



**NARRABRI MINE  
ENVIRONMENTAL  
MANAGEMENT SYSTEM**

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**WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN  
LW107 to LW110**

# **EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110**

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**ACRONYMS USED THROUGHOUT THIS DOCUMENT**

ACHMP	Aboriginal Cultural Heritage Management Plan
AHIP	Aboriginal Heritage Impact Permit
CCC	Community Consultative Committee
DGS	Ditton Geotechnical Services
DRE	Division of Resources and Energy
DP&E	Department of Planning & Environment
EA	Environmental Assessment
EP&A Act	NSW Environmental Planning and Assessment Act
EP-HMP	Extraction Plan - Heritage Management Plan
GNAC	Gomeroi Narrabri Aboriginal Corporation
LALC	Local Aboriginal Land Council
LW	Longwall
MOP	Mining Operations Plan
NLALC	Narrabri Local Aboriginal Land Council
OEH	Office of Environment and Heritage
PA	Project Approval
RAP	Registered Aboriginal Party



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**DEFINITIONS USED THROUGHOUT THIS DOCUMENT**

Ground Disturbance	Events where significant subsidence or activities including subsequent site remediation works such as the ripping of large surface cracks or channel earthworks have the potential to impact archaeological sites
Significant Subsidence Events	Events where surface cracks resulting from subsidence appear larger than 1cm in width
Breach	A breach is any incident where the management actions and requirements outlined in this AHMP have not been followed.
Complaints	A complaint occurs where a party is dissatisfied or feels that the AHMP has not been complied with.
Disputes	A general dispute occurs where two parties (one of which is Narrabri Mine) do not agree on the implementation of any of the management recommendations of this AHMP.  A technical dispute occurs where two parties (one of which is Narrabri Mine) disagree on a methodological or interpretative issue for any of the management recommendations of this AHMP.

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## 1 **INTRODUCTION**

This Extraction Plan - Heritage Management Plan (EP-HMP) has been prepared as part of the Extraction Plan for Longwalls (LW) 107 to 110 in the Hoskissons Seam at the Narrabri Mine, located south of Narrabri, NSW which is owned and operated by Narrabri Coal Operations Pty Ltd. This plan sets out the management objectives and performance measures proposed to manage potential subsidence impacts to cultural heritage within the Extraction Plan area.

Subsidence predictions by Ditton Geotechnical Services (DGS) have been used as a basis for developing the performance measures, management actions and monitoring contained within this EP-HMP (Ditton Geotechnical Services Pty Ltd, 2015, 2017). DGS's analysis and results are contained, in full, as an appendix to the Extraction Plan.

The management and monitoring measures outlined within this management plan have been prepared based upon:

- the Narrabri Mine Aboriginal Cultural Heritage Management Plan (Whitehaven Coal, 2011);
- Stage 1 Aboriginal Heritage Assessment (Australian Archaeological Survey Consultants Pty Ltd, 2007);
- Stage 2 Aboriginal Heritage Assessment (Archaeological Surveys & Reports Pty Ltd, 2009);
- Narrabri Mine Modification 5 Aboriginal Cultural Heritage Assessment (Niche Environment and Heritage, 2015a)
- Longwall Panels 101-104 - Archaeological assessment of subsidence impacts on Aboriginal objects report (Niche Environment and Heritage, 2016); and
- subsequent consultation with the Narrabri Local Aboriginal Land Council (NLALC) and Gomeroi Narrabri Aboriginal Corporation (GNAC), the Registered Aboriginal Parties (RAPs) for the Narrabri Mine.

### 1.1 **Scope**

This EP-HMP applies to cultural heritage sites that have been recorded within the LW107-LW110 extraction area only. The purpose of this document is to ensure that impacts to these sites are managed in accordance with the Project Approval and aim to:

1. Provide a precise set of procedures to enable the identification and conservation of physical and cultural heritage sites and artefacts within the extraction area;
2. Ensure all personnel are aware of their obligations, responsibilities and the procedures under the *National Parks and Wildlife Act 1974* and *NSW Heritage Act 1977*; and
3. Establish a consultation protocol with the RAPs, who are representatives of the local Aboriginal community.



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The proposed mine plan and the location of all recorded Aboriginal heritage sites are shown on Figure 1. A detailed description of the underground mining is provided within the Extraction Plan.



Legend

- AHIMS Registered Archaeological Sites
- Longwalls
- Drainage Lines

NARRABRI MINE AHMP

**PREVIOUSLY RECORDED ABORIGINAL HERITAGE SITES**

0 200 400 600 800 1000 m



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## 1.2 Legal Requirements

This document has been prepared in accordance with Project Approval 08\_0144 (as modified), relevant legislation and guidelines, and in consultation with relevant government agencies and the RAPs as discussed below.

### 1.2.1 Project Approval

The Narrabri Mine was granted Project Approval (PA) for Stage 1, by the NSW Minister for Planning in November 2007 under Part 3A of the NSW Environmental Planning and Assessment Act, 1979 (EP&A Act). This included the development of a continuous miner underground mining operation. Stage 2 involves commencement of longwall mining operation (“secondary extraction”), and the installation of additional coal processing and handling infrastructure. Stage 2 was approved by the minister in July 2010.

The PA 08\_0144, Schedule 4, Conditions 22 to 24 related to the management and protection of Aboriginal objects affected by mine operations. Condition 22 requires that:

*“The proponent shall not destroy, damage or deface any known Aboriginal objects (as defined in the National Parks and Wildlife Act 1974) without the written approval of the Secretary.”*

Condition 23 requires Narrabri Mine to revise the existing Stage 1 Aboriginal Cultural Heritage Management Plan (ACHMP) to encompass all proposed mine activities associated with Stage 2. This revised plan (Whitehaven Coal, 2011) has been prepared and submitted to the Secretary for approval.

Prior to undertaking longwall operations proposed as part of Stage 2 works, the Narrabri Mine Project Approval, (Schedule 3 Condition 4), required that:

*“The proponents prepare and implement Extraction Plan for any second workings to be mined to the satisfaction of the Secretary.”*

*“Each Extraction Plan must...include the following to the satisfaction of DRE...Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for Aboriginal heritage, to manage the potential environmental consequences of the proposed second workings on heritage sites or values.”*

Approval was initially granted in 2012 for the Narrabri Mine Extraction Plan for longwall panels LW101-LW105. In 2015, additional approval was sought for operations in the adjacent LW106, requiring revision of existing Extraction Plans and associated sub-plans, including this EP-HMP. This document has been prepared for the Extraction Plan for LW107 to LW110.

It is noted in the Project Approval that management plans prepared under Condition 4 (including this Heritage Management Plan) should address all potential impacts of proposed underground coal extraction and that they are not required to duplicate management plans required elsewhere within the Project Approval.

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Therefore, this plan addresses only potential impacts of subsidence and associated remediation works on cultural heritage. Protection of Aboriginal objects from the impacts of other mining operations is addressed in the Stage 2 ACHMP (Whitehaven Coal, 2011).

### 1.3 Relevant Legislation

The protection of Indigenous cultural heritage in New South Wales is principally governed by the National Parks and Wildlife Act 1974 (NPW Act), which is administered by the Office of Environment and Heritage (OEH). Major developments, as is the case for the Narrabri Mine, are principally governed by the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act is designed to facilitate major and critical infrastructure developments.

The original approvals for the Narrabri Mine were obtained under the Part 3A, 'Major Projects' provisions of the EP&A Act. Part 3A has since been repealed, but remains applicable to Narrabri Coal Operations under transitional provisions. Under Section 75U(d) of these provisions, an Aboriginal Heritage Impact Permit (AHIP) under the NPW Act is not required for a project approved under Part 3A. Project approvals usually require a Cultural Heritage Management Plan (CHMP) and the approved project can proceed provided it is undertaken in compliance with the CHMP and the agreed management strategies.

Consultation undertaken for the Stage 1 and 2 EAs, has been in accordance with the NSW Government's "Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation" (NSW Department of Environment & Conservation, 2005). Future investigations on site will also give due consideration to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (NSW Department of Environment Climate Change & Water, 2010).

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## **2 Cultural Heritage in LW101 – LW110**

### **2.1 Known Aboriginal Heritage Sites**

Previous archaeological surveys undertaken for the Narrabri Mine have identified a total of 142 Aboriginal sites within the mine site (Advitech, 2012, 2013a, 2013b; Archaeological Surveys & Reports Pty Ltd, 2009; Australian Archaeological Survey Consultants Pty Ltd, 2007; Landskape, 2010; Niche Environment and Heritage, 2015b, 2016). Of these 69 are located over LW101-LW110 (refer to Table 4 and Figure 1). Twenty three of these sites are located over LW107-LW110.

Six sites, 10b, 38, 39, 43, 122 & 123 (AHIMS ID: 19-3-0094, 19-3-0098, 19-3-0099 & 19-6-0033 respectively, sites 122 & 123 have not been submitted to AHIMS at the time of preparation of this EP-HMP) are recognised as being of high scientific significance due to their research potential and ability to provide a greater understanding of the past Aboriginal occupation of the region. These sites have been fenced to protect them from inadvertent or accidental damage from vehicular traffic and will be managed in accordance with management and monitoring procedures outlined in Appendix A.

Sites 38 and 39 represent camp sites, containing both knapping sites and multiple activity sites. These sites contain at least 13 and 100+ artefacts respectively and have the potential to contain more extensive subsurface deposits. Site 43, a series of hearths, also has the potential to provide important information in the understanding of the local archaeological record.

Although not reported as being scientifically significant in the original report (Archaeological Surveys & Reports Pty Ltd, 2009), the grinding groove site 10b has been specifically noted by the RAPs as being significant with the 2009 EA identifying sites 10b and 39 as being of greatest significance (R.W. Corkery & Co. Pty. Limited, 2009). Sites 122 and 123

The remaining sites are recorded in disturbed contexts and comprised of very low artefact densities (<20 artefacts). A more detailed description of the sites is provided in the Aboriginal Heritage Assessments prepared for the Stage 1 and 2 projects (Advitech, 2012, 2013a, 2013b; Archaeological Surveys & Reports Pty Ltd, 2009; Australian Archaeological Survey Consultants Pty Ltd, 2007; Landskape, 2010; Niche Environment and Heritage, 2015a, 2015b, 2016). Predictions of subsidence impacts and potential consequences to the known cultural heritage sites are described in Section 3 of this management plan.



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**Table 1: Identified Aboriginal Heritage Sites – LW101 to LW110**

Site No.	Site Name	AHIMS ID	Site Type	Easting	Northing	Long Wall	Description
<i>Australian Archaeological Survey Consultants Pty Ltd, 2007 - Narrabri Coal Mine Stage 1 Assessment</i>							
7 (Stage 1)			Scarred Tree	772759	6621273	110	A single cultural scar on a fallen tree
<i>Archaeological Surveys &amp; Reports Pty Ltd, 2009 - Narrabri Coal Mine Stage 2 Assessment (Longwall Panels 1 to 7)</i>							
1	Pine Creek T2/OS 1		Artefact Scatter	774380	6623220	107	10-15 Artefacts in 8m*8m on eroding creek bank of Pine Creek plus additional artefact 30m to east. Site and multiple artefacts identified
2	Pine Creek T2/ISO 1		Isolated Artefact	774460	6623260	107	Isolated find within 30m of creek bank. Site located but no artefacts found
3	Pine Creek T2/OS 2	19-3-0086	Artefact Scatter	774680	6623380	106	4 artefacts in a 3m*3m area on an eroding creek bank. 3 additional artefacts 10m west.
4	Pine Creek T2/OS 3	19-3-0087	Artefact Scatter	774540	6623370	107	6 Artefacts over 8m*5m area of actively eroding creek bank plus ground edged axe 10 metres west. Site and multiple artefacts found
5	Pine Creek T2/OS 4	19-3-0088	Artefact Scatter	775150	6622600	105	3 artefacts over 2m*2m area adjacent to Pine Creek.
6	Pine Creek T2/OS 5	19-3-0089	Artefact Scatter	775250	6623000	105	3 artefacts over 3m*2m area adjacent to track at creek crossing.
7	Pine Creek T2/OS 6	19-3-0090	Artefact Scatter	775170	6623200	105	6 artefacts over 30m*10m area within horseshoe bend of creek.
8	Pine Creek T2/ISO 2	19-3-0091	Isolated Artefact	775100	6623230	105	Chert flaked piece within 10m of creek.
9	Pine Creek T2/ISO 3	19-3-0092	Isolated Artefact	775000	6623380	105	Quartz trimming flake (debitage) within 20m of creek.
10a	Pine Creek T2/OS 7	19-3-0093	Artefact Scatter	775270	6623190	105	2 artefacts (chert flakes) 2m apart 20m from creek.



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Site No.	Site Name	AHIMS ID	Site Type	Easting	Northing	Long Wall	Description
10b	Pine Creek T2/AGG 1	19-3-0094	Grinding Grooves	775260	6623160	105	3 grooves on 2 floaters of sandstone within 50m of creek.
11	Pine Creek T1/OS 8	19-6-0069	Artefact Scatter	775030	6623313	105	11 artefacts over 12m*4m area within 20m of creek. <b>Incorrect AHIMS co-ordinates. Archaeological Surveys &amp; Reports Pty Ltd record Site 11 as TS1/ISO 3 in Appendix V, however refer to it as TS1/OS 8 in text (Archaeological Surveys &amp; Reports Pty Ltd, 2009)</b>
12	Pine Creek T1/OS 9	19-6-0070	Artefact Scatter	775640	6621690	103	3 artefacts over 2m*2m area being 3 cores of chert.
13	Pine Creek T1/OS 10	19-6-0071	Artefact Scatter	775700	6621640	103	4 artefacts over 30m*2m area comprising core and flakes.
14	Pine Creek T1/ISO 4	19-6-0072	Isolated Artefact	775780	6621690	103	Flaked piece of chert within 20m of creek.
15	Pine Creek T1/OS 11	19-6-0073	Artefact Scatter	775820	6621630	103	2 Artefacts 3m apart, core and flake.
16	Pine Creek T1/OS 12	19-6-0074	Artefact Scatter	776130	6621700	102	7 Artefacts over 30m*3m area within 20m of creek.
17	Pine Creek T1/ISO 5	19-6-0075	Isolated Artefact	776180	6621690	102	Chert flake 10m from creek.
18	Pine Creek T1/OS 13	19-6-0076	Artefact Scatter	776200	6621700	102	4 artefacts over 30m*2m area within 20m of creek comprising core and flakes.
19	Pine Creek T1/OS 14	19-6-0077	Artefact Scatter	776250	6621700	102	18 artefacts over 20m*20m area including collapsed wall of dam.
20	Pine Creek T1/ST 1	19-6-0078	See description	776400	6621660	101	RAPs advised during December 2014 that this is not a scarred tree.
21	Pine Creek T1/ISO 6	19-6-0079	Isolated Artefact	776600	6621740	101	Chert flake within 30m of creek.



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Site No.	Site Name	AHIMS ID	Site Type	Easting	Northing	Long Wall	Description
22	Pine Creek T1/OS 15	19-6-0080	Artefact Scatter	776050	6621620	102	5 artefacts over 15m*5m area south of the wall of a dam.
23	Pine Creek T1/OS 16	19-6-0081	Artefact Scatter	776100	6621620	102	3 artefacts over 25m*1m area – all flakes, 30-40m from creek.
24	Pine Creek T1/OS 17	19-6-0082	Artefact Scatter	776130	6621450	102	2 artefacts in vehicle track crossing creek comprising Core and Flake.
25	Pine Creek T1/ISO 7	19-6-0083	Isolated Artefact	775980	6621270	102	Chert flake at junction of drainage line with creek.
26	Pine Creek T1/ISO 8	19-6-0084	Isolated Artefact	776020	6621260	102	Chert flake at junction of drainage line with creek.
27	Pine Creek T1/OS 18	19-6-0085	Artefact Scatter	776010	6621200	102	2 artefacts 3m apart, 2 flakes.
28	Pine Creek T1/ISO 9	19-6-0086	Isolated Artefact	775900	6621080	102	Flake at junction of drainage channel and creek.
29	Pine Creek T1/ISO 10	19-6-0087	Isolated Artefact	775780	6620780	103	Core at junction of drainage channel and creek.
30	Pine Creek T1/OS 19	19-6-0088	Artefact Scatter	775690	6620800	103	2 artefacts 4m apart on gully bank.
31	Pine Creek T1/OS 20	19-6-0089	Artefact Scatter	775730	6620740	103	3 artefacts in 5m*1m area. Core and flakes within gully bank.
32	Pine Creek T1/OS 21	19-6-0090	Artefact Scatter	776250	6621480	102	2 artefacts 10m apart. core and flake 40m from creek.
33	Pine Creek T1/OS 22	19-6-0091	Artefact Scatter	776250	6621510	102	2 artefacts 15m apart. flakes 12m from creek.



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Site No.	Site Name	AHIMS ID	Site Type	Easting	Northing	Long Wall	Description
34	Pine Creek T1/OS 23	19-6-0092	Artefact Scatter	776270	6621560	101	4 artefacts 15m apart. flakes 10m from creek.
35	Pine Creek T2/OS 24	19-3-0095	Artefact Scatter	775710	6622970	104	2 artefacts 20m apart. flakes 30m from creek.
36	Pine Creek T2/ISO 11	19-3-0096	Isolated Artefact	775760	6623060	104	Chert flake 35m from creek.
37	Pine Creek T2/ISO 12	19-3-0097	Isolated Artefact	775640	6623290	104	Chert flake in road 15m from drainage line and 50m from creek.
38	Pine Creek T2/OS 25	19-3-0098	Artefact Scatter	775580	6623390	104	13 artefacts in 20m*15m area over low rise 30m from creek.
39	Pine Creek T2/OS 26	19-3-0099	Artefact Scatter	775660, 775680, 775680, 775650	6623460, 6623480, 6623520, 6623530	104	>100 artefacts contained within these coordinates, 30m from the creek, comprising flakes and flake pieces.
40	Pine Creek T2/OS 27	19-3-0100	Artefact Scatter	775720	6623530	104	4 artefacts over 7m*5m area 10m from creek comprising flakes and flake pieces.
41	Pine Creek T2/OS 27	19-3-0101	Artefact Scatter	775630	6623220	104	7 artefacts over 10m*5m area 15m from creek comprising scrapers and flakes.
42	Pine Creek T2/OS 28	19-3-0102	Artefact Scatter	775640	6623140	104	2 artefacts 5m apart comprising flakes 15m from creek.
43	Pine Creek T1/FP1	19-6-0093	Open Camp Site	775080	6620610	105	3 hearths identified in washout beside road approx. 40m from drainage line.
44	Pine Creek ISO 44		Isolated Artefact	774191	6623362	107	1 silcrete flake; 60m from creek. Site located but artefact could not be found
45	Pine Creek ISO 45		Artefact Scatter	774225	6623326	107	1 mudstone flake; 60m from creek. Site was relocated later and an additional 4 artefacts were found
46	Pine Creek ISO 46		Artefact Scatter	774223	6623302	107	1 mudstone flake; 70m from creek. Site was located; artefact could not be found but 3 additional artefacts found



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47	Pine Creek OS 47		Artefact Scatter	774254	6623273	107	2 artefacts 3m apart – all flakes; 30m from creek. Site was located and 1 of the artefacts was found and 3 additional artefacts were found
48	Pine Creek OS 48		Artefact Scatter	774286	6623232	107	3 artefacts in 3m*3m area - all flakes; 40m from creek. Site was located; previous artefacts not found but 3 additional artefacts found
49	Pine Creek OS 49		Artefact Scatter	774321	6623231	107	5 artefacts in 10m*5m area -all flakes; 30m from creek. Site was located; previous artefacts not found but 3 additional artefacts found
50	Pine Creek OS 50		Artefact Scatter	774341	6623233	107	3 artefacts in and beside gully - all flakes; 20m from creek. Site was located; previous artefacts not found but 3 additional artefacts found
51	Pine Creek OS 51		Artefact Scatter	773932	6623550	108	3 artefacts in 10m*5m area - all flakes; dam wall. Site originally on dam wall in dam and was not located as it is now underwater
52	Pine Creek OS 52		Artefact Scatter	773960	6623535	108	2 artefacts 2m apart – all flakes; dam wall. Site was located; previous artefacts not found but 2 additional artefacts found
53	Pine Creek OS 53		Artefact Scatter	773936	6623490	108	6 artefacts in 20m*5m area; dam wall; includes flakes and core. Site originally on dam wall in dam and was not located as it is now underwater
54	Pine Creek OS 54		Artefact Scatter	774187	6623206	107	2 artefacts 5m apart – all flakes; dam wall. Site originally on dam wall in dam and was not located as it is now underwater
<b>Advitech, 2012 - Archaeological Survey Report Site "Pine Creek T1/AGG 1"</b>							
122			Grinding Grooves	776000	6622361	102	6 grinding grooves located on 3 sandstone platforms
<b>Advitech, 2013b - Archaeological Survey Aboriginal Sites within Panels 6 and 7</b>							
123			Scarred Tree	774755	6623246	106	Genuine looking scar with modern surveyors markings
<b>Advitech, 2013a - Archaeological Survey Aboriginal Sites within Panels 8 and 13</b>							
124			Isolated Artefact	774207	6623420	107	Isolated artefact on existing vehicle track; 25m from creek
125			Isolated Artefact	774100	6623275	108	Isolated artefact on existing vehicle track; 100m from creek
126			Isolated Artefact	773989	6623174	108	Isolated artefact on existing vehicle track; 160m from creek. Artefact could not be relocated.
127			Artefact Scatter	773442	6623531	109	5 artefacts in 10m*5m area; 20m from creek
129			Artefact Scatter	772831	6623540	110	4 artefacts in 15m*10m area; Pine Creek directly north
130			Artefact Scatter	773065	6621721	110	20 artefacts in 50m*15m area; Pine Creek tributary directly east
131			Isolated Artefact	772841	6621434	110	Isolated artefact on creek terrace; 20m from creek



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Site No.	Site Name	AHIMS ID	Site Type	Easting	Northing	Long Wall	Description
132			Isolated Artefact	773063	6621692	110	Isolated artefact on creek terrace; 20m from creek
<i>Niche Environment and Heritage, 2015 - Narrabri Mine – Verification of Newly Identified Aboriginal Cultural Heritage Objects</i>							
133			Artefact Scatter	775535	6623132	104	5 stone artefacts located in Pine Tree grove
134			Isolated Artefact	775608	6623085	104	Isolated broken flake artefact on elevated area north-east of Site 133
135			Isolated Artefact	775608	6623150	104	Isolated stone artefact on elevated area south of creek line

### 2.2 Potential for Additional Sites

While the distribution of sites within the LW101-LW110 extraction area is directly associated with watercourses, it is likely that isolated artefacts or low density scatters also occur concealed beneath the pasture grasses.

These sites would not be in their depositional context, having been disturbed during land clearing, harrowing, ploughing, and the construction of contour banks and dams. Such a background of very low density sites is typical of open country on the western slopes and is generally considered to be the “archaeological background” with a typical artefact density in the order of one artefact per >1,000m<sup>2</sup> (Archaeological Surveys & Reports Pty Ltd, 2009).

The archaeological assessments of LW101-LW110 (Archaeological Surveys & Reports Pty Ltd, 2009; Landskape, 2010) have noted that the potential for larger unidentified sites is relatively low, given the lack of reliable water source, few exposures of sandstone bedrock, and no rock overhangs.

The management measures outlined in Table 7 and Appendix B have been developed in consultation with the RAPs and includes protocols and contact details in regards to the discovery of new sites and skeletal remains.



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### 3 Subsidence and Environmental Consequences

#### 3.1 Revised Subsidence Predictions

Revised predictions of subsidence were prepared by Ditton Geotechnical Services Pty Ltd (DGS) in 2015 for LW101-LW106 and 2017 for LW107-LW110 (Ditton Geotechnical Services Pty Ltd, 2015, 2017) in response to the proposed addition of LW106 to mine operations. Predicted maximum subsidence estimates are summarised in Table 2. The DGS reports (2015 & 2017) are provided in full as an appendix to the Extraction Plan.

**Table 2: Subsidence effect predictions (DGS, 2015 & 2017)**

LW	Cover Depth (m)	Maximum Subsidence $S_{max}(m)$	Tilt $T_{max}$ (mm/m)	Tensile Strain (mm/m)	Compressive Strain (mm/m)
101	165 - 177	2.57 - 2.65	44 - 47	9 - 10	12 - 13
102	175 - 188	2.65	40 - 45	8 - 9	10 - 12
103	190 - 200	2.71	38 - 41	7 - 8	9 - 10
104	180 - 215	2.66 - 2.71	34 - 43	6 - 9	8 - 11
105	200 - 235	2.71	30 - 38	5 - 7	7 - 9
106	220 - 255	2.58 - 2.61	25 - 31	4 - 6	6 - 7
107 - 110	240 - 325	0.24 - 2.75	17 - 44	4 - 25	3 - 16

##### 3.1.1 Subsidence Cracking

Based on the predicted range of maximum strains and cover depths, DGS has indicated that maximum surface cracking widths of between 40 – 260mm for LW101-LW106 and 30-130mm for LW107-LW110 may occur above the longwall panels and within the limits of extraction (2015 & 2017). Where strain concentrations occur in near-surface rock, these widths may double locally to between 80-520mm for LW101-106 and 60-260mm for LW107-LW110 respectively. Crack widths may also exceed the predicted range near steep creek banks along Pine Creek and its tributaries. Based on experience in the Newcastle Coalfields (ACARP, 2003 in Ditton Geotechnical Services Pty Ltd, 2012) cracks are likely to have fully developed by the time the longwall face has retreated past a given location by a distance equal to one to two times the cover depth.

Predicted subsidence cracking relative to the mine plan is shown in Appendix B of the Extraction Plan.

##### 3.1.2 Ponding

As reported by DGS (2015), the predicted maximum panel subsidence of 2.75 m could result in closed form depressions forming in the central areas of the panels and disrupt natural drainage pathways. Analysis of the pre and post mining surface levels also



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suggests that ponding (if it occurs) is likely to develop along Pine Creek and Pine Creek Tributary 1.

Maximum potential ponding depths of 0.25 - 2.1 m are estimated for LW101-LW106. DGS (2015) note that this is a significant increase from the 0.1 – 1.3 m previously predicted for LW101-LW105. Maximum potential ponding depths of 0.1 – 2.6 m are estimated for LW107-LW110 (DGS 2017)

Predicted ponding relative to the mine plan are shown in Appendix B of the Extraction Plan.

**3.1.3 Monitoring of Subsidence Impacts to Aboriginal Heritage Sites**

As part of Whitehaven’s commitments as part of this management plan, Niche Environment & Heritage was engaged by Whitehaven in 2016 to undertake monitoring of Aboriginal archaeological sites within LW101-104 for subsidence impacts. 33 Aboriginal heritage sites were inspected (Table 3) with the following impacts were identified:

- Slumping of ground surface
- Cracking of ground surface; and
- One instance of accidental surface disturbance

One site was noted as being accidentally impacted and through consultation with Aboriginal field representatives relocated these artefacts. Niche subsequently identified a range of mitigation recommendations for the future management of these sites to ensure that impacts were minimised which are summarised in Table 4.

**Table 3: Subsidence Impacts to Aboriginal Heritage Sites – LW101 to LW104**

Site No.	Site Name	AHIMS ID	Identified Impacts
10b	Pine Creek T2/AGG 1	19-3-0094	Cracks in close proximity to grinding grooves within site boundary.
37	Pine Creek T2/ISO 12	19-3-0097	Very large cracks are located within site boundary.
39	Pine Creek T2/OS 26	19-3-0099	Cracks are located within site boundary.
40	Pine Creek T2/OS 27	19-3-0100	No Impacts
41	Pine Creek T2/OS 27	19-3-0101	Cracks are located within site boundary
42	Pine Creek T2/OS 28	19-3-0102	No Impacts
11	Pine Creek T1/OS 8	19-6-0069	No Impacts
12	Pine Creek T1/OS 9	19-6-0070	Large cracks run across site area
13	Pine Creek T1/OS 10	19-6-0071	No Impacts
14	Pine Creek T1/ISO 4	19-6-0072	No Impacts
15	Pine Creek T1/OS 11	19-6-0073	No impact by subsidence. Accidental disturbance through ground surface works. Artefacts were re-located and collected (Niche 2015).
16	Pine Creek T1/OS 12	19-6-0074	No Impacts
17	Pine Creek T1/ISO 5	19-6-0075	No Impacts
18	Pine Creek T1/OS 13	19-6-0076	No Impacts
19	Pine Creek T1/OS 14	19-6-0077	No cracks within the site boundary. One crack is in close proximity to the west.
21	Pine Creek T1/ISO 6	19-6-0079	No Impacts
22	Pine Creek T1/OS 15	19-6-0080	One crack runs through site area.
23	Pine Creek T1/OS 16	19-6-0081	No cracks within the site boundary. One crack is in close proximity to the west.
24	Pine Creek T1/OS 17	19-6-0082	No Impacts



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Site No.	Site Name	AHIMS ID	Identified Impacts
25	Pine Creek T1/ISO 7	19-6-0083	No Impacts
26	Pine Creek T1/ISO 8	19-6-0084	No Impacts
27	Pine Creek T1/OS 18	19-6-0085	No Impacts
28	Pine Creek T1/ISO 9	19-6-0086	No Impacts
29	Pine Creek T1/ISO 10	19-6-0087	No Impacts
30	Pine Creek T1/OS 19	19-6-0088	No Impacts
31	Pine Creek T1/OS 20	19-6-0089	No Impacts
32	Pine Creek T1/OS 21	19-6-0090	Large crack runs across site area.
33	Pine Creek T1/OS 22	19-6-0091	Large crack runs across site area.
34	Pine Creek T1/OS 23	19-6-0092	Large crack runs across site area.
122	Pine Creek T1/AGG1	122	Cracks in close proximity to grinding grooves within the site boundary.
133	Pine Creek T2/OS29	133	Cracks are located within site boundary.
134	Pine Creek T2/ISO13	134	Very large cracks are located within site boundary.
135	Pine Creek T2/ISO14	135	No Impact

### 3.1.4 Subsidence Remediation

As reported in the Stage 2 EA (R.W. Corkery & Co. Pty. Limited, 2009) disturbance resultant from any subsidence induced surface cracking and/or ponding will be progressively rehabilitated as follows:

- Due to the relatively deep soil profile above the longwall panels, it is likely that many of the smaller width cracks would be filled in naturally by the actions of wind, water and natural soil movement. No additional remediation works would be required;
- Larger surface cracks not filled in by natural processes will need to be repaired by ripping and re-compacting spoil material or pouring gravel or grout into deep cracks. In the interests of public and stock safety, temporary fencing may be installed around large cracks, or where erosion has increased slope instability before effective repairs can be completed;
- Any changes to surface drainage paths and surface vegetation in areas of ponding development (if they occur) will be assessed at the completion of each longwall panel. Channel earthworks may be required to re-establish drainage path ways; and
- Identified sites occurring above LW107-LW110 will be avoided where practicable, but sites may be disturbed during the construction of gas drainage infrastructure and/or access tracks to these locations as per the Stage 1 Project Approval. A 'Permit to Disturb' procedure has been developed to ensure that proposed surface disturbance works are cross referenced with the identified archaeological sites prior to works commencing and will be managed separately to the extraction plan.

### 3.2 Potential Environmental Consequences: Cultural Heritage

The impact of subsidence on Aboriginal sites overlying LW107-LW110 and management recommendations are summarised in Table 4 & Table 6 and may involve the following:

- Vertical Displacement;
- Cracking;

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- Ponding; and
- Subsidence Remediation.

### 3.2.1 Artefact Scatters

All of the artefact scatters and isolated artefacts occur on actively degrading surfaces and it is assumed that most of the artefacts have already been displaced by slope-wash, stock movement, land clearance, ploughing, harrowing and vehicular traffic. There would be very few artefacts in their original depositional context or provenance and the direct impact of subsidence (vertical or horizontal displacement) is likely to be minimal.

Significant subsidence events (cracks larger than 4cm in width) and subsequent site remediation works such as the ripping of large surface cracks or channel earthworks have the potential to impact artefact scatters. However it is likely that cracking alone will not impact the surface artefacts, although they may be displaced through related surface erosional processes. Cracking does have the potential to impact the integrity of *in-situ* archaeological deposits

Both prior and during mining and if requested by the RAPs, those sites identified as being within 50 m of significant subsidence events will be surface collected. The remaining sites will be avoided where practicable. In the event that subsidence remediation works make impacts on sites unavoidable (subject to reasonable efforts to avoid such sites), the sites will also be collected in accordance with procedures outlined in Appendix A.

### 3.2.2 Scarred Trees

Two scarred trees are located within the mining impact area. One scarred tree (Site 123) is located in LW106 and is described as a genuine looking scar with modern markings. While it is possible that subsidence could result in a changed drainage pattern, it is considered that the tree's root system would resist undermining. The other tree (Site 7 Stage 1 located in LW 110) is a cultural scar recorded on a fallen log. It is not at risk from subsidence related impacts.

### 3.2.3 Axe-grinding Grooves

Two axe grinding groove sites (Site 10b and 122) are identified as occurring on sandstone floaters, not bedrock and as such the only impact to the site from subsidence would be the vertical displacement of the floaters, which would have no direct impact on the axe-grinding grooves (Archaeological Surveys & Reports Pty Ltd, 2009).

Any site remediation works such as the ripping of large surface cracks or channel earthworks also have the potential to impact grinding grooves. Niche (2016) has identified that an action plan should be developed prior to any remediation for these sites. Site 10b and 122 should be fenced and protected from any machinery as outlined in Appendix A.



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**Table 4: Management of Aboriginal Heritage Sites – LW101 to LW110**

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
	7 (Stage 1)		Moderate	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li>Avoid where practicable and monitor.</li> <li>Manage fuel loads by raking debris from site, review quarterly</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance with the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
1	Pine Creek T2/OS 1		Moderate	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance with the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
2	Pine Creek T2/ISO 1		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
3	Pine Creek T2/OS 2	19-3-0086	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
4	Pine Creek T2/OS 3	19-3-0087	Moderate	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
5	Pine Creek T2/OS 4	19-3-0088	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
6	Pine Creek T2/OS 5	19-3-0089	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
7	Pine Creek T2/OS 6	19-3-0090	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
8	Pine Creek T2/ISO 2	19-3-0091	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
9	Pine Creek T2/ISO 3	19-3-0092	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
10a	Pine Creek T2/OS 7	19-3-0093	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable and monitor.</li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
10b	Pine Creek T2/AGG 1	19-3-0094	High	<ul style="list-style-type: none"> <li>Site Cracking – cracks in close proximity to grinding grooves</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li><b>Monthly monitoring</b></li> <li><b>Formulation of Action Plan within 6 months of approval of this plan</b></li> <li><b>Remediation of Cracks</b></li> <li>Grinding grooves are considered to be located on sandstone 'floaters' in alluvial soils and are not at risk of damage from site cracking.</li> <li>This site has been fenced to provide additional protection</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
11	Pine Creek T1/OS 8	19-6-0069	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
12	Pine Creek T1/OS 9	19-6-0070	Low	<ul style="list-style-type: none"> <li>Site Cracking - Large cracks run across the site area</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
13	Pine Creek T1/OS 10	19-6-0071	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
14	Pine Creek T1/ISO 4	19-6-0072	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
15	Pine Creek T1/OS 11	19-6-0073	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site will be fenced to provide additional protection.</li> <li>Site has been collected and relocated due to accidental disturbance</li> </ul>
16	Pine Creek T1/OS 12	19-6-0074	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
17	Pine Creek T1/ISO 5	19-6-0075	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
18	Pine Creek T1/OS 13	19-6-0076	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
19	Pine Creek T1/OS 14	19-6-0077	Low.	<ul style="list-style-type: none"> <li>Site Cracking – one large crack observed to west of site</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
20	Pine Creek T1/ST 1	19-6-0078	Low.	<ul style="list-style-type: none"> <li>Not a site</li> </ul>	<ul style="list-style-type: none"> <li>Update AHIMS Site Card to reflect that this item is no longer considered to be cultural in origin.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
21	Pine Creek T1/ISO 6	19-6-0079	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
22	Pine Creek T1/OS 15	19-6-0080	Low.	<ul style="list-style-type: none"> <li>Site Cracking – one crack runs through the site area</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
23	Pine Creek T1/OS 16	19-6-0081	Low	<ul style="list-style-type: none"> <li>Site Cracking – one large crack observed to west of site</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
24	Pine Creek T1/OS 17	19-6-0082	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
25	Pine Creek T1/ISO 7	19-6-0083	Low	<ul style="list-style-type: none"> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
26	Pine Creek T1/ISO 8	19-6-0084	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
27	Pine Creek T1/OS 18	19-6-0085	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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## WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
28	Pine Creek T1/ISO 9	19-6-0086	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
29	Pine Creek T1/ISO 10	19-6-0087	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
30	Pine Creek T1/OS 19	19-6-0088	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
31	Pine Creek T1/OS 20	19-6-0089	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
32	Pine Creek T1/OS 21	19-6-0090	Low	<ul style="list-style-type: none"> <li>Site Cracking – One large crack runs across site area</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
33	Pine Creek T1/OS 22	19-6-0091	Low	<ul style="list-style-type: none"> <li>Site Cracking – One large crack runs across site area</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
34	Pine Creek T1/OS 23	19-6-0092	Low	<ul style="list-style-type: none"> <li>Site Cracking – One large crack runs across site area</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
35	Pine Creek T2/OS 24	19-3-0095	Low	Unlikely to be impacted - Very large cracks are located within site boundary	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
36	Pine Creek T2/ISO 11	19-3-0096	Low	<ul style="list-style-type: none"> <li>Site Cracking – Cracks are located within the site boundary</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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## WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
37	Pine Creek T2/ISO 12	19-3-0097	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li><b>Formulation of Action Plan within 6 months of approval of this plan</b></li> <li><b>Collection as last resort if remediation unsuccessful</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
38	Pine Creek T2/OS 25	19-3-0098	High	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li><b>Formulation of Action Plan within 6 months of approval of this plan</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
39	Pine Creek T2/OS 26	19-3-0099	High	<ul style="list-style-type: none"> <li>Site Cracking – Cracks are located within the site Boundary</li> </ul>	<ul style="list-style-type: none"> <li><b>Monthly monitoring</b></li> <li><b>Formulation of Action Plan within 6 months of approval of this plan</b></li> <li><b>Remediation of Cracks</b></li> <li><b>Management of these sites will be undertaken in consultation with the RAPs.</b></li> <li>In the event that subsidence remediation works make impacts on sites unavoidable, the sites will be collected in accordance with Appendix A.</li> <li>Sites 38 and 39 have been fenced to provide additional protection and where possible, no subsidence remediation works will be undertaken within 10m of the site boundaries as outlined within Appendix A.</li> </ul>
40	Pine Creek T2/OS 27	19-3-0100	Low	<ul style="list-style-type: none"> <li>Unlikely to be impacted</li> </ul>	<ul style="list-style-type: none"> <li><b>Annual monitoring</b></li> <li><b>Management of these sites will be undertaken in consultation with the RAPs.</b></li> <li><b>Formulation of Action Plan within 6 months of approval of this plan</b></li> <li>Predicted impact to these sites will be updated following the completion of mining within LW101 and based on the results of the subsidence monitoring. The remaining sites will be avoided where practicable. In the event that subsidence remediation works make impacts on sites unavoidable, the sites will be collected in accordance with Appendix A.</li> <li>Sites 38 and 39 have been fenced to provide additional protection and where possible, no subsidence remediation works will be undertaken within 10m of the site boundaries as outlined within Appendix A.</li> </ul>
41	Pine Creek T2/OS 27	19-3-0101	Low	<ul style="list-style-type: none"> <li>Site Cracking – Cracks are located within the site Boundary</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Monthly Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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## WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
42	Pine Creek T2/OS 28	19-3-0102	Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li>Avoid where practicable.</li> <li><b>Annual Monitoring</b></li> <li>If surface cracking or subsidence remediation works make impacts unavoidable, collect in accordance with procedures in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
43	Pine Creek T1/FP1	19-6-0093	High	<ul style="list-style-type: none"> <li>Unlikely to be impacted</li> </ul>	<ul style="list-style-type: none"> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
44	Pine Creek ISO 44		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
45	Pine Creek ISO 45		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
46	Pine Creek ISO 46		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
47	Pine Creek OS 47		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
48	Pine Creek OS 48		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
49	Pine Creek OS 49		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>



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## WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
50	Pine Creek OS 50		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
51	Pine Creek OS 51		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
52	Pine Creek OS 52		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
53	Pine Creek OS 53		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
54	Pine Creek OS 54		Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
122			High	<ul style="list-style-type: none"> <li>Surface Cracking – Cracks in close proximity to grinding grooves</li> <li>Erosion</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Monthly Monitoring</b></li> <li><b>Formulation of Action Plan</b></li> <li><b>Remediation of Cracks</b></li> <li>Grinding grooves are considered to be located on sandstone 'floaters' in alluvial soils and are not at risk from site cracking.</li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
123			High	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
124			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>



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## WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN LW107 to LW110

Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
125			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
126			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
127			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
129			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
130			Moderate	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>Avoid where practicable and monitor.</li> <li>If the site is to be impacted by subsidence remediation, all works will be undertaken in accordance the procedures outlined in Appendix A.</li> <li>This site has been fenced to provide additional protection.</li> </ul>
131			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
132			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual Monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
133			Low	<ul style="list-style-type: none"> <li>Site Cracking – Cracks located in site boundary</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Monthly monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>



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Site No.	Site Name	AHIMS ID	Archaeological Significance <sup>#</sup>	Potential Impacts <sup>*</sup>	Management
134			Low	<ul style="list-style-type: none"> <li>Site Cracking – Very large cracks are located in site boundary</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Monthly monitoring</b></li> <li><b>Remediation of Cracks</b></li> <li><b>Collection as last resort if remediation unsuccessful</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>
135			Low	<ul style="list-style-type: none"> <li>Site Cracking</li> </ul>	<ul style="list-style-type: none"> <li><b>Submit site card to AHIMS</b></li> <li><b>Annual monitoring</b></li> <li>This site has been fenced to provide additional protection.</li> <li>Where possible, no subsidence remediation works will be undertaken within 10m of the site boundary as outlined within Appendix A.</li> </ul>

**Source:** Modified from Advitech, 2012, 2013a, 2013b; Archaeological Surveys & Reports Pty Ltd, 2009; Australian Archaeological Survey Consultants Pty Ltd, 2007; Landskape, 2010; Niche Environment and Heritage, 2015, 2016.

**# Note:** This table refers to archaeological significance as described in Section 2.1. RAPs consider all sites to be culturally significant.

**\* Potential impacts identified by** Ditton Geotechnical Services Pty Ltd, 2015, 2017. Impacts as identified from DGS (2015 & 2017) Table 16



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**WHC\_PLN\_NAR\_EXTRACTION PLAN HERITAGE MANAGEMENT PLAN  
LW107 to LW110**

**Table 5: Management Summary**

<b>Management Recommendation</b>	<b>Site ID</b>
Monthly Monitoring	19-3-0094 19-3-0097 19-3-0099 19-3-0101 19-6-0070 19-6-0080 19-6-0090 19-6-0091 19-6-0092 122 - Pine Creek T1/AGG1 133 - Pine Creek T2/OS29 134 - Pine Creek T2/ISO13
Quarterly Monitoring	7 (Stage 1)
Annual Monitoring	19-3-0095 19-3-0096 19-3-0098 19-3-0100 19-3-0102 19-6-0069 19-6-0071 19-6-0072 19-6-0073 19-6-0074 19-6-0075 19-6-0076 19-6-0077 19-6-0079 19-6-0081 19-6-0082 19-6-0083 19-6-0084 19-6-0085 19-6-0086 19-6-0087 19-6-0088 19-6-0089 19-6-0093 44 – Pine Creek ISO 44 45 – Pine Creek ISO 45 46 – Pine Creek ISO 46 47 – Pine Creek OS 47 48 – Pine Creek OS 48 49 – Pine Creek OS 49 50 – Pine Creek OS 50 51 – Pine Creek OS 51 52 – Pine Creek OS 52 53 – Pine Creek OS 53 54 – Pine Creek OS 54 123 124 125



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Management Recommendation	Site ID
	126 127 129 130 131 132 135 - Pine Creek T2/ISO14
Remediation of Cracks	19-3-0094 19-3-0097 19-3-0099 19-6-0090 19-6-0091 19-6-0092 122 - Pine Creek T1/AGG1 133 - Pine Creek T2/OS29 134 - Pine Creek T2/ISO13
Collection as last resort if remediation unsuccessful	19-3-0097 134 - Pine Creek T2/ISO13
Formulation of Action Plan	19-3-0094 19-3-0097 – 0100 122 - Pine Creek T1/AGG1
Submission of AHIMS Site Cards	7 (Stage 1) 1 - Pine Creek T2/OS 1 2 - Pine Creek T2/ISO 1 44 - Pine Creek ISO 44 45 - Pine Creek ISO 45 46 - Pine Creek ISO 46 47 - Pine Creek OS 47 48 - Pine Creek OS 48 49 - Pine Creek OS 49 50 - Pine Creek OS 50 51 - Pine Creek OS 51 52 - Pine Creek OS 52 53 - Pine Creek OS 53 54 - Pine Creek OS 54 122 - Pine Creek T1/AGG1 123 124 125 126 127 129 130 131 132 133 - Pine Creek T2/OS29 134 - Pine Creek T2/ISO13 135 - Pine Creek T2/ISO14

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## 4 **Subsidence Management**

### 4.1 **Objectives**

The objectives for the management of cultural heritage values of the site are to:

- Identify, as far as practical, all Aboriginal sites and objects;
- Consult and actively involve the RAPs in the management of Aboriginal cultural heritage sites and objects;
- Advise mine staff and contractors of their personal responsibility in avoiding, managing and mitigating impacts on Aboriginal cultural heritage;
- Provide a process for mine staff and contractors to follow in managing Aboriginal cultural heritage during the carrying out of their day-to-day operational activities at the Narrabri Mine site;
- Avoid or mitigate disturbance to Aboriginal cultural resources as far as practicable;
- Salvage archaeological and cultural values at sites where impacts on sites are unavoidable (refer Appendix A);
- Provide suitable conservation measures to ensure on-going protection to those Aboriginal sites and objects not impacted by the project;
- Ensure Narrabri's commitment to best practice in the management and mitigation of Aboriginal cultural heritage is reflected in its environmental management policies and protocols; and
- Meet the conditions of development consent and associated modifications.

### 4.2 **Performance Measures and Indicators**

Performance measures for cultural heritage values are presented in Table 6, and have been developed for the LW107-LW110 extraction area in accordance with PA 08\_0144 (as modified) and approved Statement of Commitments.

Monitoring will be used to assess the impact of the mining operations against the performance measures and indicators. If monitoring and assessment indicates that a performance indicator has been exceeded, or likely to be exceeded, Narrabri Mine will implement the contingency measures outlined in Section 5.3.

**Table 6: Performance Measures – Cultural Heritage**

Performance Measure	Indicator of Success	Key Assessment Considerations	
Site remediation works do not compromise Aboriginal cultural heritage relics or values.	Works are undertaken in accordance with the Mining Operations Plan (MOP) and the EP-HMP.	1. Does the monitoring and assessment indicate that a performance measure or development consent condition has been exceeded, or likely to be exceeded?  2. Does this exceedance increase the risk of any sites being impacted?  3. What is the nature of the risk? <ul style="list-style-type: none"> <li>• Cracking</li> <li>• Ponding</li> <li>• Subsidence remediation works.</li> </ul>	
	Any new sites identified are assessed for impacts and any management recommendations are consistent with the management plan.		
The archaeological and cultural heritage values have been salvaged to contemporary best practice standards.	Salvage of archaeological and cultural values of sites undertaken prior to impact in accordance with the approved EP-HMP and with approval of the Secretary.		4. What are the potential factors that may have contributed to the risk i.e. subsidence, inadequate management measure or natural processes?  5. What actions, if any are required to mitigate and/or minimise the potential for future impacts and monitor the long term impacts of the exceedance?

#### 4.3 Trigger Action Response Plan

Subsidence management for heritage considerations within LW107-LW110 has been presented as a Trigger Action Response Plan (TARP) as detailed within Table 7.



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**Table 7: Trigger Response Action Plan (TARP)**

<b>Monitoring</b>	<b>Trigger</b>	<b>Action</b>
All sites within a given longwall panel	Level 1 Prior to longwall mining	Documented visual inspection (including photographs) of all sites within the extraction plan area will be undertaken by a qualified archaeologist in consultation with RAPs to record the current condition of each archaeological site.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
	Level 1 During longwall mining	Site personnel will inspect each site on a monthly basis during undermining. The inspections will aim to observe the relation of cracking (if any) to archaeological sites, any erosion potentially threatening the site and whether intervention and remediation works are required.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
	Level 1 Within six months of cessation of longwall mining within a panel	Documented visual inspection (including photographs) of all sites within the extraction plan area will be undertaken by a qualified archaeologist in consultation with RAPs to record the current condition of each archaeological site  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
Remaining sites overlying LW107-LW110 following completion of mining in LW107.	Level 1 Following completion of mining within LW107	The predicted impact to the remaining sites overlying LW107-LW110 will be updated based on the results of the subsidence monitoring. Those sites identified as having a high likelihood of impact will be salvaged ahead of mining as outlined within Appendix A.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal



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All sites	Level 1 Prior to any surface disturbance within 10m of an identified site.	Every effort will be made to avoid the remaining sites during all subsidence remediation works. In the event that subsidence remediation works make impacts on sites unavoidable the sites will also be collected in accordance with Appendix A.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
Site 10b	Level 1 During mining	Maintain fencing and monitor and monitor on a monthly basis for potential subsidence impacts including cracking, ponding and/or increased erosion. All fencing and signage will be removed from Aboriginal sites on completion of mining operations.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
	Level 2 Prior to any surface disturbance within 10 m of an identified site	Should any subsidence remediation works be required within 10 metres and impact to the site is unavoidable, (subject to reasonable efforts to avoid such sites), the sites will be managed as outlined within Appendix A.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
Sites 38, 39 and 43	Level 1 During mining	Maintain fencing and monitor and monitor on a monthly basis for potential subsidence impacts including cracking, ponding and/or increased erosion. All fencing and signage will be removed from Aboriginal sites on completion of mining operations.  <b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal
	Level 2 Prior to any surface disturbance within 10 m of an identified site	Should any subsidence remediation works be required within 10 metres of sites 38, 39 and 43, they will be salvaged in the manner described in Appendix A and



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		<p>the results used to provide a greater understanding of the past Aboriginal occupation of the region.</p> <p><b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal</p>
Site 19	<p>Level 1 Prior to any surface disturbance with 10 m of site</p>	<p>Should any subsidence remediation works be required within 10 metres and impact to the site is unavoidable, (subject to reasonable efforts to avoid such sites), the sites will be managed as outlined within Appendix A.</p> <p><b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal</p>
Within 100 metres of Pine Creek Tributaries	<p>Level 1 Prior to topsoil stripping</p>	<p>RAPs will be invited to monitor the activities as outlined within Appendix A.</p> <p><b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal</p>
All of site	<p>Level 1 Ongoing</p>	<p>All employees and contractors will be subject to cultural heritage awareness education as part of the induction when the package is developed and implemented. Employees and contractors involved with surface disturbance activities will be subject to a more comprehensive cultural heritage awareness education package to be developed in consultation with the RAPs. Until such a time as this awareness training is implemented, all stripping works onsite will involve representatives from the RAPs, except where the work is being undertaken in previously disturbed areas.</p> <p><b>Responsibility:</b> Mining Engineering Manager, Employees and contractors <b>Reporting</b> – Internal</p>
	<p>Level 2 Discovery of new finds of Aboriginal objects.</p>	<p>The discovery of new finds of Aboriginal objects will be recorded on standard AHIMS site cards and lodged with AHIMS as outlined in Appendix B. Sites within the</p>



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		<p>subsidence impact area will be managed in accordance with Appendix A and in consultation with the RAPs and archaeologist.</p> <p><b>Responsibility</b> – Environmental Superintendent <b>Reporting</b> – Internal</p>
	<p>Level 3 Identification of a potential burial.</p>	<p>Cease work in that area. No works to recommence until clearance is provided by OEH and/or where appropriate the NSW Police as per the protocol outlined in Appendix B.</p> <p><b>Responsibility</b> – General Manager <b>Reporting</b> – Internal, OEH/NSW Police</p>



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**5 Implementation and Operation**

**5.1 Resources and Responsibilities**

During the operational phases of the development, the Narrabri Coal Mine will be managed by the General Manager who will have overall responsibility for ensuring contractors, employees and service providers comply with all laws, regulations, licences, approvals and conditions of the project approval. Table 8 outlines the roles and responsibilities subject of this EP-HMP.

**Table 8: Roles and Responsibilities**

<b>Role</b>	<b>Responsibility</b>
General Manager	Provide the resources necessary to implement this EP-HMP.
Mining Engineering Manager	Ensure all contractors, sub-contractors and service personnel are appropriately inducted, qualified, competent and/or licensed to undertake the required work and have a good environmental performance record
Technical Services Manager	Authorise changes to this EP-HMP
Environmental Superintendent	Implementing this EP-HMP on a day-to-day basis in consultation with the RAPs. EP-HMP review.
Archaeologist(s)	Provide expertise in the management of the archaeological values of Aboriginal cultural heritage objects and/or places.
RAPs	Provide expertise in the management of Aboriginal cultural heritage objects and/or places.

All employees and contractors will be subject to cultural heritage awareness education as part of the induction when the package is developed and implemented. Employees and contractors involved with surface disturbance activities will be subject to a more comprehensive cultural heritage awareness education package to be developed in consultation with the RAPs. Until such a time as this awareness training is implemented, all stripping works onsite will involve representatives from the RAPs, except where the work is being undertaken in previously disturbed areas.

It is important to note that failure to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the NPW Act (as amended).

**5.2 Communications / Consultation**

An initial draft of this EP-HMP has been prepared based on the requirements of PA 08\_0144, as modified, the recommendations and findings of the Stage 1 and Stage 2 Environmental Assessments and the associated Aboriginal Heritage Assessments. A copy of this draft EP-HMP has been referred to the RAPs and the OEH for further consideration and ratification. Correspondence with the RAPs and the OEH will be attached as Appendix C.



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The following protocol will be followed with respect to ongoing consultation.

### **5.2.1 Notification**

Notification to the RAPs will occur within a reasonably prompt timeframe where:

- changes to the Project may have implications for Aboriginal heritage management;
- there is a significant discovery in the course of development eg Aboriginal ancestral remains or archaeological features; or
- where significant land management actions are required in Aboriginal site protection areas not envisaged by this plan.

Urgent issues requiring the attention of the RAPs will be communicated no later than one week of the issue arising.

### **5.2.2 Timeframes & Format of Responses**

Feedback requested from the RAPs should be received by Narrabri Mine preferably within two weeks and no later than four weeks from the date correspondence is issued by Narrabri Mine. The format of the response should be in written form as either a dated letter or email. The appropriate address for responses shall be provided as part of the request.

Where no response is issued within this timeframe, a follow-up phone call will be made by the Environmental Superintendent to close out the outstanding request.

### **5.2.3 Review of Consultation Protocol**

The effectiveness and value of the consultation process will be periodically reviewed internally by Narrabri Mine based on past consultation and feedback from the RAPs. In the event there is a determination that the approach to consultation needs to change, the changed procedures would be documented and a copy forwarded to the Secretary of the Department for approval.

### **5.3 Contingency Response**

In the event that the performance measures provided in Section 4.2 are considered to have been exceeded, or are likely to be exceeded, Narrabri Mine will undertake the following:

1. Report the likely exceedance of the performance indicator as soon as practicable to the relevant agencies as required under the development consent or legislation;
2. Identify an appropriate course of action with respect to the identified impact in consultation with appropriate specialists, relevant agencies and the RAPs; and
3. Review the effectiveness of this EP-HMP and performance measures to adequately manage potential impacts within the limits of the project approval.



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### 5.4 Reporting

The Annual Review (AR) is the primary reporting tool. The AR is required to be prepared under the Narrabri Mine PA development consent to review the performance of the mine against the Environmental Management Strategy and the relevant Mining Operations Plans, the conditions of this consent, and other licenses' and approvals relating to the mine.

In the context of archaeology and cultural heritage management the AR will report against and review the findings of monitoring conducted in relation to the items in Table 4 and Table 6.

Once finalised and approved, the AR will be made publicly available via the mines website.

### 5.5 Review

The Narrabri Mine PA requires a protocol for periodic review of the plan. The review requirements for the Extraction Plan, including this EP-HMP, are outlined in Section 5.3 of the Extraction Plan.

### 5.6 Complaints Management

A complaints management protocol has been developed to ensure an appropriate and consistent level of reporting, response and follow-up is adopted by Narrabri Mine. The following complaints management protocol will be followed on all complaints received relating to Aboriginal cultural heritage:

- A publicly advertised telephone complaints line will be in place to receive complaints during operating hours and record complaints at other times.
- Each complaint received will be recorded on a Complaints Form, which will include the following details:
  - The date and time of complaint.
  - Any personal details the complainant wishes to provide or if no such details are provided a note to that effect.
  - The nature of the complaint.
  - The action taken by Narrabri Mine in relation to the complaint, including any follow-up contact with the complainant.
  - If no action was taken by Narrabri Mine, the reason why no action was taken.
- The Environmental Superintendent will be responsible for ensuring that an initial response is provided within 24 hours of receipt of a complaint (except in the event of complaints recorded when the mine is not operational).
- The cause of the complaint and any required remedial actions identified.



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- Additional measures will be undertaken as required to address the complaint.
- Once the identified measures are undertaken, the Environmental Superintendent will sign off on the relevant complaint within the Complaints Register.
- If necessary, follow-up monitoring will take place to confirm the source of the complaint is adequately mitigated.
- A copy of a Complaints Register will be kept by Narrabri Mine and made available to the CCC and the complainant (on request). A summary of complaints received every 12 months will be provided to DP&E, OEH, DRE and the CCC through the AR.

Based on the nature of individual complaints, specific contingency measures may be implemented to the (reasonable) satisfaction of the complainant. The Environmental Superintendent retains ultimate responsibility to ensure that complaints received are properly recorded and addressed appropriately.

#### 5.7 Dispute Resolution

In the event that any complainant does not consider the mine's response or reactions adequately address their concerns or that a person believes that the mine is not implementing this ACHMP satisfactorily, the following procedure will be adopted:

- i. a meeting will be convened with the General Manager, or delegate, and Environmental Superintendent to seek resolution of the matter. The complainant will be provided with a written response from Narrabri Mine detailing the results of investigations to date and the agreed actions to be taken in respect of the measures to be implemented. The mine may seek advice from a qualified archaeologist to assist.
- ii. upon implementation of the nominated measures, a further meeting will be convened to seek advice of satisfaction or otherwise as to the outcomes.

If, after 21 days following Steps 1 and 2, the complainant believes the matter remains unresolved and no further agreement can be reached as to additional measures to be undertaken, the matter will be referred to the Secretary.



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# Appendix A

## Management Measures

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## **Introduction**

The following management measures have been based upon the recommendations of the Stage 1 Aboriginal Heritage Assessment (Australian Archaeological Survey Consultants Pty Ltd, 2007), Stage 2 Aboriginal Heritage Assessment (Archaeological Surveys & Reports Pty Ltd, 2009) and consultation with the Narrabri LALC and Gomeroi Narrabri People.

## **Subsidence Impact Monitoring**

Subsidence cracking/ponding and subsequent site remediation works such as the ripping of large surface cracks or channel earthworks have the potential to impact artefact scatters. The extent of these potential impacts on site is difficult to predict given the lack of subsidence data and limited local knowledge of ground response to mining.

Weekly visual inspections immediately behind the longwall face will be undertaken to monitor for active subsidence (refer to Land Management Plan). In the event that subsidence cracking, and/or remediation works are considered likely to occur within 10m of previously identified archaeological sites recorded over LW107-LW110 identified through subsidence monitoring the site will be salvaged as outlined below. The remaining sites will be avoided where practicable. In the event that subsidence remediation works make impacts on sites unavoidable (subject to reasonable efforts to avoid such sites), the sites will also be collected in the manner described below.

## **Management and Fencing of Sites**

### **Sites 19, 38, 39 and 43**

Sites 19, 38, 39 and 43 have been fenced to protect them from inadvertent or accidental damage from vehicular traffic. While fenced, the sites will have signage identifying them as 'Environmental Protection Zones' to avoid damage to the sites that might otherwise occur if they were described as Indigenous or Culturally Sensitive Areas (Archaeological Surveys & Reports Pty Ltd, 2009). All fencing and signage will be removed from Aboriginal sites on completion of mining operations.

The boundaries of these sites were determined in the field by an archaeologist in consultation with the representatives of the RAPs (Landskape, 2010). GPS coordinates of the centre of each site were recorded using a hand-held GPS unit and an appropriate works exclusion zone (minimum 10m) was devised in consultation with the RAPs.

Should any subsidence remediation works be required within 10 metres of site 19, and impact to the site is unavoidable, (subject to reasonable efforts to avoid such sites), the sites will be salvaged in the manner described below.

Should any subsidence remediation works be required within 10 metres of sites 38, 39 or 43, and impact to the site is unavoidable, (subject to reasonable efforts to avoid such sites), they will be excavated in the manner described below and the results used to provide a greater understanding of the past Aboriginal occupation of the region.



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### Scarred Tree (Site 123)

Site 123, a scarred tree is identified as having a culturally made scar(s) and will be retained in situ. While not expected to be impacted through undermining, if unintentional subsidence impacts do occur that will impact the health of the tree, then it will be cut down to preserve the scar and be relocated to a designated protected area in consultation with the RAPs and a qualified archaeologist.

### Grinding Grooves (Site 10b & 122)

Although within potential areas of subsidence, grinding groove sites 10b and 122 are considered to be located on sandstone 'floaters' in alluvial soils and as such are not at risk from site cracking. Both sites are to be fenced to protect the grinding grooves and sandstone floaters from inadvertent or accidental damage from vehicular traffic. While fenced, the site will have signage identifying it as 'Environmental Protection Zones. All fencing and signage will be removed from Aboriginal sites on completion of mining operations.

## Aboriginal Site Salvage

### Site Collection

Only those sites with a high probability of impact from subsidence induced surface cracking will be subject to surface collection by the RAPs accompanied by an archaeologist prior to commencement of mining according to the following procedure:

1. notify the Secretary of the Department of Planning and Environment (or their delegate) prior to commencing any salvaging works;
2. commission an archaeologist and invite representatives from the RAPs to salvage the artefacts by hand collection or excavation;
3. individual artefacts will be flagged;
4. the locations of flagged artefacts will be recorded in Differential GPS;
5. flagged artefacts will be numbered and collected into a bag labelled with site number, date and collection details;
6. artefacts will be retained for recording and report preparation;
7. basic attributes will be recorded on collected artefacts: raw material, technological type, implement type, weight, maximum dimension;
8. a descriptive report will be prepared with map of individual artefact locations within site or exposure boundaries;
9. following site collections the field archaeologist in consultation with the attending RAPs will provide written notification (within 7 days) of the sites cleared for ground disturbance works; and



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## Archaeological Excavations

Excavations will be conducted by an archaeologist and the RAPs as follows:

1. notify the Secretary of the Department of Planning and Environment (or their delegate) prior to commencing any salvaging works;
2. commission an archaeologist and invite representatives from the RAPs to salvage the artefacts by excavation;
3. Open area excavations of sites 38, 39 and 43 will be undertaken only in the unlikely event that impact to the site is unavoidable (subject to reasonable efforts to avoid such sites) and for the purpose of identifying aspects of stone artefact technology and assemblage. These aspects will be analysed to explore the question of Aboriginal settlement patterning and technological organisation within the region;
4. The extent of the site as visible on the surface (determined in the field by the archaeologist) will be dug by hand in 50 cm units to an identifiable culturally sterile base;
5. After an initial sample of squares dug in 5 cm spits to define the vertical distribution of artefacts within the soil, each square will be dug as a single context to an identifiable culturally sterile base;
6. The excavation will expand according to artefact densities encountered with the goal of recovering knapping floor concentrations to the extent reasonably possible. Where hearth features are encountered (site 43) a careful sectioning procedure will be followed to record the characteristics and recover charcoal for radiocarbon dating where possible. Charcoal samples will be submitted for dating where suitable samples in reliable archaeological cultural contexts are recovered; and
7. Artefacts recovered from the excavations will be analysed for the purpose of identifying aspects of stone artefact technology and assemblage. These aspects will be analysed to explore the question of Aboriginal settlement patterning and technological organisation within the region, comparing and contrasting with the available reported results of assemblage characteristics.

The research design outlined here would be developed further in the course of the archaeological salvage project and reporting.

The timeframe for analysis of stone artefacts recovered from the archaeological excavations will take up to 12 months from completion of fieldwork.

## Aboriginal Keeping Place

Following completion of analyses and reporting Aboriginal heritage material recovered from collections and salvage excavations will be placed in the care and control of the Aboriginal organisation agreed to by the RAPs (Narrabri Mine, if required, has agreed to provide a 'keeping place' within the Pit Top Area until such time as a suitable location is identified and agreed to by the RAPs).

In the event that further impacts are likely to occur and the salvaged material is to remain within a designated long term 'keeping place', an application for a care agreement must be sent to the OEH to satisfy the requirements of the NPW Act. A care agreement sets out the



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obligations of OEH and the Aboriginal person or Aboriginal organisation for the long-term safekeeping of the transferred Aboriginal object(s).

Where there is unlikely to be any further disturbance or site remediation works the artefacts can be returned to their original location. The AHIMS site cards will be updated to reflect the activities that have occurred.

#### **Ground Impacts from Weed and Feral Animal Management**

Measures to control weeds and feral animals will avoid ground impacts to identified Aboriginal heritage sites. Rabbit warrens at these locations will not be ripped.

#### **Exemptions for Emergency Vegetation Management**

Should an emergency situation arise requiring vegetation clearance (for example firefighting) in the vicinity of protected Aboriginal heritage sites, this will be undertaken with the minimum possible disturbance to the topsoil.

#### **Consultation Protocol**

Prior to any topsoil stripping within 100m of the Pine Creek tributaries, the RAPs will be informed of the extent, location, timing and expected duration of the planned remediation works and Narrabri Mine will invite a representative of the RAPs to monitor the activities.

In the event that any possible archaeological sites are identified in the absence of the RAPs, the General Manager, or authorised delegate, will notify the RAPs following the initiation of the procedures as identified in Appendix B.

In the event that any changes are proposed to the EP-HMP, or modifications are proposed to approved activities that may have impacts on items of cultural heritage significance, the General Manager, or authorised delegate will notify the RAPs for consideration and comment.

The effectiveness and value of the consultation process will be periodically reviewed with the RAPs, including rehabilitation and revegetation of the mine site. In the event there is an agreement that the approach to consultation needs to change, the changed procedures would be documented and a copy forwarded to the Secretary and recorded in the relevant AR.

#### **Aboriginal Heritage Information System (AHIMS)**

AHIMS site cards have been designed to complement the Aboriginal Heritage Information Management System (AHIMS) data structure as well as to meet the professional standards for archaeological recording of potentially sensitive information. All new sites (both previously unrecorded and salvaged/relocated sites) will be recorded by an archaeologist on standard AHIMS site cards and submitted to OEH for registration on the AHIMS database.



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### **Workforce Education and Contractor Awareness**

All employees and contractors will be subject to cultural heritage awareness education as part of the induction when the package is developed and implemented. Employees and contractors involved with surface disturbance activities will be subject to a more comprehensive cultural heritage awareness education package to be developed in consultation with the RAPs. Until such a time as this awareness training is implemented, all stripping works onsite will involve representatives from the RAPs, except where the work is being undertaken in previously disturbed areas.



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# Appendix B

## New Sites and Discovery of Skeletal Remains

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## **Non Indigenous Heritage**

No items of non-Indigenous Heritage have been identified during the various environmental impact assessment processes across the Narrabri Mine. In the event that any sites or items are discovered during construction or operation, all work in the immediate area will halt and Narrabri Mine will consult with the NSW Heritage Division.

## **Unrecorded Aboriginal Heritage Sites**

Any previously unrecorded Aboriginal heritage sites identified by contractors or during fieldwork (monitoring, supplementary fieldwork or follow up inspections etc.) will be left undisturbed. If the area of discovery is in deposited material, then work will also cease in the area where the material originated from.

The person discovering the artefact will notify their supervisor who will ensure that work has ceased and area(s) is (are) cordoned off with tape.

The supervisor will notify the General Manager or other senior Narrabri Mine person on site.

The General Manager, or other senior Narrabri Mine person, will:

1. Request a qualified archaeologist to attend the site and advise on its archaeological significance;
2. Request the site monitor from the RAPs if not already present to attend and advise on its cultural significance in consultation with the qualified archaeologist; and
3. If the find is determined to be a site, notify the OEH with the advice from the archaeologist and the RAPs for determination of further procedures.

If the find is confirmed as a site, the archaeologist will complete a OEH Standard AHIMS Site Recording Form and forward to the OEH for inclusion on the Aboriginal Heritage Information management System (AHIMS) database.

Subject to the recommendations of the archaeologist and the RAPs, the appropriate approvals will be applied for prior to further work being undertaken in the vicinity of the site. Any action to disturb or transfer Aboriginal items may also require the development of excavation and/or salvage plans in consultation with OEH and with approval of the Secretary.

The General Manager, or other senior Narrabri Mine person, will implement any other procedures or recommendations issued by the OEH.

Failure to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the NPW Act (as amended).



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## Discovery of Skeletal Remains

In the event that construction activity reveals possible human skeletal material (remains) within the development area, the following procedure is to be followed:

1. As soon as remains are exposed, all work is to halt at that location and the General Manager or other senior Narrabri Mine person on site is to be immediately notified;
2. General Manager, or other senior Narrabri Mine person, will contact police by ringing **000**; and
3. General Manager, or other senior Narrabri Mine person, will contact OEH's Environment line on **131 555** and the Heritage Division of OEH on **(02) 9873 8500**.

A physical or forensic anthropologist should inspect the remains in situ (organised by the police unless otherwise directed by the police), and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic):

1. If the remains are identified as forensic the area is deemed as a crime scene;
2. If the remains are identified as Aboriginal, the site is to be secured and DP&E, OEH and the RAPs are to be notified in writing; and
3. If the remains are identified as non-Aboriginal (historical) remains, the site is to be secured and the Heritage Division of OEH is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. The management of the area and remains is to be determined as follows:

1. If the remains are identified as a forensic matter liaise with the police;
2. If the remains are identified as Aboriginal liaise with the DP&E, the OEH and the RAPs;
3. If the remains are identified as non-Aboriginal (historical) liaise with the DP&E and the Heritage Division of OEH; and
4. If the remains are identified as not being human, then work can recommence once the appropriate clearances have been given.



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# Appendix C

## Records of Consultation

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## Record of Consultation between Narrabri Mine and Narrabri LALC, Gomeri Narrabri Aboriginal Corporation and OEH

Date	Stakeholder	Consultation
10 November 2011	GNAC	Copy of draft Heritage Management Plan provided for comment.
10 November 2011	NLALC	Copy of draft Heritage Management Plan provided for comment.
20 January 2012	GNAC	Provided with copy of updated Figure of mining footprint and outline of amended salvage measure for LW101.
20 January 2012	NLALC	Provided with copy of updated Figure of mining footprint and outline of amended salvage measure for LW101.
2 March 2012	GNAC and NLALC	Meeting to discuss the draft Heritage Management Plan. Comments made on the day by the RAPs incorporated into this version of the report (Rev F).
17 August 2015	GNAC	Copy of revised draft Heritage Management Plan provided for comment. Sought comments by 14 September 2015.
17 August 2015	NLALC	Copy of revised draft Heritage Management Plan provided for comment. Sought comments by 14 September 2015.
9 October 2015	GNAC	Reminder email seeking comments.
9 October 2015	NLALC	Reminder email seeking comments.
30 September 2016	GNAC	Copy of draft Heritage Management Plan provided for comment.
30 September 2016	NLALC	Copy of draft Heritage Management Plan provided for comment.
2 February 2017	OEH	Response to Heritage Management Plan