ENDEAVOR OPERATIONS PTY LTD

ENDEAVOR MINE

MONTHLY ENVIRONMENTAL REPORT

For the Month Ending 31 July 2018

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Name of Licensee	Endeavor Operations Pty Ltd
Environmental Protection Licence	No: 1301
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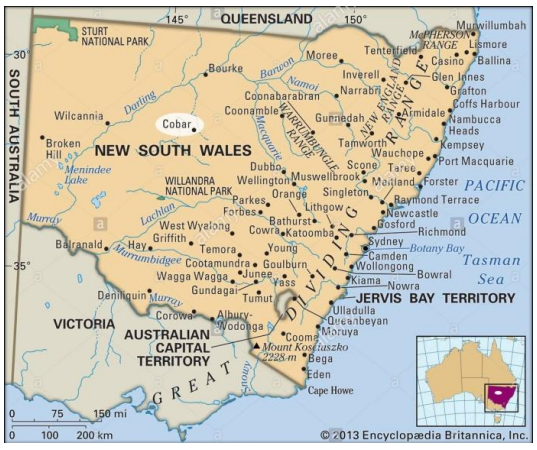
1 INTRODUCTION

We at Endeavor Mine conduct periodic environmental monitoring to substantiate the effectiveness of our environmental controls which are in place to protect the environment, the health of our workers, our neighbours and the greater community. Welcome to the July 2018 Environmental Monitoring Report.

This report has also been produced to satisfy our reporting obligations under the Protection of the Environment Operations Act 1997 (POEO Act), Mine Operational Plan (MOP) and EP Licence 1301 which requires for Endeavor Mine to publish or make pollution monitoring data available to members of the public. The report provides a summary of monthly environmental monitoring results for July 2018.

Endeavor Mine's environmental monitoring program includes the monitoring of contaminants to air, surface water and ground water at locations within or beyond mine site boundary. The program also involves the monitoring of noise (when required), the management of hazardous and non-hazardous waste, the deposition of tailings and reporting of resources such as raw water usage. All monitoring is conducted in accordance with regulatory requirements and the EOPL Annual Environmental Monitoring Plan.

Samples are periodically collected and handled in accordance and compliance with regulatory requirements and taken to laboratories accredited by the National Association of Testing Authorities (NATA) for analysis. The Report also compares the results against established internal and external targets and provides critical discussion on environmental issues and sustainability initiatives during the monitoring period.



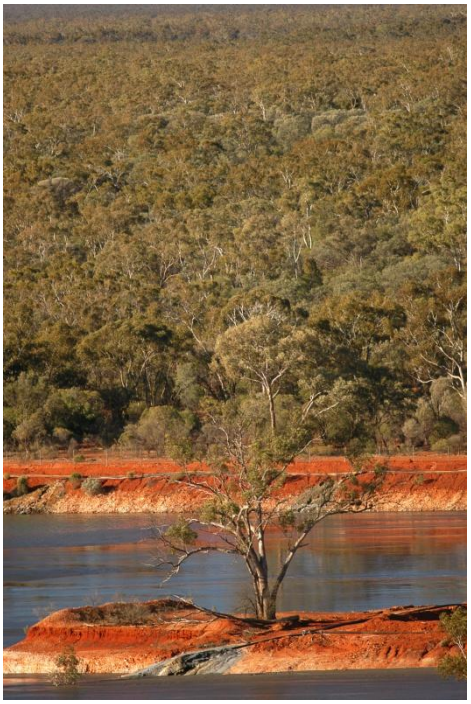
1 Meteorology

The following section presents historical and current weather data for Cobar and the surrounding Shire.

1.1 Temperature and Humidity

History

Cobar has a semi-arid climate with hot summers and cool to mild winters. Winter nights can be quite cold. Average monthly maximum temperatures tend to range from 13C to 20C in winter to between 28C to 39C in summer. Average monthly minimum temperatures range from 2C to 8C in winter to 14C to 24C in summer. The humidity in Cobar is low. During the summer the average relative humidity is about 30% in the afternoon and about 50% at 9am. In winter it is about 45% at 3pm, whilst it is about 75% at 9am.



1.2 Meteorological Data for July 2018

The average temperature for the Cobar region for July 2018 was 24^{o}C with average-low humidity and stable barometric pressure. Table 1 shows the high and low weather summary.

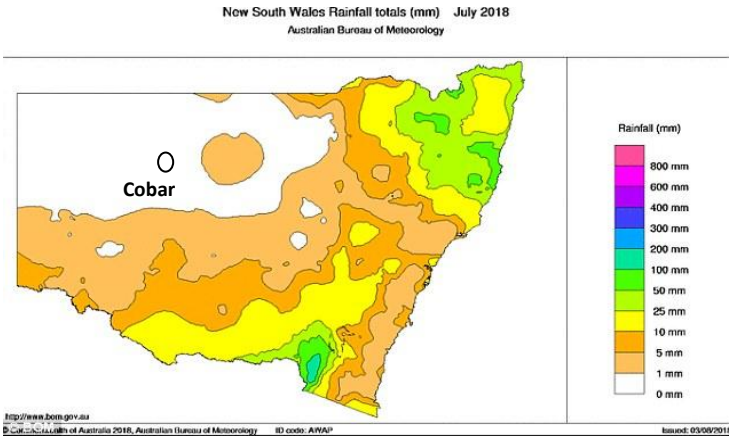
Table 1: High and Low Weather Summary for July 2018 (BoM)

	Temperature	Humidity	Pressure
High	**25.3°C (3 July,)**	**84% (2 July, 9.00am)**	**1031 mbar (1 July, 900am)**
Low	**-0.1°C (15 July)**	**17%(23 July, 3.00pm)**	**1008 mbar(28 July, 3:00 pm)**
Average	**11°C**	**50%**	**1020 mbar**

1.3 Rainfall

History

On average, rainfall in the Cobar region tends to be uniformly distributed throughout the year, with a median annual rainfall of 390-400mm. The average monthly rainfall is 33mm. The mean evaporation rate for the region is1953mm – 6 times the annual rainfall. The rainfall is however extremely variable, and this is particularly so in late summer and early spring when the highest observed falls have been in excess of 200mm in any one month. This results in the average monthly rainfall being greatly in excess of the median monthly rainfall for some months. In January, February and July, for example, the average rainfall is more than double the median rainfall.



1.4 Rainfall for July 2018

There was 0.2mm of rainfall in Cobar and surrounding areas during July 2018. YTD rainfall is shown in Table 2.

Table 2: YTD Rainfall for Cobar, NSW (BoM)

January 2018	February 2018	March 2018	April 2018	June 2018	July 2018	YTD
6.2mm	0.2mm	0.0mm	0.4mm	1.4mm	0.2mm	8.6mm

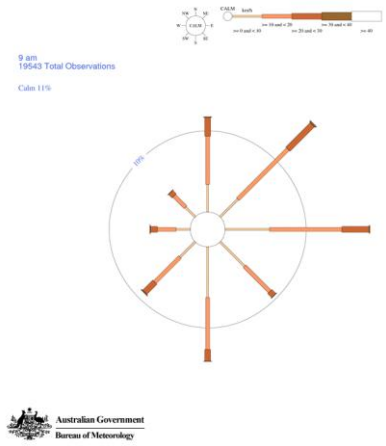
Although the Bureau of Meteorology provides up to date and accurate data for the Cobar Township, Endeavor believe it will require more acute information in the future to assist in our environmental

activities. Endeavor is currently upgrading to a newer more advanced weather station and expects to obtain more representative data regarding site weather conditions in upcoming reports.

1.5 Wind

History

The predominant wind direction for the Cobar region is East or North East, but will come from the North occasionally West during the hotter periods. Wind can play a critical role in a site's environmental performance, particularly with dust deposition and noise depending on wind direction.



1.5.1 Wind Data (BoM)

With the onset of cooler weather, winds were predominately from the West South West (WSW) with occasional winds from the NNW. The highest wind gust recorded was 57km/h on the on July 20.

2 Monitoring Requirements

The Importance of Monitoring

Increasingly, mining companies are coming under pressure to improve their environmental, social and financial performance. The challenges stem from fluctuating stakeholder demands and shifting commodity prices. To many, keeping production costs down is a top priority to ensure profit margin are maintained. But it is much more than that.

Endeavor Mine has found by implementing more accurate and efficient environmental monitoring as part of their operational culture and practices, it has produced significant and positive impacts on overall performance. By truly understanding what is happening across the operation, more informed and sustainable decisions can be made about the business.

3 Dust Monitoring

Air quality aspects and impacts associated with site operations are managed in accordance with the Air Quality Management Plan (END-PLN-ENV-006) and the requirements detailed in NSW EP Licence 1301.

The Endeavor Mine is located 47km from the nearest town (Cobar) and 4.5km away from its nearest sensitive receptor (residential property). Therefore, dust deposition at these potential sensitive receptors is considered a low environmental risk.

Nevertheless, dust deposition on and beyond the boundary of the lease has the potential to cause environmental harm. Therefore Endeavor Mine manages airborne contaminants on site through the use of water sprays and a water trucks with depositional dust monitoring stations strategically located along the boundary of ML158/159/160/161 to measure performance.

3.1 Dust Monitoring Methodology and Limits

The Endeavor Mine Dust Monitoring Program measures dust deposition rates on a monthly basis at the main mining lease boundary (4 locations) and at a background location located 11km from the operating mine site. EP Licence 1301 does not set limits for dust deposition. The results are however assessed against the recommended limits outlined in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW 2005*. This guidance document recommends that the deposition rate for total insoluble matter when expressed as a 12 month rolling average should not exceed 4 g/m^2/month and that site activities should not generate dust emissions which result in a dust deposition rate greater than 2 g/m^2/month above background levels. Table 3 describes the Pollutant, Units of Measure, Monitoring Frequency and Method of Sampling.

Table 3: Endeavor Mine Air Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 4

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 5

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

3.2 Monitoring Locations

As shown in the satellite image (Figure 1), there are 5 dust monitoring locations on the boundary of the lease, with one located 11kms from the site at the turnoff to the Mine site near the Louth Road. This station was positioned to establish background levels.

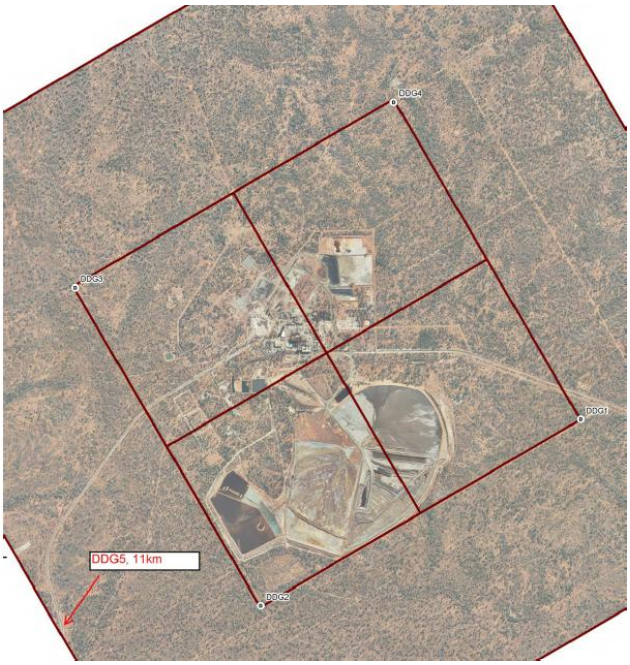


Figure 1: Endeavor Mine Dust Monitoring Locations

3.3 Dust Monitoring Results for July 2018

Table 4 shows the results of Monitoring for July 2018.

Table 4: Dust Monitoring Results for July 2018

Monitoring Location			DG1	DG2	DG3	DG4	DG5
Date / Sample Collected			**09/08/2018**	**09/08/2018**	**09/08/2018**	**09/08/2018**	**09/08/2018**
Dissolved Metals by ICP-MS		**Unit**					
Lead (Dissolved)	7439-92-1	mg/L	0.001	0.002	0.001	0.003	<0.001
Total Soluble Matter		g/mÂ².month	0.5	0.6	0.5	0.5	0.4
Total Insoluble Matter		g/mÂ².month	2.1	2.2	1.8	2.4	1.2

3.4 Discussion

As shown in Table 4, the results for Soluble Matter (TSM) and Insoluble Matter (TIM). Results for TIM were low and did not exceed the limit of 4 g/m^2/month as set in the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW 2005*. TSM were consistent with previous month result. Pb levels were detectable in 4 of the 5 with DDG5 (background) being undetectable. Levels for the other 4 sites were low and well within established guidelines.

4 Groundwater Monitoring

Deep and Shallow Aquifers

Deep regional groundwater flows to the south west, conforming to the structural dip of the underlying sedimentary rocks. Groundwater inflow into the mine is observed at a depth range of between 60 to 80 m below ground surface. A shallow, perched aquifer occurs is found in the vicinity of the Central Tailings Discharge CTD between approximately 0.5 to 13 m below ground surface. This aquifer is recharged by rainfall and seepage water from the operational TSF via a permeable gravelly soil layer in the area.

A review of groundwater characteristics undertaken by consultants Environmental Earth Sciences (EES) in 2013 indicates there is no interface between the shallow perched water and the deep regional aquifer.

Ground Water Quality

Groundwater quality at the mine is generally poor due to the high salinity. The water has been sampled by NSW Water Conservation and Irrigation for the original Environmental Impact Statement (EIS) could be considered "brackish" and was found to have an electrical conductivity (EC) of 26,000 µS/cm (sea water is approximately 30,000 us/cm). Further, it was noted that the water was not suitable for stock, domestic or farm use. Potential contamination of the groundwater would be of low risk due to the naturally poor quality of the water.

4.1 Monitoring Locations

Endeavor Mine's groundwater monitoring locations are concentrated around the perimeter of the Central Tailings Discharge (CTD) and the Sector 5 Tailings Storage Facility (CTF), while surface water monitoring locations are focused on water storages that could potentially discharge to environment during a major rain or storm event. Table 5 describes the monitoring stations where Figure 2 shows the locations of the piezometers. Depending on availability of water or flow, unfortunately on some occasions, piezometers cannot be monitored as a result of being dry.

Table 5: EPA Monitoring Stations

8	Discharge to tailings dam	Discharge to tailings dam	End of tailings line pipe that discharges"Sector Five" tailing dam as shown on map titled"Sector 5-tailing facility"and submitted to the DEC in document BTF 9027.
9	Groundwater monitoring Point		Piezometer labelled as "BH02" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
10	Groundwater Monitoring Point		Piezometer labelled as "BH02B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
11	Groundwater Monitoring Point		Piezometer labelled as "BH03" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
12	Groundwater Monitoring Point		Piezometer labelled as "BH06" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
13	Groundwater Monitoring Point		Piezometer labelled as "BH08A" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
14	Groundwater Monitoring Point		Piezometer labelled as "BH09" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
15	Groundwater Monitoring Point		Piezometer labelled as "BH10" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
16	Groundwater Monitoring Point		Piezometer labelled as "BH10B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
17	Groundwater Monitoring Point		Piezometer labelled as "BH12B" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
18	Groundwater Monitoring Point		Piezometer labelled as "BH14" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).

Table 5: EPA Monitoring Stations		
19	Groundwater Monitoring Point	Piezometer labelled as "BH15" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
20	Groundwater Monitoring Point	Piezometer labelled as "BH16" on map titled "Statutory Groundwater Monitoring Locations" received by the EPA on 12/12/14 (DOC14/317060).
25	Groundwater Monitoring	Piezometer labelled as "BH13" on map titled "Statutory Groundwater Monitoring Locations" recieved by the EPA on 12/12/14.

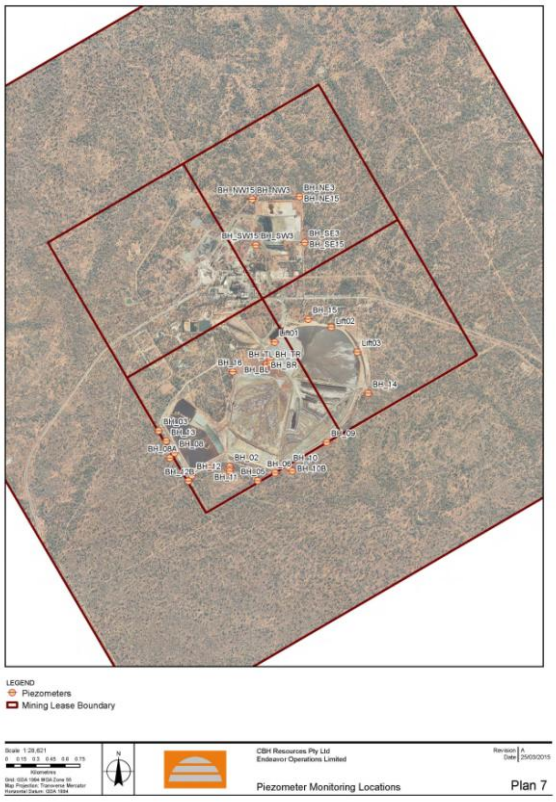


Figure 2: Location of the Piezometer Monitoring Locations

4.2 Groundwater Monitoring Results

No Groundwater Piezometers were sampled during July. It is planned to undertake Standing Water Level assessments during August 2018.

5 Surface Water

History

Surface water is categorised in two the following categories:

Clean Water: *Water that has not been degraded by contact with mine operations and is of a suitable quality for release to the off lease receiving environment. Clean water includes: Raw Water, Potable Water, and Clean Stormwater. However in an arid and water starved environment like the Cobar Shire, water is reused and recycled at every opportunity.*

Contaminated Water: *Water containing potential contaminants or pollutants and not fit for discharge, water that has had contact mining and ore processing operations. Contaminated water includes: Process Water, Tailings Supernatant, Mine Water, and Contaminated Stormwater.*

5.1 Monitoring Methodology

Although not part of the legislative commitments, Endeavor monitors surface waters on the lease as part of its internal and operational commitment. The site does not release any water directly into the environment. It operates with a closed circuit. However Endeavor remains vigilant in understanding the risks associated of impacted surface water. The main surface water monitoring point is the Evaporation Pond which is measured monthly (Volumes and pH) and biannually along with all other site dams for pH, electrical conductivity (EC), total dissolved solids (TDS), Cations (Ca, Mg, Na, K, ionic balance), Anions (SO4, Cl, alkalinity, flouride), Cyanide (total) and dissolved metals (As, Cd, Cr, Cu, Pb, Ni, Mn, Zn, Al, Fe, Se, Hg). Water in the Supergene Pit and Pontoon Dam could not be sampled due to a lack of water and unsafe access to any surface water.

5.2 Monitoring Locations

Figure 3 shows the location of the surface water dams on site that are monitored for water quality bi-annually.

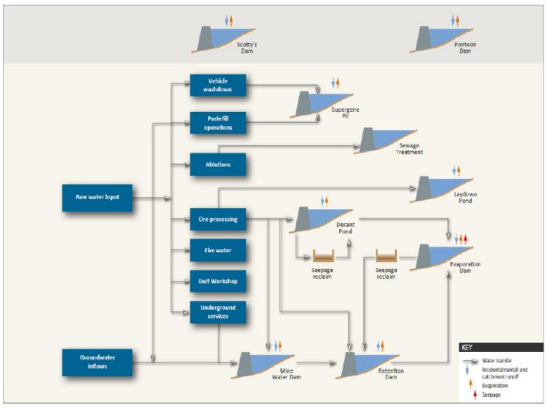
Figure 3: The Endeavor Mine: Main Water Storages

5.3 Results

5.4 Results Discussion

Due to the drought, it is difficult to access any of the dams with the exception of the Retention Dam. Access to the water is making access too dangerous. If rain occurs during August, samples will be collected.

Raw Water Usage



History

The Cobar Water Board supplies raw water to the Endeavor Mine via a pipeline along the rail corridor. This water is sourced from Burrendong Dam (right) via a system of open channels, weirs and pipelines. Endeavor Mine currently holds a high security license for 1,280 Ml per annum, with average usage being 58,000KL per month. Supply of this water is controlled by the Cobar Water Board. The licensed volume of water is generally sufficient to support mining operations. If required, an above allocation water purchase can be made through the CWB depending on the level of drought and/or water restrictions placed on the area.

Raw water is reticulated across site for use as make up water for the Retention Dam (process water) and for "clean water" uses such as vehicle and equipment wash down and dust suppression. Raw water is initially stored in 5ML holding tank from where it is distributed to either: the raw water system, the potable water treatment plant or the fire water reticulation system.

5.5 Monitoring Methodology

Joint readings by personnel from Endeavor Mine Environmental Department and the Cobar Shire Council are conducted monthly.

5.6 Results

Table 6 shows water usage year to date usage as well as usage for July 2018. Less water was used during July compared to previous months.

Table 6: Raw Water Use for July 2018

Date	YTD (KL)	Usage (KL) for July 2018
31/06/2018	492531	81853

6 Noise Management

Environmental noise is the propagation of noise with harmful impact on the activity of human or animal life According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms, regardless of how long or consistent the exposure is. Exposure for more than 8 hours to constant noise beyond 85 dB is deemed hazardous. A "Nuisance" Noise is a noteworthy and unreasonable amount of sound from neighbouring premises.

Endeavor Operations has never received a noise complaint from its neighbours. The closest sensitive receptor (neighbouring property) is Poon Boon Station, which is located 4.5 kms away from operations and has never reported a complaint for noise, dust, vibration or visual amenity. The predominant wind direction is from the east to north-east, therefore; the greatest potential noise risk is for 'Bundella', 11.8 km from the mine. Again, no complaints have been registered.

6.1 Noise and Vibration Assessment

If a noise complaint is registered, Endeavor Mine will identify the acoustic values where a potential source is emanating as well as determine background levels at the nearest sensitive receptor (nearest Property).

Acoustic values to be measured and considered include:

- Health and biodiversity of ecosystems;
- Human health and wellbeing, including ensuring a suitable acoustic environment for individuals to sleep, study or learn, and be involved in recreation, including relaxation and conversation; and
- The amenity of the community.

The noise and vibration assessment will involve the identification of a baseline noise environment, modelling of potential noise sources and assessment of potential impacts associated with the operation. Any impact assessment will be based on likely sources including indicative operating equipment.

6.1.1 Neighbours (Sensitive Receptor)

A sensitive receptor is considered to be a location in the vicinity of the operation, where noise July affect the amenity of the land use.

6.1.2 Noise Management Plan

Based on the results of the assessment, a noise management plan is in place to address how plan activities will be carried out, according to best practice noise management principles.

Best-practice noise management principles include:

- Noise impact assessments and emission calculations;
- Administration of activities;
- Stakeholder engagement;
- Adoption of noise attenuating technologies for plant and equipment (if practicable);
- Minimising background creep; and
- Containing and minimising variable noise;

6.2 Monitoring Locations

Potential Monitoring locations will include neighbouring properties. Figure 4 shows the location of the neighbouring properties.

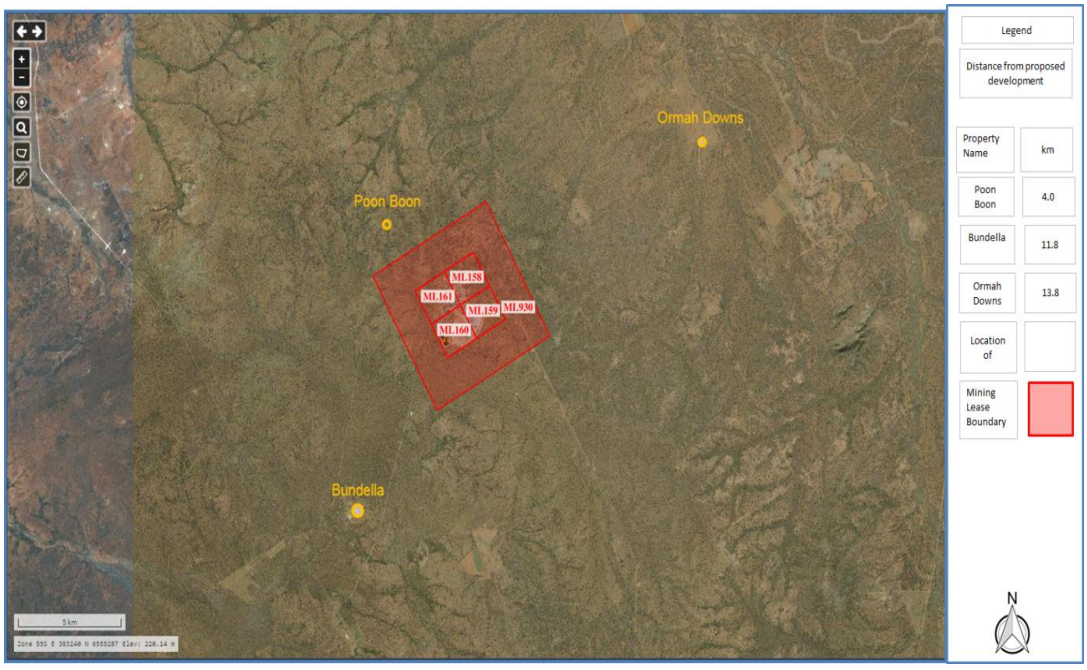


Figure 4: Closest Neighbours to Endeavor Mine

6.3 Noise Monitoring Results for July 2018

No noise complaints were registered during July 2018. The Noise Management Action Plan was not activated. Year to date, Endeavor Mine has received no complaints regarding noise or any other nuisance issue.

7 Waste Management

Endeavor Mine has developed and implemented a Waste Management Plan to provide a framework for managing process and non-process wastes, both liquid and solid, excluding waste rock, overburden and tailings. Detailed internal procedures are used to support both the operation and maintenance of the waste. The primary objectives are to:

- *Reduce potential health and environmental risks associated with waste generation and disposal;*
- *Promote the efficient use and conservation of resources, reduce the need for waste treatment facilities and reduce the requirement for raw materials;*
- *Minimise the use of hazardous materials and seek safer alternative materials where possible; and*
- *Comply with statutory requirements, specifically the conditions set out in Environmental Protection Licence 1301 and site Mining Leases and other statutory requirements.*

As stated in EP1301, Endeavor Mine "*must not cause, permit or allow any waste to be received at the premises, except the wastes expressly meeting the definition as stated in its License*". Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the Table 7. Any waste received at Endeavor Mine is subject to the limits or conditions.

Code	Waste	Description	Activity	Other Limits
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005	As specified in each particular resource recovery exemption	NA
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA

Table 7: Requirements for the Storage and Handling of Waste under EP 1301.

7.1 Waste Discussion

In late July, Endeavor Mine commenced a site wide waste reduction program starting with Scrap Steel. The sale of the scrap will fund the removal and management of other waste material such as rubber, tyres, plastics and e-waste. It is expected that a dramatic reduction will be seen in:

- Steel and other metals;
- Lighting;
- Fire Extinguishers;
- Tyres;
- E-Waste;
- Batteries;
- Poly Pipe;
- Timber;
- Empty chemical containers; and
- Waste hydrocarbons and containers.
- Any hazardous and/or trackable waste removed from site will be done so in accordance with NSW legislation.

It is our intention to reduce waste levels to sustainable levels to enable the business to better manage its “non-problematic” waste.

8 Tailings Deposition

History

Tailings (also known as "tails" or "residue" is the material left over after the process of separating the valuable fraction from the uneconomic fraction (waste) of ore. Tailings are distinct from overburden, which is the waste rock or other material that overlies an ore or mineral body and is displaced during mining without being processed.

The volumes of tailings can be large, and required engineered storage and capacity to safely house them. Depending on the nature of the ore or the type of chemicals used in the extraction process, tailings can have the potential to harm the environment unless they are deposited and managed correctly.

The reporting of monthly tailings deposition is a legislative requirement as part of EP 1301.

8.1 Results

Table 8 shows the volumes of tailings deposited for July 2018. All tailings were deposited in Sector 4.

	Environment Protection Licence Monitoring Point 7		Environment Protection Licence Monitoring Point 8		
	Volume of tailings deposited (KL)	Mass of tailing solids deposited (DMT)	Volume of tailings deposited (KL)	Mass of tailing solids deposited (DMT)	Mass of tailing solids deposited (DMT) **YTD**
July 2018	**0**	**0**	**81300**	**52050**	**334,206**

Table 8: Tailings Deposition for July 2018

9 Rehabilitation and Research

As the majority of the site will remain active for the life of the mine, only limited progressive rehabilitation is possible. However extensive planning and research into the rehabilitation of facilities such as the tailings dams are ongoing.

There are several significant projects being explored:

- *High Density Hard Pan Capping; and*
- *Sustainable Development in Post Mining Land Use (PMLU); and*
- *Investigation into Pb tolerant species.*

Endeavor Mine are currently in discussion with industry experts to look at collaborative research into sustainable final and post mining landforms.

10 Complaints Hotline

Endeavor Mine has established a complaints hotline for members of the Public to voice any concerns they July have with Endeavor Mine activities. The phone number to call is (02) 68306475 or email on enquiries@endeavor.com.au. The number can be called 24 hours a day / 7 days a week. Endeavor will investigate any complaint and take immediate action if the complaint is validated. The Hotline details were also advertised and published in the Cobar Weekly during July 2018.