Rehabilitation Management Plan

Rasp Mine

Prepared for Broken Hill Operations Pty Ltd

August 2022

Rehabilitation Management Plan

Rasp Mine

Broken Hill Operations Pty Ltd

E211010 RP#2

August 2022

Version	Date	Prepared by	Approved by	Comments
V0.1	28 July 2022	Michael Frankcombe	Nick Travers	
V1	2 August 2022	Michael Frankcombe	Nick Travers	BHOP comments addressed

Approved by

Nick Travers
Associate Environmental Specialist – Land and Rehabilitation
2 August 2022

Level 3 175 Scott Street
Newcastle NSW 2300

Lease Block

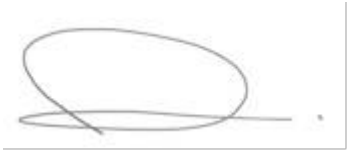
Name of mine:	Rasp Mine
Rehabilitation management plan commencement date:	1 July 2022
Rehabilitation management plan completion date:	
Mining leases (lease number(s)) and expiry date(s):	

Lease	Expiry
CML7	31 Dec 2026
MPL183	31 Dec 2026
MPL184	31 Dec 2026
MPL185	31 Dec 2026
MPL186	31 Dec 2026
ML1249 sublease	31 Dec 2026

Name of lease holder(s):	Broken Hill Operation Pty Ltd
Name of operator (if different):	Broken Hill Operation Pty Ltd
Name and contact details of mine manager (or equivalent):	Giorgio Dall'Armi Telephone: 08 80889102 Email: giorgiodallarmi@cbhresources.com.au
Name and contact details of environmental representative:	Devon Roberts Telephone: 08 80889126 Email: devonroberts@cbhresources.com.au
Name and title of representative(s) of the lease holder(s):	Giorgio Dall'Armi General Manager
Signature of representative(s) of the lease holder(s):	
Submission date:	2 August 2022
Version:	V1 (August 2022)

Declaration

I, Giorgio Dall'Armi, declare that all information contained in this document is, to the best of my knowledge, true and not misleading.



Signature

Date 2 August 2022

Preface

The Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2020 ('the Mining Amendment Regulation') commenced on 2 July 2021. The Mining Amendment Regulation imposes new standard rehabilitation conditions for all mining lease holders in NSW through amendment of the *Mining Regulation 2016*. Among a range of changes, mining leaseholders are required to:

- complete a rehabilitation risk assessment;
- develop rehabilitation objectives and completion criteria;
- undertake progressive rehabilitation;
- develop a detailed rehabilitation management plan (RMP), including a final landform and rehabilitation plan in the case of 'large mines'[1]; and
- submit an annual rehabilitation report, including a three-year 'forward program' of work summarising the mining and rehabilitation activities to be undertaken in that forward program.

As a large mine subject to existing leases, a transitional period applies to the Rasp Mine, and the new standard rehabilitation conditions took effect until 2 July 2022. The new rehabilitation conditions have replaced the existing rehabilitation and environmental management conditions on current leases at that time.

Consistent with intent of the transition period this document is presented as a Rehabilitation Management Plan (RMP) and has been prepared in accordance with the following 'form and way' guidelines for 'large mines':

- *Form and Way – Rehabilitation management plan for large mines*. Revision 1, 2 July 2021 (NSW Resource Regulator 2021a).
- *Form and way – Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines*. Revision 1, 2 July 2021 (NSW Resource Regulator 2021b).

[1] A mine subject to one or more mining leases (MLs) requiring an environment protection licence (EPL) under *the Protection of the Environment Operations Act 1997*.

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Acronyms and Abbreviations

As	Arsenic
AMD	Acid mine drainage
ARD	Acid rock drainage
ASX	Australian Stock Exchange
BGM	Bitumen impregnated Geomembrane
BHOP	Broken Hill Operations Pty Ltd
CIP	Carbon-in-pulp
Cu	Copper
DMR	Department of Mineral Resources
DP	Deposited plan
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
DSI	Detailed site investigation
EIS	Environmental impact statement
EL	Exploration licence
EPA	Environment Protection Authority
EPBC	Environment Protection & Biodiversity Conservation
EPL	Environment Protection Licence
EP&A Act	Environmental Planning and Assessment Act 1979
FOS	Factor of safety
HEPA	Heads of EPAs Australia and New Zealand
km	Kilometres
km^2	Square kilometres
g/t	Grams per tonne
Ha	Hectares
HGM	Hydraulically applied growth medium
IUCN	International Union for Conservation of Nature
JVA	Joint venture agreement
LEP	Local Environmental Plan
m^3	Cubic metres
MCP	Mine Closure Plan
ML	Mining Lease
ML/day	Mega litres per day
ML/pa	Megalitres per annum

Mm	millimetres
MMM	Minerals Mining and Metallurgy Limited
MOP	Mining Operations Plan
MPLs	Mining Purposes Leases
MOP	Mine Operations Plan
MPL	Mining Purposes Lease
NAF	Non-acid forming
NATA	National Association of Testing Authorities
NMI	Normanby Mining Investments
NML	Normanby Mining Limited
NSW	New South Wales
PAF	Potentially acid forming
Pb	Lead
POEO Act	Protection of Environment Operations Act 1997
PLMU	Post-mining land use
PMF	Probable maximum flood
PSI	Preliminary site investigation
RMP	Rehabilitation Management Plan
RO	Reverse osmosis
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SL	Special Lease
TARP	Trigger Action Response Plan
t/pa	Tonnes per annum
Zn	Zinc

1 Introduction

1.1 History of operations

1.1.1 Exploration and operating history

Consolidated Mining Lease 7 (CML7) occupies a central region of the historic Broken Hill Line of Lode orebody. Mining has been undertaken within the earlier leases making up CML7 since 1885 by several companies including Broken Hill Pty Ltd (BHP), British Broken Hill Pty Ltd, Broken Hill South and Minerals Mining and Metallurgy Ltd (MMM), among others. Operations have included both open pit mining and underground mining, with the most recent, previous to BHOP, by MMM in Kintore Pit. MMM was a publicly listed company in which Normandy Mining Ltd (NML) held a controlling interest through Poseidon Mines Investments (later Normandy Mining Investments (NMI). Mining ceased in the Kintore Pit in 1991 when NMI commenced implementation of a rehabilitation plan from 1991 to 1999 (NML, 2000). The mine site also houses a substantial amount of mining infrastructure, including heritage buildings and structures, from various past mining phases.

The Rasp Mine was purchased by CBH Resources from NMI in 2001. BHOP is a subsidiary of CBH Resources and on acquisition, BHOP continued rehabilitation of the lease to the point where it met the requirements set down by the then Department of Mineral Resources (DMR), however, final relinquishment was not sought as BHOP planned to restart mining.

Following acquisition BHOP conducted an exploration surface drilling program into the Western Mineralisation to aid in resource definition. This drilling area was within a surface exclusion zone and was conducted under a Development Approval from the Broken Hill City Council (BHCC). The drilling confirmed that significant high-grade zinc-silver-lead lenses indicated in the historical drilling data are present within the broader mineralised resource. It was concluded that given new mining technologies and mine design options available that the resource could be extracted economically.

In 2006, a Review of Environmental Factors (REF) was prepared under Part 5 of the *Environmental Planning and Assessment Act 1979)* (EP&A Act) to accompany an application to the Department of Primary Industries (DPI) in the form of a Mining Operations Plan (MOP) for an exploration decline and the extraction of a bulk 200 t sample. The purpose of the bulk sample and underground in-fill drilling proposed was for resource assessment to confirm the viability of an underground mine and mineral processing plant. The MOP was approved by the then DPI in October 2006, and decline development commenced in February 2007. The initial application was for the decline to proceed 2,100 m at a depth of 300 m. However, an amendment to the MOP was approved in May 2008 to extend the decline to 3,000 m (3,500 m including drilling cuddies). This amendment has been incorporated into the current MOP together with clarification of points raised by the DPI at a review meeting in October 2008.

In addition to the above activities in 2007, under Part 4 of the EP&A Act a Statement of Environmental Effects (SEE) was prepared to permit recovery of some small high-grade ore blocks in the floor of the Kintore Pit culminating in the extraction of 15,000 t of remnant ore material over a period of approximately three months. It involved crushing ore on-site, prior to haulage by truck to the CBH owned Endeavour Mine at Cobar. Approval was granted by Broken Hill City Council (BHCC) on 26 April 2007. This temporary mining was completed in August 2007.

In 2009 BHOP sought approval from the then Department of Industry & Investment (I&I NSW) to recommence underground mining (120,000 tpa) and surface drilling activities via a new MOP supported by an assessment under Part 5 of the EP&A Act with a Review of Environmental Factors (REF). This was approved in December 2009. Approval was obtained from BHCC via a Development Application (DA) to crush, stockpile and transport ore off site to the Endeavour Mine for processing under part 4 of the EP&A Act. This DA was approved in January 2010 and was supported by a Statement of Environmental Effects (SEE). The planned mining and transport of ore was not undertaken. In December 2010 an extension to 28th February 2011 was granted for the MOP.

An application was made in March 2007 for the extension of underground mining to include the Western Mineralisation and the Centenary Mineralisation together with further mining development of the Main Lode Pillars, the expansion of mining production to 750,000 tpa and the construction and operation of a processing plant. Approval was sought for the Project from the Department of Planning (DoP) under Part 3A of the EP&A Act. The application was supported by an Environmental Assessment (EA). Approval was granted in January 2011.

A modification to the Project Approval was sought in November 2011 from the then Department of Planning & Investment (DoPI) to accommodate the relocation of the ventilation shaft from Kintore Shaft in Little Kintore Pit to a purpose-built shaft located in a central area northwest of the Lease. This relocation was required as heavy rains in early 2011 damaged the Kintore Shaft and rehabilitation of the Shaft to enable the construction of the ventilation shaft was no longer possible. The modification was granted in March 2012 and the MOP amended in March 2012.

In 2013 a Main Lode crown pillar which formed a critical part of the mining plan, was found to have collapsed resulting in a change to production rates and 49 personnel redundancies as new mine plans were developed and implemented. This also led to variations between production rates between the MOP and Annual Environment Management Report (AEMR) for that year.

In February 2014 at the request of Crown Lands an application was made to the Division of Resources and Energy (DRE) for the relinquishment of the tourist area around and including the café and Miners Memorial, car parking area and the road leading to these tourist features. Work on this ceased as BHOP did not have the resources to meet the requirements of DRE. In 2015 a formal Deed of Responsibility between BHOP and Lands Administration Ministerial Corporation as reserve trust manager for Crown Lands, to accept liability for tourists entering these sites.

In February 2014 an application was made to the DPE to modify the Project Approval to allow for flexibility in crusher hours to 24 hours per day and to truck ore off-site. The request to truck ore off-site was removed from the application. The Modification was granted by DPE in August 2014 and the MOP amended in September 2014.

In November 2014 an application was made to the DPE for a minor modification (MOD3) to PA 07_0018 under Section 75W of the EP&A Act to extend underground mining to Block 7 (including the Zinc Lodes) located to the southwest of CML7. The ore mined was to replace ore that had been unable to be mined as originally approved and therefore will remain within the limits for extraction (750,000 tpa).

In March 2017 an application was made to the DPE for a modification (MOD4) to PA 07_0018 under Section 75W of the EP&A Act to construct a concrete batching plant and to extend the life of the Blackwood Pit (TSF2) tailings storage facility by infilling some low points around its perimeter. The Modification was granted by DPE in September 2017.

A minor modification (MOD5) to PA 07_0018 under Section 75W of the EP&A Act was sought to extend the current Stores Warehouse, install a cement silo at the current Backfill Plant, and to adjust air quality monitoring requirements, was approved on 2 November 2018.

In August 2021 an application was made to modify PA 07_0018 (MOD6) under section 4.55(2) of the *Environmental Planning and Assessment Act* 1979 (EP Act). This was to allow co-disposal of waste rock and tailings to Kintore Pit and to enable continued operations as the existing tailings storage facility (TSF2) is anticipated to reach capacity in late 2022. The modification was approved March 2022.

A minor modification (MOD7) to PA 07_0018 under Section 75W of the EP&A Act to utilise waste rock material stored in the BHP Pit for Blackwood Pit (TSF2) embankment construction, and conduct crushing and screening activities within BHP Pit, was approved on 29 July 2019.

In April 2021 a minor modification (MOD8) to PA 07_0018 under Section 75W of the EP&A Act was made to incorporate a predefined region of Mine Lease 1249 that is proposed to be mined under a sublease arrangement with Perilya Broken Hill Limited (PBHL), the lease holder.

The application for this modification was made pursuant to Section 4.55(1A) of the Environment al Planning and Assessment Act 1979 (EP&A Act) and is determined a minor modification as there are no additional surface activities or environmental impacts associated with the application and it is consistent with the original development application.

In August 2021 a minor modification (MOD9) to PA 07_0018 under Section 75W of the EP&A Act was made to allow for the installation of an emergency egress and the construction of two development drives through Blocks 13, 14 and 15, towards the Blackwoods orebody and the incline for the Box Cut and mine access proposed in the MOD6 submission. The application for this modification was made pursuant to Section 4.55(1A) of the Environment al Planning and Assessment Act 1979 (EP&A Act) and is determined a minor modification as there are no additional surface activities or environmental impacts associated with the application and it is consistent with the original development application.

1.1.2 Rehabilitation history

i Approved life of mine

PA 07_0018 approves mining operations on site until 31 December 2026 at a maximum rate of 500,000 tpa or more than 8,450,000 t of ore over the life of the project. It is anticipated that BHOP will seek to extend this approval to align with the increase in tails storage capacity approved in MOD6, an additional approximately 13 years.

ii Activities proposed during the RMP term

During the term of the RMP, BHOP proposes to conduct underground mining of the Western Mineralisation, the Main Lode Pillars (focusing on the remaining remnant material) and Zinc Lodes and operate the processing plant for production of mineral concentrates and a rail siding for concentrate despatch as well as other supporting activities.

The mine portal and access decline will be moved from Kintore Pit to a new Box Cut to allow Kintore Pit to be used for the disposal of dry tailings (TSF3) from TSF2. Excess waste rock from underground operations, particularly waste rock with > 0.5% lead will be co-disposed with the tailings in TSF 3.

BHOP plan to continue capping non-active mining areas (free areas) over CML7 by using waste rock with less than 0.5% lead (inert waste rock) for erosion protection and lead dust minimisation.

1.2 Development consents, leases and licences

1.2.1 Development consents

Table 1.2 lists the consents held by BHOP.

Table 1.1 Development consents

Approval number	Date Issued	Duration	Purpose
DA 125/2001	5 September 2002	completed	
DA 101/2007	26 April 2007	completed	
DA 264/2009	19 January 2010	2 February 2011	For ancillary surface mining activities including crushing, stockpiling, and transport of ore.

Table 1.1 Development consents

Approval number	Date Issued	Duration	Purpose
PA 07_0018	31 January 2011	31 December 2026	Mineral production of 750,000 tpa from Western Mineralisation, Centenary Mineralisation and Main Lode Pillars. Construction and operation of a minerals processing plant and rail loadout facility.
PA 07_0018 MOD1	16 March 2012	31 December 2026	Relocation of ventilation shaft.
PA 07_0018 MOD2	29 August 2014	31 December 2026	24-hour crusher operation.
PA 07_0018 MOD3	17 March 2015	31 December 2026	Extension of underground mining to include all of Block 7 and the Zinc Lodes.
PA 07_0018 MOD4	6 September 2017	31 December 2026	Installation of concrete batching plant and extension of TSF2 embankments.
PA 07_0018 MOD5	2 November 2018	31 December 2026	Construction of cement silo and warehouse extension.
PA 07_0018 MOD6	16 March 2022	31 December 2026	Dry tailings disposal from TSF2 to Kintore Pit, relocate mine portal and access decline to a new box cut and utilise low lead waste rock for rehabilitation capping and lead dust minimisation.
PA 07_0018 MOD7	29 July 2019	31 December 2026	Crushing and screening of material in BHP pit for TSF2 embankment construction.
PA 07_0018 MOD8	20 April 2021	31 December 2026	Incorporate a predefined region of ML1249 to be mined under a sublease agreement with Perilya Broken Hill Ltd.
PA 07_0018 MOD9	23 December 2021	31 December 2026	Installation of development drives and emergency egress ladderway to the surface.

1.2.2 Mining leases

Table 1.2 Mining authorities

Mining authority	Grant date	Last renewed	Renewal Date	Holder	Purpose
CML7	8 October 1987	17 January 2007	31 December 2026	BHOP	Open cut mining, shaft sinking, stoping, tunnelling, dam construction, extraction and obtaining minerals, generation of electricity, erecting dwellings, storage of fuels, dumping of ore, treatment and dumping of tailings, development of roads.
MPL183	4 February 1981	24 April 2007	31 December 2026	BHOP	Dumping of ore and mine residues, treatment of tailings.
MPL184	4 February 1981	24 April 2007	31 December 2026	BHOP	Dumping of ore and mine residues, treatment of tailings.
MPL185	4 February 1981	24 April 2007	31 December 2026	BHOP	Dumping of ore and mine residues, treatment of tailings.
MPL186	4 February 1981	24 April 2007	31 December 2026	BHOP	Dumping of ore and mine residues, treatment of tailings.
ML1249 sublease	20 April 2021		31 December 2026	BHOP	Extraction and obtaining minerals.
EL 5818	8 March 2021	7 March 2009	8 March 2023	BHOP	Dumping of ore and mine residues, treatment of tailings.

1.2.3 Other licences and permits

Other licences and permits held by BHOP are listed in Table 1.3.

Table 1.3 Other licences and permit

Licence/permit	Issued by	Date of expiry	Purposes
EPL12559	EPA	Upon surrender, suspension or revocation	Authorises the carrying out of scheduled activities: Crushing, grinding or separating > 500,000 – 2,000,000 t processed. Mining for minerals > 500,000 – 2,000,000 t produced.
Explosives XMNF200003	SafeWork NSW	24 October 2024	Authorises the manufacture, possession and storage of explosives.
Dangerous goods NDG005239	SafeWork NSW	Upon notification	Authorises the storage and use of dangerous good.
Refrigerant AU31297	Refrigerant Trading Council	27 March 2025	Authorises the use of refrigerant.
Water extraction 85WA752823	NOW	29 March 2027	Permits the extraction of water from Shaft 7 and underground dewatering (370 ML).
Radiation 5063802	EPA	26 July 2023	Sell and/or possess radiation apparatus. Sell and/or possess radioactive items or items containing radioactive substances.

1.2.4 List of consents, leases and licences

1.2.5 History of MOPs

The site has been managed in accordance with the MOPs listed in Table 1.4.

These previous MOPs are revoked and superseded by this Rehabilitation Management Plan (**this document**).

Table 1.4 MOP and MCP history

Plan	Plan period	Purpose
Mining Operations Plan Ref: 06/6463	0ct 2006 – Aug 2008	Construct exploration decline, conduct drilling and obtain bulk sample, supported by a REF.
Mining Operations Plan Amendment Ref: 06/6436	May 2008 – October 2008	Extend the exploration decline.
Mining Operations Plan Ref: 06/6463	Sep 2009 – Dec 2010 (extended to March 2011)	For underground mining and stockpiling 120,000 tpa,
Mining Operations Plan Ref: 06/6483	Apr 2011 – Mar 2014	Mining production of 750,000 tpa from Western Mineralisation, Centenary Mineralisation and Main Lode Pillars. Construction and operation of a minerals processing plant and rail loadout facility. Supported by an EAR prepared for DoPI Part 3A Project Approval.

Table 1.4 MOP and MCP history

Plan	Plan period	Purpose
Mining Operations Plan Ref: 06/6463	Mar 2012 – Mar 2014	Relocation of ventilation shaft.
Mining Operations Plan Ref: 06/6463	Apr 2014 – Jun 2014	Extension of MOP requested and granted.
Mining Operations Plan Ref: 06/6463	Jun 2014 – Aug 2014	Extension of MOP requested and granted.
Mining Operations Plan Ref: 06/6463	Oct 2014 – Oct 2015	Allow 24-hour crusher operation.
Mining Operations Plan Ref: 06/6463	Aug 2014 – Oct 2014	Extension of MOP requested and granted.
Mining Operations Plan Ref: 06/6463	Nov 2014 – Oct 2015	New MOP for underground mining, ore processing and despatch of concentrates, including ancillary activities.
Mining Operations Plan Amendment Ref: 06/6463	Mar 2015 – Oct 2015	Extension of underground mining to include all of Block 7 and the Zinc Lodes.
Mining Operations Plan	Oct 2017 – Sep 2019	New MOP submitted to the DRG.
Mining Operations Plan (Amendment)	Dec 2020 – Sep 2021	Amended MOP submitted to the DRG.
Mining Operations Plan	Jun 2021 – Sep 2021	Amended MOP submitted to the DRG.
Mining Operations Plan	Sep 2021 – Sep 2023	Amended MOP submitted to NSW RR.

1.3 Land ownership and land use

1.3.1 Land ownership and land use figures

CML 7 consists of several mining leases that were originally gazetted in September 1886 and consolidated into CML7 in 1987. Most of the land on which the CML7 and MPL's are located in land designated as 'Willyama Common Reserve 2421'. Other areas are located on Western Land Leases and a small portion of the CML7 area is freehold as identified in the Certificate of Title 4635/757298. The underlying tenure is shown on Figure 1.2.

There are a several other occupants conducting activities within CML7 and these are listed in Table 1.5 and shown on Figure 1.3.

The nearest residences to the active mine areas are located along Eyre Street, Bonanza Street and within the rail corridor. Mine residences owned by Perilya are located in Proprietary Square.

Table 1.5 Land holding and occupiers within CML7

Holding	Underlying land owner	Type	Usage	Area (ha)	Occupier
1	Crown	Willyama Common	Olive grove	2.59	Broken Hill Gourmet Products Cooperative Limited

Table 1.5 Land holding and occupiers within CML7

Holding	Underlying land owner	Type	Usage	Area (ha)	Occupier
2	Crown	Willyama Common	Vodaphone communications tower	0.1	Crown Castle Australia
3	Crown	Willyama Common	2 residences (South Road), 1 unoccupied and 1 tenanted	0.26	Line of Lode Reserve Trust
4	Crown	Willyama Common	Broken Earth Restaurant and Miners Memorial	5.61	Line of Lode Reserve Trust (the Miners Memorial is located on MPL's 183 and 184) Licence to Occupy UG12R
5	Crown	Willyama Common	British Flats, unoccupied building	1.7	Line of Lode Reserve Trust
5A	Crown	Willyama Common	Residences 27A&B, to be repaired and used for public tourism (D4874)	0.6	Jamieson House Reserve Trust
6	Crown	Willyama Common	As per MPL183	1.3	BHOP (Partial overlap with Holding 4 the Miners Memorial is located on this lease)
7	Crown	Willyama Common	As per MPL184	4.38	BHOP (Partial overlap with Holding 4 the Miners Memorial is located on this lease)
8	Crown	Willyama Common	As per MPL185	1.43	BHOP (Partial overlap with Holding 4 the Miners Memorial is located on this lease)
9	Crown	Willyama Common	As per MPL186	0.5	BHOP
10	BHOP	Freehold 4635/757298	Mining purposes	0.21	BHOP
11	Crown	Willyama Common	Tourism area, Browns Shaft	0.25	BHCC, Licence to Occupy UG2-3A
12	Crown	Willyama Common	Tourism area, Block 10	1.29	BHCC, Licence to Occupy C39-1L

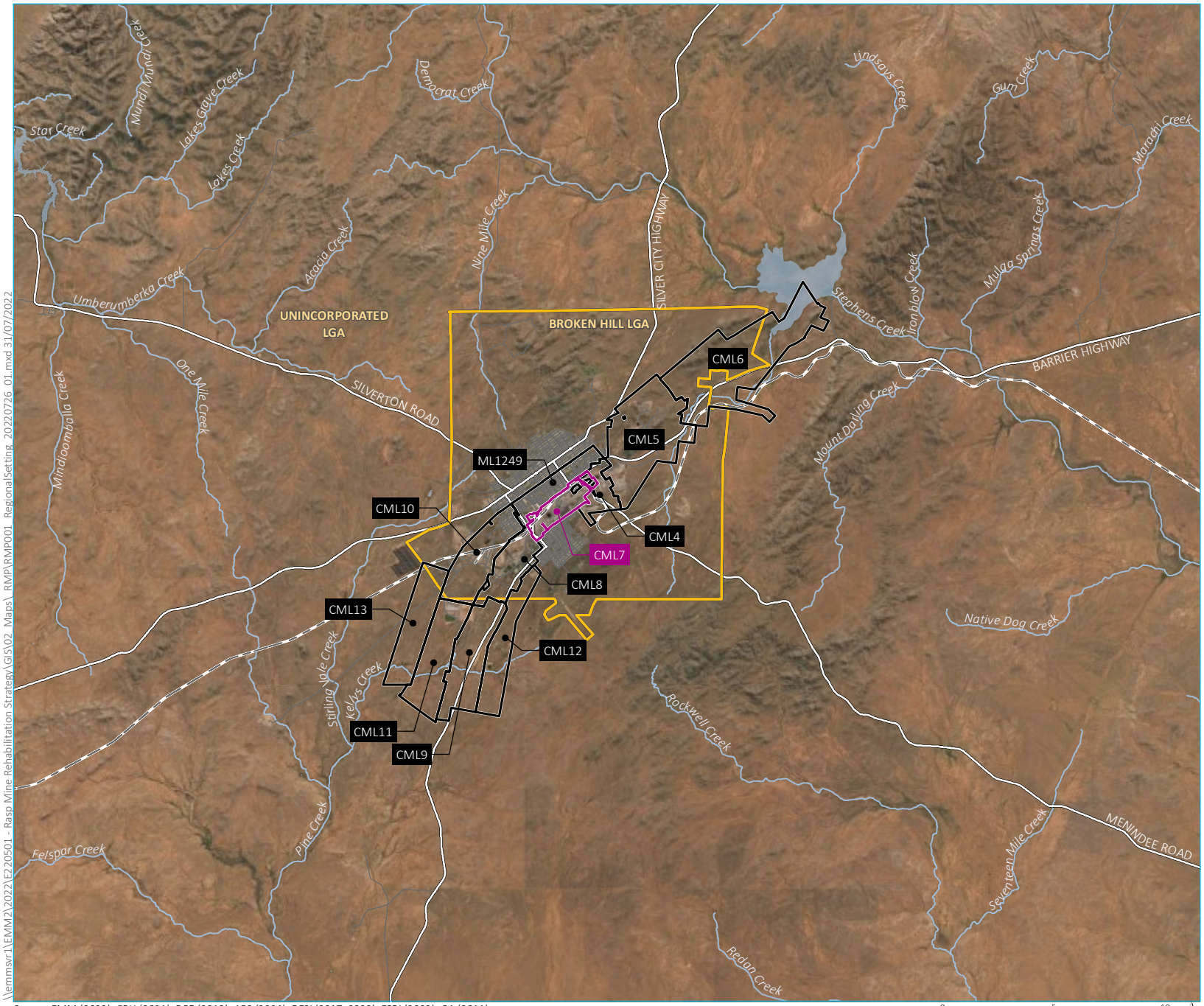
Some of BHOP activities are not located within CML7 and are located on adjacent freehold and Western Land Leases, these include:

- Administration offices located in Eyre Street – Main Administrative building is owned as freehold by BHOP, administration block known as Radford House is leased by BHOP from Lifeline on a 5-year lease, expiry 31 August 2021. BHOP are currently in the process of purchasing Radford House.
- Rail and Rail Loadout – is leased by BHOP from Australian Rail Track Corporation (ARTC) on a 10-year lease, 31 August 2021, with a 10-year option.
- Stores Warehouse – is located on Western Lands Leases.

i Other occupiers on CML7

a Crown Castle Australia

A communication tower has been managed by Crown Castle Australia since 2001. Known locally as the Vodafone Communications Tower (Photograph 1.1), the Tower services the City of Broken Hill. Although the Tower is located on CML7 and within the surface area of BHOP, BHOP is required to allow access to the Tower for maintenance and repair work (*Telecommunications Act 1997*).



KEY

- Broken Hill Operations mining lease
- Perilya mining lease
- Rail line
- Major road
- Minor road
- Named watercourse
- Named waterbody
- Local government area

INSET KEY

- Major road
- NPWS reserve
- State forest

Source: EMM (2022); CBH (2021); DPE (2019); ABS (2021); DFSI (2017, 2020); ESRI (2022); GA (2011)

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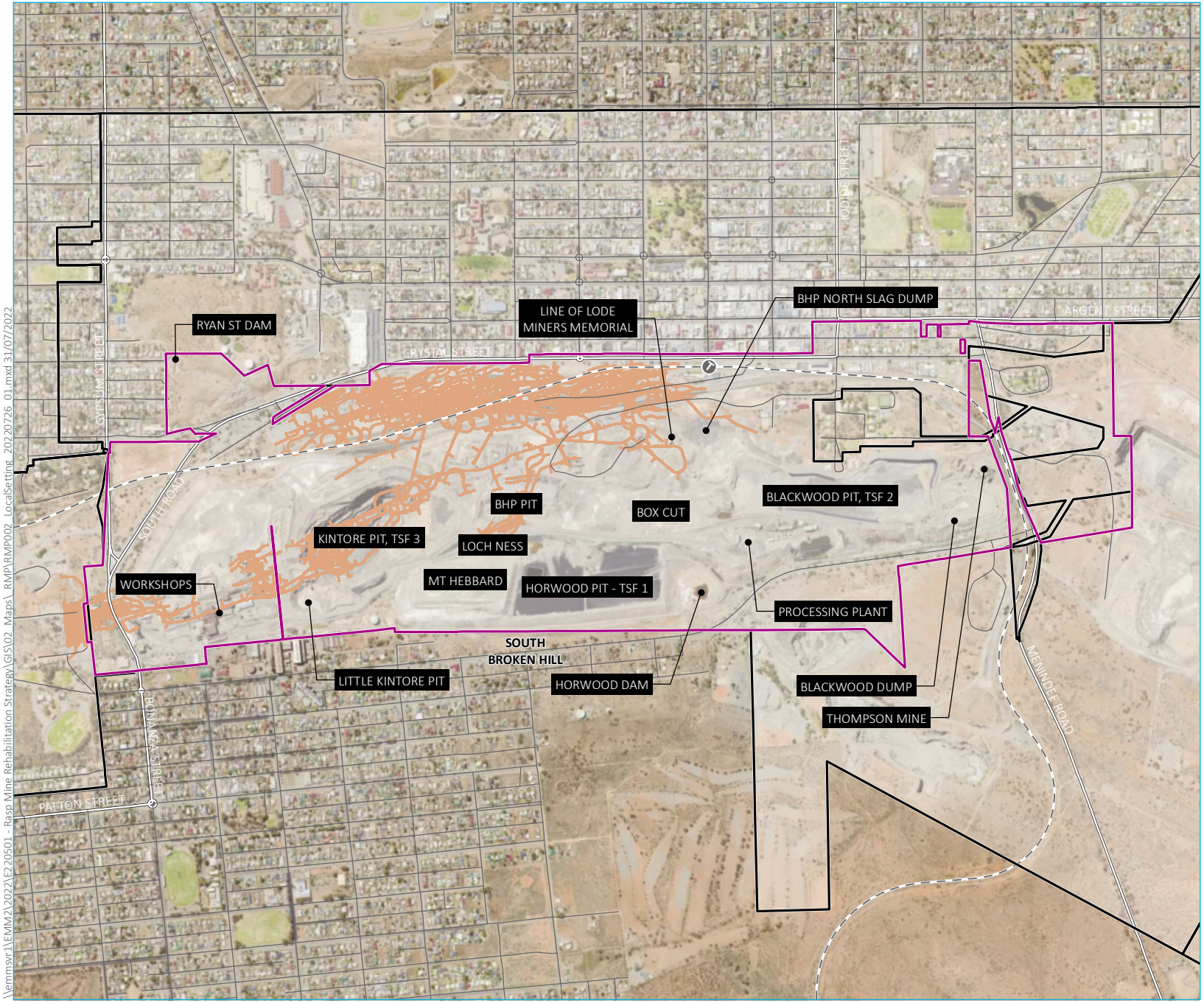
Regional setting

Rasp Mine
Rehabilitation Management Plan
Figure 1.1

EMM
creating opportunities



KEY

- Broken Hill Operations mining lease
- Perilya mining lease
- Train station
- Existing underground workings
- Rail line
- Major road
- Minor road

\\emmsvr1\EMM2\2022\E220501 - Rasp Mine Rehabilitation Strategy\GIS\02 Maps\ RMP\RMP002 LocalSetting 20220726 01.mxd 31/07/2022

Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020); Metromap (2022); GA (2011)

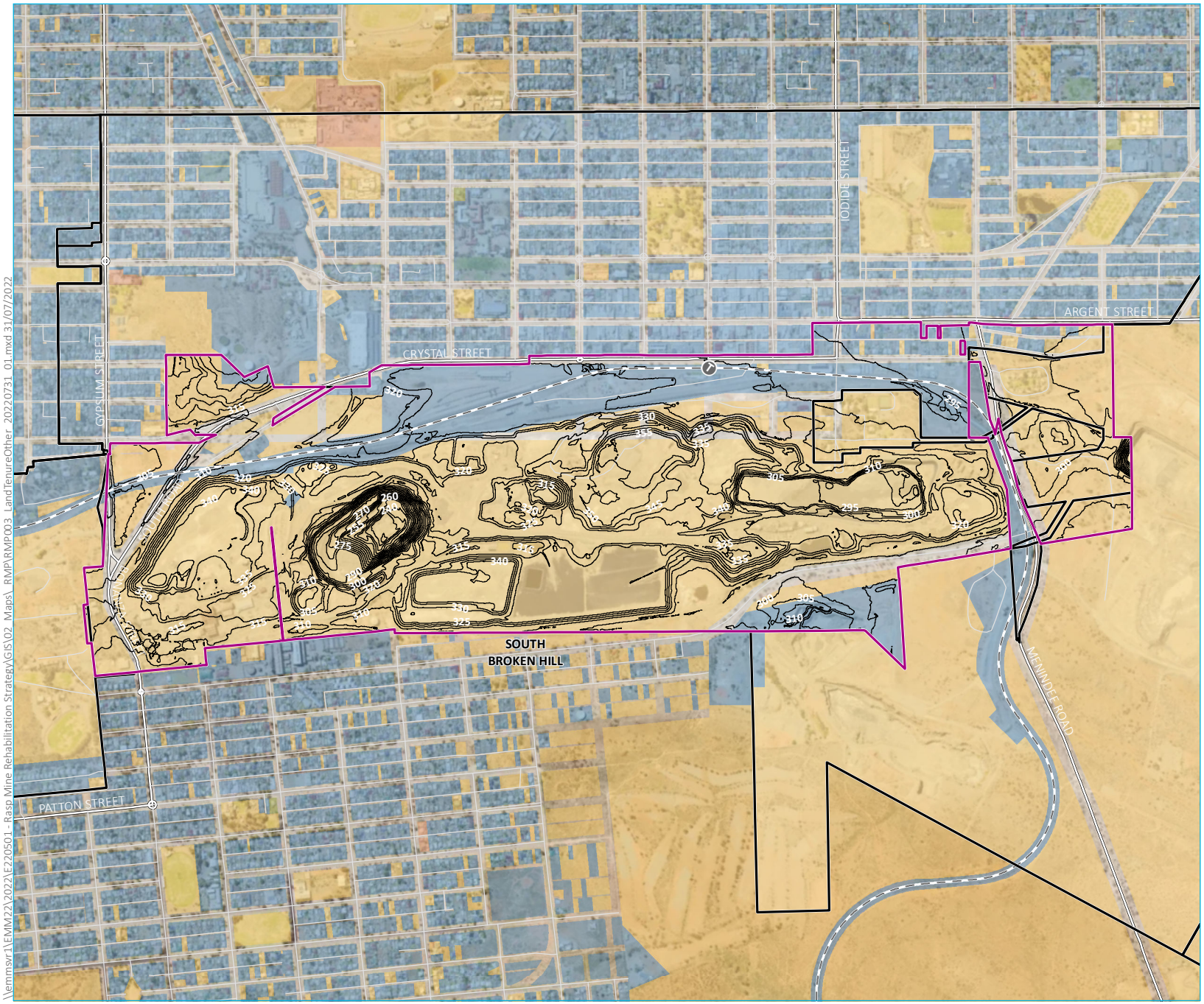
0 0.5 1 km

GDA2020 MGA Zone 54

Land tenure - mine locality plan (local)

Rasp Mine
Rehabilitation Management Plan
Figure 1.2

EMM
creating opportunities



Land tenure - other

Rasp Mine
Rehabilitation Management Plan
Figure 1.3

EMM
creating opportunities

Photograph 1.1 Vodaphone communications tower

b Broken Hill Miners Memorial and Broken Earth Café

The Broken Hill Miners Memorial and Broken Earth Café (Photograph 1.2) are located centrally in the Project Area and within the surface lease of BHOP. The buildings are owned by the Line of Lode Reserve Trust (LOLRT).

The Line of Lode Association (LOLA) was established in 1995 as a community-based group to oversee the development of tourism and other commercial possibilities with CML7. Several residential and other buildings were donated to LOLA in 2000. In September 2011 the LOLA was dissolved and their assets located on CML7 transferred to the then Land and Property Management Authority and now DPIE-Crown Land (Crown Lands), that established the Line of Lode Reserve Trust (LOLRT) and act as trustee of these assets. These assets include two residences location on South Road or Bonanza Street, Jamieson House (residence 27A&B), British Flats within Proprietary Square, and the Café and Miners Memorial centrally located on the city side of CML7 atop an old mine waste dump.

These facilities are not affected by mining operations. A Deed of Responsibility is in place between BHOP and the Lands Administration Ministerial Corporation allowing public access for tourism.

Photograph 1.2 Miners memorial and Broken Earth Cafe

c Olive Grove Plantation

A plantation of 1000 olive trees (Photograph 1.3) was planted in October 2004 by the Broken Hill Gourmet Products Co-operative Limited on an area of land previously used as water storage. It is located on 2.59 ha to the north-west of CML7 and within the surface area of BHOP. The project produces olives each year which are pressed for their oil and sold commercially.

Photograph 1.3 Olive plantation

d Other properties

Several residential and other buildings were donated to LOLA (now LOLRT) in 2000. These assets include two residences location on South Road or Bonanza Street, Jamieson House (residence 27A&B) (Photograph 1.4), British Flats (Photograph 1.5) within Proprietary Square, and the Café and Miners Memorial centrally located on the city side of CML7 atop an old mine waste dump.

British Flats is listed on the BHCC LEP 2013 for its heritage significance. These buildings are not owned by BHOP however are located on CML7 and are included in the surface rights areas of BHOP.

Photograph 1.4 Jamieson House (Residence 27A & B)

Photograph 1.5 British Flats

2 Final land use

2.1 Regulatory requirements for rehabilitation

Regulatory requirements for rehabilitation applicable to the Rasp Mine are listed in Table 2.1. These include requirements specified in mining leases, relevant legislation and guidelines and other statutory approvals, permits and licences issued for the site.

No final land-uses are mandated in the Development Approvals or Development Consents that apply to the project.

As the mine is defined as a large mine in that it has one or more mining leases and the carrying out of activites under at least one of which requires an environmental protection licence (EPL) under the *Protection of the Environment Operations Act* 1997, the new standard mining conditions will apply to all mining leases on the project. The relevant standard rehabilitation conditions are listed in Table 2.1.

Table 2.1 Regulatory requirements for rehabilitation

Instrument	Condition	Applicable domains/ land parcels	Timing	RMP section
Development Consents				
PA 07_0018	Sch.3, c.34 The proponent must rehabilitate the site progressively, that is, as soon as practicable following disturbance, to the satisfaction of the Secretary.			
	Sch.3, c.34A Within 6 months from approval of Modification 6, the proponent must prepare a Rehabilitation Strategy for the site to the satisfaction of the Secretary. This strategy must: • be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Secretary; • be prepared in consultation with relevant stakeholders including the RR, MEG,EPA, NSW Health (Western NSW Local Health District), DPE Water, Heritage NSW, Council and Perilya Broken Hill Limited; • define the rehabilitation objectives for and schedule of the mine site and "free areas", with consideration of heritage values, dust management, water and leachate management, subsidence, visual impacts and public safety; • include a conceptual final landform and rehabilitation plan; • include a life on mine rehabilitation and mining schedule which outlines key progressive rehabilitation milestones from the commencement of operations through to decommissioning and mine closure; and • managing and minimising any adverse socio-economic effects associated with mine closure. The proponent must implement the approved Rehabilitation Strategy for the project.		17 September 2022	
	Sch.3 c.35 The proponent must prepare and implement a Rehabilitation Management Plan for the project in accordance with the conditions imposed on the mining lease(s) associated with the project under the *Mining Act* 1992.	1,2,3,4	1 August 2022	Section 6
	(iii) the grasses, plants, shrubs and/or trees proposed to be planted on the subject area following mining operations.	1,2,3,4	1 August 2022	Section 6

Table 2.1 Regulatory requirements for rehabilitation

Instrument	Condition	Applicable domains/ land parcels	Timing	RMP section
Mining Leases				
CML 7	5. The holder of a mining lease must rehabilitate land and water in the mining area that is disturbed by activities under the mining lease as soon as reasonably practicable after the disturbance occurs.	1,2,3,4	1 August 2022	Section 6
	6 (1) The holder of a mining lease must ensure that rehabilitation of the mining area achieves the final land use for the mining area.	1,2,3,4	1 August 2022	Section 4
	6 (2) The holder of the mining lease must ensure any planning approval has been obtained that is necessary to enable the holder to comply with subclause (1)	1,2,3,4	1 August 2022	Table 1.2
	6 (3) The holder of the mining lease must identify and record any reasonably foreseeable hazard that presents a risk to the holder's ability to comply with subclause (1). Note— Clause 7 requires a rehabilitation risk assessment to be conducted whenever a hazard is identified under this subclause.	1,2,3,4	July 2022	Section 3
	6(4) In this clause— final land use for the mining area means the final landform and land uses to be achieved for the mining area— (a) as set out in the rehabilitation objectives statement and rehabilitation completion criteria statement, and (b) for a large mine—as spatially depicted in the final landform and rehabilitation plan, and (c) if the final land use for the mining area is required by a condition of development consent for activities under the mining lease—as stated in the condition. Planning approval means— (a) a development consent within the meaning of the Environmental Planning and Assessment Act 1979, or (b) an approval under that Act, Division 5.1.	1,2,3,4	1 August 2022	Section 4 Section 5 N/A
	7 (1) The holder of a mining lease must conduct a risk assessment (a rehabilitation risk assessment) that— (a) identifies, assesses and evaluates the risks that need to be addressed to achieve the following in relation to the mining lease— (i) the rehabilitation objectives, (ii) the rehabilitation completion criteria; (iii) for large mines—the final land use as spatially depicted in the final landform and rehabilitation plan, and (b) identifies the measures that need to be implemented to eliminate, minimise or mitigate the risks.	1,2,3,4	July 2022	Section 3
	7 (2) The holder of the mining lease must implement the measures identified.	1,2,3,4		

Table 2.1 Regulatory requirements for rehabilitation

Instrument	Condition	Applicable domains/ land parcels	Timing	RMP section
	7 (3) The holder of a mining lease must conduct a rehabilitation risk assessment— (a) for a large mine—before preparing a rehabilitation management plan, and (b) for a small mine—before preparing the rehabilitation outcome documents for the mine, and (c) whenever a hazard is identified under clause 6(3)—as soon as reasonably practicable after it is identified, and (d) whenever given a written direction to do so by the Secretary.	1,2,3,4		Section 3
	10 (1) The holder of a mining lease relating to a large mine must prepare a plan (a rehabilitation management plan) for the mining lease that includes the following— (a) a description of how the holder proposes to manage all aspects of the rehabilitation of the mining area; (b) a description of the steps and actions the holder proposes to take to comply with the conditions of the mining lease that relate to rehabilitation, (c) a summary of rehabilitation risk assessments conducted by the holder, (d) the risk control measures identified in the rehabilitation risk assessments; (e) the rehabilitation outcome documents for the mining lease; (f) a statement of the performance outcomes for the matters addressed by the rehabilitation outcome documents and the ways in which those outcomes are to be measured and monitored.	1,2,3,4	1 August 2022	This document
	10 (2) If a rehabilitation outcome document has not been approved by the Secretary, the holder of the mining lease must include a proposed version of the document.	1,2,3,4	1 August 2022	Section 4
	10 (3) A rehabilitation management plan is not required to be given to the Secretary for approval.	Noted		
	10 (4) The holder of the mining lease— (a) must implement the matters set out in the rehabilitation management plan, and (b) if the forward program specifies timeframes for the implementation of the matters—must implement the matters within those timeframes.	Noted		
	12 (1) The holder of a mining lease must prepare the following documents (the rehabilitation outcome documents) for the mining lease and give them to the Secretary for approval— (a) the rehabilitation objectives statement, which sets out the rehabilitation objectives required to achieve the final land use for the mining area; (b) the rehabilitation completion criteria statement, which sets out criteria, the completion of which will demonstrate the achievement of the rehabilitation objectives; and (c) for a large mine, the final landform and rehabilitation plan, showing a spatial depiction of the final land use.		1 August 2022	Section 4 Section 4 Section 5

Table 2.1 Regulatory requirements for rehabilitation

Instrument	Condition	Applicable domains/ land parcels	Timing	RMP section
	12 (2) If the final land use for the mining area is required by a condition of development consent for activities under the mining lease, the holder of the mining lease must ensure the rehabilitation outcome documents are consistent with that condition.			N/A
	13 (1) The holder of a mining lease must prepare a program (a forward program) for the mining lease that includes the following— (a) a schedule of mining activities for the mining area for the next 3 years; (b) a summary of the spatial progression of rehabilitation through its various phases for the next 3 years; and (c) a requirement that the rehabilitation of land and water disturbed by mining activities under the mining lease must occur as soon as reasonably practicable after the disturbance occurs.	1,2,3,4	1 August 2022	Section 6
MPL183	As per CML7 (standard conditions – common to all MLs)			
MPL184	As per CML7 (standard conditions – common to all MLs)			
MPL185	As per CML7 (standard conditions – common to all MLs)			
MPL186	As per CML7 (standard conditions – common to all MLs)			
ML 930	As per CML7 (standard conditions – common to all MLs)			
ML1249 sublease	As per CML7 (standard conditions – common to all MLs)			
EL 5818	As per CML7 (standard conditions – common to all MLs)			

2.2 Final land use options assessment

BHOP purchased the Rasp Mine from NMI in March 2001. Prior to the purchase by BHOP, NMI managed the site under a care and maintenance management plan having undertaken and completed rehabilitation of the site (to the extent that was agreed by the then DMR). The mine was being used by the LOLA as a tourist operation with guided tours conducted through the old processing plant and heritage buildings, and a private tourist operator conducted underground tours via the Delprats Shaft. Tourism operations ceased when the mine reopened in 2010.

Department of Primary Industries – Lands (DPI – Lands, 2016) prepared a draft Broken Hill, Line of Lode Masterplan that outlines a range of projects associated with mining heritage at the line of lode including:

- interpretative mining tours;
- construction of an amphitheatre for memorial ceremonies, open air cinema or musical performances;
- expansion of the Broken Earth café (currently being undertaken); and
- construction of new methods of accessing the top of hill including walkways, cycle paths and chair lift (currently being undertaken).

A Broken Hill Rehabilitation Steering Committee (Broken Hill Mining inter-Agency Committee (BHMIAC) was formed with the purpose of facilitating a coordinated whole of government approach to establishing sustainable post-mining land use options for the mines within the Broken Hill district (M Newton, pers.com). The initial focus of the Committee is limited to the Rasp mine and adjacent Perilya mining operations and associated facilities. It is the objective that the focus of the Committee will be expanded in the future to the broader Broken Hill mining district. The Group is comprised of representatives from DPC, EPA, Resources Regulator, Crown Lands, OEH, Broken Hill Lead Program, DPE as well as Broken Hill Council. It is not the role of the Group to be part of any decision making required as part of any regulatory function executed by the government agencies represented on the Group.

Site inspections at Broken Hill were undertaken by Committee 13-14 August 2019. The purpose of the inspection was to provide the site context to members of the group to ensure committee members understand the complexity of issues that need to be addressed in developing a pathway to confirming post-mining land use option(s) (M Newton, pers.com). It also intended to provide an opportunity for both BHOP and Perilya to outline issues that required further clarification.

BHOP has had no further contact with the committee since the 2019 inspection however it can be inferred that there is a desire for a mining tourism for relevant sections of the site. In the absence of specific guidance from the Committee or DPI- Lands, BHOP have adopted a 'fall back' safe, stable and non-polluting final land-use that provides for a heritage final land use for the greater mine area.

BHOP has initiated for final land-use consultation with the Committee and other relevant stakeholders (section 4.2) acknowledging that due to the complexity of issues it may take several years for consensus to be achieved.

Other alternate post-mine land uses were considered and excluded (Table 2.2).

Table 2.2 Excluded post-mine land uses

Post-mine land use	Reasons
Grazing	Aridity, lack of growing media, lack of suitable water, contamination, available area, waste landforms with suitable gradients will be capped with inert waste rock for lead dust control preventing the establishment of pastures.
Biodiversity	Aridity, lack of growing media, waste landforms will be capped with inert waste rock for lead dust control.
Industry	Visual amenity, geotechnical stability, available area, conflict with heritage use
Residential	Geotechnical, contamination, visual amenity, available area, conflict with heritage use

A biodiversity final land-use may be possible on site if the waste rock has sufficient fines to support sparse native vegetation. Waste rock typically contains between 1-2% silt and sand sized particles which severely limits the water and nutrient holding capacity of the waste rock and generally results in hostile conditions for plant germination and establishment.

Desktop mapping of vegetation mapping undertaken by OzArk (2017) (Figure 2.1) for the adjacent Perilya Mine indicates that two vegetation communities are likely to have existed prior to being cleared by historical mining:

- 27. Acacia aneura- Acacia tetragonophylla tall shrub land; and
- 34. Atriplex vesicaria dwarf open scrub.

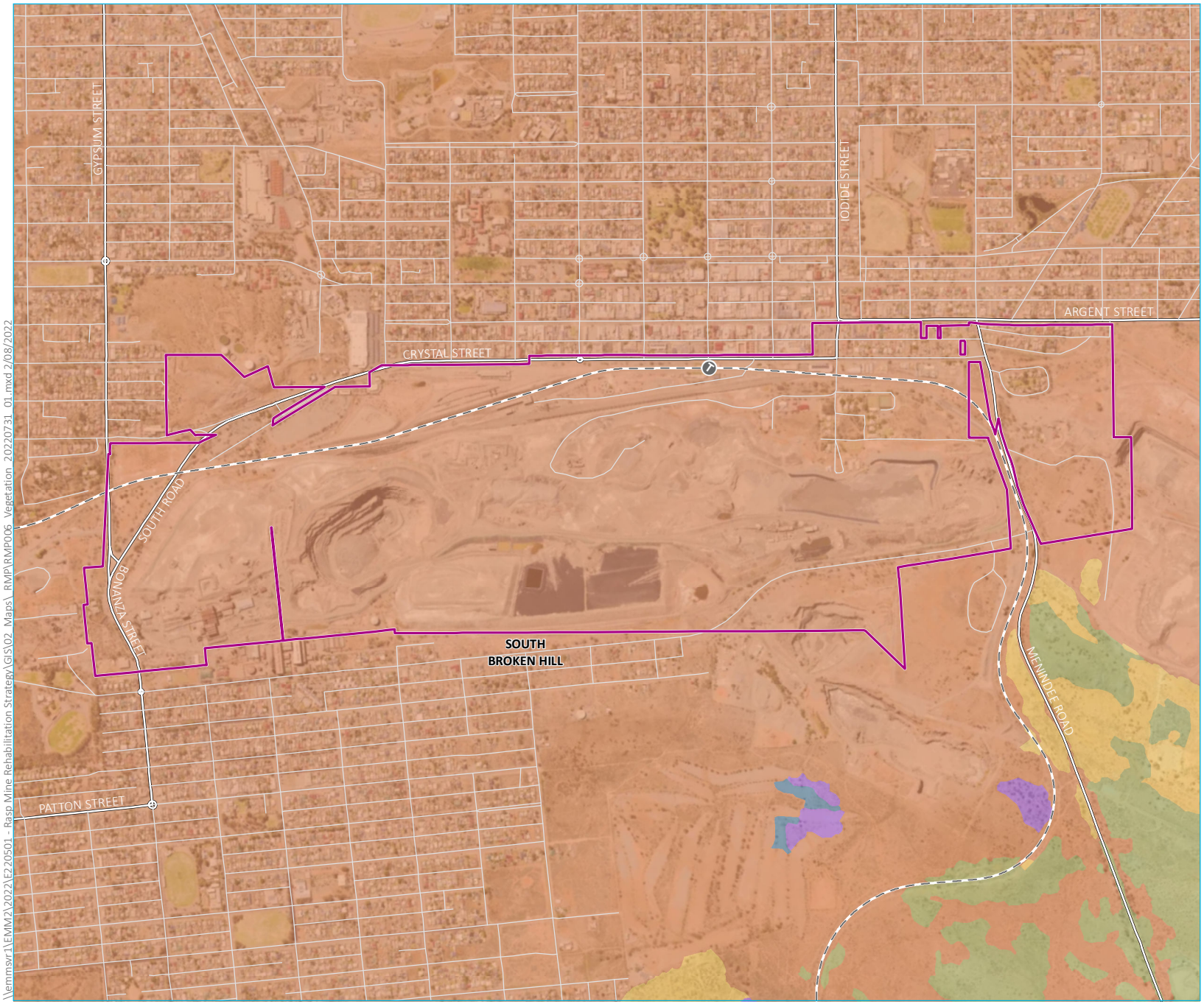
These vegetation communities are described in detail in Pickard and Norris (1994) and are replicated in Table 2.3.

Table 2.3 Vegetation Map Units

Number/ Name	Map unit 27 *Acacia aneura- Acacia tettagononphylla* (Mulga-Dead Finish)	Map unit 34. *Atriplex vesicaria* dwarf open scrub (Bladder Saltbush on downs and ranges)
Geographic distribution	Widespread and scattered community on rocky hills and ridges, such as the Barrier Ranges, where it is most common and extensive, the Grey Range, Scopes Range east of Broken Hill and mesas of White Cliffs. Also occurs on both sides of the Darling River north-west of Wilcania, and on parts of the Cobar pediplain.	Widespread in the north-west of the map area from Wilcannia to both South Australian and Queensland borders
Landforms	Steep to moderate slopes on hills of Devonian sandstone, rocky cliffs, abutment out-cropping sandstone.	Broad undulating stony plains, often of plateaus, and on stony ranges.
Soils	Skeletal lithosols, some desert loams. Local patches of aeolian sediment.	Brown desert loams with extensive lags of silcrete gibbers, gilgai brown clays; skeletal lithosols.
Structure	Open-shrubland of rather small and stunted bushes of *Acacia aneura* and *Acacia tetragonophylla* with extensive open areas. Also extensive areas of dead shrubs from wildfire or drought stress.	Moderate to sparse *Atriplex vesicaria* forming dwarf open-scrub with open inter-bush areas. On strongly gilgaied sites, *Astrebla lappacea* and various herbs usually occur in the depression and *Atriplex vesicaria* on the rises. On rocky ranges, the inter-bush area are frequently occupied by various herbs and low shrubs.
Canopy species	*Acacia aneura, Acacia tetragonophylla, Atalaya hemiglauca, Casuarina pauper, Grevilia striata*.	Vary with the site and habitat. Downs often have *Atriplex vesicaria, Maireana pyramidata* (especially in sandier soil in drainage lines), and *Astrebla lappacea*. Ranges and rocky sites of have *Atriplex vesicaria, Maireana pyramidata* and scattered emergent *Acacia aneura* and *Casuarina pauper*. Low open woodland of *Acacia cana* on sandier rises and in creeks.
Other species	Various herbs including *Ptilotus spp.,* and grasses, especially *Enneapogon avenaceus* and *Aristida contorta*	Wide ranges of herbs and grasses, especially *Astrebla lappacea*. In some areas, scattered *Sarcostemma austral* and *Sclerostegia* spp. occur. Ground cover species on downs are usually short-lived perennial grasses, especially *Enneapogon* spp., *Triraphis mollis, Sprobolus actinocladus, Dicanthium sericeum*, and the more long-lived perennial *Eragrostis setifolia*. Common forbes include *Sclerolaena brachyptera, Sclerolaena eriantha* and *Sclerolaena ventricosaI*.

Previous revegetation trials on site have failed due to lack of suitable growing media and the harsh climatic conditions. BHOP are currently undertaking an assessment to see if it is feasible to manufacture a growth media from commercially produced organic waste. If the outcome from the assessment is positive then BHOP may consider undertaking further trials.

To minimise the potential for lead dust generation from land shaping, constraints posed by historical mining wastes (eg TSF 1), and a desire to not alter historical landforms, BHOP propose to leave the outer facing batters at angle of repose as agreed and approved by the then DMR for NMI in 1996 (detail in section 2.4.1v). BHOP are currently undertaking erosion modelling to determine if rock mulching is required to achieve target erosion rates. If rock mulching is required, then there will be insufficient growing media for vegetation establishment on the outer batters.



KEY

- Broken Hill Operations mining lease
- Train station
- Rail line
- Major road
- Minor road

Plant community type

- 0 | Not native vegetation
- 123 | Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 128 | Nelia tall open shrubland of semi-arid sandplains
- 139 | Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
- 155 | Bluebush shrubland on stony rises and downs in the arid and semi-arid zones

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Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011); OEH (2022)

0 0.5 1 km

GDA2020 MGA Zone 54

Modelled vegetation communities prior to mining disturbance

Rasp Mine
Rehabilitation Management Plan
Figure 2.1

EMM
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2.3 Final land use statement

The proposed final land uses for the mine will be a combination of:

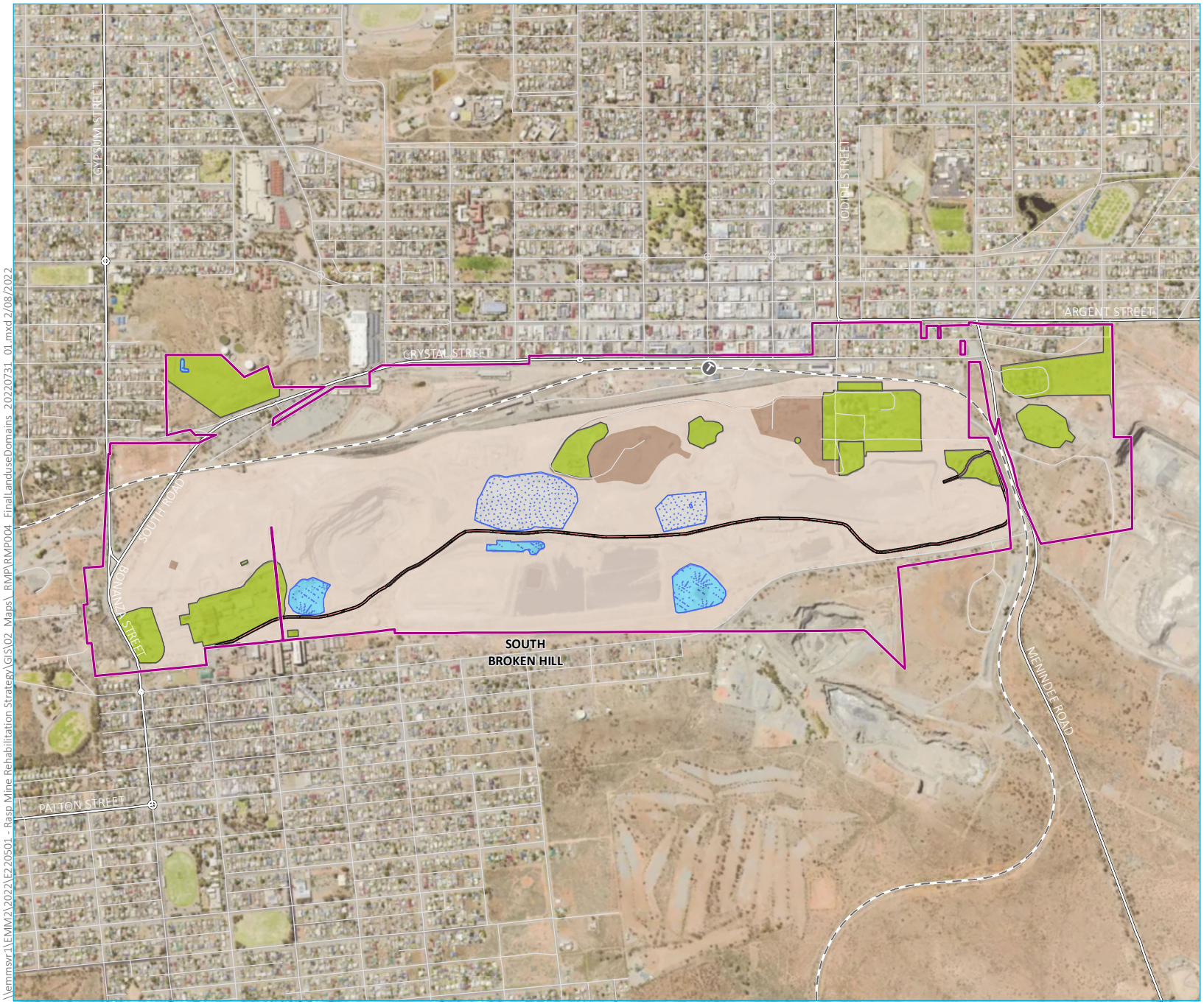
- mining landscape - safe, stable and non-polluting waste landforms;
- biodiversity where suitable growing media exists;
- mining and industrial heritage; and
- mining and industrial related tourism.

2.4 Final land use and mining domains

The Rasp Mine has five (5) final land-use domains and eight (8) mining domains as summarised in Table 2.4 and shown in Figure 2.2 and Figure 2.3. Domain codes are in accordance with the Resources Regulator Mine Rehabilitation Portal Guideline (RR 2021). Detailed descriptions of these domains are provided in the following sub-sections.

Table 2.4 Rasp Mine – rehabilitation domains

Code	Domain name	Area (ha)
Final land use domains		
F	Water management areas	6.50
H	Heritage area	50.31
I	Infrastructure	3.66
J	Final void	11.44
K	Other – mining landscape	231.82
	Other – other users	14.52
Mining domains		
1	Infrastructure Areas	25.25
2	Tailings storage facilities	58.86
3	Water management areas	11.13
4	Waste emplacement areas	164.12
6	Underground mining area	2.79
7	Beneficiation facility	5.80
8	Other - heritage	50.31



KEY

- Broken Hill Operations mining lease
- Train station
- Rail line
- Major road
- Minor road

Final land use domain

- Final void
- Heritage area
- Infrastructure
- Water management areas
- Other - mining landscape
- Other - other users

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Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

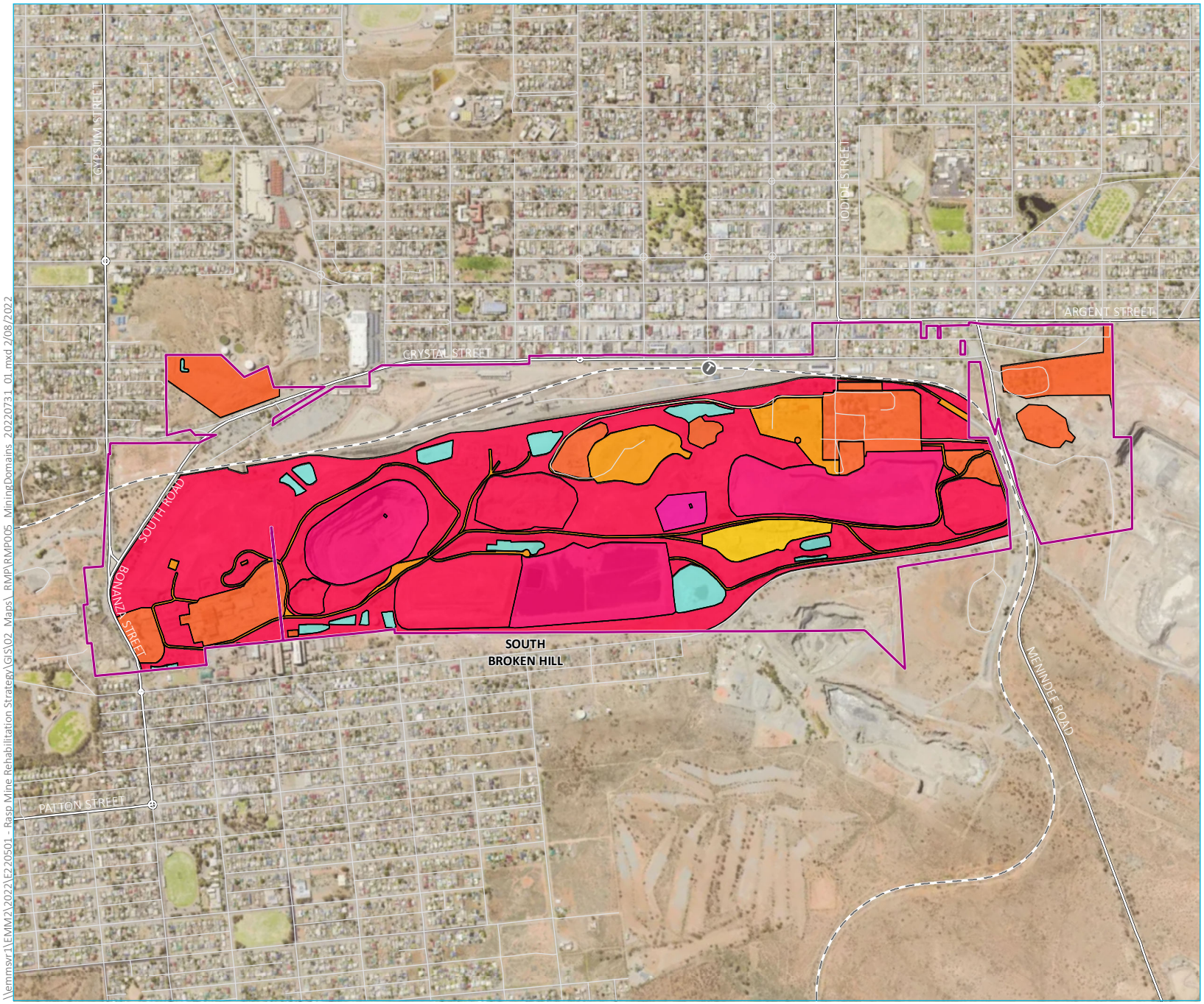
0 0.5 1 km

GDA2020 MGA Zone 54

Final land use domains

Rasp Mine
Rehabilitation Management Plan
Figure 2.2

EMM
creating opportunities



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Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

Mining domains

Rasp Mine
Rehabilitation Management Plan
Figure 2.3

EMM
creating opportunities

2.4.1 Final land use domains

i Domain F – Water management area

Significant water management works were undertaken by NMI from 1993 through to 2000 to minimise the discharge of surface water and divert it to evaporation basins within or adjacent to the lease (NML, 2000). A summary of surface water management works undertaken by NMI prior to BHOP purchasing the mine is detailed in Table 2.5.

Table 2.5 Surface water management works undertaken by NML

Location	Works	Date	Purpose
Haul road at the toe of the Horwood tailings dump (TSF1) and Horwood Dam	Bunding of haul road and Horwood Dam	January 1993	To prevent stormwater from the southern side of the city entering the lease.
Horwood tailings dump (TSF1)	Earth fill near Kintore pit and change of road gradients. Trenching from Dump 1A to Kintore Pit.	January 1993	Diversion of flow away from TSF1. Diversion of flow from the old crusher and mill areas to the then mill dam and an area south of Kintore Pit. Trenching was undertaken to divert flow from Dump 1A to Kintore Pit.
Waste dumps (including old tailings dumps covered with rock) in the Delprats area	Recontouring and excavation of a drainage channel	1993/1994	Divert flow from the waste dumps to the BHP pit.
Delprats waste dump	Recontouring and redirecting drainage	1994/1995, extended in 1997/1998	Divert flow from Delprat dump and roadway to BHP pit to the south and Block 14 to the north.
Dump 1A and All Nations tailings dump	Perimeter bunding	1995/1996 and 1996/1997	Runoff from the top of Dump 1A and All Nations tailings dump re-directed to Kintore Pit.
No 7 winder southeast to the old mill	Bunding	1995/1996 and 1996/1997	Divert flow to the old Kintore Pit.
Old Broken Hill South tailings dump western side of CML7 overlooking the rail yards	Using waste rock to cover and construct a stormwater retention area	1996/1997	Cover tailings and create stormwater capture and evaporation.
Old Sulphide Corporation fire/ambulance building	Excavation of a retention basin	1996/1997	Capture of stormwater from the south-eastern side of CML7 and redirecting it via a culvert under the main access road into old Kintore Pit.
North-east boundary fence	Removal of mullock and slack and construction of major drainage bunds	1996/1997	Direct stormwater to the Horwood Dam to eliminate any runoff or seepage outside the lease boundary from that area.

Table 2.5 Surface water management works undertaken by NML

Location	Works	Date	Purpose
Rail yards	Construction of an evaporation pond at the base of the black slag dump and connection to the rail yards evaporation pond	1999/2000	To divert, capture and evaporate contaminated stormwater.
Blackwoods waste rock dump	Bunding and regrading of benches	1997/1998	To redirect stormwater from Blackwoods waste rock dump to Blackwoods Pit.

The concept final landform design maximises the opportunity for diversion of stormwater flow away from the angle of repose outer batters and maintains internal drainage to pits and low points to encourage retention and evaporation. Modification to some of the works undertaken by NMI is proposed to minimise the concentration of flows and erosion potential, and to avoid the reliance on structural erosion controls. It also accounts for drainage modification undertaken by BHOP over the life of the mine.

A surface water model of the proposed final landform is current being developed, the results of which will be detailed in the Rehabilitation Management Strategy (RMS) to be submitted to DPE for approval in September 2022. This RMP will be updated accordingly.

The key formal evaporation dams (other than the final voids) planned to remain following closure are detailed in Table 2.6.

Table 2.6 Water storages

Water Storage	Capacity	Purpose	Comments
Ryan Street Dam		Collect contaminated stormwater run-off from the historical Block 10 smelter.	BHOP investigating an option to establish an artificial wetland in this dam to improve contaminant capture.
Horwood Dam	7,66m^3	Receives seepage and stormwater runoff from the Mt Hebbard and TSF 1 outer batters.	BHOP are investigating an option to establish an artificial wetland in this dam to improve contaminant capture.

Details of evaporation to remain will be refined in the surface water model currently being developed for the site.

ii Domain H – Heritage areas

The Rasp mine site has many items that possess heritage significance on a local, State and National level. As a result, constraints apply to some actions that would ordinarily form part of conventional mine rehabilitation works as detailed in Table 2.7.

Table 2.7 Statutory listing implications

Listing	Relevant legislation	Protections	Implications
National Heritage List	*Environmental Protection Biodiversity Conservation Act 1999*	Site is listed on the NHL are defined as Matters of National Environmental Significance (MNES). Under the EPBC Act, an action that may have a significant impact on a MNES is deemed to be a 'controlled action' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may potentially have a significant impact on a MNES is to be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for determination as to whether or not it is a controlled action. If deemed a controlled action the project is assessed under the EPBC Act for approval.	The project area falls under the NHL listing for the City of Broken Hill (refer to attachments). Whether an action needs to be referred is determined by the proponent via a self-assessment process. *Matters of National Environmental Significance, Significant Impact Guidelines 1.1* (Department of the Environment 2013) provides a framework to assist proponents. The Rasp Mine Closure Remediation Plan would need to be self-assessed to determine whether the implementation of the plan would have a significant impact on the assessed significance of the City of Broken Hill NHL listing. It would be deemed to have a significant impact if one of the following statements is found to be true: • one or more of the National Heritage values to be lost; • one or more of the National Heritage values to be degraded or damaged, or • one or more of the National Heritage values to be notably altered, modified, obscured or diminished.
State Heritage Register	*Heritage Act 1977*	Items are protected under Section 57 of the Heritage Act as they are significant in the development of NSW	• Cannot be disturbed/impacted/changed without approval. • Change must be justified. • Approval not guaranteed.
LEP listing	*Environmental Planning and Assessment Act 1979*	As defined by the standard LEP and the DCP.	• Council to approve changes. • Development that has the potential to affect heritage items is discouraged.

Numerous gazetted heritage items are located within the site as detailed in Table 2.8.

Table 2.8 Gazetted heritage items

Item	Register	Item ID	Project area	Comments
City of Broken Hill	NHL	C2015G00102	X	
BHP Chimney Ruins of First Offices	SHR	01820	X	
	LEP	I14	X	
BHP North Slag Dump	LEP	I15	X	
British Flats – Proprietary Square	LEP	I21	X	Abutting Mining Precinct 11 (I417)
Sydney Railway Station (former)	LEP	I210	X	Directly adjacent to
Radford House	LEP	I116	X	Surrounded on the south-west, north-west and north-east sides by Mining Precinct 1
Mining Precinct 1	LEP	I236–I262	X	Items listed separately on the LEP as: • I236 Brick Pier Foundations • I237 South Mill • I238 Carpenter's paint Shop • I239 Changehouse • I240 Coal Bins • I241 Compressor Rooms (Old Power House) • I242 Electrical Workshop • I243 Fire and Ambulance Station • I244 General Offices • I245 General Store Offices • I246 Mechanical Workshop (Old General Workshop • I247 Mullock Bin • I248 No 2 Control Substation • I249 No 6 Shaft Vent Fan • I250 Pattern Store (Carpenter's Shop) • I251 Pumphouse • I252 Pumphouse and Cooling water Reservoir • I253 Rigger's Shop • I254 Roaster Plant • I255 Sand Plant • I256 Saw Mill and Extension • I257 Square Concrete Foundation • I258 Tankstand • I259 Two Water Tanks • I260 Two Water Tanks and a Stone Foundation • I261 Water Tower • I262 Yardman's Office

Table 2.8 Gazetted heritage items

Item	Register	Item ID	Project area	Comments
Mining Precinct 2	LEP	I263-I280	X	Items listed separately on the LEP as: • I263 Ambulance Garage • I264 Changehouse • I265 Covered Overpass • I266 Crusher Station • I267 Headframe, No 4 Shaft • I268 Ice-making Plant Building • I269 Lamp Repair Room • I270 Lamp Room • I271 Magazine • I272 No 7 Headframe • I273 No 7 Rescue Equipment Building • I274 No 4 Rescue Equipment and Waiting Sheds • I275 No 7 Winding House • I277 Rectifier Room • I278 Saw Mill • I279 Underground Offices Building • I280 Winding House and Motor, No 4 Shaft
Mining Precinct 5	LEP	I285–I295	X	Items listed separately on the LEP as: • I285 BHP Concentrations Mill Foundations • I286 BHP South Smelter Walls and Stack • I287 Delprat Changehouse • I288 Delprat General Offices • I289 Delprat Headframe and Shaft • I290 Delprat Winder Foundation • I291 Delprat Winder House • I292 Loading Platform • I293 Slag Dump, Foundations and Timber Piles • I294 Stone Wall and Concrete Footings • I295 Three Water Tanks
Mining Precinct 6	LEP	I296–I304	X	Items listed separately on the LEP as: • I296 Mullock Dump with Tram Lines • I297 Ore Outcrop • I298 Thompsons Ambulance Station • I299 Thompsons Changehouse • I300 Thompsons Conveyor, Storage Bin and Loading Hopper • I301 Thompsons Crusher House • I302 Thompsons General Offices • I303 Thompsons Headframe, Brace Housing and Conveyor • I304 Thompsons Winderhouse

Table 2.8 Gazetted heritage items

Item	Register	Item ID	Project area	Comments
Mining Precinct 7	LEP	I305–I309	X	Items listed separately on the LEP as: • I305 Building Foundation • I306 Four Concrete Piers • I307 Headframe • I308 Stone Wall • I309 Time Chute Race
Mining Precinct 11	LEP	I417	X	Proprietary Square Residences – off site in CML7 but in a surface exclusion area
Mining Precinct 12	LEP	I415–416	X	Items listed separately on the LEP as (located adjacent to site but outside CML7): • I415 Broken Hill City Council Film Studio Precinct (former Central Mine Assay Office and Central Power Station (CPS) • I416 Broken Hill City Council Film Studio Precinct (former Central Mine Assay Office and Central Power Station)

NMI's rehabilitation and closure program focused on the preservation of significant buildings and structures on the leases. NMI's rehabilitation program commenced in 1991 with comprehensive and systematic identification of movable items that constituted either:

- salvageable (ie saleable) material;
- scrap; or
- heritage items for conservation.

Direct sale of equipment was undertaken up until 1995 when an auction was held to sell remaining equipment. Scrap material was removed for burial in several campaigns from 1992 to 1997 and moveable heritage items were retained for future use by the LOLA or removed to museums in Broken Hill.

In 1993, BHCC was granted funding by the Heritage Council of NSW to support a study by industrial archaeologist J McCarthy of the significance of the headframes at No.4 and No. 7 shafts. BHCC noted, in presenting the findings of this report that:

"Preservation of the mining character of Broken Hill was essential for the long term prosperity of the town. This would impact on the rehabilitation strategies of the mines, with potential tourists coming to see mines, not vegetation." (MREMP minutes March, 1993).

Of note in the report was reference to the black slag dump overlooking Crystal Street on the western side of the lease. It was agreed the distinctive nature of this feature warrants its preservation and not covered or regraded in any way. The high density and cohesiveness of the slag makes the dump highly stable and its vertical face prevents access. Ownership of the dump maintained with BHP until it was purchased by MMM in 1998 (NML, 2000).

A gap behind a prominent freestanding stone and brick wall, which formed part of the original BHP smelter, and which over time had been washed out, was filled with rock by NMI from 1993-1994 to support it and prevent any further deterioration

Newer buildings, not important to understanding the site history – including a heavy equipment workshop, assay office, reagent store and training office were dismantled and removed in 1995-1996.

The tailings grinding and retreatment plant near the mill and its associated feed bin, apron feeder and conveyors were removed, foundations excavated, and the site cleared and graded. The coarse ore feed bin, primary crusher, secondary crushing and screening plants and conveyors were dismantled and removed, but the concrete foundations were left in place at the request of the LOLA. The voids were filled with rock.

At the South Mine Mill water supply tanks, thickeners and filter plant were removed and the mill dams filled with waste rock. Unwanted water pipes, tailings pipes, railway tracks and the firehouse drying mast were removed.

Important and distinctive infrastructure that was retained included:

- No. 7 and No. 4 headframes and winder houses, and the complex of associated structures, such as the covered walkway at No. 7;
- Brownes shaft (Junction) complex;
- Thompsons shaft (Junction) complex;
- Delprats headframe and winder;
- South Mine ambulance rooms, changeroom/bathhouse etc;
- South Mine Mill and workshops; and
- offices in Eyre Street (freehold, not on CML 7) and houses on South Road, Delprats Managers house and the British Flats.

Plant and equipment excluded from the main auction sale held by MMM in May 1995 and left in place for future mining heritage tourism included:

- the winders at Brownes shaft, Delprats, Thompsons and No. 7 (main) shafts
- in the mill, one set of roll crushers, one ball mill and the Mt Hebbard flotation cells and two solid displacement Aldridge pumps;
- all the original electrical switching and control stations;
- the sand fill plant with several sets of drag classifier;
- in the workshops, two (2) pre 1900 lathes and several overhead cranes;
- in the compressor building, the original compressor; and
- in the fire service pump house, several examples of high pressure water pumps.

In 1994-1995, old plans and records dating back to the early 1900's were collected and stored and made available to the LOLA. Work commenced to make safe for public access (to the then DMR and Workcover requirements at that time) the buildings and mine structures to be retained. This included:

- removing scrap, removing or repairing unsafe walkways, and removing contaminated material from the Mill and filling pits in the basement with rock;
- removing scrap and filling pits at the No.7 shaft crusher station; and
- clean-up and removal of scrap and removal of tailings around the old sand plant building.

Repair of the buildings continued in 1996-1997. Damaged roofs and walls were reclad (with iron sheets chosen for their 'weathered' look) and, in the Mill, unwanted stairways, power cables, pipework, walkways and steel work were repaired or removed, all accessible areas were cleared, and potentially hazardous areas partitioned off.

Shafts were either capped or fenced as detailed in Table 2.9.

Table 2.9 Shaft safety works undertaken by NML

Shaft	Details of works
No. 1	Previously filled, reinforced concrete slab
No. 4	Open, with steel mesh safety grid, chainwire cyclone fence
No. 5	Open upcast airway, mesh safety grid and security fence repaired
No. 6	Open upcast airway, additional chainwire security fence
Sandpass decline	Previously filled, reinforced concrete slab
Sandpass shaft	Previously filled, chainwire security fence
Campbell	Decked and fenced, signage fitted
Delprats vent shaft	Upcast airway, chainwire safety fence
Jimmy Green	Previously filled, reinforced concrete slab
Brownes	Decked with heavy gauge railway line and erection of security fencing
Thompsons	Open, with decking, security fence repaired
Thompsons vent shaft	Previously filled, reinforced concrete slab
King	Open, reinforced concrete slab
King vent shaft	Open, gaps around fan duct housing decked and concreted
Reyallick	Decked and chainwire security fence
McIntyre	Decked and chainwire security fence
Marsh	Decked and chainwire security fence

The LOLA was established in 1995 as a community-based group to oversee the development of tourism and other commercial possibilities with CML7. Several residential and other buildings were donated to LOLA in 2000. In September 2011 the LOLA was dissolved and their assets located on CML7 transferred to the then Land and Property Management Authority and now DPIE-Crown Land (Crown Lands), that established the Line of Lode Reserve Trust (LOLRT) and act as trustee of these assets. These assets include two residences location on South Road or Bonanza Street, Jamieson House (residence 27A&B), British Flats within Proprietary Square, and the Café and Miners Memorial centrally located on the city side of CML7 atop an old mine waste dump.

It is BHOP's intention that the mines heritage items remain following the cessation of mining and that the greater mine area is used for historical mining and industrial related tourism to minimise the socio-economic impacts on the City of Broken Hill. However, the responsibility for the heritage items will ultimately need to be transferred by BHOP to another entity. Formal consultation has commenced with relevant stakeholders to plan for this process (section 4.2).

Some heritage items may be structurally unsound and may not be fit for purpose for future mining use or tourism use (eg Carpenters Paint Shop). It may be necessary to seek development approval to demolish these items.

A draft conservation management plan (CMP) was prepared for BHOP in 2012 by Austral Archaeology Pty Ltd in association with Dr Peter Bell. The CMP comprises two volumes: Volume 1 is the main body of the CMP and Volume 2 includes the individual heritage inventory forms for each building and site.

GML Heritage (GML) prepared the *Rasp Mine Conservation Management Strategy,* in August 2015, commissioned by Broken Hill Operations Pty Ltd (BHOP). The objective of the report (GML 2015) was:

> …to integrate the findings and policies of the Draft CMP with the current management framework for Rasp Mine, to provide for appropriate management of the large number of individual heritage items, to align with BHOP's planning for mine closure and lease relinquishment and to form the basis for preparation of a revised Conservation Management Plan.

A revised CMP is being prepared by EMM in accordance with schedule 3, condition 30 of PA 07_0018 to inform the protection and management of heritage items following the cessation of mining.

iii Domain I - Infrastructure

At mine closure, infrastructure that has been installed by BHOP will be demolished and disposed of underground. Concrete structures and pads will be removed and placed underground or crushed and placed around heritage areas to minimise lead-bearing dust emissions. Contaminated material will be removed and disposed of underground or to the Kintore Pit (TSF 3) where it will be capped and covered with inert waste rock. Slopes greater than 18°, installed by BHOP, will be reshaped to ensure geotechnical and erosional stability.

Crushed cover will be placed as cover around heritage items to provide for public safety and to minimise lead-bearing dust emissions.

There are several sealed and unsealed hardstand and laydown areas across the site. The sealed areas will remain in-situ with removal of any contaminated material and the areas cleaned down. Most of the sealed areas are located around historic buildings and will remain for the proposed mining tourism final land use. Unsealed areas will have contaminated material removed and then covered with inert waste rock to minimise dust emissions.

It is intended that electrical services will be retained for mining heritage tourism purposes and therefore will only be partially terminated. Two electrical substations will be terminated, demolished, and placed underground.

Development approval will be required for demolition of buildings and structures erected by NMI in the 1990's. Demolition of current BHOP structures and buildings may also require a modification to the PA07_0018, which references the original Environmental Assessment that requires their retention to add another layer of mining history to the site.

Some unsealed and sealed roads will remain to allow access to the heritage items for the mining heritage tourism final land-use, access to the Vodaphone, Line of Lode Café, Miners Memorial, and lookout. Broken Hill City Council is responsible for the Line of Lode Café, Miners Memorial and lookout, access road, car parks, walkways and fences.

iv Domain J – Final voids

Two (2) final voids will remain at closure:

- BHP Pit; and
- Box Cut.

Little Kintore Pit will be partially backfilled with waste rock from the excavation of the Box Cut to form a shallow stormwater detention pond designed to capture runoff from the capped Kintore Pit landform up to and including a 1:100-year ARI event (Figure 2.4 and Figure 2.5) where it would evaporate or seep into the floor of the backfilled pit.

The finished surface will be a rough surface inert waste rock with 1 to 2% fines.

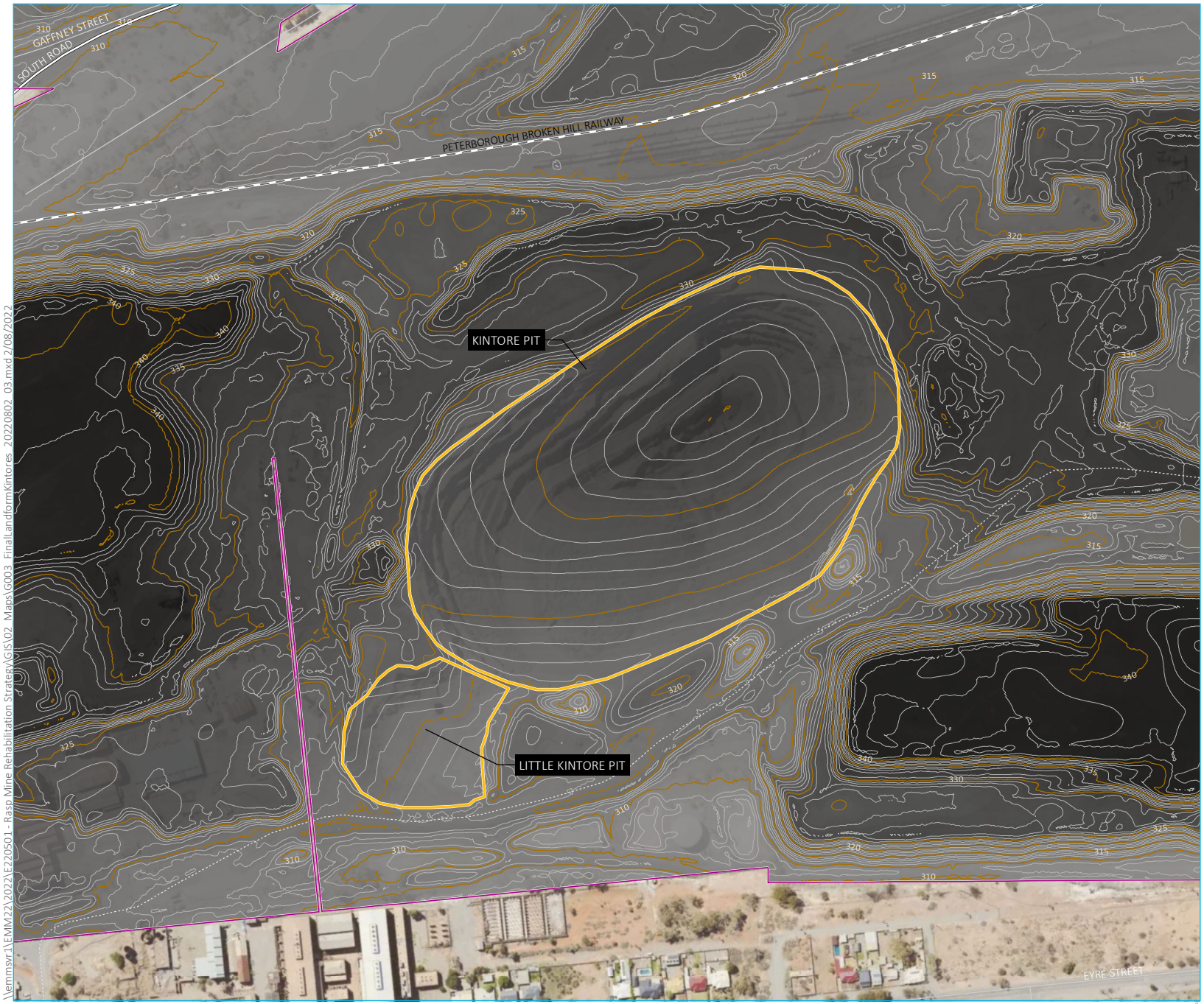
a BHP Pit

The BHP Pit is currently used for the temporary storage of low-grade ore and waste rock. It is expected at closure that the BHP pit will be partially backfilled with waste rock and then capped with inert waste rock. The extent of backfilling is limited by the in-situ heritage items within the pit. The volume of waste rock to be placed in the pit is dependent on approval being obtained to increase the rate of covering free areas with inert waste rock.

It is expected that the BHP will form part of the mining heritage final land use and it will be bunded for public safety purposes.

b Box Cut

MOD 6 approved the harvesting of dry tailings from the Blackwood Pit (TSF 2) for disposal in Kintore Pit (TSF 3) as TSF2 is reaching it maximum capacity. This will require excavation of a Box Cut, mainly via earthworks with some surface blasting at the lower levels (30 m), to gain access to competent rock from which a new portal and decline would be installed. This would require relocating up to 490,000 t of excavated material to Little Kintore Pit and BHP Pit (all material has been deemed to be >0.5% Pb and would be stored in-pit).



KEY

- Broken Hill Operations mining lease
- Modelled final landform area
- Rail line
- Major road
- Minor road
- Vehicular track

Contour

- 1 m contour interval
- 5 m contour interval

Elevation (mAHD)

360

215

\\emmsvr1\EMM22\2022\E220501 - Rasp Mine Rehabilitation Strategy\GIS\02 Maps\G003 FinalLandformKintores 20220802 03.mxd 2/08/2022

Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

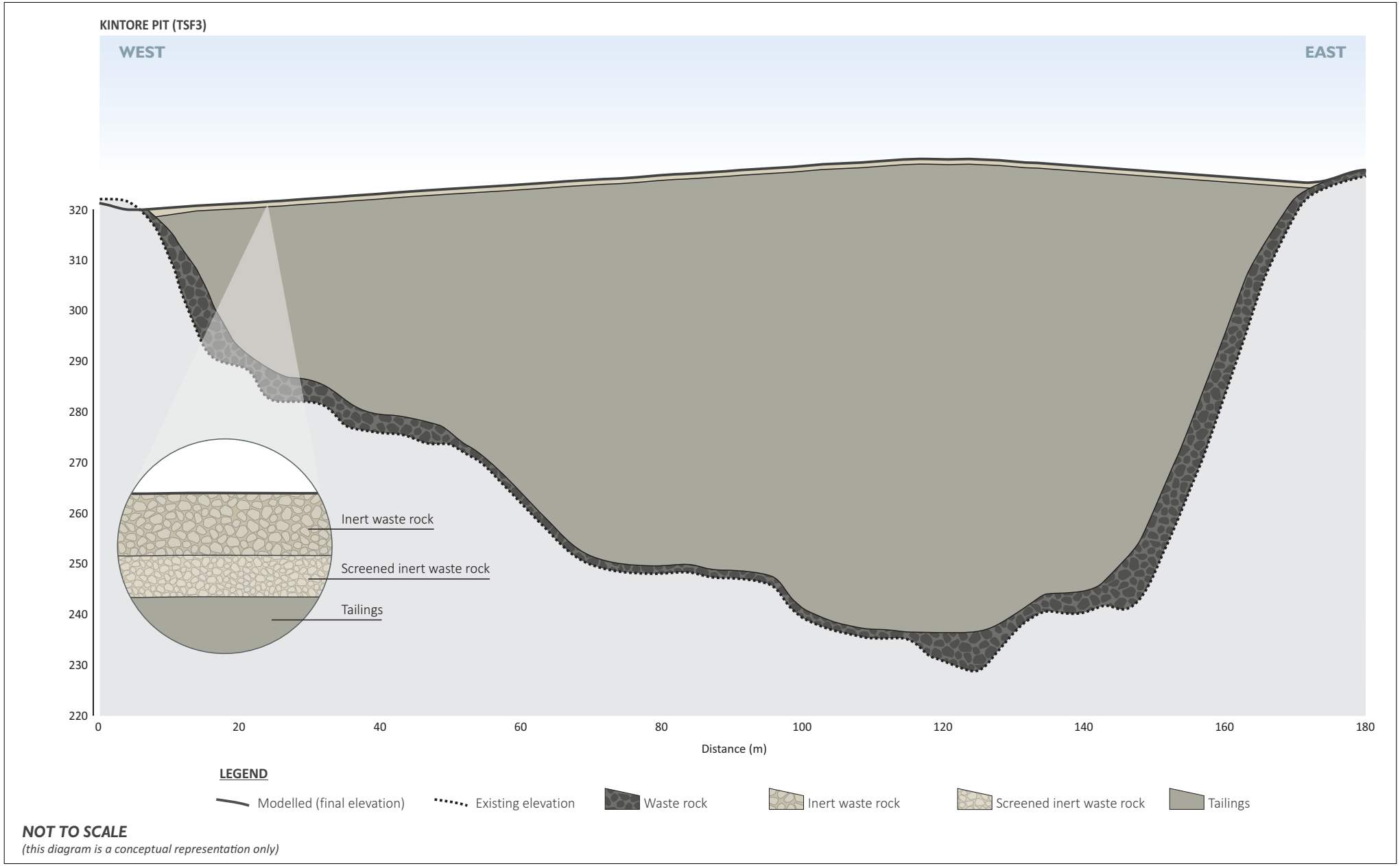
0 50 100 m

GDA2020 MGA Zone 54

Kintore Pit (TSF 3) and Little Kintore Pit final landform

Rasp Mine
Rehabilitation Management Plan
Figure 2.4

EMM
creating opportunities



Kintore Pit final landform cross section

Rasp Mine
Rehabilitation Management Plan
Figure 2.5

Following cessation of underground operations, removal of all infrastructure and plugging and capping of the portal, the Box Cut will be partially backfilled with waste rock then capped with inert waste rock to form a stormwater detention pond (Figure 2.6). Surface water contained in the stormwater detention pond would be expected to evaporate or seep to ground water.

The finished surface will be a rough surface of inert waste rock with 1 to 2% fines.

The sides of the Box Cut above the backfilled surface will be exposed in-situ rock.

v Domain K – Mining landscape

The bulk of the mine will be rehabilitated to be a safe, stable and non-polluting mining landscape. This involves leaving all mining landforms not constructed or modified by BHOP as constructed as reshaping is either not possible due to impact waste storages that were constructed prior to BHOP such as TSF 1, mining lease boundary or existing infrastructure such as rail, road and powerline constraints, and the potential to generate lead dust during shaping operations.

During negotiations between NMI and various state government agencies on rehabilitations works to be undertaken, there was considerable debate on waste dump and TSF 1 embankment stability and what works needed to be undertaken to achieve stability. In 1992 NMI engaged Barrett, Fuller and Partners to undertake a geotechnical stability assessment of the waste and TSF landforms (NML,2000). The study concluded that the waste dumps and tailings embankments within the South Mine were geotechnically stable and that the long-term performance of the embankments with respect to stability aspects should be satisfactory under currently anticipated conditions. Representatives the then Department of Land and Water Conservation and EPA disagreed and considered that the report did not adequately address erosional stability of the landforms and they recommended that the slopes be recontoured to 20° or NML needed to make a long-term commitment for maintenance of the batters.

The minutes of the 1996 MREMP Review meeting held 29 October 1996 stated:

"Subsequent to the review meeting held on 18th October 1995 further discussions took place between the Department of Land and Water Conservation and Department of Mineral Resources personnel concerning batter angles of dumps. As a result of these discussions and the receipt of correspondence from Mr A McGufficke, the Chief Inspector of Mines, Mr G Terry, advised Mr McGufficke in a letter dated 27th February 1996 that '…, the Department of Mineral Resources is of the view that mullock (rock) armouring of dumps to the angle of repose fully satisfies the requirements of the lease conditions. The MREMPs for CML7 have been approved as complying with the appropriate lease conditions.'. Mr Terrey further advised that 'The Department will take full responsibility for the consequences of this approval.'.

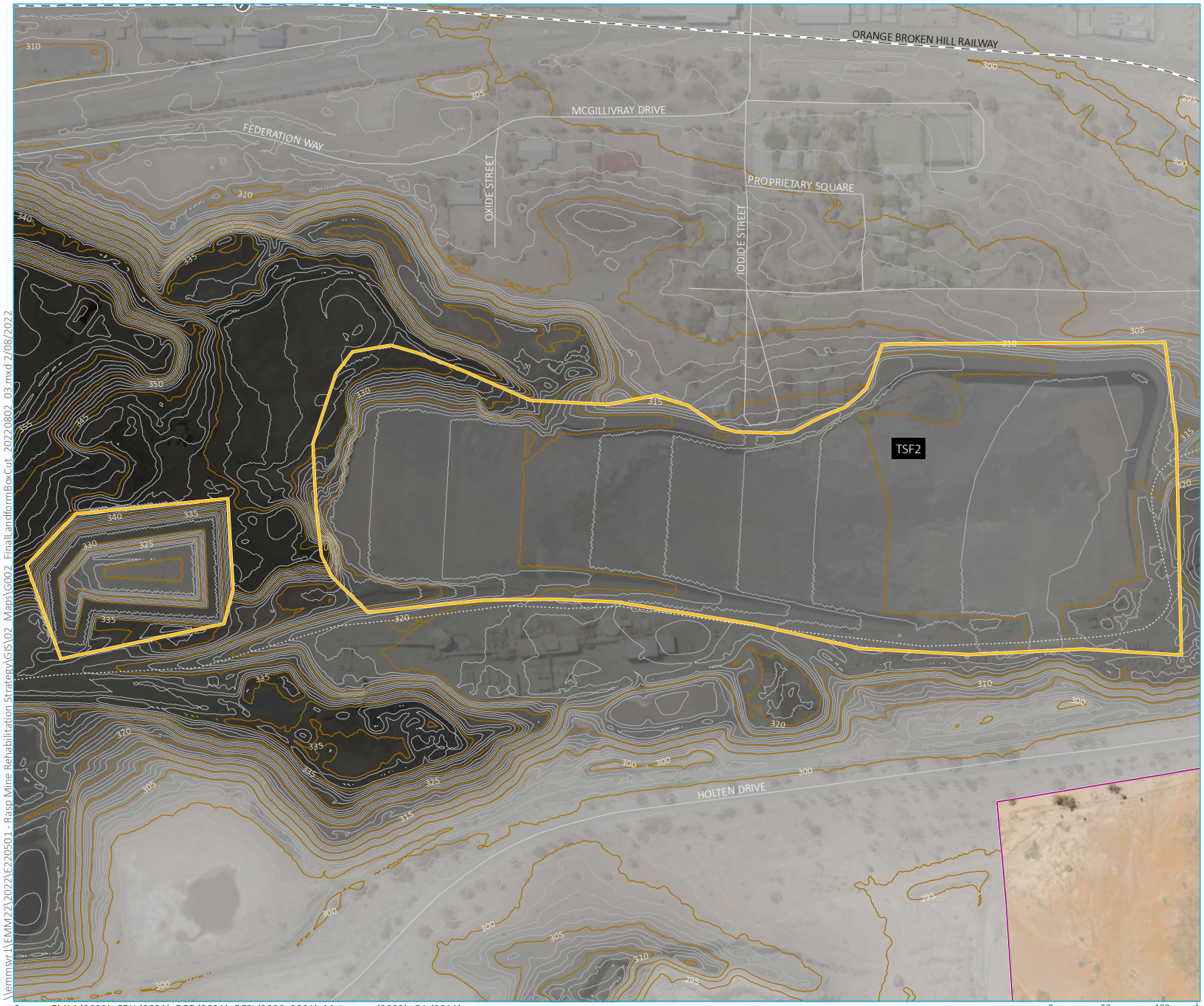
Mr Goodman advised the meeting that the Department of Mineral Resources now considered the matter of batter angles on dumps on dumps was resolved. However, he acknowledged that some long-term maintenance programme should be prepared together with an estimated cost of such maintenance. The offer by the Department of Land and Water Conservation personnel to assist in preparing a maintenance programme was accepted by Mr Goodman.".

Despite rock mulching of waste dump and TSF 1 batters by NMI in the 1990's and subsequent acceptance of these works by the then DMR, if identified by erosion monitoring, additional rock mulch will be applied to the angle of repose batters for erosional stability and to minimise the generation lead dust emissions and flat areas, covered with inert waste rock to minimise lead dust emissions.

This approach will preserve the context of the mining heritage landscape while providing the necessary level of erosion and dust control agreed originally between NML and the relevant State Government agencies.

As detailed in section 3.3, BHOP have adopted a 3-level risk-based approach to acceptable rates of erosion based on Howard and Loch (2019). Formal erosion monitoring has not been undertaken to date on the angle of repose batters on the historical Rasp mine landforms.

BHOP will undertake formal erosion monitoring of the batters using Lidar or similar technique every three (3) years to determine if the rate of erosion aligns with the acceptable rate of erosion. The measured erosion rates then can be entered into a landform evolution model such as SBERIA to model the long-term stability of the mining landforms and this can be compared to the predicted rate of erosion for a rock mulched slope if required.



KEY

- Broken Hill Operations mining lease
- Modelled final landform area
- Rail line
- Major road
- Minor road
- Vehicular track

Contour

- 1 m contour interval
- 5 m contour interval

Elevation (mAHD)

360

215

Box Cut and TSF2 final landform

Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

0 50 100 m

GDA2020 MGA Zone 54

\\emmsvr1\EMM22\2022\E220501 - Rasp Mine Rehabilitation Strategy\GIS\02 Maps\G002 FinalLandformBoxCut 20220802 03.mxd 2/08/2022

Rasp Mine
Rehabilitation Management Plan
Figure 2.6

EMM
creating opportunities

2.4.2 Mining domains

i Domain 1 – Infrastructure

Infrastructure associated with the mine excluding the processing plant are listed in Table 2.10.

Table 2.10 Rasp Mine Infrastructure

Area	Sub area	Assets	Requirements for demolition, removal or disconnection
Backfill Plant	Buildings and infrastructure	Structure, tanks, cyclone	DA. Demolish and place underground.
Mechanical Workshop	Buildings and infrastructure	Offices, workshops	Heritage structure to be in-situ with minor repairs for safety, refer to Final Land use Domain H.
Electrical Workshop	Buildings and infrastructure	Offices, workshops	Heritage structure to be in-situ with minor repairs for safety, refer to Final Land use Domain H.
Mining Workshop	Buildings and infrastructure	Offices, workshops	Heritage structure to be in-situ with minor repairs for safety, refer to Final Land use Domain H.
Employee facilities	Buildings and infrastructure	Shower block, laundry, employee carpark	DA. Disconnect services, demolish and place underground.
Access roads and haul roads	Sealed roads		Strip bitumen and contaminated material and cover with inert waste rock.
Sewage treatment	Mill and mechanical workshop	Septic systems x 2	DA. Disconnect services, demolish and place underground.
Hardstands and laydown areas			Items removed and disposed underground, areas cleaned and contaminated materials removed.
Remote learning area		Bunding, structure	DA. Bund to be pushed back over the area.
Power, electrical substations	Power lines	22kV, 415kV	Power connection for South Mill heritage area to remain. Dismantle and remove.
		7 switch yard and sub-stations	Dismantle and remove.
Rail load out facility and spur line		Rail line	Dismantle and remove.

Non-BHOP owned infrastructure that will remain following the cessation of mining are listed in Table 2.11.

Table 2.11 Non-BHOP owned infrastructure

Owner	Assets	Requirements for demolition, removal or termination
Broken Hill Gourmet Products Cooperative Limited	Olive Grove	Agreement for mining lease relinquishment to allow activity to continue.
Crown Castle Australia	Vodaphone Communications Tower	Agreement to allow activity to continue.
Line of Lode Reserve Trust	Broken Earth café and Miners memorial. Two residences (South Rd) British flats	Agreement for mining lease relinquishment to allow activity to continue.
Jamieson House Reserve Trust	Residence D4874, old mine managers house	Agreement for mining lease relinquishment to allow activity to continue.
Broken Hill City Council	Browns Shaft tourist interpretive signage to buildings and structures Block 10 interpretive signage and structures	Licence to Occupy UG2-3A- Browns shaft tourist area. Licence to Occupy C39-1L- Block 10 tourist area.

2.4.3 Domain 2 – Tailings storage facilities

There are two (2) existing and one (1) proposed tailings storage facilities at Rasp Mine:

- Horwood Dam (TSF 1
- Blackwoods Pit (TSF 2)
- Kintore Pit (TSF 3)

i Horwood Dam (TSF 1)

The Horwood Dam (TSF1) was capped by NMI using smelter slag as approved by the then DMR. Some modification to the surface of TSF1 proposed as detailed in section 2.4.1v to divert surface flows away from the north-eastern angle of repose batter to decrease the risk of erosion.

ii Blackwoods Pit (TSF 2)

The Blackwoods Pit (TSF2) is reaching its maximum capacity. MOD 6 approved removing tailings from TSF2 to Kintore Pit (TSF3) for disposal. TSF2 will be capped as detailed in section 3.5.5ii.

iii Kintore Pit (TSF 3)

Underground access is currently through Kintore Pit. MOD6 approved the construction of a Box Cut and portal for a new underground access to allow Kintore Pit to be backfilled with waste rock and tailings trucked from TSF 2. TSF3 will be capped as detailed in section 3.5.5ii.

3 Rehabilitation risk assessment

3.1 Rehabilitation risk assessment approach

A rehabilitation risk assessment was completed in August 2021 in accordance with the principles outlined in *AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines (AS/NZS ISO 31000:2009)* (Standards Australia, 2009) and Clause 7 of Schedule 8A of the *Mining Regulation* 2016. Rehabilitation risk has been considered with regards to risk which exists from past mining and proposed rehabilitation phases of the operation and has been developed with reference to available guidance from the Resources Regulator.

The risk assessment is maintained by BHOP. Key outcomes of the risk assessment are summarised in section 3.2, detailing the risk, impact, risk control, and where the risk controls are described in detail in this RMP.

3.2 Key rehabilitation risks

Broken Hill has been a significant mining centre since the discovery of silver-lead-zinc ore bodies in 1883. The history of mineral development at Broken Hill and the heritage value of associated infrastructure has State and National significance (NSW Government, 2020). In January 2015, the City of Broken Hill was granted heritage status and placed on the National Heritage Listing for its contribution to mining (Australian Government, 2020).

From 1885, mining has been undertaken continuously, by multiple companies, on earlier leases that now comprise CML7. Minerals Mining and Metallurgy (MMM) ceased mining on CML7 in April 1991. Normandy Mining Limited held a controlling interest in MMM. Rehabilitation of CML7 commenced in 1991 and was completed in 1999 (Normandy, 2000). The Mine was purchased by CBH from Normandy Mining in 2001.

Historic operations have left the Mine area highly modified and disturbed. The original landform has been significantly altered, most native vegetation has been removed and soils have been degraded and covered with waste rock or tailings (BHOP, 2020a).

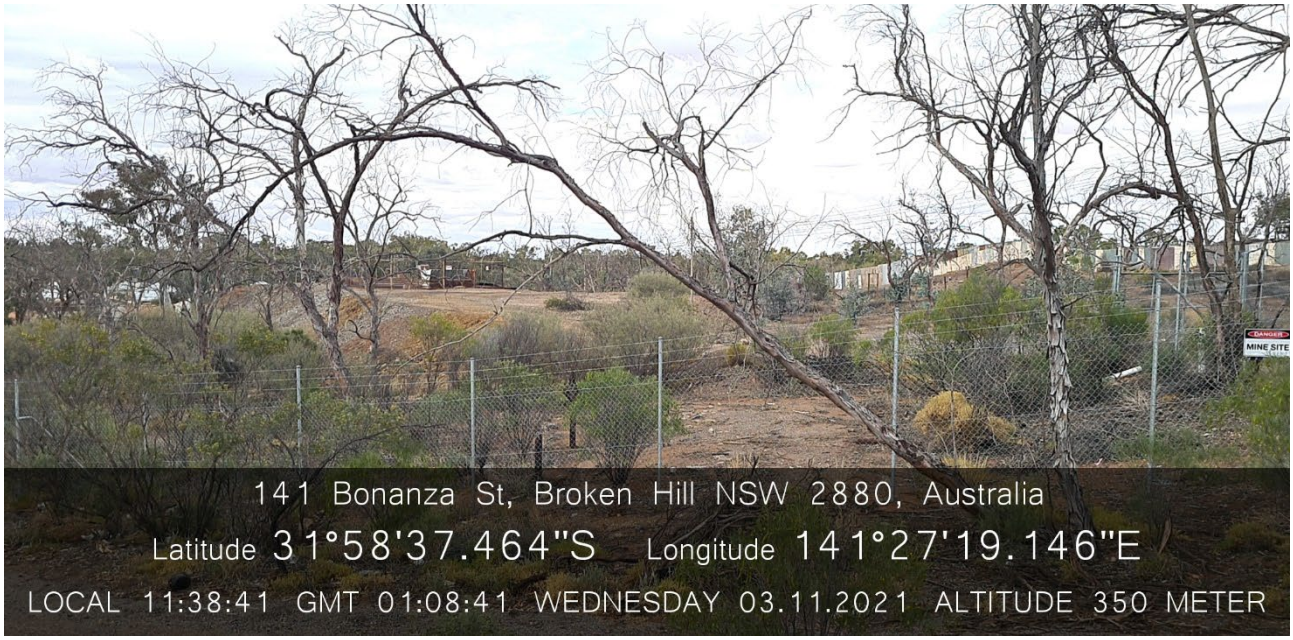
3.3 Climate

3.3.1 Constraint

The Mine is situated in the NSW arid zone which has a hot dry climate. A median rainfall of 254 mm has been recorded at the Broken Hill Airport Station with most rain failing in the summer months. The mean maximum temperatures range from 15.6˚C in July to 33.6˚C in January, while the mean minimum temperatures range from 4.8˚C in July to 19.3˚C in January. The annual evaporation rate is high, in the order of 2,614 mm (BOM, 2021).

Current climatic conditions (ie drought and high evaporation rates) are hostile to the germination of seed and plant growth particularly with the lack of suitable growth media within Mine areas. Successful revegetation programs in the region have utilised irrigation to overcome the climatic issues. The use of town water for irrigation, however, is not considered to be a viable long-term closure solution. Wastewater was used successfully for the establishment of vegetation in the 1930s in the Broken Hill area. Irrigation is unlikely to be a suitable option given the value of water resources in Broken Hill and the likely failure of the revegetation once irrigation activities cease.

The climate of the mine is characterised by low annual rainfall and high evaporation rates. During 2019 and 2020, the mine experienced drought conditions with total annual rainfall being 96 mm and 109 mm respectively. Both years were below the long-term annual average rainfall (150 mm) at Broken Hill (BOM, 2021). There is evidence of tree death within the mine due to these drought conditions (Photograph 3.1).



Photograph 3.1 Tree death due to drought conditions

The frequent drought conditions are considered unlikely to support revegetation adequate for water or wind erosion control purposes.

Vegetation is commonly used to stabilise rehabilitated mining landforms against erosion and this approach is generally appropriate for where rainfall is adequate to support plant growth where soil surface cover equal to or greater than 60% can be achieved. However, in semi-arid and arid rainfall environment, the impacts of vegetation on erosion are generally minimal because the prevailing rain cannot sustain sufficient vegetation cover to control erosion.

The cover response curved developed by Kirby (1969) (Figure 3.1) shows that the impact of contact cover on erosion is not adequate until a cover level greater than approximately 30% is achieved.

Data from the United States of America (USA) suggests that peak erosion rates occur where annual rainfall is in the order of 300 mm-350 mm/h (Figure 3.2) which is slightly more than the annual average rainfall at the mine.

This means that other forms of soil surface cover such as timber debris or rock in combination with vegetation will be required to provide adequate erosion protection on rehabilitated landforms.

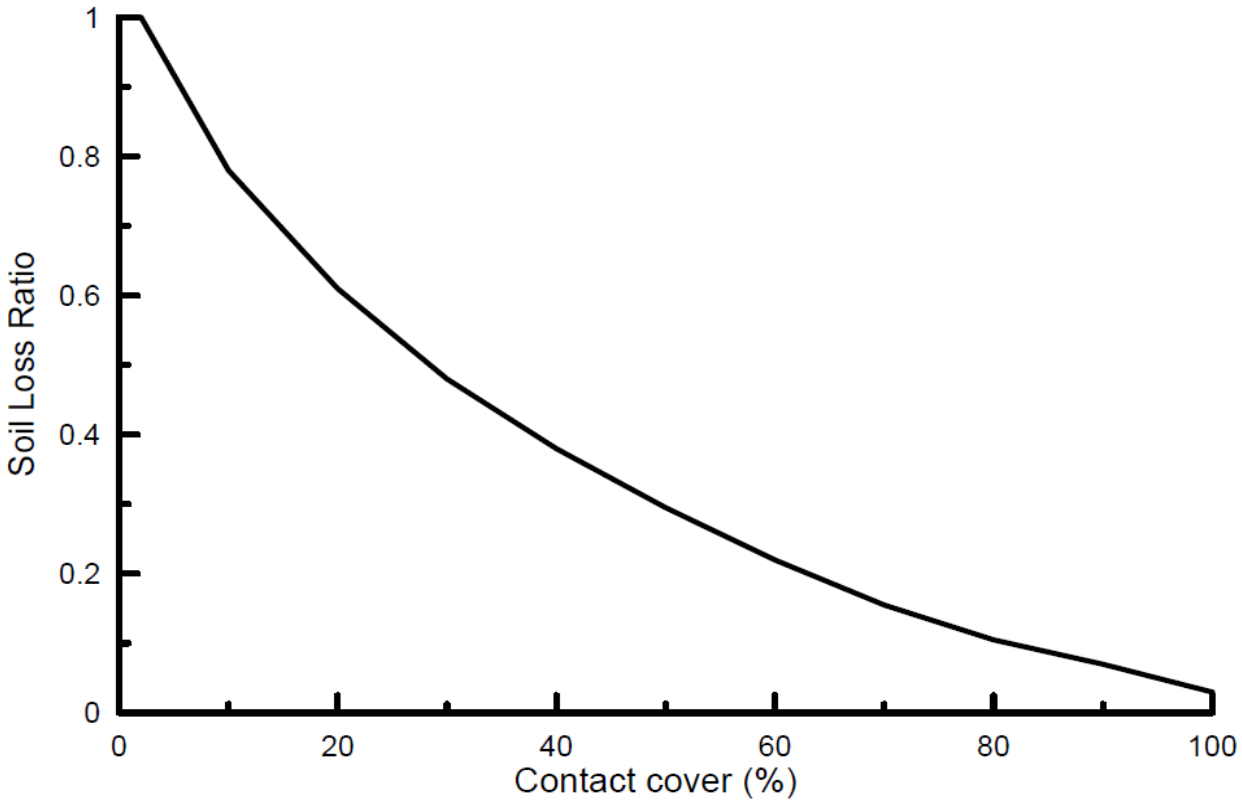


Figure 3.1 Relationship between contact cover and soil loss (Kirby 1969)

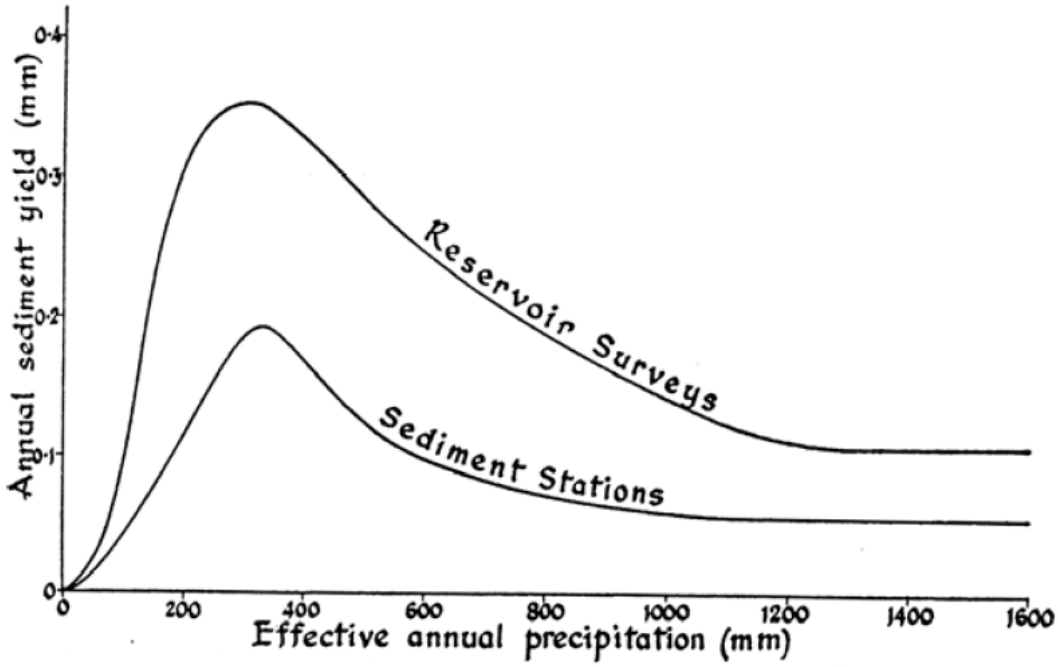


Figure 3.2 Relationship between annual rain and erosion (Kirby 1969)

3.3.2 Management and mitigation

BHOP will segregate and preserve waste rock with low lead (<0.5%) and low sulphur (≤0.2%) for rehabilitation capping purposes (inert waste rock). The inert waste rock will provide the necessary protection from water and wind erosion. Erosion modelling will be undertaken during the development of the RMP to verify the erosion stability of the waste rock.

3.4 Growth mediums

3.4.1 Constraint

There are no topsoil or subsoil resources available within the mining area due to past historical mining practices. Waste rock is the only growth medium present at the Mine. During the site inspection, vegetation was not typically observed on areas treated with waste rock. This is most likely associated with low concentrations of nutrients, low water holding capacity of the waste rock and high surface temperatures.

Waste rock has been used as a growth medium at other mine sites throughout Australia, however the success of revegetation has been varied with vegetation typically taking longer to establish. If waste rock is used as a growth medium, ameliorants are typically required to increase the water holding capacity, improve the nutrient status and increase the concentration of organic matter.

Rock/soil matrices have been used successfully on other mine sites in Australia with these climatic constraints, the most relevant being Cowal Gold in NSW. They consist of a ratio of approximately three parts rocks to one part soil with proportions adjusted such that it is close to the optimal packing density for binary mixture (pers.comm. R Loch).

Because of its high level of erosion resistance and low rates of erosion, the rock/soil matrix layer only needs to be 300 – 500 mm deep. Importantly:

- the rock/soil matrices move with the underlying waste rock and is unaffected by any settlement or movement that may occur;
- vegetation growth is vigorous when sufficient soil is mixed with the rock and the properties of the rock are not detrimental to vegetation growth (non-acid forming, non-saline);
- high surface roughness means that cross-slope concentration of flow is minimised or eliminated and therefore gully formation is unlikely; and
- erosion control and stability of the rock/soil matrices are predictable and reliable.

Rock/soil matrices rely on having suitable growing media to mix with the rock. Given the absence of soil resources on site, suitable soil would either need to be imported to site or manufactured from suitable organic material.

BHOP consider the importation of growing media to unsustainable due to cost and the potential environmental impacts on the source borrow area.

3.4.2 Management and mitigation

BHOP consider that the manufacture of a growing media may be possible using locally sourced organic material feed sources such as mechanically harvested weeds, municipal organic and putrescible wastes, biosolids and woody wastes such as tub-ground pallets and have commenced an investigation into the feasibility of doing this.

The manufacture of growing media for green wastes and waste organic material is anticipated to require treatment via composting or biological breakdown using processes such as the VRM Biologik Groundswell® Continuous Fermentation process.

Composting is an aerobic process that involves shredding the organic material into finer particles and then forming them into triangular or trapezoidal shaped windrows. The stockpiles need to have a moisture content between 45 to 65%. During warmer months it often necessary to apply additional water to maintain moisture levels.

Turning is required more often during the initial stages of rapid decomposition and less frequently as decomposition approaches completion.

The Groundswell® continuous fermentation process is a licenced process that facilitates and accentuates the activity of a special group of photosynthetic bacteria that manage the production and consumption of odour producing substances and promote the digestion of organic material. This forms a product that is closer to an organic soil than a compost, called Humisoil®.

It involves the addition of two inoculants mixed with water during the organic shredding process, or in layers during the windrowing process, to achieve a 40% moisture content in the windrow. The material is formed into 'M' shaped windrows and then covered with a tarpaulin for a six-week period.

The windrow is then spread out and the process repeated, and the windrow is covered again for a 20-week period.

At the end of 20-week period the process is complete and the Humisoil® would be available for rehabilitation purposes on site.

Manufactured growth mediums such as high-quality composts and Humisoil® organic soil can rapidly establish beneficial soil bacteria and arbuscular mycorrhizal fungi further binding the soil with glomalin (soil carbon cement) and increasing soil aggregation (Hendrickson et.al 2008).

In seasonally dry, variable, or unpredictable environments like the mine, mycorrhizal fungi play an extremely important role in plant-water dynamics. The hyphal tips are hydrophilic – both the end in the plant and the end in the soil – enabling both water and nutrients to diffuse from one end to the other along a moisture gradient (Allen 2007).

Mycorrhizal fungi can supply moisture to plants in dry environments by exploring micropores not accessible to plant roots. They can also improve hydraulic conductivity by bridging macropores in dry soils of low water-holding capacity. Further, mycorrhizal fungi can increase drought resistance by stimulating an increase in the number and depth of plant roots (Solamain *et al.* 2010).

Morris, 2004 identified that a 1% increase soil humus can result in a 4% increase in stored soil water or 160,000 L of water per hectare based on a 0.3 m soil depth.

BHOP are investigating the feasibility of growth media manufacture realising that a successful outcome will require collaboration with Broken Hill City Council, Landcare Broken Hill and other industries and that additional approvals may be required.

If it is determined that the process is feasible, then BHOP may undertake rehabilitation trails on site where the manufactured growth media would be mixed with inert waste rock and then seeded with appropriate native grass and ground cover species.

3.5 Geochemistry

3.5.1 General

Underground waste rock material comprises the following geological units:

- Metasediments – The most abundant rock type comprising psamimite (quartz – feldspar) and pelite (biotite, sillimanite, garnet, feldspar).

- Potosi Gneiss – A leucocratic quartzo-feldspathic gneiss comprising quartz + feldspar + biotite + garnet with varying occurrences of sillimanite.
- Pegmatite – Coarse grained leucocratic quartzo - feldspathic rocks comprising feldspar and quartz with lesser amounts of muscovite. Locally biotite may be present.
- Amphibolites – A rock which contains greater than 40% mafic minerals, generally comprising pyroxenes, amphibole, plagioclase, garnet. Grades into garnet, amphibolite and soliated, quartz – feldspar – biotite – garnet rock.

Mine ore lacks pyrite and contains only traces of protoxide, and acid waters are not generated from ore oxidation and tailings oxidation. Furthermore, calcite is a common mineral in Broken Hill ores. The presence of calcite buffers any acid fluid and, with oxidative coatings on galena and sphalerite in tailings, acid mine waters have not derived from the ore or tailings over the last 130 years of mining. While there is minor visual evidence of isolated pockets of waste rock oxidation, ground and surface water monitoring records all reveal stable pH ranging from 5.09 to 7.3.

Assay records from metallurgy do not detect free sulphur.

The Potosi Gneiss unit is quarried as “blue metal” from an adjacent quarry. This rock is used for road base in Broken Hill and surrounding areas. As such, Potosi Gneiss from development activities will be crushed onsite and used for road base in the construction of the underground roads.

Waste rock from underground mine development is primarily used for back filling underground voids. Small amounts are also used for road base, surface covering to reduce dust and noise bunding. Grading of waste rock will be integrated into future rehabilitation trials.

Waste material is tested and low grade (<0.5% Pb, ≤0.2% S) material is used for road repair, surface coverings and noise abatement bunds, where required.

Placement of waste rock is critical to meeting the rehabilitation requirement to minimise dust generation from the site post closure.

3.5.2 Waste rock lead dust potential

i Constraint

In 2017 BHOP engaged Pacific Environment Ltd to study waste rock and provide recommendations for its suitability and effectiveness as a medium for dust suppression over selected surfaces of the Rasp Mine.

Pacific Environment (PE 2017) undertook an assessment of waste rock from the stockpile within Kintore Pit, to use as embankment material for the extension of the Blackwood Pit TSF2, proposed by MOD4, and more generally, its use for other dust suppression applications as part of the rehabilitation process for the Mine site. This included cover for existing areas that may otherwise have a potential to generate dust containing elevated lead concentrations. The rock is known to contain potentially elevated lead concentrations due to the ore bodies being mined.

To minimise any potential health affects for the local community the original EA stipulated that any waste rock material used for rehabilitation, or other site surface purposes, will be ‘inert’. What constitutes ‘inert’ material has not been defined in the EA and no directly applicable criteria are available for assessing the potential for hazardous dusts generated from the weathering of waste rock at the site, potentially resulting in exposure scenarios for inhalation/ingestion by residents outside the site, or for site users post-rehabilitation.

For rehabilitation planning purposes inert waste rock shall be waste rock that contains <0.5% Pb and ≤0.2% S.

The study utilised a 'multiple lines of evidence approach', in accordance with the NEPM 2013. This is used for evaluating and integrating information from different sources of data and uses best professional judgement to assess the consistency and plausibility of the conclusions which can be drawn.

PE, 2017 studied the rock type (geological description), moisture content, particle size distribution (PSD), and metals content of the waste rock. In addition, consideration was given to the prior Human Health Risk Assessment work undertaken by Toxikos (2010, 2015), background soil/dust data, air quality modelling and recent Confined Air Burst Chamber (CABC) testing undertaken by Pacific Environment on-site for the purposes of quantifying dust control.

The results of the waste rock assessment identified that:

- the rock type varies, however all rock types identified are competent and mostly hard, with good resistance to weathering;
- the rock comprises only approximately 1% fines capable of producing dust;
- this was qualified by Confined Air Burst Chamber tests, which identified a 99.7% reduction in dust generation from the waste rock, compared to disturbed dry tailings;
- lead concentrations averaged 2,371.5 mg/kg (0.24%) and were taken from crushed samples (and therefore conservative). This is approximately 4 times the NEPM HIL-C criterion (600 mg/kg), but significantly below surface dust averages (15,640 mg/kg, or 1.56%). Whilst the NEPM criteria are not directly applicable, they do represent a level below which soils would not be considered a risk to human health;
- bioaccessibility is very low (7.3% on average). This is much lower than the 50% (bioavailability) assumed for the calculation of HIL's. This would suggest that results, if adjusted for bioaccessibility, would meet HIL-C criteria; and
- air quality modelling conducted by PE (2017), assumed a waste rock concentration of 0.5% (5,000 mg/kg). Results demonstrate compliance with all the NSW EPA impact assessment criteria for all air quality parameters assessed.

The results support the use of the waste rock for dust suppression for the TSF and 'free areas' and are considered unlikely to cause an unacceptable risk to human health based upon the site's ultimate final land use as mining heritage tourism.

Air quality modelling has assumed lead concentrations above those identified in the waste rock on site (0.5% compared to 0.24%), and therefore the waste rock is likely to meet NSW EPA impact assessment criteria and is unlikely to impact further upon surface soil lead concentrations within local communities. The very low dusting potential of the rock supports this conclusion.

PEL concluded that the 0.5% lead concentration adopted by the air quality model is a suitable criterion for waste rock placement on-site and that the waste rock, when placed, is suitable as a means of reducing, to an acceptable level, the potential for dust generation from the TSF and 'free areas' of the site.

PEL recommended that:

- waste rock be tested prior to placement to ensure median level of lead concentration does not exceed 0.5%; and
- dust suppression water spraying is carried out during capping material (waste rock) placement to ensure finer particles are washed between the larger rocks.

ii Management and mitigation

BHOP will segregate and preserve waste rock with low lead (<0.5%) and low sulphur (≤0.2%) for rehabilitation capping purposes. The waste rock will provide the necessary surface roughness and soil surface cover to limit wind erosion and the generation of dust. Waste rock will be water during placement and spreading to minimise dust generation.

3.5.3 Waste rock acid rock drainage potential

i Constraints

The low levels of sulphur and pyrite in the ore indicate there is negligible potential for acid generation. This is confirmed by site ground (pH 5.09 to 7.3) and surface water (pH 5.78 to 7.59) monitoring records all reveal stable pH.

The drainage, while neutral, does contain metals, particularly where water contacts with rock materials as is the case with the *in-situ* orebody as well as ores altered by processing (grinding and refining).

ERM 2021 undertook geochemical analysis of the waste rock material and found that regarding the potential for acidic drainage:

- Most samples tested were classified as non-acid forming (NAF) (76%) with low sulphur (S) (<0.3%) and low to moderate acid neutralising capacity (ANC), only 3 of the 50 samples showed moderate to high sulphur (0.42% to 1.14%).
- Two psammopelite samples (4% of samples) were classified as potentially acid forming (PAF) and 10 samples (20%) as uncertain (UC). All PAF and UC samples were <0.2% sulphur.
- Mineralogy testing demonstrated that the samples mostly consist of quartz and very slow to slow reacting silicates. Some chlorite was present in most samples, a mineral with immediate reactivity. Garnets were identified in all samples, which can provide fast reacting silicate buffering. No carbonate minerals were identified.
- All rock type groupings, including the psammopelite rock type, had average net potential ratio (NPR) values ≥2. The NPR ratio is the ratio of acid neutralisation capacity (ANC) over maximum potential acidity (MPA), with a ratio above 2 indicating that the material is NAF.

ERM 2021 concluded that while a small subset of samples were identified as PAF, the central tendency in the data (and specifically the average NPR ratio ≥2 for all rock types) indicate that the material is expected to be largely NAF. Additional sampling has been undertaken and the outcomes from this provided in an updated waste rock management strategy.

ii Management and mitigation

Waste rock with > 0.2% sulphur will be placed in the Kintore Pit for disposal with dry tailings and ultimately capped with inert waste rock. If ARD was to occur it would be contained within the pit and ultimately seep into the underground workings.

Groundwater studies in the area and on site have demonstrated that groundwater within the bedrock aquifer is generally unsuitable for potable use or irrigation and marginal for stock watering. Baseline groundwater sampling is compared with the descriptive statistics for the waste rock leach testing results and results are shown in Table 3.1.

Table 3.1 Comparison of metalliferous drainage data with ground baseline data

Grouping	Ec (µS/cm²)	SO4 (mg/L)	Cd (mg/L)	Pb (mg/L)	Mn (mg/L)	Zn (mg/L)	Fe (mg/L)
Groundwater baseline	13,900	9,660	6.32	2.25	907	3,330	1.57
DI leach - median	320	37.5	0.0001	0.0015	0.009	0.005	0.1115
DI leach – 90th percentile	689	37.5	0.0001	0.0015	0.009	0.005	0.115
DI leach - maximum	1,900	432	0.0003	0.02	0.415	0.028	1.57
NAF liquor - median	210	45	0.0015	0.001	0.12	0.005	0.05
NAF liquor – 90th percentile	277	78	0.035	0.53	0.45	2.88	4.23
NAF liquor - maximum	709	312	0.31	5.93	1.02	87.5	33

Results show that all median leaching values were well below baseline values, with the exception of Fe for NAG liquor data.

ERM 2021 concluded from the results obtained that the waste rock analysed, in comparison with the background groundwater baseline data, that there was potential for metalliferous drainage from the waste rock. However, this would have limited if any material impact on the existing water quality of the basement rock aquifer.

3.5.4 Waste rock mineralised drainage potential

i Constraints

ERM 2021 undertook geochemical analysis of the waste rock material and made the following conclusions with regard to the potential for metalliferous drainage:

- Elemental enrichment, based on the total elemental data for the samples and using the geochemical abundance index (GAI), identified several elements enriched more than 12 times the average crustal abundance.
- The majority of these were identified for psammopelite samples and elements enriched at this level included silver (Ag), arsenic (As), bismuth (Bi), cadmium (Cd), Molybdenum (Mo), Pb, antimony (Sb) and Zn.
- Analysis of a deionised (DI) water leach at a solid to liquid ratio of 1:2 and of the NAG test liquor for the samples indicate the potential for metalliferous drainage when the metal content of the leachate is compared to conservative freshwater aquatic ecology guidelines (specifically the freshwater aquatic guidelines for slightly to moderately disturbed aquatic ecosystems - ANZECC & ARMCANC, 2000).
- Metals leaching at concentrations above the conservative aquatic guidelines for both the DI leachate and NAG liquor included (but were not limited to) aluminium (Al), chromium (Cr), copper (Cu) and Pb. It should be noted that the NAG liquor data presents a conservative estimation for drainage quality in the long term, with NAG testing entailing aggressive oxidation of a pulverised rock sample.

- While most samples have been classified as non-acid generating, the DI leachate and the NAG testing indicate that the most of material sampled has potential to generate metalliferous drainage.
- All median leaching values (for both DI leach and NAG liquor) are well below the baseline values at the Rasp Mine, except for iron (Fe) for the NAG liquor data, all 90th percentile values are also below the baseline values.

ERM 2021 concluded that given these results potential metalliferous drainage from the waste rock should have limited if any material impact on the existing water quality of the basement rock aquifer.

ERM 2021 also conducted a detailed risk assessment based using a source-pathway-receptor (SPR) evaluation process for surface water runoff and concluded:

"The risk assessment for the mine placement domains indicates that potentially complete SPR linkages are limited to on-site receptors. These are related to use of dewatering water and surface water onsite. Risk rankings for these potentially complete SPR linkages were considered to be low".

ii Management and mitigation measures

As discussed in section 5.1.2, BHOP will segregate and preserve waste rock with low lead (<0.5%) and low sulphur (<0.2%) for rehabilitation capping purposes. Waste rock generated from mining, the construction of the box cut and portal will either be placed in the Kintore Pit (non-inert waste rock) or segregated and preserved for capping of the Kintore Pit (TSF 3) or TSF 2.

Any mineralised drainage is expected to seep to the bottom of the Kintore Pit and into the underground workings. Any mineralised drainage from the capping of the TSF2 will be retained by the liner in the TSF2. As detailed in section 5.3.3 ii, ERM 2021 determined that there was potential for metalliferous drainage from the waste rock. However, this would have limited if any material impact on the existing water quality of the basement rock aquifer.

3.5.5 Tailings geochemistry

i Constraints

The tailings contain, on average, zinc (0.4%), lead (0.4%), silver (8 ppm), iron (3.3%) sulphur, (1.2%), arsenic (460 ppm), bismuth (70 ppm), cadmium (trace) and antimony (45 ppm) (BHO AEMR, 2014).

Average lead concentration within the tailings is less than that recommended by PEL for waste rock material. Despite formation of crusts on the surface of the tailings, due to the fine particle size, tailings can be eroded by wind and generate dust.

ii Management and mitigation

a Tailings Storage Facility 2

It is proposed that in the final stages of tailings deposition the delivery system would be realigned to also discharge tailings from along the crest of TSF 2 Embankment 2 shaping the surface to direct runoff towards the spillway. The tailings beach surface near the spillway would be shaped by selective tailings placement from Embankment 2 to fill the environment containment freeboard to a point that the remaining depression below the spillway level would contain the 1:100-year 72-hour rainfall runoff event from the TSF2 catchment area.

Following deposition of the tailings to the designed level an application of soil stabilising polymer would be applied through the water spray system to minimise dust entrainment by wind while the tailings are allowed to settle and consolidate.

Ponding water would be allowed to evaporate or be recirculated over the dryer part of the beach to remove the water from the low areas and promote drying of the tailings prior to the placement of cover material. It is expected that the tailings beach may be accessible for construction works within a few months after final placement of tailings.

The surface of the TSF2 would be covered progressively with screened inert waste rock followed by inert run of mine waste rock. Access over the tailing would be by end tipping the waste rock material on previously spread material with vehicles travelling on the previously placed material only. No vehicles would be permitted to travel directly on the tailings surface and disturb the dust control crust on the tailing surface. During these activities dust monitoring would continue from the monitoring station located adjacent to the Pit (and at other monitoring stations across the site).

The proposed design of the cover layer comprises:

- 200 mm thick capillary break layer formed of screened inert waste rock placed over the tailings surface to prevent the capillary rise of contaminants; and
- 300 mm thick cover formed of compacted run of mine inert waste rock. The mine waste rock would contain sufficient fines to create a well graded rockfill after compaction.

The rockfill would be watered and compacted using heavy smooth drum compaction equipment. The cover would be robust and resistant to wind and water erosion. Studies would be conducted to determine if a further in-fill layer is required and the thickness of this additional layer (the current rehabilitation cover thickness allows for 1 m).

The cover layer would be constructed over the entire tailings surface and be integrated into the in-situ rock on the Pit rim and the embankment rockfill. The surface would be shaped to shed water towards the low area near the spillway.

b Tailings Storage Facility 3

TSF3 will be filled to the natural surface level of approximately RL330 (when domed). As the emplaced tailings surface reaches the crest of the pit, the depression formed by the southern branch of the access ramp would be filled in to promote surface runoff toward the stormwater pond to be located near Little Kintore Pit. The waste rock perimeter layers around the pit may be stopped at approximately 10 m below the pit rim, or lower if operation considerations and geotechnical assessments of the emplaced compacted tailings confirm it is not required for tailings liquefaction risk management. Tailings would be placed and compacted against the pit wall. The final surface of TSF3 will be cover with a screened inert waste rock capillary break and then inert waste rock cover as per TSF 2. After allowing a suitable period to allow for any settlement and consolidation of the tailings and waste rock, the final surface will be shaped as a shallow dome to shed to the sides of the pit and either seep to groundwater or be directed to Little Kintore Pit stormwater detention basin.

3.5.6 Contamination

i Constraints

Mining has been undertaken within the earlier leases making up CML7 since 1885 by several companies including Broken Hill Pty Ltd (BHP), British Broken Hill Pty Ltd, Broken Hill South and Minerals Mining and Metallurgy Ltd (MMM), among others. Operations have included both open pit mining and underground mining, with the most recent, previous to BHOP, by MMM in Kintore Pit. Historically, appropriate management of potentially contaminated mining wastes including tailings, low grade ores, smelter slag and waste rock was rarely considered resulting in potentially widespread historical contamination. Except for Block 10 Hill, the Line of Lode represents the outcrop of a significant lead-zinc orebody with naturally elevated levels of contamination.

BHOP has operated the site to contemporary standards to minimise further contamination of CML7 including the characterisation and segregation of waste rock, low grade ore and construction of appropriate tailings storage facilities. Hydrocarbons and chemicals are stored and managed in accordance with appropriate standards with documented spill clean-up procedures.

ii Management and mitigation

Significant remediation works were undertaken by NML as part of their rehabilitation and closure works and these are summarised below:

a Mill

Mill spillage collected in the mill sump, and material remaining in thickeners and the stacking area was removed and taken offsite to Pinnacles Mine for retreatment in 1991-1992. In 1993-1994, 3,000 t of spillage, which had collected in the mill underfloor pits, was removed, and treated. Parts of the interior of the Mill accessible to the public were cleaned of spillage in a major phase of repair work undertaken in 1996-1997.

Underground fuel tanks were excavated and removed, and voids filled with waste rock in 1995-1996.

Areas of contamination around the exterior of the Mill were identified and removed for reprocessing or burial during rehabilitation of the mill infrastructure in 1996 – 1998.

b Block 10 Hill

Remediation of Block 10 Hill was undertaken in three (3) phases:

Phase One (1993-1994)

Excavation works were undertaken to remove all tailings and associated contaminated soil and rocky material that was in various small mounds. High grade material was reprocessed at the Pinnacles Mine and low-grade material buried in existing older tailings dumps south of Delprats Mine that were later covered by waste rock and regraded as part of the sites water management plan.

The excavation work was undertaken in close consultation with the then DMR and Council to ensure preservation of the heritage structures on site, which were subsequently developed for public use by Council. DMR also undertook a revegetation program on the adjoining area using sewage sludge and imported clay soil. Native species were broadcast sown and irrigated but was only partially successful. The area has since been covered with rock.

Phase Two (1995-1996)

Tailings and other waste remaining along a water main that crosses the site was removed and the area filled and covered with rock and crusher dust.

Phase Two (1995-1996)

Following assessments by contamination consultants Otek Australia, civil and hydrological engineer J Miedecke and archaeologist J McCarthy, a final rehabilitation plan for Block 10 was agreed. The plan involved covering all contaminated areas with rock and constructing rock contour banks and sediment traps either side of the hillslope. The design capacities for the structures were for a 1 in 100-year ARI event (NML, 2000).

Heritage structures were stabilised by placement of rock around their foundations.

Contaminated runoff from this area is still being captured in the Ryan Street Dam. BHOP are currently investigating further management options for this location.

c Blackwoods tailings dump

In 1997, small old free-standing tailings dump north of Blackwoods Pit, regarded as having heritage value, was found to have unacceptably high lead levels (~ 1%). It was removed by NML at the direction of DMR to a nearby area and buried as fill within a drainage control structure, redirecting runoff back from the lease boundary into Blackwoods Pit.

d Brownes Shaft

From 1997 – 1999, contaminated material was removed at Brownes Shaft and Mill without damaging the heritage values of the site as it was a publicly access area for tourism managed by Council. Remediation works comprised:

- The base of the stone wall of the Mill was built up with rock to cover contaminated material that could not be removed without damaging the wall and to support it.
- A set of old tanks had been built on a foundation of both tailings and orebody outcrop (that has high scientific and heritage value). Remediation focused on removed contaminated material from the outcrop back to stable rock, protect and present the heritage items, which included the outcrop itself, and leave the tanks on a stable footing. The contaminated material was removed, where possible, by a team using handheld tools and brooms. The bases of the water tanks, which were founded on contaminated material, were meshed and shotcreted and the base of the small hill covered with rock, leaving the outcrop exposed.
- Tailings north-west of the shaft and extending onto Pasminco's lease was removed and the area recovered with rock and stormwater management bunds.

e All Nations Tailings Dam

Tailings excavated as part of remediation works were initially placed into the existing All Nations Tailings Dam. NML (2000) states the All Nations Dam contains 4.4 Mt of tailings. An additional dam was built onto the side of the All Nations Dam (Horwood's Dam TSF 1) (it is assumed that the Mt Hebbard waste dump was constructed on top of the All Nations Dam). Some small tailings dumps from earlier mining were removed for reprocessing, or buried beneath waste rock dumps.

BHOP will remediate any contamination created as part of the current mining activities, or any areas of old contamination disturbed as part of BHOP's operations. It is expected that any hydrocarbon contaminated material will be bioremediated on site and then used for rehabilitation works and any material contaminated with heavy metals will either be placed underground or within TSF 3.

Phase 1 – Preliminary Site Investigations (PSI) and Phase 2 – Detailed Site Investigations (DSI) contamination assessments will be undertaken as required.

3.5.7 Subsidence

i Constraints

Coffey was engaged to assess the potential for subsidence at surface and the effect, if any, on the Broken Hill railway operations to the north-east of the CML7 from mining beneath these facilities. The assessment looked at the stope geometry, geology and the railway infrastructure. An exclusion area and buffer zone of 150 m was established around the rail infrastructure.

The Coffey 2007 analysis of the potential for caving in the western mineralisation found that the most critical type of failure mode from vertical (piping), diverging (outwards) and converging (inward) was converging. However, this is unlikely to propagate to a great extent before the void is able to support the span and vertical failure is the most likely critical failure mode.

The analysis shows that a stope failure is not expected to propagate through to the surface and significant surface subsidence is not predicted above the stopes. The analysis estimates some hanging wall failures with the currently estimated rock mass properties and the open stope geometry proposed. However, these failures are expected to be localised and are not expected to result in continuous caving to the surface. The presence of a more competent Potosi Gneiss unit above the stope hanging walls will restrict any failure from propagating upward assuming the unit is always above the stopes.

After extensive analysis Coffey 2007 concluded that any stope failure (no matter how unlikely) would not propagate through to the surface and therefore significant surface subsidence is not predicted above the stopes.

It is important to note that the analysis indicated that there exists some potential for hanging wall failures, however these failures are expected to be localised in extent. The presence of the more competent Potosi Gneiss above the stope hanging walls limits potential of a failure from propagating upward. Furthermore, if there was a failure, rock expansion would fill the void and prevent failure propagation to the surface.

ii Management and mitigation

Key subsidence risks are managed and mitigated by:

- use of empirical stope design charts in conjunction with detailed geotechnical modelling of extraction sequences to ensure ground stresses do not exceed the capabilities of the rock mass;
- regular stope inspections used to ascertain if predicted behaviour matches the actual performance of the void;
- installation of modern ground support/reinforcement systems which capitalise on the inherent strength of the rock mass;
- placement of mine back fill (eliminating the void) in a timely manner after production has ceased; and
- use of trained and competent people in critical functional roles such as mine technical services and mining operations.

As part of the mine design process, each stope undergoes an individual risk assessment. The assessment addresses the following:

- stope size and shape;
- ground support requirements, including additional support into the hanging wall if required;
- ring design and stope firing sequence; and
- back fill requirements.

This process mitigates the potential for localised failures within the stoping blocks. Additional diamond drilling and geological mapping of the orebody, footwall and hanging wall occurs as underground development progresses. This additional geological and geotechnical information is used for the individual stope assessments and in the larger mine planning process to further mitigate the risk of localised failures.

3.5.8 Pit wall geotechnical stability

a Constraints

Ground Control Engineering (GCE) to undertake an assessment of the geotechnical stability of the historic tailings with the Kintore Pit (GCE, 2019) and an assessment of geotechnical impacts of the emplacement wet tailings on pit wall stability (GCE 2019a).

The slope stability analyses conducted by GCE highlights the potential for slope scale instability of the historic tailings slope forming the north wall of the Kintore Pit under certain hydrogeological conditions. Circular failure or composite failure with a major circular component was considered by GCE 2019 as the most likely potential failure mechanism.

The progressive placement of fresh tailings against the existing historic tailings slope is expected to increase the stability of the slope.

The assessment of the slope of the waste rock stockpile located in Kintore Pit indicates that the waste rock slope may experience shallow sloughing of the near surface materials and that the placement of engineered fill against the toe would improve the stability of the slope. The slope stability analyses conducted by GCE 2019a indicates that current, free draining, waste rock dump slope has a factor of safety for overall slope scale stability of greater than 1.3.

The modelling highlights the potential for shallow, circular style failure (sloughing) in all cases. This may materialise as minor rilling, which is typical of waste rock slopes.

b Management and mitigation

Works have been proposed by Golder to support the slopes during tailings and waste rock placement and safety bunds have been included in the conceptual placement design to mitigate these risks.

The pit wall geotechnical instability risk be fully mitigated by the complete backfilling of the Kintore Pit with waste rock and tailings.

The Little Kintore Pit and the Box cut will also be backfilled with waste rock mitigating any pit wall geotechnical instability.

4 Rehabilitation objectives and completion criteria

4.1 Rehabilitation objectives and rehabilitation completion criteria

The overall rehabilitation objectives for the Rasp Mine have not changed from that proposed in the *Closure Report* prepared by NML in 2000 and agreed by the then MREMP Review meeting stakeholders and then in subsequent MOP's submitted by BHOP, which is to rehabilitate the site to a safe, stable and non-polluting landform appropriate to the surrounding land fabric of the Broken Hill region that provides for a mining heritage tourism related final land use.

Rehabilitation objectives and rehabilitation criteria for the mine are provided in Table 4.1 on the following page.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
F	**Water Management Areas**	**3**	**Water Management Areas**	Water management areas are safe, stable and non-polluting and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	Water management areas have been constructed in accordance their design drawings.	Design reports and drawings. As constructed drawings and reports.	Inspection reports. As constructed reports.
					Water management areas are capable of containing/ conveying their design storms.	Design reports and drawings As constructed drawings and reports	Inspection reports. As constructed reports.
					Water management areas are structurally stable.	Presence/absence active rills, gullies and tunnels. Presence/absence of seeps, slumps and cracking.	Inspection reports. Rehabilitation monitoring reports.
H	**Heritage Areas**	**8**	**Other - Heritage**	There is no residual contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg PAF rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Contamination Remediation Report prepared by Land Contamination Consultant Engineered capping design with specifications.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully or tunnel erosion are within the parameters for safe and stable landform.	Presence/absence active rills, gullies and tunnels within rehabilitation monitoring transects. Inert waste rock or hard stand soil surface cover in rehabilitation transects ≥60%.	As constructed reports as constructed report. Rehabilitation monitoring reports.
				Heritage items do not pose a safety risk to people, stock, or native animals	Heritage buildings and structures are structurally safe.	Structural assessment against building code and adaptive reuse.	Structural assessment reports. Heritage assessments reports.
					Access is restricted to unsafe heritage items.	Barricades, fencing, shafts and portals capped and sealed.	Safety inspection reports.
				Transfer ownership and maintenance responsibilities to future owners/operators	Heritage items transferred to future owners/operators in consultation with LOLA/ BHMIAC/Council/ Crown Lands.	Formal agreements/Deeds.	Formal agreements/Deeds.
I		**I**	**Infrastructure areas**	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials	Removal of all infrastructure not required for the final land-use.	Infrastructure removed.	Inspection reports.
					Removal of all footings and slabs.	Infrastructure removed.	Surveyed and marked on as-constructed final landform plan.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
					Surveying and sealing of all drill holes and boreholes, n shafts in accordance with departmental guidelines and relevant standards.	Sealing complete.	Engineering inspection reports.
				There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg non-inert rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Contamination Remediation Report prepared by Land Contamination Consultant. Engineered capping design with specifications.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna. The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully or tunnel erosion are within the parameters for safe and stable landform. Discharge points from rehabilitated landforms to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies and tunnels within rehabilitation monitoring transects. Soil surface cover in rehabilitation transects equivalent to analogue soil surface cover.	As constructed reports as constructed report. Rehabilitation monitoring reports.
				Infrastructure to remain are suitable for the intended post mine land use.	Access tracks that are to remain are in a trafficable condition that is suitable for their intended purposes.	Any required maintenance complete.	Inspection reports.
J	**Final voids**	**5**	**Open cut voids – BHP Pit, Little Kintore Pit**	Water quality is similar to background levels.	Pits floors and walls (where feasible to be covered with inert waste rock.	Water levels and water quality.	Inspection reports. Water monitoring reports.
				Voids walls do not pose a safety risk to people, stock or native animals.	Safety bunds and signage installed at recommended set back distances. Little Kintore Pit to be partially backfilled.	Installation of safety bunds and signage. Partial backfilling of Little Kintore Pit.	As constructed drawings. Inspection reports.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				The final landform is stable and does not present a risk of environmental harm downstream/ downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully, tunnel erosion or landslips.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies, tunnels, land slips within rehabilitation monitoring transects.	As constructed reports. Rehabilitation monitoring reports.
K	**Other – Mining landscapes**	**2**	**Tailings storage facilities**	The tailings storage facility will be capped to minimise the potential for exposure of potentially environmentally sensitive tailings material in the rehabilitated landform.	Tailings will be appropriately encapsulated to not pose any threat of environmental harm or constrain the intended final land use.	The structural integrity of the TSF's has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and does not pose threat of environmental harm.	Engineered capping design with specifications. Testing confirms capping integrity. Sign off of tailings dams from DPIE-RR.
					The tailings storage facility will be capped and reshaped to be free draining to minimise the potential for exposure and contaminated seepage of potentially environmentally sensitive tailings material in the rehabilitated landform.	Final landforms are safe, stable, non-polluting and free draining. Capped tailings geochemical analysis indicates there is no evidence of non-inert waste rock within the surface materials or wall.	Confirmed by survey to be free draining following the expected settlement period. Soil/rock analysis results. Testing confirms capping integrity. Sign off of tailings dams from DPIE-RR.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
					Tailing's storage facility has been capped in accordance with an approved capping design.	Capping depths and materials have been undertaken in accordance the approved capping design.	Engineered capping design with specifications. Testing confirms capping integrity. Sign off of tailings dams from DPIE-RR.
				The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully or tunnel erosion are within the parameters for safe and stable landform. Discharge points from rehabilitated landforms to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies and tunnels within rehabilitation monitoring transects. Inert waste rock cover in rehabilitation transects ≥60%.	As constructed reports. Rehabilitation monitoring reports.
K	**Other – Mining landscapes**	**3**	**Water management areas**	The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully or tunnel erosion or slumping and are within the parameters for safe and stable landform. Discharge points from rehabilitated landforms to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies and tunnels within rehabilitation monitoring transects. Inert waste rock cover over: Angle of repose batters ≥ 95% All other areas 60%.	Geotechnical assessments Erosion monitoring and reporting Rehabilitation monitoring reports.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				There is no residual surface contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg non-inert rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met.	Contamination Remediation Report prepared by Land Contamination Consultant.
K	**Other – Mining landscapes**	**4**	**Waste Emplacement Areas**	The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully or tunnel erosion or slumping and are within the parameters for safe and stable landform. Discharge points from rehabilitated landforms to natural channels are stable.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies and tunnels within rehabilitation monitoring transects. Inert waste rock cover over: • Angle of repose batters ≥ 95%. • All other areas 60%.	Geotechnical assessments. Erosion monitoring and reporting. Rehabilitation monitoring reports.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				There is no residual surface contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg non-inert rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met.	Contamination Remediation Report prepared by Land Contamination Consultant.
K	**Other – Mining landscapes**	**6**	**Underground mining areas**	All surface underground mining infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.	Removal of all infrastructure not required for the final land-use.	Infrastructure removed	Inspection reports
					Removal of all footings and slabs.	Infrastructure removed	Surveyed and marked on as-constructed final landform plan
					Surveying and sealing of all mine and ventilation shafts in accordance with departmental guidelines and relevant standards.	Sealing complete	Engineering inspection reports

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				There is no residual surface contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg non-inert rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met.	Contamination Remediation Report prepared by Land Contamination Consultant.
				The final landform is stable and does not present a risk of environmental harm downstream/ downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully, tunnel erosion or landslips are within the parameters for safe and stable landform.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies, tunnels, land slips within rehabilitation monitoring transects. Inert waste rock surface cover in rehabilitation transects ≥60%.	As constructed reports. Rehabilitation monitoring reports.
					There is no ongoing subsidence.	Subsidence monitoring indicates no active subsidence.	Subsidence monitoring reports.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
K	**Other – Mining landscapes**	**7**	**Beneficiation facility**	All processing infrastructure is removed to ensure the site is safe and free of hazardous materials	Removal of all processing infrastructure and services not required for the final.	Infrastructure removed.	Inspection reports.
					Removal of all footings and slabs.	Infrastructure removed.	Surveyed and marked on as-constructed final landform plan.
				There is no residual surface contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use. Residual waste materials stored on site (eg non-inert rock) will be appropriately contained/encapsulated so it doesn't pose any threat of environmental harm or constrain the intended final land use.	Contamination will be appropriately remediated so that appropriate guidelines for land use are met.	Contamination Remediation Report prepared by Land Contamination Consultant.

Table 4.1 Rehabilitation objectives and rehabilitation completion criteria

Final land use domain code	Final land use domain	Mining domain code	Mining domain	Rehabilitation objectives	Completion criteria	Performance indices	Justification and validation methods
				The final landform is stable and does not present a risk of environmental harm downstream/ downslope of the site or a safety risk to the public/stock/native fauna.	There is no active rill, gully, tunnel erosion or landslips are within the parameters for safe and stable landform.	The final landform has been constructed in general accordance with the approved Final Landform & Rehabilitation Plan. Presence/absence active rills, gullies, tunnels, land slips within rehabilitation monitoring transects. Inert waste rock surface cover in rehabilitation transects ≥60%	As constructed reports. Rehabilitation monitoring reports.

4.2 Stakeholder consultation

As detailed in section 2.2, the BHMIAC was formed with the purpose of facilitating a coordinated whole of government approach to establishing sustainable post-mining land use options for the mines within the Broken Hill district (M Newton, pers.com). The initial focus of the Committee is limited to the Rasp mine and adjacent Perilya mining operations and associated facilities. It is the objective that the focus of the Committee will be expanded in the future to the broader Broken Hill mining district. The Committee is comprised of representatives from DPC, EPA, Resources Regulator, Crown Lands, OEH, Broken Hill Lead Program, DPE as well as Broken Hill Council.

Site inspections at Broken Hill were undertaken by Committee 13-14 August 2019. The purpose of the inspection was to provide the site context to members of the group to ensure they have an understanding of the complexity of issues that need to be addressed in developing a pathway to confirming post-mining land use option(s) (M Newton, pers.com). It also intended to provide an opportunity for both BHOP and Perilya to outline issues that required further clarification to the stakeholders.

BHOP has had no further contact with the committee since the 2019 inspection however it can be inferred that there is a desire for a mining tourism for relevant sections of the site. In the absence of specific guidance from the Committee or Crown Lands, BHOP have adopted a 'fall back' safe, stable and non-polluting final land-use that provides for a mining heritage tourism final land use for the greater mine area.

BHOP has initiated for final land-use consultation with the Committee and other relevant stakeholders. Details of consultation is provided in Table 4.2.

Table 4.2 Stakeholder consultation

Stakeholder consultation	Form	Date	Topics	Stakeholder response	BHOP action
Department of Regional NSW Resources Regulator – Matt Newton	Email	11 February 2021	Final land use options, facilitation of an BHMIAC meeting	Nil	Email from company to set up an initial meeting
Heritage NSW – Tempe Beaven	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
Department of Regional NSW, Mining, Exploration and Geoscience - Christine Fawcett	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
Department of Planning and Environment (Compliance) – Ben Gazi	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
Department of Planning and Environment (Compliance) – Katrina O'Reily	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Please submit request via the planning portal	Request submitted via the planning portal
Broken Hill Council – Kobus Nieuwoudt	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil

Table 4.2 Stakeholder consultation

Stakeholder consultation	Form	Date	Topics	Stakeholder response	BHOP action
NSW DPIE Water and Natural Resources Access Regulator – Tim Baker	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	DPE Water has considered the request and has no specific comments to provide in terms of landuse options. Please note however that DPE Water has responsibilities under water management legislation and related policies that may need to be considered in the design and selection of landuse options. DPE Water would appreciate further consultation once a draft Rehabilitation Management Plan has been prepared.	Draft RMP provided to DPE Water for review
Transport for NSW – Howard Ore	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
Dam Safety NSW – Heather Middleton	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
NSW DPIE, Biodiversity and Conservation Division – Michael Todd	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil

Table 4.2 Stakeholder consultation

Stakeholder consultation	Form	Date	Topics	Stakeholder response	BHOP action
Crown Lands – Shaun Barker	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Please note that post-closure land use for the Rasp Mine will need to be actioned/considered in the broader context of all mines in Broken Hill to ensure consistency in how this is approached and undertaken. I will take this forward to the Broken Hill Post Mining Interagency Group and will respond in due course.	Nil
Crown Lands – Sharon Hawke	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	I acknowledge the complexities concerning this site not only for the DPE-Crown Lands but for the NSW Government as a whole and these issues were highlighted in the visit in August 2019 that I attended. At this time Crown Lands in unable to provide guidance or requirements to determine final land use options as further consultation will be required with other agencies and stakeholder groups.	Nil
Maari Ma Health – Kaylene Kemp	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
NSW Health, Far West Local Health District – Leanne Hastwell	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil

Table 4.2 Stakeholder consultation

Stakeholder consultation	Form	Date	Topics	Stakeholder response	BHOP action
Broken Hill Environmental Lead Program– Kathryn Graham	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
NSW Resources Regulator – Matt Newton	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil
Environment Protection Authority – Jason Price	Email with letter	14 June 2022	Final land use options, RMP and RMS preparation	the consultation letter about the preparation of a final land use plan for the Rasp mine in Broken Hill took some time to land with the appropriate EPA officers, including the Broken Hill Environmental Lead Program team, and as a result I am requesting a 2 week extension to provide comments on the plan (I understand from BHOP's letter that comments were required by today). Can you let me know if this is acceptable and that our comments would still be considered during preparation of the plan?	Advised that this is acceptable
Environment Protection Authority – Jessica Creed	Email with letter	15 June 2022	Final land use options, RMP and RMS preparation	Nil	Nil

5 Final landform and rehabilitation plan

5.1 Final landform and rehabilitation plan – electronic copy

Plan 1: Final landform features is provided in Appendix C.1.

Plan 2: Final landform contours in provided in Appendix C.2.

6 Rehabilitation implementation

6.1 Life on mine rehabilitation schedule

As an underground metalliferous mine, no significant rehabilitation works are proposed until the cessation of mining. Proposed rehabilitation works for the next three (3) years are detailed in Table 6.1.

Table 6.1 Proposed rehabilitation works

Location	Proposed works	Duration
Blackwood waste dump	Spreading of inert waste rock to reduce lead dust emissions	January – December 2023
Caledonian waste dump	Spreading of inert waste rock to reduce lead dust emissions	January – December 2024
Café waste dump	Spreading of inert waste rock to reduce lead dust emissions	January – December 2023
Little Kintore Kit	Backfilling of waste rock from the excavation of the Box Cut	September 2022 – March 2023
Kintore Pit	Backfilling with waste and tailings from TSF 2	June 2023 – on going

6.2 Phases of rehabilitation and general methodologies

6.2.1 Active mining phase

PA 07_0018 and CML7 approves mining until 31 December 2026 and thereafter to rehabilitate the site to the satisfaction of the Department of Regional NSW – Resources Regulator. With the MOD6 approval to place dry tailings into Kintore Pit, there is sufficient tailings storage capacity and ore reserves to extend the mine life until 2036 however any such extension will require a modification to PA 07_0018 and renewal of the mining leases.

6.2.2 Decommissioning

i Site security

The site is fenced with security fencing around the active mining areas with several electronically activated gates to ensure only approved personnel and contractors can access the site.

Decommissioning will not commence until mining and process has been completed. It is envisaged that a core workforce and contractors would be retained/engaged to implement the rehabilitation and closure phases of the project.

It is envisaged that key administration buildings, ablution facilities and workshops would remain during the rehabilitation phase of the project for BHOP and contractor personnel.

ii Infrastructure to be removed or demolished

It is envisaged that key administration buildings, ablution facilities and workshops would remain during the rehabilitation phase of the project for BHOP and contractor personnel.

The only infrastructure envisaged to remain will be unsealed access tracks for rehabilitation monitoring and maintenance and access for other infrastructure owners (eg Vodaphone).

Underground mining equipment that is uneconomical to recover will remain underground.

Mine and ventilation shafts will be sealed and capped in accordance with regulatory requirements.

Concrete from slabs and foundations is expected to be broken up and used as inert rock to cover free areas to minimise lead dust emissions

Infrastructure to be demolished and removed is detailed in section 2.4.1iv and section 2.4.1i.

iii Management of carbonaceous/contaminated material

There are no carbonaceous materials on site due to the site being a metalliferous mine.

A summary of contaminated land remediation works undertaken by NML prior to BHOP commencing operations is detailed in section 3.4.6.

a Regulatory framework

The site has known and potential sources of contamination which may impact the environment or human health receptors for final land use domains. To ensure risk to receptors is understood and mitigated the site will require contaminated site investigations completed in accordance with:

- NSW Contaminated Land Management Act 1997 ('CLM Act');
- NSW Protection of the Environment Operations Act 1997 ('POEO Act'); and
- NSW *Environmental Planning and Assessment Act 2000* ('EP&A Act') and State Environmental Planning Policy (SEPP) no.55 – Remediation of Land.

Applicable guidelines which should be used to support any contamination assessments include:

- Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) National Water Quality Management Strategy - Australian Water Quality Guidelines for Fresh and Marine Waters, as updated in 2018 by the Australian and New Zealand Governments (ANZG 2018);
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013, including 20 Schedules and Appendices (B1 to B9), and the NEPM Toolbox, updated April 2014 (the ASC NEPM);
- NSW EPA (1995) Sampling Design Guidelines;
- NSW EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste;
- NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme; and
- NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Sites.

b Areas of known or likely or potential contamination

Potential sources of contamination at the Site include:

- water management areas containing heavy metal run off and sediments;
- storage, handing and dispensing of hydrocarbons and chemicals;
- roads and tracks where non-inert rock was used for construction and/or sheeting purposes;

- processing and handing areas of ores; and
- historical processing, waste and tailings storage areas.

c Scope of contamination studies

A Stage 1 PSI will be completed in accordance with the ASC NEPM to assess if potential source-pathway-receptor linkages may be present at the site. Due to the understanding of existing sources of contamination it is likely that a Stage 2 DSI will be required to quantify potential ecological and human health risk. If contamination is present at levels which pose an unacceptable risk a remediation action plan (RAP) will be required. This stage should be integrated into the overall mine closure design where encapsulation, on-site treatment, in situ or bioremediation may form part of the overall closure approach. Where remediation is completed validation sampling will be required in accordance with the ASC NEPM and the NSW EPA guidelines.

All contamination investigations be completed by an appropriately qualified contamination consultant.

d Potential remediation strategies

Any contaminated sediments and rock will be excavated and either disposed of underground or transported to the TSF 3 for capping. Any hydrocarbon contaminated soil will be bioremediated on site.

iv Hazardous materials management

Hazardous and dangerous goods currently used on site are detailed in Table 6.2 and Table 6.3 on the following pages.

Any quantities of these materials that are on site post rehabilitation will be disposed of lawfully.

Table 6.2 Dangerous goods quantities

Common Name	Proper Shipping Name	ID or Code No.	Type of Storage Facility	Max Storage Capacity (L)	Typical Quantity (L)	UN Number	ADG Class	PG
Reagent shed		BD01	Roofed Store			Mixed	4.2, 8, 9 Combustible Liquid	II or III
Filter shed	Corrosive Liquids, N.O.S. (dithiophosphate salt)	BD02	Enclosed Roof Store		4000	1760	8	II
SEX Mixing Tank	Corrosive Liquid, Toxic, N.O.S.	TK03	Process Mixing	10000	8000	2922	8 (6.1)	III
SEX Head Tank		TK04	Above Ground Tank	1000	1000	2922	8 (6.1)	III
Copper Sulphate Mixing Tank	Environmentally Hazardous Substance, Liquid, N.O.S. - (Contains Copper Sulphate)	TK05	Process Mixing	10000	8000	3082	9	III
Copper Sulphate Storage Tank		TK14	Above Ground Tank	10000	8000	3082	9	III
Copper Sulphate Head Tank		TK06	Above Ground Tank	1000	1000	3082	9	III
SMBS Mixing Tank	Bisulphites, Aqueous Solution, N.O.S.	TK07	Process Mixing	10000	8000	2693	8	III

Table 6.3 Surface dangerous goods manifest

Product Name	Location	Maximum Quantity	U.N. Number	A.D.G. Class	Hazchem Code	Packing Group
EXPLOSIVE, BLASTING, TYPE B	SURFACE-MAG-01	3000 KG	0082	1.1D	N/A	N/A
EXPLOSIVE, BLASTING, TYPE E	SURFACE-MAG-01	1000 KG	0241	1.1D	N/A	N/A
BOOSTERS without detonator	SURFACE-MAG-01	500 KG	0042	1.1D	N/A	N/A
CORD, DETONATING, flexible	SURFACE-MAG-01	1500 M	0065	1.1D	N/A	N/A
CHARGES, SHAPED without detonator	SURFACE-MAG-01	20 Units	0059	1.1D	N/A	N/A
DETONATORS, ELECTRIC for blasting	SURFACE-MAG-02	6000 Units	0030	1.1B	N/A	N/A
DETONATORS, ELECTRIC for blasting	SURFACE-MAG-02	500 Units	0456	1.4S	N/A	N/A
DETONATORS, NON ELECTRIC for blasting	SURFACE-MAG-02	6000	0360	1.1B	N/A	N/A
SUBTEK CHARGE (Ammonium Nitrate Emulsion)	SURFACE-MAG-03	25000 KG	0241	1.1D	5.1	N/A
DIESEL	TK-01	61900 L	00C1	C1		N/A
DIESEL	TK-02	61900 L	00C1	C1		N/A
EXPLOSIVE, BLASTING, TYPE B	UG-MAG-01	22000 KG	0082	1.1D	N/A	N/A

Table 6.3 Surface dangerous goods manifest

Product Name	Location	Maximum Quantity	U.N. Number	A.D.G. Class	Hazchem Code	Packing Group
EXPLOSIVE, BLASTING, TYPE E	UG-MAG-01	5000 KG	0241	1.1D	N/A	N/A
BOOSTERS without detonator	UG-MAG-01	1000 KG	0042	1.1D	N/A	N/A
CORD, DETONATING, flexible	UG-MAG-01	5000 M	0065	1.1D	N/A	N/A
CHARGES, SHAPED without detonator	UG-MAG-01	0 Units	0059	1.1D	N/A	N/A
DETONATORS, ELECTRIC for blasting	UG-MAG-02	6000 Units	0030	1.1B	N/A	N/A
DETONATORS, ELECTRIC for blasting	UG-MAG-02	500 Units	0456	1.4S	N/A	N/A
DETONATORS, NON ELECTRIC for blasting	UG-MAG-02	6000 Units	0360	1.1B	N/A	N/A
SUBTEK CHARGE (Ammonium Nitrate Emulsion)	UG-MAG-03	25000 KG	0241	1.1D	5.1	N/A

v Underground infrastructure

Key underground infrastructure includes:

- a spiral decline that extends from the surface to the bottom of the mine (approximately 700 m);
- ventilation shafts
  - 1 x exhaust;
  - 3 x intake (No.7 Shaft, No.6 Shaft, Delprat's Shaft); and
- associated compressors, pump stations, ventilation fans, crib room, toilets and electrical infrastructure.

A detailed shaft and decline sealing design has yet to be prepared for the Rasp Mine.

Prior to decommissioning BHOP will recover equipment from the mine where viable to do so as well as materials that could result in groundwater contamination.

Underground pumps would be turned off and over time it is expected that groundwater levels would slowly fill back to pre-mining levels. A groundwater model is currently being prepared to determine the rate of inflow, final levels, and water quality.

All the associated above ground infrastructure would be demolished and removed, sold for re-use or scrapped.

The shafts and drift would be capped to permit a mining heritage final land use.

A detailed capping design will be prepared at an appropriate time closure to schedule closure.

6.2.3 Landform establishment

i Water management infrastructure

All water management infrastructure apart from evaporation ponds/dams and TSF spillways will be rehabilitated. The final landform design will aim to convert many of the diversion bunds constructed by NML in the 1990's from concentrated flows to sheet flows to reduce the erosion potential of runoff.

This will include treating and discharging any stored water in accordance with the EPL and excavating any contaminated sediment for disposal in the TSF 3.

The dam walls and drain banks would be pushed back into their excavation and reshaped to approximate pre-mining landforms and re-establish sheet flow conditions.

Rehabilitated water management infrastructure would be capped with inert waste rock to minimise erosion and lead dust emissions.

ii Final landform construction: general requirements

The bulk of the landforms at Rasp Mine are the result of historical mining operations and approved rehabilitation works undertaken by NML as previously detailed. The key changes to the historical landforms at Rasp Mine include:

- backfilling Kintore Pit with waste rock and tailings;
- partial backfilling of Little Kintore Pit;
- partial backfilling of BHP Pit with waste rock;

- backfilling of Blackwoods Pit with tailings; and
- excavation and then partial backfilling of a Box Cut for new access for underground mining operations to allow Kintore Pit to be used for dry tailings storage.

iii Final landform construction: reject emplacement areas and tailings

a Kintore Pit (TSF 3)

The Kintore Pit will be completely backfilled with tailings and waste rock and then capped with inert waste rock to form a gently sloping domed landform with slopes ranging from 3.28% - 6.7%. The finished surface will be a rough surface inert waste rock with 1 to 2% (Figure 2.4 and Figure 2.5).

Surface drainage of the capped landform will be toward a stormwater detention pond in the partially backfilled Little Kintore Pit.

b Little Kintore Pit

Little Kintore Pit will be partially backfilled with waste rock from the excavation of the Box Cut to form a shallow stormwater detention pond designed to capture runoff from the capped Kintore Pit landform (Figure 2.4) where it would either evaporate or seep into the floor of the backfilled pit.

The finished surface will be a rough surface inert waste rock with 1 to 2% fines.

c Box Cut

Following cessation of underground operations, removal of all infrastructure and plugging and capping of the portal, the Box Cut will be partially backfilled with waste rock then capped with inert waste rock to form a stormwater detention pond (Figure 2.6). Surface water contained in the stormwater detention pond would be expected to evaporate or seep to ground water.

The finished surface will be a rough surface of inert waste rock with 1 to 2% fines.

The sides of the Box Cut above the backfilled surface will be exposed in-situ rock.

d Blackwood Pit (TSF2)

During the final stages of mining and processing, tailings would cease to be excavated from TSF 2, and deposited tailings would be used to fill the cells within TSF2 leaving with finished tailings surface with a 1% gradient from west to east (Figure 2.6).

The surface of the TSF2 would be covered progressively with screened inert waste rock capillary break layer 200 mm think followed inert run of mine waste rock layer 300 mm thick. The finished surface will be a rough surface of inert waste rock with 1 to 2% fines with a formal engineered spillway in the south-eastern corner be designed and constructed in accordance ANCOLD 2019 and the ICMM 2020 Global Tailings Standard.

e Horwood Tailings Dam (TSF1)

Rehabilitation of the Horwood Tailings Dam (TSF1) was undertaken by NML and subsequently approved by the then DMR (NML, 2000). Minor modification to the surface of TSF1 is proposed to divert overland flow away from the angle of repose batter on the north-eastern side of TSF 1 to the north-west to the S22 evaporation ponds and ultimately to Little Kintore Pit (Plan 2). This will significantly reduce the potential for erosion of the angle of repose TSF 1 north-eastern wall and the volume of water that flows into Horwood Dam and potentially off-site.

The regraded surface will have a gently graded surface grading from the north-east to north-west and it will be covered with inert waste rock in addition to the existing slag if required (Plan 2).

f Existing waste rock dumps

No new waste rock dumps have been created by BHOP other than for backfilling existing pits. Existing waste rock dumps (free areas) will be capped with inert waste rock to minimise dust emissions and the angle of repose batters will be rock mulched if required for erosional stability.

Reshaping of the Horwood waste dump batters will be undertaken to reduce the potential for erosion and to assist the diversion of flow away from the angle of repose waste rock dumps (Plan 2).

The reshaped dump will be capped with inert waste rock for erosion and lead dust control.

iv Final landform construction: Box Cut and Processing Plant

a Box Cut

Following cessation of underground operations, removal of all infrastructure and the capping of the portal, the Box Cut will be partially backfilled with waste rock then capped with inert waste rock to form a stormwater detention pond (Figure 2.6). Surface water contained in the stormwater detention pond would be expected to evaporate or seep to ground water.

The finished surface will be a rough surface of inert waste rock with 1 to 2% fines.

The sides of the Box Cut above the backfilled surface will be exposed in-situ rock.

b Processing Plant

Minor reshaping of the internally draining landforms will be required once the processing plant has been removed for safety and erosional stability. The reshaped landforms will be capped with inert waste rock for erosion and lead dust control (Plan 2).

v Final landform construction: BHP Pit

The BHP Pit will be partially backfilled with waste rock. The pit cannot be completely backfilled due to existing heritage items. A perimeter bund will be constructed around the pit rim for safety.

The pit will be used for evaporation of surface runoff.

vi Construction of creek/river diversion works

There are no creek or river diversions associated with Rasp Mine.

6.2.4 Growth medium development

As detailed in section 3.4, historical mining has buried any topsoil and subsoil resources that could be used for revegetation purposes. An investigation is currently being undertaken to determine if it is viable to manufacture suitable growths mediums from green waste produced in Broken Hill. Until the outcome of that study is known, BHOP's position is to cover rehabilitated landforms with inert waste rock for erosion control and to reduce the generation of lead dust.

6.2.5 Ecosystem and land use establishment

Not applicable as vegetative rehabilitation is not viable or proposed as detailed in section 3.4.

6.2.6 Ecosystem and land use development

Not applicable as vegetative rehabilitation is not viable or proposed as detailed in section 3.4.

6.3 Rehabilitation of areas affected by subsidence

Coffey Mining (Coffey, 2007) analysis of the potential for caving in the Western Mineralisation found that the most critical type of failure mode from vertical (piping), diverging (outwards) and converging (inward) was converging. However, this is unlikely to propagate to a great extent before the void can support the span and vertical failure is the most likely critical failure mode.

The analysis shows that a stope failure is not expected to propagate through to the surface and significant surface subsidence is not expected above the stopes. The analysis estimates some hanging wall failures with the currently estimated rock mass properties and the open stope geometry proposed. However, these failures are expected to be localised and are not expected to result in continuous caving to the surface. The presence of a more competent Potosi Gneiss unit above the stope hanging walls will restrict any failure from propagating upwards assuming the unit is always above the stopes.

After extensive analysis Coffey Mining concluded that any stope failure (no matter how unlikely) would not propagate through to the surface and therefore significant surface subsidence is not predicted above the stopes.

If subsidence did occur, then appropriate rehabilitation measures would be developed depending on the nature, extent and location of the subsidence.

7 Rehabilitation quality assurance

BHOP will develop rehabilitation specifications for all stages of rehabilitation implementation. This will include technical requirements, inspection and testing requirements and hold and witness points. This will ensure that each stage of rehabilitation is completed to the agreed design and then next step/phase cannot proceed until there is formal signoff that the rehabilitation has been implemented as required.

All steps will be documented, and records will be retained to:

- Show progression towards achieving the set closure criteria or identifying areas that have degraded over time to inform intervention and management.
- If rehabilitation does not achieve the required criteria or fails in a particular area, reviewing the records of the rehabilitation methodology used can assist in determining root causes of the failure.
- Documenting the process enables comparison of results where different methodologies have been applied.
- It enables a process to be repeated by following a documented procedure.

8 Rehabilitation monitoring program

8.1 Analogue sites baseline monitoring

As vegetative rehabilitation is not viable at Rasp Mine due to the lack of suitable growth mediums, the use of traditional rehabilitation monitoring techniques such as Landscape Function Analysis as detailed in *Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes with Special Reference to Minesites and Rangelands Version 3.1* (Tongway and Hindley, 2004) is not applicable to the Rasp Mine.

Analogue monitoring of soil and surface water for background contamination will be undertaken.

Values for tolerable rates of erosion have been determined from Howard and Loch (2019) as detailed in section 2.4.1 vi.

8.2 Rehabilitation establishment monitoring

As vegetative rehabilitation is not viable at Rasp Mine due to the lack of suitable growth mediums, rehabilitation establishment monitoring is not required.

8.3 Measurement of rehabilitation performance

Rehabilitation completion criteria detailed in Table 4.1 are used as the basis for assessing when rehabilitation of the project is complete.

The adopted rehabilitation criteria for the site have been developed in accordance with the unique constraints posed by the mine site and historical mining activities and practices. They consist of a set of objectives, rehabilitation criteria and evidence that criteria have been met.

9 Rehabilitation research and trials

9.1 Current rehabilitation research and trials

As detailed in section 3.4, BHOP consider that the manufacture of a growing media may be possible using locally sourced organic material feed sources such as mechanically harvested weeds, municipal organic and putrescible wastes, biosolids and woody wastes such as tub-ground pallets and will investigate the feasibility of doing this.

The manufacture of growing media for green wastes and waste organic material is anticipated to require treatment via composting or biological breakdown using processes such as the VRM Biologik Groundswell® Continuous Fermentation process.

Manufactured growth mediums such as high-quality composts and Humisoil® organic soil can rapidly establish beneficial soil bacteria and arbuscular mycorrhizal fungi further binding the soil with glomalin (soil carbon cement) and increasing soil aggregation (Hendrickson et.al 2008) and in seasonally dry, variable, or unpredictable environments like the mine, mycorrhizal fungi play an extremely important role in plant-water dynamics. The hyphal tips are hydrophilic – both the end in the plant and the end in the soil – enabling both water and nutrients to diffuse from one end to the other along a moisture gradient (Allen 2007).

BHOP are investigating the feasibility of growth media manufacture realising that a successful outcome will require collaboration with BHCC, Landcare Broken Hill and other industries and that additional approvals may be required.

If it is determined that the process is feasible, then BHOP may undertake rehabilitation trails on site where the manufactured growth media would be mixed with inert waste rock and then seeded with appropriate native grass and ground cover species.

This initial report from this investigation is expected in September 2022.

9.2 Future rehabilitation research and trials

If the manufacture of growth media from green waste is determined to be viable then BHOP may undertake a pilot manufactured growth media and revegetation trial.

10 Intervention and adaptive management

A rehabilitation Trigger Action Response Plan (TARP) has been developed for the site to respond to potential threats to the success of rehabilitation outcomes of the grassland and shrubland communities, as detailed in Table 10.1.

Table 10.1 Rehabilitation Trigger Action Response Plan

Threats to rehabilitation success	Potential source of threat	Trigger	Action/Response	How impact will be monitored	Notification protocol
Final land use domain - Infrastructure					
Land contamination	Contaminated land remains	Audit of site contamination indicates contaminated land is present. Audit details remedial recommendations.	Remedial recommendations are implemented. Site re-audit to ensure contamination removed.	Remediation verification report.	Notification to the EPA and Resources Regulator may be required if gross contamination or environmental harm has occurred.
Final landforms not in accordance with RMP	Erosion/instability/lead dust emissions	As constructed surveys, rehabilitation monitoring.	Engage an independent specialist to determine in non-conforming landform can still achieve RMP objectives: • erosion stability; • geotechnical stability; • lead dust control; • surface and ground water quality; and • implement recommendations if rework is required.	Annual rehabilitation monitoring.	Depending on severity: • incident report; and • revision of RMP.
Final land use domain – Other Mining Landscape					
TSF	Contaminated seepage from capped TSF's.	Visual assessment, surface and/or groundwater monitoring trigger exceedances, rate of seepage not decreasing following.	Engage an independent specialist to identify cause of seepage and implement investigations. Implement seepage collection and pump underground.	Surface and groundwater monitoring	Depending on severity: • incident report; and • revision of RMP.
	Water ponding on capped surface due to differential settlement.	Surveys of the capped TSF surface.	Placement of additional soil material to restore gradients and re-seed.	Rehabilitation monitoring and survey.	Annual rehabilitation report.
	Differential settlement/slips of the TSF embankments.	Surveys of the capped TSF surface, Lidar monitoring of slopes.	Engage independent TSF dam geotechnical engineer/ erosion specialist to undertake an investigation and implement recommendations.	Rehabilitation monitoring and survey.	Depending on severity: • incident report; and • revision of RMP.

Table 10.1 Rehabilitation Trigger Action Response Plan

Threats to rehabilitation success	Potential source of threat	Trigger	Action/Response	How impact will be monitored	Notification protocol
	Failure to remove TSF's from Dam Safety NSW register.	Correspondence from Dam Safety NSW.	Engage independent TSF dam geotechnical engineer to apply to Dam Safety NSW for removal address any identified concerns and management/mitigation requirements.	Independent report.	Annual rehabilitation report
Erosion of rehabilitated area	Excessive rainfall.	Rehabilitation monitoring and inspections.	Backfill any eroded areas using material available on site. If erosion is due to flow exceeding the critical shear of the revegetated surface, provide additional erosion protection as required eg rock soil matrix, rock lining etc.	Rehabilitation monitoring and inspections.	Annual rehabilitation report.
Weed invasion and/or dominance by exotic grass species	Weed invasion and/or dominance by exotic grass species.	Rehabilitation LFA monitoring exceeding exotic species indices.	Undertake weed control and reseed as required.	Rehabilitation monitoring and inspections.	Annual rehabilitation report.
Subsidence above underground mine areas	Collapse of underground pillars and infilling of underground voids	Subsidence and rehabilitation monitoring	Engage a suitably qualified and experienced subsidence/geotechnical engineer to determine cause and solution (most likely backfilling or exclusion fencing).	Subsidence and rehabilitation monitoring	Incident reporting, Annual rehabilitation reports.

11 Review and implementation

In accordance with Clause 11 of Schedule 8A to the *Mining Regulation* 2016, this RMP will be amended if any of the following arise:

- there are changes to rehabilitation objectives and completion criteria;
- there are changes to the proposed rehabilitation landforms or key rehabilitation methods;
- there are changes to the identified risk or associated control measures;
- mining recommences on site; or
- as otherwise directed to do so by the Secretary of DPE or nominated delegate.

12 References

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Appendix A
Approvals

EMM
creating opportunities

A.1 Mining tenements

INSTRUMENT OF RENEWAL

LEASE:	Consolidated Mining Lease No 7 (Act 1973)
HOLDER:	Broken Hill Operations Pty Ltd
DATE OF LEASE:	8 October 1987
EXPIRY DATE OF LEASE:	31 December 2005
PERIOD OF RENEWAL UNTIL:	31 December 2026
AREA: *AS SHOWN BY PLAN NO D6199*	342.66 hectares
DEPTH RESTRICTION:	Various *as shown on Plan No D6199 R*
SURFACE EXCEPTION:	Various *as shown on Plan No D6199 R*
MINERALS:	Antimony, arsenic, barite, beryllium minerals, bismuth, cadmium, calcite, clay/shale, cobalt, copper, dimension stone, feldspathic materials, fluorite, garnet, germanium, gold, graphite, iron minerals, lead, limestone, manganese, mercury, molybdenite, nickel, selenium, silver, structural clay, sulphur, tin, tourmaline, tungsten and its ores, vanadium, zinc.

And those mining purpose as specified in Schedule 2, attached to this instrument

ROYALTY PAYABLE:	at the rate which, from time to time, may be prescribed.

AMENDMENTS TO THE CONDITIONS OF THE LEASE:

(a) **All the Conditions contained in the lease prior to the renewal have been deleted.**

(b) **The lease is now subject to the attached Mining Lease Conditions 2004 numbered:**

1 to 3 (inclusive), 5 to 34 (inclusive)

Condition Nos. 2, 3, 13 – 22 (inclusive), are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

Attachments

Schedule of Lease referred to in the annexes Consolidation Mining Lease No7 under the Mining Act, 1973

Schedule No. 2 - Details of Lands and Purposes

Copy of Plan number D6199 R
Coloured Copy of Plan number D6199 R in reference to Condition 33

We, Broken Hill Operations Pty Ltd (ACN 054 920 893), hereby accept the renewal of this Lease and agree to be bound by the conditions specified.

GREG JONES
GENERAL MANAGER
– GEOLOGY

.....
Broken Hill Operations Pty Ltd (ACN 054 920 893)

Renewed this 17th **day of** January **200**7

.....
by delegation from the Minister.

Schedule of Leases included in Consolidated Mining Lease No 7 (Act 1973)

Schedule 1

This page and the succeeding pages are the schedule of leases and referred to in the annexed Consolidated Mining Lease No. 7 under the Mining Act, 1973, granted eighth day of October 1987.

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Witness to Minister's signature

Mineral Lease No 2357 (Act 1874)
Mineral Lease No 2358 (Act 1874)
Mineral Lease No 2361 (Act 1874)
Mineral Lease No 2368 (Act 1874)
Mineral Lease No 2371 (Act 1874)
Mineral Lease No 2630 (Act 1874)
Mineral Lease No 9113 (Act 1874)
Mineral Lease No 9114 (Act 1874)

Mineral Lease No 4807 (Act 1906)
Mineral Lease No 4808 (Act 1906)
Mineral Lease No 4809 (Act 1906)
Mineral Lease No 4810 (Act 1906)
Mineral Lease No 4874 (Act 1906)
Mineral Lease No 4875 (Act 1906)
Mineral Lease No 4933 (Act 1906)
Mineral Lease No 4934 (Act 1906)
Mineral Lease No 4952 (Act 1906)
Mineral Lease No 5456 (Act 1906)
Mineral Lease No 5613 (Act 1906)
Mineral Lease No 5841 (Act 1906)
Mineral Lease No 5597 (Act 1906)
Mineral Lease No 6079 (Act 1906)
Mineral Lease No 6113 (Act 1906)
Mineral Lease No 6115 (Act 1906)
Mineral Lease No 6116 (Act 1906)
Mineral Lease No 6137 (Act 1906)
Mineral Lease No 6160 (Act 1906)
Mineral Lease No 6167 (Act 1906)
Mineral Lease No 6264 (Act 1906)
Mineral Lease No 6284 (Act 1906)
Mineral Lease No 6403 (Act 1906)

Mining Purposes Lease No 597 (Act 1906)
Mining Purposes Lease No 607 (Act 1906)
Mining Purposes Lease No 1238 (Act 1906)

Private Lands Lease No 3711 (Act 1906)
Private Lands Lease No 3712 (Act 1906)
Private Lands Lease No 3787 (Act 1906)
Mining Lease No 41 (Act 1973)

Mining Lease No 47 (Act 1973)
Mining Lease No 70 (Act 1973)
Mining Lease No 443 (Act 1973)
Mining Lease No 535 (Act 1973)
Mining Lease No 610 (Act 1973)
Mining Lease No 687 (Act 1973)
Mining Lease No 946 (Act 1973)

Mining Purposes Lease No 120 (Act 1973)
Mining Purposes Lease No 158 (Act 1973)
Mining Purposes Lease No 177 (Act 1973)
Mining Purposes Lease No 187 (Act 1973)
Mining Purposes Lease No 188 (Act 1973)
Mining Purposes Lease No 189 (Act 1973)
Mining Purposes Lease No 190 (Act 1973)
Mining Purposes Lease No 208 (Act 1973)

Schedule No 2

This page and the succeeding pages is the schedule No. 2 and referred to in the annexed Consolidated Mining Lease No. 7 under the Mining Act, 1973, granted eighth day of October 1987.

.....

Witness to Minister's signature

Details of Lands, Purposes and Depths

Lands	Purposes	Depth Restriction
Shown on plan M18388 previously being Mining Purpose Lease 597 (Act 1906)	1. Constructing, maintaining or using in connection with mining or mining purposes a building, dam or any machinery. 2. The dumping or depositing of any ore, mineral, mine residues or tailings.	The surface and the soil below thereof to a depth of 15.24 metres.
Shown on plan M18466 previously being Mining Purpose Lease 607 (Act 1906)	1. Constructing, maintaining or using in connection with mining or mining purposes a building or any machinery. 2. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom.	The surface and the soil below thereof to a depth of 15.24 metres.
Shown on plan M22229 previously being Mining Purpose Lease 1238 (Act 1906)	1. Constructing, maintaining or using in connection with mining or mining purposes a building, electricity transmission line, pipeline, railway, road or any machinery/ 2. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom. 3. The generation of electricity for use in connection with mining or mining purposes. 4. The dumping or depositing of any ore, mineral, mine residues or tailings. 5. Erecting dwellings for the use of persons employed on or about the mine or on or about land subject to a lease for mining purposes.	The surface and the soil below thereof to a depth of 76.20 metres.

Lands	Purposes	Depth Restriction
Shown on plan D1731 previously being Mining Purpose Lease 120 (Act 1973)	1. Constructing, maintaining or using in connection with mining or mining purposes a road or any machinery. 2. The dumping or depositing of any ore, mineral, mine residues or tailings. 3. The storing of fuel, machinery or equipment in connection with mining or mining purposes.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D1732 previously being Mining Purpose Lease 158 (Act 1973)	1. Constructing, maintaining or using in connection with mining or mining purposes a drain. 2. The dumping or depositing of any ore, mineral, mine residues or tailings. 3. The storing of fuel, machinery or equipment in connection with mining or mining purposes.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D3815 previously being Mining Purpose Lease 177 (Act 1973)	1. Constructing, maintaining or using in connection with mining or mining purposes a shaft.	The surface and the soil below thereof to a depth of 20 metres.
Shown on plan D3564 previously being Mining Purpose Lease 187 (Act 1973)	1. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom. 2. The dumping or depositing of any ore, mineral, mine residues or tailings.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D3565 previously being Mining Purpose Lease 188 (Act 1973)	1. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom. 2. The dumping or depositing of any ore, mineral, mine residues or tailings.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D3566 previously being Mining Purpose Lease 189 (Act 1973)	1. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom. 2. The dumping or depositing of any ore, mineral, mine residues or tailings.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D2322 previously being Mining Purpose Lease 190 (Act 1973)	1. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom. 2. The dumping or depositing of any ore, mineral, mine residues or tailings.	The surface and the soil below thereof to a depth of 10 metres.
Shown on plan D1730 previously being Mining Purpose Lease 208 (Act 1973)	1. Constructing, maintaining or using in connection with mining or mining purposes a dam and road. 2. The dumping or depositing of any ore, mineral, mine residues or tailings. 3. The treatment of tailings, water or a mineral bearing substance for the extraction or obtaining of any mineral therefrom.	The surface and the soil below thereof to a depth of 10 metres.

MINING LEASE CONDITIONS 2004 -*CML 7 (73)*

Notice to Landholders

1. Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

   If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

Mining, Rehabilitation, Environmental Management Process (MREMP)

2. **Mining Operations Plan**

(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries – Mineral Resources.

(b) The MOP must:

- identify areas that will be disturbed by mining operations;
- detail the staging of specific mining operations;
- identify how the mine will be managed to allow mine closure;
- identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;
- reflect the conditions of approval under:
  - the Environmental Planning and Assessment Act 1979
  - the Protection of the Environment Operations Act 1997
  - and any other approvals relevant to the development including the conditions of this lease; and
- have regard to any relevant guidelines adopted by the Director-General.

(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is a defence to a breach of this condition if:

i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the *Mining Act 1992*, the *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* or the *Occupational Health and Safety Act 2000*; and

ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out.

Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.

(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition (c) does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.

Annual Environmental Management Report (AEMR)

3. **Reporting**

(a) The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.

(b) The EMR must:

- report against compliance with the MOP;
- report on progress in respect of rehabilitation completion criteria;
- report on the extent of compliance with regulatory requirements; and
- have regard to any relevant guidelines adopted by the Director-General;

Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.

Working Requirement

5. The lease holder must: expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than $100,000 per annum whilst the lease is in force.

The Minister may at any time or times, by instrument in writing served on the lease holder, increase or decrease the expenditure required or the number of people to be employed.

Control of Operations

6. (a) If an Environmental Officer of the Department believes that the lease holder is not complying with any provision of the Act or any condition of this lease relating to the working of the lease, he may direct the lease holder to:-

(i) cease working the lease; or

(ii) cease that part of the operation not complying with the Act or conditions;

until in the opinion of the Environmental Officer the situation is rectified.

(b) The lease holder must comply with any direction given. The Director-General may confirm, vary or revoke any such direction.

(c) A direction referred to in this condition may be served on the Mine Manager.

Reports

7. The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) A statement of the ore and mineral reserves

(e) Particulars of exploration proposed to be conducted in the next twelve months period;

(f) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

Licence to Use Reports

8. (a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

Confidentiality

9. (a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

Terms of the non-exclusive licence

10. The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

Safety

12. Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

Rehabilitation

13. Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.

Exploratory Drilling

15. (1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

Transmission lines, Communication lines and Pipelines

17. Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

Fences, Gates

18. (a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

Roads and Tracks

19. (a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

20. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Natural Resources.

Use of Mercury or Cyanide

22. The lease holder must not use mercury or cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.

Resource Recovery

23. (a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

Indemnity

24. The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

Single Security

25. (a) A security in the sum of $250,000.00 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Consolidated Mining Lease No 7 (Act 1973), Mining Purposes Lease Nos 183, 184, 185 and 186 (Act 1973)). If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

SPECIAL CONDITIONS

General

26. In respect of the area shown on Catalogued Plan No M8388 the registered holder shall not conduct any mining operations other than diamond drilling between the depths of 15.24 metres and 76 metres below the surface unless with the consent of the Minister first and subject to such conditions as may be stipulated.

27. In respect of the area shown on Catalogued Plan No M2193 the registered holder shall ensure that mining operations are conducted in such a manner as not to interfere with the stability of any railway line traversing the area and the registered holder shall adhere to any direction to this affect which may be given from time to time by the Minister.

28. The registered holder shall not deposit any refuse or waste rock on the dumps located on the areas indicated by Catalogue Plan Nos D3564, D3565, D3566 and D2322 unless authorised by the Minister and subject to such conditions as may be stipulated.

29. (a) Notwithstanding that the registered holder shall have complied with conditions numbered 30 to 32 (inclusive) the registered holder shall pay to the public authority the cost incurred by such public authority of making good any damage caused by operations carried on by or under the authority of the registered holder or any person claiming through or under the registered holder.

(b) AND THE REGISTERED HOLDER HEREBY COVENANTS with the said public authority that the registered holder will pay to the said public authority the cost incurred by the public authority of making good any such damage caused as aforesaid.

AND IT IS HEREBY AGREED AND DECLARED that the amount to be paid by the registered holder under the provisions of this clause shall include in addition to the cost of all necessary labour and materials all costs and expenses reasonably incurred in and about the making of surveys the preparation of plans and specifications and estimates the supervision and inspection of the works and all administrative and overhead costs and expenses of the public authority as the case may be related or attributable to the works undertaken to make good any damage caused. A certificate under the hand of the public authority as to the amount of the cost of making good any damage shall in all respects and for all purposes be conclusive evidence of the amount of such cost and of the due determination thereof.

Catchment Areas and Reserves

30. (a) If the registered holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of Stephen's Creek Catchment Area the registered holder shall refrain from using or cease using as the case may require such process within twenty four hours of the receipt by the registered holder of a notice in writing under the hand of the Minister or the Director General requiring the registered holder so to do.

(b) The registered holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.

(c) The registered holder shall not erect nor permit to be erected any dwellings unless with the consent of the Minister or Country Energy-Water and subject to such conditions as may be stipulated.

(d) The registered holder shall make such provisions for sanitation as may be approved by Country Energy-Water and shall at all times observe and perform any requirements of the said Country Energy-Water respecting sanitation.

31. Operations shall be conducted in such a manner as not to interfere with or cause damage to the assets of Country Energy-Water situated on or around the subject area.

32. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve No 2421 for Temporary Common; Reserve No 69262 from Sale for future Public Requirements, Reserve No 3073 from Sale for Public Recreation and Reserve No 30905 for Quarry.

Prospecting/Mining Restriction

33. The registered holder must not prospect or mine any mineral on the surface of the areas shown by:-

a) Yellow tint on the plan annexed hereto of below the surface thereof to a depth of 10 meters;

b) Blue tint on the plan annexed hereto of below the surface thereof to a depth of 15.24 meters;

c) Red tint on the plan annexed hereto of below the surface thereof to a depth of 20 meters;

d) Green tint on the plan annexed hereto of below the surface thereof to a depth of 76.20 meters;

34. Subject to the requirements of any order issued pursuant to section 75 of the Mining Act (1992):

(a) the registered holder shall not, unless with the written approval of the Minister and subject to such conditions as he may impose, carry out a mining purpose on the lands described in column 1 of the Schedule numbered 2 annexed hereto other than a mining purpose specified opposite that description in column 2 of that schedule;

(b) the registered holder shall not carry out a mining purpose specified in column 2 of Schedule 2 except in accordance with the conditions of this lease including any conditions that may be referred to in Column 3 of that schedule opposite that purpose.

CONSOLIDATED MINING LEASE – CML No. 7 (Act '73)

(SUBJECT TO SURVEY)

REGISTERED HOLDER — MINERALS MINING AND METALLURGY LIMITED

PARISH OF PICTON COUNTY OF YANCOWINNA

REDUCTION RATIO 1·4 000

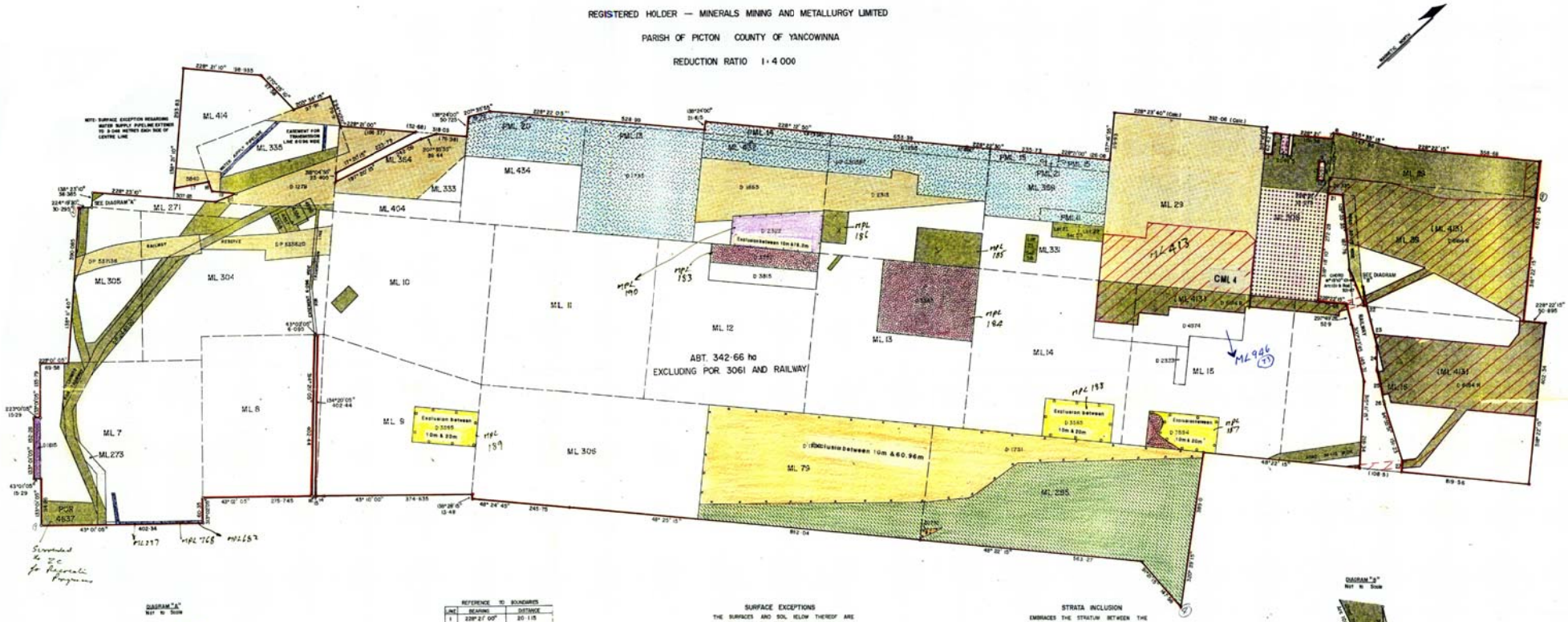


DIAGRAM "A"
Not to Scale

REFERENCE TO BOUNDARIES		
LINE	BEARING	DISTANCE
1	228° 21' 00"	20·115
2	138° 18' 10"	50·29
3	228° 21' 00"	40·055
4	318° 18' 10"	50·29
5	228° 21' 00"	9·695
6	138° 18' 10"	50·29
7	138° 18' 10"	12·13
8	228° 22' 15"	12·27
9	48° 21' 00"	13·66
10	107° 57' 00"	5·59
11	138° 18' 10"	45·465
12	228° 21' 00"	16·495
13	318° 18' 10"	50·29
14	43° 02' 45"	13·945
15	43° 02' 05"	5·03
16	43° 02' 05"	6·095
17	39° 20' 10"	87·37
18	114° 09' 35"	21·605
19	48° 23' 10"	72·68
20	203° 36' 15"	67·275
21	48° 21' 00"	41·825
22	117° 44' 15"	86·985
23	120° 25' 45"	64·88
24	129° 51' 29"	61·175
25	120° 25' 45"	91·51
26	122° 21' 15"	6·035
27	130° 53' 46"	24·52

Connection

SURFACE EXCEPTIONS

THE SURFACES AND SOIL BELOW THEREOF ARE EXCLUDED TO THE FOLLOWING DEPTHS

1. 6·096 METRES SHOWN (dot. 0·39 ha)
2. 15·24 METRES SHOWN (dot. 42·59 ha)
3. 20·00 METRES SHOWN (dot. 6·08 ha)
4. 30·48 METRES SHOWN (dot. 4·77 ha)
5. 60·96 METRES SHOWN (dot. 18·27 ha)
6. 76·2 METRES SHOWN (dot. 32·23 ha)
7. 152·4 METRES SHOWN (dot. 23·79 ha)

STRATA INCLUSION

EMBRACES THE STRATUM BETWEEN THE DEPTHS OF 420·62 METRES AND 664·46 METRES FROM THE SURFACE (dot 2328 mE) SHOWN

STRATA EXCLUSIONS

THE STRATA BETWEEN THE FOLLOWING DEPTHS ARE EXCLUDED

1. BETWEEN 10 METRES AND 20 METRES FROM THE SURFACE SHOWN (dot 4·27 ha)
2. BETWEEN 10 METRES AND 60·96 METRES FROM THE SURFACE SHOWN (dot. 18·08 ha)
3. BETWEEN 10 METRES AND 76·2 METRES FROM THE SURFACE SHOWN (dot. 2·08 ha)

Area effected by CML 4 surface to a depth 15.24 m

DIAGRAM "B"
Not to Scale

COMPILED FROM EXISTING MINES PLANS AND CURRENT LEASE DOCUMENTS

TRACED BY : Anne Mullaly

PREPARED BY :

EXAMINED BY :

CATALOGUE No. D 6199 R

Instrument of Renewal

I, **Kevin Ruming, Director Strategic Resource Assessment and Advice,** pursuant to section 114 of the *Mining Act 1992*, determine to renew Exploration Licence No **5818 (Act 1992)** held by **Broken Hill Operations Pty Ltd, ACN 054 920 893**:

In respect of **Group One (1) minerals**;

a) For the further term ending on **8 March 2023;** and

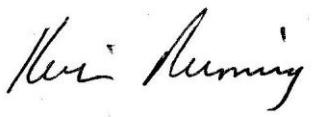
b) Over the exploration area described in Schedule 1; and

c) Subject to the conditions set out in Schedule 2 and Schedule 3; and

d) In compliance with any Activity Approvals in Schedule 4; and

e) In accordance with the approved work program referenced in Schedule 5.

Signed this 23rd day of June 2017



Kevin Ruming

Director Strategic Resource Assessment and Advice

As delegate for the Minister for Resources

Delegation dated: 1 May 2017

EXPLORATION LICENCE

Issued under the Mining Act 1992

EXPLORATION LICENCE NUMBER:	**5818 (Act 1992)**
RENEWAL DATE:	**23 June 2017**
DUE EXPIRY DATE:	**8 March 2023**
LICENCE HOLDER:	**Broken Hill Operations Pty Ltd** **ACN 054 920 893**
EXPLORATION AREA:	**See Schedule 1**
RESOURCE:	**Group One (1) minerals**

Information about this licence

This exploration licence is issued under the *Mining Act 1992.* The licence holder may:

- Apply for the renewal of this exploration licence; or
- Apply for the transfer of this exploration licence to another person.

Renewal applications are to be submitted within the period of two months prior up to midnight on the expiry date of the licence consistent with the *Mining Act 1992.*

The following fees are payable in connection with this licence:

- An annual rental fee; and
- An annual administrative levy.

Additional rights and responsibilities of licence holders are set out in the *Mining Act 1992* and the *Mining Regulation 2016*.

Please note that licence holders may also be required to obtain approvals and comply with requirements of other legislation when carrying out exploration activities, including (but not limited to):

- The *Environmental Planning and Assessment Act 1979;*
- The *Protection of the Environment Operations Act 1997*; and
- The *Water Act 1912* and the *Water Management Act 2000.*

Rights of the licence holder under this licence

This licence gives the licence holder an exclusive right to prospect for:

- The mineral(s) or group(s) of minerals to which this licence relates; and
- In respect of the land to which this licence relates.

However, in accordance with section 45 of the *Aboriginal Land Rights Act 1983*, if this licence relates to:

- **Group 1 minerals**, then this licence does **not** give the licence holder the right to prospect for any minerals except gold and silver on land vested in the New South Wales Aboriginal Land Council or a Local Aboriginal Land Council at the original date of grant of this licence.

Restrictions on the exercise of rights under this licence

It is the responsibility of the licence holder to apprise themselves of the restrictions on the exercise of rights under this licence that exist under NSW and Commonwealth legislation.

Exploration Area (Schedule 1)

The land to which this licence applies is set out at Schedule 1 of this licence.

Licence Conditions (Schedules 2 and 3)

This licence is subject to the conditions in Schedule 2 and Schedule 3. The licence holder must conduct prospecting operations in accordance with these conditions, as well as any conditions imposed by the *Mining Act 1992* and *Mining Regulation 2016*. In particular:

- The conditions set out in Schedule 2 are general conditions; and
- The conditions (if any) set out in Schedule 3 are additional conditions.

Contravention of licence conditions is an offence under the *Mining Act 1992*.

Further Approvals under this licence (Schedule 4)

The licence holder may need to obtain further approvals or Ministerial consent before carrying out prospecting operations on the land subject to this licence (see in particular the activity approval requirements for assessable prospecting operations section 23A of the *Mining Act 1992,* which requires an activity approval to be obtained prior to commencing any assessable prospecting operation). Approvals or consents which have been granted after commencement of this licence, and after 1 July 2015, are attached at Schedule 4 of this licence.

Work Program (Schedule 5)

Condition 1 of Schedule 2 of this licence requires the licence holder to comply with the Work Program. The Work Program unique identifier is set out at Schedule 5 of this licence. The Work Program may be varied on application of the licence holder, with the approval of the Minister.

Licence History

Identifier	Effective date	Reasons for Update
19	**23 June 2017**	Renewal of EL **5818 (1992)**

DEFINITIONS

In this licence:

(a) A reference to a Code or Guideline is a reference to that document as amended or replaced from time to time, and
(b) Words have the meaning given to those terms in the *Mining Act 1992* unless otherwise defined below:

Change in effective control of the licence holder means any occurrence which results in any person, not being a related body corporate of the licence holder, newly being in one or more of the following positions:

(a) having the capacity to appoint or control more than 50% of the number of directors of the licence-holder's board;
(b) being entitled to exercise (directly or indirectly) more than 50% of the votes entitled to be cast at any general meeting of the licence-holder; or
(c) holding more than 50% of the issued share capital (other than shares issued with no rights other than to receive a specified amount in distribution) of the licence-holder.

Environmental incident notifications and reports means any notifications and reports to be provided to relevant authorities under Part 5.7 or Part 5.7A of the *Protection of the Environment Operations Act 1997*.

Foreign acquisition of substantial control in the licence holder means any occurrence which results in a foreign party, not being a related body corporate of the licence holder, newly being in one or more of the following positions:

(a) having the capacity to appoint or control 15% or more of the number of directors of the licence-holder's board;
(b) being entitled to exercise (directly or indirectly) 15% or more of the votes entitled to be cast at any general meeting of the licence-holder; or
(c) holding interests in 15% or more of the issued share capital (other than shares issued with no rights other than to receive a specified amount in distribution) of the licence-holder.

National park, regional park, historic site, nature reserve, karst conservation reserve and Aboriginal area have the meaning given to those terms in the *National Parks and Wildlife Act 1974.*

Related Body Corporate has the same meaning given to that term in the *Corporations Act 2001 (Cth).*

Relevant authorities has the meaning given to that term in section 148 of the *Protection of the Environment Operations Act 1997*.

Work Program means the approved work program referred to in Schedule 5 of this licence, as amended from time to time with the approval of the Minister.

EXPLORATION AREA

The exploration area comprises of an area of **10 units** as specified in the table below, exclusive of any land:-

(a) vested in the Commonwealth of Australia; or

(b) that was not subject to the licence immediately before this renewal.

***Note**: This exclusion (b) may include land that, at the date this licence was initially granted, was:*

- *subject to an authority, or an application for an authority;*
- *subject to a residence area or business area referred to in clause 1, Part 1 of Schedule 11 of the Mining Regulation 2003;*
- *subject to any mining reserve constituted under section 367 of the Mining Act 1992 which prohibited the grant of new exploration licences;*
- *vested in the Commonwealth of Australia;*
- *located within a national park, regional park, historic site, nature reserve, karst conservation area or Aboriginal area established under the National Parks & Wildlife Act 1974 or other legislation; or*
- *vested in an Aboriginal Land Council or Local Land Council under the Aboriginal Land Rights Act 1983 at the original date of grant of this licence, unless this licence authorises exploration for gold, silver or uranium.*

1:1,000,000	Blocks	Units
BROKEN HILL	*3426*	*nop rstu*
BROKEN HILL	*3427*	*lm q*

The boundaries of the exploration area are indicated on the following diagram.

DISCLAIMER

The boundaries of the exploration area in the diagram are indicative only, based on knowledge and understanding at the time this licence was granted. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date. No warranty about the accuracy, currency or completeness of any information in this diagram is inferred (including, without limitation, any information provided by third parties). While all reasonable care has been taken in the compilation of this diagram, to the extent permitted by law, the NSW Department of Planning and Environment excludes all liability for the accuracy or completeness of the information, or for any injury, loss, or damage whatsoever (including without limitation liability for negligence and consequential losses) suffered by any person acting, or purporting to act, in reliance upon anything contained herein. Users should rely upon their own advice, skills, interpretation and experience in applying the information in the diagram.

RESOURCES & ENERGY

DIAGRAM X1706-003R

RM8: V17/1856

"R"

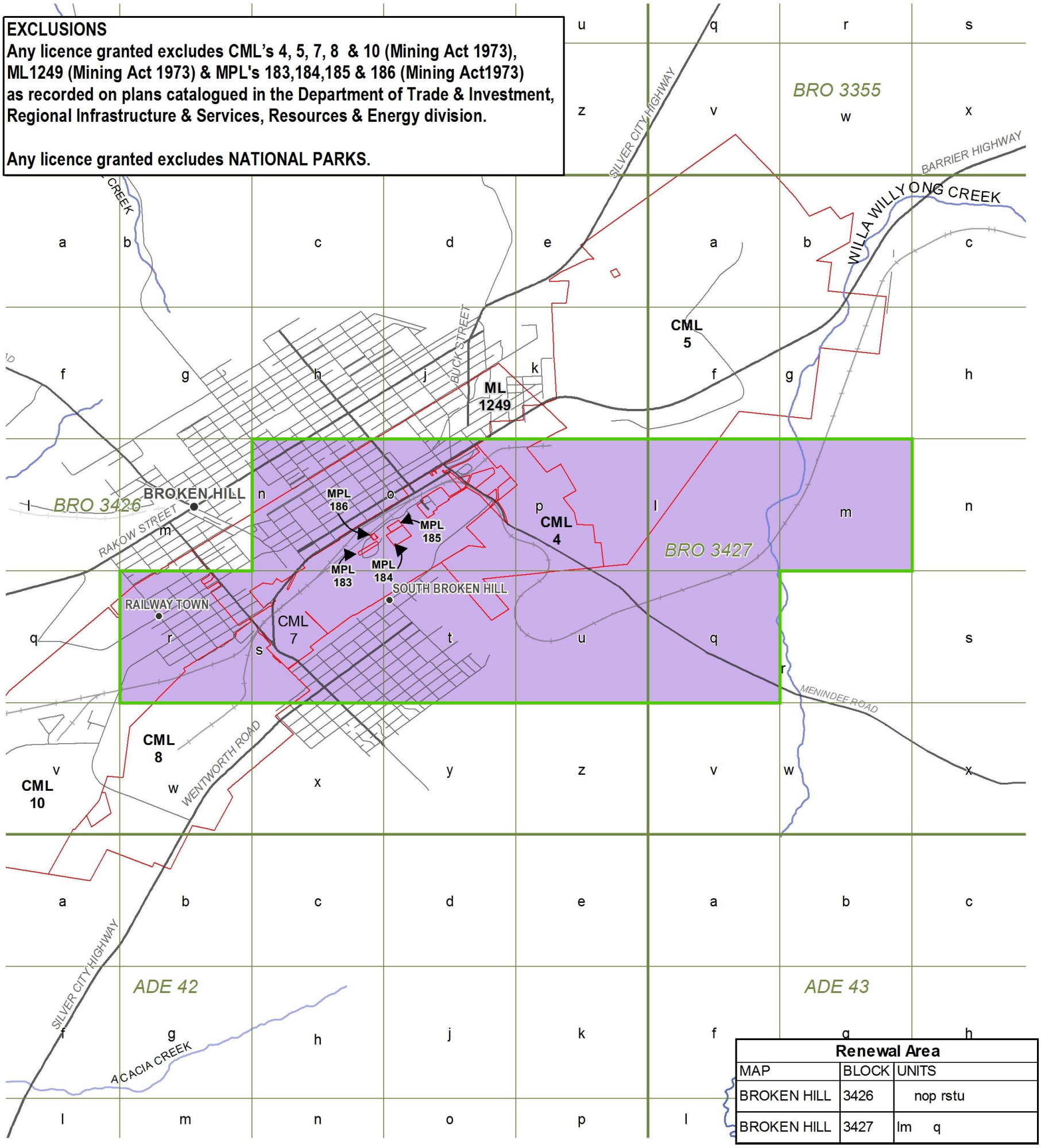
HOLDER'S COPY

DIAGRAM of EL No. 5818

WAS ELA 1706 (Act 1992)
MAIN HOLDER: BROKEN HILL OPERATIONS PTY LTD
GRANT DATE : 08-MAR-2001 MINERAL GROUP(S): 1
MAP SHEET(S): 7134 & 7234
COUNTY(IES): YANCOWINNA

EXCLUSIONS
Any licence granted excludes CML's 4, 5, 7, 8 & 10 (Mining Act 1973), ML1249 (Mining Act 1973) & MPL's 183,184,185 & 186 (Mining Act1973) as recorded on plans catalogued in the Department of Trade & Investment, Regional Infrastructure & Services, Resources & Energy division.

Any licence granted excludes NATIONAL PARKS.



Renewal Area		
MAP	BLOCK	UNITS
BROKEN HILL	3426	nop rstu
BROKEN HILL	3427	lm q

DRAFTING SERVICES
OPERATIONS & PROGRAMS

NSW GOVERNMENT | Department of Industry Resources & Energy

V.2016

N

RENEWAL AREA: 10 UNITS (DEALING No.19)

0 1 2 3 4 5
kilometres

A4 Print
Prepared by: S.Ferguson 27-03-2017
Checked by: F. Schiavo 29-03-2017

GENERAL CONDITIONS

Work Program

1. The licence holder must carry out the operations, and any other activities, described in the Work Program and comply with any commitments in relation to the conduct of operations specified in the Work Program, as for the time being in force, in respect of this licence.

Native Title

2. The licence holder must not prospect on any land or waters within the exploration area on which Native Title has not been extinguished under the *Native Title Act 1993* (Cth) without the prior written consent of the Minister.

Community Consultation

3. The licence holder must carry out community consultation in relation to the planning and conduct of activities under this licence in accordance with the *Exploration Code of Practice: Community Consultation* (NSW Department of Planning and Environment).

Protection of the Environment

4. The licence holder must prevent, or if that is not reasonably practicable, minimise so far as is reasonably practicable, any harm to the environment arising from activities carried out under this licence.

Security

5. The licence holder must provide a security deposit to secure funding for the fulfilment of obligations under this licence (including obligations that may arise in the future) as follows:

(a) Amount: **$10,000**
(b) Licence holder's entitlement to interest: none.

Note: Requests for information about licences covered by a group security deposit can be made via email to securities.titles@industry.nsw.gov.au.

Rehabilitation

6. The licence holder must carry out rehabilitation of all disturbance caused by activities carried out under this licence in accordance with the requirements in Part B of the *Exploration Code of Practice - Rehabilitation* (NSW Department of Planning and Environment) to the satisfaction of the Minister.

Environmental Incident Reporting

7. The licence holder must provide environmental incident notifications and reports to the Secretary no later than 7 days after those notifications and reports are provided to relevant authorities under the *Protection of the Environment Operations Act 1997.*

Annual Activity Reporting

8. Unless otherwise approved by the Secretary, the licence holder must submit annual activity reports prepared in accordance with the *Exploration Guideline: Annual Activity Reporting for Prospecting Titles* (NSW Department of Planning and Environment) at the following times:

(a) Annually, within one calendar month following the grant anniversary date of this licence;
(b) On any other date or dates directed by the Secretary in writing; and
(c) Within one calendar month following the cancellation or expiry of this licence.

Change in Control

9. Subject to condition 10, if the licence holder is a corporation or a trust, the Minister's prior written approval is required before any:

(a) Change in effective control of the licence holder; or
(b) Foreign acquisition of substantial control in the licence holder.

10. The Minister’s approval is not required where a change in effective control of the licence holder, or a foreign acquisition of substantial control of the licence holder, occurs as a result of the acquisition of shares or other securities on a registered stock exchange.

ADDITIONAL CONDITIONS

Drilling Notification

11. At least 28 days before commencing any drilling operation (for assessable prospecting operations), the licence holder must provide a written notice to DPI Water drilling.mineralsandenergy@dpi.nsw.gov.au which sets out:

(a) the licence holder's intention to drill the exploratory holes; and
(b) a description of the nature and location of the proposed exploratory holes.

Drilling Notification Additional

12. If a coal seam is discovered in the exploration area, the licence holder must:

(a) immediately inform the Secretary of the discovery, and
(b) as soon as reasonably practicable after the discovery, furnish written particulars of the discovery to the Secretary.

Activity Approvals Issued Prior To 1 March 2016

13. Any prospecting operations the subject of an activity approval granted pursuant to this exploration licence before 1 March 2016 must, in addition to any requirements of that approval, be carried out in accordance with the following Codes of Practice:

(a) Part B of the Exploration Code of Practice: Environmental Management
(b) Part B of the Exploration Code of Practice: Produced Water Management, Storage and Transfer

and these codes prevail to the extent of any inconsistency with a requirement of such an activity approval.

Assets of Essential Energy - Water

14. Operations must be conducted in a manner that does not interfere with or cause damage to the assets of Essential Energy Water Division situated on or around the licence area.

Within the exploration area, Essential Energy may have a number of high voltage overhead power lines. These power lines may present a safety hazard to mobile drilling plant and operations and appropriate caution should be exercised by the operators of such equipment. In general a minimum of ten metres horizontal clearance should be maintained from any overhead power line. Should any incident occur, Essential Energy must be contacted immediately on telephone 132080.

FURTHER APPROVALS

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WORK PROGRAM

In accordance with Condition 1 of this licence the approved Work Program is the document identified by the identification number:

WP-EL5818-2017-2023

INSTRUMENT OF RENEWAL

LEASE:	Mining Purposes Lease No 183 (Act 1973)
HOLDER:	Broken Hill Operations Pty Ltd
DATE OF LEASE:	4 February 1981
EXPIRY DATE OF LEASE:	31 December 2005
PERIOD OF RENEWAL UNTIL:	31 December 2026
AREA:	1.25 hectares
AS SHOWN BY PLAN NO D3562	
DEPTH RESTRICTION:	10 metres
SURFACE EXCEPTION:	Nil
PURPOSES:	1. Dumping of ore and mine residues. 2. Treatment of tailings.
ROYALTY PAYABLE:	At the rate which, from time to time, may be prescribed.

AMENDMENTS TO THE CONDITIONS OF THE LEASE:

(a) All the Conditions contained in the lease prior to the renewal have been deleted.

(b) The lease is now subject to the attached Mining Lease Conditions 2004 numbered:

1 to 17 (inclusive), and 25 to 28 (inclusive).

Condition Nos. 2 to 8 (inclusive), 14 and 15 are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

We, Broken Hill Operations Pty Ltd (ACN 054 920 893), hereby accept the renewal of ~~this~~ Lease and agree to be bound by the conditions specified.

S.J. LONERGAN
COMPANY SECRETARY

Managing Director

.....

Broken Hill Operations Pty Ltd (ACN 054 920 893)

Renewed this 24th day of April 2007

.....

by delegation from the Minister.

MINING LEASE CONDITIONS 2004

1. Notice to Landholders

Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

Environmental Management Conditions

2. Mining Operations Plan

(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries – Mineral Resources.

(b) The MOP must:

- identify areas that will be disturbed by mining operations;
- detail the staging of specific mining operations;
- identify how the mine will be managed to allow mine closure;
- identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;
- reflect the conditions of approval under:
  - the Environmental Planning and Assessment Act 1979
  - the Protection of the Environment Operations Act 1997
  - and any other approvals relevant to the development including the conditions of this lease; and
- have regard to any relevant guidelines adopted by the Director-General.

(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is a defence to a breach of this condition if:

i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the *Mining Act 1992*, the *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* or the *Occupational Health and Safety Act 2000*; and

ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out.

Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.

(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition (c) does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.

Annual Environmental Management Report (AEMR)

3. Reporting

(a) The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.

(b) The EMR must:

- report against compliance with the MOP;
- report on progress in respect of rehabilitation completion criteria;
- report on the extent of compliance with regulatory requirements; and
- have regard to any relevant guidelines adopted by the Director-General;

Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.

4. Rehabilitation

Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.

5. Exploratory Drilling

(1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

6. Roads and Tracks

(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

7. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Natural Resources.

8. **Use of Mercury or Cyanide**

The lease holder must not use mercury or cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.

9. **Reports**

The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) A statement of the ore and mineral reserves

(e) Particulars of exploration proposed to be conducted in the next twelve months period;

(f) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

10. **Licence to Use Reports**

(a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

11. Confidentiality

(a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

12. Terms of the non-exclusive licence

The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

13. Safety

Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

14. Transmission lines, Communication lines and Pipelines

Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

15. Fences, Gates

(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

16. Resource Recovery

(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

17. Indemnity

The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

25. Single Security

(a) A security in the sum of $250,000.00 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Consolidated Mining Lease No 7 (Act 1973), Mining Purposes Lease Nos 183, 184, 185 and 186 (Act 1973)). If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

SPECIAL CONDITIONS

Catchment Areas and Reserves

26. (a) If the registered holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of Stephen's Creek Catchment Area the registered holder shall refrain from using or cease using as the case may require such process within twenty four hours of the receipt by the registered holder of a notice in writing under the hand of the Minister or the Director General requiring the registered holder so to do.

(b) The registered holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.

(c) The registered holder shall not erect nor permit to be erected any dwellings unless with the consent of the Minister or Country Energy-Water and subject to such conditions as may be stipulated.

(d) The registered holder shall make such provisions for sanitation as may be approved by Country Energy-Water and shall at all times observe and perform any requirements of the said Country Energy-Water respecting sanitation.

27. Operations shall be conducted in such a manner as not to interfere with or cause damage to the assets of Country Energy-Water situated on or around the subject area.

28. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve No 2421 for Temporary Common; Reserve No 69262 from Sale for future Public Requirements, Reserve No 3073 from Sale for Public Recreation and Reserve No 30905 for Quarry.

INSTRUMENT OF RENEWAL

LEASE:	Mining Purposes Lease No 184 (Act 1973)
HOLDER:	Broken Hill Operations Pty Ltd
DATE OF LEASE:	4 February 1981
EXPIRY DATE OF LEASE:	31 December 2005
PERIOD OF RENEWAL UNTIL:	31 December 2026
AREA: AS SHOWN BY PLAN NO D3563	4.43 hectares
DEPTH RESTRICTION:	10 metres
SURFACE EXCEPTION:	Nil
PURPOSES:	1. Dumping of ore and mine residues. 2. Treatment of tailings.
ROYALTY PAYABLE:	At the rate which, from time to time, may be prescribed.

AMENDMENTS TO THE CONDITIONS OF THE LEASE:

(a) All the Conditions contained in the lease prior to the renewal have been deleted.

(b) The lease is now subject to the attached Mining Lease Conditions 2004 numbered:

1 to 17 (inclusive), and 25 to 28 (inclusive).

Condition Nos. 2 to 8 (inclusive), 14 and 15 are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

We, Broken Hill Operations Pty Ltd (ACN 054 920 893), hereby accept the renewal of this Lease and agree to be bound by the conditions specified.

S. J. LONERGAN
COMPANY SECRETARY

Managing Director

.....
Broken Hill Operations Pty Ltd (ACN 054 920 893)

Renewed this 24th day of April 2007

.....
by delegation from the Minister.

MINING LEASE CONDITIONS 2004

1. Notice to Landholders

Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

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(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries – Mineral Resources.

(b) The MOP must:

- identify areas that will be disturbed by mining operations;
- detail the staging of specific mining operations;
- identify how the mine will be managed to allow mine closure;
- identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;
- reflect the conditions of approval under:
  - the Environmental Planning and Assessment Act 1979
  - the Protection of the Environment Operations Act 1997
  - and any other approvals relevant to the development including the conditions of this lease; and
- have regard to any relevant guidelines adopted by the Director-General.

(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is a defence to a breach of this condition if:

i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the *Mining Act 1992*, the *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* or the *Occupational Health and Safety Act 2000*; and

ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out.

Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.

(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition (c) does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.

Annual Environmental Management Report (AEMR)

3. Reporting

(a) The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.

(b) The EMR must:

- report against compliance with the MOP;
- report on progress in respect of rehabilitation completion criteria;
- report on the extent of compliance with regulatory requirements; and
- have regard to any relevant guidelines adopted by the Director-General;

Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.

4. Rehabilitation

Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.

5. Exploratory Drilling

(1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

6. Roads and Tracks

(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

7. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Natural Resources.

8. **Use of Mercury or Cyanide**

The lease holder must not use mercury or cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.

9. **Reports**

The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) A statement of the ore and mineral reserves

(e) Particulars of exploration proposed to be conducted in the next twelve months period;

(f) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

10. **Licence to Use Reports**

(a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

11. Confidentiality

(a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

12. Terms of the non-exclusive licence

The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

13. Safety

Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

14. Transmission lines, Communication lines and Pipelines

Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

15. Fences, Gates

(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

16. Resource Recovery

(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

17. Indemnity

The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

25. Single Security

(a) A security in the sum of $250,000.00 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Consolidated Mining Lease No 7 (Act 1973), Mining Purposes Lease Nos 183, 184, 185 and 186 (Act 1973)). If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

SPECIAL CONDITIONS

Catchment Areas and Reserves

26. (a) If the registered holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of Stephen's Creek Catchment Area the registered holder shall refrain from using or cease using as the case may require such process within twenty four hours of the receipt by the registered holder of a notice in writing under the hand of the Minister or the Director General requiring the registered holder so to do.

(b) The registered holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.

(c) The registered holder shall not erect nor permit to be erected any dwellings unless with the consent of the Minister or Country Energy-Water and subject to such conditions as may be stipulated.

(d) The registered holder shall make such provisions for sanitation as may be approved by Country Energy-Water and shall at all times observe and perform any requirements of the said Country Energy-Water respecting sanitation.

27. Operations shall be conducted in such a manner as not to interfere with or cause damage to the assets of Country Energy-Water situated on or around the subject area.

28. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve No 2421 for Temporary Common; Reserve No 69262 from Sale for future Public Requirements, Reserve No 3073 from Sale for Public Recreation and Reserve No 30905 for Quarry.

TITLE DEALING ENQUIRY

Title :	**MPL : 184 : 1973 (MINERAL)**				
Dealing Number :	9	Dealing Code :	REN	Dealing Status :	D
Date Received :	21-DEC-2004			Determination Status :	APPROVED
File Number :	T03 1108			Determination Date :	24-APR-2007
Comments :					

Renewed Values

Expiry Date : 31-DEC-2026

Effective Date : 24-APR-2007

Holders : BROKEN HILL OPERATIONS PTY LTD

Main Holder : BROKEN HILL OPERATIONS PTY LTD

Minerals : NIL MINERALS

Shape Change : NO

Area : 4.43 HA

Location :

Map Sheets :

Surface Exception : NIL

Depth Restriction : WHOLE 10 METRES

Methods / Purposes : DUMPING OF ORE AND MINE RESIDUES
TREATMENT OF TAILINGS

Security Required : $250,000

Expenditure : $0

Labour : 0

Detailed Comments :

INSTRUMENT OF RENEWAL

LEASE:	Mining Purposes Lease No 185 (Act 1973)
HOLDER:	Broken Hill Operations Pty Ltd
DATE OF LEASE:	4 February 1981
EXPIRY DATE OF LEASE:	31 December 2005
PERIOD OF RENEWAL UNTIL:	31 December 2026
AREA: AS SHOWN BY PLAN NO D2320	1.39 hectares
DEPTH RESTRICTION:	10 metres
SURFACE EXCEPTION:	Nil
PURPOSES:	1. Dumping of ore and mine residues. 2. Treatment of tailings.
ROYALTY PAYABLE:	At the rate which, from time to time, may be prescribed.

AMENDMENTS TO THE CONDITIONS OF THE LEASE:

(a) All the Conditions contained in the lease prior to the renewal have been deleted.

(b) The lease is now subject to the attached Mining Lease Conditions 2004 numbered:

1 to 17 (inclusive), and 25 to 28 (inclusive).

Condition Nos. 2 to 8 (inclusive), 14 and 15 are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

We, Broken Hill Operations Pty Ltd (ACN 054 920 893), hereby accept the renewal of this Lease and agree to be bound by the conditions specified.

S.J. Lonergan
Company Secretary

R.E. Besley
Managing Director

.....
Broken Hill Operations Pty Ltd (ACN 054 920 893)

Renewed this 24th day of April 2007

.....
by delegation from the Minister.

MINING LEASE CONDITIONS 2004

1. Notice to Landholders

Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

Environmental Management Conditions

2. Mining Operations Plan

(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries – Mineral Resources.

(b) The MOP must:

- identify areas that will be disturbed by mining operations;
- detail the staging of specific mining operations;
- identify how the mine will be managed to allow mine closure;
- identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;
- reflect the conditions of approval under:
  - the Environmental Planning and Assessment Act 1979
  - the Protection of the Environment Operations Act 1997
  - and any other approvals relevant to the development including the conditions of this lease; and
- have regard to any relevant guidelines adopted by the Director-General.

(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is a defence to a breach of this condition if:

i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the *Mining Act 1992*, the *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* or the *Occupational Health and Safety Act 2000*; and

ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out.

Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.

(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition (c) does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.

Annual Environmental Management Report (AEMR)

3. Reporting

(a) The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.

(b) The EMR must:

- report against compliance with the MOP;
- report on progress in respect of rehabilitation completion criteria;
- report on the extent of compliance with regulatory requirements; and
- have regard to any relevant guidelines adopted by the Director-General;

Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.

4. Rehabilitation

Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.

5. Exploratory Drilling

(1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

6. Roads and Tracks

(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

7. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Natural Resources.

8. Use of Mercury or Cyanide

The lease holder must not use mercury or cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.

9. Reports

The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) A statement of the ore and mineral reserves

(e) Particulars of exploration proposed to be conducted in the next twelve months period;

(f) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

10. Licence to Use Reports

(a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

11. Confidentiality

(a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

12. Terms of the non-exclusive licence

The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

13. Safety

Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

14. Transmission lines, Communication lines and Pipelines

Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

15. Fences, Gates

(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

16. Resource Recovery

(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

17. Indemnity

The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

25. Single Security

(a) A security in the sum of $250,000.00 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Consolidated Mining Lease No 7 (Act 1973), Mining Purposes Lease Nos 183, 184, 185 and 186 (Act 1973)). If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

SPECIAL CONDITIONS

Catchment Areas and Reserves

26. (a) If the registered holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of Stephen's Creek Catchment Area the registered holder shall refrain from using or cease using as the case may require such process within twenty four hours of the receipt by the registered holder of a notice in writing under the hand of the Minister or the Director General requiring the registered holder so to do.

(b) The registered holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.

(c) The registered holder shall not erect nor permit to be erected any dwellings unless with the consent of the Minister or Country Energy-Water and subject to such conditions as may be stipulated.

(d) The registered holder shall make such provisions for sanitation as may be approved by Country Energy-Water and shall at all times observe and perform any requirements of the said Country Energy-Water respecting sanitation.

27. Operations shall be conducted in such a manner as not to interfere with or cause damage to the assets of Country Energy-Water situated on or around the subject area.

28. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve No 2421 for Temporary Common; Reserve No 69262 from Sale for future Public Requirements, Reserve No 3073 from Sale for Public Recreation and Reserve No 30905 for Quarry.

INSTRUMENT OF RENEWAL

LEASE:	Mining Purposes Lease No 186 (Act 1973)
HOLDER:	Broken Hill Operations Pty Ltd
DATE OF LEASE:	4 February 1981
EXPIRY DATE OF LEASE:	31 December 2005
PERIOD OF RENEWAL UNTIL:	31 December 2026
AREA: AS SHOWN BY PLAN NO D2321	4852 square metres
DEPTH RESTRICTION:	10 metres
SURFACE EXCEPTION:	Nil
PURPOSES:	1. Dumping of ore and mine residues. 2. Treatment of tailings.
ROYALTY PAYABLE:	At the rate which, from time to time, may be prescribed.

AMENDMENTS TO THE CONDITIONS OF THE LEASE:

(a) All the Conditions contained in the lease prior to the renewal have been deleted.

(b) The lease is now subject to the attached Mining Lease Conditions 2004 numbered:

1 to 17 (inclusive), and 25 to 28 (inclusive).

Condition Nos. 2 to 8 (inclusive), 14 and 15 are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

We, Broken Hill Operations Pty Ltd (ACN 054 920 893), hereby accept the renewal of this Lease and agree to be bound by the conditions specified.

P.S. LOVERGOM
Company Secretary

R.E. BESLEY
Managing Director

.....
Broken Hill Operations Pty Ltd (ACN 054 920 893)

Renewed this 24th day of April 2007

.....
by delegation from the Minister.

MINING LEASE CONDITIONS 2004

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- identify areas that will be disturbed by mining operations;
- detail the staging of specific mining operations;
- identify how the mine will be managed to allow mine closure;
- identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;
- reflect the conditions of approval under:
  - the Environmental Planning and Assessment Act 1979
  - the Protection of the Environment Operations Act 1997
  - and any other approvals relevant to the development including the conditions of this lease; and
- have regard to any relevant guidelines adopted by the Director-General.

(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is a defence to a breach of this condition if:

i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the *Mining Act 1992*, the *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* or the *Occupational Health and Safety Act 2000*; and

ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out.

Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.

(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition (c) does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.

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Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.

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Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.

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(1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

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(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

7. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Natural Resources.

8. **Use of Mercury or Cyanide**

The lease holder must not use mercury or cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.

9. **Reports**

The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) A statement of the ore and mineral reserves

(e) Particulars of exploration proposed to be conducted in the next twelve months period;

(f) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

10. **Licence to Use Reports**

(a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

11. Confidentiality

(a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

12. Terms of the non-exclusive licence

The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

13. Safety

Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

14. Transmission lines, Communication lines and Pipelines

Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

15. Fences, Gates

(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

16. Resource Recovery

(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

17. Indemnity

The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

25. Single Security

(a) A security in the sum of $250,000.00 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Consolidated Mining Lease No 7 (Act 1973), Mining Purposes Lease Nos 183, 184, 185 and 186 (Act 1973)). If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

SPECIAL CONDITIONS

Catchment Areas and Reserves

26. (a) If the registered holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of Stephen's Creek Catchment Area the registered holder shall refrain from using or cease using as the case may require such process within twenty four hours of the receipt by the registered holder of a notice in writing under the hand of the Minister or the Director General requiring the registered holder so to do.

(b) The registered holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.

(c) The registered holder shall not erect nor permit to be erected any dwellings unless with the consent of the Minister or Country Energy-Water and subject to such conditions as may be stipulated.

(d) The registered holder shall make such provisions for sanitation as may be approved by Country Energy-Water and shall at all times observe and perform any requirements of the said Country Energy-Water respecting sanitation.

27. Operations shall be conducted in such a manner as not to interfere with or cause damage to the assets of Country Energy-Water situated on or around the subject area.

28. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve No 2421 for Temporary Common; Reserve No 69262 from Sale for future Public Requirements, Reserve No 3073 from Sale for Public Recreation and Reserve No 30905 for Quarry.

A.2 Project approval

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, as delegate for the Minister for Planning, approve the project application referred to in Schedule 1, subject to the conditions in Schedules 2 to 4.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Sam Haddad
Director-General

Sydney

SCHEDULE 1

Application Numbers:	07_0018
Proponent:	Broken Hill Operations Pty Ltd
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Rasp Project

The Department has prepared a consolidated version of the approval which is intended to include all modifications to the original determination instrument.

The consolidated version of the consent has been prepared by the Department with all due care. This consolidated version is intended to aid the consent holder by combining all consents relating to the original determination instrument but it does not relieve a consent holder of its obligation to be aware of and fully comply with all consent obligations as they are set out in the legal instruments, including the original determination instrument and all subsequent modification instruments.

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Red type represents the March 2012 Modification (Mod 1 - Ventilation Shaft)
Blue type represents the August 2014 Modification (Mod 2 – 24 Hour Primary Crusher)
Green type represents the March 2015 Modification (Mod 3 – Block 7 Extension)
Purple type represents the September 2017 Modification (Mod 4 – Tailings Storage Facility)
Dark blue type represents the October 2018 Modification (Mod 5 – Cement Silo and Warehouse Extension)
Orange type represents the July 2019 Modification (Mod 7 – Additional Crushing and Screening)
Brown type represents the April 2021 Modification (Mod 8 – Underground Mining Extension)
Pink type represents the December 2021 Modification (Mod 9 – Extension of Underground Exploration)
Mustard type represents the March 2022 Modification (Mod 6 – Tailings Management and Underground Access)

DEFINITIONS

Annual review	The review required by Condition 3 of Schedule 4
BCA	Building Code of Australia
Boxcut	The boxcut identified in the Figure in Appendix 2
Broken Hill Lead Reference Group	A group of government agency and industry stakeholders aiming to minimise the impact of lead exposure in Broken Hill while maintaining a viable mining industry, chaired and co-ordinated by Council
Conditions of this approval	Conditions contained in Schedules 2 to 4 inclusive
Council	Broken Hill City Council
Department	Department of Planning and Environment (DPE)
DPE Water	Water Group within the Department
EA	*Rasp Mine Zinc-Lead-Silver Project: Environmental Assessment Report*, prepared by Broken Hill Operations Pty Ltd and dated July 2010, as amended by: • *Rasp Mine Zinc-Lead-Silver Project: Response to Submissions Report*, prepared by Broken Hill Operations Pty Ltd and dated July 2010; • *Rasp Mine Zinc-Lead-Silver Project: Preferred Project Report (PPR)*, prepared by Broken Hill Operations Pty Ltd and dated September 2010; • Modification application 07_0018 Mod 1 and accompanying Environmental Assessment titled: *Rasp Mine, Zinc-Lead-Silver Project, Variation to Project, Relocation of Ventilation Shaft*, dated November 2011; • Modification application 07_0018 Mod 2 and accompanying Environmental Assessment titled: *Rasp Mine Zinc-Lead-Silver Project Modification 2* and Response to Submissions letter from the Proponent dated May 2014; • Modification application 07_0018 Mod 3 and accompanying Environmental Assessment titled: *Rasp Mine Zinc-Lead-Silver Project Environmental Assessment Modification 3 Mining Extension* and Response to Submissions dated January 2015; • Modification application 07_0018 Mod 4 and accompanying Environmental Assessment titled: *Rasp Mine Environmental Assessment Modification 4, Concrete Batching Plant Blackwood Pit TSF2 Extension* dated April 2017 and Response to Submissions dated June 2017; • Modification application 07_0018 Mod 5 and accompanying Statement of Environmental Effects titled: *Rasp Mine Statement of Environmental Effects Modification 4, Warehouse Extension, Cement Silo & Adjustment of Air Quality Monitoring* dated August 2018; • Modification application 07_0018 Mod 7 and accompanying Statement of Environmental Effects titled: *Rasp Mine Statement of Environmental Effects Modification 7, Utilising Rock Fill Material in BHP Pit for TSF2 Embankment Construction* dated June 2019; • Modification application 07_0018 Mod 8 and accompanying Modification Report titled: Rasp Mine PA07_008 Modification Report (MOD8) – Mining Under a Perilya Sublease dated March 2021; • Modification application 07_0018 Mod 9 and accompanying Modification Report titled: *Rasp Mine Modification 9 Modification Report* dated 4 August 2021, and additional information provided by the Proponent to support the modification application; and • Modification application 07_0018 Mod 6 and accompanying Modification Report titled: *Rasp Mine Modification Report (MOD6) Kintore Pit TSF3* dated August 2021, associated Submissions Report titled: *Rasp Mine Submissions Report (MOD6) Kintore Pit TSF3* dated December 2021 and additional information provided by the Proponent to support the modification application and included in Appendix A of the Department's assessment report on Modification 6.
EEL	Emergency Egress Ladder
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
EPL	Environment Protection Licence issued under the POEO Act
Feasible	Feasible relates to engineering considerations and what is practical to build or implement
Free Areas	Non-active mining areas within CML7 that are not disturbed by the project but contribute to the wind-blown dust from the project site, as identified in Appendix 4
Heritage NSW	Heritage NSW, as delegate of the NSW Heritage Council
Incident	A set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in this approval

Material harm	Is harm that: • involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or • results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
MEG	Mining, Exploration and Geoscience within the Department of Regional NSW
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the project
Minister	Minister for Planning, or delegate
Mitigation	Activities associated with reducing the impacts of the project, prior to or during those impacts occurring
Non-compliance	An occurrence, set of circumstances or development that is a breach of this approval but is not an incident
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or a mining company (or its subsidiary)
Project	The development to which this approval applies
Proponent	Broken Hill Operations Pty Ltd, or any person who carries out the project under this approval
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The treatment or management of land disturbed by the project for the purpose of establishing a safe, stable and non-polluting environment, and includes remediation
RR	Resources Regulator within the Department of Regional NSW
Secretary	Planning Secretary under the EP&A Act, or nominee
Site	The land listed in Appendix 1
TfNSW	Transport for NSW
TSF2	Tailings storage facility 2, identified as Blackwood Pit in the Figure in Appendix 2
TSF3	Tailings storage facility 3, identified as Kintore Pit in the Figure in Appendix 2

SCHEDULE 2

ADMINISTRATIVE CONDITONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation or rehabilitation of the project.

TERMS OF APPROVAL

2. The Proponent must carry out the project:
   (a) generally in accordance with the EA;
   (b) in accordance with the conditions of this approval; and
   (c) in accordance with any written directions of the Secretary.

   Note: The general layout of the project is shown in Appendix 2.

3. If there is any inconsistency between the documents listed in condition 2 above, the most recent document in the relevant condition shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. Consistent with the requirements of this approval, the Secretary may make written directions to the Proponent in relation to:
   (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this approval, including those that are required to be, and have been, approved by the Secretary; and
   (b) the implementation of any actions or measures contained in any such document referred to in condition 4(a).

LIMITS ON APPROVAL

Mining Operations

5. The Proponent may carry out mining operations on site until 31 December 2026.

   Note to Condition 5: Under this approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Secretary. Consequently, this approval will continue to apply in all respects - other than the right to conduct mining operations - until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Production

6. The Proponent shall not extract more than 500,000 tonnes of ore per annum on-site, or more than 8,450,000 tonnes of ore over the life of the project.

6A. The annual extraction limit set in Schedule 2 condition 6 can be increased up to no more than 750,000 tonnes of ore per annum subject to further air quality impact assessment undertaken to the satisfaction of the EPA and a revised limit approved in writing by the Secretary.

Transport

7. Until ore processing facilities have been constructed and commissioned on the site, the Proponent is permitted to transport crushed ore by road to the Endeavour Mine, or such other location approved by the Secretary, for processing. Following commissioning of the ore processing facilities, the Proponent shall only transport zinc and lead concentrates from the site by rail, except in an emergency situation and with the prior written approval of the Secretary.

STRUCTURAL ADEQUACY

8. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

   Notes to Condition 8:
   - *Under Part 6 of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works; and*
   - *Parts 1-9 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 sets out the requirements for the certification of the project.*

DEMOLITION

9. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.

OPERATION OF PLANT AND EQUIPMENT

10. The Proponent shall ensure that all the plant and equipment used on site, or to transport materials to and from the site, is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF ANY STRATEGY, PLAN AND PROGRAM

11. With the approval of the Secretary, the Proponent may submit any strategy, plan or program required by this approval on a progressive basis.

SURRENDER OF DEVELOPMENT CONSENTS

12. Within six months of the commencement of works the subject of this approval, the Proponent shall surrender all existing development consents applying to the site in accordance with section 4.63 of the EP&A Act.

SCHEDULE 3

ENVIRONMENTAL PERFORMANCE CONDITIONS

AIR QUALITY AND GREENHOUSE GAS

Odour

1. The Proponent shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

Greenhouse Gas Emissions

2. The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Secretary.

Air Quality Criteria

3. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not cause an exceedance of the criteria listed in Tables 1, 2 or 3 at any residence on privately-owned land.

Table 1: Long Term Criteria for Particulate Matter

Pollutant	Averaging Period	[d] Criterion
Total solid particles (TSP)	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 25 µg/m^3
Particulate matter < 2.5 µm ($PM_{2.5}$)	Annual	[a] 8 µg/m^3

Table 2: Short Term Criterion for Particulate Matter

Pollutant	Averaging Period	[d] Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3
Particulate matter < 2.5 µm ($PM_{2.5}$)	24 hour	[a] 25 µg/m^3

Table 3: Long Term Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Project Contribution	Maximum Total Deposited Dust Level
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 1–3:

- [a] *Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources);*
- [b] *Incremental impact (i.e. incremental increase in concentrations due to the project on its own);*
- [c] *Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method;*
- [d] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.*

4. The Proponent shall ensure that the project is operated in a manner that does not exceed the criteria listed in Tables 4 and 5.

Table 4: Discharge Criteria for Point 1 – Ventilation Shaft

Pollutant	Units of Measure	Concentration Limit
Oxides of nitrogen (as NO_2)	Milligrams per cubic metre	350

Total solid particles (TSP)	Milligrams per cubic metre	20
[a] Type 1 and Type 2 substances	Milligrams per cubic metre	1
Volatile organic compounds (as n-propane)	Milligrams per cubic metre	40

Table 5: Discharge Criteria for Point 2 – Process Enclosure/ Baghouse Stack

Pollutant	Units of Measure	Concentration Limit
Total solid particles (TSP)	Milligrams per cubic metre	20
[a] Type 1 and Type 2 substances	Milligrams per cubic metre	1

Notes to Tables 4–5:

- *[a] Total of Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, Sn and V; and*
- *reference conditions for the limits in Tables 4 and 5 are: dry, 273K and 101.3 kPa.*

Operating Conditions

5. The Proponent shall:
   (a) implement best practice dust management, including all reasonable and feasible measures to minimise dust emissions, including point source and fugitive emissions;
   (b) minimise any visible off-site dust generated by the project or the site; and
   (c) regularly assess real-time air quality monitoring and meteorological forecasting data and relocate, modify and/ or suspend operations to ensure compliance with the relevant conditions of this approval,
   to the satisfaction of the Secretary.

6. The Proponent shall seal and maintain the roads listed in Table 6 to the satisfaction of the Secretary. The roads shall be sealed prior to the commencement of ore extraction or their use, unless otherwise agreed by the Secretary.

Table 6: Roads to be Sealed and Maintained

Road Status	Road	Approximate Length (m)
Existing	Front gate to truck wash	292
	'Diamond' intersection to core shed	360
	Front gate road to car park	132
New	Truck wash to haul road connection from Kintore Pit	690
	Kintore Pit intersection (truck wash and haul roads) to ROM pad (haul road for ore mine trucks)	1,186
	Altered ROM pad to and through mill	384
	Mill to rail load out (concentrate trucks)	910
	Truck wash road to workshop	190
	Haul road to backfill plant	400
Modification 6	Haul road for transportation of harvested tailings from TSF2 to TSF3	2,283
	Ore haul road from the new portal (Modification 6) to the Run of Mine Pad	325

7. Ore crushing shall only be undertaken in a fully-enclosed structure that is designed, operated and maintained to ensure internal negative internal air pressure relative to ambient (external) conditions. The enclosure and associated emissions controls must be designed, constructed, operated and maintained to ensure that visible fugitive emissions from the enclosure are minimised.

8. A chemical dust suppressant shall be applied as per the manufacturer's specification, or more often as required, to all 'free areas' identified in the figure in Appendix 4.

9. All aboveground conveyors and transfer points prior to the grinding circuit (SAG and ball mills) shall be enclosed.

10. Video recording equipment shall be installed to assist in the active management of emissions from the tailings storage facility.

Air Quality Management Plan

11. The Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared by a suitably qualified and experienced person/s, in consultation with EPA and submitted to the Secretary for approval prior to the commencement of construction on the site;
    (b) identify all major sources of particulates and other air pollutants that may be emitted from the project, being both point source and diffuse emissions, including identification of the potential for lead contamination to be carried by these particulates;
    (c) include an air quality monitoring program that:
        - provides a real-time monitoring system of dust emissions around the perimeter of TSF2 that triggers an automated water spray system prior to adverse meteorological conditions occurring;
        - is capable of measuring lead concentrations located in the prevailing down wind direction near the perimeter of TSF2;
        - provides for periodic point source monitoring at Point 1 (Ventilation Shaft) and Point 2 (Process Enclosure/ Baghouse Stack);
        - provides for continuous ambient monitoring across an ambient air quality and dust monitoring network comprising no fewer than ten monitoring locations (Points 3 to 12) for total suspended particulates, PM_{10}, lead and dust deposition. Monitoring locations shall be informed by the outcomes of the air quality assessments presented in the EA and PPR and identified in consultation with EPA;
        - provides for continuous meteorological monitoring using a meteorological monitoring station located on the site;
        - is consistent with the requirements of *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (NSW EPA, 2022), or the latest version, the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment (Clean Air) Regulation 2010*; and
        - details trigger response management protocols in combination with continuous particulate matter monitors and a meteorological monitoring station on-site, with clear and specific reactive mitigation measures to be implemented in accordance with the trigger response management protocol; and;
    (d) pro-active and reactive management and response mechanisms for particulates with specific reference to measures to be implemented and actions to be taken to minimise and prevent potential elevated air quality impacts (including ambient air and deposited dust impacts) on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project at any time;
    (e) procedures to review and refine the reactive management triggers for wind speed and dust concentrations;
    (f) procedures and processes for monitoring ambient dust and deposited dust impacts;
    (g) provision for regular review of dust monitoring data, with comparison of monitoring data with that assumed and predicted in the documents referred to under Condition 2 of Schedule 2;
    (h) details of measures to be implemented to address any situation in which monitored dust impacts exceed those assumed and predicted in the documents referred to under Condition 2 of Schedule 2;
    (i) specific complaints management procedures in the event that dust monitoring indicates elevated off-site impacts;
    (j) procedures for the minimisation of dust generation on the site and measures to be implemented to ensure compliance with the air quality criteria and operating conditions in this approval;
    (k) protocols for regular maintenance of plant and equipment to minimise the potential for elevated dust generation, leaks and fugitive emissions; and
    (l) a contingency plan should an incident, upset or other initiating factor lead to elevated dust impacts, whether above normal operating conditions or above environmental performance goals/ limits.

11A. The Proponent must implement the Air Quality Management Plan as approved by the Secretary.

LEAD AWARENESS AND PUBLIC HEALTH

Contribution to Public Blood lead Monitoring & Public Education

12. During the implementation of the project, the Proponent shall make a reasonable contribution towards the cost of:
    (a) public health monitoring, particularly in relation to child blood lead levels; and
    (b) public education campaigns about the health risks associated with lead,

to the satisfaction of the Secretary.

Note: The Secretary will consult with NSW Health (Western NSW Local Health District) on the reasonableness of the proposed contribution prior to making any decisions under this condition, and determine the date upon which the contributions shall commence.

Lead Management Plan

13. The Proponent shall prepare and implement a Lead Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the Broken Hill Lead Reference Group, including the EPA, NSW Health (Western NSW Local Health District) and Council;
    (b) be submitted to the Secretary for approval by 30 June 2011;
    (c) outline the proposed commitment towards the cost of:
        - public health monitoring, particularly in relation to child blood lead levels, and tracking of this data over time; and
        - public education campaigns about the health risks associated with lead, including lead hygiene, lead and children, tank water lead risks and soil lead contamination risks.
    (d) identify additional reasonable and feasible measures that could be implemented either on site or in the areas adjoining the site to minimise the potential lead impacts of the project and "free areas";
    (e) include a program for the staged implementation of the measures identified in (d) above in the event that dust emissions are higher than predicted or the public health monitoring suggests further action is required to reduce blood lead levels in the environment surrounding the site; and
    (f) include a detailed communication strategy, that outlines how the relevant dust and blood level monitoring data would be reported on the Proponent's website along with any relevant public education material.

Updated Human Health Risk Assessment

14. Within one year of the commencement of operation of the project, and every five years thereafter, unless otherwise agreed by the Secretary, the Proponent shall update the human health risk assessment prepared for the project and presented in the EA to the satisfaction of the Secretary. The updated risk assessment shall:
    (a) be prepared by a suitably-qualified expert whose appointment has been endorsed by the Secretary;
    (b) take into account monitoring data collected under this approval, and such other information as may be relevant to the assessment; and
    (c) be prepared in consultation with the EPA and the NSW Health (Western NSW Local Health District).

14A. The updated Health Risk Assessment must inform the revision of the Air Quality Management Plan and the Lead Management Plan required under this approval, if monitoring data shows that the project is contributing to increased blood lead levels.

NOISE AND VIBRATION

Hours of Operation

15. Unless the Secretary agrees otherwise, the Proponent must comply with the operating hours in Table 6.1.

Table 6.1: Operating Hours

Activity	Hours
Mod 6 construction activities excluding new decline underground activities, and TSF3 tailings preparation works	7 am to 6 pm, Monday to Saturday No activities on Sundays or public holidays
Construction, excluding construction of the EEL and Mod 6 construction activities	7 am to 6 pm, Monday to Friday 8 am to 1 pm, Saturday No activities on Sundays or public holidays
Capping and rehabilitation of TSF2	
Shunting of concentrate wagons	7 am and 6 pm on any day
Production rock blasting	6:45 am and 7:15 pm on any day
Transporting cement to the cement silo	7 am to 7 pm on any day
Loading the cement silo	
All other activities, including construction of the EEL, construction of the new decline (underground activities) and TSF3 tailings preparation works	24 hours a day, 7 days a week

16. Deleted.

Noise Limits

17. The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 7 except as otherwise permitted under conditions 17B and 17D below.

Table 7: Operational Noise Criteria

Location	[a] Day (dB(A))	[b] Evening (dB(A))	[c] Night (dB(A))
A1 – Piper Street North	40	37	35
A2 – Piper Street Central	40	37	35
A3 – Eyre Street North	44	41	39
A4 – Eyre Street Central	44	41	39
A5 – Eyre Street South	44	41	39
A6 – Bonanza and Gypsum Streets	48	41	39
A7 – Carbon Street	45	42	36
A8 – South Road	48	39	39
A9 – Crystal Street	46	39	39
A10 – Barnet and Blende Streets	42	41	35
A11 – Crystal Street	46	39	39
A12 – Crystal Street	46	39	39
A13 – Eyre Street North 2	40	35	35
A14 – Piper Street North	40	35	35

Notes to Condition 17:

- *Receiver locations are as identified in the noise assessments presented in the EA and PPR;*
- *Noise limits are to be measured in accordance with the Noise Policy for Industry (NSW EPA, 2017)*, or its latest version;
- *[a] Day is defined as 7 am to 6 pm Mondays to Saturdays and 8 am to 6 pm on Sundays and public holidays;*
- *[b] Evening is defined as 6 pm to 10 pm on any day; and*
- *[c] Night is defined as 10 pm to 7 am Mondays to Saturdays and 10 pm to 8 am on Sundays and public holidays.*

17A. The daytime criteria in Table 7 of this approval do not apply when the following activities are being carried out:

(a) construction of the concrete batching plant and associated noise bund;
(b) construction of TSF2, including:
  - embankment 2;
  - the spillway;
  - embankment 3;
  - embankment 1;
(c) capping and rehabilitation of TSF2;
(d) construction of the cement silo and warehouse extension; and
(e) crushing and screening activities associated with construction of TSF2 embankments.

17B. With regard to the activities specified in condition 17A(a)-(e) of this approval, the Proponent must:

(a) notify the Department prior to commencement and upon completion of each activity;
(b) minimise the noise generated by these activities in accordance with the best practice requirements outlined in the *Interim Construction Noise Guideline* (DECC, 2009), or its latest version; and
(c) ensure that the noise generated by the project does not cause exceedances of the amenity criteria of 65 dB $L_{Aeq,(day)}$ specified for an urban/industrial interface area under the *NSW Industrial Noise Policy*.

17C. The Proponent must not carry out any of the activities specified in condition 17A(a)-(c) concurrently.

17D. The noise criteria in Table 7 of this approval apply for construction of Stages 1 and 2 of the boxcut, excluding daytime criteria for receivers described in Table 7a. The proponent must ensure that the noise generated by the project does not exceed the criteria in Table 7a during standard construction hours – defined as Monday to Friday 7 am to 6 pm and Saturday 8 am to 1 pm and no time on Sundays and public holidays.

Table 7a: Additional Construction Noise Criteria for the Boxcut Construction

Location	Day (dB(A))
A1 – Piper Street North	43
A2 – Piper Street Central	45
A3 – Eyre Street North	47

Location	Day (dB(A))
A13 – Eyre Street North 2	48
A14 – Piper Street North	47

Notes to Condition 17D:

- *Receiver locations are as identified in the noise assessments presented in the Appendix 3; and*
- *Noise limits are to be measured in accordance with the Noise Policy for Industry (NSW EPA, 2017)*, or its latest version.

Blasting Limits

18. The Proponent shall ensure that basting on the site does not cause exceedances of the criteria in Tables 8 and 9.

Table 8: Blasting Criteria (excluding Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	[a] Allowable Exceedance
Residence on privately owned land	115	5	[b] 5% of the total number of blasts over a 12-month period
	120	10	0%
Public Infrastructure	-	100	0%

Table 9: Blasting Criteria (Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	[a] Allowable Exceedance
Residence on privately owned land	115	[c] 3 (interim)	5% of the total number of blasts over a 12-month period
	120	10	0%
Broken Hill Bowling Club, Italio (Bocce) Club, Heritage Items within CML7	-	50	0%
Perilya Southern Operations	-	100	0%
[d] Public Infrastructure	-	100	0%

These criteria do not apply if the Proponent has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

Notes to Tables 8 and 9:

- *[a] The allowable exceedance must be calculated separately for development blasts and production blasts;*
- *[b] The 5% allowable exceedance does not apply to production blasts until the Proponent has successfully completed a Pollution Reduction Program aimed at achieving this goal, as required by the EPA under the Proponent's EPL (No. 12559), or as otherwise agreed with the EPA;*
- *[c] The interim criteria applies unless and until such time that the Proponent has written consent from the Secretary to apply site specific criteria in accordance with condition 19 of this approval; and*
- *[d] The Proponent must close South Road to pedestrians if blasts are expected to exceed a peak particle velocity ground vibration of 65 mm/s at the road reserve surface, while the blast firing occurs.*

19. The Proponent may establish site specific ground vibration criteria for residential receivers that may be affected by blasting operations in Block 7, to the satisfaction of the Secretary. These criteria must:
    (a) be prepared by a suitably qualified mining engineer;
    (b) be prepared in consultation with the EPA;
    (c) protect the amenity of all residences on privately owned land; and
    (d) be based on blast monitoring data for the Block 7 mining area.

Blast Frequency

19A. The Proponent may carry out a maximum of:
    (a) 1 production blast a day and 6 production blasts a week, averaged over a calendar year; and
    (b) 6 development blasts a day and 42 development blasts a week, averaged over a calendar year.

Operating Conditions

19B. The Proponent must:
(a) implement best management practice to:
- protect the safety of people in the surrounding area; and
- protect public or private infrastructure/property in the surrounding area from any damage;

(b) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site;
(c) use reasonable endeavours to co-ordinate blasting at the site:
- to minimise cumulative blasting impacts associated with the operation of nearby mines; and
- to avoid disturbing users of nearby recreational facilities, including the Broken Hill Bowling Club and the Italio (Bocce) Club;

(d) minimise the noise impacts of the project during adverse meteorological conditions (stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level);
(e) carry out regular monitoring to determine whether the project is complying with the relevant conditions of this approval; and
(f) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this approval;

to the satisfaction of the Secretary.

Noise and Blast Management Plan

20. The Proponent shall prepare and implement a Noise and Blast Management Plan for the project to the satisfaction of the Secretary. This plan must:
(a) be prepared in consultation with EPA, and submitted to the Secretary for approval by the end of June 2011;
(b) describe the noise mitigation measures that would be implemented to:
- ensure compliance with the relevant conditions of this approval, including a real-time noise management system that employs both reactive and proactive mitigation measures;
- address activities associated with the construction of the concrete batching plant and TSF2, and the capping and rehabilitation of TSF2; and
- address activities associated with the construction of the boxcut, TSF3 and tailings harvesting routes as described in Modification 6;

(c) include a noise monitoring program that:
- uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the project; and
- includes a protocol for determining exceedances of the relevant conditions of this approval;

(d) describe the blast management measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this approval;
(e) include a blast monitoring program that:
- evaluates the performance of the project, including compliance with the applicable criteria;
- uses a combination of roving blast monitors (at least 1) and fixed blast monitors (at least 6); and
- includes a protocol for determining and responding to exceedances of the relevant conditions of this approval; and

(f) detail notification requirements to relevant government agencies.

UNDERGROUND MINING

Performance Measures

20A. The Proponent shall ensure that there are no measurable subsidence impacts caused by underground mining beneath South Road and other public infrastructure.

SOIL AND WATER

21. Except as may be expressly provided by an Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*, the Proponent shall comply with section 120 of that Act, which prohibits the pollution of waters.

Water Supply

22. The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations to match its water supply.

Note: The Proponent is required to obtain the necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000.

Water Management Plan

23. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Secretary. This plan must be consistent with the Stormwater Management Plan presented as Annexure K to the EA, incorporate any changes to reflect the final detailed design of the project, and be prepared in consultation with EPA, DPE Water and RR. The plan must: be submitted to the Secretary for approval by the end of June 2011, and must include:
    (a) a Site Water Balance, which must:
        - include details of:
            - sources and security of water supply;
            - methods to monitor, measure and manage reporting on water take (exempt and licensable);
            - water use on site;
            - water management on site;
            - any off-site water transfers; and
        - investigate and implement all reasonable and feasible measures to minimise water use by the project;
    (b) an Erosion and Sediment Control Plan, which must:
        - identify activities that could cause soil erosion, generate sediment or affect flooding;
        - describe measures to minimise soil erosion and the potential for transport of sediment to downstream waters, and manage flood risk;
        - describe the location, function and capacity of erosion and sediment control structures and flood management structures; and
        - describe what measures would be implemented to maintain the structures over time;
    (c) a Surface Water Management Plan, which must include:
        - detailed baseline data on surface water flows and quality in creeks and other waterbodies that could potentially be affected by the project;
        - surface water and stream health impact assessment criteria including trigger levels for investigating any potentially adverse surface water impacts;
        - a program to monitor and assess:
            - surface water flows and quality;
            - impacts on water users;
            - stream health;
            - channel stability; and
        - detail relocated and additional water management infrastructure required by Modification 6 including the boxcut, water storage S37, the TSF3 and "free areas".
    (d) a Groundwater Monitoring Program, which must:
        - provide a program to monitor seepage movement within and adjacent to all tailings storage facilities (the TSF1, TSF2 and TSF3);
        - include details of parameters and pollutants to be monitored for:
            - water from mine dewatering;
            - groundwater locations to the east of TSF1;
            - surface water represented by Horwood Dam;
            - water captured by the toe drains of the tailings storage facility;
            - water seepage from the tailings storage facility; and
            - the background local groundwater system.
        - outline performance parameters against monitoring data will be compared to determine whether seepage is occurring, and whether an unacceptable impact on local groundwater may be occurring;
        - include details of contingency measures to be implemented in the event that an unacceptable impact is identified.

TRANSPORT

24. The Proponent shall maintain the existing 66 carparking spaces, or an equivalent number elsewhere on the site, for the duration of the project.

25. The Proponent shall consult with the TfNSW and Council in relation to the footpath modifications required at the Eyre Street site access and shall address the design requirements of those agencies in relation to those works. All footpath works shall be completed prior to the commencement of operation of the project, and shall be undertaken at no cost to the TfNSW or Council.

26. A truck waiting area with capacity to accommodate at least two B-Double vehicles at any time shall be provided inside the Eyre Street site access to avoid trucks queuing into Eyre Street.

27. If the Holten Road site access is required during construction of the project, the Proponent shall, prior to using this access, consult with and address the requirements of the TfNSW and Council with respect to traffic access at this location.

28. The Proponent shall commission dilapidation reports for roads likely to be affected by the construction of the project, prior to the commencement of construction and immediately prior to completion of construction. The Proponent shall fund rectification of any deterioration of road pavement quality as a result of construction-related traffic.

28A. The Proponent must enter into a Deed of Agreement with the TfNSW for the protection and management of South Road, to the satisfaction of the TfNSW, prior to the commencement of production blasting in Block 7.

Traffic Management Plan

29. The Proponent shall prepare and implement a traffic management plan to the satisfaction of the Secretary. The plan shall focus on traffic management during construction of the project, and must be developed in consultation with the TfNSW and Council. The plan must be submitted for the approval of the Secretary prior to the commencement of construction.

HERITAGE

30. The Proponent shall prepare and implement a Conservation Management Plan for the site to the satisfaction of the Secretary. This plan must provide a strategic framework for all heritage items located on the Lease, based on the principles of the Burra Charter, and developed in consultation with the Heritage NSW and Council. The plan must be submitted for the approval of the Secretary by December 2011.

30A. If any unexpected heritage items are identified over the life of the project, the Proponent must cease works and contact the Heritage NSW in writing prior to works continuing in the affected areas.

VISUAL AMENITY

31. The Proponent shall:
(a) minimise the visual impacts, and particularly the off-site lighting impacts, of the project;
(b) take all practicable measures to further mitigate off-site lighting impacts from the project; and
(c) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*, or its latest version,
to the satisfaction of the Secretary.

WASTE

32. The Proponent shall:
(a) minimise the waste generated by the project; and
(b) ensure that the waste generated by the project is appropriately stored, handled, and disposed of,
to the satisfaction of the Secretary.

33. The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Secretary. This plan must:
(a) be prepared in consultation with RR, and submitted the Secretary for approval by the end of March 2011;
(b) identify the various waste streams of the project;
(c) estimate the volumes of tailings and other waste material that would be generated by the project;
(d) describe and justify the proposed strategy for disposing of this waste material;
(e) describe what measures would be implemented to meet the requirements set out above in condition 32; and
(f) include a program to monitor the effectiveness of these measures.

33A. The Proponent must update the Waste Management Plan required by condition 33 of this approval by December 2017, unless the Secretary agrees otherwise. The updated plan must include:
(a) a long-term waste management strategy; and
(b) an action plan for the implementation of the key measures proposed to achieve the strategy.
Following approval, the Proponent must implement the plan.

REHABILITATION

Progressive Rehabilitation

34. The Proponent must rehabilitate the site progressively, that is, as soon as is practicable following disturbance, to the satisfaction of the Secretary.

Rehabilitation Strategy

34A. Within 6 months from approval of Modification 6, the Proponent must prepare a Rehabilitation Strategy for the site to the satisfaction of the Secretary. This strategy must:

(a) be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Secretary;

(b) be prepared in consultation with relevant stakeholders including the RR, MEG, EPA, NSW Health (Western NSW Local Health District), DPE Water, Heritage NSW, Council and Perilya Broken Hill Limited;

(c) define the rehabilitation objectives for and schedule of the mine site and "free areas", with consideration of heritage values, dust management, water and leachate management, subsidence, visual impacts and public safety;

(d) includes a conceptual final landform and rehabilitation plan;

(e) include a life of mine rehabilitation and mining schedule which outlines key progressive rehabilitation milestones from the commencement of operations through to decommissioning and mine closure; and

(f) managing and minimising any adverse socio-economic effects associated with mine closure.

The Proponent must implement the approved Rehabilitation Strategy for the project.

Rehabilitation Management Plan

35. The Proponent must prepare and implement a Rehabilitation Management Plan for the project in accordance with the conditions imposed on the mining lease(s) associated with the project under the *Mining Act 1992*.

SCHEDULE 4

ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must:
   (a) be submitted to the Secretary for approval by the end of June 2011;
   (b) provide the strategic framework for the environmental management of the project;
   (c) identify the statutory approvals that apply to the project;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
   (e) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the project;
      - respond to any non-compliance; and
      - respond to emergencies; and
   (f) include:
      - copies of any strategies, plans and programs approved under the conditions of this approval; and
      - a clear plan depicting all the monitoring required to be carried out under the conditions of this approval.

Management Plan Requirements

2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria; and
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the project; and
      - effectiveness of any management measures (see (c) above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences;
   (f) a program to investigate and implement ways to improve the environmental performance of the project over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with the conditions of this approval and statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

   Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Annual Review

3. By the end of 31 March 2023, and annually thereafter, the Proponent must submit a report reviewing the environmental performance of the project to the satisfaction of the Secretary. This review must:
   (a) describe the project (including any rehabilitation) that was carried out in the past calendar year, and the project that is proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:
      - relevant statutory requirements, limits or performance measures/criteria;
      - monitoring results of previous years;
      - relevant predictions in the documents referred to in Conditions 2 of Schedule 2; and

- requirements of any plan or program required under this approval;

(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;
(d) identify any trends in the monitoring data over the life of the project;
(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies;
(f) describe what measure will be implemented over the next year to improve the environmental performance of the project; and
(g) evaluate and report on compliance with the performance measures, criteria and operating conditions of this approval.

Revision of Strategies, Plans & Programs

4. Within three months of:
(a) the submission of an annual review under Condition 3 above;
(b) the submission of an incident report under Condition 5 below;
(c) the submission of an audit report under Conditions 7 – 8A below;
(d) any modification of the conditions of this approval (unless the conditions require otherwise), or
(e) a direction of the Secretary under Condition 2 of Schedule 2.

the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

REPORTING

Incident Notification, Reporting and Response

5. The Secretary must be notified in writing via the Major Projects website immediately after the Proponent becomes aware of an incident. The notification must identify the project (including the development application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in Appendix 5.

Non-Compliance Notification

5A. The Secretary must be notified in writing via the Major Projects website within seven days after the Proponent becomes aware of any non-compliance. A non-compliance notification must identify the project and the application number for it, set out the condition of approval that the project is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: *A non-compliance which has been notified as an incident does not need to also be notified as a noncompliance.*

Regular Reporting

6. The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any approved plans or programs of the conditions of this approval.

INDEPENDENT ENVIRONMENTAL AUDIT

7. Within one year of the date of physical commencement of development under Modification 6, and every three years after, unless the Secretary directs otherwise, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the project. The audit must:
(a) be prepared in accordance with the *Independent Audit Post Approval Requirements* (NSW Government 2020); and
(b) be submitted, to the satisfaction of the Secretary, within two months of undertaking the independent audit site inspection, unless otherwise agreed by the Secretary.

8. In accordance with the specific requirements of the *Independent Audit Post Approval Requirements* (NSW Government 2020), the Proponent must:
(a) review and respond to each Independent Audit Report prepared under Condition 7 above;

(b) submit a response to the Secretary and any other NSW agency that requests it, together with a timetable for the implementation of the recommendations of the Independent Audit Report;

(c) implement the recommendations to the satisfaction of the Secretary; and

(d) make each Independent Audit Report and response to it publicly available no later than 60 days after submission to the Secretary.

MONITORING AND ENVIRONMENTAL AUDITS

8A. Any condition of this approval that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.

For the purposes of this condition, as set out in the EP&A Act, "monitoring" means monitoring of the project to provide data on compliance with the approval or on the environmental impact of the project, and an "environmental audit" means a periodic or particular documented evaluation of the project to provide information on compliance with the approval or the environmental management or impact of the project.

ACCESS TO INFORMATION

9. From the end of March 2011 until the completion of all rehabilitation required under this approval, the Proponent shall:

(a) make copies of the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this approval) publicly available on its website:

- the documents referred to in Condition 2 of Schedule 2;
- all current statutory approvals for the project;
- all approved strategies, plans and programs required under the conditions of this approval;
- the proposed staging plans for the project if the construction, operation or decommissioning of the project is to be staged;
- regular reporting on the environmental performance of the project in accordance with the reporting requirements in any plans or programs approved under the conditions of this approval;
- the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans or programs;
- a summary of the current phase and progress of the project;
- contact details to enquire about the project or to make a complaint;
- a complaints register, updated on a monthly basis;
- the annual reviews of the project;
- any independent environmental audit of the project, and the Proponent's response to the recommendations in any audit; and
- any other matter required by the Secretary;

(b) keep this information up-to-date,

to the satisfaction of the Secretary.

INDEPENDENT REVIEW

10. If an owner of privately-owned land considers the project to be exceeding the criteria in schedule 3 at his/her land, then he/she may ask the Secretary in writing for an independent review of the impacts of the project on his/her land.

If the Secretary is satisfied that an independent review is warranted, then the Proponent shall:

(a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:

- consult with the landowner to determine his/her concerns;
- conduct monitoring to determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
- if the project is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and

(b) give the Secretary and landowner a copy of the independent review within 2 months of the Secretary's decision, unless the Secretary agrees otherwise.

UPDATING AND STAGING OF STUDIES, STRATEGIES AND PLANS

11. To ensure the studies, strategies and plans for the project are updated on a regular basis and incorporate any required measures to improve the environmental performance of the project, the Proponent may submit revised studies, strategies or plans required for the project under the conditions of approval at any time.

With the agreement of the Secretary, the Proponent may also submit any study, strategy or plan required under the conditions of this approval on a staged basis.

12. The Secretary may approve a revised strategy or plan required under the conditions of approval, or the stage submission of these documents, at any time. With the approval of the Secretary, the Proponent may prepare the revised or staged strategy or plan without undertaking consultation with all parties nominated under the applicable condition in this approval.

Notes:

- *While any study, strategy or plan may be submitted on a progressive basis, the Proponent must ensure that the existing operations on site are covered by suitable studies, strategies or plans at all times.*
- *If the submission of any study, strategy or plan is to be staged, then the relevant study, strategy or plan must clearly describe the specific stage to which the study, strategy or plan applies, the relationship of this stage to any future stages, and the trigger for updating the study, strategy or plan.*

APPENDIX 1: SCHEDULE OF LAND

Mineral Authorities/ Lot Number	Deposited Plan Number
CML 7	-
MPL 183	-
MPL 184	-
MPL 185	-
MPL 186	-
EL 5818	-
1	26/ 758018
2	26/ 758018
3	26/ 758018
4	26/ 758018
5	26/ 758018
6	26/ 758018
7	26/ 758018
8	26/ 758018
9	26/ 758018
10	26/ 758018
17	26/ 758018
1	809279
2	809279
1	134676
2	134676
3	134676
11	725393
675	761716
1790	757298
Sublease area within ML1249 depicted in Figure 1 below	-

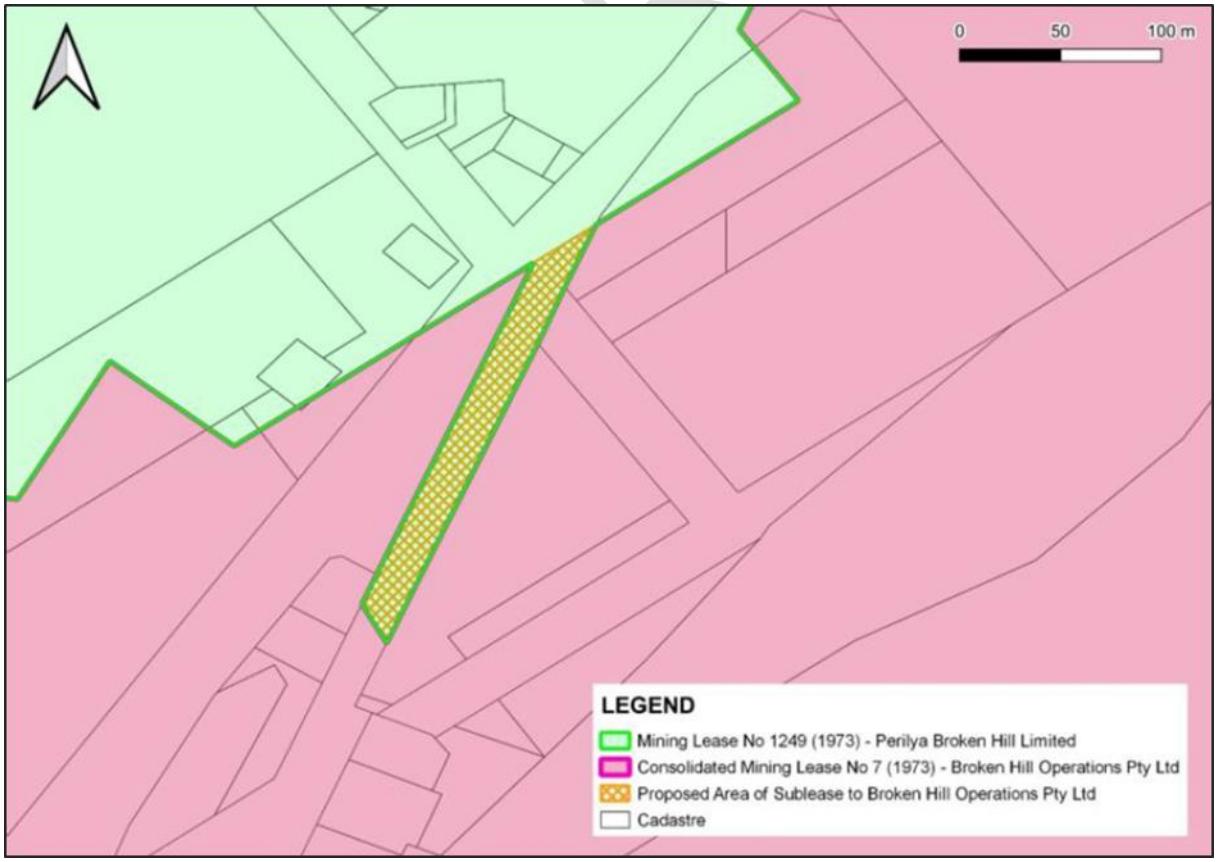
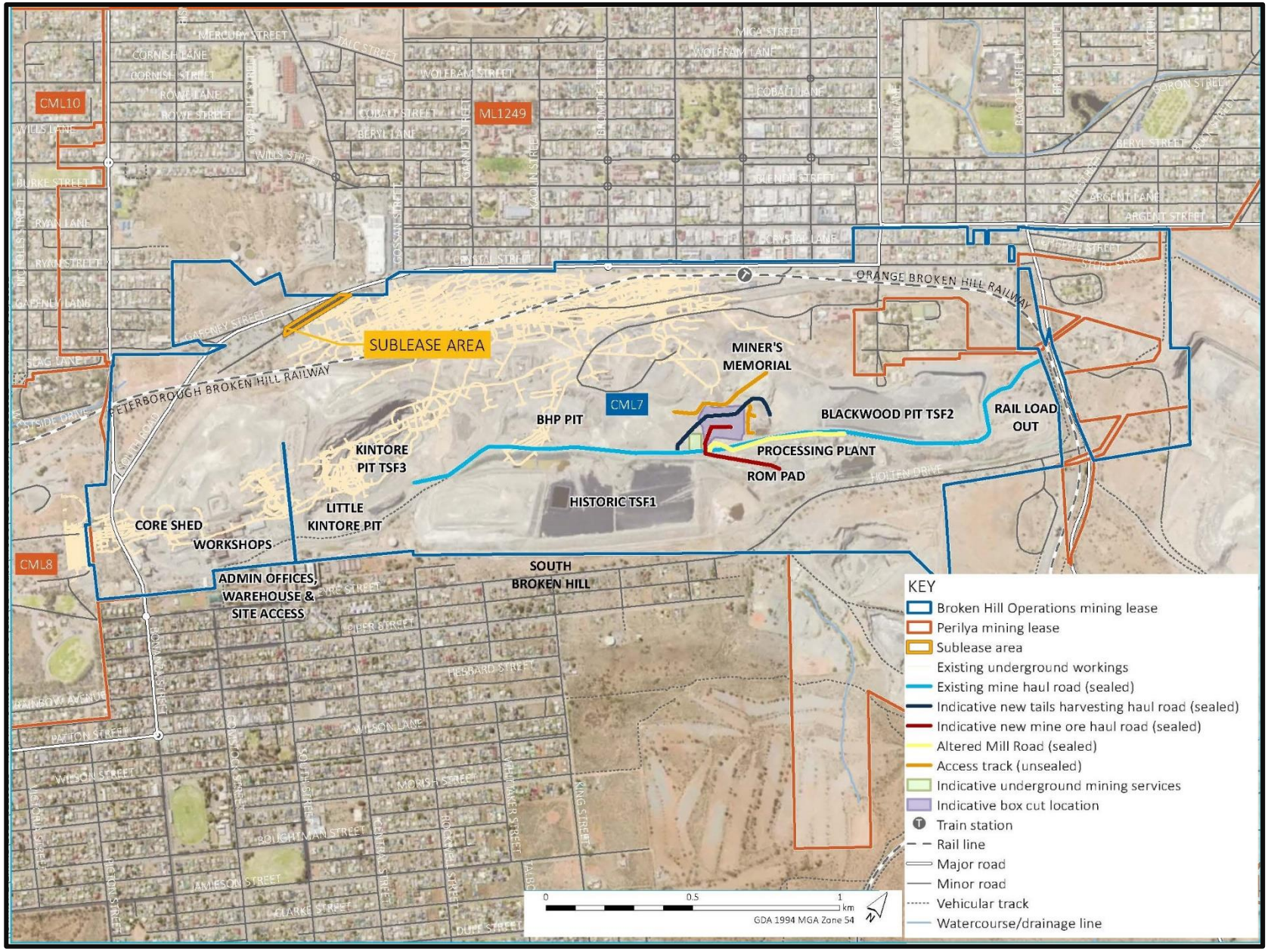
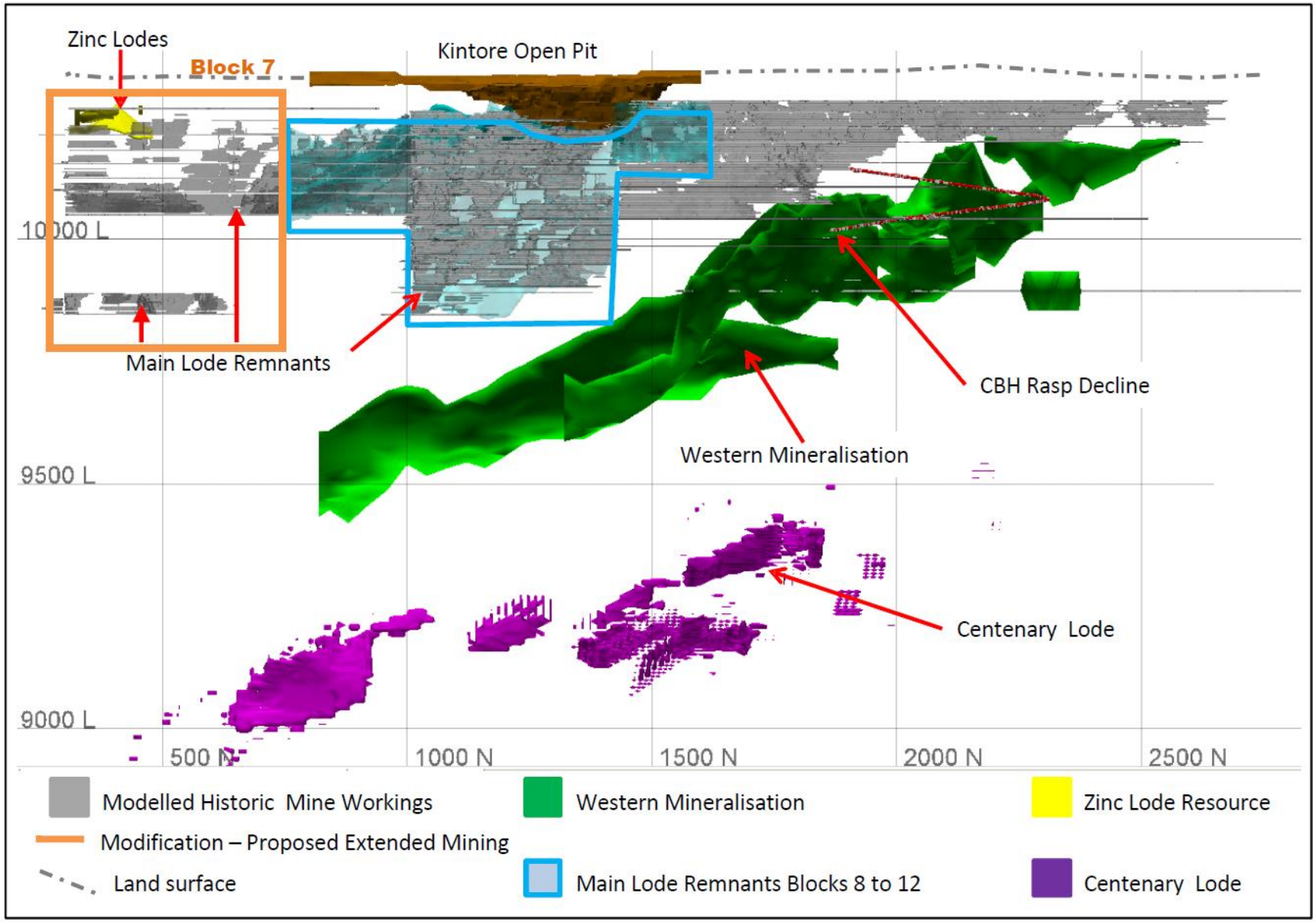


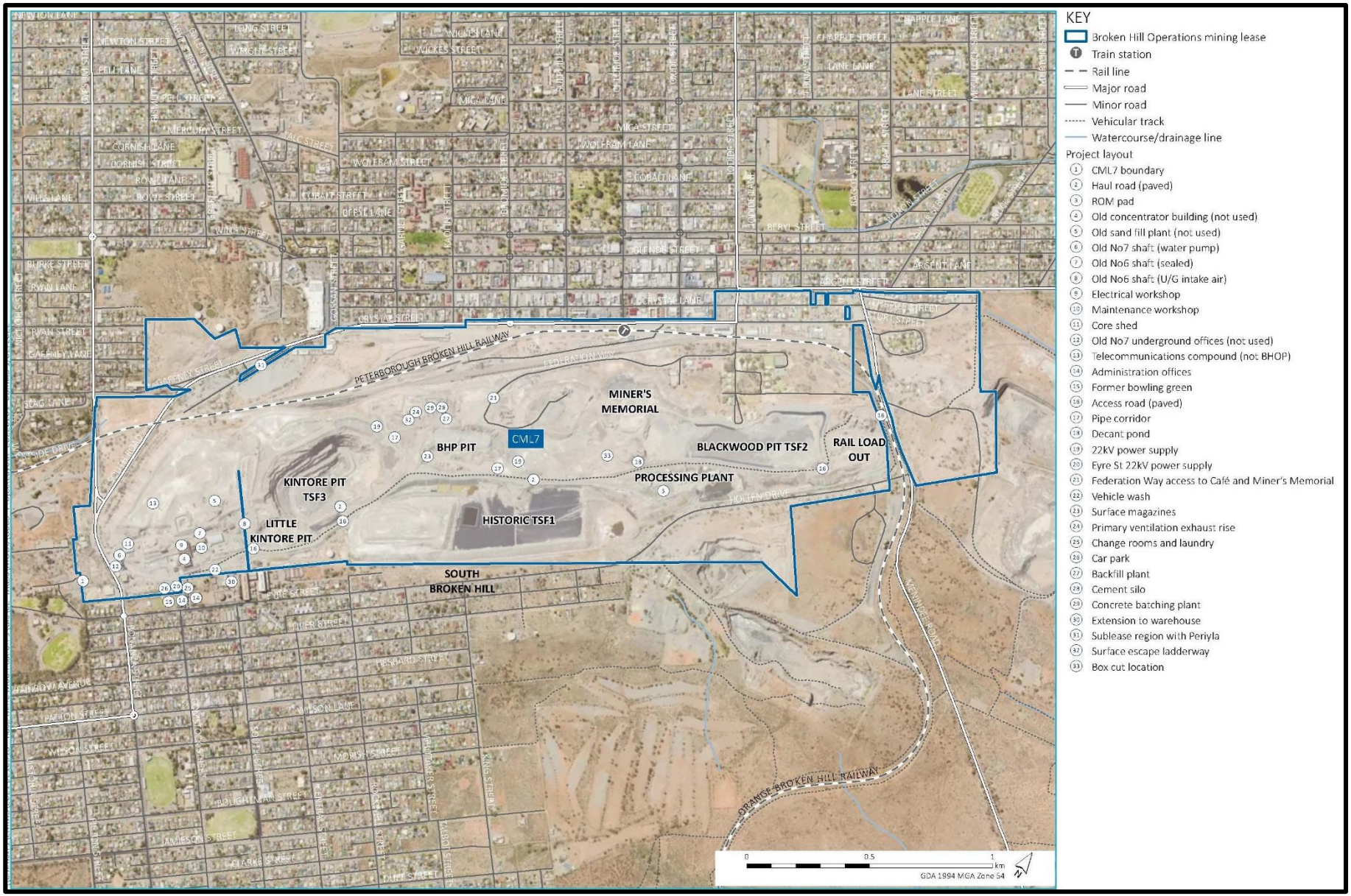
Figure 1 - Sublease area within ML1249

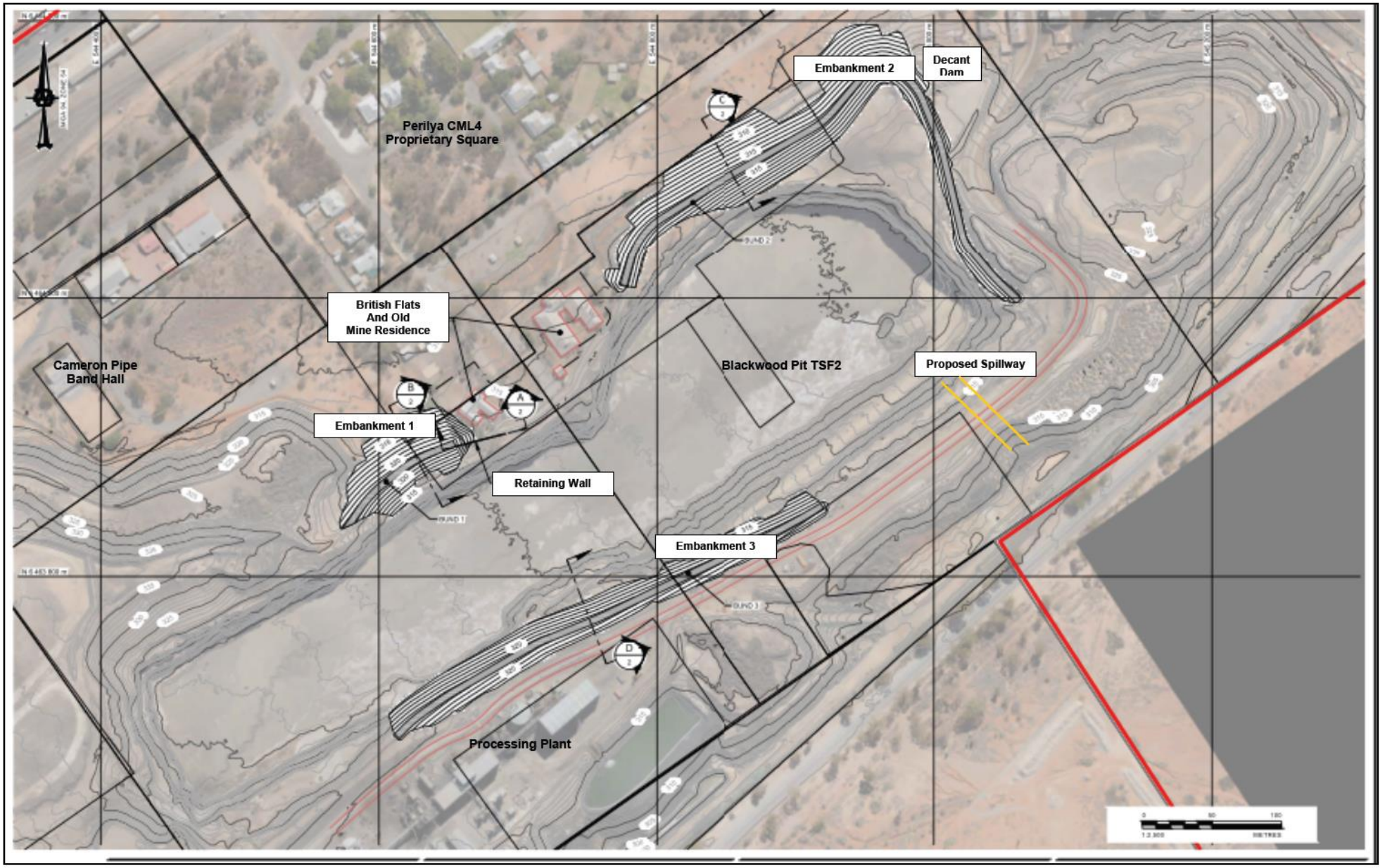
APPENDIX 2: PROJECT AREA

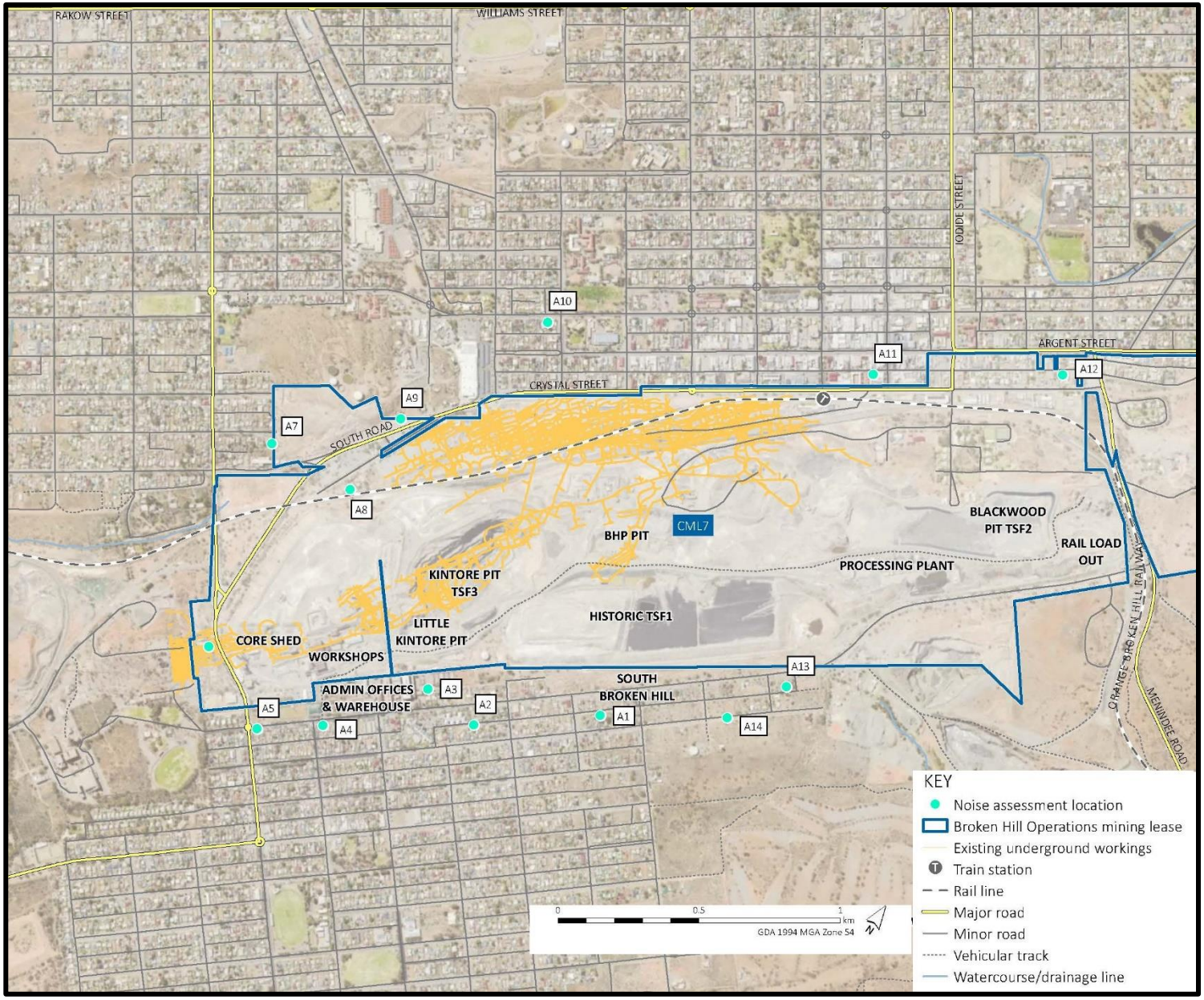



Zinc Lodes
Block 7
Kintore Open Pit
10000 L
Main Lode Remnants
CBH Rasp Decline
Western Mineralisation
9500 L
Centenary Lode
9000 L
500 N
1000 N
1500 N
2000 N
2500 N
Modelled Historic Mine Workings
Western Mineralisation
Zinc Lode Resource
Modification – Proposed Extended Mining
Land surface
Main Lode Remnants Blocks 8 to 12
Centenary Lode

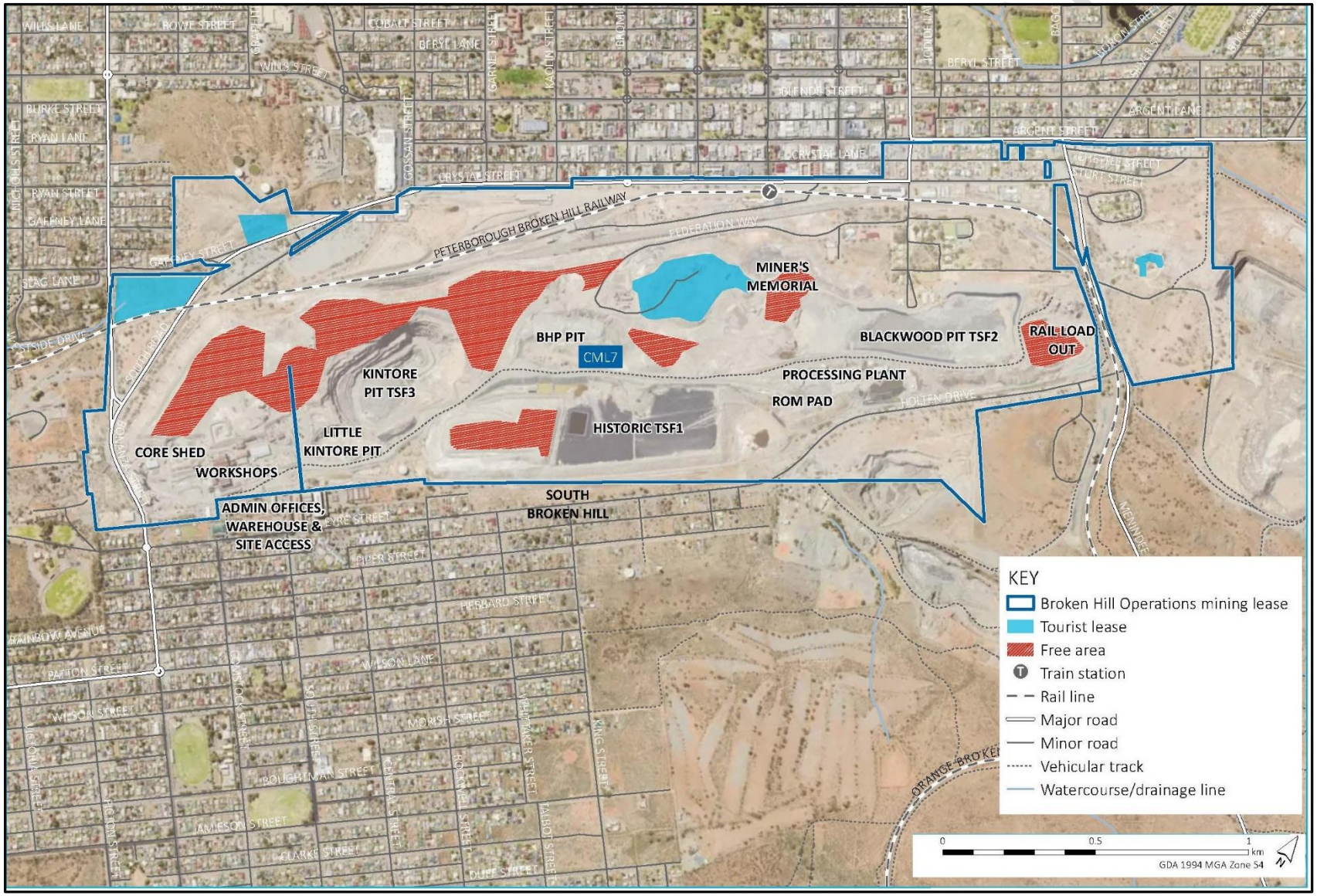
APPENDIX 3: PROJECT LAYOUT PLANS




Perilya CML4
Proprietary Square
Embankment 2
Decant
Dam
British Flats
And Old
Mine Residence
Cameron Pipe
Band Hall
Blackwood Pit TSF2
Proposed Spillway
Embankment 1
Retaining Wall
Embankment 3
Processing Plant


RAKOW STREET
WILLIAMS STREET
IODIDE STREET
ARGENT STREET
CRYSTAL STREET
SOUTH ROAD
A1
A2
A3
A4
A5
A7
A8
A9
A10
A11
A12
A13
A14
CML7
BHP PIT
KINTORE PIT
TSF3
LITTLE
KINTORE PIT
HISTORIC TSF1
BLACKWOOD
PIT TSF2
RAIL LOAD
OUT
PROCESSING PLANT
CORE SHED
WORKSHOPS
ADMIN OFFICES
& WAREHOUSE
SOUTH
BROKEN HILL
ORANGE TO KEN HILL RAILWAY
MENINDEE ROAD
0
0.5
1
km
GDA 1994 MGA Zone 54
KEY
Noise assessment location
Broken Hill Operations mining lease
Existing underground workings
Train station
Rail line
Major road
Minor road
Vehicular track
Watercourse/drainage line

APPENDIX 4: PLAN OF FREE AREAS



APPENDIX 5: INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

WRITTEN INCIDENT NOTIFICATION REQUIREMENTS

1. A written incident notification addressing the requirements set out below must be submitted to the Secretary via the Major Projects website within seven days after the Proponent becomes aware of an incident.

2. Written notification of an incident must:
   a) identify the project and application number;
   b) provide details of the incident (date, time, location, a brief description of what occurred
   c) and why it is classified as an incident;
   d) identify how the incident was detected;
   e) identify when the Proponent became aware of the incident;
   f) identify any actual or potential non-compliance with conditions of approval;
   g) describe what immediate steps were taken in relation to the incident;
   h) identify further action(s) that will be taken in relation to the incident; and
   i) identify a project contact for further communication regarding the incident.

3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Proponent must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

4. The Incident Report must include:
   a) a summary of the incident;
   b) outcomes of an incident investigation, including identification of the cause of the
   c) incident;
   d) details of the corrective and preventative actions that have been, or will be, implemented
   e) to address the incident and prevent recurrence; and
   f) details of any communication with other stakeholders regarding the incident.

A.3 Environmental Protection Licence

Environment Protection Licence

Licence - 12559

Licence Details	
Number:	12559
Anniversary Date:	02-November

Licensee

BROKEN HILL OPERATIONS PTY LTD

PO BOX 1967

NORTH SYDNEY NSW 2059

Premises

CONSOLIDATED MINING LEASE 7

EYRE STREET

BROKEN HILL NSW 2880

Scheduled Activity

Crushing, grinding or separating

Mining for minerals

Fee Based Activity	Scale
Crushing, grinding or separating	> 500000-2000000 T annual processing capacity
Mining for minerals	> 500000-2000000 T annual production capacity

Region

Riverina Far West

Suites 7-8, Level 1 Griffith City Plaza, 130-140 Banna Avenue
GRIFFITH NSW 2680

Phone: (02) 6969 0700

Fax: (02) 6969 0710

PO Box 397

GRIFFITH NSW 2680

Environment Protection Licence

Licence - 12559

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Environment Protection Licence

Licence - 12559

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

Licence - 12559

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

BROKEN HILL OPERATIONS PTY LTD
PO BOX 1967
NORTH SYDNEY NSW 2059

subject to the conditions which follow.

Environment Protection Licence

Licence - 12559

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 500000 - 2000000 T annual processing capacity
Mining for minerals	Mining for minerals	> 500000 - 2000000 T annual production capacity

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
CONSOLIDATED MINING LEASE 7
EYRE STREET
BROKEN HILL
NSW 2880
WILLYAMA COMMON, RESERVE 2421

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

Ancillary Activity
Chemical storage
Concrete batching
Metallurgical activities
Railway system activities

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

A4.2 For the purposes of condition A3.1 the licence application includes:

1) The Project Approval issued by the Department of Planning and Infrastructure on 31 January 2011;
2) The Project Approval modification titled "Rasp Mine Mod 1" issued by the Department of Planning and Infrastructure issued on 16 March 2012;
3) The Environmental Assessment titled "Final Report - Rasp Mine" dated July 2010;
4) The Environmental Assessment titled "Rasp Mine - Preferred Project Report" dated September 2010;
5) The Broken Hill Operations Pty Ltd Rasp Mine "Noise and Blast Management Plan" submitted to the EPA on the 14 October 2011.
6) The Environmental Assessment titled "Rasp Mine - Relocation of Ventilation Shaft" dated November 2011;
7) The Broken Hill Operations Pty Ltd Rasp Mine "Air Quality Management Plan" submitted to the EPA in March 2011;
8) The Broken Hill Operations Pty Ltd Rasp Mine "Site Water Management Plan" dated 20 March 2012 and;
9) The Broken Hill Operations Pty Ltd Rasp Mine "Construction and Operations Manual for Tailing Storage in Blackwood Pit" submitted to the EPA in April 2012.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

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EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Dust and blast monitoring		Ventilation shaft labelled 'Proposed exhaust shaft location' in Figure 2 titled "Ventilation rise alternate location" in the environmental assessment titled "Rasp Mine Variation to Project - Relocation of Ventilation Shaft" dated November 2011
2	Dust process plant monitoring		Process enclosure/Baghouse stack labelled 'Primary crusher & Dust extraction unit' in Figure 2-4 titled "Plant Layout" in the enviromental assessment titled "Rasp Mine - Preferred Project Report" dated September 2010.
3	Dust monitoring		Dust deposition gauge labelled D1 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
4	Dust monitoring		Dust deposition gauge labelled D2 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
5	Dust Monitoring		Dust deposition gauge labelled D3 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
6	Dust Monitoring		Dust deposition gauge labelled D4 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
7	Dust monitoring		Dust deposition gauge labelled D5 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
8	Dust monitoring		Dust deposition gauge labelled D6 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
9	Dust monitoring		Dust deposition gauge labelled D7 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
10	Dust monitoring		High volume dust sampler labelled TSP-HVAS on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
11	Dust monitoring		High volume dust sampler labelled PM10-HVAS1 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
12	Dust monitoring		High volume dust sampler labelled PM10-HVAS2 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
13	Dust monitoring		Tapered element oscillating microbalance sampler labelled TEOM1 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06

14	Dust monitoring	Tapered element oscillating microbalance sampler labelled TEOM2 on map "Figure 1" submitted to the EPA on 02/03/12 and kept on EPA file LIC07/2213-06
57	Dust monitoring	High volume dust sampler labelled TSP-HVAS on map.....

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
29	Surface water monitoring		Storm water pond labelled "S31-1" as shown in Figure 3 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
31	Surface water monitoring		Storm water pond labelled "S49" as shown in Figure 2 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
32	Surface water monitoring		Storm water pond labelled "S1-A" as shown in Figure 2 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
33	Surface water monitoring		Storm water pond labelled "S9B-2" as shown in Figure 5 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
34	Surface water monitoring		Storm water pond labelled labelled "Horwood Dam" as shown in Figure 6 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
35	Off site receiving waters		Ephemeral drainage line upstream of the Rasp Mine shown as "Monitoring location 1 upstream" on Map 1 in the email to the EPA on 3 April 2012 and kept on EPA file LIC07/2213-06

36	Off site receiving waters	Ephemeral drainage line downstream of the Rasp Mine shown as "Monitoring location 2 downstream" on Map 1 in the email to the EPA on 3 April 2012 and kept on EPA file LIC07/2213-06
37	Groundwater monitoring	Groundwater monitoring bore labelled "GW01" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
38	Groundwater monitoring	Groundwater monitoring bore labelled "GW02" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
39	Groundwater monitoring	Groundwater monitoring bore labelled "GW03" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
40	Groundwater monitoring	Groundwater monitoring bore labelled "GW04" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
41	Groundwater monitoring	Groundwater monitoring bore labelled "GW05" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
42	Groundwater monitoring	Groundwater monitoring bore labelled "GW06" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
43	Groundwater monitoring	Groundwater monitoring bore labelled "GW07" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
44	Groundwater monitoring	Groundwater monitoring bore labelled "GW08" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
45	Groundwater monitoring	Groundwater monitoring bore labelled "GW09" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06

46	Groundwater monitoring	Groundwater monitoring bore labelled "GW10" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
47	Groundwater monitoring	Groundwater monitoring bore labelled "GW11" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
48	Groundwater monitoring	Groundwater monitoring bore labelled "GW12" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
49	Groundwater monitoring	Groundwater monitoring bore labelled "GW13" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
50	Groundwater monitoring	Groundwater monitoring bore labelled "GW14" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
51	Groundwater monitoring	Groundwater monitoring bore labelled "GW15" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
52	Groundwater monitoring	Groundwater monitoring bore labelled "GW16" in Figure 8 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
53	Groundwater monitoring	Surface water pond for Shaft 7 mine water labelled "Mine Settlement Ponds" as shown in Figure 3 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06
54	Groundwater monitoring	Surface water pond for Kintore Pit mine water labelled "Mine Settlement Ponds" as shown in Figure 3 of the Site Water Management Plan dated 20 March 2012 and kept on EPA file LIC07/2213-06

P1.4 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

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Noise/Weather

EPA identification no.	Type of monitoring point	Location description
15	Noise monitoring	Point labelled "A1" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
16	Noise monitoring	Point labelled "A2" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
17	Noise monitoring	Point labelled "A3" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
18	Noise monitoring	Point labelled "A4" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
19	Noise monitoring	Point labelled "A5" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
20	Noise monitoring	Point labelled "A6" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
21	Noise monitoring	Point labelled "A7" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.

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22	Noise monitoring	Point labelled "A8" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
23	Noise monitoring	Point labelled "A9" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
24	Noise monitoring	Point labelled "A10" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
25	Noise monitoring	Point labelled "A11" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
26	Noise monitoring	Point labelled "A12" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
27	Noise monitoring	Point labelled "A13" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
28	Noise monitoring	Point labelled "A14" in Figure 1 of the report at Appendix C of the Rasp Mine Environmental Assessment titled "Modification 3 Mining Extension" dated November 2014 kept at DOC14/279713-01 on EPA file EF13/4102.
55	Meteorological Station – to determine meteorological conditions for noise monitoring	

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3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Air Concentration Limits

POINT 1

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
Nitrogen Oxides	milligrams per cubic metre	350	dry, 273 K, 101.3 kPa		

POINT 1,2

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
Total Solid Particles	milligrams per cubic metre	20	dry, 273 K, 101.3 kPa		

POINT 1

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
volatile organic compounds as n-propane equivalent	milligrams per cubic metre	40	dry, 273 K, 101.3 kPa		

POINT 1,2

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
Type 1 and Type 2 substances in aggregate	milligrams per cubic metre	1	dry, 273 K, 101.3 kPa		

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L4 Noise limits

L4.1 Operational activities associated with the project are permitted to occur at any time, subject to compliance with the noise limits specified at condition L4.2 and subject to the following restrictions:

a) Shunting of the concentrate wagons must only occur between 7.00am and 6.00pm on any day; and
b) Production rock blasting must only occur between 6.45am and 7.15pm on any day.

L4.2 Noise from the Rasp Mine premises must not exceed the limits presented in the table below at the monitoring locations listed in column 1.

Location	Day [dB LAeq 15 minute]	Evening [dB LAeq 15 minute]	Night [dB LAeq 15 minute]
Point 15 - A1 Piper Street North	38	37	35
Point 16 - A2 Piper Street Central	38	37	35
Point 17 - A3 Eyre Street North	44	41	39
Point 18 - A4 Eyre Street Central	44	41	39
Point 19 - A5 Eyre Street South	44	41	39
Point 20 - A6 Bonanza & Gypsum Streets	48	41	39
Point 21 - A7 Carbon Street	35	35	35
Point 22 - A8 South Road	48	39	39
Point 23 - A9 Crystal Street	46	39	39
Point 24 - A10 Barnet & Blende Streets	42	41	35
Point 25 - A11 Crystal Street	46	39	39
Point 26 - A12 Crystal Street	46	39	39
Point 27 - A13 Eyre Street North 2	38	35	35
Point 28 - A14 Piper Street North	35	35	35

L4.3 Noise from the premises is to be measured at the most affected point within the boundary of

the nominated premises, or at the most affected point within 30 metres of a dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise level limits in Condition L4.2 unless otherwise stated.

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

L4.4 The noise limits set out in the Noise Limits table apply under all meteorological conditions except for the following:
a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
c) Stability category G temperature inversion conditions.

For the purposes of this condition:
a) Data recorded by the meteorological station identified as EPA Identification Point(s) 55 must be used to determine meteorological conditions; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5 Blasting

L5.1 The overpressure sound level and ground vibration peak particle velocity from blasting operations carried out in or on the premises, excluding Block 7, for the period 7am to 7pm must not exceed the limits in the table below unless expressly provided by a condition of this licence.

Location	Airblast Overpressure (dB - Lin Peak)	Ground Vibration (mm/s)	Allowable Exceedence
Residence on privately owned land	115	5	5% of the total number of blasts in any 12 month annual return reporting period
Residence on privately owned land	120	10	0%

Note:
- The allowable exceedence must be calculated separately for development blasts and production blasts;
- The 5% allowable exceedence does not apply to the production blasts until the licensee has completed a Pollution Studies and Reduction Program at condition U5.1 aimed at achieveing the limit or as otherwise agreed with the EPA; and
- Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L5.2 The overpressure sound level and ground vibration peak particle velocity from blasting operations carried out in or on the premises at Block 7 for the period 7am to 7pm must not exceed the limits in the table below unless expressly provided by a condition of this licence.

Location	Airblast Overpressure - dB Lin Peak	Ground Vibration - mm/s	Allowable Exceedence
Residence of privately owned land	115	3 (interim)	5% of the total number of blasts over the 12 month annual return reporting period
Residence of privately owned land	120	10	0%

Note:
- The allowable exceedence must be calculated separately for development and production blasts;
- The interim limit applies unless the licensee has written consent from the Department of Planning and Environment to apply an alternative site specific criteria for Block 7; and
- Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determing whether or not the limit has been exceeded.

L5.3 The licensee may carry out a maximum of:

a) 1 production blast each day and 6 production blasts each week, averaged over a calendar year; and
b) 6 development blasts each day and 42 development blasts each week, averaged over a calendar year.

L5.4 The overpressure level from blasting operations at the premises must not exceed 105dB (Lin Peak) for the period 7pm to 10pm at any noise sensitive location:

Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L5.5 The overpressure level from blasting operations at the premises must not exceed 95dB (Lin Peak) for the period 10pm to 7am at any noise sensitive locations.

Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L5.6 Conditions L5.1, L5.2, L5.3, L5.4 and L5.5 apply at any point within 1 metre of any noise sensitive location including residential premises, school, hospital or any blasting monitoring location specified in this licence.

L6 Hours of operation

L6.1 Standard construction hours

Unless otherwise specified by any other condition of this licence, all construction activities are:

a) restricted to between the hours of 7:00am and 6:00pm Monday to Friday;
b) restricted to between the hours of 8:00am and 1:00pm Saturday; and
c) not to be undertaken on Sundays or Public Holidays.

L7 Potentially offensive odour

L7.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

L8 Other limit conditions

L8.1 All storm water and other surface water holding ponds identified in the Site Water Management Plan must be designed, constructed and maintained to accommodate the stormwater runoff generated in a 100 year (24 hour) Average Recurrence Interval rain event.

L8.2 The water storage ponds listed below must have the base and wall artificially lined with an impermeable high density polyethylene liner:

1) "Mine Settlement Ponds" and "Backfill Plant Sediment Pond" identified in Figure 3 of the Rasp Mine Site Water Management Plan.
2) "Plant Event Pond" and the "Overflow Event Pond" identified in Figure 4 of the Rasp Mine Site Water Management Plan.

L8.3 The licensee must ensure waste rock used for the construction of the amenity bund around the Concrete Batching Plant and other surface area works is tested in accordance with Appendix D of the Construction Environment Management Plan (BHO-PLN-ENV-011) dated December 2017 and ensure that waste rock used does not average a lead (Pb) fraction of more than 0.5%.

L8.4 During construction works the licensee must:

1. Have a traffic light system for wind speeds; and
2. introduce additional dust mitigation measures when wind speeds are averaging greater than 40 kilometres per hour; and
3. when wind speeds exceed 50 kilometres per hour, any dust generating construction activities must cease.

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4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O3.2 Ore trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O3.3 Visible dust emissions from any tailings storage facility must be immediately suppressed by water or chemical application.

O3.4 Crushing of extracted material must only occur inside the crusher enclosure.

O3.5 The crusher enclosure must be designed to operate under negative pressure at all times.

O3.6 The crusher enclosure and associated emission controls must be constructed and operated in such a manner, as to ensure visible fugitive emissions from the enclosure are minimised.

O3.7 The Air Quality Management Plan must include dust mangment practices that effectively minimise dust emissions at all times, including all mitigation measures discussed in the Environmental Assessment titled "RASP Mine Zinc-Lead-Silver Project Environmental Assessment Report, July 2010" and additional measures proposed in the document titled "RASP Mine Zinc-Lead-Silver Project Prefered Project Report Report September 2010".

O4 Processes and management

O4.1 All surface water storage ponds must be maintained to ensure that sedimentation does not reduce their capacity by more than 10% of the design capacity.

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5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 29,31,32,33,34,35,36

Pollutant	Units of measure	Frequency	Sampling Method
Cadmium	milligrams per litre	Special Frequency 2	Representative sample
Chloride	milligrams per litre	Special Frequency 2	Representative sample
Electrical conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Lead	milligrams per litre	Special Frequency 2	Representative sample
Manganese	milligrams per litre	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	In situ
Sodium	milligrams per litre	Special Frequency 2	Representative sample
Sulfate	milligrams per litre	Special Frequency 2	Representative sample
Total dissolved solids	milligrams per litre	Special Frequency 2	Representative sample
Zinc	milligrams per litre	Special Frequency 2	Representative sample

POINT 37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Representative sample
Cadmium	milligrams per litre	Quarterly	Representative sample
Calcium	milligrams per litre	Quarterly	Representative sample
Chloride	milligrams per litre	Quarterly	Representative sample
Electrical conductivity	microsiemens per centimetre	Quarterly	Representative sample
Iron	milligrams per litre	Quarterly	Representative sample
Lead	milligrams per litre	Quarterly	Representative sample
Magnesium	milligrams per litre	Quarterly	Representative sample
Manganese	milligrams per litre	Quarterly	Representative sample
pH	pH	Quarterly	In situ
Sodium	milligrams per litre	Quarterly	Representative sample
Sulfate	milligrams per litre	Quarterly	Representative sample
Total dissolved solids	milligrams per litre	Quarterly	Representative sample
Zinc	milligrams per litre	Quarterly	Representative sample

POINT 53,54

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Monthly	Representative sample
Cadmium	milligrams per litre	Monthly	Representative sample
Calcium	milligrams per litre	Monthly	Representative sample
Chloride	milligrams per litre	Monthly	Representative sample
Electrical conductivity	microsiemens per centimetre	Monthly	Representative sample
Iron	milligrams per litre	Monthly	Representative sample
Lead	milligrams per litre	Monthly	Representative sample
Magnesium	milligrams per litre	Monthly	Representative sample
Manganese	micrograms per litre	Monthly	Representative sample
pH	pH	Monthly	In situ
Sodium	milligrams per litre	Monthly	Representative sample
Sulfate	milligrams per litre	Monthly	Representative sample
Total dissolved solids	milligrams per litre	Monthly	Representative sample
Zinc	Measure 1	Monthly	Representative sample

M2.3 Air Monitoring Requirements

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POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Dry gas density	kilograms per cubic metre	Every 6 months	TM-23
Moisture	percent	Every 6 months	TM-22
Molecular weight of stack gases	grams per cubic metre	Every 6 months	TM-23
Nitrogen Oxides	milligrams per cubic metre	Every 6 months	TM-11
Temperature	degrees Celsius	Every 6 months	TM-2
Total Solid Particles	milligrams per cubic metre	Every 6 months	TM-15
Type 1 and Type 2 substances in aggregate	milligrams per cubic metre	Every 6 months	TM-12, TM-13 & TM-14
Velocity	metres per second	Every 6 months	TM-2
volatile organic compounds as n-propane equivalent	milligrams per cubic metre	Every 6 months	TM-34
Volumetric flowrate	cubic metres per second	Every 6 months	TM-2

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Dry gas density	kilograms per cubic metre	Quarterly	TM-23
Moisture	percent	Quarterly	TM-22
Molecular weight of stack gases	grams per cubic metre	Quarterly	TM-23
Temperature	degrees Celsius	Quarterly	TM-2
Total Solid Particles	milligrams per cubic metre	Quarterly	TM-15
Type 1 and Type 2 substances in aggregate	milligrams per cubic metre	Quarterly	TM-12, TM-13 & TM-14
Velocity	metres per second	Quarterly	TM-2
Volumetric flowrate	cubic metres per second	Quarterly	TM-2

POINT 7,6,5,3,4,8,9

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19
Total lead	grams per square metre per month	Monthly	AM-19

POINT 10,57

Pollutant	Units of measure	Frequency	Sampling Method
Lead	micrograms per cubic metre	Every 6 days	AM-11
Total suspended particles	micrograms per cubic metre	Every 6 days	AM-15

POINT 11,12

Pollutant	Units of measure	Frequency	Sampling Method
PM10	milligrams per cubic metre	Every 6 days	AM-18

POINT 13,14

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Daily	AM-22

M2.4 For the purposes of the table(s) above Special Frequency 2 means the collection of two samples a year six months apart.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Analysis of heavy metals in air samples required by this licence must be done in accordance with:
(a) APHA 3030 for the preparation of the sample; and
(b) APHA 3111B for the measurement of lead.

M3.3 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before

any tests are conducted.

M4 Weather monitoring

M4.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

POINT 55

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	15 minutes	Continuous
Wind Direction at 10 metres	AM-4	Degrees in a clockwise direction from True North	15 minutes	Continuous
Wind Speed at 10 metres	AM-4	metres per second	15 minutes	Continuous
Rainfall	AM-4	millimetres	1 hour	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous

M5 Recording of pollution complaints

M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M5.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M6.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M7 Blasting

M7.1 To determine compliance with conditions L5.1, L5.2, L5.3, L5.4 and L5.4:

(a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for all blasts carried out in or on the premise at the following locations;

The blast monitor labelled "V1" in Figure 1 titled "Blast Monitoring Locations" of Broken Hill Operations Pty Ltd - Rasp Mine - "Blasting Monitoring Program Management Plan" received by the EPA 29 June 2015 DOC15/238188.
The blast monitor labelled "V2" in Figure 1 titled "Blast Monitoring Locations" of Broken Hill Operations Pty Ltd - Rasp Mine - "Blasting Monitoring Program Management Plan" received by the EPA 29 June 2015 DOC15/238188.
The blast monitor labelled "V3" in Figure 1 titled "Blast Monitoring Locations" of Broken Hill Operations Pty Ltd - Rasp Mine - "Blasting Monitoring Program Management Plan" received by the EPA 29 June 2015 DOC15/238188.
The blast monitor labelled "V4 New location" in Attachment B of the document titled "Report to support EPL 12559 variation" dated August 2018 and kept on EPA file DOC18/228266-03.
The blast monitor labelled "V5" in Figure 1 titled "Blast Monitoring Locations" of Broken Hill Operations Pty Ltd - Rasp Mine - "Blasting Monitoring Program Management Plan" received by the EPA 29 June 2015 DOC15/238188.

The specific monitoring locations are subject to the actual blasting locations as described in Table 4 - "Airblast Overpressure and Ground Vibration Monitoring Locations" of Broken Hill Operations Pty Ltd - Rasp Mine - "Blasting Monitoring Program Management Plan" received by the EPA 29 June 2015 DOC15/238188; and

(b) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standards AS 2187.2-2006.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 **Monitoring report**
The licensee must supply with the Annual Return an Environmental Monitoring Report which is to be completed and attached to each Annual Return.
The Environmental Monitoring Report must include:

a) a summary of all monitoring results including Air, Water and Noise;
b) an analysis and interpretation of all monitoring results;
c) identification of any adverse trend or non-compliance; and
d) actions to correct any adverse trends and/or non-compliances.

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.8 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.9 Blast monitoring reporting
The licensee must supply a Blast Management Report quarterly and must include:

a) a summary of production blast levels (which excludes block 7 production blasts);
b) the percentage of production blasts < 5 mm/s and the percentage of blasts > 5 mm/s;
c) an analysis and interpretation of all blast results from the licensed monitors and from the network of roving monitors used to assess potential impacts on the amenity of receptors;
d) identification of any adverse trend or non-compliance;
e) actions to correct any adverse trends or non-compliance; and
f) any proposed future corrective actions that will be implemented to meet ongoing compliance with production blast limits at condition L5.1.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;

d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

8 Special Conditions

E1 Concrete Batching Plant construction

E1.1 The licensee must construct the Concrete Batching Plant (CBP) consistent with the Construction Environment Management Plan (BHO-PLN-ENV-011) dated December 2017 and kept on EPA file DOC17/609105-02.

Environment Protection Licence

Licence - 12559

Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 12559

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

Environment Protection Licence

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Craig Bretherton

Environment Protection Authority

(By Delegation)

Date of this edition: 02-November-2006

Environment Protection Licence

Licence - 12559

End Notes

1	Licence varied by notice 1073249, issued on 14-May-2007, which came into effect on 14-May-2007.
2	Licence varied by notice 1078521, issued on 11-Oct-2007, which came into effect on 11-Oct-2007.
3	Licence varied by format and/or typographical corrections, issued on 22-Oct-2007, which came into effect on 22-Oct-2007.
4	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
5	Licence varied by notice 1105830, issued on 12-May-2010, which came into effect on 12-May-2010.
6	Licence varied by notice 1117212, issued on 19-Aug-2010, which came into effect on 19-Aug-2010.
7	Licence varied by notice 1126030, issued on 30-Mar-2011, which came into effect on 30-Mar-2011.
8	Licence varied by notice 1126952, issued on 13-Jul-2011, which came into effect on 13-Jul-2011.
9	Licence varied by notice 1501373 issued on 09-Sep-2011
10	Licence varied by notice 1502363 issued on 07-Nov-2011
11	Licence varied by notice 1503474 issued on 23-Dec-2011
12	Licence varied by notice 1504518 issued on 23-Feb-2012
13	Licence varied by notice 1504790 issued on 20-Apr-2012
14	Licence varied by notice 1506738 issued on 20-Jun-2012
15	Licence varied by notice 1507657 issued on 09-Aug-2012
16	Licence varied by notice 1515835 issued on 01-Aug-2013
17	Licence varied by notice 1516037 issued on 08-Aug-2013
18	Licence varied by notice 1519905 issued on 20-Mar-2014
19	Licence varied by notice 1524545 issued on 28-Aug-2014
20	Licence varied by notice 1524732 issued on 10-Sep-2014
21	Licence varied by notice 1528988 issued on 20-Mar-2015
22	Licence varied by notice 1529466 issued on 13-Apr-2015
23	Licence varied by notice 1532070 issued on 16-Jul-2015

Environment Protection Licence

Licence - 12559

24	Licence varied by notice	1537327 issued on 10-Mar-2016
25	Licence varied by notice	1543368 issued on 31-Aug-2016
26	Licence varied by notice	1559865 issued on 21-Dec-2017
27	Licence varied by notice	1571969 issued on 14-Mar-2019
28	Licence varied by notice	1582736 issued on 26-Aug-2019
29	Licence varied by notice	1585837 issued on 04-Oct-2019

A.4 Water access licences

BOX 1W
(AH617451)

NEW SOUTH WALES

CERTIFICATE OF TITLE

WATER MANAGEMENT ACT, 2000

WAL TITLE REFERENCE	
WAL31065	
EDITION	DATE OF ISSUE
1	21/3/2013
CERTIFICATE AUTHENTICATION CODE	
XS6V-DL-ZW5L	

This certificate is issued under s87B of the Water Management Act, 2000.

WARNING NOTE: INFORMATION ON THIS REGISTER IS NOT GUARANTEED

TENURE TYPE: CONTINUING

HOLDER(S)

BROKEN HILL OPERATIONS PTY LTD (WB AH617451)

ENCUMBRANCES
---
1. SECURITY INTERESTS IN THE WATER ENTITLEMENT REPLACED BY THIS ACCESS LICENCE THAT WERE REGISTERED OR CAPABLE OF BEING REGISTERED WITH LPI OR ASIC BEFORE THE COMMENCEMENT DATE OF THIS LICENCE 30/3/2012 MAY BE RECORDED ON THIS LICENCE WITHIN THREE YEARS FROM THE COMMENCEMENT DATE. SEE NOTES.
2. TERM TRANSFER: NIL

ACCESS LICENCE DETAILS

CATEGORY: AQUIFER

SHARE COMPONENT:
SHARE - 370 UNITS
WATER SOURCE - ADELAIDE FOLD BELT MDB GROUNDWATER SOURCE
WATER SHARING PLAN - NSW MURRAY DARLING BASIN FRACTURED ROCK GROUNDWATER SOURCES

EXTRACTION COMPONENT:
TIMES/RATES/CIRCUMSTANCES - SUBJECT TO THE CONDITIONS OF THE WATER ACCESS LICENCE
EXTRACTION FROM - AQUIFER
EXTRACTION ZONE - WHOLE WATER SOURCE

NOMINATED WORKS:
WORK APPROVAL NUMBER(S) - 85WA752823
INTERSTATE TAGGING ZONE - NIL

CONDITIONS

LICENCE CONDITIONS FORM A PART OF THIS LICENCE AND AFFECT THE SHARE AND EXTRACTION COMPONENTS. CONDITION STATEMENTS ARE AVAILABLE FROM THE NSW OFFICE OF WATER (NOW).

NOTES

A WATER LICENCE INFORMATION SHEET IS AVAILABLE FROM THE NSW OFFICE OF WATER (NOW) AND SHOULD BE REFERRED TO IN INTERPRETING THIS LICENCE. NOW WEBSITE WWW.WATER.NSW.GOV.AU, PHONE 1800 353 104, EMAIL INFORMATION@WATER.NSW.GOV.AU

END OF PAGE 1 CONTINUED OVER

BOX 1W
(AH617451)

NEW SOUTH WALES

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WATER MANAGEMENT ACT, 2000

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EDITION	DATE OF ISSUE
1	21/3/2013
CERTIFICATE AUTHENTICATION CODE	
XS6V-DL-ZW5L	

This certificate is issued under s87B of the Water Management Act, 2000.

NOTES (CONTINUED)

NOW REFERENCE NUMBER: 85AL752822
PREVIOUS WATER ACT LICENCE NUMBER(S): 85PT990026, 85BL256102.

**** END OF CERTIFICATE ****

Appendix B
Rehabilitation risk assessment

EMM
creating opportunities

Rehabilitation Risk Assessment

Date: 15/7/2022
Participants: Nick Travers (EMM), Michael Frankcombe (EMM)

Project No: E211010
Project Name: Rasp Mine - Closure Studies, Rehabilitation Strategy and Rehabilitation Management Plan
Client: Broken Hill Operations Pty Ltd (BHOP)
Site: Rasp Mine, Broken Hill NSW

CLOSURE RISK DESCRIPTION (Unwanted Event)	POTENTIAL IMPACTS (Consequence)	POTENTIAL CAUSES (Risk Pathway - Root Causes)	RISK #	RELEVANT? (Yes / No)	Existing Proposed Controls (per Rasp Mine MOP, October 2021 - September 2023)
LANDFORM STABILITY					
Instability/failure of waste rock emplacements	* Major costs for landform re-design/re-work; * Inability to achieve relinquishment; * Adverse impacts on downstream receptors (eg sediment runoff and surface water impacts); * Failure of WRE capping through ground disturbance and erosion resulting in exposure of materials with elevated lead levels; * lead dust emissions	* Unacceptable rates of erosion results in landform/rehab failure; * Landform design not sympathetic to the base material characteristics and local climatic conditions; * Modelling of landform morphology and failure risk not undertaken (eg WEPP, RUSLE, SIBERIA); * Grazing impacts/disturbance (eg stock over-grazing, feral fauna activity) * Not constructed to design; * Lack of suitable inert waste rock or rock mulch (material balance)	001	Yes	*For slopes created by BHOP, completion of geotechnical stability assessment; slopes >20 degrees to be assessed, cut and re-shaped for long-term stability. * Angle of repose slopes previously rock mulched by NMI
Instability/failure of tailings storage facilities	* Major costs for landform re-design/re-work; * Inability to achieve relinquishment; * Adverse impacts on downstream receptors (eg sediment runoff and surface water impacts); * Failure of TSF capping through ground disturbance and erosion resulting in exposure of capped tailings materials	* Unacceptable rates of erosion results in landform/rehab failure; * Landform design not sympathetic to the base material characteristics and local climatic conditions; * Modelling of landform morphology and failure risk not undertaken (eg WEPP, RUSLE, SIBERIA); * Footprint limitations require steeper slopes * Not constructed to design; * Lack of inert waste rock or rock mulch(material balance)	002	Yes	* TSF1 capped will slag, TSF2 and TSF3 will be covered with inert waste rock to enhance stability and contain any potentially hazardous material.
LANDFORM DESIGN & CONSTRUCTION					
The reconstructed landform is not capable of supporting the nominated PMLU	* Inability to satisfy approval conditions; * Inability to achieve relinquishment; * Subsidence, tunnel erosion and/or differential settlement of rehabilitated landforms; * Re-design of existing rehabilitated landforms; unacceptable rates of erosion - landform design not sympathetic to the base material characteristics and local climatic conditions; * Modelling of landform morphology and failure risk not undertaken (eg WEPP, SIBERIA); * Failure of tailings capping and exposure of hostile material.	* Landform design does not adequately consider the end land use(s); * Final landform design (eg slope and shape) does not adequately consider the intended PMLUs; * Modelling of landform morphology and failure risk not undertaken (eg WEPP, SIBERIA);	003	Yes	Landform features such as final voids and slopes are to be retained as these are consistent with the mining character of the site and are a definitive feature of the visual character of Broken Hill. Development of rehabilitation strategy, and rehabilitation managment plan (RMP) including final landform designs considerate of generic stable landforms and tourism-related PMLUs.
Acid Mine Drainage (AMD) capillary rise (upward migration of acidity and salinity) into rehabilitation profile - TSF2, TSF3	* Contamination and sterilisation of clean upper sub- and topsoil material; * Medium- and long-term failure of surface vegetation, crops or pasture (eg acidification of root zone). * Long-term contamination liability	* Disposal of PAF waste rock and tailings into TSF2 * Geochemical processes (eg ARD capillary rise); * Inadequate capping design (does not prevent capilliary rise) * No or inadequate modelling of capillary process and associated risks. * No modelling to test performance of proposed capping options to mitigate risk	004	Yes	Extensive geochemical assessments (waste rock characterisation by ERM and EMM) indicate negligible quantities of PAF material exist at-surface across the site
Acid Mine Drainage (AMD) - impacts on groundwater and surface water receptors	* Adverse impacts on sensitive receptors *Ongoing exceedance of water qaulity objectives post-closure *Ongoing legacy and compliance issues (financial and reputational impact)	* Disposal of PAF waste rock and tailings into TSF2 * Inadequate capping design (does not prevent seepage and AMD) * No modelling to test performance of proposed capping options to mitigate risk	005	Yes	Extensive geochemical assessments (waste rock characterisation by ERM and EMM) indicate negligible quantities of PAF material exist at-surface across the site
Neutral Mine Drainage (NMD) capillary rise (upward migration of heavy metals) into rehabilitation profile - TSF2,TSF3	* Contamination and sterilisation of clean inert waste rock; * Long-term contamination liability	* NMD containing metals generated from in-situ orebody and ores altered by processing (grinding and refining) when in contact with water. * Disposal of NMD waste rock and tailings into TSF2, TSF3 * Geochemical processes (capillary rise); * No or inadequate modelling of capillary process and associated risks. * Inadequate capping layer(s) or layers do not prevent capilliary rise * No modelling to test performance of proposed capping options in terms of capilliary rise and seepage	006	Yes	* capillary break including in capping design * store/release cover design * non-vegetative capping design due to climate and growing media constraints
Neutral Mine Drainage (NMD) and impacts on groundwater and surface water receptors - TSF2,TSF3	* Adverse impacts on sensitive receptors *Ongoing exceedance of water qaulity objectives post-closure *Ongoing legacy and compliance issues (financial and reputational impact)	* NMD containing metals generated from in-situ orebody and ores altered by processing (grinding and refining) when in contact with water. * Disposal of NMD waste rock and tailings into TSF2, TSF3 * Geochemical processes (eg ARD capillary rise); * No or inadequate modelling of capillary process and associated risks. * Inadequate capping layer(s) or layers do not prevent capilliary rise * No modelling to test performance of proposed capping options in terms of capilliary rise and seepage	007	Yes	* capillary break including in capping design * store/release cover design * non-vegetative capping design due to climate and growing media constraints * groundwater poor quality due to mineralisation
Visual amenity - final landform design does not visually integrate with the surrounding landscape and/or does meet community expectations	* Inability to satisfy approval conditions; * Community does not accept final landform design; * Inability to achieve relinquishment. * Reputational impacts	* Lack of landform character / visual impact assessment as part of landform design. * Lack of consultation with community and other stakeholders on PMLU and proposed final landform	008	Yes	Landform features such as final voids and slopes are to be retained as these are consistent with the mining character of the site and are a definitive feature of the visual character of Broken Hill.
GEOTECHNICAL STABILITY					
Slumping and failure of TSF2 embankment/retaining wall failure	* Major costs for landform re-design/re-work; * Inability to achieve relinquishment; * tailings release (mass discharge) - harm to/loss of persons and property downstream; * Reputation impacts	* No geotechnical stability assessments (ANCOLD) to confirm long-term stability and hazard classification * Erosion of embankment slope gradient not sympathetic to the erosion and geotechnical constraints of the soil material; * insufficient or inappropriate final surface cover provide long-term erosional stability * Seismic event * inappropriate or inadequate surface water runoff drainage system causing undesired impoundment of water and/or rilling and gullying. * inappropriate or inadequate sub-surface drainage system resulting in saturation of impounded tailings and potential for liquefaction.	009	Yes	Quality assurance during construction, water drainage system to prevent water pooling, geomembrane and filter curtain to cater for any differential settlement preventing erosion and slumping. Flood management – spillway design for a probable maximum flood (generally considered to be 1 in a million probability); Environmental containment freeboard – designed to a 1:10,000 annual exceedence probability AEP), 72 hour event; Earthquake loading – seismic parameters OBE: 0.12 g, MDE/MCE: 0.2 g. Stormwater management on Embankments tied into the site stormwater management system. Inspections and seismic monitoring.
Subsidence/differential settlement at surface above former underground mine workings	* Harm to /loss of persons and property downstream; * Inability to support targeted PMLUs and PMLU users; * Reputational impacts; * Major costs for landform re-design/re-work; * Inability to achieve relinquishment.	* No geotechnical stability assessments to confirm long-term stability; * Insufficient volume of benign waste rock and/or overburden to use as surface backfill for underground subsidence. * stopes not adequately backfilled	010	Yes	As per Risk #1 Also - * Stope backfilling with waste rock * Mitigation practices during mining phase, eg: - selected mining method (ie no block caving) - design of extraction sequences to ensure ground stresses do not exceed the capabilities of the rock mass. - Ground support and measures as outlined in the Ground Control Management Plan.
MATERIAL BALANCE - MINING WASTE AND OVERBURDEN					
Location and volume of deleterious mining waste and contaminated materials is unknown	* Adverse impacts to downstream receptors (eg acid-mine drainage); *Inability to surrender mining leases	* Inadequate characterisation of mining wastes across the site (geochemical testing/analysis and volumetric survey); * Location for disposal of tailings and other contaminated materials by former operators not known * Closure material balance not accurate based on 'close now' scenario	011	Yes	* Extensive geochemical assessments (waste rock characterisation by ERM and EMM) indicate negligible quantities of PAF material exist at-surface across the site. * Limited understanding of location, quanitity and risk associated with NMD material and metalliferous mine drainage
Insufficient volume of inert waste rock to use as surface backfill for underground subsidence	* Inability to account for predicted ongoing ground settlement; * Inability to achieve nominated PMLU. * Inability to adequately backfill underground workings and mitigate subsidence/differential settlement risk	* Volume of remaining non-backfilled voids in main lode area not known * Volume of required backfill material not known (no or incomplete rehabilitation material balance for underground and aboveground rehabilitation)	012	Yes	No detailed material balance provided in MOP re: available material for stope backfilling, but MOP does infer use of material will be available (most waste rock to be returned underground).
Insufficient volume of inert waste rock to use for encapsulation of deleterious wastes and/or construct target landform design	* Inability to construct adequate depth of cover above problematic mining or other wastes; * Inability to construct nominated post-mining landform design; * Unplanned cost for landform re-design or substitute materials; * Need to import rock mulch to cover angle of repose batters	* Inadequate characterisation of mining wastes across the site (geochemical testing/analysis and volumetric survey); * Random unquantified non-inert material * Closure material balance not accurate based on 'close now' scenario	013	Yes	No detailed material balance provided in MOP
MATERIAL BALANCE - SOIL AND GROWING MEDIA					
Insufficient volume of native soil resource (subsoil and topsoil) to use as final cover material	* Inability to support proposed PMLUs (eg native vegetation, cropping or pasture)	* Subsoil and topsoil resources not stripped and stockpiled; * Subsoil and topsoil resources lost by previous operators	014	Yes	MOP identifies lack of soil resource (resource does not exist). Proposed establishment of waste-rock based covers on final landforms to manage erosion risks and provide surface stability
Quality of native soil resource inadequate to support biodiversity PMLU	* Inability to support proposed PMLUs (eg native vegetation, cropping or pasture); * Unplanned costs to import/apply alternative growing media; * Extended closure time and cost to achieve performance targets.	* Subsoil and topsoil resources not stripped and stockpiled; * Subsoil and topsoil resources lost by previous operators * No trials undertaken into alternative growth media and techniques.	015	Yes	MOP identifies lack of soil resource (resource does not exist)
REVEGETATION					
Inability to re-establish target plant community types (PCTs)	* Inability to satisfy approval conditions; * Inability to achieve relinquishment; * Unplanned rehabilitation/closure liability; * Unplanned, undesired change of end land use;	* Drought/climate change; * No available growth media ; * Lack of suitable seed resources	016	No	MOP identifies lack of soil resource (resource does not exist) - rehabilitation of native vegetation is not possible or proposed
PUBLIC HEALTH AND SAFETY					
Retained historical heritage - buildings/structures structurally unsound	* Harm/fatality to member of public	* Historical heritage structures not assessed for structural stability as part of closure planning * Unsafe/at-risk structures not removed * Unsafe/at-risk structures not barricaded to prevent public access	017	Yes	Final agreed end of mine life status for heritage buildings. Delapidation surveys Fencing of areas where access needs to be controlled.

REHABILITATION RISK BASED ON CURRENT & PROPOSED CONTROLS

RISK #	Likelihood (L)	Impacted Area: Financial	Health & Safety	Environmental	Community Relations	Company Reputation	Security	Legal Compliance	Inherent Risk Level (IRL)	Additional Identified Risks/Issues (from EMM studies and site assessment)	Additional Recommended Controls (from EMM studies and site assessment)
001	B - Likely	4 - Major	1 - Insignificant	3 - Moderate	N/A	3 - Moderate	N/A	4 - Major	High	1/ Rill/gully erosion and slumping of angle of repose slopes	Erosion and landform design assessment, to include: * erosion material characterisation * erosion modelling (WEPP) * generation of landform design 'rules' and 3D final landform designs based on modelling *Lidar erosion monitoring of angle of repose slopes and rock mulching if required *geotechnical assessment and buttressing or slope reduction if required and if possible due to boundary/infrastructure constraints
002	D - Unlikely	3 - Moderate	N/A	3 - Moderate	2 - Minor	3 - Moderate	N/A	3 - Moderate	Moderate	1/ Lack of assessment/modelling to demonstrate how rock/soil final cover will perform in terms of erosion over the long-term 2/ No geotechical reports undertaken for long term closure plan only for TSF operational use Golder plan for TSF2 as part of MOD6? 3/ Surface flow diversion over north-eastern batter of TSF1 actively eroding	Erosion and landform design assessment, to include: * erosion material characterisation * erosion modelling (WEPP) * generation of landform design 'rules' and 3D final landform designs based on modelling Geotechnical stability assessment of TSF1 and the final landform design for TSF2 * final landform will divert surface water away from TSF 1 batter (may be able to be done via tailings beaching or waste emplacement instead of earthworks) * Lidar erosion monitoring of batters
003	E - Rare	3 - Moderate	N/A	3 - Moderate	3 - Moderate	3 - Moderate	N/A	2 - Minor	Moderate	Not applicable	Not applicable
004	E - Rare	N/A	2 - Minor	3 - Moderate	2 - Minor	2 - Minor	N/A	3 - Moderate	Moderate	Not applicable	Nil
005	E - Rare	N/A	2 - Minor	3 - Moderate	2 - Minor	2 - Minor	N/A	3 - Moderate	Moderate	As per Risk # 004	As per Risk # 004
006	C - Possible	N/A	N/A	3 - Moderate	2 - Minor	3 - Moderate	N/A	3 - Moderate	High	Extent of NMD material (location, quanitity) and risk is unknown. Risk of metalliferous NMD drainage to surface and groundwater receptors post-closure is unknown	Geochemical mine waste characterisation to quantify the volume and extent of NMD material on site and risks Modelling of proposed TSF capping scenarios to demonstrate performance (mitigaton of AMD capilliary rise and deleterious seepage)
007	C - Possible	N/A	2 - Minor	3 - Moderate	2 - Minor	3 - Moderate	N/A	3 - Moderate	High	Risk of metalliferous NMD drainage to surface and groundwater receptors post-closure is unknown	Groundwater modelling (inc solute transport modelling) to assess closure risk to surface- and groundwater receptors Surface water assessment and modelling to asess closure risks to surface- and groundwater receptors
008	E - Rare	N/A	N/A	N/A	3 - Moderate	1 - Insignificant	N/A	N/A	Low	Not applicable	Not applicable
009	E - Rare	4 - Major	5 - Critical	4 - Major	4 - Major	4 - Major	N/A	5 - Critical	High	No geotechical reports undertaken for long term closure plan only for TSF operational use	Geotechnical stability assessment of the final landform design for TSF2. Final landform design for TSF2 needs to consider flooding, water retention and liquefaction risks
010	E - Rare	4 - Major	4 - Major	2 - Minor	2 - Minor	3 - Moderate	N/A	3 - Moderate	Moderate	Not applicable	Geotechnical monitoring and further geotechnical assessment at closure phase to demonstrate subsidence/differential settlement is un-changed
011	C - Possible	3 - Moderate	N/A	3 - Moderate	1 - Insignificant	1 - Insignificant	N/A	3 - Moderate	High	Extent of NMD material (location, quanitity) and risk is unknown. Risk of metalliferous NMD drainage to surface and groundwater receptors post-closure is unknown	Geochemical mine waste characterisation to quantify the volume and extent of NMD material on site and risks Map remediation works and disposal locations detailed in NML 2000.
012	C - Possible	3 - Moderate	3 - Moderate	3 - Moderate	1 - Insignificant	2 - Minor	3 - Moderate	3 - Moderate	High	No clear inventory of materials for rehabilitation in current MOP or 2015 MCP	BHOP to provide detailed inventory of materials to include in updated RMP (informed by final EMM geochemical assessment)
013	C - Possible	2 - Minor	N/A	4 - Major	1 - Insignificant	3 - Moderate	N/A	4 - Major	High	No clear inventory of materials for rehabilitation in current MOP or 2015 MCP	BHOP to provide detailed inventory of materials to include in updated RMP (informed by final EMM geochemical assessment)
014	B - Likely	3 - Moderate	N/A	3 - Moderate	1 - Insignificant	3 - Moderate	N/A	3 - Moderate	Moderate	Need to identify alternate source of growth media that can be used to support vegetation, if/where required	Alternate growth media assessment (waste to soils)
015	D - Unlikely	3 - Moderate	N/A	3 - Moderate	1 - Insignificant	3 - Moderate	N/A	3 - Moderate	Moderate	Not applicable	Not applicable
016	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable	Not applicable
017	E - Rare	2 - Minor	2 - Minor	N/A	3 - Moderate	3 - Moderate	2 - Minor	2 - Minor	Moderate	Not applicable	Not applicable

REHABILITATION RISK BASED ON ADDITIONAL OR REVISED CONTROLS

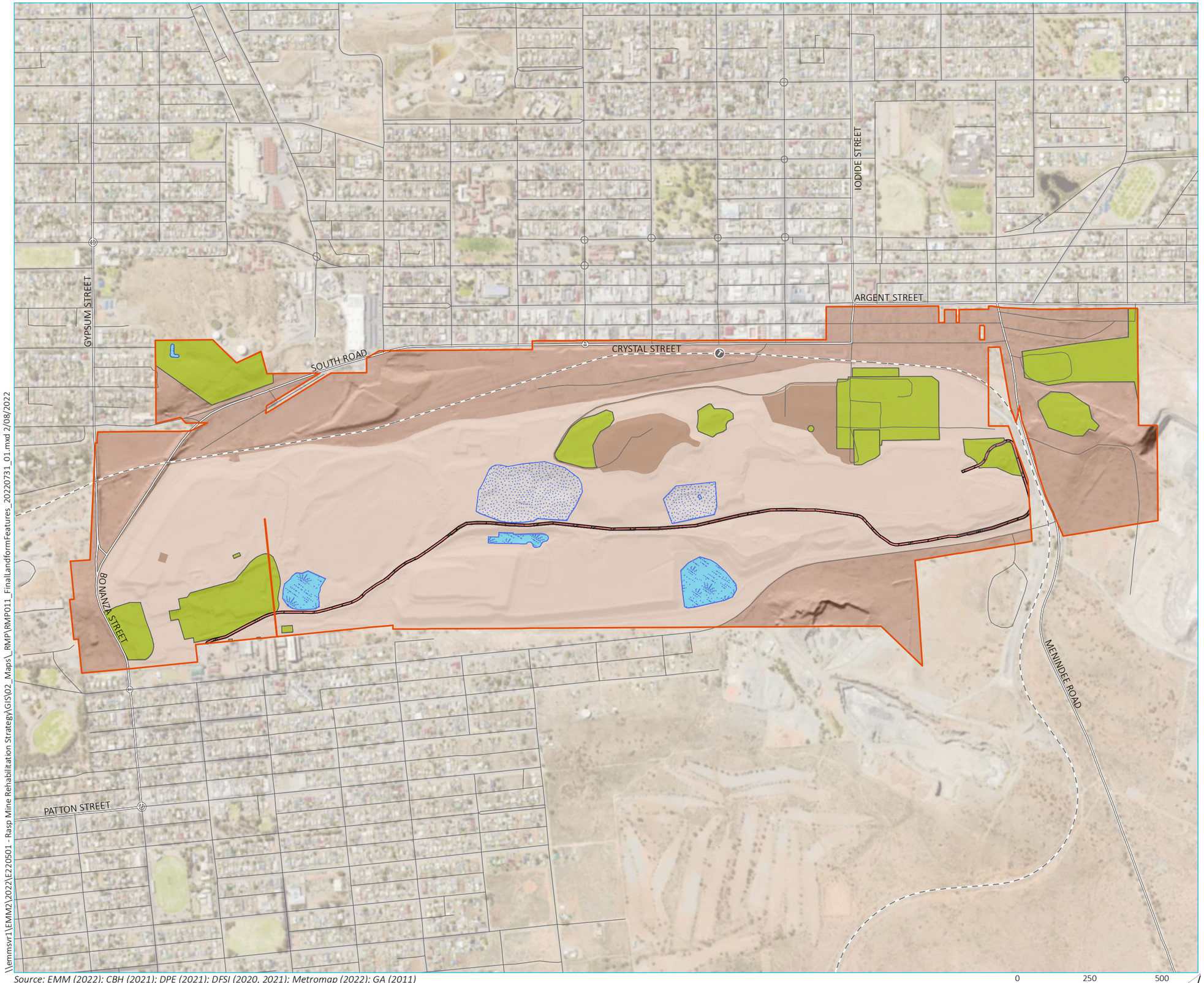
RISK #	Likelihood (L)	Impacted Area: Financial	Health & Safety	Environmental	Community Relations	Company Reputation	Security	Legal Compliance	Residual Risk Level (RRL)	Closure knowledge gaps	Uncertainties	Client Acceptance of Additional Risks / Uncertainties (does the Client accept this uncertainty - summarise/explain)	Path Forward (Agreed way forward for RMP)
001	E - Rare	2 - Minor	1 - Insignificant	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	1/ Erosional stability of final landforms based on the materials proposed for use as final cover (waste rock mulch) 2/ Have geotehcnical stability assessments already been done for legacy landforms (or will they be done) and who is responsible for managing this closure risk?	NSW RR may require evidence of geotechnical stability (safety) of legacy landforms	No - studies to be commissioned to address knowledge gaps	Erosion and landform design assessment, to include: * erosion material characterisation * erosion modelling (WEPP) * generation of landform design 'rules' and 3D final landform designs based on modelling. RMP will describe fate of WRE
002	E - Rare	2 - Minor	N/A	2 - Minor	N/A	2 - Minor	N/A	2 - Minor	Low	1/ Erosional stability of final landforms based on the materials proposed for use as final cover (waste rock mulch) 2/ No geotechical reports undertaken for long term closure plan only for TSF operational use 1/ Who is providing the final landform design for TSF2? Golder MOD6? 2/ Has this design considered surface water runoff, flooding, water retention and saturation/liquefaction risks?	Not applicable	No - studies to be commissioned to address erosion characterisation/landform design knowledge gap	Erosion and landform design assessment, to include: * erosion material characterisation * erosion modelling (WEPP) * generation of landform design 'rules' and 3D final * landform designs to refined modelling. * RMP will describe fate of TSF's * Lidar monitoring of TSF1 batter to determine if long term stable and if rock mulching is required
003	E - Rare	3 - Moderate	N/A	3 - Moderate	3 - Moderate	3 - Moderate	N/A	2 - Minor	Moderate	Not applicable	Not applicable	Not applicable	Not applicable
004	E - Rare	N/A	2 - Minor	2 - Minor	2 - Minor	2 - Minor	N/A	2 - Minor	Low	Not applicable	Not applicable	Not applicable	Not applicable
005	E - Rare	N/A	2 - Minor	2 - Minor	2 - Minor	2 - Minor	N/A	2 - Minor	Low	Not applicable	Not applicable	Not applicable	Not applicable
006	E - Rare	N/A	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Extent of NMD material (location, quanitity) and is unknown. Risk of metalliferous NMD drainage to surface and groundwater receptors post-closure is unknown	Not applicable	No - studies to be commissioned to address knowledge gaps	Complete updated geochemical characterisation to quantify location and quanitity of NMD material and ability to generate metalliferious drainage. Groundwater assessment and modelling (including solute transport modelling and seepage modelling of TSF capping scenarios) Surface water assessment and modelling
007	C - Possible	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	As per Risk # 006	Not applicable	As per Risk # 006	As per Risk # 006
008	E - Rare	N/A	N/A	N/A	3 - Moderate	1 - Insignificant	N/A	N/A	Low	Not applicable	Not applicable	Not applicable	Not applicable
009	D - Unlikely	3 - Moderate	1 - Insignificant	3 - Moderate	1 - Insignificant	1 - Insignificant	1 - Insignificant	3 - Moderate	Moderate	1/ Who is providing the final landform design for TSF2? 2/ Has this design considered surface water runoff, flooding, water retention and saturation/liquefaction risks?	Not applicable	TO BE DISCUSSED WITH BHOP	RMP to nominate geotech sign-off on TSF2 embankment as evidence of performance against completion criteria **ACTION: BHOP to advise EMM on plans (or otherwise) to obtain geotech sign-off on TSF embankment**
010	E - Rare	4 - Major	4 - Major	2 - Minor	2 - Minor	3 - Moderate	N/A	3 - Moderate	Moderate	Has any predictive modelling of future ground moverment (subsidence) been undertaken that has relevance to closure risk assessment?	Not applicable	Not applicable	RMP to refer to existing geotechnical subsidence assessments (if applicable) to demonstrate longer-term closure risk (low) as it relates to geotechnical stability of underground workings
011	E - Rare	1 - Insignificant	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Extent of NMD material (location, quanitity) and associated metalliferous drainage risk is unknown. No or incomplete rehabilitation material balance for underground and aboveground rehabilitation	Not applicable	No - studies to be commissioned to address knowledge gaps	* Complete updated geochemical characterisation to quantify location and quanitity of NMD material and ability to generate metalliferious drainage. * Map remediation works and disposal locations detailed in NML 2000.
012	C - Possible	3 - Moderate	3 - Moderate	3 - Moderate	1 - Insignificant	2 - Minor	3 - Moderate	3 - Moderate	High	No or incomplete rehabilitation material balance for underground and aboveground rehabilitation	Volume of waste rock required to complete backfill of underground workings and surface rehabilitation (waste rock mulch) Available volume of material to use	TO BE DISCUSSED WITH BHOP	TO BE DISCUSSED WITH BHOP
013	C - Possible	2 - Minor	N/A	4 - Major	1 - Insignificant	3 - Moderate	N/A	4 - Major	High	No or incomplete rehabilitation material balance for underground and aboveground rehabilitation	Volume of benign material to use for capping of deleterious materials (eg inert waste rock) Available volume of material to use	TO BE DISCUSSED WITH BHOP	TO BE DISCUSSED WITH BHOP
014	D - Unlikely	3 - Moderate	N/A	3 - Moderate	1 - Insignificant	1 - Insignificant	N/A	3 - Moderate	Moderate	Unknown sources (feedstock) within greater Broken Hill area available to generate alternate growth media	Unknown what alternate growth media will be used for if final landform does not involve any revegetation?	Not applicable	Not applicable
015	D - Unlikely	2 - Minor	N/A	3 - Moderate	1 - Insignificant	3 - Moderate	N/A	3 - Moderate	Moderate	Not applicable	Not applicable	Not applicable	Not applicable
016	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable	Not applicable	Not applicable	Not applicable
017	E - Rare	1 - Insignificant	1 - Insignificant	N/A	2 - Minor	2 - Minor	2 - Minor	1 - Insignificant	Low	Not applicable	Not applicable	Not applicable	Not applicable

Dust emissions from final landforms (lead dust)	Impacts on public (eg urban areas and site tourists), including: * Nuisance dust deposition * Exposure to lead dust	* Lack of vegetative cover on final landforms * Lack of alternative ground cover to minimise wind erosion	018	Yes	Placement of inert waste rock over areas, including areas around infrastructure, roads and other mining affected areas and 'free areas' that have potential for dust generation. Cover TSF2, TSF3 with suitable waste rockto enhance stability and suitably contain any potentially hazardous material minimising dust generation.	D - Unlikely	N/A	2 - Minor	2 - Minor	2 - Minor	2 - Minor	N/A	2 - Minor	Low	Not applicable	Assess effectiveness of rock mulch cover on final landforms to also mitigate water erosion	E - Rare	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Not applicable	Not applicable	Not applicable	Not applicable
Final landforms not safe and stable - harm or fatality to member of public	Harm or fatality to member of public	* geotechnical failure of final landforms (mass movement) * Geotechnical mass movement (subsidence/differential settlement) * Lack of fencing or other means to restrict access to at-risk areas	019	Yes	* pits to be back filled or partially backfilled - Little Kintore, Blackwoods, BHP * crest bunds installed where required on pits and dumps * stability assessments by in house geotechnical resources	B - Likely	4 - Major	1 - Insignificant	3 - Moderate	N/A	3 - Moderate	N/A	4 - Major	High	1/ Current MOP notes historic landforms (eg final voids and slopes) will be retained per historic mining character - no mention made of assessment for geotechnical stability and safety (this is only proposed for BHOP-generated landforms). 2/ MOP refers to re-shaping to achieve long-term stability but this seems focussed in geotechnical stability, with no consideration of erosional stability	Erosion and landform design assessment, to include: * erosion material characterisation * erosion modelling (WEPP) * generation of landform design 'rules' and 3D final landform designs based on modelling	E - Rare	2 - Minor	1 - Insignificant	2 - Minor	N/A	1 - Insignificant	N/A	1 - Insignificant	Low	Not applicable	Not applicable	Not applicable	Not applicable
Safety of retained final voids - harm or fatality to member of public	* Deliberate or inadvertent access to pit crests - slips/falls	* Lack of fencing, bunding or other means to restrict access to unsafe areas	020	Yes	* pits to be back filled or partially backfilled - Little Kintore, Blackwoods, BHP * crest bunds installed where required on pits and dumps * stability assessments by in house geotechnical resources	E - Rare	4 - Major	4 - Major	N/A	3 - Moderate	3 - Moderate	N/A	4 - Major	Moderate	Not applicable	Not applicable	E - Rare	4 - Major	4 - Major	N/A	3 - Moderate	3 - Moderate	N/A	4 - Major	Moderate	Not applicable	Not applicable	Not applicable	Not applicable
Safety of former underground workings - harm or fatality to member of public	* Deliberate or inadvertent access to shafts and portals by members of the public	* Lack of fencing or other means to restrict access	021	Yes	Sealing of all mine entries in accordance with State Government requirements Areas fenced to control access to unsafe areas. Documented Infrastructure Safety Plan.	E - Rare	4 - Major	4 - Major	N/A	3 - Moderate	3 - Moderate	N/A	4 - Major	Moderate	Not applicable	* map location of backfilled, capped, fenced shafts as detailed in NML 2000	E - Rare	4 - Major	4 - Major	N/A	3 - Moderate	3 - Moderate	N/A	4 - Major	Moderate	Not applicable	Not applicable	Not applicable	Not applicable
SURFACE WATER																													
The pre-project catchment hydrology cannot be reinstated	* Catchment and sub-catchment flows are permanently altered as a result of final landform changes; affecting downstream users and sensitive receptors; * Inability to satisfy approval conditions; * Inability to achieve relinquishment; * Final landforms permanently alter catchment and sub-catchment flows (ie. final landform designs do not consider pre-mining catchment hydrology); * Final landforms deliberately alter original catchments in order to manage other risks (eg final voids, permanent flood levees etc); * Adjoining land use changes not considered (cumulative impacts); * Inadequate staging plans - final hydrology not realised.	* Final landform design(s) do not integrate with, or do not adequately integrate with, site- and/or local hydrology (eg drainage lines, creeks etc)	022	Yes	Determine stormwater management requirements. Review current water storage structures and water flows and determine how water is to be redirected to pits and final water structures. Design final shape and drainage.	E - Rare	2 - Minor	N/A	2 - Minor	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options. **Site is highly modified and spatially constrained which limits ability for significant re-shaping to tie final landform into surrounding drainage lines. Likewise, site to be rehabilitated to a historical heritage PMLU which means most existing mining landforms will remain as they currently exist.** **Site generated runoff will have to be retained on-site and disposed underground.**	Closure surface water assessment to cover: * flooding/hydrology risks of final landforms * applicable surface water WQOs * integrated SW/GW assessment to address options for long-term SW disposal to underground workings	E - Rare	1 - Insignificant	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Not applicable	agrees that SW assessment needs to be undertaken	SW assessment to be undertaken
Ongoing impact on water quality in creeks and drainage lines downstream of rehabilitated areas	* Erosion and sediment runoff from rehabilitated areas; * Adverse impacts to downstream users and sensitive receptors (cumulative impacts); * Inability to satisfy approval conditions; * Inability to achieve relinquishment;	* Instability and erosion of rehabilitated landforms. * Major storm event. • Water management measures do not perform to plan. • Implemented solutions do not eliminate pollution. * Lack of knowledge of seepage issues. • Site is space constrained.	023	Yes	Removal of dirty water storages and associated contaminated material and dispose in underground voids and / or TSF2/TSF3 is completed. TSF2/TSF3 surface and shape, installation of control runoff areas where required (eg rock lined drains) to reduce likelihood of potential erosion. Structures to be non-eroding Rain water runoff quality meets agreed guidelines. Development of water management plan for closure Engage water specialist to design post mine water management - Water Closure Management Plan. Determine appropriate slopes to achieve required drainage (direction). Appropriate consideration to rainfall runoff in slope design. Determination if required of agreed (EPA) locally derived water quality objectives.	D - Unlikely	3 - Moderate	3 - Moderate	3 - Moderate	3 - Moderate	3 - Moderate	N/A	3 - Moderate	Moderate	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Closure surface water assessment to cover: * flooding/hydrology risks of final landforms * applicable surface water WQOs * integrated SW/GW assessment to address options for long-term SW disposal to underground workings * final landform design to maximise internal diversion of surface flows to evaporation ponds where possible	E - Rare	1 - Insignificant	1 - Insignificant	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Not applicable	agrees that SW assessment needs to be undertaken	SW assessment to be undertaken
Flood events result in damage to or loss of rehabilitated ground	* Unplanned rehabilitation/closure liability; * Inability to achieve relinquishment, or delays to relinquishment.	* Inadequate or no flood modelling;	024	Yes	Determine stormwater management requirements. Review current water storage structures and water flows and determine how water is to be redirected to pits and final water structures. Design final shape and drainage. Rock mulch armouring of final landforms and surfaces	E - Rare	2 - Minor	N/A	2 - Minor	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Closure surface water assessment to cover: * flooding/hydrology risks of final landforms * applicable surface water WQOs * integrated SW/GW assessment to address options for long-term SW disposal to underground workings	E - Rare	1 - Insignificant	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Not applicable	agrees that SW assessment needs to be undertaken	SW assessment to be undertaken
Water quality in retained water management structures not suitable to support PMLUs	* Unplanned rehabilitation/closure liability;	* Residual contaminated material in ponds and drains - not identified and removed during rehabilitation phase; * Ongoing sediment / contaminant inflows - inadequate erosion and sediment control system.	025	Yes	Determine stormwater management requirements. Review current water storage structures and water flows and determine how water is to be redirected to pits and final water structures. Design final shape and drainage. Removal of dirty water storages and associated contaminated material and dispose in underground voids and / or TSF2, TSF3 is completed.	E - Rare	3 - Moderate	2 - Minor	3 - Moderate	2 - Minor	2 - Minor	2 - Minor	3 - Moderate	Moderate	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Closure surface water assessment to cover: * flooding/hydrology risks of final landforms * applicable surface water WQOs * integrated SW/GW assessment to address options for long-term SW disposal to underground workings	E - Rare	1 - Insignificant	N/A	1 - Insignificant	1 - Insignificant	1 - Insignificant	N/A	1 - Insignificant	Low	Lack of detailed mine closure SW assessment addressing flooding, water quality objectives (WQOs) and long-term water management disposal options.	Not applicable	agrees that SW assessment needs to be undertaken	SW assessment to be undertaken
GROUNDWATER - LEVEL AND QUALITY																													
Groundwater levels do not return to regional levels (due to mounding) and adversely impacts future beneficial uses	* Altered groundwater flow regimes; * Undesired GW expression at surface down-gradient of site	* Tails water seepage causing groundwater mounding * Underground disposal (pump back) of surface water to manage SW risks	026	Yes	* GW generally very deep (≥100m depth) * Evaporation exceeds rainfall * groundwater data available * existing quality is low (saline, metals)	E - Rare	N/A	N/A	1 - Insignificant	N/A	N/A	N/A	1 - Insignificant	Low	No numerical (predictive) groundwater model exists for the site that can be used to assess long-term risks to groundwater receptors post-closure	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2 and capacity to mitigate metalliferous drainage risks)	E - Rare	N/A	N/A	1 - Insignificant	N/A	N/A	N/A	1 - Insignificant	Low	Lack of detailed mine closure GW assessment addressing groundwater levels and quality post-mining, and long-term seepage risks and performance of final covers on relevant landforms (eg TSF2)	Mine closure groundwater assessment and modelling for Rasp will need to consider groundwater affecting activities for the adjoining Perilya mine (ie take, plans for deep disposal etc). EMM scope and budget does not consider this.	No - studies to be commissioned to address knowledge gaps	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2)
Groundwater levels do not return to regional levels (due to drawdown during mining) and adversely impacts future beneficial uses	* Groundwater accessibility by third-party users is adversely affected as a result of groundwater drawdown - additional licensing and cost impacts;	* Lack of groundwater drawdown modelling/prediction - over-extraction of groundwater during mining phase; * Unintentional exceedance of abstraction limits in water licences or permits;	027	Yes	* GW generally very deep (≥100m depth) * Evaporation exceeds rainfall * groundwater data available * existing quality is low (saline, metals)	E - Rare	N/A	N/A	1 - Insignificant	N/A	N/A	N/A	1 - Insignificant	Low	No numerical (predictive) groundwater model exists for the site that can be used to assess long-term risks to groundwater receptors post-closure	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2 and capacity to mitigate metalliferous drainage risks)	E - Rare	N/A	N/A	1 - Insignificant	N/A	N/A	N/A	1 - Insignificant	Low	Lack of detailed mine closure GW assessment addressing groundwater levels and quality post-mining, and long-term seepage risks and performance of final covers on relevant landforms (eg TSF2)	Mine closure groundwater assessment and modelling for Rasp will need to consider groundwater affecting activities for the adjoining Perilya mine (ie take, plans for deep disposal etc). EMM scope and budget does not consider this.	No - studies to be commissioned to address knowledge gaps	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2)
Deleterious mine seepage/drainage into local aquifer and migration to groundwater and surface water receptors	* Adverse impacts to groundwater beneficial uses / GDEs er post-closure; * Groundwater contamination prevents future potential beneficial use(s).	* No or inadequate geocehmical characterisation of mining wastes (eg waste rock, overburden, tailings etc) * Inadequate placement and/or encapsulation of deleterious material within the final landform; * No or inadequate final cover/capping of deleterious material * No hydrogeological or geochemical investigations and modelling; * Leakage from existing storages eg S22;	028	Yes	Extensive geochemical assessments (waste rock characterisation by ERM and EMM) indicate negligible quantities of PAF material exist at-surface across the site. Limited understanding of location, quanitity and risk associated with NMD material and metalliferous mine drainage No controls currently proposed re: long-term management of material generating metalliferous drainage. Existing studis indicate GW migration is into the mine due to long-term extraction/draw-down	D - Unlikely	2 - Minor	N/A	2 - Minor	2 - Minor	2 - Minor	N/A	2 - Minor	Low	Extent of NMD material (location, quantity) and risk is unknown. Risk of metalliferous NMD drainage to surface and groundwater receptors post-closure is unknown	Geochemical mine waste characterisation to quantify the volume and extent of NMD material on site and risks Development of capping scenarios for long-term encapsulation of deleterious materials and validation of capping performance through seepage modelling	E - Rare	2 - Minor	N/A	2 - Minor	1 - Insignificant	1 - Insignificant	N/A	2 - Minor	Low	Lack of detailed mine closure GW assessment addressing groundwater levels and quality post-mining, and long-term seepage risks and performance of final covers on relevant landforms (eg TSF2) Extent of NMD material (location, quantity) and associated metalliferous drainage risk is unknown. No or incomplete rehabilitation material balance for underground and aboveground rehabilitation	Mine closure groundwater assessment and modelling for Rasp will need to consider groundwater affecting activities for the adjoining Perilya mine (ie take, plans for deep disposal etc). EMM scope and budget does not consider this.	No - studies to be commissioned to address knowledge gaps	Complete updated geochemical characterisation to quantify location and quanitity of NMD material and ability to generate metalliferous drainage. Groundwater assessment and modelling (including solute transport modelling and seepage modelling of TSF capping scenarios) Surface water assessment and modelling
Seepage from the tailings facilities or other storages to groundwater resulting in contamination (eg salinity, heavy metals)	* Adverse impacts to groundwater beneficial uses post-closure; * Groundwater contamination prevents future potential beneficial use(s).	* No hydrogeological or geochemical investigations and modelling; * Impacts on beneficial uses not assessed; * surface expression of groundwater associated with the tailings dams or other water storages eg S22 has previously occurred *	029	Yes	* GW generally very deep (≥100m depth) * Evaporation exceeds rainfall * groundwater data available * existing quality is low (saline, metals)	D - Unlikely	2 - Minor	N/A	2 - Minor	2 - Minor	2 - Minor	N/A	2 - Minor	Low	No numerical (predictive) groundwater model exists for the site that can be used to assess long-term risks to groundwater receptors post-closure	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2, TSF3 and capacity to mitigate metalliferous drainage risks)	D - Unlikely	3 - Moderate	N/A	3 - Moderate	2 - Minor	2 - Minor	N/A	3 - Moderate	Moderate	Lack of detailed mine closure GW assessment addressing groundwater levels and quality post-mining, and long-term seepage risks and performance of final covers on relevant landforms (eg TSF2, TSF 3)	Mine closure groundwater assessment and modelling for Rasp will need to consider groundwater affecting activities for the adjoining Perilya mine (ie take, plans for deep disposal etc). EMM scope and budget does not consider this.	No - studies to be commissioned to address knowledge gaps	Groundwater assssment and modelling to address: * predicted groundwater recovery post-mining (inc,. Consideration of water disposal in underground workings) * predicted groundwater quality post-mining * seepage modelling of final landform capping options (eg final cover on TSF2, TSF3)
HERITAGE																													
Heritage items not reinstated and protected at closure	* Non-compliance with statutory obligations; * Reputational impact.	* Inadequate record keeping * Inadequate maintenance * Accidental damage to heritage items	031	No	* Protection works undertaken by formers operators * Items donated to LOLA and museums by former operators * Conservation management plans and conservation management strategies prepared and implemented	C - Possible	2 - Minor	2 - Minor	N/A	3 - Moderate	3 - Moderate	N/A	2 - Minor	High	1/ Existing CMP (circa 2013) is outdated. 2/ Ongoing lack of direction from regulatory agency panel on site rehabilitation and heritage-related PMLUs 3/ Unclear who is proposed to 'take on' retained heritage structures post-mining	1/ Updated CMP (inc. heritage register) requried - needs to identify what structures will be retained, to inform rehabilitation strategy (tourism PMLU) 2/ Consult with government agency panel and propose a 'base case' to include in RMP, and seek their feedback	D - Unlikely	2 - Minor	2 - Minor	N/A	3 - Moderate	3 - Moderate	N/A	2 - Minor	Moderate	Who will take on retained heritage items/structures post-closure (as part of relinquishment)?	Not applicable	Formal consultation with relevant stakeholders has commenced	Ongoing dialogue with stakeholders, CMP is being updated

Heritage structures removed/destroyed, or retained heritage structures not maintained	* Non-compliance with historical heritage legislation * Reputational impact * Inability to achieve/support heritage-related PMLU	* No entity willing to take on the site assets/liability in particular due to maintenance costs * No legal mechanism for handing over responsibility * Unknown management requirements for heritage sites – demolition, dismantling, dilapidation surveys, retention. * Lack of knowledge of heritage obligations for the site	032	Yes	* Conservation Management Plan, including heritage sites register	C - Possible	2 - Minor	2 - Minor	N/A	3 - Moderate	3 - Moderate	N/A	2 - Minor	High	1/ Existing CMP (circa 2013) is outdated. 2/ Ongoing lack of direction from regulatory agency panel on site rehabilitation and heritage-related PMLUs 3/ Unclear who is proposed to 'take on' retained heritage structures post-mining	1/ Updated CMP (inc. heritage register) requried - needs to identify what structures will be retained, to inform rehabilitation strategy (tourism PMLU) 2/ Consult with government agency panel and propose a 'base case' to include in RMP, and seek their feedback	D - Unlikely	2 - Minor	2 - Minor	N/A	3 - Moderate	3 - Moderate	N/A	2 - Minor	Moderate	Who will take on retained heritage structures post-closure (as part of relinquishment)?	Not applicable	Formal consultation with relevant stakeholders has commenced	Ongoing dialogue with stakeholders, CMP is being updated
INFRASTRUCTURE																													
Retained infrastructure is inconsistent/incompatible with the intended final land use	* Unplanned cost to remove; * Unplanned rehabilitation/closure liability; * Inability to achieve relinquishment.	* Landform designs do not consider retained infrastructure; * Mine plans and closure plans do not consider retained infrastructure and land use compatibility; * Landowner/land manager/R&R agreement not obtained on infrastructure to be retained; * Formal landowner agreement not obtained regarding infrastructure to be retained; * Landowner does not accept the final condition of retained infrastructure at point of closure.	033	Yes	* Conservation Management Plan, including heritage sites register Relevant heritage structures to be retained post-mining to support proposed mine hertage related PMLU	D - Unlikely	4 - Major	N/A	N/A	3 - Moderate	3 - Moderate	N/A	N/A	High	1/ Existing CMP (circa 2013) is outdated. 2/ Ongoing lack of direction from regulatory agency panel on site rehabilitation and heritage-related PMLUs 3/ Unclear who is proposed to 'take on' retained heritage structures post-mining	1/ Updated CMP (inc. heritage register) requried - needs to identify what structures will be retained, to inform rehabilitation strategy (tourism PMLU) 2/ Consult with government agency panel and propose a 'base case' to include in RMP, and seek their feedback	E - Rare	2 - Minor	N/A	N/A	3 - Moderate	2 - Minor	N/A	N/A	Moderate	**Who will take on retained heritage structures post-closure (as part of relinquishment)?** **Which structures will remain to support heritage PMLU?**	Not applicable	Formal consultation with relevant stakeholders has commenced	Ongoing dialogue with stakeholders, CMP is being updated
SITE CONTAMINATION																													
Residual site contamination not removed/remediated prior to mine closure	* Contamination prevents or limits the intended final land use; * Non-compliance with environmental protection legislation, policies and NEPM for site contamination; * Residual contamination results in surface water or groundwater contamination; * Unexpected cost to manage/treat contaminated material; * Delays to closure and relinquishment; * Unplanned rehabilitation/closure liability.	* Types and locations of known and potential site contamination not identified, tested and removed/remediated prior to mine closure; * Hostile tailings material, PAF, rejects material etc not appropriately disposed at depth/capped as part of mine planning and landform construction/reinstatement; * No or inadequate remediation;	034	Yes	MOP (pg 103) - Inspection and removal of contamination associated with BHOP mining activities	D - Unlikely	4 - Major	2 - Minor	3 - Moderate	3 - Moderate	3 - Moderate	N/A	3 - Moderate	High	Not applicable	Post-excavation validation sampling progRam to confirm all validated material has been removed	D - Unlikely	3 - Moderate	2 - Minor	3 - Moderate	3 - Moderate	3 - Moderate	N/A	3 - Moderate	Moderate	Not applicable	Not applicable	Not applicable	Not applicable
CLIMATE CHANGE																													
Droughts and climate change	* Delays to rehabilitation establishment; * Loss of establishing rehabilitation (native vegetation, crops and pasture); * Unplanned rehabilitation/closure liability; * Inability to achieve, or delays to, mine relinquishment.	* Revegetation is not mature / resilient to extended dry conditions; * Lack of watering/irrigation programs (rehabilitation maintenance) during establishment phase resulting; * over-watering impedes hardening of reveg; * Inadequate soil/growth media preparation.	035	No	MOP identifies lack of soil resource (resource does not exist) - rehabilitation of native vegetation is not possible or proposed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable	Not applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable	Not applicable	Not applicable	Not applicable

Appendix C
Landforms and rehabilitation plans

EMM
creating opportunities



KEY

- MINERALS - CURRENT TITLES
- Train station
- Rail line
- Major road
- Minor road

Final land use domain

- Final void
- Heritage area
- Infrastructure
- Water management areas
- Other - mining landscape
- Other - other users

\\emmsvr1\EMM2\2022\E220501 - Rasp Mine Rehabilitation Strategy\GIS\02_Maps_RMP\RMP011_FinalLandformFeatures_20220731_01.mxd 2/08/2022

Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

0 250 500 m

GDA2020 MGA Zone 54

Final landform features (Plan 1)

Rasp Mine
Rehabilitation Management Plan
Appendix C.1

EMM
creating opportunities

KEY

- MINERALS - CURRENT TITLES
- Train station
- Rail line
- Major road
- Minor road
- 1 m contour interval

Final land use domain

- Final void
- Heritage area
- Infrastructure
- Water management areas
- Other - mining landscape
- Other - other users

\\emmsvr1\EMM2\2022\E220501 - Rasp Mine Rehabilitation Strategy\GIS\02_Maps_RMP\RMP012_FinalLandformContours_20220731_01.mxd 2/08/2022

Source: EMM (2022); CBH (2021); DPE (2021); DFSI (2020, 2021); Metromap (2022); GA (2011)

Final landform contours (Plan 2)

Rasp Mine
Rehabilitation Management Plan
Appendix C.2

EMM
creating opportunities

Australia

SYDNEY
Ground floor 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 8.03 Level 8
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
Suite 9.02 Level 9
109 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO
2345 Younge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER
60 W 6th Ave Suite 200
Vancouver BC V5Y 1K1
T 604 999 8297

linkedin.com/company/emm-consulting-pty-limited

emmconsulting.com.au