



# REHABILITATION REPORT

## 1 February 2019 to 31 January 2020

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Mt Boppy Gold Mine  
Canbelego NSW

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# Rehabilitation Report

## Mt Boppy Gold Mine

1 February 2019 to 31 January 2020

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## TITLE BLOCK

<b>Name of Mine</b>	Mt Boppy gold mine
<b>MOP Commencement Date</b>	31 October 2019
<b>MOP Completion Date</b>	31 October 2021
<b>Mining Authorisations</b>	ML311, ML1681, MPL240, GL3255, GL5836, GL5848, GL5898
<b>Name of Authorisation holders</b>	Manuka Resources Ltd
<b>Name of Mine Operator (if different)</b>	n/a
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<b>Signature of Representative(s) of the Authorisation Holder(s)</b>	
	<b>Date</b>
	<b>Version 1</b>

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## FOREWORD

This Rehabilitation Report for the Mt Boppy Gold Mine has been prepared by Manuka Resources Pty Ltd (“the Company” or “Manuka Resources”). Manuka Resources Pty Ltd, is the owner and operator of the Mt Boppy Gold Mine (the ‘Mine’). The Mine is located approximately 275 kilometres (km) west-north-west of Dubbo and 48 km east of Cobar, adjacent to the township of Canbelego in New South Wales (NSW) (refer to **Figure 1**).

The site was historically worked as an underground mine from 1901 to 1923, and in its day was one of the largest gold producers in Australia, having produced around 500,000 ounces (oz.). The 100 years of historical operations resulted in a series of surface tailings storage facilities, a relatively small open-cut void, process plant and other ancillary equipment remaining on the site. The Mt Boppy site was purchased from Epoch Minerals in 1993 by Polymetals Pty Ltd and used for the treatment of silver and gold-bearing supergene tailings transported from the Pasmenco-owned Elura Mine. In 2002, Polymetals were granted the rights to recommence mining works, converting the site from an underground to an open cut operation. Polymetals produced around 70,000 oz. of gold from approximately 500,000t of ore up until 2006 when operations were placed on hold and care and maintenance activities were implemented. Ore processing infrastructure was removed from the site during this time, with the exception of the crusher plant which was refurbished and recommissioned by Black Oak Minerals (BOML, parent of Polymetals) in early 2015. Mining recommenced in mid-2015 under Black Oak Minerals, who extracted ore which was sent to the nearby Manuka Silver Mine for processing until Black Oak Minerals (then owner of Manuka mine) entered receivership in December 2015. The Mine was subsequently sold to Mt Boppy Resources Pty Ltd (a wholly owned subsidiary of Manuka Resources Limited) in June 2019. Since 2016, extensive improvements have been made to the surface water management systems with earthworks improvements as directed by NSW EPA. Additional mine plan studies and reviews were undertaken by the Manuka Resources to recommence operations and processing at the Manuka plant (Manuka Silver Project) south of Cobar. Essentially the mining and processing strategy as started by BOML, will be continued by the current owner albeit at a reduced scale.

This Rehabilitation Report has been prepared in accordance with the Condition 3 (f) of Transfer Approvals dated 16 December 2016, of the subject Mining Authorisations. The report follows the format and content requirements identified in Environmental Management Guidelines for Industry: The Annual Environmental Management Report (last updated January 2006) prepared by NSW Department of Primary Industries – Mineral Resources.

This Rehabilitation Report (formerly known as the Annual Environmental Management Report or AEMR) for the Mt Boppy Gold Mine is applicable for the period 1 February 2019 to 31 January 2020 (the “Reporting Period”).

**FOREWORD ..... I**

**LIST OF ACRONYMS..... V**

**1. INTRODUCTION..... 6**

1.1 CONSENTS, LEASE, LICENCES AND PERMITS..... 6

1.2 MINE CONTACTS ..... 9

1.3 ACTIONS REQUIRED FROM REHABILITATION REPORT REVIEW MEETING..... 10

**2. OPERATIONS DURING THE REPORTING PERIOD..... 10**

2.1 EXPLORATION ..... 10

2.2 LAND PREPARATION..... 10

2.3 CONSTRUCTION ..... 11

2.4 MINING ..... 11

2.5 MINERAL PROCESSING ..... 11

2.6 WASTE MANAGEMENT ..... 12

2.6.1 Non-Production Waste ..... 12

2.6.2 Production Waste..... 13

2.7 ORE AND PRODUCT STOCKPILES ..... 14

2.8 WATER MANAGEMENT ..... 14

2.9 HAZARDOUS MATERIAL MANAGEMENT ..... 16

2.10 OTHER INFRASTRUCTURE MANAGEMENT ..... 16

**3. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE ..... 17**

3.1 METEOROLOGICAL MONITORING..... 17

3.2 AIR POLLUTION..... 18

3.2.1 Environmental Management ..... 18

3.2.2 Environmental Performance ..... 18

3.2.3 Reportable Incidents ..... 19

3.2.4 Further Improvements..... 19

3.3 EROSION AND SEDIMENTATION ..... 19

3.3.1 Environmental Management ..... 19

3.3.2 Environmental Performance ..... 19

3.3.3 Reportable Incidents ..... 20

3.3.4 Further Improvements..... 20

3.4 SURFACE WATER POLLUTION ..... 21

3.4.1 Environmental Management ..... 21

3.4.2 Environmental Performance ..... 21

3.4.3 Reportable Incidents ..... 21

3.4.4 Further Improvements..... 21

3.5 GROUNDWATER POLLUTION..... 22

3.5.1 Environmental Management ..... 22

3.5.2 Environmental Performance ..... 22

3.5.3 Reportable Incidents ..... 22

3.5.4	Further Improvements.....	22
3.6	CONTAMINATED AND/OR POLLUTED LAND .....	23
3.6.1	Environmental Management .....	23
3.6.2	Reportable Incidents .....	23
3.6.3	Further Improvements.....	23
3.7	THREATENED FLORA AND FAUNA.....	23
3.7.1	Environmental Management .....	23
3.7.2	Environmental Performance .....	24
3.7.3	Reportable Incidents .....	24
3.7.4	Further Improvements.....	24
3.8	WEEDS.....	24
3.8.1	Environmental Management .....	24
3.8.2	Environmental Performance .....	24
3.8.3	Reportable Incidents .....	24
3.9	BLASTING .....	25
3.10	OPERATIONAL NOISE .....	25
3.11	VISUAL AMENITY AND STRAY LIGHT .....	25
3.12	ABORIGINAL AND NATURAL HERITAGE .....	26
3.13	SPONTANEOUS COMBUSTION .....	26
3.14	BUSHFIRE.....	26
3.15	MINE SUBSIDENCE.....	27
3.16	HYDROCARBON CONTAMINATION .....	27
3.16.1	Environmental Management .....	27
3.16.2	Environmental Performance .....	27
3.16.3	Reportable Incidents .....	27
3.16.4	Further Improvements.....	27
3.17	METHANE DRAINAGE / VENTILATION .....	28
3.18	PUBLIC SAFETY .....	28
3.19	OTHER ISSUES AND RISKS.....	28
<b>4.</b>	<b>COMMUNITY RELATIONS .....</b>	<b>28</b>
4.1	ENVIRONMENTAL COMPLAINTS .....	28
4.2	COMMUNITY LIAISON.....	28
<b>5.</b>	<b>REHABILITATION .....</b>	<b>29</b>
5.1	BUILDINGS.....	29
5.2	REHABILITATION OF DISTURBED LAND .....	29
5.2.1	Domain 1 – Infrastructure Area .....	31
5.2.2	Domain 2 – Tailings Storage Facility .....	31
5.2.3	Domain 3 – Water Management Area .....	31
5.2.4	Domain 4 – Overburden Emplacement Areas .....	31
5.2.5	Domain 5 – Stockpiled Material .....	31
5.2.6	Domain 6 – Open cut Voids .....	31
5.3	REHABILITATION TRIALS AND RESEARCH .....	33

5.4	FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN.....	33
<b>6.</b>	<b>ACTIVITIES FOR NEXT REPORTING PERIOD .....</b>	<b>33</b>
6.1	PROPOSED ACTIVITIES .....	33
6.2	EXPLORATION .....	34
6.3	CONSTRUCTION .....	34
6.4	MINING .....	34
6.5	REHABILITATION .....	35
6.5.1	Domain 1 – Infrastructure Area.....	35
6.5.2	Domain 2 – Tailings Storage Facility .....	36
6.5.3	Domain 3 – Water Management Area.....	36
6.5.4	Domain 4 – Waste Rock Emplacement Areas. ....	36
6.5.5	Domain 5 – Stockpiled Material.....	37
6.5.6	Domain 6 – Open Cut Voids.....	37
6.5.7	General Site and Revegetation .....	37

## FIGURES

Figure 1: Locality Plan.....	7
Figure 2: Mt Boppy Mine – Current Layout .....	<b>Error! Bookmark not defined.</b>
Figure 3: Historical Average Dust Deposition Data 2007 – 2016.....	18
Figure 4: North western wall of TSF.....	19
Figure 5: Northern side of TSF embankment. ....	20
Figure 6: Existing disturbance and rehabilitation status by Domains.....	30

## TABLES

Table 1: Mt Boppy tenements. ....	6
Table 2: Non Production Waste Management .....	13
Table 3: Production and Waste Volume Summary .....	15
Table 4: Waste Rock Volumes per Sulphur Percentage and Characterisation .....	14
Table 5: Existing stored water quantities.....	15
Table 6: Rainfall (mm) Total 2010 to 2019 Mt Boppy.....	17
Table 7: Rehabilitation Summary .....	32
Table 8: Maintenance Activities on Rehabilitated Land .....	32

## LIST OF ACRONYMS

AEMR	Annual Environmental Management Report
bgl	Below Ground Level
DA	Development Approval
DRE	Division of Resources and Energy
EL	Exploration Licence
ESCP	Erosion and Sediment Control Plan
EPA	NSW Environment Protection Authority
MBR	Mt Boppy Resources Pty Ltd
ML	Mining Lease
MOP	Mining Operations Plan
PAF	Potentially Acid Forming
RL	Relative Level
RO	Reverse Osmosis
ROM	Run-of-Mine
TSF	Tailings Storage Facility
WRE	Waste Rock Emplacement

# 1. INTRODUCTION

## 1.1 CONSENTS, LEASE, LICENCES AND PERMITS

The Mt Boppy Gold Mine (“the mine”) is located approximately 275 kilometres (km) west-north-west of Dubbo and 48 km east of Cobar, adjacent to the township of Canbelego in New South Wales (NSW) (refer to **Figure 1**).

The mine is comprised of seven mining tenements: GL3255, GL5836, GL5848, GL5898, ML311, MPL240 and ML1681 (see **Table 1**). **Figure 2** shows these tenements held by Mt Boppy Resources Pty Ltd (a wholly owned subsidiary of Manuka Resources Limited) along with the general layout of the mining area.

**Table 1:** Mt Boppy Gold Mine tenements.

LEASE	AREA (HA)	GRANT DATE	STATUS	EXPIRY	REGISTERED HOLDER
GL <sup>1</sup> 3255	8.281	20 May 1926	Granted	20 May 2033	MBR
GL 5836	6.045	15 June 1965	Granted	15 June 2033	MBR
GL 5848	8.625	15 February 1968	Granted	15 June 2033	MBR
GL 5898	7.512	21 June 1972	Granted	12 December 2033	MBR
ML <sup>3</sup> 311	10.117	8 December 1976	Granted	12 December 2033	MBR
MPL <sup>4</sup> 240	17.8	17 January 1986	Granted	12 December 2033	MBR
ML 1681	188.1	12 December 2012	Granted	12 December 2033	MBR

<sup>1</sup> Gold Lease

<sup>3</sup> Mining Lease

<sup>4</sup> Mining Purposes Lease

Each mine operator in NSW is required to develop and implement a Mining Operations Plan (MOP). The MOP documents the site activities, with reference to best mining practices and the holder’s progress towards the required environment and rehabilitation outcomes. The current MOP for the Mt Boppy Mine addresses the activities for the operational mine phase for the period 31 October 2019 to 31 October 2021.

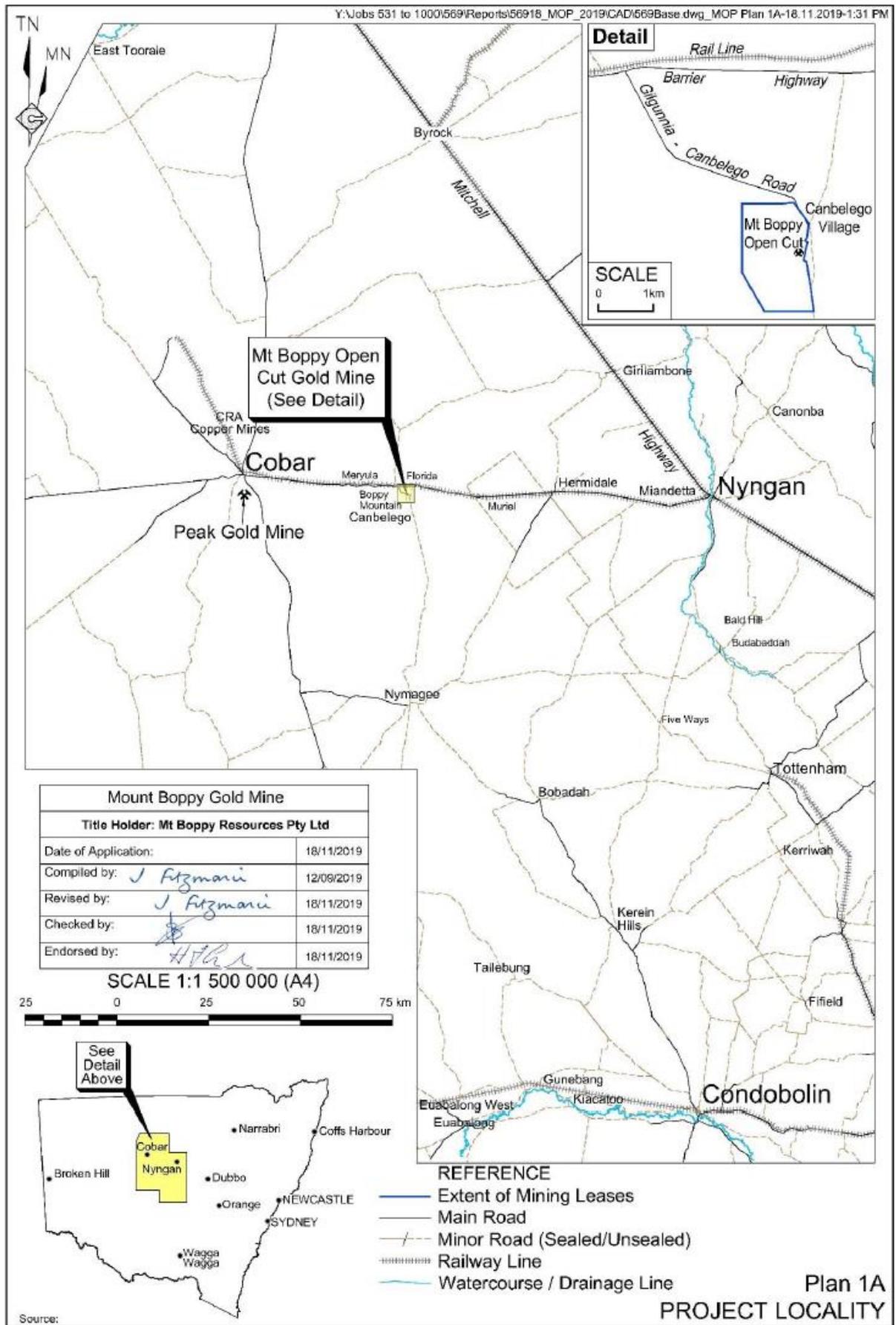


Figure 1: Locality Plan

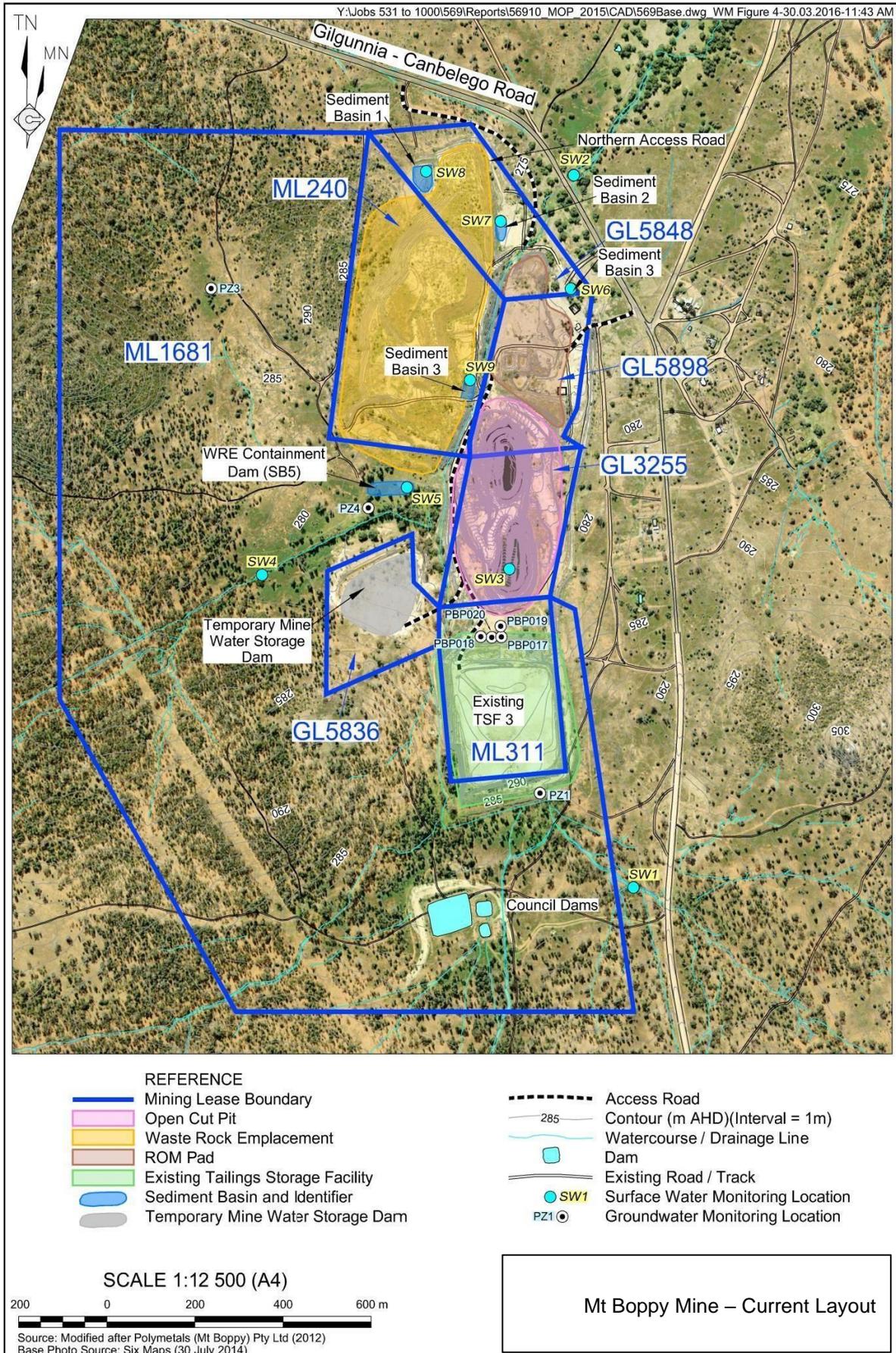


Figure 2: Mt Bopy Mine – Current Layout

**Development Consent DA 2011/LD-00070REV1.**

DA 2011/LD-00070REV1 was granted by Cobar Shire Council on 27 July 2015. This consent is for the extension and operation of the mine including mining of approximately 630,000t of ore, management of potentially acid forming waste rock, transportation of ore to the Manuka Mine, construction of temporary mine water storage dams and 24 hour 7 days per week operations.

DA 2012/LD-00034 was granted by Cobar Shire Council on 22 November 2012. This consent is for the expansion of the off-lease mining camp.

**Environmental Protection Licence (EPL) 20192**

Issued by the NSW EPA under the *Protection of the Environment Operations Act 1997*, the current version of EPL 20192 is dated 20 February 2019. This recent variation was made to reflect the improvements made at site to the surface water management and the fact the site is currently non-operational. The scheduled activities under this EPL remain unchanged at:

- Crushing, grinding or separating (>100,000t – 500,000t);
- General chemical storage (0-5000kL storage capacity);
- Metal processing (>100,000t – 500,000t);
- Mineral processing (>100,000t – 500,000t); and
- Mining for minerals (>100,000t – 500,000t).

**Water Access Licences**

Extraction of groundwater at Mt Boppy Mine is carried out in accordance with two Groundwater Licence conditions:

- Work Approval Number 85WA75612: Issued by the (then) NOW for the water supply works associated with three water supply bores within Lot 7301 DP 1170536.
- Work Approval Number 85WA753524: Issued by the (then) NOW for the water supply works associated with excavation of the open cut pit.

**1.2 MINE CONTACTS**

Mr Haydn Lynch is appointed Chief Operating Officer of Manuka Resources and is responsible for the overall environmental and operational performance of the mine during its ownership by Manuka Resources.

Mr Craig Fittock is the appointed Site Manager and is responsible for the everyday activities on the mine site and achievement of the nominated and conditioned operational and environmental goals for the mine.

The contact details for the mine are as follows:

Postal Address:	Manuka Resources Ltd P.O. Box 273 Cobar NSW 2835	Physical Address:	Mt Boppy Mine Canbelego NSW 2835
Phone:	0421 370 902		
Email:	hlynch@manukaresources.com.au		

### 1.3 ACTIONS REQUIRED FROM REHABILITATION REPORT REVIEW MEETING

The previous Rehabilitation Report was lodged by Mt Boppy Resources Pty Ltd in February 2019. A site inspection was held on 16 January 2019 by the Resources Regulator, attended by Amy McKenzie and Chloe Bigg. An Inspection Outcome letter was issued on 19 February 2019 and provided the below 4 key observations for our consideration.

- **Observation 1:** Erosion identified along the watercourse that intersects the site. An access road crossing has been washed out between the ROM and the Waste Rock Emplacement. Sediment fencing not maintained across the site.
- **Observation 2:** A breach of the diversion bund between the watercourse and the pit has occurred with evidence of water flow to the pit.
- **Observation 3:** Pests (goats) and weeds (tobacco bush) observed in active rehabilitation areas.
- **Observation 4:** Some positive results from endemic seed collection and germination methods on batters of waste rock emplacement areas.

All wash out damage has been rectified as per the concerns raised during these observations and spot spraying of Tobacco Bush has taken place during the reporting period. This is an ongoing and labour-intensive program to get on top of and eradicate this aggressive pest species. It is a key priority over the new reporting period as we prepare for footprint reduction and rehabilitation into the near future. Irrigation of the WRE over the coming reporting periods will help to support the positive results from endemic seed collection and germination in this area.

## 2. OPERATIONS DURING THE REPORTING PERIOD

### 2.1 EXPLORATION

No exploration activities were carried out within the Mt Boppy Gold Mine tenements during the reporting period. There are limited exploration activities forecast for the 2020-2021 period.

### 2.2 LAND PREPARATION

Ongoing monitoring and maintenance of drainage works and minor rehabilitation have occurred on existing disturbed areas only.

The waste rock and soil material that has been previously extracted on the site, has been placed as follows with rehabilitation planning in mind:

- The waste rock has been placed within the WRE, used in the formation of the ROM pad, or placed on the perimeter of TSF 3 in readiness for capping of PAF material. Approximately 10,200t of weathered overburden material has also been stockpiled on the WRE and will be recovered to supplement the soil material as a growth medium.
- The currently recovered soil material and weathered overburden will provide sufficient material to apply a 50mm depth of growth medium across the final WRE, capped TSF 3 and ROM pad (total area of 34.2ha). Remaining soil and weathered overburden will be spread across selected

infrastructure areas. It is noted that much of the infrastructure area already comprises a base of weathered material / soil which, with appropriate treatment, will provide an adequate growth medium.

No further soil material is expected to be recovered during this, or future, reporting periods, with the exception of the second temporary mine water storage dam which may be constructed to the west of the WRE. Should this dam be constructed, the soil material will be selectively stripped and stockpiled for replacement following decommissioning of the dam. The timing for construction of the dam and ultimate sizing of the dam will be dependent on weather conditions.

## **2.3 CONSTRUCTION**

There were no construction works carried out during the reporting period.

Significant surface earthworks were conducted in the 2016-17 period and reported in 2016-17 Rehabilitation Report. Full details are provided in Appendix A of the 2016-2017 AEMR with major items noted below.

- The existing evaporation dam was improved with the clay lining being repaired after the base of the dam was cleaned out and walls reprofiled.
- Three raised causeways were removed, two of which were reconstructed to bed level crossings and the other to a stabilised pipe culvert crossing.
- Repair of bunds and reconstruction of all dirty and contaminated drains.

All construction activities occurred on previously disturbed areas.

## **2.4 MINING**

No mining activities were conducted during the Rehabilitation Report reporting period. Operations are scheduled to recommence in early 2020 and be completed before the end of the reporting period.

Once mining operations cease, key operational activities will involve transportation of ROM ore from the ROM pad and rehabilitation.

## **2.5 MINERAL PROCESSING**

The mineral processing plant was decommissioned and removed from site prior to 2015 with crushing the only form of processing undertaken before ore was transported to the Manuka mine in 2015.

The suspension of the EPL at the Manuka 'Wonawinta' site in 2016 prevented the advancement of the Mt Boppy project. The EPL suspension and transfer of licence into the site owners name (Manuka Resources Ltd) was completed in late 2018 and as such Mt Boppy Resources were in a position to continue to develop an appropriate development strategy at the Mt Boppy mine over 2019.

During the reporting period, the crushing of existing ore stockpiles was re-established, with the introduction of a mobile crushing plant. This crushed material was then hauled to the Wonawinta mine site.

This process will continue in the new reporting period in order to process the ore to be mined from the open pit. ROM ore will be crushed on-site, however, further processing and liberation of gold will be

undertaken off site at the Manuka ‘Wonawinta’ Mine. Therefore, as no mineral processing is proposed to be undertaken on site, no process residues or tailings will be generated.

The existing TSF 3 will be utilised for the storage of ‘increased risk’ PAF material (>1% S) prior to capping with NAF material. As TSF 3 has been constructed for the management of PAF tailings material, the placement of ‘increased risk’ PAF waste rock within the existing TSF 3 will consolidate all ‘increased risk’ materials in one location. The existing tailings will also restrict the passage of oxygen to the base of the PAF material, which will be limed at the highly conservative rate of 30t/ha and subsequently clay capped, covered with NAF material and rehabilitated similarly to the PAF encapsulation area within the WRE.

## 2.6 WASTE MANAGEMENT

Waste generated at the Mt Boppy Gold Mine falls within two defined categories:

- Non-Production waste; or
- Production waste.

Both waste streams are consistent with details provided in the MOP.

### 2.6.1 Non-Production Waste

Waste management processes have been improved during the reporting period as a result of site activities ramping up.

Non-production waste generated during this report period was collected at the Mine and removed for disposal or recycling by a suitable qualified contractor. **Table 2** presents the non-production waste and describes how each class of waste is stored and subsequently removed from the Mine.

Table 2 **Non-Production Waste Management**

WASTE TYPE	STORAGE / MANAGEMENT	REMOVAL / DISPOSAL
General waste (including food scraps)	Covered bins or skips are located at lunch areas, offices, outside workshops and elsewhere as required. Where these bins are located in open areas, they are fitted with animal proof lids.	Collected on a regular basis by a licensed contractor and transported to the Cobar Waste Disposal Facility for disposal.
General Recyclables	Covered bins or skips are located at lunch areas, offices, outside workshops and elsewhere as required. Where these bins are located in open areas, they are fitted with animal proof lids.	Collected on a regular basis by a licensed contractor and transported to a licensed recycling facility in Dubbo.

WASTE TYPE	STORAGE / MANAGEMENT	REMOVAL / DISPOSAL
Waste Oils and Greases	Placed within the bunded tank within the workshop area. Where required, smaller, temporary storage containers are positioned in work areas, with the contents of those containers then transferred to the large storage tank.	Collected on an as needs basis by a licensed contractor and transported to an appropriately licensed facility for recycling.
Batteries	Placed within a covered and marked used battery storage area until removed from the Mine.	Collected on an as needs basis by a licensed contractor and transported to an appropriately licensed facility for recycling.
Tyres	Placed within a marked used tyre storage area until removed from site.	Tyres are disposed of at a licensed waste management facility or removed by a third part approved to recycle tyres.
Scrap Metal	Stored in a specified area within the workshop area, or elsewhere, as required.	Collected on an as needs basis by a scrap metal recycler.
Wastewater	Treated in the on-site Sewage Treatment Plant.	The on-site system is pumped out by a licensed contractor on an as needs basis.

## 2.6.2 Production Waste

No mining of waste rock has occurred during the reporting period.

**Table 3** summarises the production and estimated mine waste quantities during the reporting period and expected volumes during the next reporting period subject to operations commencing this year.

Table 3: **Production and Waste Volume Summary**

	Start of Reporting Period 1 February 2019	End of Reporting Period 1 February 2020	Predicted for End of Next Reporting Period 1 February 2020
<b>Topsoil Stockpiled (t)</b>	9,900	9,900	9,900
<b>Topsoil Used/Spread (t)</b>	2,200	2,200	3,500
<b>Waste Rock (bcm)</b>	2,651,590 (t)	343,542	218,280
<b>Ore (bcm)</b>	268,860	263,207	146,521
<b>Processing Waste (t)</b>	251,709	190,000	190,000

Waste characterisation testing completed to date confirms that a proportion of the waste rock is classified as PAF. PAF material will be encountered once mining reaches depths of approximately 50m to 60m

below ground level. **Table 4** presents the results of a block model used to predict the volume of waste rock at varying sulphur percentages, the characterisation of that material and where it will be placed.

**Table 4: Waste Rock Volumes per Sulphur Percentage and Characterisation**

S%	VOLUME (BCM)	TONNES	CHARACTERISATION	PLACEMENT
0 to 0.1	7,907	19,477		
0.1 to 0.2	8,259	21,040	NAF	WRE
0.2 to 0.3	11,406	29,886	NAF	WRE
0.3 to 0.4	10,541	27,654	PAF – moderate risk	WRE – encapsulated
0.4 to 0.5	11,957	31,267	PAF – moderate risk	WRE – encapsulated
0.5 to 1	126,599	338,242	PAF – moderate risk	WRE – encapsulated
>1	50,175	134,445	PAF – increased risk	TSF 3
<b>Total</b>	<b>226,844</b>	<b>602,010</b>		

Waste rock material with total sulphur content greater than 1% (~51 000BCM - down to 165mRL) is considered to be 'increased risk' material and will be placed within the existing TSF 3 structure prior to capping. The remaining 'moderate risk' PAF material with total sulphur content between 0.3% and 1% (~149,000 bcm) will be placed within specially designed sections of the WRE. Waste rock will be placed in lifts onto the WRE and shaped by bulldozer to the design slopes. The remaining ~28,000 bcm of waste rock is considered non-acid forming (NAF), as shown in **Table 4** above.

## 2.7 ORE AND PRODUCT STOCKPILES

No mining occurred during the reporting period; therefore, no new ore stockpiles were created.

The crushing of existing ore stockpiles was re-established, with the introduction of a mobile crushing plant. This crushed material was then hauled to Manuka's Wonawinta mine site. Approximately 15,000 tonnes of stockpiled ore was removed from site during the reporting period.

## 2.8 WATER MANAGEMENT

The objectives for the management of surface water, erosion, sedimentation and pollution at the Mt Boppy Gold Mine are as follows.

- To ensure the segregation of "dirty" and "contaminated" water from "clean" water, with dirty and contaminated water directed to and detained in the appropriate water management structures.
- To maximise the use of dirty water for dust suppression in order to minimise the need for discharge.
- To prevent discharge of contaminated water, other than by controlled irrigation to appropriately contained catchments to increase evaporative losses and eliminate the need for treatment and discharge.
- To monitor the effectiveness of surface water controls and ensure all relevant water quality criteria are met.

Water management over the reporting period involved the dewatering activities of the Open Pit, and the consequent storage in the Water Storage Dam.

**Table 5** provides a summary of volumes of water stored at the start and end of the reporting period as well as the total storage capacity.

Table 5: Existing stored water quantities

	Volumes Held (ML)		
	Start of Reporting Period	End of Reporting Period	Storage Capacity
Temporary Mine Water Storage Dam	0 ML	30 ML	51.5 ML
Open Cut Pit	~ 350 ML	~ 200 ML	~ 700+ ML (unknown quantity)

As preparations for the recommencement of mining operations 2020 began towards the end of the reporting period, pit dewatering activities began to take place intermittently from November 2019 through to January 2020 and are ongoing with completion expected in March 2020. The open pit has filled with water over the past 3 years since it was previously pumped dry by previous mine operators. There was approximately 350 Mega litres to dewater in total.

An independent environmental assessment was carried out in September and October 2019 to assess the dewatering options and test the quality of the water. Detailed inspections of the Mt Boppy mine site, including the open pit, the piping and pumping infrastructure, the water storage dam and the water drainage channel through the mining lease were completed. The water drainage channel was then followed off the mine site, across the roadway (Rosevale Road) and onto the adjacent "Common" land. Drainage channels continued onto the property of Coonara, which was also inspected (in the presence of the landowner) to assess the water spreading paddocks that the drainage lines feed into.

It was determined that the principal ephemeral stream (drainage line) which traverses through the centre of the Mt Boppy Mine site originally flowed through the area where the open pit is now situated, however, has been diverted away from the mine workings by the early miners of the Mt Boppy Gold Mine. This unnamed ephemeral creek flows generally south to north through the mine site, passing between the ROM pad and the north and eastern capped tailings storages, from where it re-joins its original course heading north east towards the Barrier Highway, before it is intersected by private property.

Stream flow data does not exist for the unnamed ephemeral creek and on-site experience shows that it rarely contains water and generally flows only after heavy summer storms. It is reported to have been several years since this was last observed.

There are two pipes set up to dewater the open pit. One pipe pumps water directly to the mine water storage dam to the west of the pit. This water has been stored for use during future mining operations, with large losses to evaporation. The other pipe can release water into the natural water drainage channel on the western side of the open pit. The location where the pipe can release water, at a flow rate of approximately 100 l/sec, is naturally lined with rock, which has been reinforced with additional larger rocks placed strategically in potential high energy points to prevent the opportunity for erosion to develop. If used, water released from this pipe will travel along this existing water drainage line through natural downhill flow. Contour plans show a gradual decrease from 280m AHD to 275m over a distance of approximately 1.2km from the pipe release location to the 'Common' land boundary at the roadway (Rosevale Road). The drainage channel passes across the roadway, which has an established flow path incorporated into the roadway design and is signposted accordingly.

As the water follows the natural unnamed ephemeral creek, it will make its way onto the property of 'Coonara' where the paddocks have established water spreading diversion bunds every 500 – 550m apart which are generally representative of a slow and gradual height/contour change of 0.8m-1.0m.

Independent water quality sampling confirmed that the water in the open pit is suitable for stock-watering and meets the published water quality criteria as per the Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines (ANZECC 2000). Water samples were collected using a van dorn water sampler at depths of 10m, 20m and 30m. The analytic results show very little variation at depth for the samples. Analysis was carried out using NATA accredited laboratory ALS.

Dewatering will continue during the next reporting period to enable recommencement of mining operations. It is hoped the dewatering program can be ramped up if approval is granted for the offsite release of clean water to the neighbouring property, in addition to the existing evaporation process taking place in the mine water storage dam. If approvals to discharge water offsite are not granted in the immediate term all water will be evaporated and no community benefit will result.

All dewatering activities will be carried out in accordance with the Soil and Water Management Plan.

## **2.9 HAZARDOUS MATERIAL MANAGEMENT**

As the mine was in a pre-operational phase for most part of the reporting period, only a small quantity of engine oils were kept on site in a self-bunded oil storage container at the mine workshop.

Diesel is stored in a 70,000L capacity self-bunded container tank adjacent to the mine workshop and used for light vehicle refuelling. MBR maintains records of diesel deliveries and usage. There are no processing reagents, laboratory chemicals or other hazardous materials stored on site. Reagents, alkalis and acids used during on-site processing between 2002 and 2005 have previously been removed from site.

The planned mining for the next reporting period does not require any significant volume of hazardous materials.

## **2.10 OTHER INFRASTRUCTURE MANAGEMENT**

Offices, a standard septic and leach drain (capped), mine workshops, and Reverse Osmosis (RO) plant are located on the mine site. Power if used, is supplied by diesel generators located at the workshop and RO plant. Grid power continues to be maintained to the site and powers the camp but no upgrades to mine site supply have occurred during the reporting period. The high voltage mains power has been disconnected from use (at the mine site) at the air break switch.

### 3. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Management of environmental risks and environmental mitigation measures are thoroughly addressed in the Mining Operations Plan (MOP 2019 – 2021) and are consistent with the requirements outlines the 2015 SoEE and supporting documentation. The following subsections provide a summary of applicable management measures to update progress against the MOP and any updates or changes.

#### 3.1 METEOROLOGICAL MONITORING

Table 6 provides monthly rainfall figures for 2010 to the end of 2019.

Table 6: Rainfall (mm) Total 2010 to 2019 Mt Boppy

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
January	11.2	19	111.6	0.6	5	N/A	26.6	32.6	28.5	15
February	128.2	32.6	49.4	12.2	73.8	N/A	4.4	0.0	5.0	17
March	29.4	24.8	86.6	55.6	55.6	N/A	28.8	53.6	0	27
April	38	16.6	0.2	0	29.8	N/A	79.6	7.4	2.5	21
May	29.6	43.2	12	23.8	16.4	N/A	68.2	59.0	3.0	9.5
June	19.4	2.2	33.2	81	41.2	N/A	107	7.0	7.5	7
July	81.6	13.6	28	42.8	1.2	36.6	52.2	3.4	10.0	10
August	26	16.8	0.6	0.2	34	17.2	59	16.0	26.0	2
September	55.4	28.2	17.4	19.4	16.4	7.6	101	1.4	0	2
October	95.2	23	2.4	8	0.4	31	22.4	59.8	68.0	0
November	125.4	52.2	31.4	1.2	3.2	87.6	14.2	44.0	54.0	33
December	70.8	37.8	6	35	34.2	23	35.6	64.2	3.0	0
<b>Annual Total</b>	<b>710.2</b>	<b>310.0</b>	<b>378.8</b>	<b>279.8</b>	<b>311.2</b>	<b>203.0</b>	<b>599.0</b>	<b>348.4</b>	<b>207.5</b>	<b>143.5</b>

Daily rainfall observations for the 2019-2020 reporting period recorded only 1 day of heavy rainfall (>25mm/24hr) in the month of November 2019 and a total annual rainfall of 143.5mm. This is well below the mean rainfall for the Cobar district of 388.8 mm. There were only a total of 16 days throughout the whole year where rainfall that fell was greater than 1mm. Most events that occurred throughout the year were minimal to non-existent, with high temperatures and winds generally evaporating any moisture before it could hit the ground. Based on both local (Canbelego) and BOM (Cobar) long term records, 2019 has been one of the driest years ever on record and the record for the longest consistent dry period of severe drought.

#### Further Improvements

All efforts will be focused on maximising the capture of any rainfall for use on site during 2020. The ongoing drought continues to have a significant impact on land management and water availability across the region. This will create additional challenges when operations cease and we are focussing on rehabilitation of the site.

### 3.2 AIR POLLUTION

#### 3.2.1 Environmental Management

The four residents of Canbelego are the sensitive receptors to dust emissions from the Mine. Potential sources of dust during the reporting period included light vehicle movements during site inspections and maintenance and the use of earth moving machinery for the materials handling associated with crushing and haulage of stockpiles. The mobile crushing plant is also a key source of potential dust generation.

Due to the prevailing semi-arid environment, dust levels may also be elevated during certain climatic conditions. The main sources of dust associated with rehabilitation activities are wind erosion of exposed surfaces including stockpiled soil and areas of the WRE not yet fully rehabilitated.

Compliance requirements for dust deposition must not exceed 2 g/m<sup>2</sup>/month above background levels, resulting in a maximum permitted quantity of 4 g/m<sup>2</sup>/month. A review of available historical dust monitoring data has been undertaken by current and previous owners over time. This data is provided in **Figure 3**. It should be noted that data between 2007 to 2012 relates to a non-operational period, while data from 2015 was taken during an operational (active mining) period. **Figure 3** demonstrates that dust levels remain well below the stated compliance criteria during periods of no operational activity.

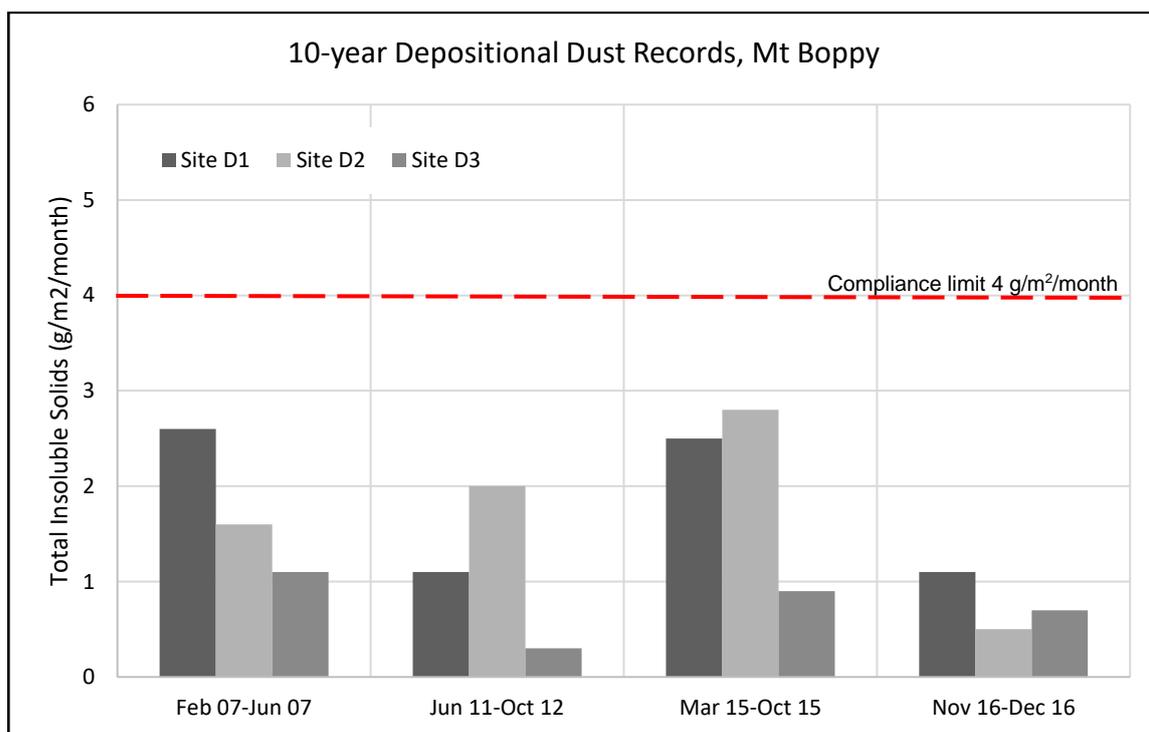


Figure 3: Historical Average Dust Deposition Data 2007 – 2016

#### 3.2.2 Environmental Performance

Dust monitoring was not performed during the reporting period but have been re-established in the new year as the site prepares for consistent material handling activities to begin. This monitoring will remain in place and continue for the next reporting period as the site remains active.

As there has been no non-compliant sampling results and no complaint (formal or via informal staff communications) from the community, no additional management strategies for air pollution resulting from airborne dust are considered necessary at this stage. The ongoing strategies (water cart, dust suppression

sprinklers on active stockpiles, minimising haulage speed and distances, etc) will be maintained. Regular dust suppression will be conducted on areas cleared of vegetation, soil stockpile areas, haul / access roads and active areas of the waste rock emplacement using a water truck. A water truck will be located on site permanently for this purpose.

### 3.2.3 Reportable Incidents

There were no reportable incidents or complaints relating to air pollution during the reporting period.

### 3.2.4 Further Improvements

Monthly dust deposition monitoring at the three designated monitoring sites has resumed, ensuring compliance with relevant designated criterion of <4 g/m<sup>2</sup>/month (cumulative dust deposition). Management strategies proposed during mining activities include:

- Ongoing rehabilitation and revegetation of previously disturbed areas that will not be affected by future mining activity;
- Wetting of road surfaces and stockpiles when appropriate;
- Restrictions on off-road vehicle movements; and
- Imposing appropriate speed limits on site.

## 3.3 EROSION AND SEDIMENTATION

### 3.3.1 Environmental Management

Efforts for the current reporting period were focused on monitoring and maintenance of all disturbed surfaces, and for the early detection and amelioration of erosion and sedimentation. Due to the lack of heavy rainfall, the need for monitoring during the reporting period was minimal.

### 3.3.2 Environmental Performance

**Figures 4 and 5** show current site conditions. **Figure 4** was the site of significant works on the north western wall of the TSF, which had been re-profiled, topsoil applied and seeded with native seed in 2016.



Figure 4: North western wall of TSF showing groundcover species continuing to grow despite dry weather.  
Photo taken February 2019.

The reporting period over 2019 was again a drier than average year with limited storm activity. Coverage which was previously established has managed to stay alive however new growth has been limited.

**Figure 5** shows a section of the eastern embankment of the WRE which has achieved groundcover levels consistent with the natural surrounds. Shrub species include grey copper burr and *Maeireana brevifolia* amongst scattered annual grasses, which is providing good soil stabilisation and prevention of erosion.



Figure 5: **Northern side of TSF embankment with established groundcover, representing the target groundcover levels.** Photo taken February 2019.

Recent remediation works (early 2017) will substantially improve erosion and sediment control on the site. There was evidence that the former disturbed areas of the site that were rehabilitated either by planting trials by Polymetals or by natural colonisation were becoming less prone to erosion. Similar planting methods will be employed by Mt Boppy Resources when final landforms are completed which should result in stabilization of disturbed areas.

### 3.3.3 Reportable Incidents

No incidents of excessive erosion or sedimentation have been noted or observed during the reporting period.

### 3.3.4 Further Improvements

Monitoring and maintenance of drainage remediation works and sediment fencing will be ongoing for the next reporting period. Final land shaping will occur where possible, topsoil spreading and seeding with native plant species. Success criteria in terms of rehabilitation standard have been determined and are presented in the current MOP.

There will be potential for erosion and sediment during the next reporting period from rehabilitated areas prior to the successful establishment of vegetation. When we start to handle soil and prepare for rehabilitation works, the following strategies will be employed:

- Soil stripping areas will be clearly defined and marked prior to commencement.
- Soil will not be stripped in wet conditions and the grass and shrub layer will be stripped with the soil. If very dry, soils will be lightly watered to reduce the potential for wind erosion but not so as to be wet and thereby increasing compaction.
- The topsoil will be preferentially transferred directly to rehabilitation areas or placed in designated temporary stockpile areas located in consideration of local flow paths / drainage lines.

- Before soil resspreading, the ground surface will be scarified or ripped along the line of the contour to break any compacted and smooth surfaces and assist in keying the resspread soil.
- The resspread soils will be left with a roughened surface and sown with a groundcover mix as soon as possible to stabilise the soils.

### **3.4 SURFACE WATER POLLUTION**

#### **3.4.1 Environmental Management**

The Soil and Water Management Plan was updated in August 2016 and details a comprehensive stormwater management plan to ensure diversion of clean water around existing disturbed areas and direction of “dirty water” into sediment basins. In summary, the following principal surface water management measures have (and will continue to be) implemented:

- Maintenance of the completed clean and dirty water drains.
- Maintenance and operation of the sediment basins, in accordance with, as a minimum, the ‘Blue Book’ standards, and direction of stormwater runoff from the waste rock emplacement to these basins.
- Maintenance of the containment dams to provide a minimum freeboard for a 1 in 100-year ARI 72hr rainfall event.
- Installation of additional temporary erosion and sediment control devices (including sediment fencing, hay bales, jute mesh etc.) as required.

#### **3.4.2 Environmental Performance**

The mine has operated as a nil discharge site during the reporting period. Pit dewatering activities took place intermittently from November 2019 through to January 2020. Only one rainfall event of >25mm/24hr was recorded during the reporting period in November 2019. No surface water samples were collected for analysis in 2019-20 as the site was dry for a significant period of the year. Sampling from the two designated surface water monitoring points SW1 (Monitoring Point 3, upstream) and SW2 (Monitoring Point 4, downstream) will take place (when possible) during the next reporting period.

#### **3.4.3 Reportable Incidents**

There were no reportable incidents during this period.

#### **3.4.4 Further Improvements**

Surface water sampling and analysis will recommence in the new reporting period in accordance with the Soil and Water Management Plan. In addition, if dewatering activities are approved and ramped up to allow for off-site discharge, the following approach will be put into place at Mt Boppy Mine:

- Physical inspections of the natural water drainage channel and the water spreading at Coonara will take place on a periodic basis to monitor the flow of water, specifically looking at early signs of erosion, and the spread of water into unexpected / unpredicted areas. If water is showing signs of spreading outside of the Coonara property boundaries, the pumping of water should be put on hold until further assessment can be undertaken to confirm the potential flow path, and/or allow evaporation of the existing water flow to take place before pumping water is resumed.

- If at any stage water samples and inspections indicate a change from the accepted water quality or signs of erosion or unpredicted (or un-approved) water runoff, the pumping should be turned off immediately and the approach re-assessed.
- The MBR caretaker shall work with Local Land Services to manage any pest control issues that may arise from the presence of water. Feral pigs and kangaroos may become attracted to the area. This can be monitored and managed as required.

## **3.5 GROUNDWATER POLLUTION**

### **3.5.1 Environmental Management**

The Mine is not located in an area with a significant groundwater resource, with water contained mainly within fracture zones. The extraction of groundwater will have no effect on any regional aquifer and there will be no effect on other licensed groundwater users (the nearest licensed bore to the site is located over 20km away). Furthermore, there are no groundwater dependent ecosystems (GDEs) in proximity to the Mine Site. Following completion of groundwater extraction, local groundwater levels are expected to return to existing levels as is currently reflected in the open water body in the existing pit. Impacts on the local and regional groundwater regime are therefore expected to be minimal.

### **3.5.2 Environmental Performance**

The Mine has not been operational since November 2015, and no works conducted on-site other than remediation of surface water management structures. Pumping for the purpose of pit dewatering and RO plant for supply of camp water recommenced towards the end of the 2019-20 reporting period.

No groundwater samples were collected for analysis during the reporting period due to mining activities being deferred. Water quality monitoring at four existing piezometers (PBP001, 003, 004 and 018) and water level monitoring at six existing piezometers (PBP001, 003, 004, 017, 018 and 019) will take place on a quarterly basis coincident with the surface water monitoring.

It is noted that one minor change to the method of monitoring, relevant to the measurement of standing water levels within the production bore (as required by Water Licence 85BL256088), has been made. Rather than install and monitor a data logger in the production bore (PBP017), which is impractical due to the presence of the pump within the bore, the Company will rely upon manual water level measurements to monitor standing water levels.

### **3.5.3 Reportable Incidents**

There were no complaints or incidents relating to groundwater during the reporting period.

### **3.5.4 Further Improvements**

Groundwater samples will be collected for analysis during the next reporting period with the recommencement of operations.

## **3.6 CONTAMINATED AND/OR POLLUTED LAND**

### **3.6.1 Environmental Management**

No contaminated land is known to be present within the Mine Site with a previous overflow from the TSF (resulting from human error by the previous operator) having been remediated to the satisfaction of NSW EPA.

The risks of contaminating the receiving environment are very low, with the crusher plant decommissioned and removed by Black Oak Minerals in 2015, there has been no processing of ore on-site and consequently no generation of tailings material or other processing wastes. There are no chemical reagents stored or utilised on the site.

TSF 3 (to the south of the open cut - see **Figure 2**) is regarded as a potentially contaminated site. Water quality monitoring results obtained in December 2010 indicated that there are no significant levels of contaminants contained in the surface waters (ephemeral ponding) in the tailings material. The TSF was used as an area to encapsulate Potentially Acid-Forming (PAF) material by Black Oak Minerals and will continue to be used by Mt Boppy Resources for the same purpose when mining recommences. The PAF and underlying tailings is scheduled to be fully capped (currently partially capped) by an impermeable layer as outlined in the MOP.

### **3.6.2 Reportable Incidents**

There were no reportable incidents for this period.

### **3.6.3 Further Improvements**

No further improvements are proposed at this time.

## **3.7 THREATENED FLORA AND FAUNA**

### **3.7.1 Environmental Management**

The mine site is highly disturbed from over a century of mining activities. There is very little remaining native vegetation on the site with the original vegetation being either cleared or infested with weeds. Previously completed field surveys indicate that there are no species of threatened flora on the mine site and that remnant vegetation communities were highly disturbed and degraded and of limited ecological value.

No clearing of native vegetation has occurred during this reporting period. Monitoring of rehabilitation trial works from previous reporting periods was undertaken by visual survey by the residential site caretaker. Monitoring outcomes include:

- Response to above average rainfalls in previous reporting periods (2016-17) includes substantial growth rates of established seedlings, however competition from exotic species is also increased during wet seasons.
- Lower than average rainfalls (60% less than the previous nine years average) during 2019 hampered growth of cover which had been established in prior periods.
- Grazing pressure from kangaroos is the dominant wildlife threat to groundcover re-establishment. Due to the rise in feral goat prices and subsequent goat meat industry, control of feral goats within the mine site has not been necessary.

- The recommended method of rehabilitation is direct seeding.

The boundary of the mine disturbance area is enclosed by a hinge joint netting fence which serves to reduce access by herbivores (kangaroos, goats, stray stock) and reduce grazing pressure on rehabilitation areas. This fence is monitored and maintained by the residential caretaker and damage repaired as required. While effective, the fence does not provide total exclusion and some evidence of kangaroo/goat access is still evident. The need for additional fencing around specific rehabilitation sites is an item of consideration when planning future rehabilitation works, particularly during the early vegetation establishment phase.

### **3.7.2 Environmental Performance**

The residential caretaker has continued to collect seeds from native trees, shrubs and grasses on an opportunistic basis around the mine holding and surrounding township areas. These have been potted out and will be redistributed on rehabilitation areas as seasonal conditions become favourable.

### **3.7.3 Reportable Incidents**

No reportable incidents occurred during the reporting period relating to flora or fauna.

### **3.7.4 Further Improvements**

Revegetation works are to continue based on seasonal opportunities and rainfall. There is no plan to disturb or clear any new ground within the lease area. Weed control and maintenance of boundary fences is proposed to continue with the aim of increasing flora and fauna values, especially in the areas under rehabilitation. Focus will be placed on promoting native groundcover species on the Waste Rock Emplacement (WRE).

## **3.8 WEEDS**

### **3.8.1 Environmental Management**

Mt Boppy Resources aims to control weed infestation by reducing the existing weed stock and maintaining revegetated areas until native systems are established. The target weed species include Blue Heliotrope, African Boxthorn, Prickly Bush, Peppercorn, Noogoora Burr and Wild Tobacco.

Weed control has previously been undertaken onsite by the Cobar Shire Council as part of Council's shire-wide control program, as well as specific works (spot spraying) by Manuka Resources.

### **3.8.2 Environmental Performance**

African boxthorn, wild tobacco and prickly pear have been persistent in some of the disturbed areas on site and have continued to be addressed by spot spraying during this reporting period, which we will maintain into the next reporting period.

### **3.8.3 Reportable Incidents**

No reportable incidents have occurred during the reporting period.

### 3.9 BLASTING

Potential environmental impacts resulting from air blast or vibration (caused by blasting activities) were assessed not applicable unless blasting operations occurred. As there were no blasting activities during the previous reporting period no monitoring or assessment took place during the reporting period.

Once mining activities ramp up, blasting activities are likely to occur during the next reporting period. The following operational safeguards and mitigation measures for blasting will be implemented:

- The burden distance and stemming length will be carefully selected and then implemented precisely to ensure that explosion gases are almost completely without energy by the time they emerge into the atmosphere.
- Charges will be set in carefully designed sequences and with inter-row delays so as to consistently detonate and provide good progressive release of burden.
- Appropriate materials will be used for stemming.
- The maximum weight of explosive detonated in a given delay period (the maximum instantaneous charge (MIC)) will be limited to conservative and proven levels.

All blasts will be monitored and the blast design progressively optimised to minimise adverse impacts.

### 3.10 OPERATIONAL NOISE

No excessive operational noise was generated during the reporting period, with the forecast recommencement of mining operations deferred, the absence of heavy plant and equipment was not an issue. The re-introduction of a mobile crushing plant was managed appropriately with regards to usage times and location on site. There were no noise mitigation or monitoring works required during the reporting period.

In case of any future instances where noise levels may exceed relevant noise criteria at nearby non-Company owned residences, negotiated agreements have been reached with the residents of the privately owned residences within the potential impacted area.

In any event, noise management measures that will be implemented include the following:

- All equipment used on site will be regularly serviced to ensure the sound power levels remain as low as practicable.
- Frequency modulated reversing alarms will be fitted to all earthmoving equipment to further reduce sound power levels of that equipment.
- The on-site haul and access roads will be well maintained to limit body noise from empty trucks.
- Off-site transport of ore will be undertaken through the northern access road, located away from the Canbelego Township.

### 3.11 VISUAL AMENITY AND STRAY LIGHT

The Canbelego area is not located on any frequented tourist routes and the Mine is not visible from the Barrier Highway approximately 2.5km to the north due to intervening vegetation and generally low height of the mining landform.

Existing waste emplacements are approximately 12m above the surrounding landscape. The planned future maximum height of the waste emplacements (up to 20m high) will similarly not be visible from the Barrier Highway. Whilst the components of the Mine will be visible from some residences in Canbelego, given that the Mine has been a prominent visual feature of the local Canbelego area for over a century,

the approved activities are not expected to be a significant visual issue. The planned rehabilitation of the WRE and TSF 3 will also act to ameliorate visual impacts in the longer term.

Any artificial lighting required will be positioned and directed to minimise emissions and used only when required.

### 3.12 ABORIGINAL AND NATURAL HERITAGE

As there were no mining or construction activities conducted onsite during the reporting period. The likelihood of disturbance of natural or Aboriginal heritage items is considered negligible for planned operational activities and rehabilitation in the next reporting period. We do however recognise the importance of the risks and acknowledge the following key areas of importance within our Mine site:

- Two Aboriginal heritage items (scarred trees) have been previously identified. Neither of these trees will be disturbed by the planned operations. In any event, all site employees will be made aware of their obligations under the National Parks and Wildlife Act 1974.

Should any relic be uncovered during future activities, work in the area surrounding the relic would cease and the Department of Premier and Cabinet (DPC) (formerly OEH) and Ngiyampaa people would be informed of the find. Work would not recommence in the area immediately surrounding the find until the area has been inspected and permission has been given to proceed.

- A total of 24 European heritage items have previously been identified within the Mine Site, including:
  - Site of former blacksmith shop: Area is highly disturbed; little remains but some scrap metal and bricks. No foundation or postholes present to determine dimensions of original footprint.
  - Concrete and brick foundations believed to be for a winder frame: Two sections of the foundation with dimensions 14m x 3.5m x 1m and 3.5m x 3.5m x 1m. The foundation is largely destroyed, and little remains from the original structure.
  - Historic Rubbish/Ash Piles: Multiple piles containing scrap metal and locally produced bricks, cans, broken pottery, cupels, crucibles, glass bottles and bricks within areas of approximately 30m x 35m.
  - Mine Shafts: Two open mine shafts (approximately 40m deep) from early 1901–1928 mining phase with timber lined walls for support. Rectangular in shape with one north to south orientation, and the other with east to west orientation lengthwise approximately 12m. Shafts remain intact with little to no apparent damage to its original fabric.

### 3.13 SPONTANEOUS COMBUSTION

As no material on site is prone to spontaneous combustion no specific management measures are necessary.

### 3.14 BUSHFIRE

The high levels of previous disturbance at the Mine Site, combined with low vegetation cover, result in minimal bushfire risk. In any event, we will maintain contact with the local RFS and adopt the following controls and safeguards:

- Firebreaks will be maintained around the Mine Site.
- All equipment on site will be equipped with adequate and fully operational fire suppression equipment, in accordance with AS 1841 and AS 1851.

- On-site employees will to be trained on the proper use of the firefighting equipment held on site.
- Employees/contractors will be instructed not to throw cigarette butts from any vehicle or item of equipment on site.
- The water truck will be used for firefighting assistance and all reasonable support will be given to the local RFS in the event of a bushfire within or near the Mine.

### **3.15 MINE SUBSIDENCE**

Whilst underground mining has historically been undertaken within the area, the majority occurs within the footprint of the open cut. Therefore, the planned open cut mining will not result in any subsidence. Furthermore, as blasting will be designed to minimise amenity impacts, the potential for blasting to result in the collapse of any underground workings, not contained within the immediate blast zone, is considered to be non-existent.

### **3.16 HYDROCARBON CONTAMINATION**

#### **3.16.1 Environmental Management**

Limited amounts of diesel are delivered to the mine site by a licenced bulk transporter who adopts industry best practices to prevent any spillage during the transfer of diesel from the road tanker to the onsite containerised diesel tank. Diesel and oils are stored according to Australian Standard 1940-2017. This includes provisions for fire prevention, barriers and bunds, ventilation considerations and appropriate signage. Transfer is always undertaken by appropriately trained site personnel. Spill kits are available at various locations around the site and staff and contractors are trained in the use of such kits during site inductions.

#### **3.16.2 Environmental Performance**

Diesel is stored in a 10,000L capacity self-bunded container tank, south of the pit, to service the submersible pump generator. Access to diesel is limited to employees who have completed the mine induction. The site is regularly inspected for evidence of spill or leakage.

#### **3.16.3 Reportable Incidents**

No reportable incident relating to hydrocarbon spills occurred during the reporting period.

#### **3.16.4 Further Improvements**

For the proposed operational phase, a management and spill plan for hydrocarbons will be re-implemented. Management practices will continue to include:

- Use of bunded oil storage container for storage of all oil drums;
- Maintenance of all valves and piping systems;
- Frequent removal of used oil by a licenced waste oil contractor; and
- Use of oil-capturing systems in vehicle service areas.

All fuels and oils will be stored in accordance with AS1940-2017 Australian Standard for Storage and Handling of Flammable and Combustible Liquids.

### **3.17 METHANE DRAINAGE / VENTILATION**

Ventilation and methane drainage is assessed as not applicable as MBR is an open cut mine with no methane-generating geology identified.

### **3.18 PUBLIC SAFETY**

Access to the Mine is restricted by rural fencing and bunding. Additional bunding is also in place around the existing open cut. Fencing is inspected on a regular basis and access of public to the site restricted. All site visitors are required to report to the caretaker prior to entry. Site safety inductions are conducted at the site, with all authorised visitors accompanied by a company representative. Considering the isolated nature of the site and restricted access there will be minimal risk to public safety.

There were no reportable incidents relating to public safety during the reporting period.

### **3.19 OTHER ISSUES AND RISKS**

No further environmental issues or risks were identified.

## **4. COMMUNITY RELATIONS**

### **4.1 ENVIRONMENTAL COMPLAINTS**

No complaints relating to environmental management or emissions were received during the reporting period.

### **4.2 COMMUNITY LIAISON**

The site caretaker resides in Canbelego and regularly liaises with other residents in the town on an informal basis. No structured consultation has been undertaken with residents in regard to mine status. Given the absence of potentially impacting activities during the reporting period, formal consultation did not take place.

The four residents in Canbelego and the landowners of the surrounding properties were consulted regarding the possible options for dewatering the Mt Boppy open pit during the reporting period. Informal discussions have shown positive representation from land holders towards the proposed release of the water via the natural drainage channel in a slow and controlled manner. All landowners were grateful for the consultation and are hopeful that the release of water will go ahead and provide the surrounding land with some relief from the current drought.

## 5. REHABILITATION

Our rehabilitation objectives for the Mine Site can be defined in the short term and long term.

In the short term, the objective would be to stabilise all earthworks, drainage lines and disturbed areas no longer required for mine-related activities in order to minimise erosion and the generation of sediment-laden water, and to reduce the visibility of the activities from adjacent properties and the local road network. Erosion control would be achieved by the early establishment of a groundcover while appropriately positioned tree lot plantings would assist in creating a visual screen to adjacent properties.

In the longer term, and in order to achieve the nominated post mining land use goals, the objectives are as follows.

- Provide for the removal of all mining-related infrastructure not required for the agreed end land use.
- Create a low maintenance, geotechnically stable and safe landform that is secure and non-polluting.
- Construct above ground landforms which are commensurate with the surrounding land fabric as far as practicable.
- Provide for a sustainable growth medium suitable for the establishment and retention of the nominated vegetation communities.
- Revegetate with native tree, shrub and grass species comparable with, and with maintenance requirements no greater than, the surrounding vegetation communities.

### 5.1 BUILDINGS

Buildings and infrastructure areas include the site office, workshops, access and haul roads and the hardstand areas adjacent to the open cut and WRE.

No permanent buildings were renovated or removed during the reporting period.

### 5.2 REHABILITATION OF DISTURBED LAND

Within each primary domain, the status of existing disturbance and rehabilitation at the Mine is described as follows and shown in **Figure 6**.

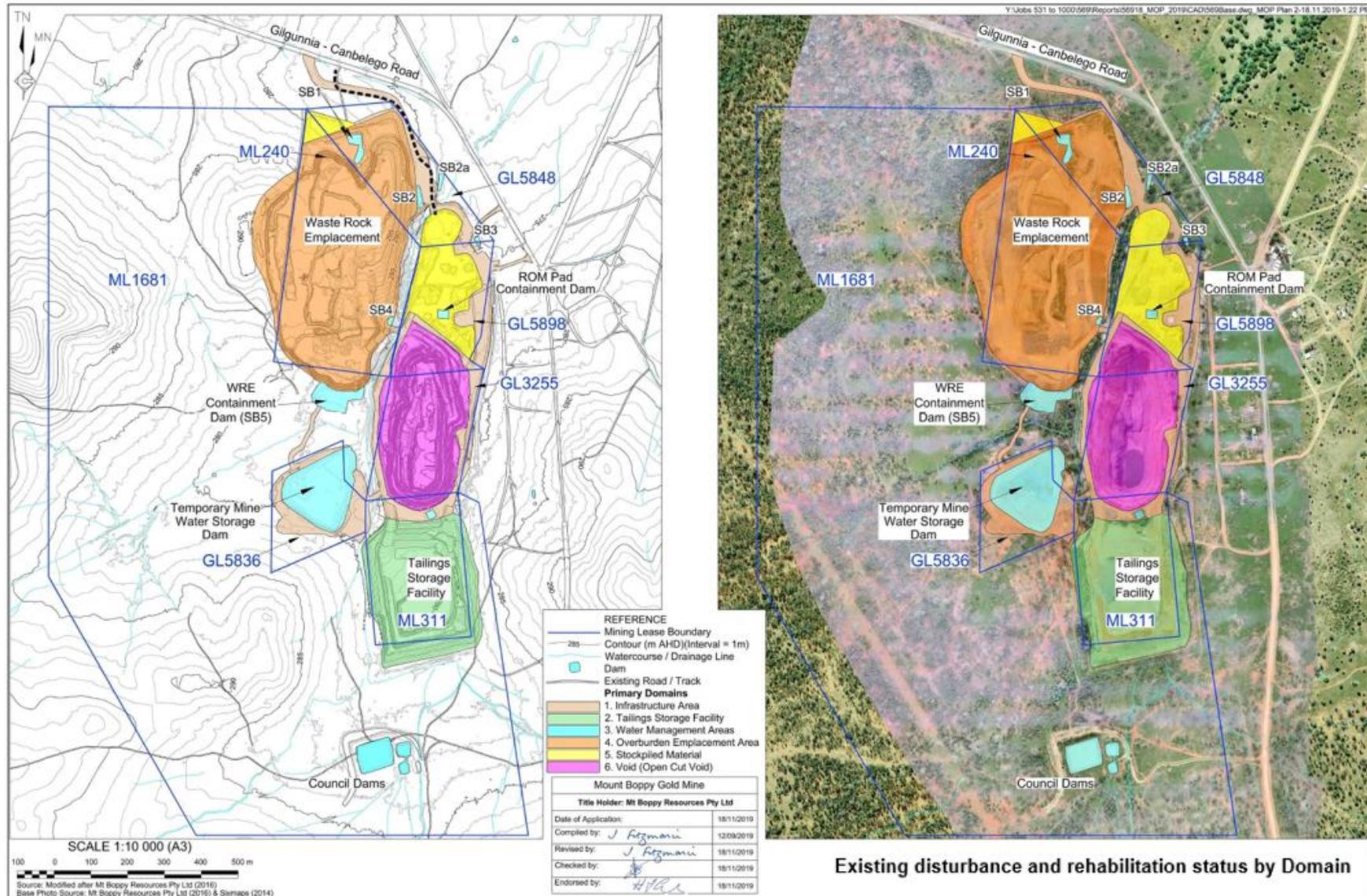


Figure 6. Mt Boppy Domains, existing disturbance and rehabilitation status as at end of reporting period.

### 5.2.1 Domain 1 – Infrastructure Area

This domain includes a demountable site office and a heavy vehicle workshop, which have been established to the east and south respectively of the former mill and process area. These areas remained active during the majority of this reporting period.

### 5.2.2 Domain 2 – Tailings Storage Facility

This domain includes the TSF 3. There are no external inflows and bunding is intact and stable on this facility. No rehabilitation took place during the reporting period.

### 5.2.3 Domain 3 – Water Management Area

This domain includes the site of the former historic tailings placement area (within GL 5836). All tailings from this site has previously been removed and there is no contamination evident. A temporary mine water storage dam has been constructed within this area. Whilst soil testing has previously been undertaken (2010), further testing will be undertaken at mine closure to demonstrate that no contamination is present.

The Historic Creek Diversion is also included in this domain. This existing creek (ephemeral flows) diversion was constructed in the early 1900's and has not been modified by MBR or its predecessor companies. The creek is currently stable with no specific rehabilitation requirements known and no specific rehabilitation works planned.

### 5.2.4 Domain 4 – Overburden Emplacement Areas

This domain includes the existing Waste Rock Emplacement / Capped TSF Areas. The former TSF's were capped by Polymetals and utilised for placement of waste rock. These areas are currently receiving waste rock. Ongoing placement of waste rock during the reporting period will form this area into the approved WRE. At mine closure, this area will be inspected and, if necessary, testing completed, to demonstrate that these former TSF's remain adequately capped and that contamination is not present.

### 5.2.5 Domain 5 – Stockpiled Material

The former mill, process area, raw water pond, process pond and pollution control pond are all included in this domain.

All former plant has been decommissioned and some of the reusable plant is still stored on site. Plant and concrete foundations have been broken and removed from site. The raw and process ponds have had the liners removed and the ponds have been backfilled. The area has now been incorporated into the ROM pad area.

### 5.2.6 Domain 6 – Open cut Voids

The open cut pit is being actively worked. Mining operations within the open cut will be completed during 2020. A perimeter bund is in place.

**Table 7** provides a summary of the rehabilitation efforts at the Mt Boppy Gold Mine to date. No final rehabilitation works were conducted in the reporting period.

Table 7: Rehabilitation Summary

<b>A: MINE LEASE(S) AREA</b>	<b>Total Area, start of Reporting Period (ha)</b>	<b>Total Area, end of Reporting Period (ha)</b>	<b>Area Estimated end of next Reporting Period (ha)</b>
A1 Mine lease(s) area	246.48	246.48	246.48
<b>B: DISTURBED AREAS</b>			
B1: Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	16.4	16.4	12.0
B2: Active mining area (excluding items B3-5 below)	9.5	9.5	0
B3: Waste emplacements (active, unshaped, in/out of pit)	16.2	16.2	8
B4: Tailings emplacements (active, unshaped, uncapped)	5.1	5.1	2.5
B5: Shaped waste emplacement (awaits final vegetation)	5.5	5.5	11.7
<b>TOTAL ALL DISTURBED AREAS</b>	<b>52.7</b>	<b>52.7</b>	<b>34.2</b>
<b>C: REHABILITATION</b>			
C1: Total rehabilitated area (except for maintenance)	0	0	18.5
<b>D: REHABILITATION ON SLOPES</b>			
D1: 10 to 18 degrees	0	0	9.6
D2: Greater than 18 degrees	n/a	n/a	n/a
D3: Less than 10 degrees	0	0	10.8
E1: Pasture and grasses	0	0	0
E2: Native forests/ecosystems	0	0	0
E3: Plantations and crops	0	0	0
E4: Other (include non-vegetative outcomes)	0	0	9.6

**Table 8** provides a summary of maintenance activities undertaken on rehabilitated land during the reporting period.

Table 8: Maintenance Activities on Rehabilitated Land

<b>Nature of Treatment</b>	<b>Area Treated (ha)</b>		<b>Comment / Control Strategies / Treatment Detail</b>
	<b>This AEMR Period</b>	<b>Next AEMR Period</b>	
Additional erosion control works (drains re-contouring, rock protection)	0	0	Ongoing monitoring and maintenance of 2016 surface drainage works. Some remediation required in 2019.
Re-covering (detail – further topsoil, subsoil sealing, etc.)	0	0	
Soil treatment (detail - fertiliser, lime, gypsum.)	0	0	
Treatment/Management (detail - grazing, cropping, slashing, etc.)	0	0	
Re-seeding/Replanting (detail - species density, season, etc.)	0	1.5	Reseeding on western TSF bank if favourable seasonal conditions occur.
Adversely Affected by Weeds (detail - type and treatment)	1	5	Wild Tobacco bush spraying during next period.
Feral animal control (detail - additional fencing, trapping, baiting, etc.)	0	0	Monitoring and maintenance of fences.

### **5.3 REHABILITATION TRIALS AND RESEARCH**

Mt Boppy's resident caretaker has continued harvesting local species during the last reporting period. These have predominately been Native Blackthorn and Warrior Bush.

Several previous rehabilitation trials have been undertaken at the Mine Site. The most recent trial work occurred between 2007 and 2015 and covered an area of 1ha and included four photo monitoring points and seven transect lines. Monitoring was undertaken on an annual basis and included measurement of number of seedlings, assessment of grazing pressure, presence of weed species and groundcover (e.g. bare soil, vegetation, litter, rock etc.). The results of this monitoring were presented within the respective AEMRs.

Four analogue sites were also established in 2011 and were also monitored in the same manner to provide comparative data. The results of this monitoring was also presented within the respective AEMRs.

Whilst the rehabilitation trial areas are now incorporated into the modified WRE, monitoring of the analogue sites will continue for comparison against the results of rehabilitation monitoring undertaken as part of the MOP.

### **5.4 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN**

Rehabilitation planning and monitoring will focus on determining whether progress towards achieving the relevant performance indicators and completion and relinquishment criteria presented in the MOP are being achieved. The rehabilitation planning will be very focused on maximising the use of heavy equipment and people on site during this last year of active operations and ensuring final landforms and material placement is maintained as a priority while the resources are readily available to achieve the planned outcomes.

## **6. ACTIVITIES FOR NEXT REPORTING PERIOD**

### **6.1 PROPOSED ACTIVITIES**

The proposed activities for the new reporting period are consistent with the approved operations under DA 2011/LD-00070-Rev1 and include the following:

- Mining ore and waste rock from the open cut void.
- Placement of waste rock on and expanding of the existing Waste Rock Emplacement (WRE) and subsequent rehabilitation.
- Internment of potentially acid forming (PAF) material within designated areas of the WRE and subsequent capping and rehabilitation.
- Internment of PAF waste rock within Tailings Storage Facility (TSF) 3 and subsequent completion of capping and final rehabilitation.
- Dewatering of the pit, storage of water within temporary mine water storage dams and irrigation of areas of the Mine, either for the purpose of dust suppression, rehabilitation or evapotranspiration.
- Construction of an alternative entry and access road to the Mine from the Gilgunnia-Canbelego Road.
- Mining and crushing of up to approximately a further 300 000t of ore material.

- Transportation of ore from the Mine to Manuka Mine (Kidman Way, Cobar), including approximately 50,000t of previously stockpiled ore.
- Maintenance of ancillary infrastructure such as internal roads, offices and workshops, car parking and hardstand areas, and water management structures.

Site activities during the 2020-2021 reporting period will be undertaken in accordance with the MOP.

## 6.2 EXPLORATION

Drilling within the open cut is forecast for the 2019/20 period to further define the resource. Drilling may also occur on the Exploration Licence immediately east of the open cut (Boppy South) with a view to converting that portion of the EL to an ML subject to drilling outcomes. This is dependent on progress with the recommencement of mining and processing in the existing pit.

## 6.3 CONSTRUCTION

Limited construction (if any) is currently forecast in the new reporting period.

Should it be required, the principal construction activities will be the construction of the second temporary mine water storage dam west of the WRE. The temporary mine water storage dam will be constructed through excavation of material to create in-ground storage volume. The base and walls of the dam will be compacted to achieve required permeability criteria and excavated material will either be used for the creation of diversion bunding or stockpiled adjacent the dams within the approved disturbance footprint. The dam will temporarily hold water pumped out of the open cut pit and will be constructed to provide the necessary holding capacity together with a freeboard of at least 0.3m (or equivalent to twice the volume of a 1 in 100 year-72 hour rainfall event).

Other construction activities during the MOP term will include progressive construction of haul roads within the open pit to a width of approximately 10m, including a bund at least half the height of the largest mobile equipment tyre, and a gradient of 1:8 to suit the mobile equipment being used to execute the mining activities.

## 6.4 MINING

Mining will be by conventional drill and blast, load and haul methods. Mining will involve the drilling and blasting of rock, followed by the loading of the fractured ore and waste into haul trucks. The primary blasting agent will be ANFO and non-electric detonation will be used to initiate the blast. Blasting frequency is expected to average two per week with each blast recovering between 40 000t and 70 000t of waste rock or ore.

The following design criteria will generally be adopted.

- Operational Face Height: 5m
- Final Face Height: 20m
- Operational Bench Width: 20m
- Final Bench Width: 5m
- Face Angle (weathered material): ~55 to 65°
- Face Angel (unweathered material): 70°

These design criteria will continue to be reviewed throughout operations to ensure that the open cut is developed to provide a safe and stable landform.

During the new reporting period, the development of the open cut pit will comprise gradual deepening and extension of the previous pit limits. The final pit will be up to approximately 105m deep, 200m wide and 450m long. Access to the pit is currently via a dual lane ramp on the western side of the pit. This access arrangement will be modified to allow for the pit expansion. All active mining activities are expected to be completed during this reporting period.

## **6.5 REHABILITATION**

This section provides an overview of the rehabilitation activities proposed to be implemented during the new reporting period on a domain by domain basis (as per the Mining Operations Plan (MOP) and revegetation procedures for the site generally).

It is noted that, during the reporting period, specific final landform water management concepts and designs will be developed further as part of mine closure planning. It is planned to prepare and submit a separate final landform water management plan following the completion of mining in the second half of 2020.

With reference to the current MOP rehabilitation domains, the following rehabilitation activities are proposed for the next reporting period:

### **6.5.1 Domain 1 – Infrastructure Area**

This area will remain as an active operational area throughout the new reporting period. Following the completion of mining (second half of 2020), hardstand areas around the open cut pit and WRE will be trimmed / profiled (if required), deep ripped, soiled with 50mm of soil material (if available following rehabilitation of the WRE and TSF 3) and revegetated.

Sections of access road that are required for ongoing care and maintenance activities and long-term access will be retained.

Following the completion of ore transportation, the remaining infrastructure area east of the ROM pad, containing the office and workshops, will also be decommissioned and rehabilitated. This will involve the following activities:

- Disconnection of switch boards and electrical connections by a licenced electrician.
- Recovery and removal of all consumables and equipment, including the redundant plant and equipment in various storage areas. Any waste material will either be taken to a licenced facility or collected by a licenced waste contractor.
- Excavation and on-site treatment of any known hydrocarbon contaminated material.
- Loading of the demountable office building for off-site use/sale/recycling.
- Dismantling of the heavy vehicle workshop and transportation off site.
- Demolition of the workshop shed and removed as scrap to the Cobar Waste Disposal Depot.
- Breaking of all concrete footings / pads and removal to the Cobar Waste Disposal Facility or concrete recycler.
- Completion of a contamination assessment and removal and treatment / disposal of any remaining contamination (if identified).

- Trimming / profiling of the area to provide a free-draining landform.
- Deep ripping and, if soil material is available following rehabilitation of the WRE and TSF 3, spreading to a depth of 50mm.
- Revegetation in accordance with the species and revegetation process outlined in the MOP.

### **6.5.2 Domain 2 – Tailings Storage Facility**

During this reporting period, 'increased risk' PAF material will be paddock dumped over the existing tailings surface in piles approximately 3m high. These will be pushed out by a bulldozer to compact and push into the tailings surface and lime added at a conservative rate of 30t/ha. A clay liner will then be compacted over the PAF material to a minimum depth of 0.9m and with a permeability of  $1 \times 10^{-9}$ m/s. NAF material will then be paddock dumped and dozer profiled to create a minimum 2m thick store and release cover. The profiled surface will be free draining with appropriate water management structures.

If sufficient soil material is available, this will be spread to a depth of approximately 50mm across the flatter areas. Alternatively, weathered / clayey overburden material will be preferentially placed across the top of the NAF material to provide a growth medium. The areas will then be seeded with groundcover and shrub species.

The placement of PAF, formation of a clay liner and placement of a NAF cover will occur progressively during the 2020 and 2021 reporting periods. It is expected that this process will be completed approximately 2 to 3 months following the completion of mining, which is scheduled for late 2020.

### **6.5.3 Domain 3 – Water Management Area**

The Water Management areas will remain active throughout the next reporting period. MBR will maintain the sediment retention basins to ensure that they retain sufficient capacity and are appropriately managed to avoid discharges to surface water or that discharges meet the applicable guidelines and approval requirements.

Following the completion of mining, remaining water within the temporary mine water storage dams will be pumped back into the final open cut void. Following this, all pumps and pipelines will be recovered. The material excavated to create the dams will then be pushed back into the dams and profiled using a bulldozer to create a free draining landform. Soil material recovered during the construction of the dams will be respread and the area revegetated.

The sediment basins will be retained for long-term water management from the rehabilitated WRE. Any sediment build up within the basins will be removed and buried within the WRE. The spillways of the basins will also be inspected and, if required, additional stabilisation undertaken (such as rock armouring) to ensure long-term integrity.

The existing creek diversion and Council water storage dams will be retained in their current form with no rehabilitation activities applicable.

### **6.5.4 Domain 4 – Waste Rock Emplacement Areas.**

Areas within the waste rock emplacements are likely to become available for rehabilitation during this new reporting period.

The WRE will be progressively constructed through paddock dumping of NAF material and profiling using a bulldozer. The PAF encapsulation area within the WRE will be similarly formed through paddock dumping of a base layer of NAF material to a minimum thickness of 3m. The NAF material will be selected to provide good drainage beneath the WRE such that the PAF material is not subject to wetting and drying

cycles. PAF material will be built up in lifts to a maximum of approximately 15m thickness with NAF material used to form the batters of the WRE.

The areas of PAF encapsulation will be progressively limed, clay capped and covered with NAF as per TSF 3. Similarly, if sufficient soil material is available, this will be spread to a depth of 50mm across the flatter areas. Alternatively, weathered / clayey overburden material will be preferentially placed across the top of the NAF material to provide a growth medium. The areas will then be seeded with groundcover and shrub specie. Pending suitability of water quality, water from the open cut may be utilised to irrigate the WRE to assist with vegetation establishment.

### **6.5.5 Domain 5 – Stockpiled Material.**

This area incorporates the existing ROM pad. This area will remain active during the reporting period. Following the completion of ore transportation, all ore will have been removed from the ROM pad area. The ROM pad will then be profiled using a bulldozer to provide a free-draining landform deep ripped and, if available, soil material or suitably weathered overburden spread to a thickness of 50mm. The area will then be revegetated. As for the WRE, pending suitability of water quality, water from the open cut may be utilised to irrigate the rehabilitated areas to assist with vegetation establishment.

### **6.5.6 Domain 6 – Open Cut Voids**

The open cut voids will remain as an active operational area throughout the new reporting period, however any terminal batters will be formed in accordance with the open cut design criteria.

At the completion of mining, all mobile equipment, pumps and piping will be removed from the open cut pit. Appropriate safety bunding and signage will be retained around the perimeter of the open cut pit. The final location of the bund will be such that it is at a sufficient distance from the pit edge so that any potential for pit wall failure will not intercept the bund.

The closure bund will typically be a minimum of 2m high with 2.5:1 V:H batters, however, where the haul road enters the pit, the bund will be increased in height to further prevent stock and vehicular access. Appropriate warning signs will also be installed at regular intervals around the outside of the bund.

### **6.5.7 General Site and Revegetation**

Rehabilitation trials and monitoring completed to date indicates that planting of tube stock at the Mine only has limited success. Therefore, revegetation will be undertaken by either direct or mechanical seeding. Seeding will be completed as soon as practicable after placement of soil material / growth medium and before the surface forms a crust so as to achieve an optimal surface microhabitat.

Direct seeding lines for tree species will be spaced a minimum of 6m apart on flat areas and 8m on slopes to provide sufficient space for establishment and maintenance of groundcover species. Seeding rates will need to be high due to potential impact of grazing animals and will be approximately 1.5kg per kilometre.

In regard to grazing pressure management during the rehabilitation phase and the need to prevent access to rehabilitating areas by kangaroos and feral goats, MBR propose the erection of a large herbivore exclusion fence around disturbance areas within the Mine Site to eliminate on-site feral goat populations from disturbed and rehabilitating areas. The fence will be a small hinge joint netting fence with additional salvage wires, resulting in a fence approximately 1200mm high. This fence is low maintenance and will discourage kangaroo movement and stop re-population by feral goats, however, small mammal and reptile movement will not be impacted.