management framework for each site in LW 401 -408.

8.1.1 Ground disturbance and permit process

In the event that any surface disturbance works are required (e.g. in relation to subsidence remediation activities), MCO should apply the ground disturbance permit process outlined in the currently approved Moolarben Coal Complex Heritage Management Plan.

8.1.2 Monitoring of Aboriginal Heritage sites

8.1.2.1 Monitoring – sites for inclusion in the subsidence monitoring program

Section 5.9.1 of the Heritage Management Plan states that:

> *Monitoring of potential subsidence impacts will be undertaken for a number of rock shelter and open grinding groove sites (unless previously salvaged), in order to identify and document whether any subsidence impacts have arisen from mining. Monitoring of the above sites will involve the following:*
>
> - *MCO will engage an appropriately qualified expert to monitor the Aboriginal archaeological sites described as requiring monitoring in Appendix D. This may include the establishment of a percentage estimate of the likelihood of subsidence occurring in sensitive areas.*
> - *Where insufficient pre-existing information is available for any of the specific Aboriginal archaeological sites to permit comparison with the condition post-mining, more detailed recording will occur prior to undermining*
> - *Monitoring will involve inspecting and recording the condition of these specific Aboriginal archaeological sites within three to six months after undermining has occurred. Each inspection will involve recording of data on environmental conditions, pre-existing human and natural impacts, heritage evidence present and any identified changes to these environmental and heritage conditions compared with previous inspections. The potential cause (subsidence or other impacts) of changes to the condition of individual sites will be assessed.*
> - *Monitoring will be focussed on the features of the site that make it significant (e.g. grooves, art, artefacts and/or PAD).*
> - *A report documenting the results of monitoring will be prepared that details the methodology of the inspections, conditions of the environment and Aboriginal heritage evidence at the relevant sites, comparisons with previously reported conditions at each site, identification of any natural and/or human impacts during the intervening period, identification of any implications for the ongoing management and protection of Aboriginal heritage evidence at the Moolarben Coal Complex, and documentation of the actual impacts of operations on the Aboriginal archaeological sites.*
> - *Copies of this report will be distributed to the RAPs, Heritage NSW and the DPIE and a summary included in the Annual Review.*

Sites recommended for monitoring of subsidence impacts at LW 401 – 408 are outlined in Table 10.

8.1.2.2 Baseline recording

In line with the Moolarben Heritage Management Plan (MCO 2020):

> *Where insufficient pre-existing information is available for any of the specific Aboriginal archaeological sites to permit comparison with the condition post-mining, more detailed recording will occur prior to undermining*

Sufficient baseline recording has been completed for:

- S1MC280; Ulan Creek 2 (AHIMS ID#36-3-0042)
- S1MC358b (AHIMS ID#36-3-3305)

8.1.3 Previously unrecorded Aboriginal Heritage sites

Section 5.10 of the Heritage Management Plan describes protocols for the management for previously unrecorded Aboriginal archaeological sites. It says:

> *5.10.5: If the site is determined to be of 'high scientific significance' by the qualified archaeologist, proposed management actions will be discussed with the RAPs. Following these discussions, management actions will be implemented (e.g. salvage, excavation, subsidence monitoring and blast vibration monitoring) in accordance with the procedures outlined in this HMP appropriate for the type of site.*
>
> *5.10.6: If the site is determined to be of 'low or moderate scientific significance', the qualified archaeologist will propose appropriate management of the newly identified site in accordance with the procedures outlined in this HMP, at which time a salvage team will be organised. MCO may utilise a salvage team that is already onsite to complete the salvage works depending on the priority of the work area in relation to the construction program.*

8.1.4 Surface Collection and Excavation

The Heritage Management Plan requires that sites be managed via surface collection and test excavation. Should test excavation result in the site being determined to be of high scientific significance then salvage excavations should follow.

Individual site recommendations for surface collection and excavation are presented in Table 12.

The Heritage Management Plan describes the process as follows:

> *Aboriginal archaeological sites that are considered to hold research potential and are scheduled to be impacted will undergo a two-phase program of archaeological excavation. This program will include an initial exploratory phase followed, when warranted, by a more targeted investigation of the site's research potential as follows:*
>
> 1. *initial subsurface testing using one or more linear transects of hand excavated, regularly-spaced shovel test pits (Section 5.6.1); and*
>
> 2. *controlled salvage excavation of areas with high research potential as identified through Phase 1 (the initial subsurface testing) (Section 5.6.2).*
>
> *If the initial program of shovel test pits determines that the site does not hold high scientific significance in accordance with the Burra Charter (Australia ICOMOS 1999) and the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011), then the second phase of investigation (i.e. open area excavation) will not be undertaken. For instance, if initial subsurface testing revealed evidence of poor spatial integrity at the site (e.g. ground disturbance, sheet erosion) or few subsurface artefacts, there will remain little value in a more detailed scientific investigation of the site through controlled salvage excavation.*

Initial Subsurface Testing

The objective of the initial phase of the archaeological excavation program is to determine the nature, extent and composition of each site. Data collected during this phase will be used to inform the need for a further controlled salvage excavation phase (where required), which is designed to target in situ concentrations of sub-surface cultural deposits.

Following the initial subsurface testing (shovel test pits), any sites that reveal poor spatial integrity, significant ground disturbance, shallow soil profiles and/or few subsurface cultural material, will not be subject to further subsurface investigation (i.e. the second phase of more detailed investigation and controlled salvage excavation will not occur).

Initial subsurface testing will be undertaken as follows:

- *One or more transects of shovel test pits spaced no more than 20 m apart will be excavated along the length and/or width of the site (as determined from surface expression of artefacts). Areas of grossly modified terrain (e.g. dams) will be excluded from the sampling process.*
- *Approximately 0.5 m x 0.5 m (0.25 square metres [m²]) test pits will be dug by hand (shovel) at each designated shovel test pit point (approximately 20 m apart along the length of the transect).*
- *For the initial subsurface testing, all excavated material will be sieved through 5 millimetre (mm) aperture screens.*
- *The number of transects and shovel test pits may be reduced depending on the nature and scale of the site being assessed, subject to advice from a suitably qualified and experienced archaeologist and in consultation with the attending RAPs.*
- *The spacing of transects and shovel test pits may be reduced depending on the nature and scale of the site being assessed, subject to advice from a suitably qualified and experienced archaeologist and in consultation with the attending RAPs. For example, when undertaking test pits within a rock shelter, testing will be undertaken in closer proximity.*

Controlled Salvage Excavation

Where controlled salvage excavation is determined to be warranted in consultation with a suitably qualified and experienced archaeologist and the attending RAPs, the following process will be generally implemented at a level appropriate to the extent and nature of the site:

- *Controlled salvage excavation will be undertaken by a suitably qualified archaeologist(s), with assistance provided by the RAPs.*
- *All excavation will be carried out manually using trowels, shovels and mattocks (where appropriate).*
- *Open area excavation will proceed in 1 m² units.*
- *All excavation units (i.e. shovel test pits and open area 1 x 1 m2 squares) will be assigned an alpha-numeric identifier.*
- *The first excavation unit will be excavated and documented in 5 cm spits at each area – either PAD or site – being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*
- *Excavation will cease at culturally sterile units or bedrock in all instances – the identification of sterile stratigraphic units will draw upon a geomorphological understanding of the wider Moolarben Coal Complex.*

- *Photographic and/or scale-drawn records of exposed soil profiles in open area excavations will be made.*
- *If specific archaeological features (e.g. hearths) are identified, the entire feature will be excavated and recorded prior to the continuation of excavation. Features will be photographed and scale plans drawn.*

8.2 Site Specific Management Measures and summary of management requirements

Table 10 includes a summary of the management requirements and recommendation for specific sites in UG4 LW401-408 below.

In addition to the management and mitigation measures above, it is recommended that detailed archival recording occur for the art and grinding groove components of S1MC280 and S1MC475 prior to extraction, utilising tools such as 3D scanning, photogrammetry and photography. Additional analysis through usewear and residue analysis should be undertaken on grinding grooves at S1MC280 and consideration should also be given to the geochemical analysis of art pigments where supported by the RAPs prior to extraction. This information will provide further detail to baseline recording and act as a mitigation measure should harm occur to the features.

Table 10. Summary of management requirements for Aboriginal Heritage sites UG4 LW401-408

AHIMS	Site Name	Site Type	Scientific Significance	Management Requirements
36-3-1071	S1MC256	Shelter with Artefacts	Low	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-1072	S1MC257	Artefacts	Low	Ground disturbance permit process
36-3-1073	S1MC258	Artefacts	Low	Ground disturbance permit process
36-3-1074	S1MC259	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-1075	S1MC260	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-1076	S1MC261	Shelter with Artefacts	Low	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5 of the HMP)
36-3-1077	S1MC262	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-1086	S1MC271	Shelter with Artefacts	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-1088	S1MC273	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-0042	S1MC280; Ulan Creek 2	Shelter with Art, Artefacts and Grinding Grooves	High	A baseline recording has been completed for the site. Undertake detailed recording of art (Section 5.5.2 of the HMP). It is recommended this included detailed photography and photogrammetry. Consideration should be given to the geochemical analysis of art pigments where supported by the RAPs. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5) and, if required, archaeological excavation (Section 5.6) prior to extraction Undertake a detailed archival recording of grinding grooves through means such as photography, photogrammetry, and 3D scanning prior to extraction. Usewear and residue analysis of grinding surfaces should be undertaken prior to impact.
36-3-1104	S1MC290	Shelter with Artefacts	Low	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection prior to extraction (Section 5.5)
36-3-1105	S1MC291	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-1108	S1MC294	Shelter with Artefacts	Low	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection prior to extraction (Section 5.5)
36-3-1415	S1MC321 (NB9)	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-1416	S1MC322 (NB10)	Artefacts and PAD	Moderate	Ground disturbance permit process

AHIMS	Site Name	Site Type	Scientific Significance	Management Requirements
36-3-3304	S1MC356b	Artefacts (Isolated Find)	Low	Ground disturbance permit process
36-3-3305	S1MC358b	Shelter with PAD	Low	Baseline recording has been completed for this site. Where impacts are deemed likely to occur, undertake surface collection prior to extraction (Section 5.5)
36-3-3799	S1MC464	Artefacts	Moderate	Ground disturbance permit process
36-3-3800	S1MC465	Artefacts and PAD	Moderate	Ground disturbance permit process
36-3-3804	S1MC466*	Shelter with Artefacts and PAD	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-3801	S1MC468	Shelter with Artefacts and PAD	Low	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-3802	S1MC471	Shelter with PAD	Low	Unmitigated impact
36-3-3803	S1MC472	Shelter with Artefacts and PAD	Low	Where impacts are deemed likely to occur, undertake surface collection prior to extraction (Section 5.5)
36-3-3798	S1MC473	Shelter with PAD	Low	Unmitigated impact
36-3-3785	S1MC474	Shelter with Artefacts and PAD	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5) and, if required, archaeological excavation (Section 5.6) prior to extraction
36-3-3786	S1MC475	Shelter with Grinding Grooves, Artefact and PAD	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5) and, if required, archaeological excavation (Section 5.6) prior to extraction. Where impacts are likely to the grinding groove, archival recording through means such as photography, photogrammetry or 3D scanning should be undertaken prior to extraction.
36-3-3796	S1MC478	Artefacts	Moderate	Ground disturbance permit process
36-3-3787	S1MC479	Artefacts and PAD	Low	Ground disturbance permit process
Pending	S1MC483	Shelter with PAD	Low	Unmitigated impact
36-3-3788	S1MC484	Shelter with Artefacts	Low	Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-3795	S1MC485	Shelter with PAD	Low	Unmitigated impact
36-3-3789	S1MC486	Shelter with PAD	Low	Unmitigated impact
36-3-3794	S1MC487	Shelter	Low	Unmitigated impact
36-3-3790	S1MC488	Shelter with Artefacts and PAD	Low	Where impacts are deemed likely to occur, undertake surface collection (Section 5.5)
36-3-3791	S1MC490	Shelter with PAD	Low	Unmitigated impact

AHIMS	Site Name	Site Type	Scientific Significance	Management Requirements
36-3-3792	S1MC491	Shelter with PAD	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5) and, if required, archaeological excavation (Section 5.6) prior to extraction
36-3-3793	S1MC494	Shelter with Artefacts and PAD	Moderate	Complete baseline recording prior to extraction. Where impacts are deemed likely to occur, undertake surface collection (Section 5.5) and, if required, archaeological excavation (Section 5.6) prior to extraction

* S1MC466 The shelter is located outside of the Study Area for Longwalls 401-408. The extent of the site is within the Study Area, however it is unlikely that the open artefact scatters and PAD themselves would be impacted by mine subsidence (MSEC 2021)

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Annex 1. AHIMS Search Results

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 6075 Bottom Section

Client Service ID : 569300

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-3027	S2MC 347	GDA	55	762025	6424710	Closed site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Ms.Clare Anderson					Permits		
36-3-3028	S2MC 348	GDA	55	762027	6424745	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Ms.Clare Anderson					Permits		
36-3-3029	S2MC 349	GDA	55	761992	6424821	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Ms.Clare Anderson					Permits		
36-3-3030	S2MC 350	GDA	55	762036	6424934	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Ms.Clare Anderson					Permits		
36-3-3031	S2MC 351	GDA	55	762001	6424823	Closed site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Ms.Clare Anderson					Permits		
36-3-3586	S2MC435	GDA	55	763208	6424230	Closed site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Mr.Jamie Reeves					Permits		
36-3-3587	S2MC434	GDA	55	763234	6424245	Closed site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Mr.Jamie Reeves					Permits		
36-3-3585	S2MC433	GDA	55	763331	6424253	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Niche Environment and Heritage,Mr.Jamie Reeves					Permits		
36-3-1041	S1MC 225	AGD	55	761752	6425887	Open site	Valid	Artefact : 1		
Contact		Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1042	S1MC226	AGD	55	761726	6426232	Open site	Valid	Artefact : 1		
Contact		Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1043	S1MC227	AGD	55	761825	6426206	Open site	Valid	Artefact : 1		
Contact		Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1044	S1MC228	AGD	55	762428	6426370	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761800 - 763800, Northings : 6424000 - 6428000 with a Buffer of 0 meters. Additional Info : Due Diligence and site cards. Number of Aboriginal sites and Aboriginal objects found is 73

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1045	S1MC229	AGD	55	762430	6426375	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1047	S1MC231	AGD	55	761907	6426804	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1048	S1MC232	AGD	55	761926	6426825	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1049	S1MC233	AGD	55	761954	6426840	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1050	S1MC234	AGD	55	761990	6426858	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1051	S1MC235	AGD	55	762126	6426823	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1052	S1MC236	AGD	55	762199	6426811	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1053	S1MC237	AGD	55	762202	6426805	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1054	S1MC238	AGD	55	762211	6426803	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1055	S1MC239	AGD	55	762220	6426805	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1056	S1MC240	AGD	55	762231	6426802	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1057	S1MC241	AGD	55	762272	6426800	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1058	S1MC242	AGD	55	762291	6426801	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1059	S1MC243	AGD	55	762310	6424801	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1060	S1MC244	AGD	55	762395	6426732	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1062	S1MC246	AGD	55	761820	6426775	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits	3439
36-3-1063	S1MC247	AGD	55	761831	6426745	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761800 - 763800, Northings : 6424000 - 6428000 with a Buffer of 0 meters. Additional Info : Due Diligence and site cards. Number of Aboriginal sites and Aboriginal objects found is 73

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1064	S1MC248	AGD	55	761863	6426758	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1065	S1MC249	AGD	55	761863	6426771	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1066	S1MC250	AGD	55	761860	6426773	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1067	S1MC252	AGD	55	761867	6426779	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1068	S1MC253	AGD	55	761870	6426772	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1090	S1MC275	AGD	55	761878	6426869	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1091	S1MC276	AGD	55	761877	6426917	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1092	S1MC277	AGD	55	761862	6426931	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1093	S1MC278	AGD	55	761688	6426940	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-0822	S1MC25	AGD	55	761802	6425783	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-0823	S1MC26	AGD	55	761766	6425183	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-0824	S1MC27	AGD	55	761828	6425100	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1140	S1MC303	GDA	55	762029	6426950	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1141	S1MC304	GDA	55	762216	6426991	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1142	S1MC305	GDA	55	762474	6426945	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1143	S1MC306	GDA	55	762426	6426370	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-2790	S1MC396	GDA	55	763700	6426207	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761800 - 763800, Northings : 6424000 - 6428000 with a Buffer of 0 meters. Additional Info : Due Diligence and site cards. Number of Aboriginal sites and Aboriginal objects found is 73

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Peter Kuskie					Permits		
36-3-1150	S2MC1	GDA	55	763454	6426266	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1154	S2MC5	GDA	55	763592	6424924	Open site	Valid	Artefact : 2		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1155	S2MC6	GDA	55	763750	6424949	Open site	Valid	Artefact : 26		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1156	S2MC7	GDA	55	763625	6425020	Open site	Valid	Artefact : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1157	S2MC8	GDA	55	762810	6425021	Open site	Valid	Artefact : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1158	S2MC9	GDA	55	762818	6424980	Open site	Valid	Artefact : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1159	S2MC10	GDA	55	762899	6425019	Open site	Valid	Artefact : 3		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1160	S2MC11	GDA	55	762932	6425019	Open site	Valid	Artefact : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1161	S2MC12	GDA	55	762928	6425072	Open site	Valid	Art (Pigment or Engraved) : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-2654	S2MC269	GDA	55	763744	6424582	Open site	Valid	Artefact : 1		
	Contact	Recorders	South East Archaeology					Permits		
36-3-3005	S2MC273	GDA	55	763778	6424129	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie					Permits		
36-3-3265	S2MC277	GDA	55	763404	6426033	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Ms.Caitlin Marsh					Permits		
36-3-0692	CE-16-IF	AGD	55	763631	6425794	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Lance Syme					Permits	2531	
36-3-1415	S1MC321	GDA	55	763728	6427662	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1201	S2MC56	GDA	55	763691	6426485	Open site	Valid	Artefact : 110		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1401	S2M257	GDA	55	763698	6426910	Open site	Valid	Artefact : 2		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1402	S2MC257	GDA	55	763567	6426991	Open site	Valid	Artefact : 1		101603

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761800 - 763800, Northings : 6424000 - 6428000 with a Buffer of 0 meters. Additional Info : Due Diligence and site cards. Number of Aboriginal sites and Aboriginal objects found is 73

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 6075 Bottom Section

Client Service ID : 569300

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1403	S2MC258	GDA	55	763414	6427000	Open site	Valid	Artefact : 9		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1404	S2MC259	GDA	55	763374	6427039	Open site	Valid	Artefact : 1		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1406	S2MC261	GDA	55	763640	6426505	Open site	Valid	Grinding Groove : 92		101603
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1478	Ulan ID#85 (Identifier 85)	GDA	55	762012	6426721	Open site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-3041	S2MC324	GDA	55	762693	6425223	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Ms.Caitlin Marsh					Permits		
36-3-3218	S2MC408	GDA	55	762045	6425394	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms.Caitlin Marsl					Permits		
36-3-3219	S2MC407	GDA	55	761975	6425325	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms.Caitlin Marsl					Permits		
36-3-3220	S2MC406	GDA	55	762518	6425721	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms.Caitlin Marsl					Permits		
36-3-3144	MUG1-Mod 1	GDA	55	763495	6426122	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Ms.Caitlin Marsh					Permits		
36-3-3145	MUG1-Mod 2	GDA	55	763481	6425902	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Ms.Caitlin Marsh					Permits		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761800 - 763800, Northings : 6424000 - 6428000 with a Buffer of 0 meters. Additional Info : Due Diligence and site cards. Number of Aboriginal sites and Aboriginal objects found is 73

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 6075 Top Section

Client Service ID : 569290

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-3470	S1MC461	GDA	55	762945	6431533	Open site	Valid	Artefact : -		
Contact	Recorders	Niche Environment and Heritage,Mr.Jamie Reeves						Permits		
36-3-3471	S1MC460	GDA	55	763572	6432235	Open site	Valid	Artefact : -		
Contact	Recorders	Niche Environment and Heritage,Mr.Jamie Reeves						Permits		
36-3-0051	Ulan Creek Site 9	AGD	55	761204	6430454	Closed site	Valid	Artefact : -	Shelter with Deposit	361
Contact	Recorders	Ms.Laila Haglund						Permits		
36-3-0008	Curra Creek;Goulburn River;	AGD	55	762677	6430674	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1299
Contact	Recorders	L Giles						Permits		
36-3-1069	S1MC254	AGD	55	763332	6431357	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1070	S1MC255	AGD	55	763334	6431358	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm,Mr.Giles (dup ID#12832) Hamm						Permits	3439	
36-3-1071	S1MC256	AGD	55	762878	6429620	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1072	S1MC257	AGD	55	762850	6429600	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1073	S1MC258	AGD	55	762865	6429652	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1074	S1MC259	AGD	55	762889	6429671	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1075	S1MC260	AGD	55	762849	6429605	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1076	S1MC261	AGD	55	762876	6429660	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1077	S1MC262	AGD	55	762876	6429676	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1078	S1MC263	AGD	55	762177	6430458	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1079	S1MC264	AGD	55	762010	6430705	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1080	S1MC265	AGD	55	762224	6430592	Open site	Valid	Artefact : 1		
Contact	Recorders	Mr.Giles (dup ID#12832) Hamm						Permits		
36-3-1081	S1MC266	AGD	55	763000	6431393	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761000 - 764000, Northings : 6429000 - 6432603 with a Buffer of 0 meters. Additional Info : Due diligence and purchase of site cards. Number of Aboriginal sites and Aboriginal objects found is 55

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1082	S1MC267	AGD	55	761945	6430063	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1083	S1MC268	AGD	55	761875	6430102	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1084	S1MC269	AGD	55	761882	6430110	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1085	S1MC270	AGD	55	762024	6430287	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1086	S1MC271	AGD	55	763749	6428829	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1095	S1MC281	AGD	55	762865	6432219	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1096	S1MC282	AGD	55	762851	6432207	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1097	S1MC283	AGD	55	762912	6432185	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1098	S1MC284	AGD	55	762877	6432127	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1099	S1MC285	AGD	55	762905	6431976	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1100	S1MC286	AGD	55	762868	6431969	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1101	S1MC287	AGD	55	763240	6430143	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1102	S1MC288	AGD	55	763336	6430223	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1103	S1MC289	AGD	55	763795	6429838	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1104	S1MC290	AGD	55	763739	6429835	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1105	S1MC291	AGD	55	763726	6429853	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1106	S1MC292	AGD	55	763406	6429904	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761000 - 764000, Northings : 6429000 - 6432603 with a Buffer of 0 meters. Additional Info : Due diligence and purchase of site cards. Number of Aboriginal sites and Aboriginal objects found is 55

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1107	S1MC293	AGD	55	763385	6429901	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1108	S1MC294	AGD	55	763673	6429849	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1109	S1MC295	AGD	55	763273	6429928	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1110	S1MC296	AGD	55	763503	6429961	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1111	S1MC297	AGD	55	763420	6430329	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1146	S1MC309	GDA	55	761931	6429034	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1147	S1MC310a	GDA	55	761821	6429070	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1148	S1MC311a	GDA	55	761748	6429079	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1149	S1MC312a	GDA	55	761120	6429161	Open site	Valid	Artefact : 1		101600
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-2597	S1MC324	AGD	55	763245	6432104	Open site	Valid	Artefact : 1		
	Contact	Recorders	Archaeological Risk Assessment Services (ARAS)					Permits	3439	
36-3-1407	S1MC313	GDA	55	762188	6429182	Open site	Valid	Art (Pigment or Engraved) : 2		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1408	S1MC314	GDA	55	761819	6429071	Open site	Valid	Artefact : 2		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits		
36-3-1409	S1MC315	GDA	55	761959	6429047	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1410	S1MC316	GDA	55	762039	6429072	Open site	Valid	Artefact : 2		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1411	S1MC317	GDA	55	762078	6429120	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1412	S1MC318	GDA	55	762107	6429141	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm					Permits	3439	
36-3-1413	S1MC319	GDA	55	761634	6429082	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761000 - 764000, Northings : 6429000 - 6432603 with a Buffer of 0 meters. Additional Info : Due diligence and purchase of site cards. Number of Aboriginal sites and Aboriginal objects found is 55

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 6075 Top Section

Client Service ID : 569290

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Giles (dup ID#12832) Hamm					**Permits**	3439	
36-3-1414	S1MC320	GDA	55	761047	6429251	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Mr.Giles (dup ID#12832) Hamm					**Permits**	3439	
36-3-1417	S1MC323	GDA	55	763211	6432118	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Mr.Giles (dup ID#12832) Hamm					**Permits**	3439	
36-3-3236	S1MC432	GDA	55	762917	6431617	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Niche Environment and Heritage,Mr.Balazs Hansel					**Permits**		
36-3-3228	Liverpool Range TL LU2/L1	GDA	55	761702	6430532	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Julie Dibden,NSW Archaeology Pty Ltd					**Permits**		

Report generated by AHIMS Web Service on 18/02/2021 for Kosta Contos for the following area at Datum :GDA, Zone : 55, Eastings : 761000 - 764000, Northings : 6429000 - 6432603 with a Buffer of 0 meters. Additional Info : Due diligence and purchase of site cards. Number of Aboriginal sites and Aboriginal objects found is 55

Annex 2. Site Data

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3785 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC474

Easting: 763347 **Northing:** 6427365 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

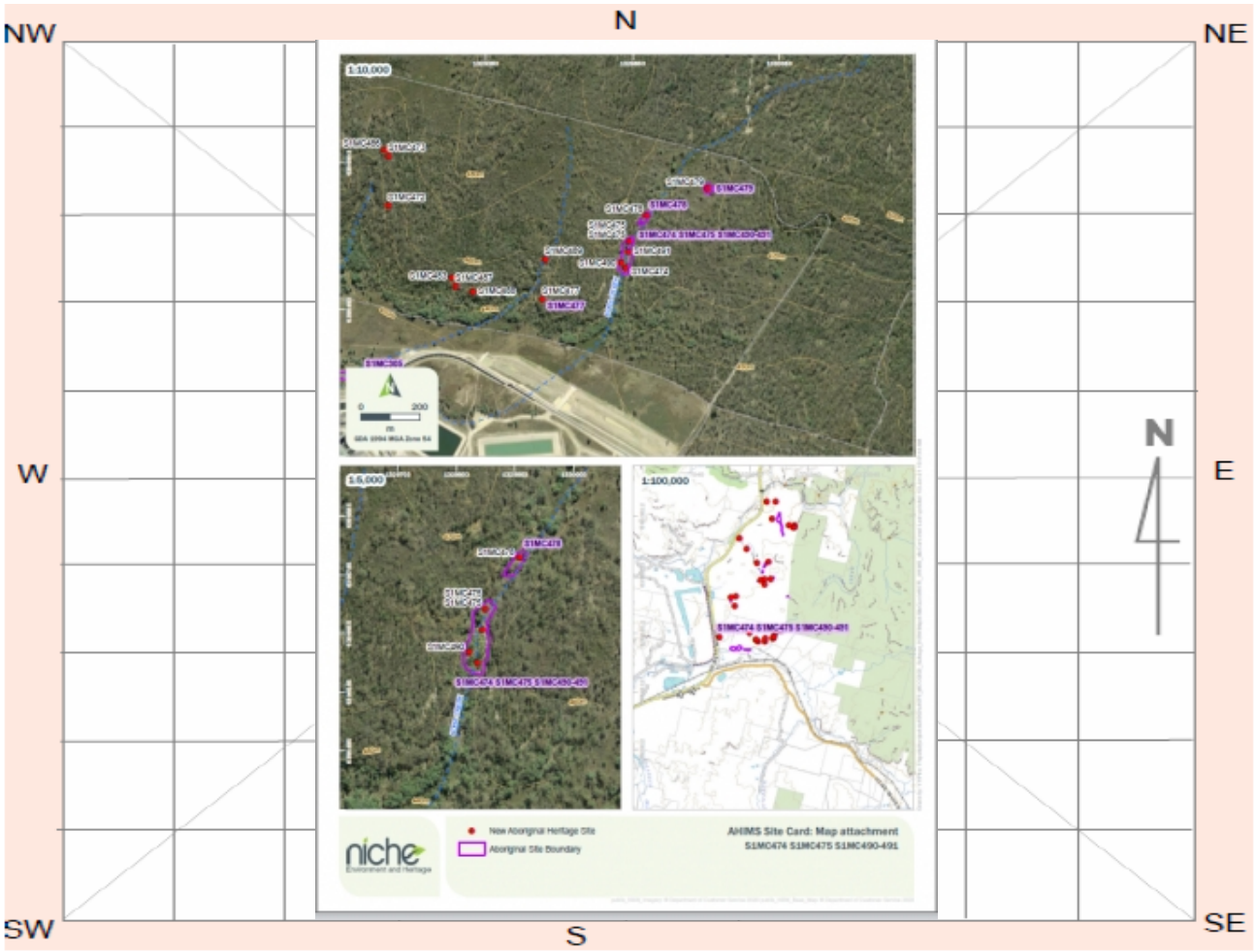
Land Form Unit: Ridge **Vegetation:** Open Woodland

Distance to Water (m): 20 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Shelter approximately 5m (w) x 4.7m (d) x 2.2m (h) in size. Ringbark tree has collapsed onto shelter roof. Fissuring is evident, running left to right along the ceiling of the shelter for approximately 2m. Another shelter with a stone floor is located directly south of shelter.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	5	5	4				

Description:

Conglomerate sandstone outcrop with shelter, Stone floor with sandy deposit, approximately 30 to 40 cm deep, extending into the dripline and downslope of the shelter. 5 artefacts located in the dripeline of shelter and downslope. PAD has been disturbed by animal interference, wombat burrowing.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		5	4				

Description:

Conglomerate sandstone outcrop with overhang and shelter. Shelter has been subjected to cavernous weathering and blockfall along dripline. PAD is approximately 30 - 40 cm deep and extends beyond the dripline downslope.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

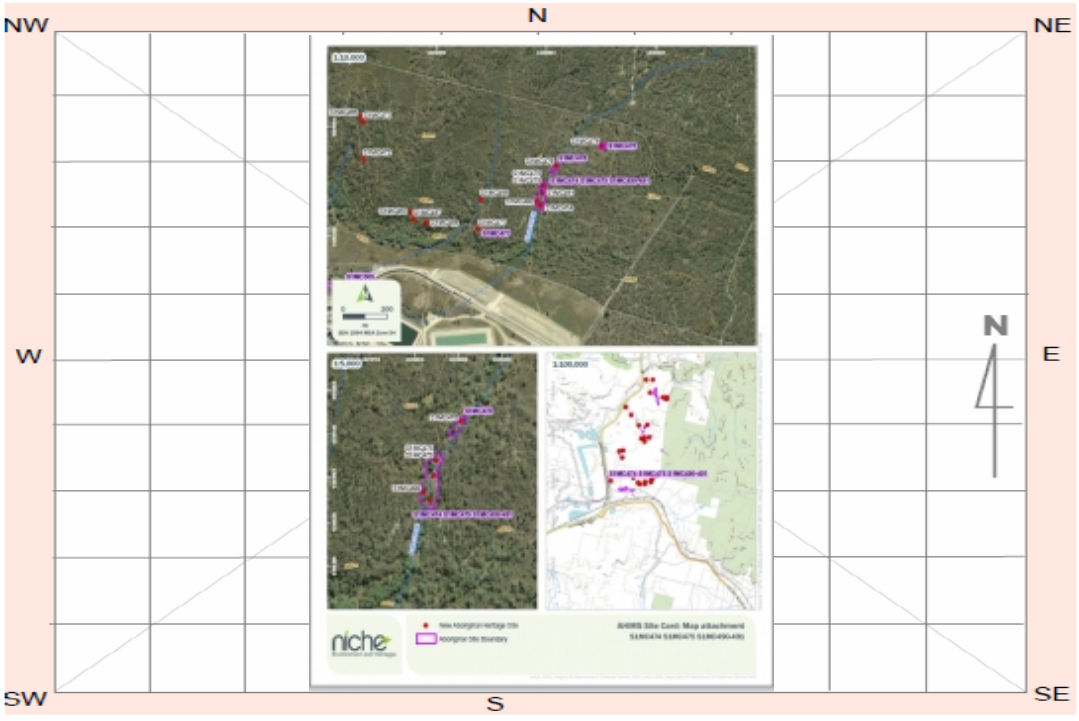
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Shelter approximately 5m (w) x 4.7m (d) x 2.2m (h) in size. Ringbark tree has collapsed onto shelter roof. Fissuring is evident, running left to right along the ceiling of the shelter for approximately 2m. Another shelter with a stone floor is located directly south of shelter.

Site plan



Site photographs

Description: General photo of site S1MC 474, facing east.

Description: General photo of primary overhang at S1MC 474, facing east.

Description: S1MC474- volcanic core and quartz flake

Description: S1MC474- chert utilised tool ventral surface

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3786 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC475

Easting: 763355 **Northing:** 6427457 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

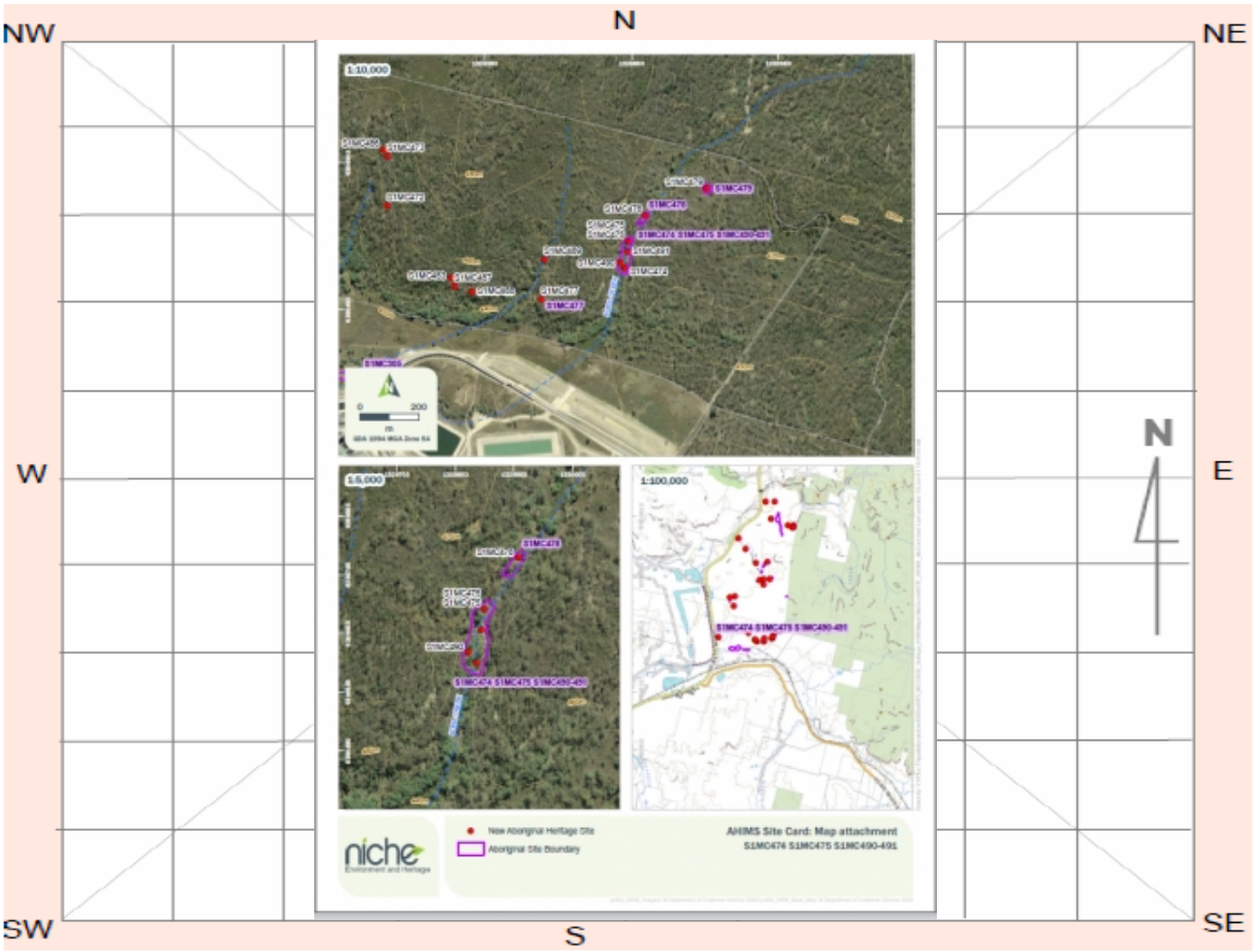
Land Form Unit: Stream Channel **Vegetation:** Open Woodland

Distance to Water (m): 0 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: The drainage line is sandstone lined and has dirt build up. Apple gum growing on top of sandstone shelf. The overhang south of the drainage line has a sloped stone floor with no deposit.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

	Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	2	1				

Description:

Two conglomerate sandstone overhangs/shelters (north and south) with horizontal bedding of yellow sandstone and ironstone centered around drainage line. Small deposit with rockfall and animal burrowing. 1 grey chalcedony complete flake, <20mm in maximum dimension located in northern shelter.

Features:

	Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Grinding Groove	1	0.14	0.04				

Description:

1 Grinding groove immediately west of southern shelter. Dimensions 14 cm long x 4 cm wide x 0.6cm deep.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3. Potential Archaeological Deposit		2	1				

Description:

The northern most of the two shelters contains PAD with a complete flake identified in PAD.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

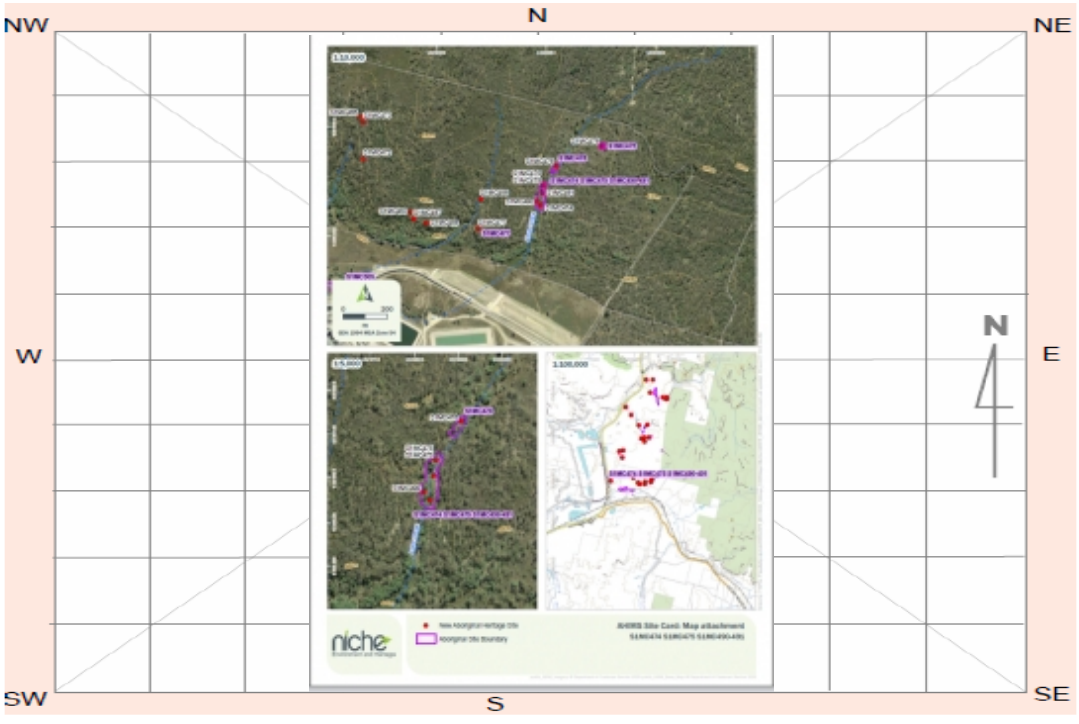
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: The drainage line is sandstone lined and has dirt build up. Apple gum growing on top of sandstone shelf. The overhang south of the drainage line has a sloped stone floor with no deposit.

Site plan



Site photographs

Description: Shelter (north), containing stone artefact, facing north-east.

Description: Shelter (south), with grinding roove immediately adjacent, facing north-east.

Description: Grinding Groove at creeks edge of site S1MC 475.

Description: Chalcedony complete flake at shelter(north) at S1MC475.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title	Surname	First name

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3787 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC479

Easting: 763609 **Northing:** 6427650 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

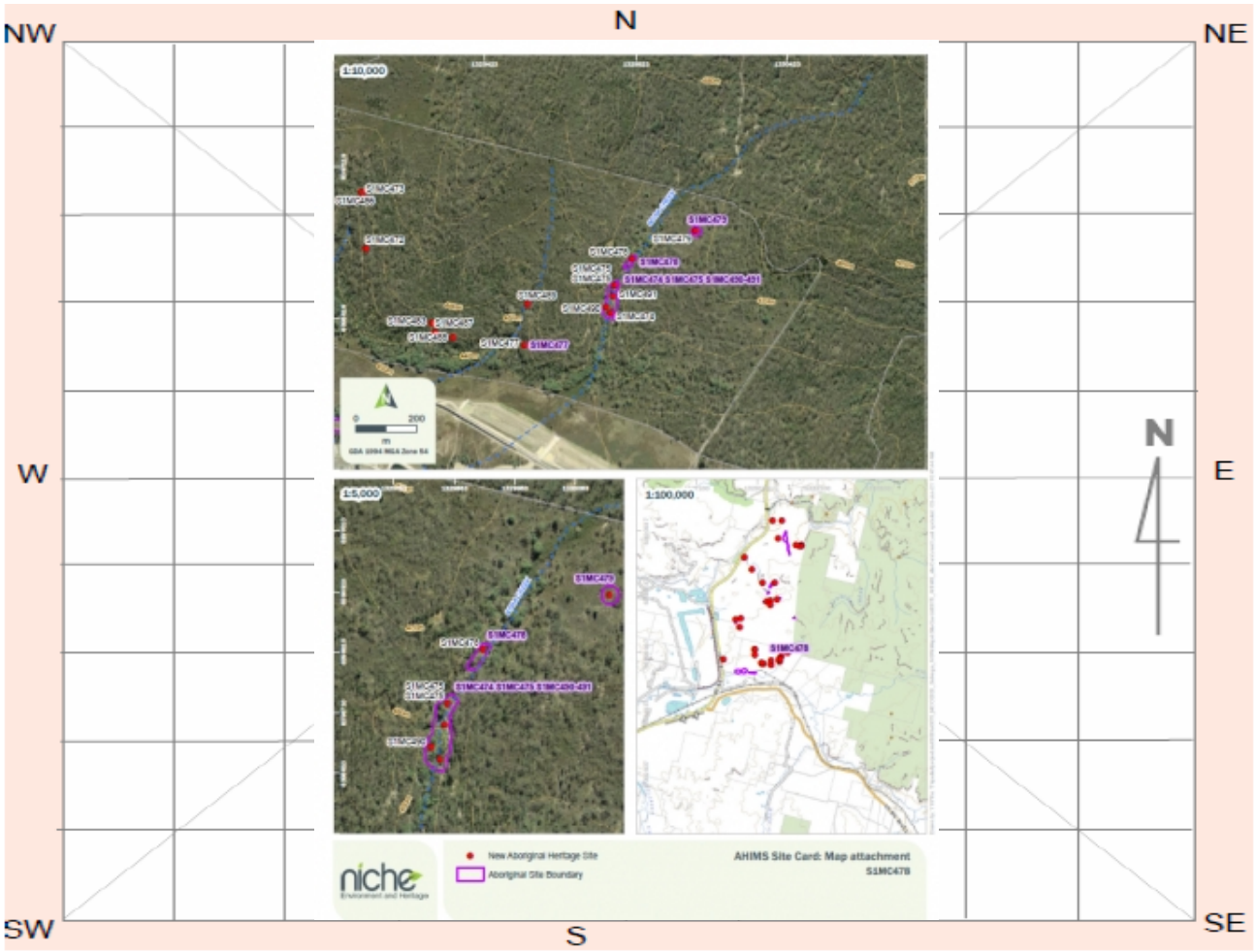
Land Form Unit: Flat **Vegetation:** Open Woodland

Distance to Water (m): 140 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information:

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	5	30	30				

Description:

S1MC479 is a low density open artefact scatter comprising five stone artefacts and Potential Archaeological Deposit located on an open sandy quartz plateau, surrounded by upland swamp, approximately 140 m east of Bora Creek.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		30	30				

Description:

Sandy deposit with low density artefact scatter.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

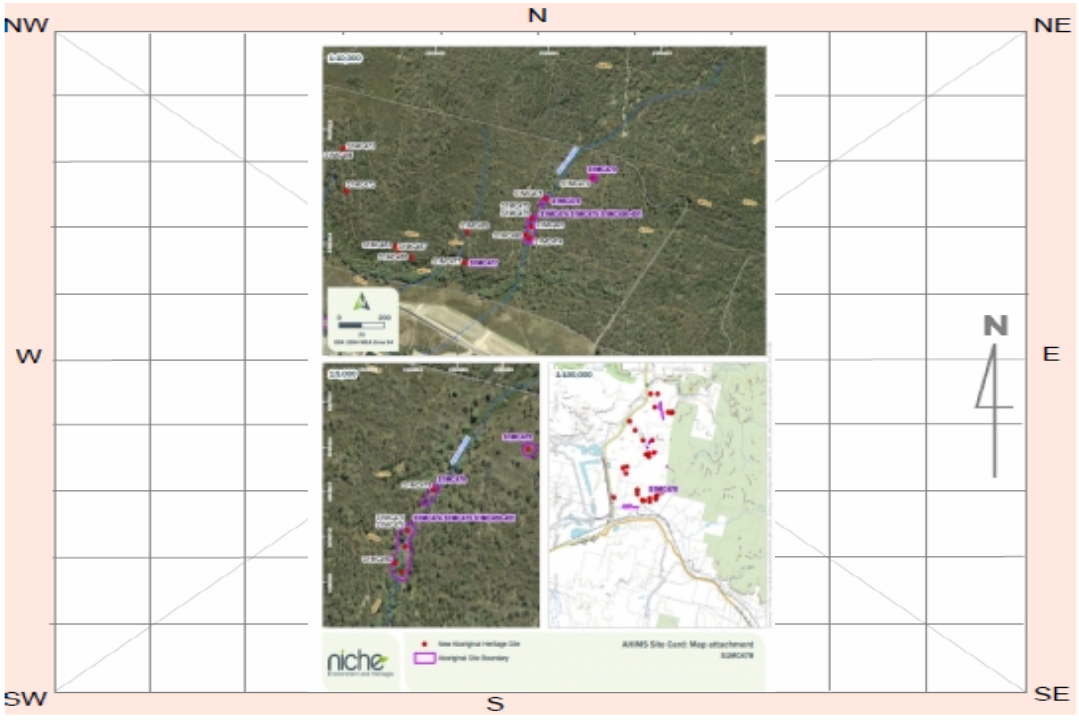
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

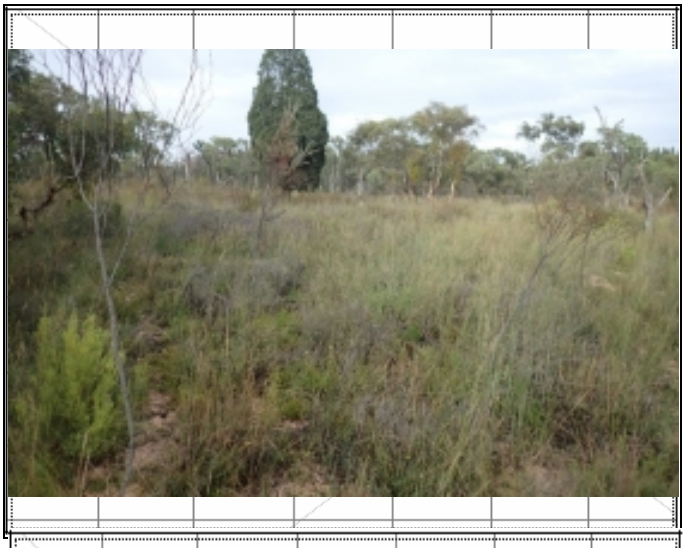
Description:

Other Site Info:

Site plan



Site photographs



Description: General photo of site s1mc479, facing south

Description: site s1mc479, stone artefact.

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3788 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC484

Easting: 761836 **Northing:** 6428672 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

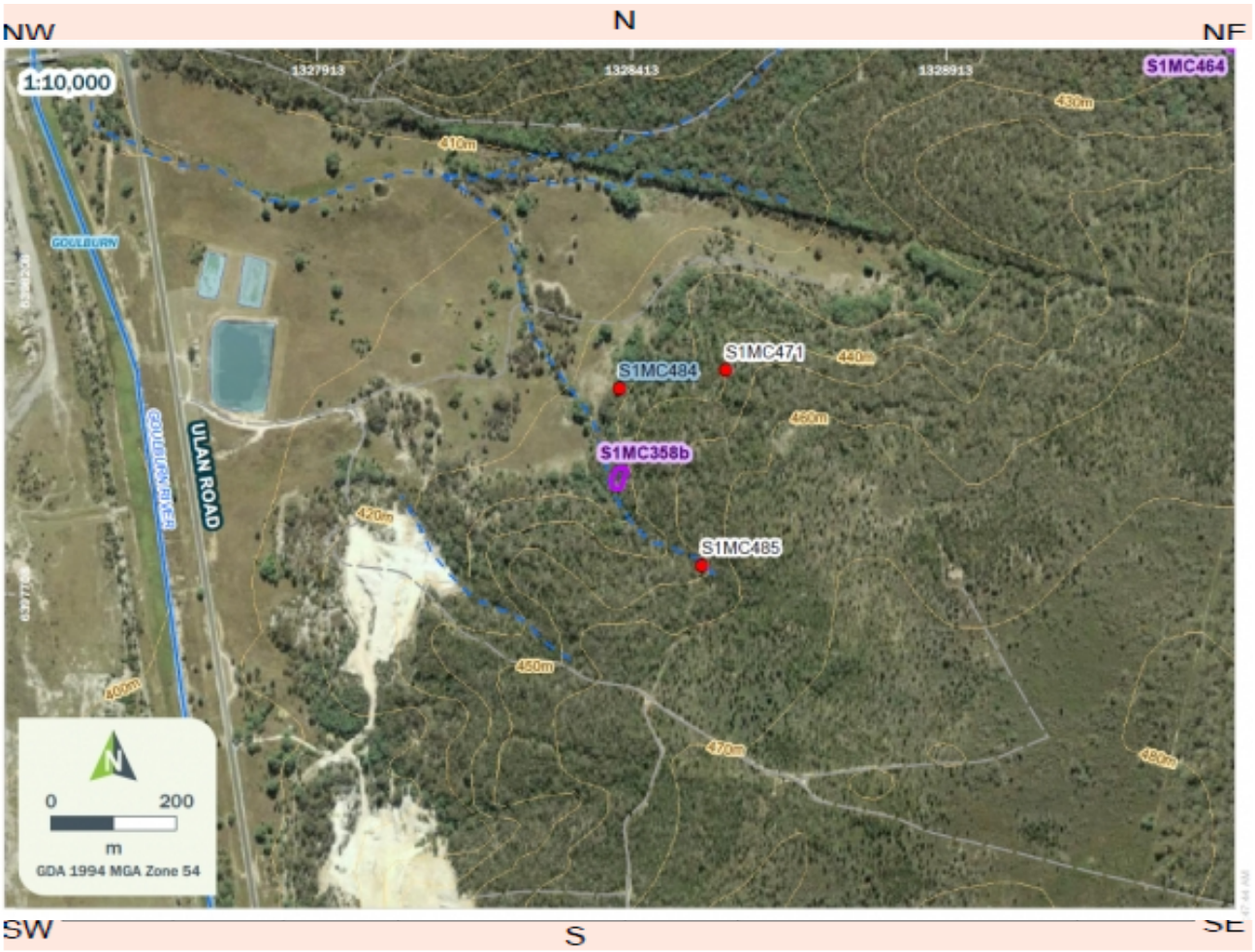
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 100 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Overhang located at base of a continuous ridgeline. Burnt wood buried at front of shelter.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	2.8	2.4				

Description:

S1MC484 consists of a conglomerate sandstone outcrop with continuous overhang. Overhang contains sandy deposit with depth of approximately 10cm. 1 complete quartz flake, with platform, feather termination and maximum dimension of 15mm identified in dripline.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

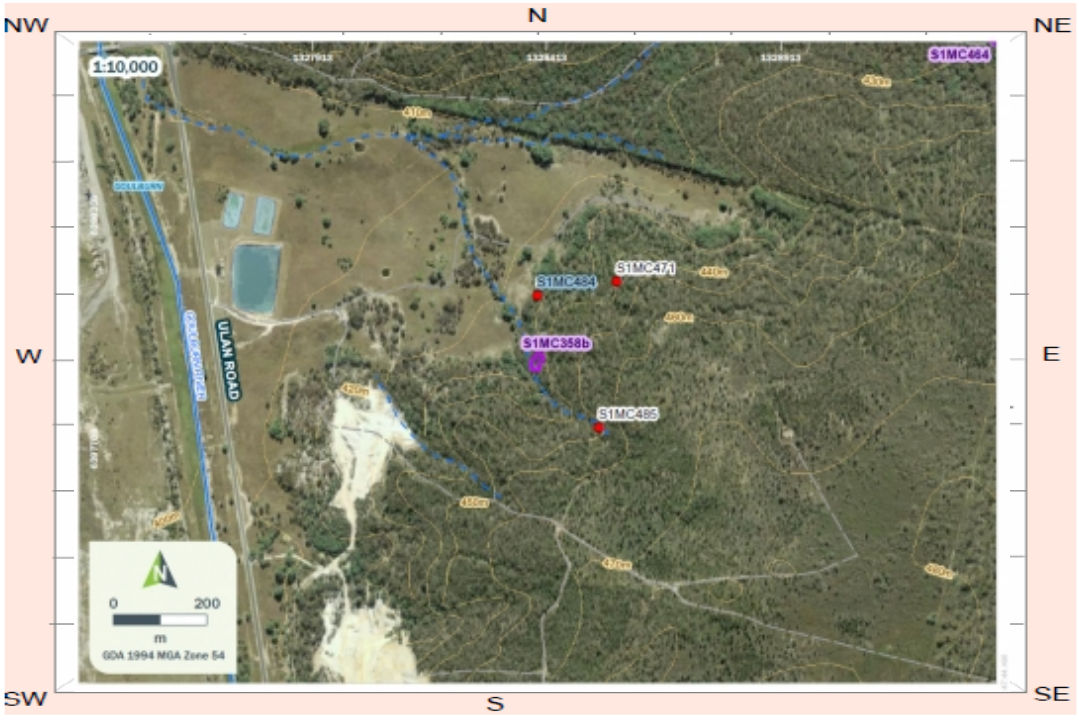
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Overhang located at base of a continuous ridgeline. Burnt wood buried at front of shelter.

Site plan



Site photographs

Description: General photo of site S1MC484, facing north-east

Description: S1MC484 Isolated quartz flake located in dripline

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3789 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC486

Easting: 762509 **Northing:** 6427718 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

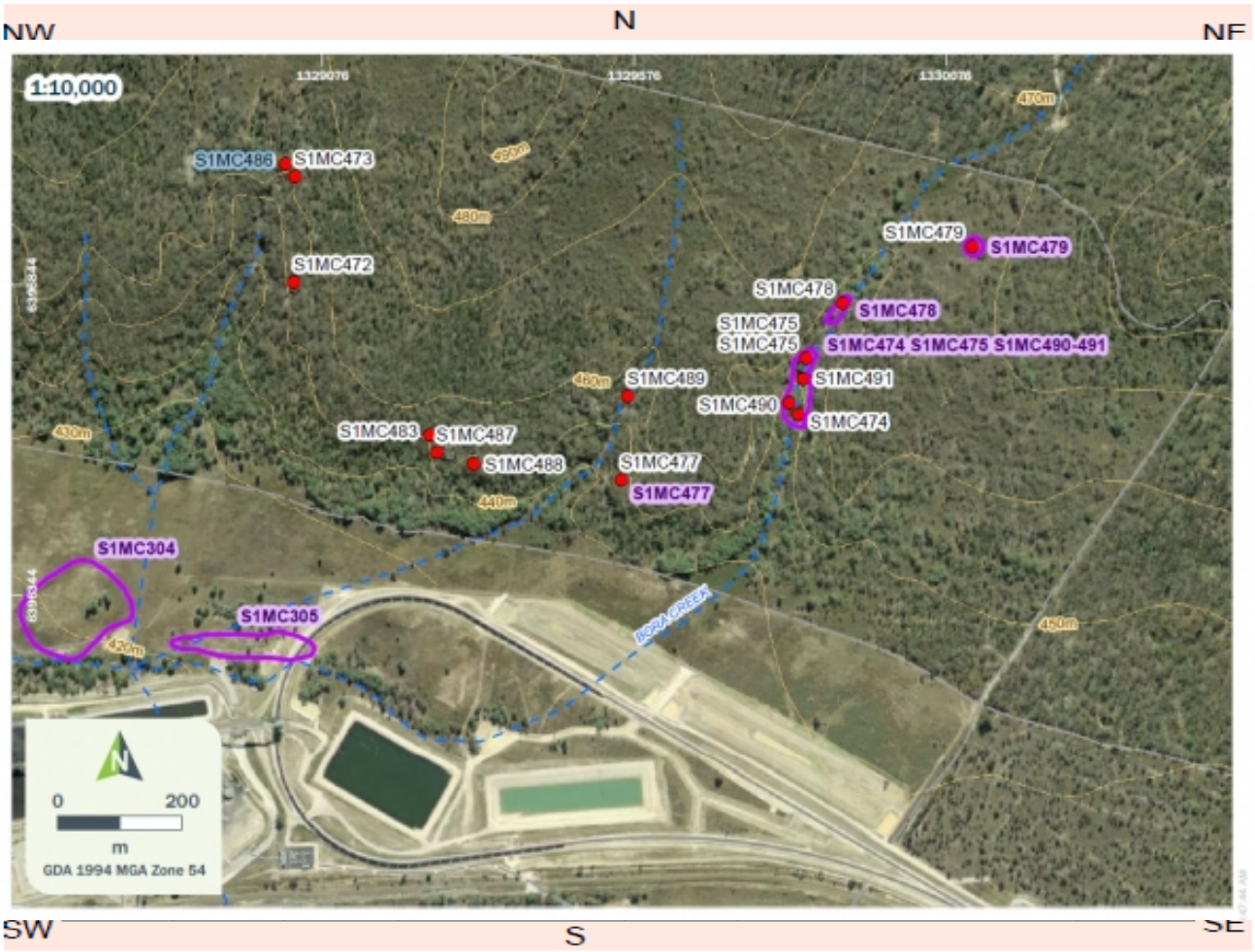
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 20 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Overhangs have formed a sheltered gully, centered on a drainage line. Substantial blockfall indicate there was originally a larger shelter.The deposit has potential to contain Aboriginal stone objects. However most is inaccessible due to blockfall. Some areas of flatter ground are further downslope.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Potential Archaeological Deposit		2	10				

Description:

PAD located in Conglomerate sandstone outcrop with overhang and shelter. Sandstone with red ironstone and yellow sandstone horizontal bedding. PAD consists of a Rocky deposit with iron rich soils and quartz pebbles with a depth of approximately 20 cm.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

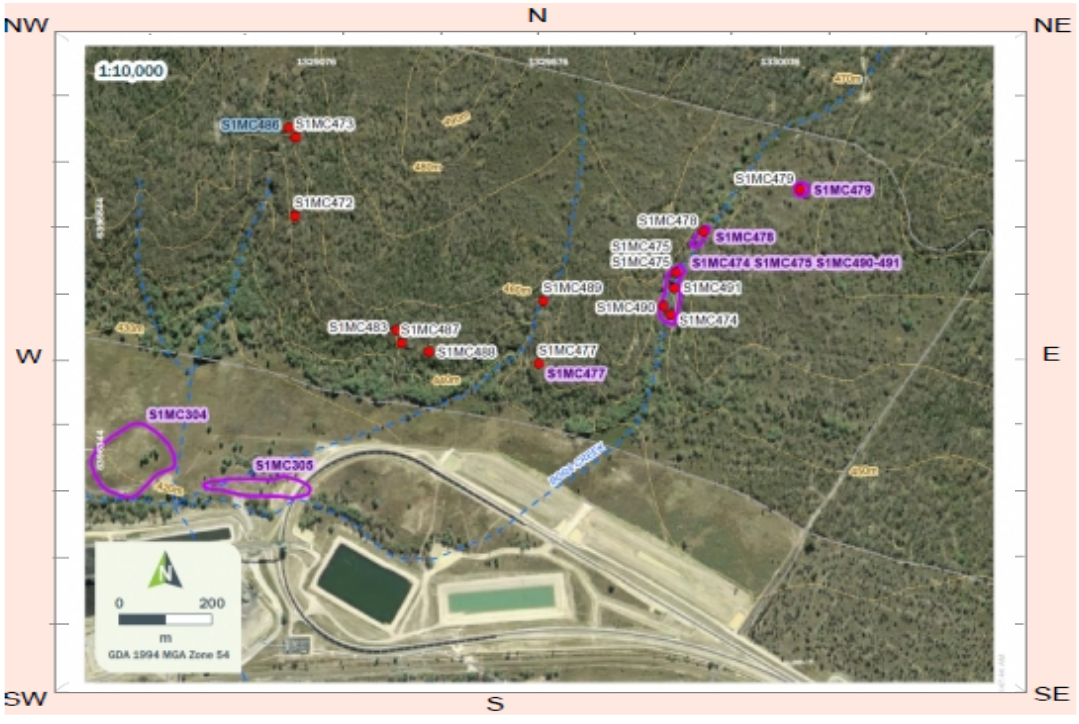
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Overhangs have formed a sheltered gully, centered on a drainage line. Substantial blockfall indicate there was originally a larger shelter.The deposit has potential to contain Aboriginal stone objects. However most is inaccessible due to blockfall. Some areas of flatter ground are further downslope.

Site plan



Site photographs

Description: General photo of S1MC486, facing north-west.

Description: General photo of S1MC486, facing south-east

Description: Head of gully with collapsed overhangs near S1MC486.

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3790 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC488

Easting: 762835 **Northing:** 6427259 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

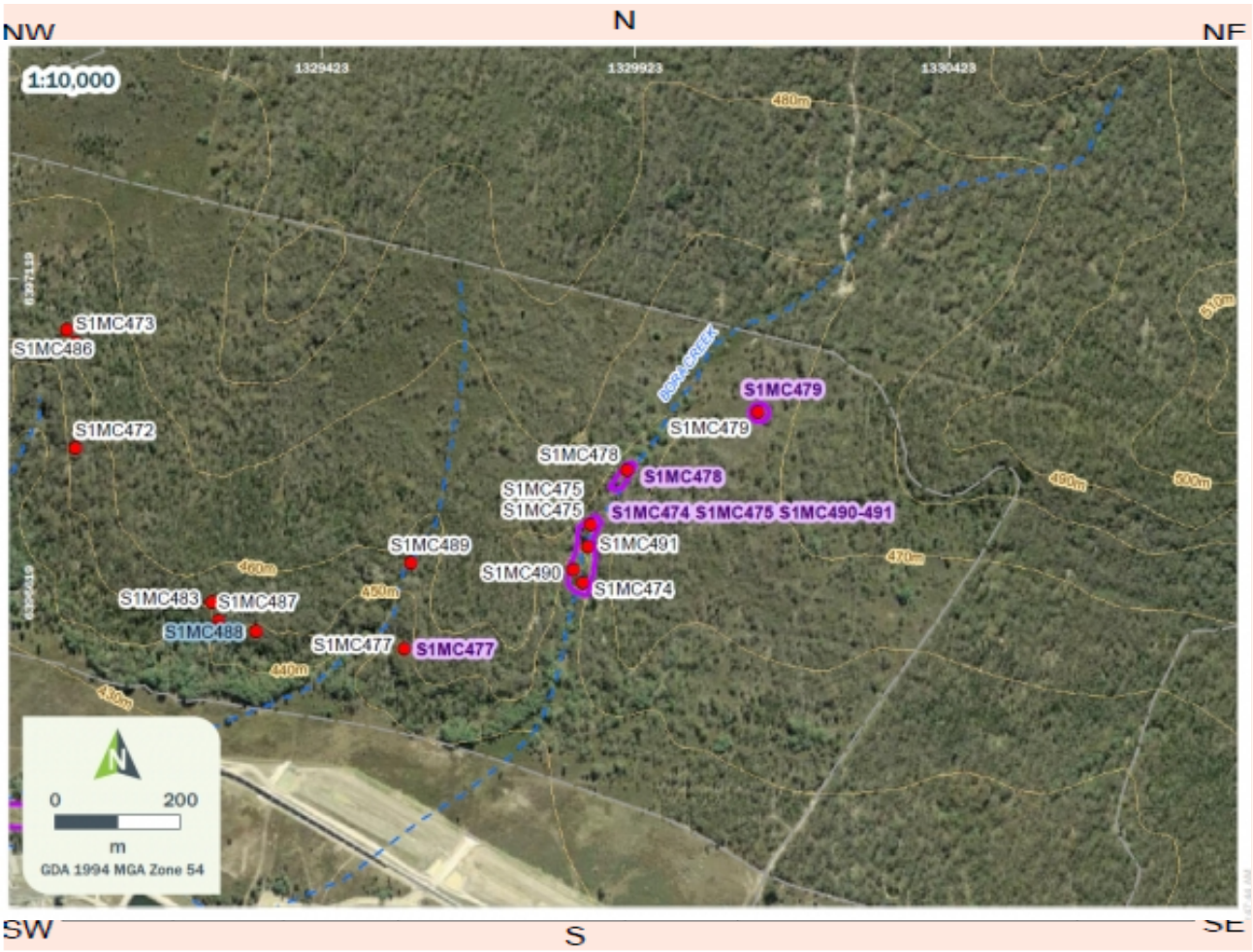
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 100 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Overhangs has formed through cavernous weathering and animal burrowing. Located in a continuous exposure of sandstone.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	9	3.4				

Description:

Conglomerate sandstone outcrop with overhang and shelter. 1 complete quartz flake located in dripline. Rib, knuckle, toe and tibia animal bones discovered in deposit. No indication of cultural modification of bone. Deposit is disturbed from animal use.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		9	3.4				

Description:

PAD located in Conglomerate sandstone outcrop with overhang and shelter. Shelter is deep and has been extensively dug out by wombats. Deposit approximately >50cm deep. PAD reduces in size at front of shelter, tightens and then reopens towards the rear.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

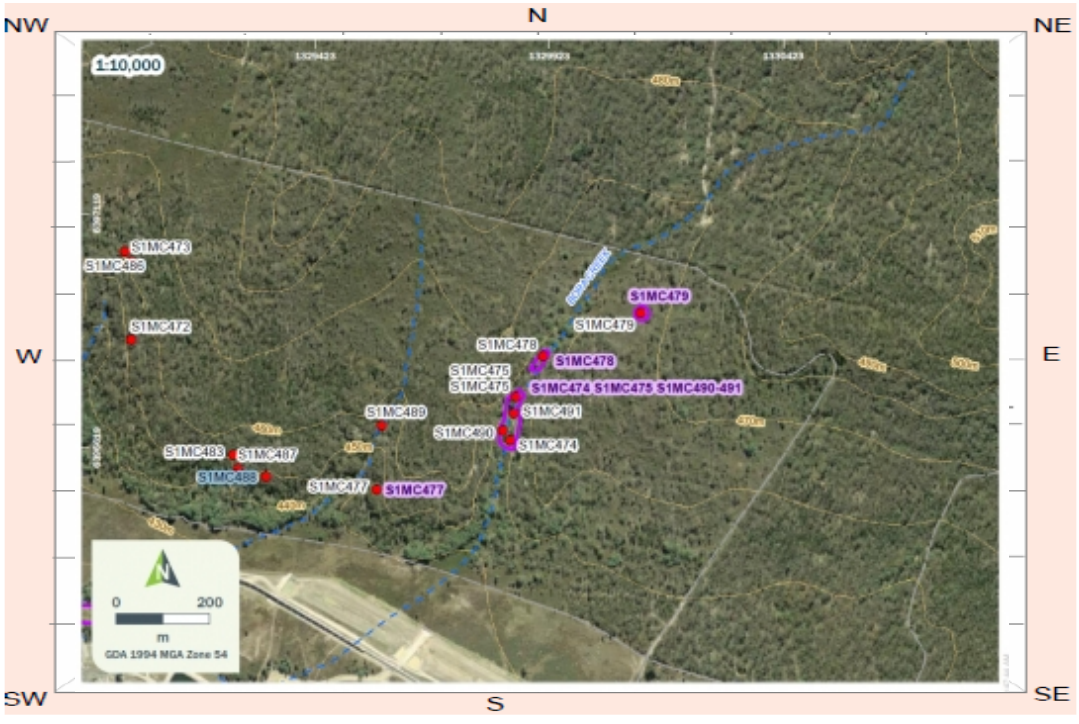
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

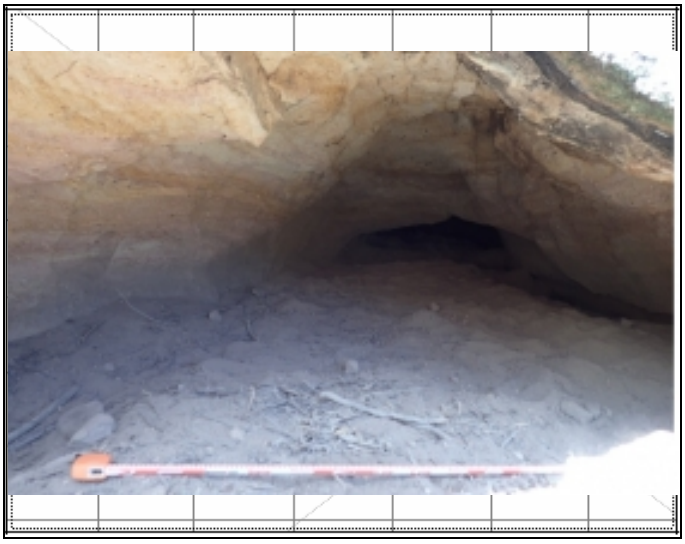
Other Site Info: Overhangs has formed through cavernous weathering and animal burrowing. Located in a continuous exposure of sandstone.

Site plan



Site photographs

Description: General photo of S1MC488, facing north



Description: General photo of S1MC488, facing north

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3791 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC490

Easting: 763332 **Northing:** 6427384 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

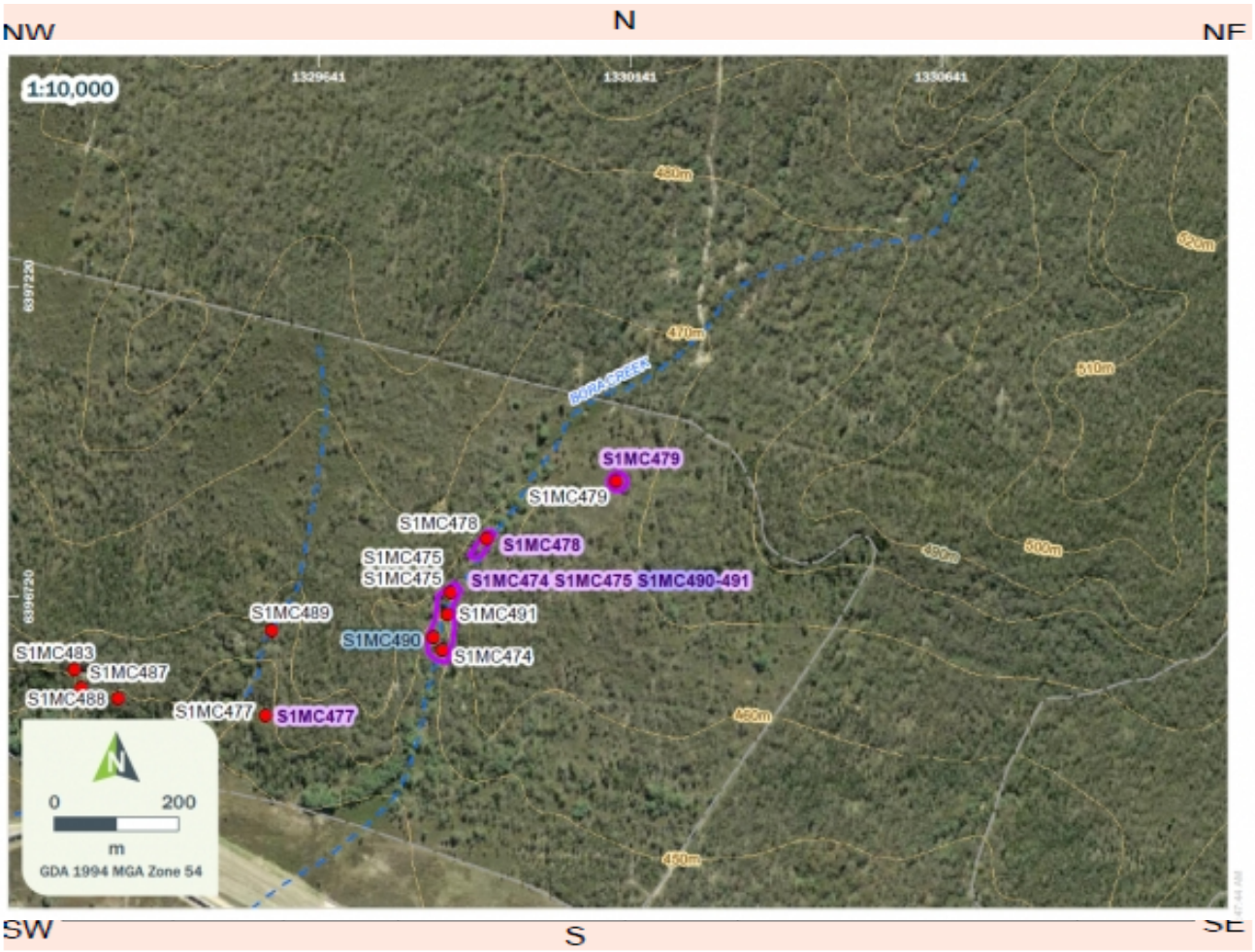
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 20 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: The shelter has a sandy floor. While no Aboriginal objects were identified, the close proximity to the overhang within the gully to a drainage line and other sites, increases the likelihood that subsurface Aboriginal objects may be present.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Potential Archaeological Deposit		1.8	2				

Description:

PAD located in Conglomerate sandstone outcrop with overhang and shelter. Shelter has a sandy floor with a depth greater than 30cm, extending into dripline and downslope of the shelter. No Aboriginal objects were identified within the PAD.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

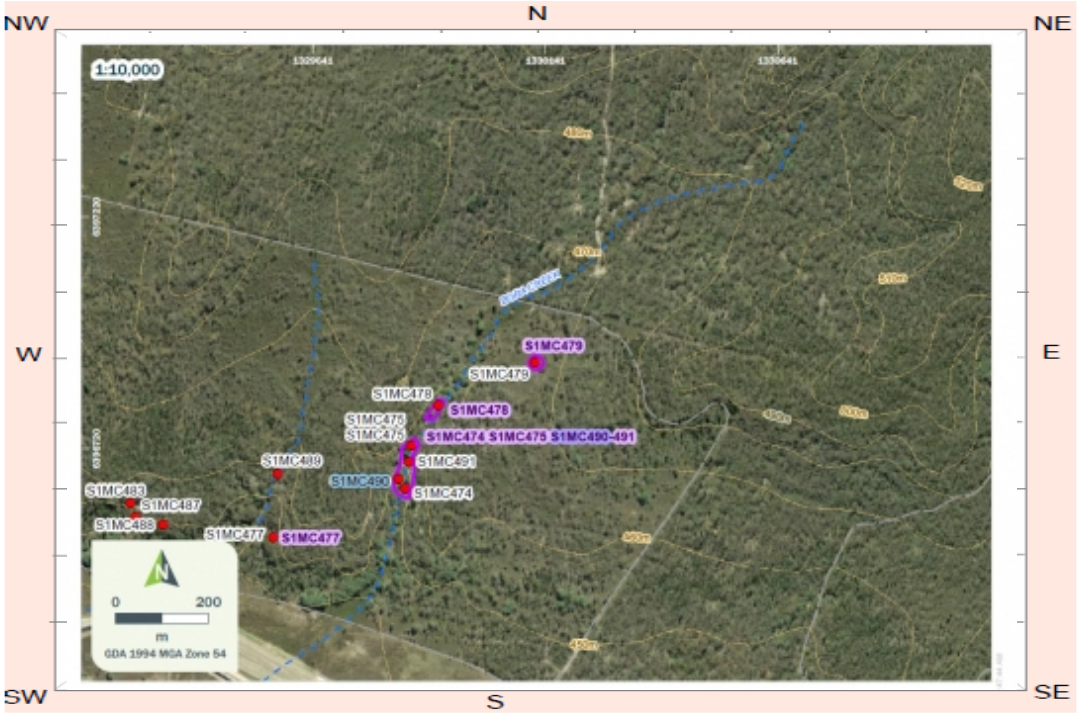
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

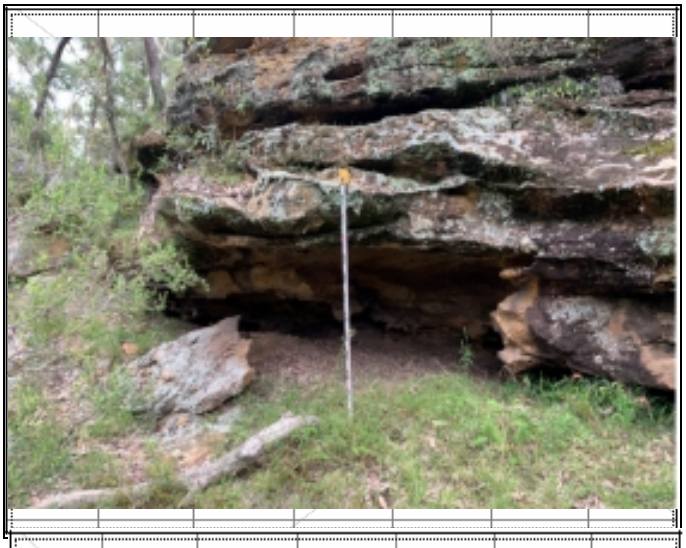
Description:

Other Site Info: The shelter has a sandy floor. While no Aboriginal objects were identified, the close proximity to the overhang within the gully to a drainage line and other sites, increases the likelihood that subsurface Aboriginal objects may be present.

Site plan



Site photographs



Description: S1MC490 facing north-east

Description: S1MC490 shelter interior showing blockfall and leaf litter covering floor.

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3792 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC491

Easting: 763352 **Northing:** 6427422 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

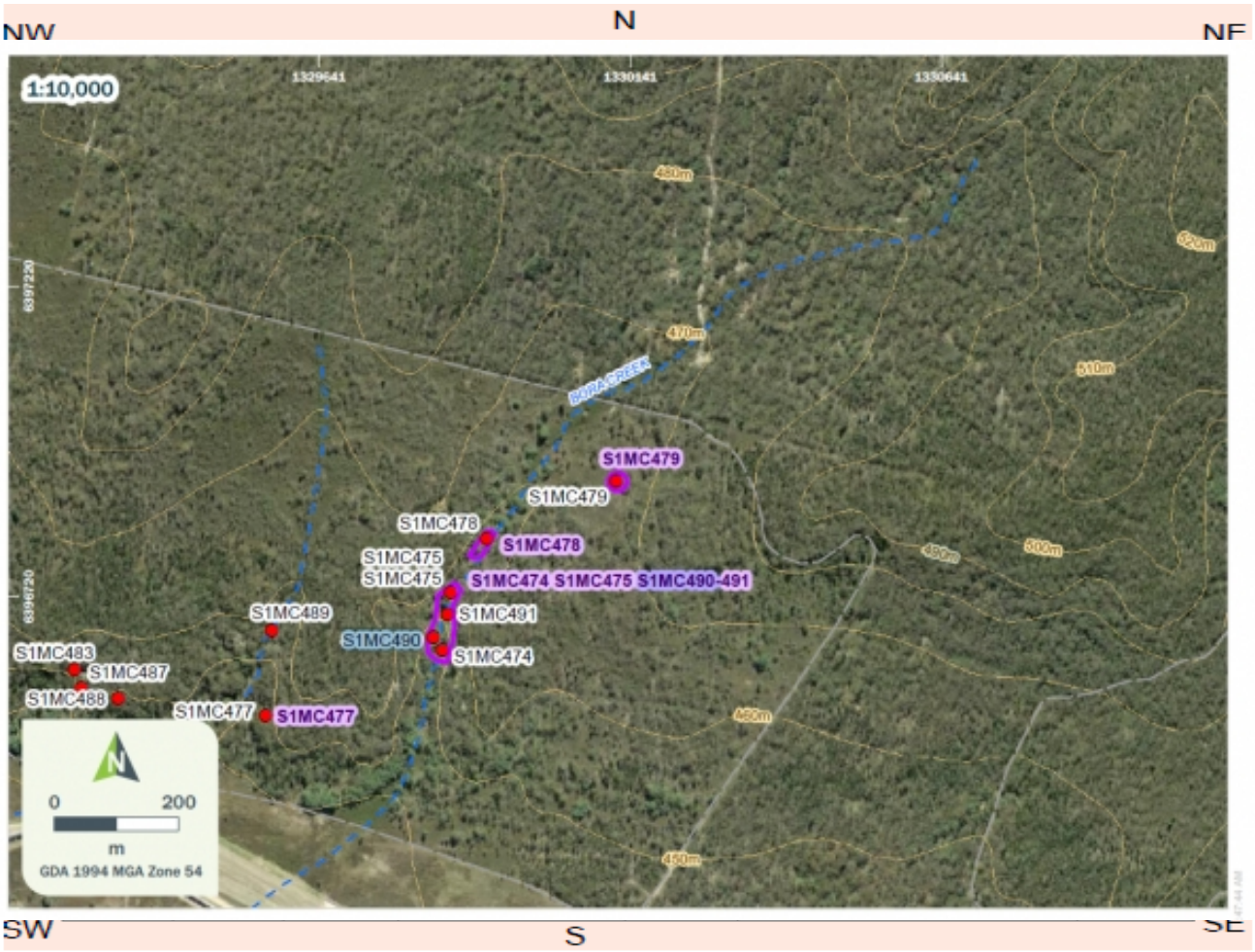
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 20 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: While the floor of the shelter is rocky with minor to moderate blockfall, areas at and downslope of the dripline are relatively level. The site is located in a gully along Bora Creek and contains a number of sandstone overhangs, two of which contained visible stone artefacts.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Potential Archaeological Deposit		2	4				

Description:

PAD located in Conglomerate sandstone outcrop with overhang and shelter. Shelter has a sandy floor with a depth greater than 30cm, extending into dripline and downslope of the shelter. No Aboriginal objects were identified within the PAD.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

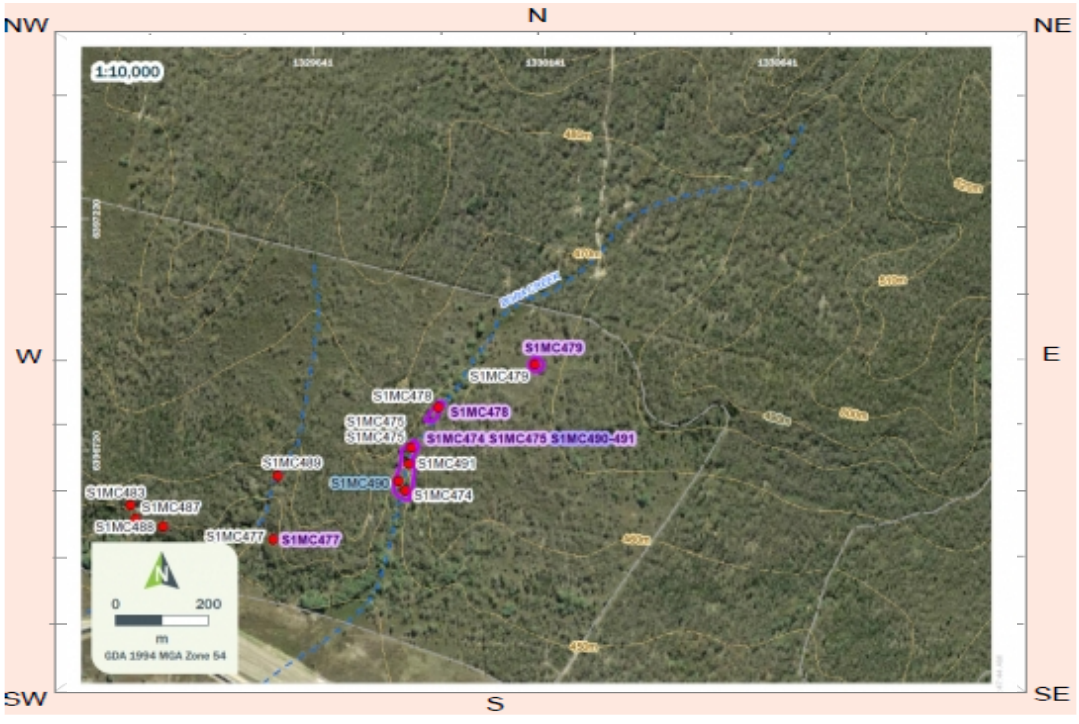
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: While the floor of the shelter is rocky with minor to moderate blockfall, areas at and downslope of the dripline are relatively level. The site is located in a gully along Bora Creek and contains a number of sandstone overhangs, two of which contained visible stone artefacts.

Site plan



Site photographs

Description: S1MC491, facing north-east

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3793 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC494

Easting: 762943 **Northing:** 6429187 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

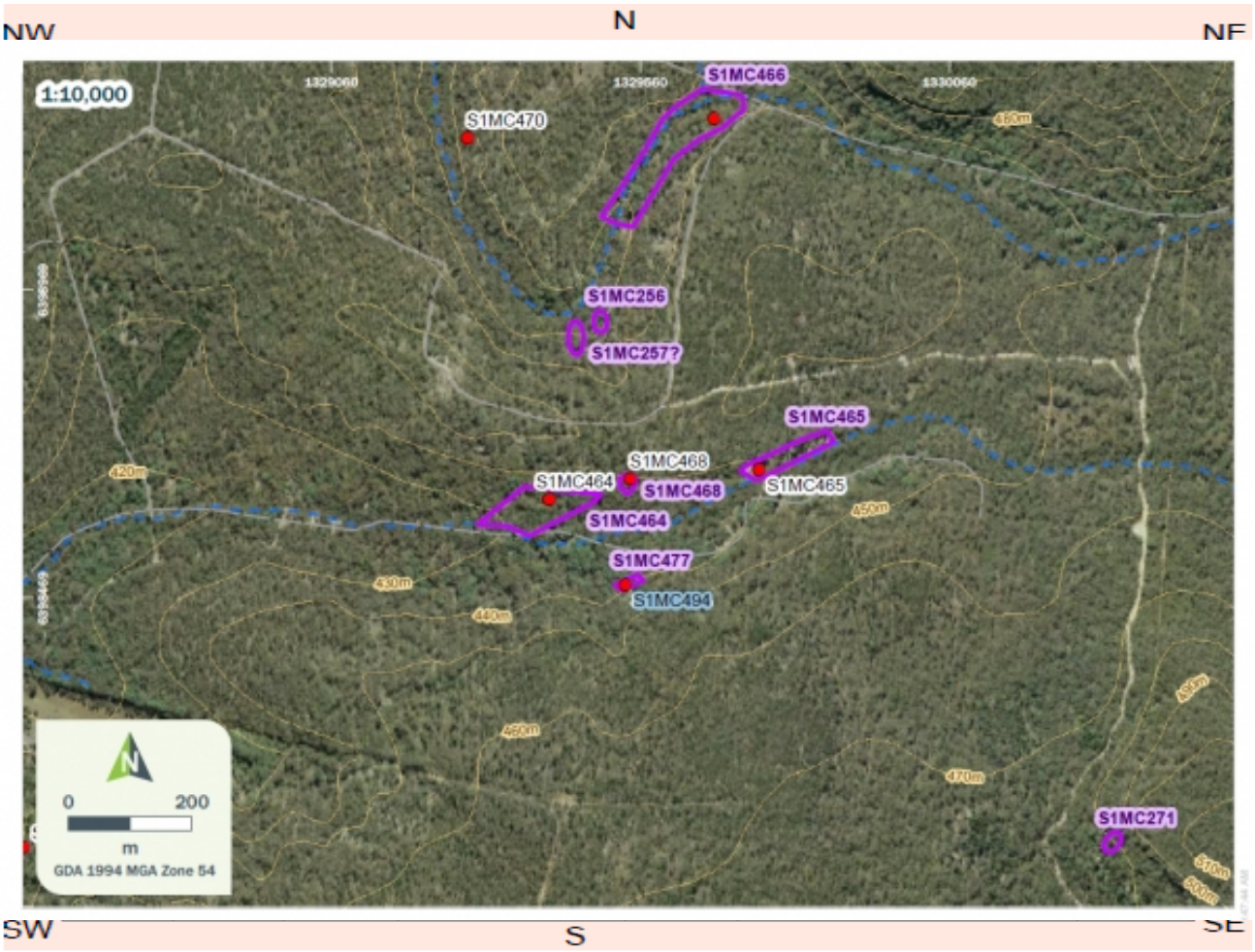
Land Form Unit: Ridge **Vegetation:** Open Woodland

Distance to Water (m): 50 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: overhangs are located at base of ridgeline with a creek to the north and active drainage line to the west. Graffiti damage evident on the panels of the main shelter.

Site location map



Site contents information

open/closed site: Closed

Site condition: Graffitti Damag

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	3	9.3	3				

Description:

A small overhang is located immediately east of the primary deposit and contains an artefact scatter.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		9.3	3				

Description:

S1MC494 consists of a PAD in a large conglomerate sandstone overhang with horizontal bedding with thicker bands of conglomerate pebbles and ironstone. PAD consists of sandy deposit with depth >50cm in the dripline of shelter. Deposit and overhang continue to the east to a smaller overhang.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

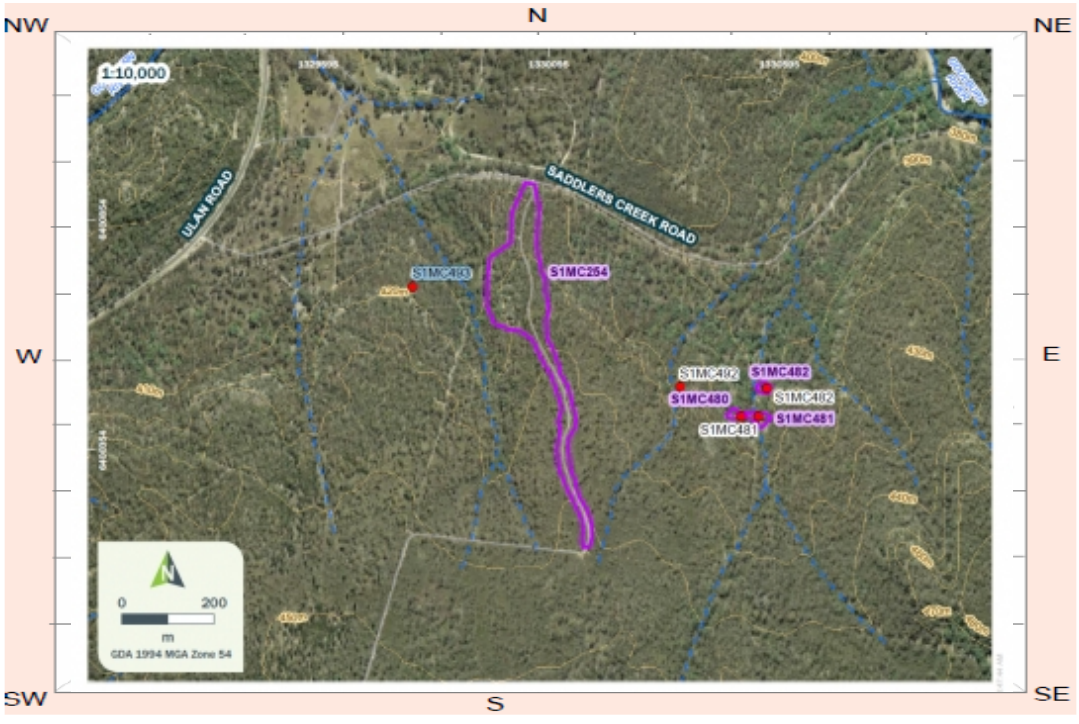
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: overhangs are located at base of ridgeline with a creek to the north and active drainage line to the west. Graffiti damage evident on the panels of the main shelter.

Site plan



Site photographs

Description: S1MC494 Shelter with Artefacts and PAD, stone artefacts were identified to the east

Description: S1MC494, overhang containing stone artefacts, primary deposit and overhang is to the west

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3794 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC487

Easting: 762776 **Northing:** 6427273 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

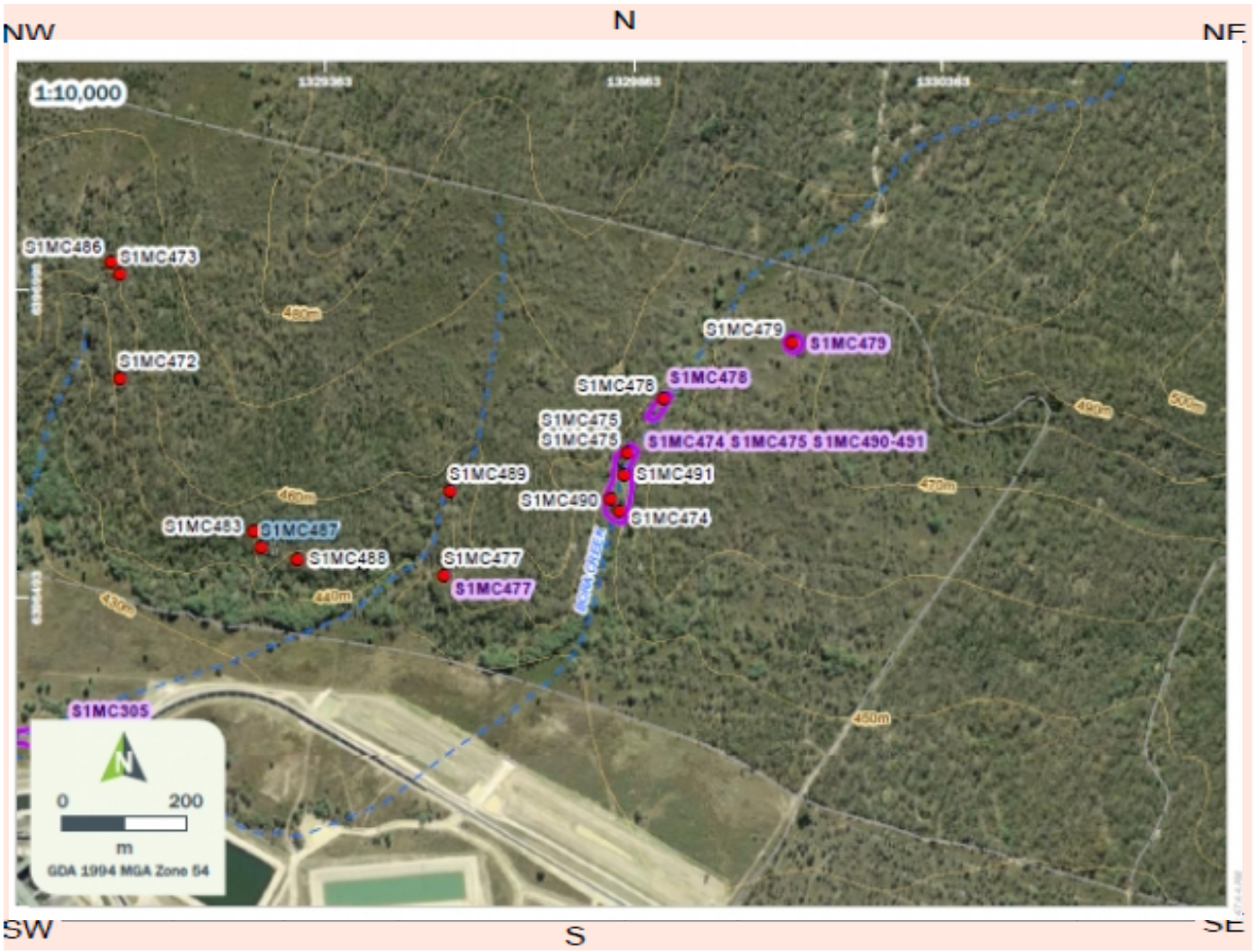
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 100 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information:

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Habitation Structure	1	4	2				

Description:

Isolated overhang at the top of a section of ridgeline that has sheered away from the primary rock face. No cultural material was identified. The shelter provides an alternative, protected location to sit. Shelter had stone sloped floor.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

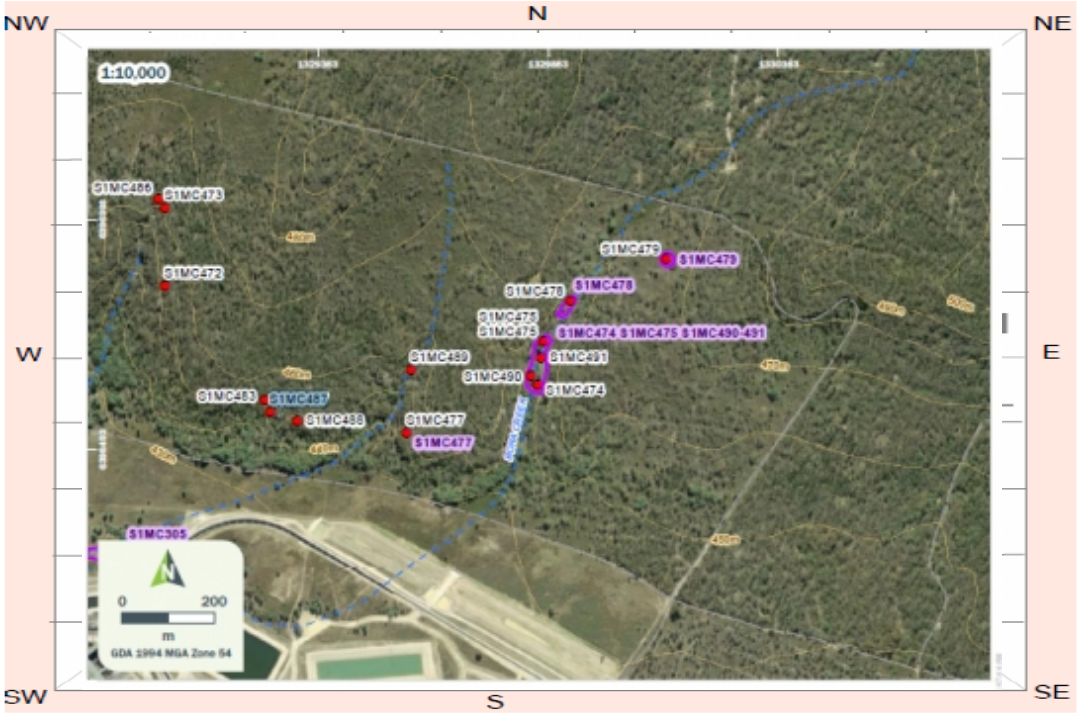
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs

Description: General photo of site S1MC 487 facing east

Description: General photo of site S1MC 485 facing northeast

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3795 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC485

Easting: 761982 **Northing:** 6428401 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

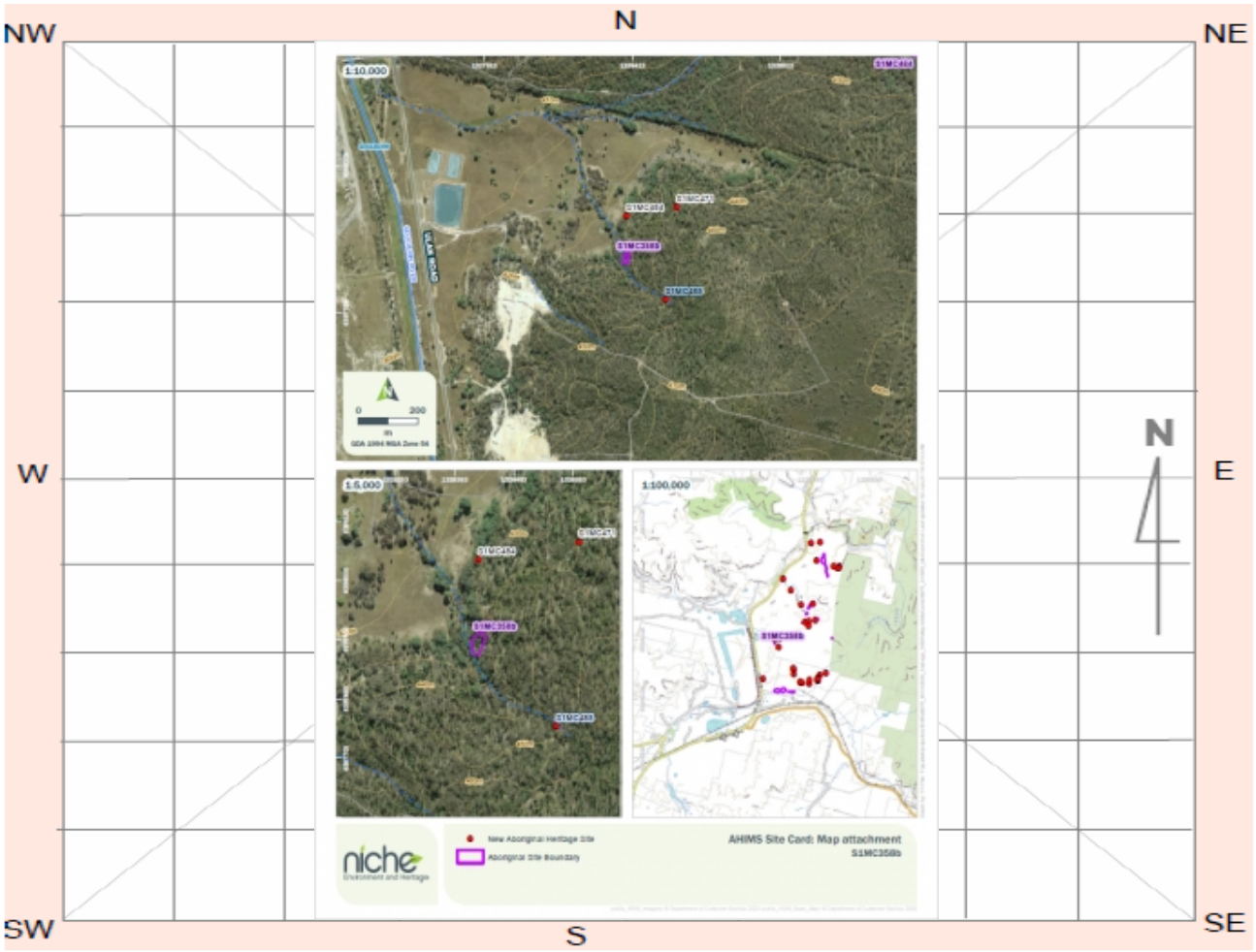
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 0 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information:

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Potential Archaeological Deposit		11	3				

Description:

Continuous overhang with three conglomerate sandstone shelters with ironstone banding. Shelters are 11 m x 3 m, 5m x 3m and 8m x 2m in size. Shelters contain a sandy deposit. Recorded as PAD due to the depth of the deposit which appears to be greater than 50 cm in some sections of the shelters.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

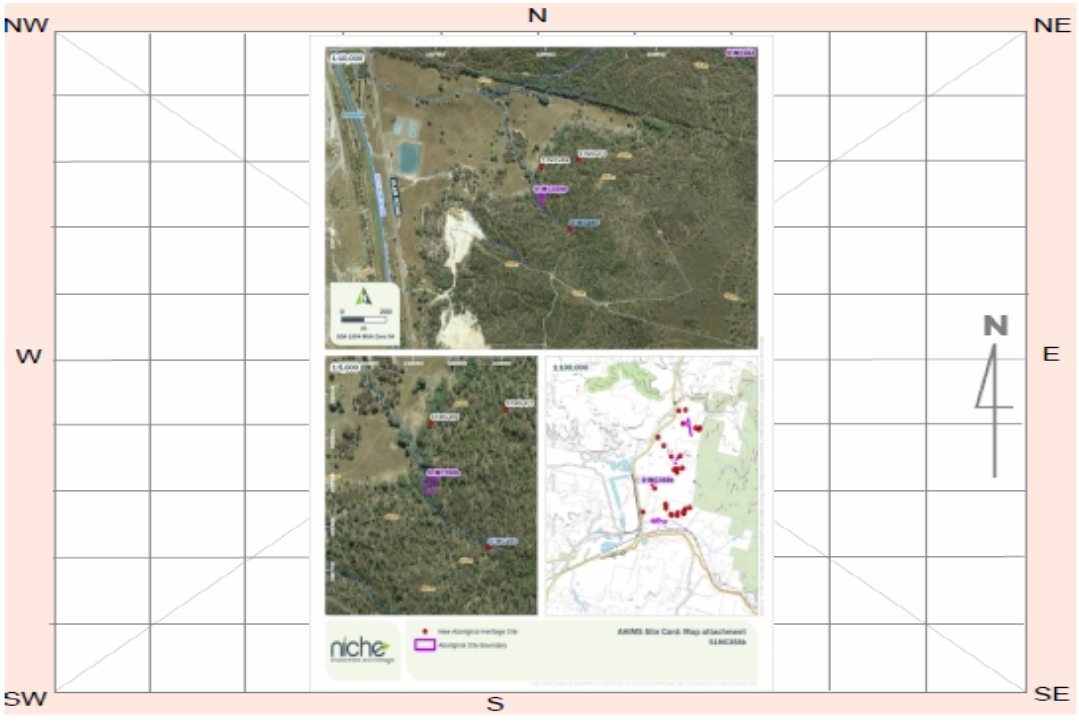
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs

Description: General photo of site S1MC 485 facing east

Description: General photo of site S1MC 485, facing south

Description: General photo of site S1MC 485, facing north-east

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3796 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC478

Easting: 763408 **Northing:** 6427548 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

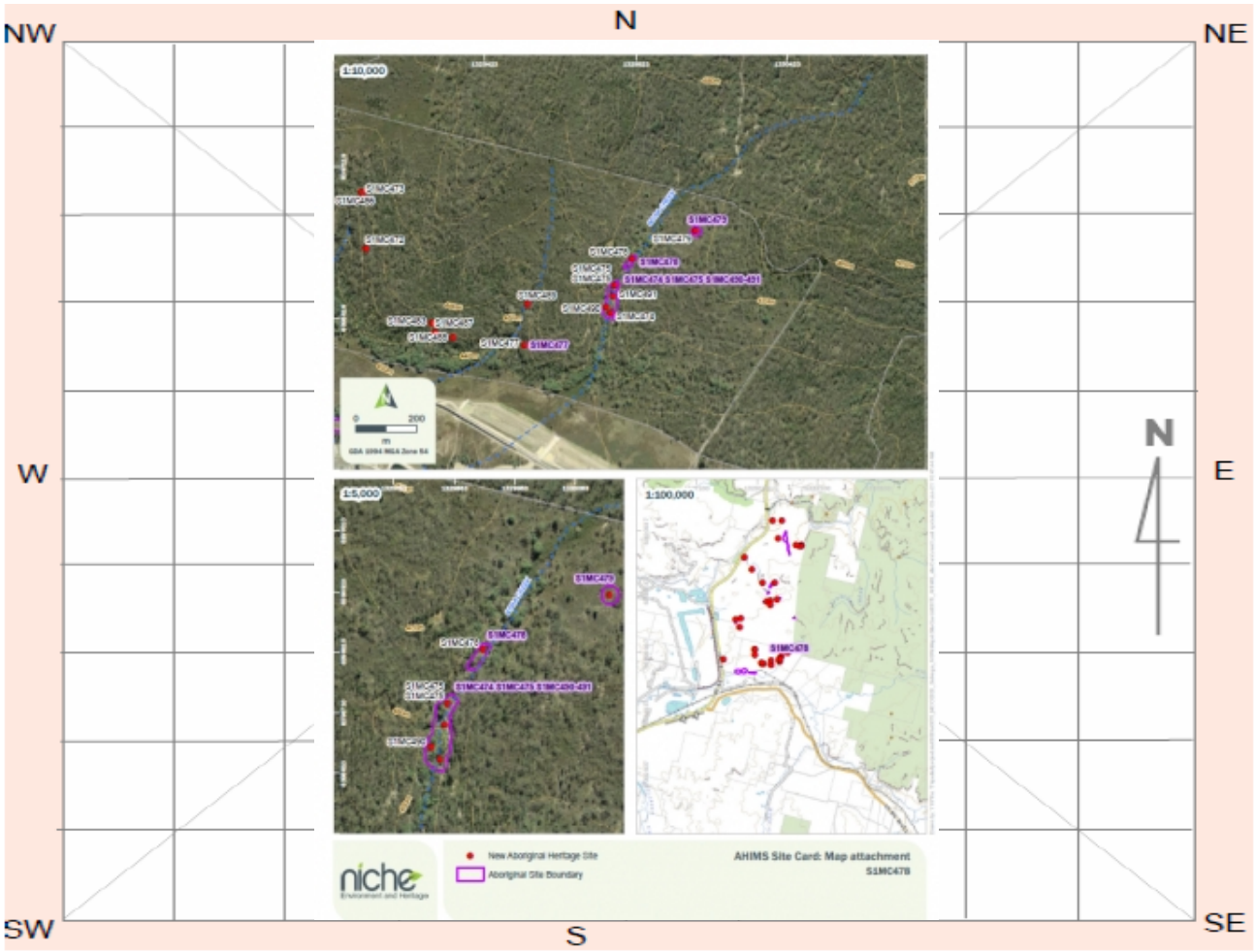
Land Form Unit: Stream Bank **Vegetation:** Open Woodland

Distance to Water (m): 0 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information:

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	4	50	15				

Description:

open artefact scatter located 70 m north-east, upstream, of S1MC475 along Bora Creek. Four artefacts were identified in patches of exposure along the sloped, sandy quartz creek banks, including a sandstone chopper tool with stepped retouched, a large tuff flake and 2 complete quartz flakes.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

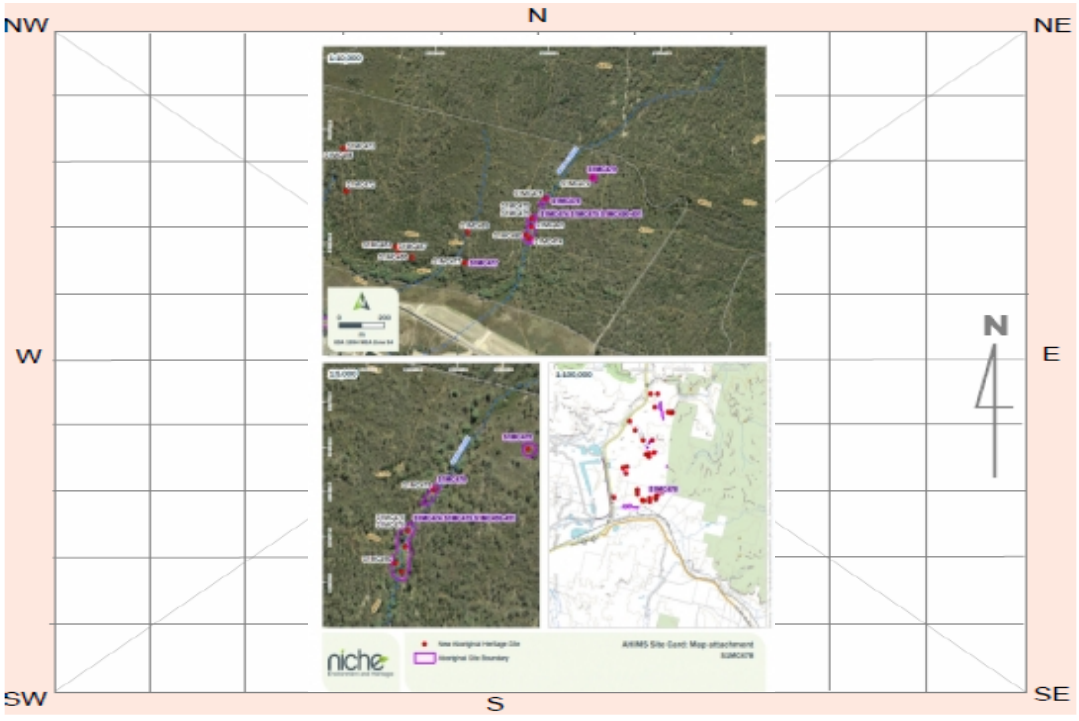
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

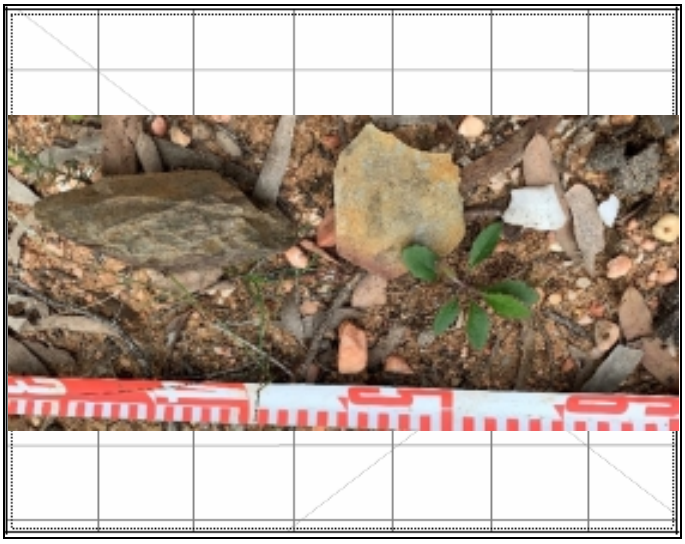
Other Site Info:

Site plan



Site photographs

Description: S1MC478, facing south. The drainage line flows towards S1MC475.



Description: - sandstone chopper tool, tuff flake and quartz flakes.

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3797 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC477

Easting: 762939 **Northing:** 6429186 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

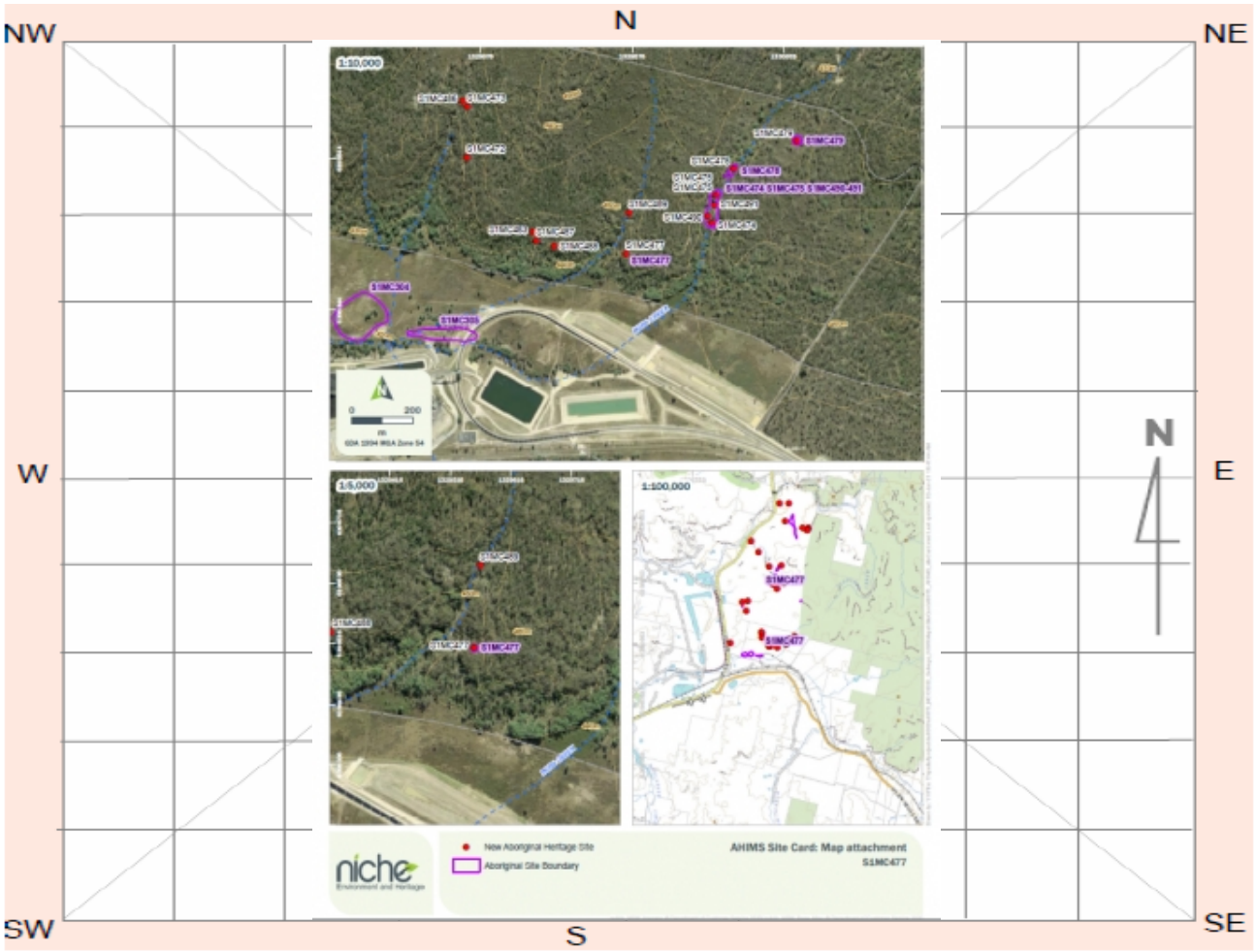
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 50 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Disturbed site due to track.

Site location map



Site contents information

open/closed site: Closed

Site condition: Disturbed

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	3	5	5				

Description:

Three quartz stone artefacts identified along an old track, mid slope, among quartz gravels. The artefacts included a quartz complete blade flake with flaked platform and feather termination, a block flake with crushed platform and an angular fragment.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

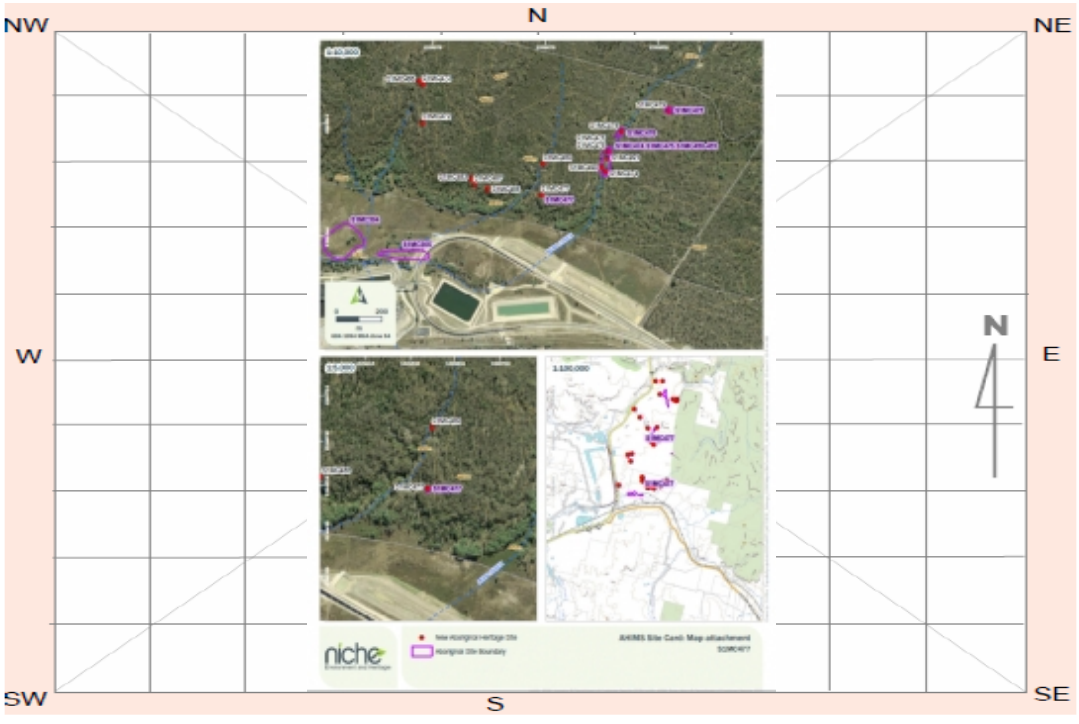
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Disturbed site due to track.

Site plan



Site photographs

Description: General photo of site S1MC 477, facing south-east.

Description: General photo of site S1MC 477, facing south-west.

Description: Quartz flakes at S1MC 477

Description: Quartz complete flake at S1MC477

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3798 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC473

Easting: 762525 **Northing:** 6427700 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

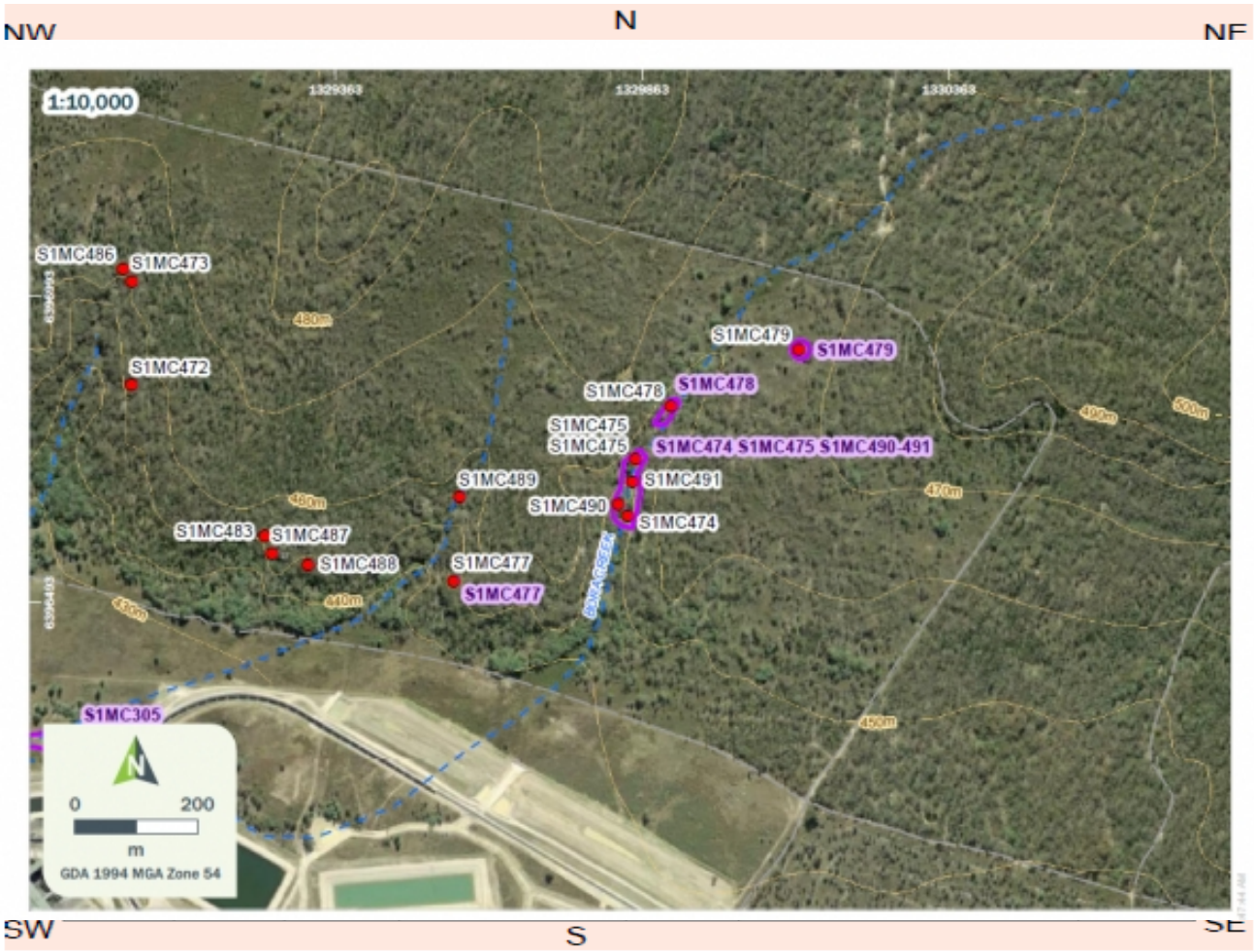
Land Form Unit: Stream Channel **Vegetation:** Open Woodland

Distance to Water (m): 20 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Rockshelter approx. >20m(w) x 2.3m(d) x 5.6m(h) in size. Overhangs have formed a sheltered gully, centred on a drainage line with water and waterholes. Coarse to medium grained yellow oxide is present in pockets between ironstone banding.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Potential Archaeological Deposit		10	2				

Description:

Conglomerate sandstone outcrop with overhang and shelter, with red ironstone and yellow sandstone horizontal bedding. Substantial blockfall indicate there was originally a larger overhang and shelter. Rocky deposit with iron rich soils and quartz pebbles with a deposit approximal 20 cm.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

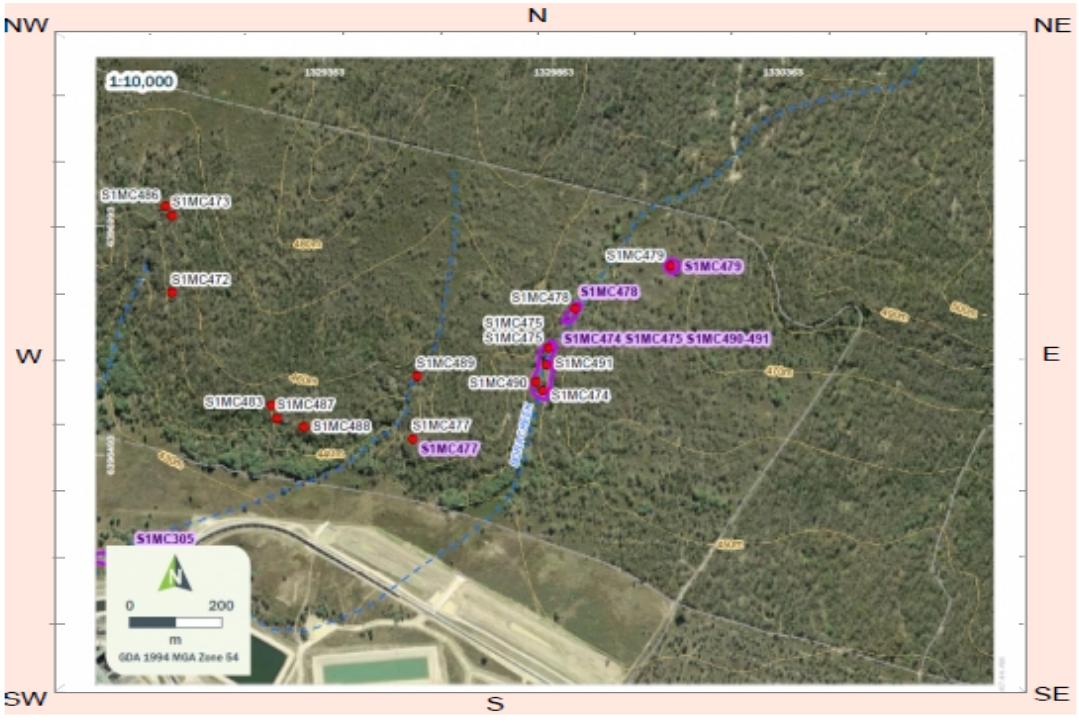
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Rockshelter approx. >20m(w) x 2.3m(d) x 5.6m(h) in size. Overhangs have formed a sheltered gully, centred on a drainage line with water and waterholes. Coarse to medium grained yellow oxide is present in pockets between ironstone banding.

Site plan



Site photographs

Description: : General photo of S1MC473, facing east

Description: General photo of S1MC473 , facing north-east

Description: Source of yellow oxide from S1MC473

Description: Yellow oxideeroding onto floor of shelter at S1MC473

Site restrictions

Do you want to Restrict this site?: ☐

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title	Surname	First name

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3799 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC464

Easting: 762817 **Northing:** 6429321 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

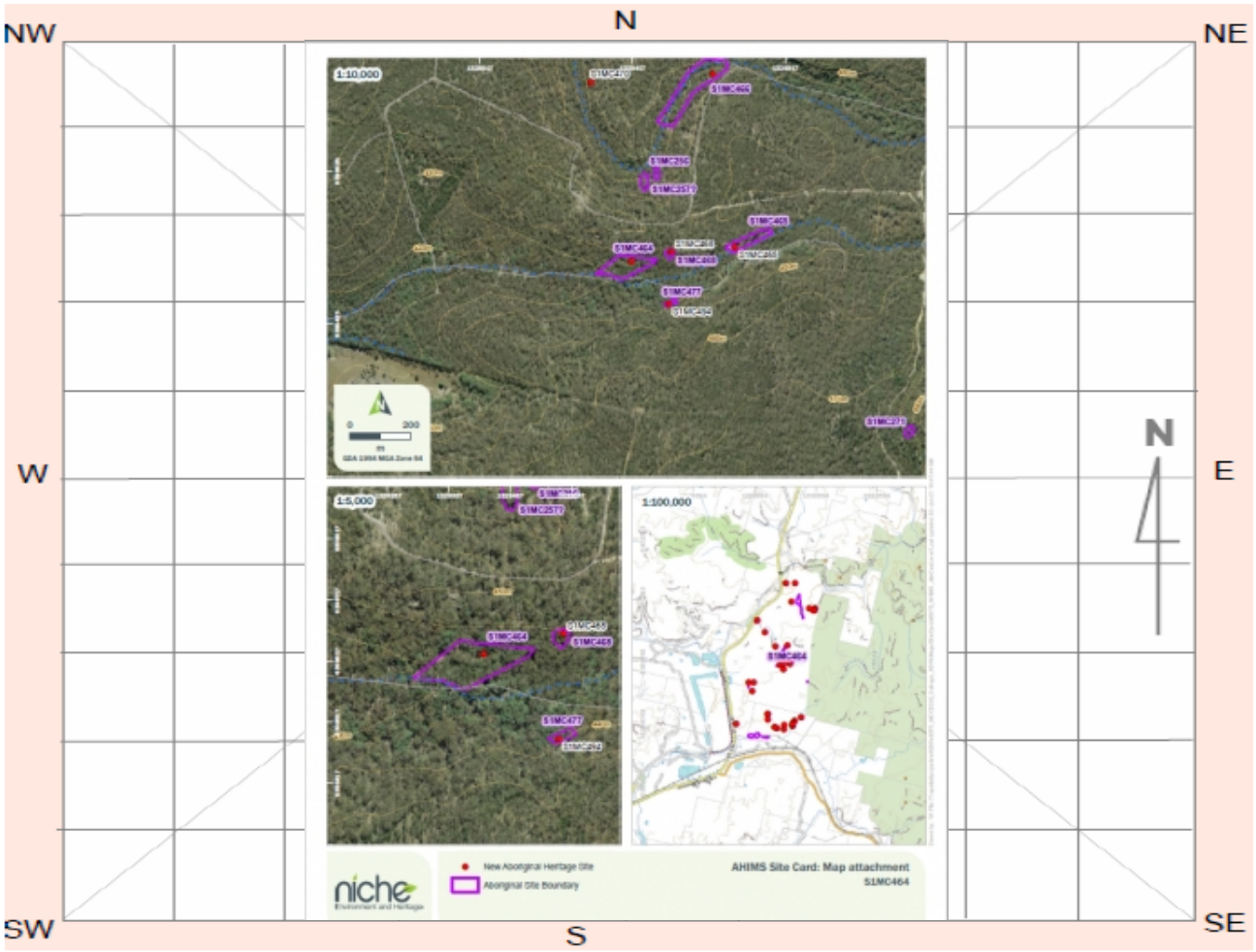
Land Form Unit: Flat **Vegetation:** Open Forest

Distance to Water (m): 50 **Primary Report:** UG4 Additional Survey, Moolarben NSW, ACHA

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Stone artefacts are visible over a 145 m by 40 m area in quartz sands that have been disturbed by vehicle movement, vegetation clearance and sheetwash.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	28	145	40				

Description:

Artefact assemblage contains range of raw material types common to Ulan and Moolarben region including quartz, tuff, chert and fossilised wood. Artefact types include cores, broken tools, complete and broken flakes. Assemblage includes example of bipolar, blade and microblade reduction techniques.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

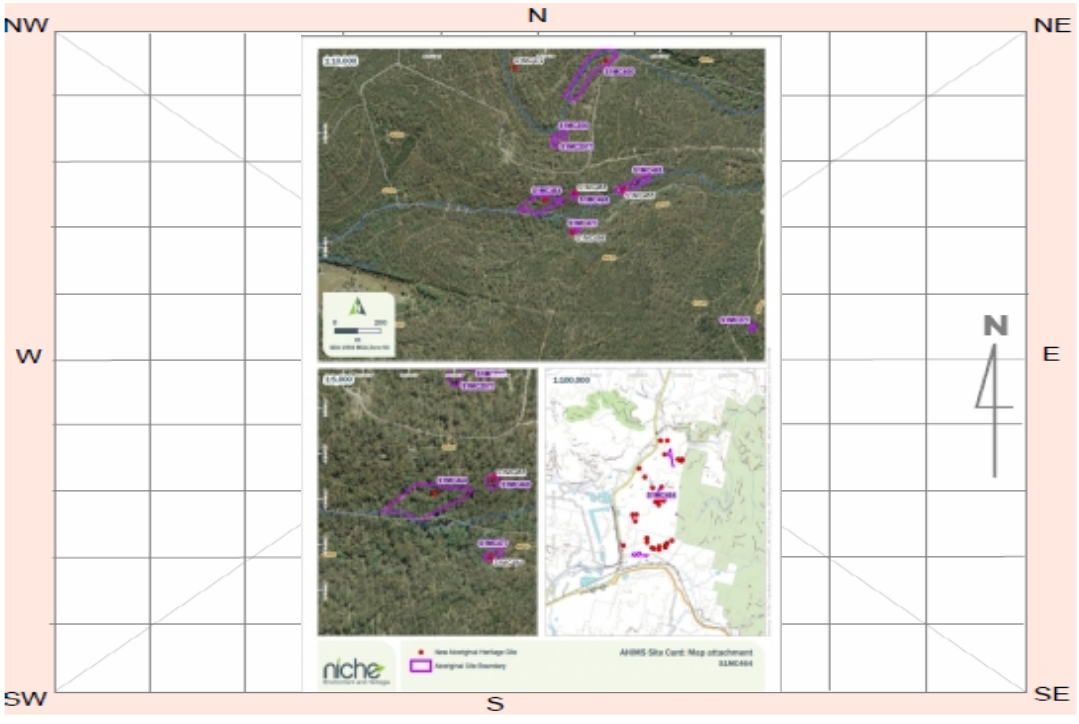
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Stone artefacts are visible over a 145 m by 40 m area in quartz sands that have been disturbed by vehicle movement, vegetation clearance and sheetwash.

Site plan



Site photographs

Description: General location of S1MC464 in Open Depression.

Description: Drainage into S1MC464.

Description: Stone artefacts identified in S1MC464.

Description: Stone artefacts identified in S1MC464.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3800 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC465

Easting: 763147 **Northing:** 6429384 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

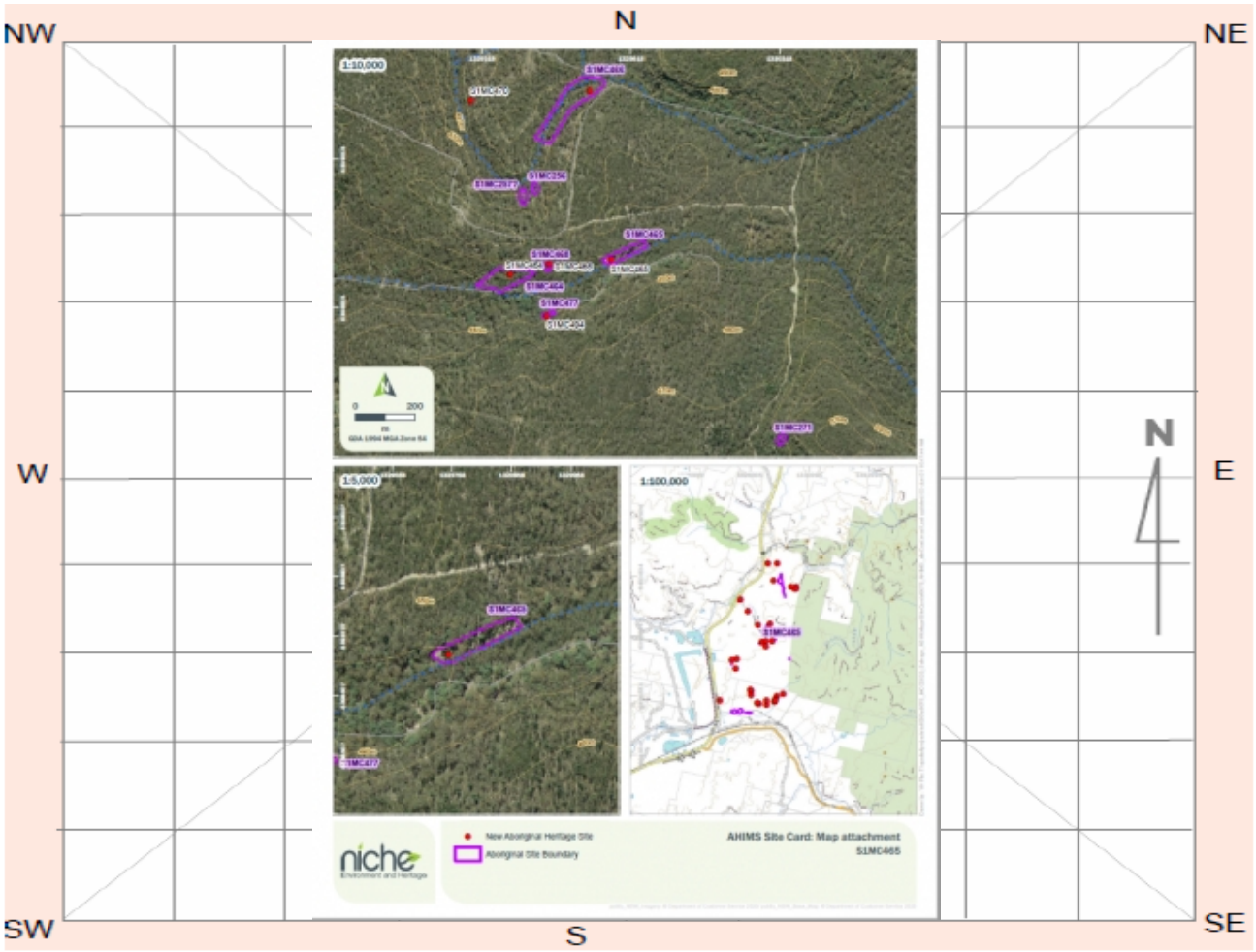
Land Form Unit: Flat **Vegetation:** Open Forest

Distance to Water (m): 50 **Primary Report:** UG4 Additional Survey, Moolarben NSW, ACHA

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Stone artefacts are visible in quartz sands that have been disturbed by vegetation clearance and sheetwash. Site S1MC 465 is approximately 200 m east of site S1MC 464.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	11	130	80				

Description:

Artefact assemblage contains range of raw material types common to Ulan and Moolarben region including quartz, tuff and chert, Artefact types include complete and broken flakes. Assemblage includes example of bipolar and blade reduction techniques. Platform rejuvenation evident on tuff flake.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2. Potential Archaeological Deposit		130	80				

Description:

Stone artefacts visible in quartz sands. The topsoil of the site has been disturbed through historical earthworks, vehicle movement and sheetwash, the site demonstrates a high degree of connectivity due to its close proximity to rock shelter sites, connected by a drainage line.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

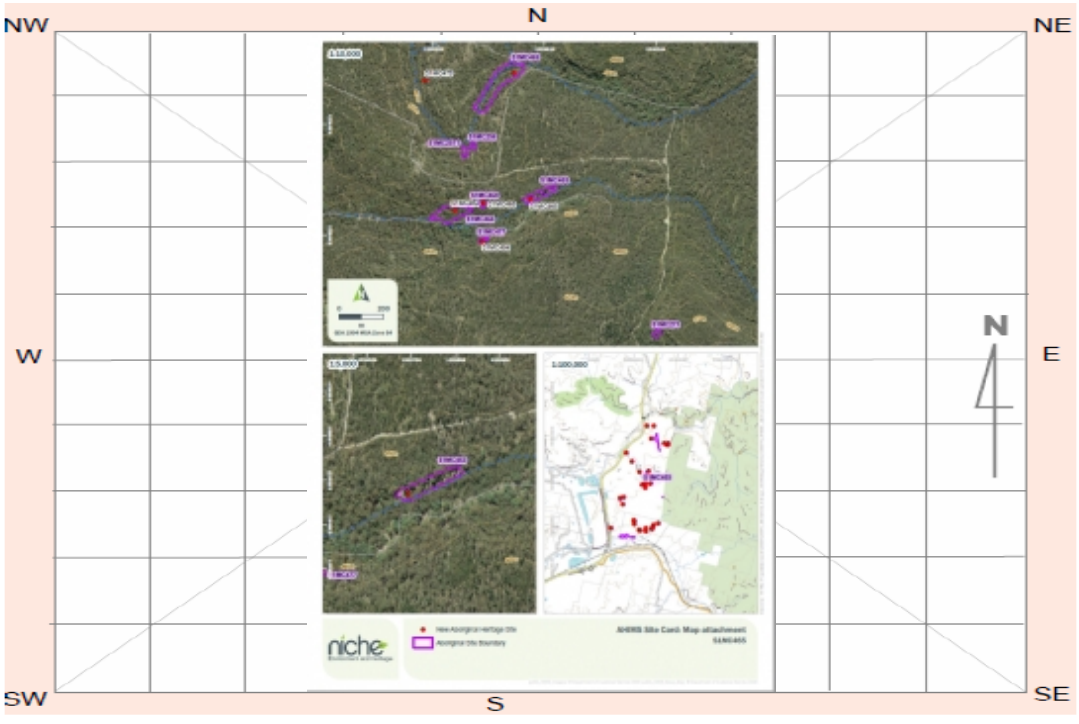
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Stone artefacts are visible in quartz sands that have been disturbed by vegetation clearance and sheetwash. Site S1MC 465 is approximately 200 m east of site S1MC 464.

Site plan



Site photographs

Description: General location of S1MC465.

Description: Stone artefacts identified at S1MC465.

Description: Stone artefacts identified at S1MC465.

Description: Stone artefacts identified at S1MC465.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3801 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC468

Easting: 762942 **Northing:** 6429358 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

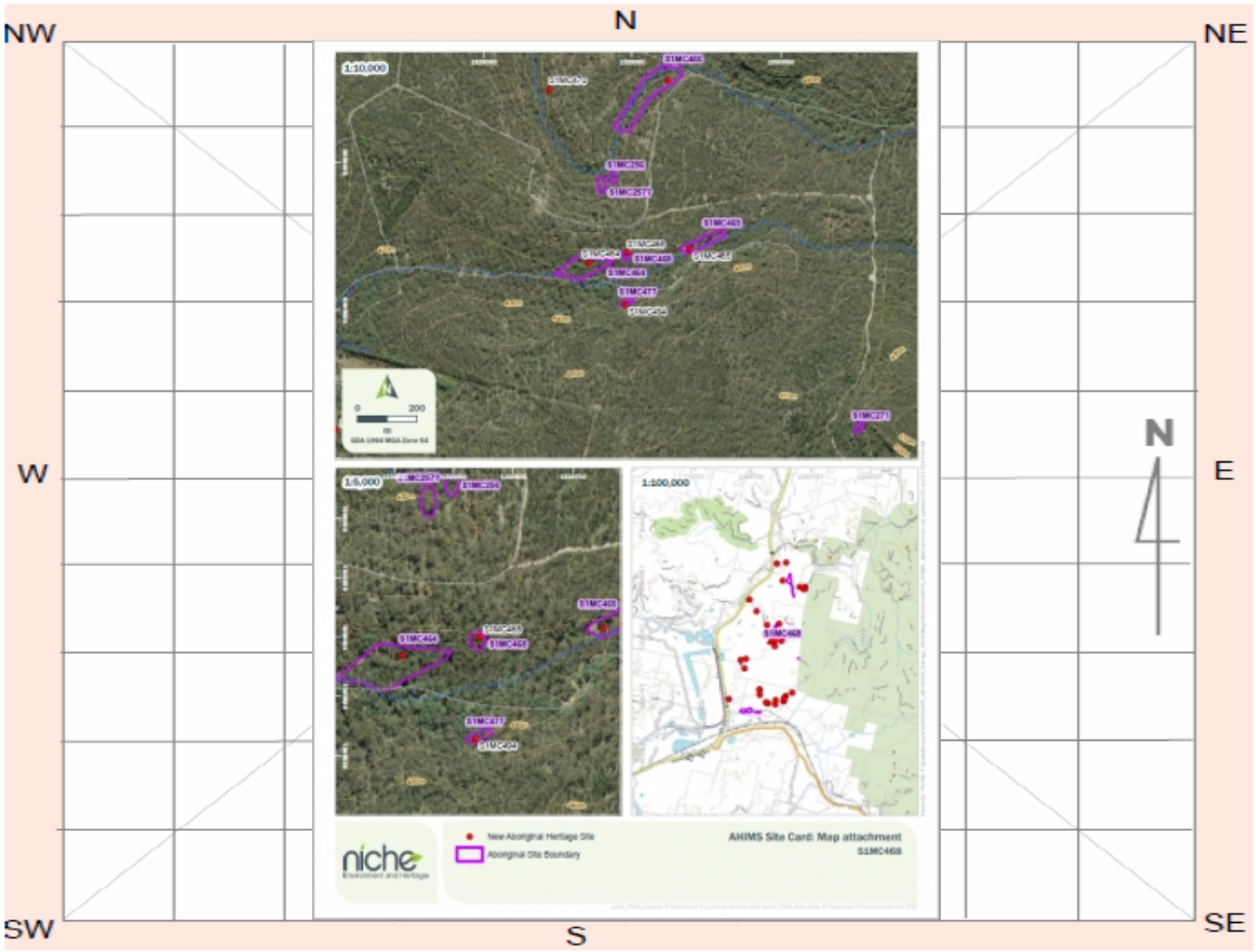
Land Form Unit: Stream Bank **Vegetation:** Open Woodland

Distance to Water (m): 80 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Continuous exposure of sandstone, along the base of a ridgeline in an open depression, 60 m east of S1MC 464 and 170 m west of S1MC 465. A drainage line runs west/east approximately 80m to the south of the overhang. Likely a place utilised to site due to its proximity to other sites.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	2	15	20				

Description:

Two artefacts were identified in the PAD of shelter, a tuff proximal flake with weathered cortex, and a quartz broken flake. Artefacts locate approximately 400 mm at the dripline, continuing downslope to the drainage line. Conglomerate sandstone overhang with ironstone banding, 6m (w) x 1.5m (h).

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2. Potential Archaeological Deposit		15	20				

Description:

PAD is approximately 40 cm deep and is located downslope of rock shelter. Artefacts were identified in PAD.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

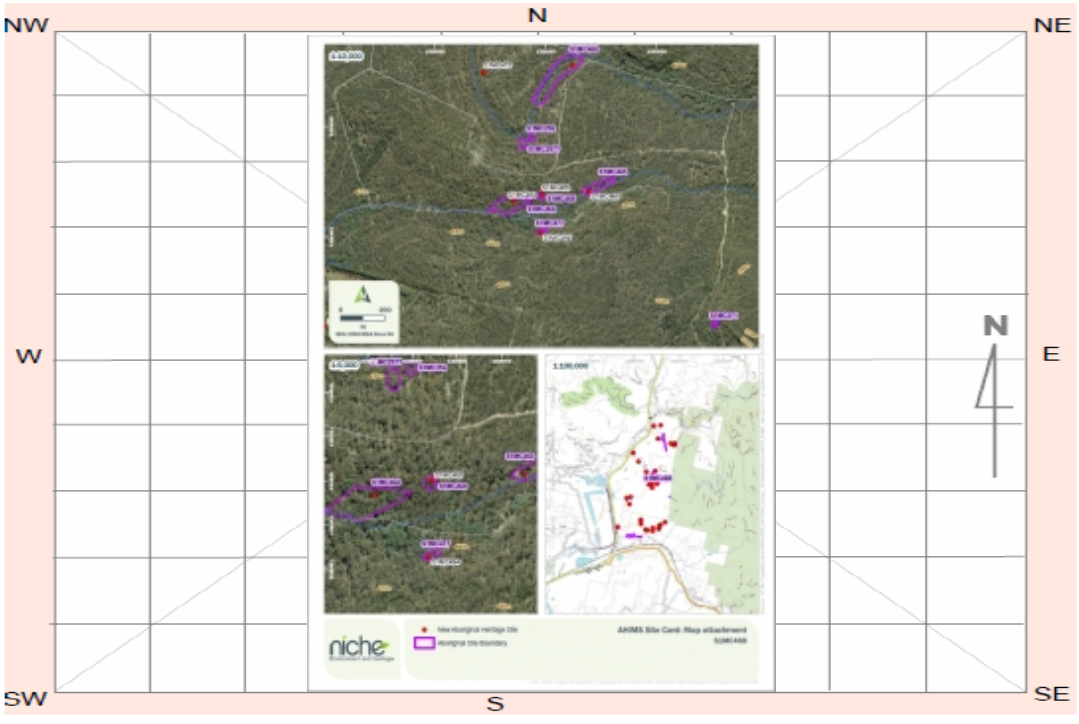
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Continuous exposure of sandstone, along the base of a ridgeline in an open depression, 60 m east of S1MC 464 and 170 m west of S1MC 465. A drainage line runs west/east approximately 80m to the south of the overhang. Likely a place utilised to site due to its proximity to other sites.

Site plan



Site photographs

Description: General shot of rock shelter S1MC468, facing north.

Description: PAD within shelter S1MC468, facing north.

Description: Stone artefacts identified within dripline of S1MC468.

Description: View from site S1MC468 facing south.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title | **Surname** | **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3802 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC471

Easting: 762003 **Northing:** 6428711 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

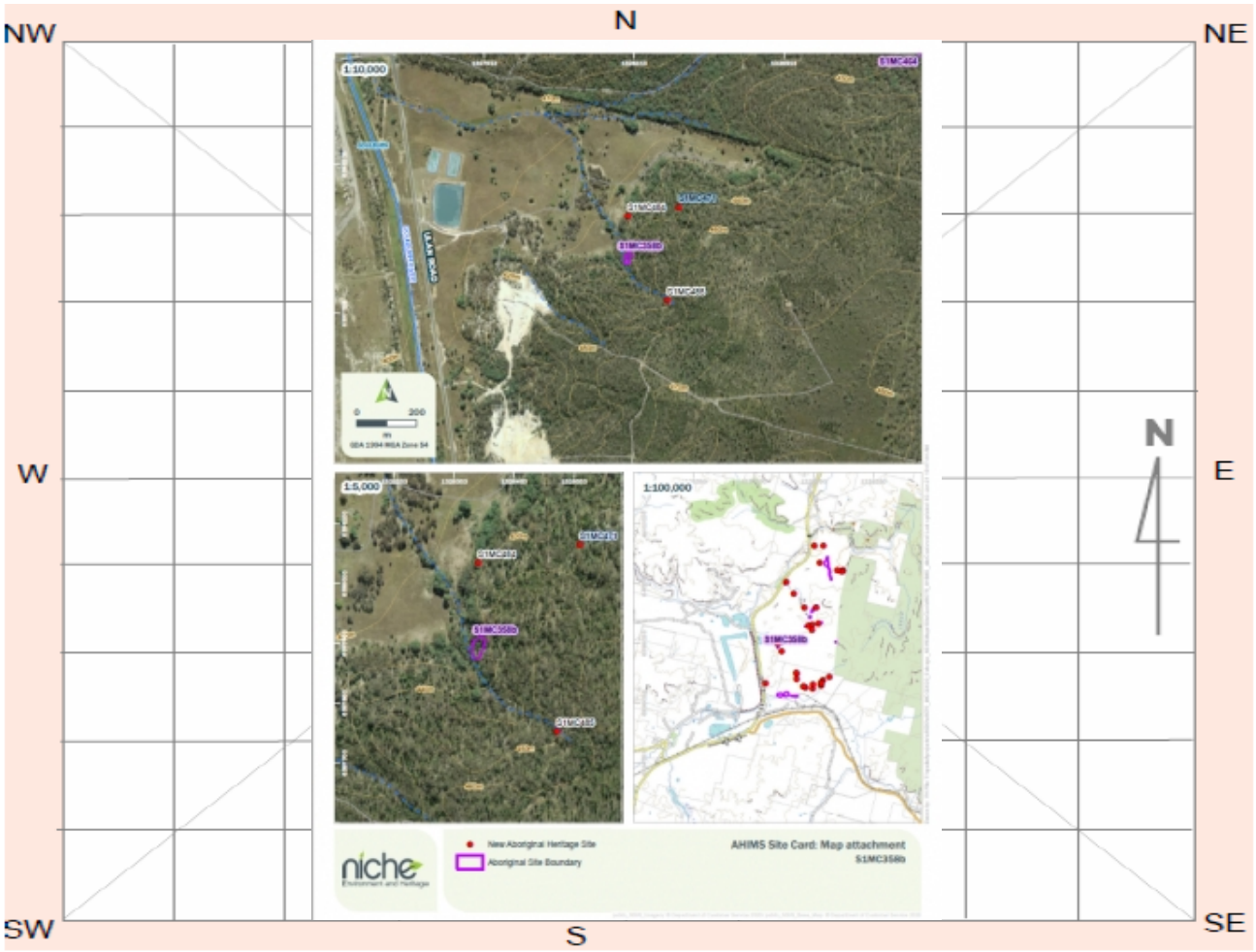
Land Form Unit: Slope **Vegetation:** Open Woodland

Distance to Water (m): 200 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Animal burrowing evident within shelter. The representative of the Registered Aboriginal Parties present stated that was enough space to sit in the shelter.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Potential Archaeological Deposit		1	1				

Description:

Isolated exposed sandstone shelter located in the midslope with PAD. Gaps in back of overhang. Floor is sandy PAD with blockfall.
No artefacts visible. The pattern of weathering from water dripping along the dripline on the internal blockfall was of interest.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

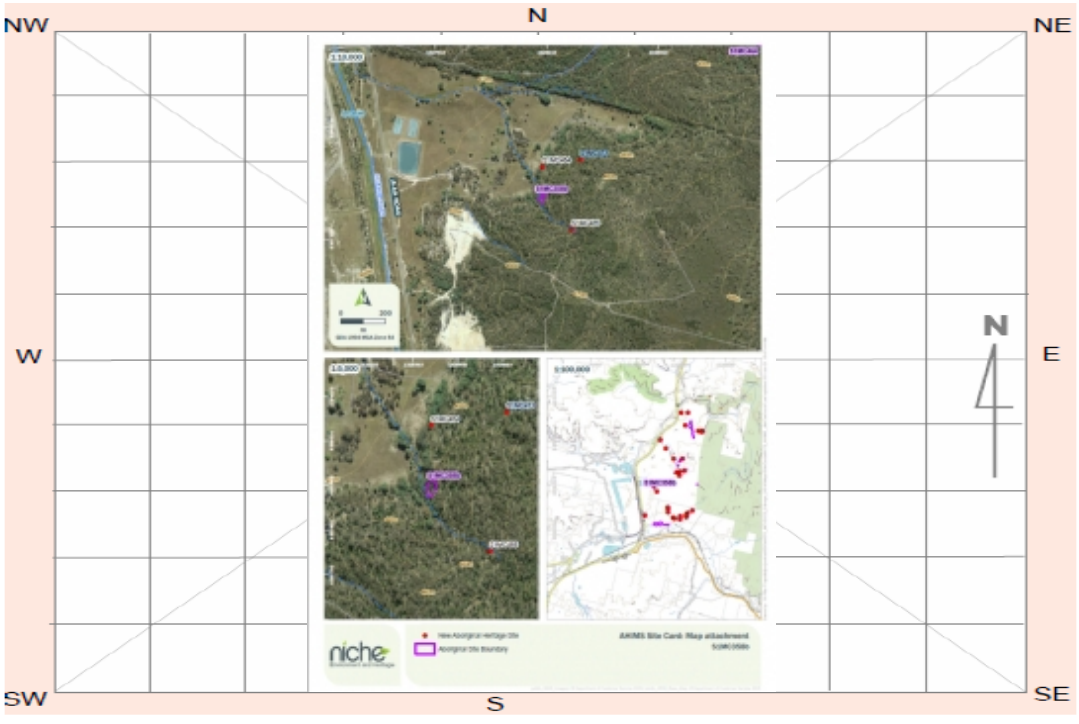
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Animal burrowing evident within shelter. The representative of the Registered Aboriginal Parties present stated that was enough space to sit in the shelter.

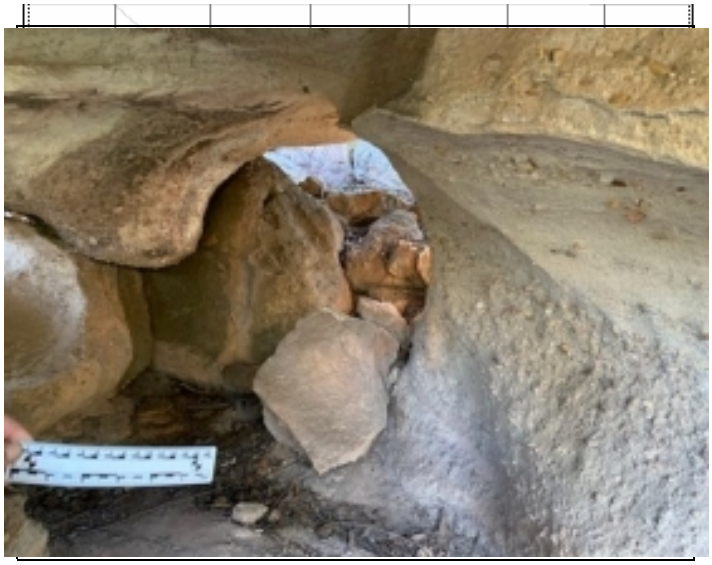
Site plan



Site photographs

Description: General shot of S1MC471, facing north-west.

Description: Weathering along internal blockfall of S1MC471.



Description: Weathering along internal blockfall of S1MC471.

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3803 **Date recorded:** 19-08-2021

Site Location Information

Site name: S1MC472

Easting: 762533 **Northing:** 6427532 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms.	Freeman	Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

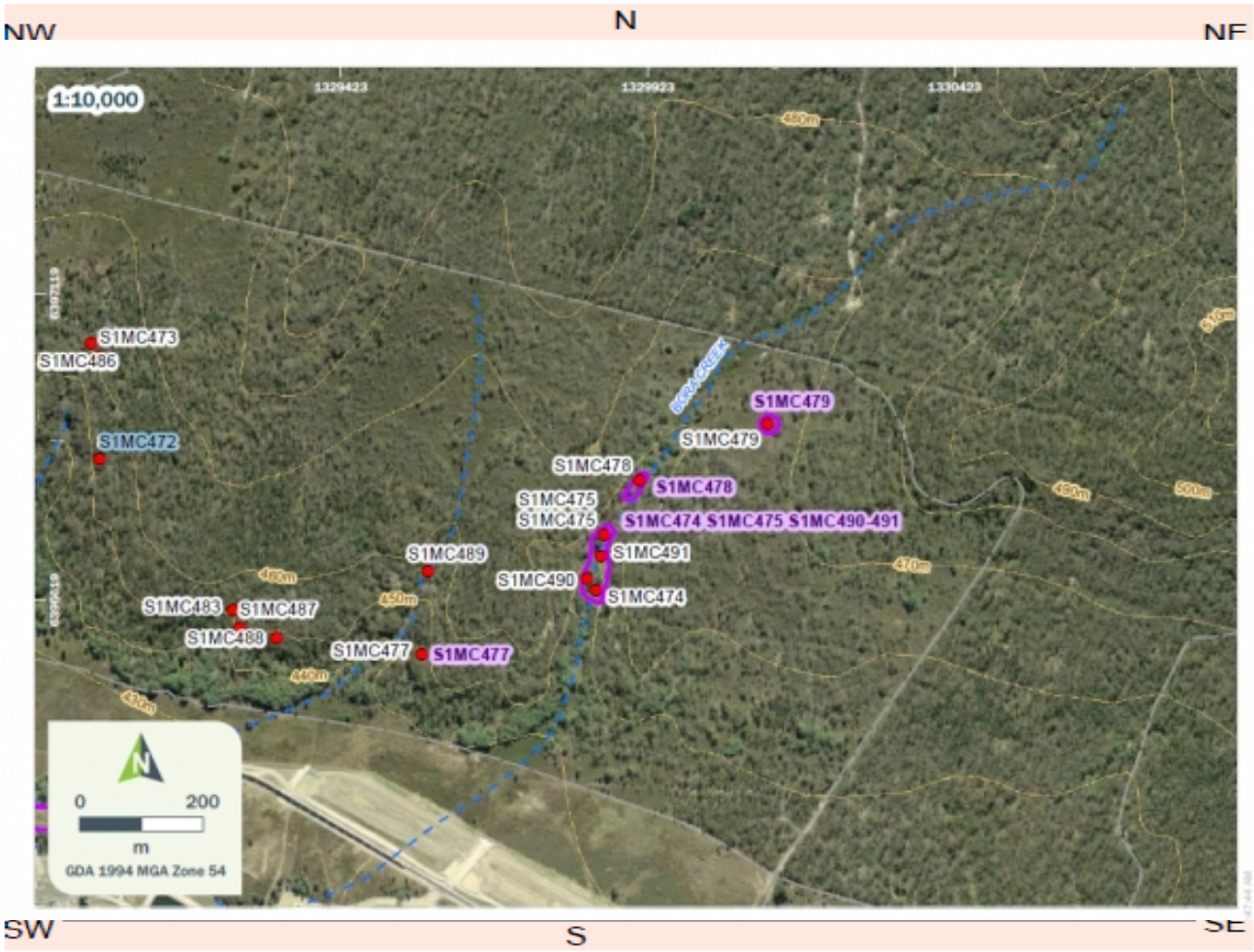
Land Form Unit: Ridge **Vegetation:** Open Woodland

Distance to Water (m): 200 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded within Moolarben Coal Operations (MCO). Contact MCO for more information.

Other site information: Rockshelter approx. 6.5m(w) x 2.3m(d) x 2.4m(h) in size. Formed through cavernous weathering, blockfall and undermining due to wombat burrowing. . Fissuring running diagonally and vertically through horizontal bedding. Veins of ironstone and discolouration of sandstone through ironstone wash.

Site location map



Site contents information

open/closed site: Closed

Site condition: Good

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	2	1				

Description:

Conglomerate sandstone outcrop with shelter, with horizontal bedding. The PAD consists of exfoliated sandy and rocky deposit on a sloped floor that has been disturbed by wombat burrowing. 1 quartz flake with feather termination and flaked platform.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		2	1				

Description:

PAD consists of exfoliated sandy and rocky deposit on a sloped floor that has been disturbed by wombat burrowing. PAD located in rock shelter approximately 6.5m(w) x 2.3m(d) x 2.4m(h) in size.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

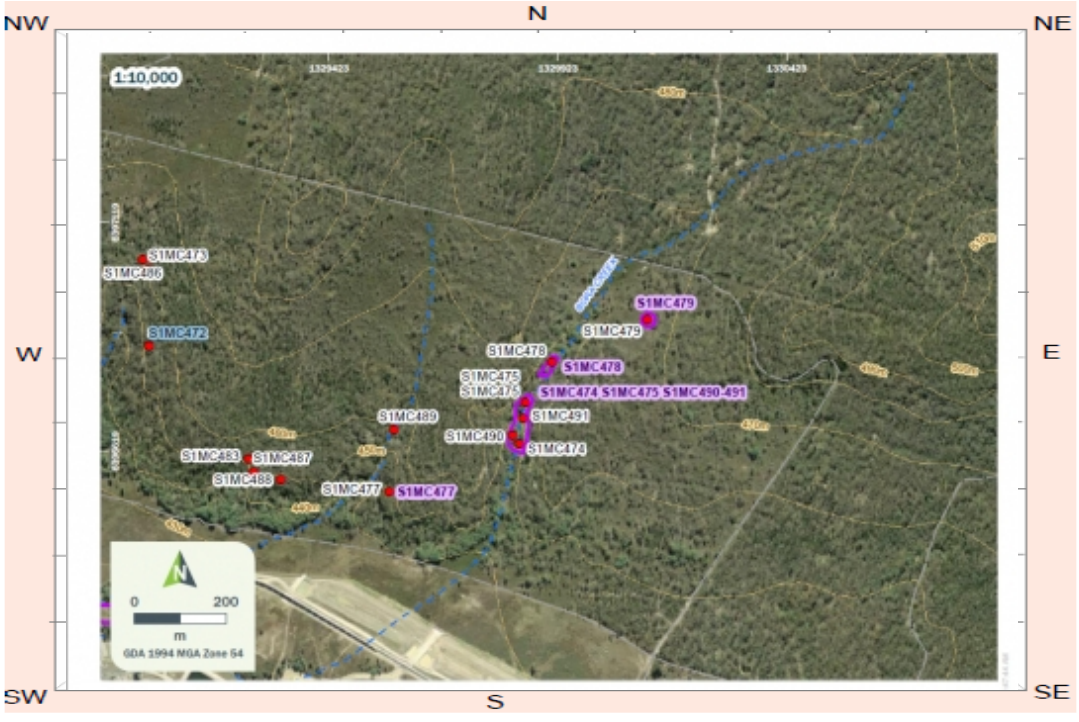
Description:

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Rockshelter approx. 6.5m(w) x 2.3m(d) x 2.4m(h) in size. Formed through cavernous weathering, blockfall and undermining due to wombat burrowing. . Fissuring running diagonally and vertically through horizontal bedding. Veins of ironstone and discolouration of sandstone through ironstone wash.

Site plan



Site photographs

Description: General shot of shelter S1MC472, facing north-east.

Description: General view of S1MC472, facing east.

Description: Fissuring occurring through sandstone, S1MC472

Description: Stone artefact located at S1MC472.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender ☐ General ☐ Location ☐

Why is this site restricted?:

Further information contact

Title	Surname	First name

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 36-3-3804 **Date recorded:** 15-09-2021

Site Location Information

Site name: S1MC466

Easting: 763003 **Northing:** 6429918 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 55 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title Ms. **Surname** Freeman **First name** Chelsea

Organisation: Niche environment and heritage

Address: 4/460 church street parramatta nsw 2150

Phone: 0488774501 **E-mail:** cfreeman@niche-eh.com

Site Context Information

Land Form Pattern: Steep Hills **Land Use:** Mining

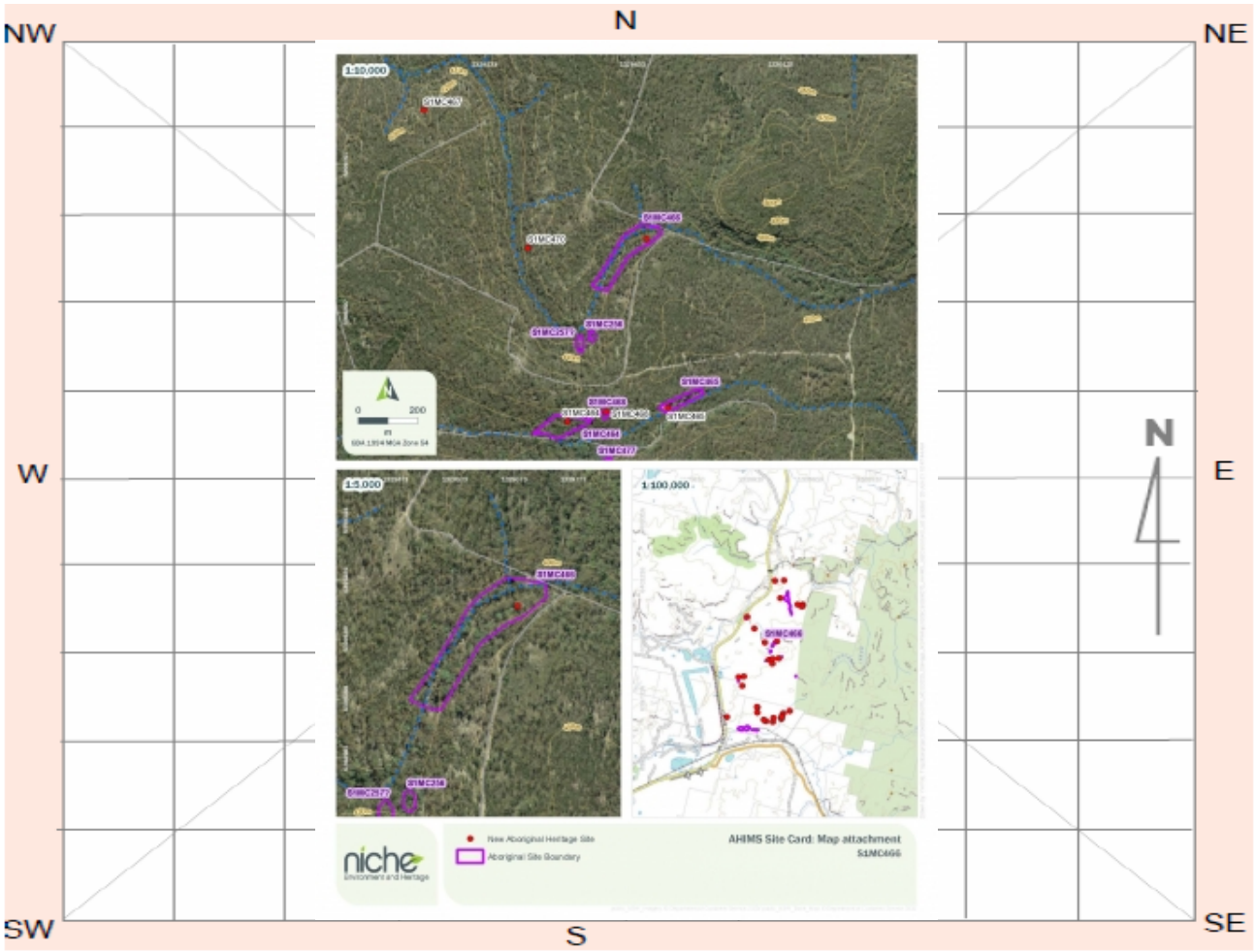
Land Form Unit: Stream Channel **Vegetation:** Open Woodland

Distance to Water (m): 30 **Primary Report:** UG4 Additional Survey Moolarben, ACHA.

How to get to the site: Site recorded with Moolarben Coal Operations (MCO). Contact MCO for more informaiton

Other site information: Artefact reduction techniques evident in the assemblage include blade and microblade, bipolar and non-determinate reduction.

Site location map



Site contents information

open/closed site: Closed

Site condition: Erosion

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	21	270	60				

Description:

21 stone artefacts observed from the sandstone outcrop extending down to and on both sides of the drainage line, and eroding from the creek banks, over a 270m x 60m area. Artefact types include quartz, chert and tuff complete and broken flakes and broken tools. Artefact reduction techniques evident.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.	Potential Archaeological Deposit		1.4	3				

Description:

Pagoda style sandstone outcrop situated on a gently sloped open depression, adjacent an incised drainage line on a plateaux which flows from a cliff-line to an enclosed gully. Sandy quartz sand deposits with a build up of exfoliated material. 150 mm at dripline, 1000mm towards creekline.

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

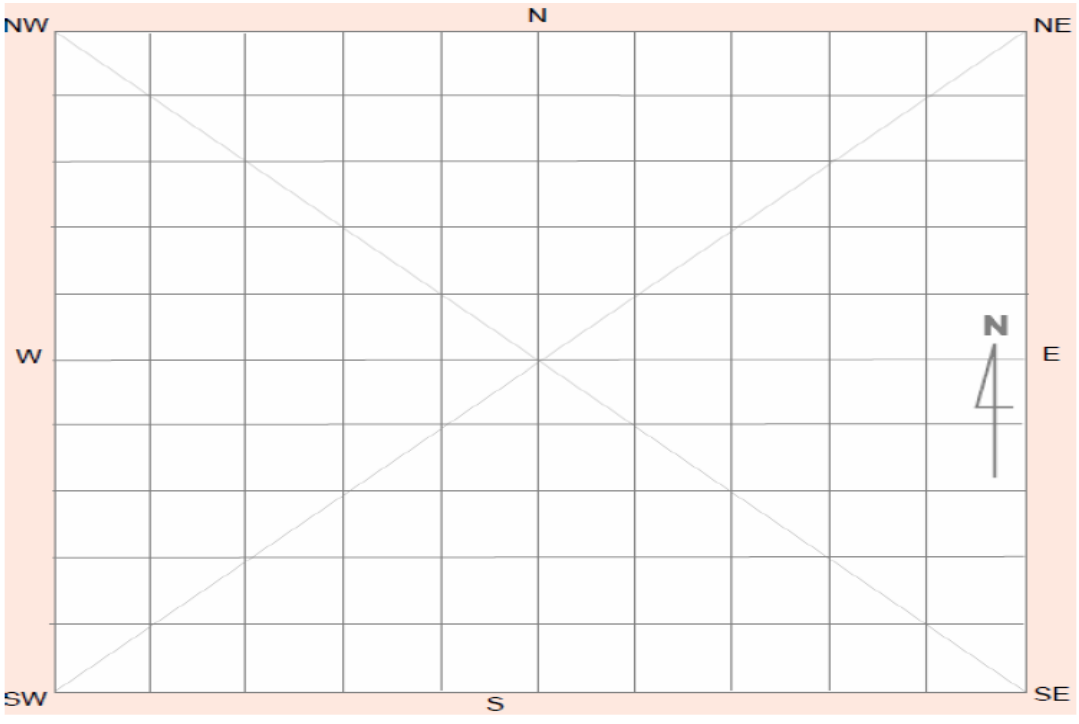
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: Artefact reduction techniques evident in the assemblage include blade and microblade, bipolar and non-determinate reduction.

Site plan



Site photographs

Description: Incised drainage line intersection S1M466.

Description: General photo of site S1MC 466, facing north. PAD and shelter.

Description: Stone artefacts at S1MC466.

Description: chert flake with usewear at site S1MC466.

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**