CSA Environmental Monitoring Report H1 2023

Name of Mine:	CSA
Leaseholder:	Metals Acquisition Limited
Environment Protection License:	EPL1864
Mining Lease:	Consolidated Mining Lease 5 (CML5)

Document Approval	
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Contents

Introduction

Cobar Management Pty Ltd (CMPL) operates the CSA mine, which is located 11km north of Cobar, New South Wales. CMPL, a wholly owned subsidiary of Metals Acquisition Limited (MAC), retains ownership of CSA, which operates as an underground copper mine, hoisting up to 1 million tonnes of copper ore and producing more than 146,000 tonnes of copper concentrate per annum.

Ore is processed on site by grinding and flotation. Once processed, the concentrate slurry is thickened, filtered, dried and stockpiled. Concentrate is then transported by rail to Port Waratah in Newcastle, for storage and export by ocean freight. Tailings are stored in the South Tailing Storage Facility on site, and waste rock is stockpiled for future closure requirements.

Scope

This report will provide a summary and brief analysis of the ongoing environmental monitoring for CSA from January to June of 2023. This includes air quality, water (including surface water, potable water, groundwater quality, and groundwater levels), and soil analyses. Any potential breaches will be investigated against the relevant guidelines.

Monitoring of emissions and general airborne pollutant data that is not particulate matter is conducted in accordance with the National Pollutant Inventory (NPI) and National Greenhouse Gas Inventory Reporting (NGER) and is not covered in this report.

Regulatory context

CSA operates within the licensing conditions of the DA set in 1995, as well as the EPL1864. In addition to these, CSA is legally obligated to ensure that operations do not occur in exceedance of set limits within the relevant legislation, this being Protection of the Environment Operations Act (POEO act), the Mining Act 1992, and various other pieces of specific legislation and guidelines, including Australian National Committee on Large Dams (ANCOLD) and the Environment Protection Authority guidelines. A full list of relevant legislation can be found in **Table 7**, Appendix A. CSA provides this monitoring data on the MAC website for public viewing, as of the requirements in the NSW EPA guidelines.

Environmental monitoring and reporting also occurs in accordance with the requirements of the CSA Environmental Management Strategy (EMS), as well as applicable regulations including ISO14001. CSA Mine must report on environmental performance on a yearly basis through the Environmental Protection Authority Annual Return and the Resource Regulator Annual Return. The EPA Annual Return pertains to pollution and monitoring, whereas the Resource Regulator return pertains to land rehabilitation.

Note: *Although EPL1864 does not require any specific monitoring and thus doesn't require and monitoring reports to be made publicly available, CSA are operating beyond best practice, and therefore undertakes monitoring and publicly reports on environmental data that is relevant to site operations*.

Weather conditions

Cobar is a highly arid region, experiencing weather extremes and bouts of extreme dry weather in addition to high levels of heat and wind. Climatic data for Cobar are collected at a Bureau of Meteorology (BoM) weather station (MO 48027) located adjacent to Louth Road, south of the mine. Rainfall and temperature records have been recorded from May 1962, and evaporation from November 1967 to 2016.

Climatic data for the Cobar region from the Bureau of Meteorology can be seen in Figures 1 through 4, below. This data stands to provide background for monitoring schedules utilised at CSA, in addition to an explanation of possible adverse monitoring results which may occur.

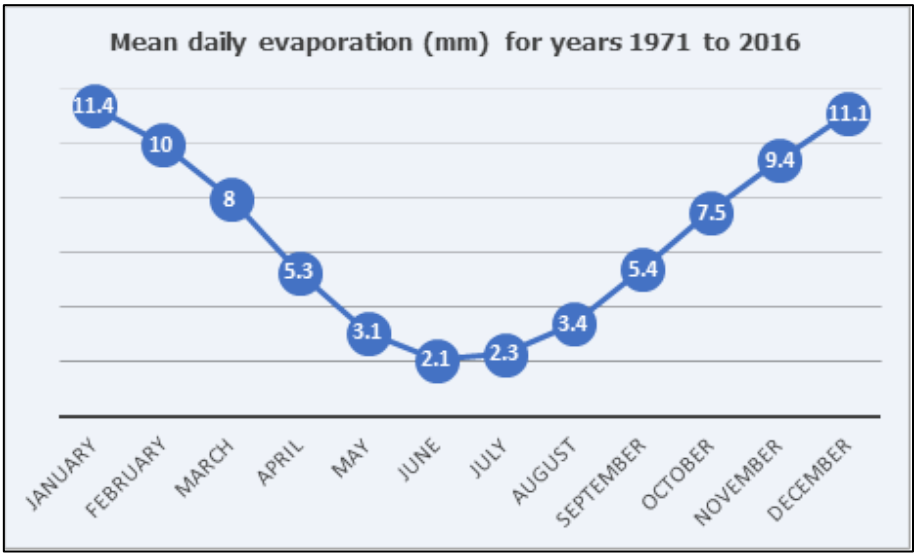

Figure 1 Mean daily evaporation for Cobar, years 1971-2016 (BoM, 2023)

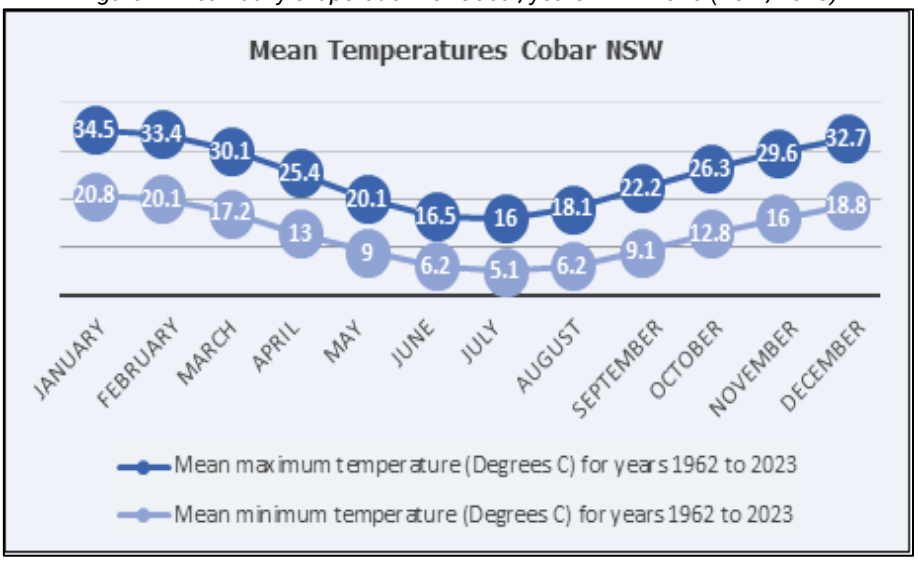

Figure 2 Mean max and min temperatures for Cobar, years 1962-2023 (Bom,2023)

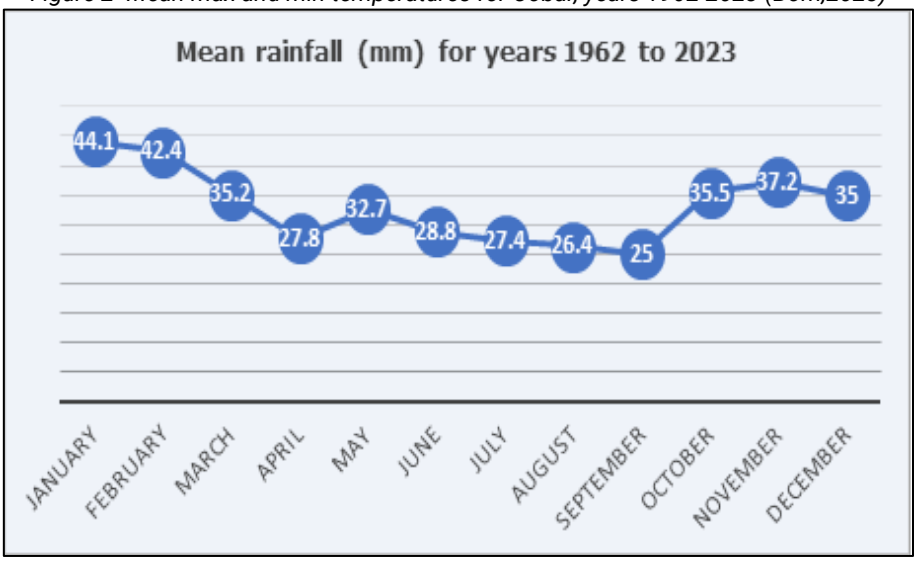

Figure 3 Mean rainfall for Cobar, years 1962-2023 (BoM, 2023)

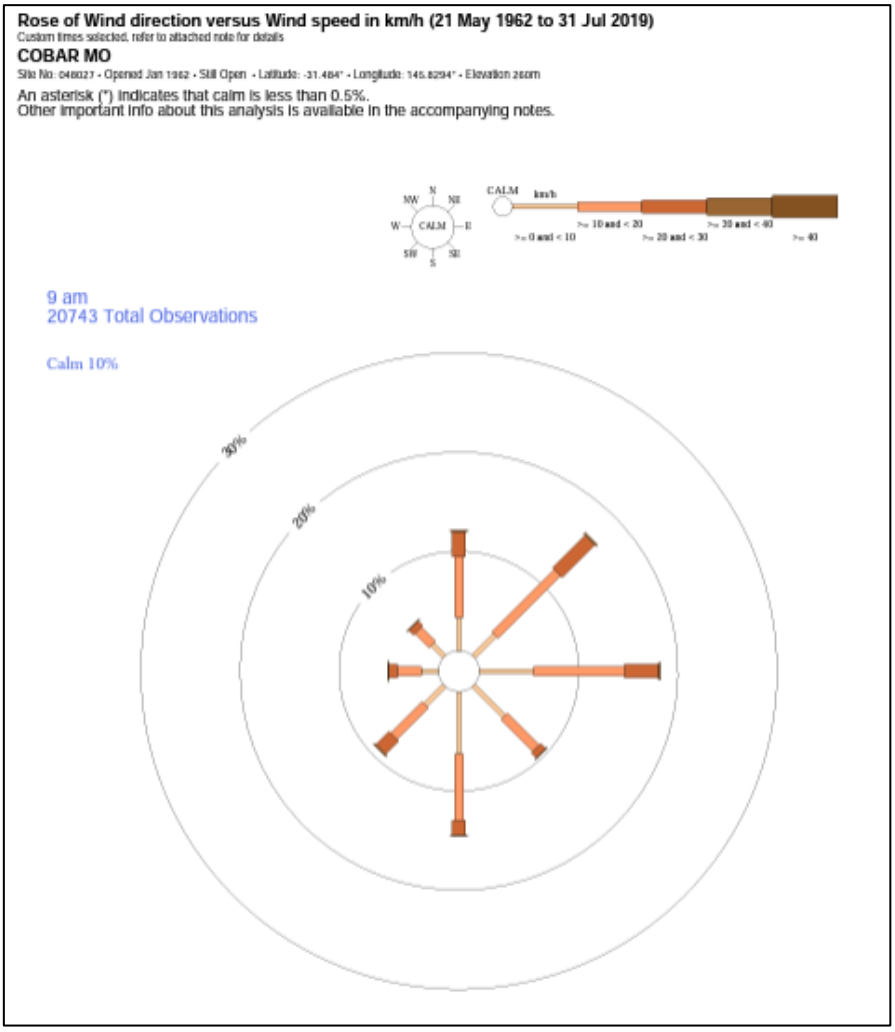

Figure 4 Cobar wind rose (BoM, 2019)

Air Quality

Dust

CSA Mine operations have the potential to contribute to air pollution through the presence of airborne dust. Several aspects of surface operations have the potential to create dust, including the usage of equipment, in addition to secondary pollution created through emissions from vehicles, plant and equipment (the latter of which will not be assessed in this report).

The main dust generating activities which may occur at CSA include: the operations of machinery on unsealed surface roads, topsoil stripping, wind impacts on exposed stockpiles of concentrate, movement of waste rock or other materials, surface exploration drilling, and ventilation exhaust from underground mining activities.

Stationary depositional dust gauges (DDG) are in place at CSA, strategically located to ensure a thorough coverage across all areas of operations. This includes at far corners of the lease/fence area, in addition to in areas of high traffic and operations, i.e. haul roads. See **Figure 5** which shows the DDG locations and **Figure 7** which shows the high reading locations. The DDG's on the site perimeter (D13,D14,D15 and D16) are to ensure compliance with no dust leaving premise whilst the DDG's in closer proximity to the mine operations are for internal use, to monitor and manage site works and to address or change site work practices as required.

Metrics of dust measurement include depositional dust, measured is in *ash content per square metre per month* ($g/m^2/m$). Data for depositional dust for January to June 2023 can be seen in **Table 1** and **Figure 6** and **Figure 7** below.

The lease perimeter dust gauges are all within the NSW EPA guideline limit of 4 g/m^2/m, which shows that the higher dust readings recorded onsite are not impacting or migrating offsite. There was a slight spike in depositional dust in May, which subsided into June and July. It is estimated that this spike occurred due to dry weather conditions, and subsided due to increased precipitation in the region in June and July. This did exceed the guideline limit of 4 g/m^2/month in the short term in some areas of site as seen in the red highlighted cells in **Table 1**, however this was able to be explained through gauge D5 being located in a high traffic area (TSF haul road) during a period of increased operations throughout May and June, and the January gauge D2 and April gauge D11 exceedances being anomalies brought about by a combination of factors, including weather and operational changes occurring.

It is noted that the 4 g/m^2/month recommended limit is an annualised averaged result and thus short-term spikes are not necessarily a non-compliance with the regulations, nonetheless they are triggers for internal process reviews and remediation processes. It is also noted that depositional dust once it is above the 4 g/m^2/month is then termed nuisance dust.

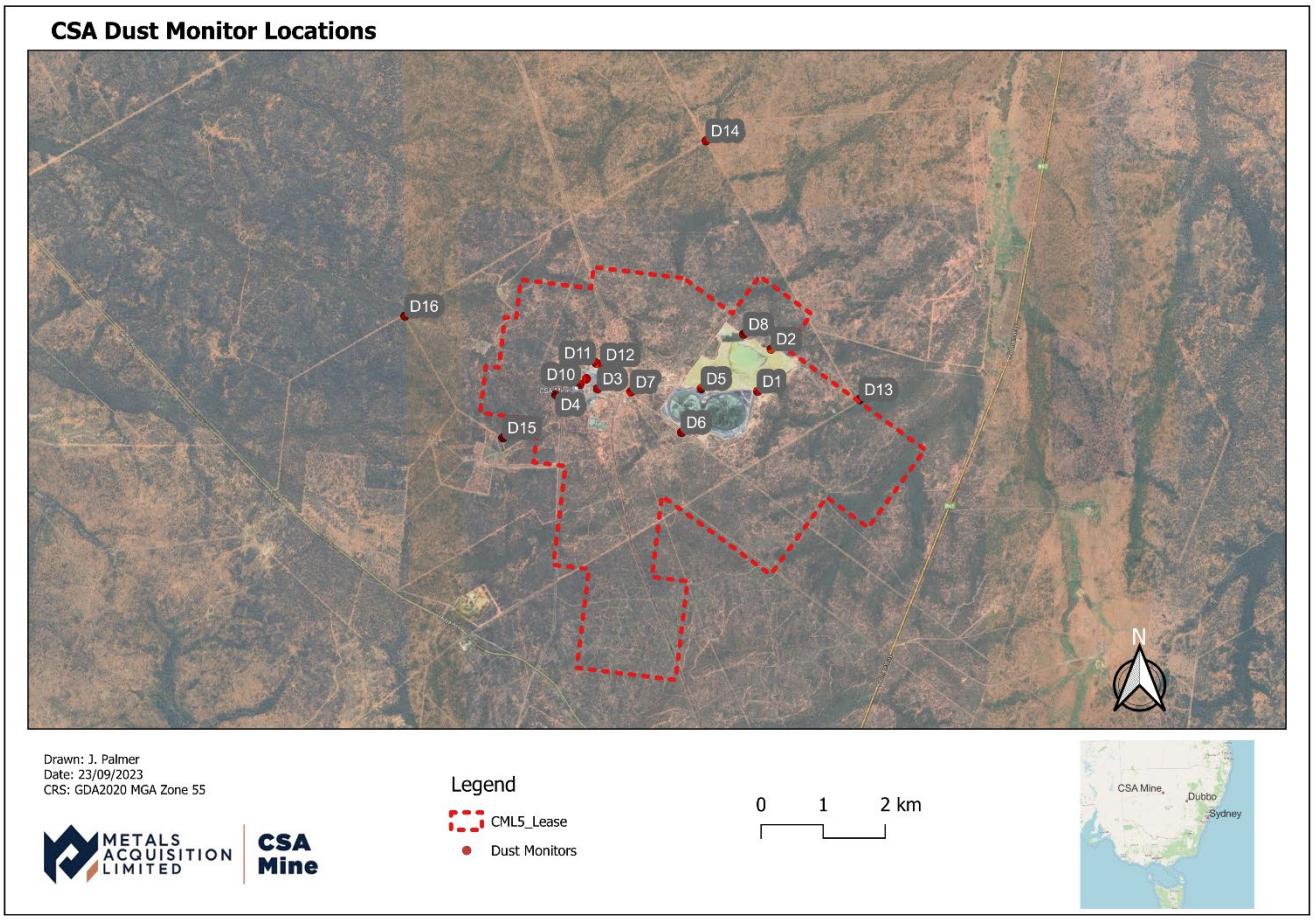

Figure 5 Dust Monitor Locations within CML5 Lease

Table 1 Depositional Dust results

Dust Gauges	Ash content g/m²/month					
	Jan	Feb	Mar	Apr	May	Jun
Compliance DDG's						
D13	1	0.1	0.1	0.3	0.3	**0.1**
D14	1.5	0.6	0.6	0.3	0.5	**0.1**
D15	0.6	1.3	1.3	0.5	0.4	**0.1**
D16	0.9	0.1	0.1	0.4	0.4	**0.1**
Site Management DDG's						
D1	2.1	2.3	2.3	1.3	0.8	**1.3**
D2	5.8	0.7	0.7	0.6	0.3	**0.2**
D3	1.6	0.9	0.9	0.9	1	**0.8**
D4	1	0.3	0.3	0.6	0.7	**0.6**
D5	2.4	1.2	1.2	1.5	16.8	**15.2**
D6	1.1	0.3	0.3	0.6	0.8	**0.3**
D7	2.3	1	1	0.9	2.5	**3.6**
D8	2.7	0.5	0.5	0.6	0.1	**0.1**
D9	2.6	2.2	2.2	2	2.5	**1.4**
D10	2.6	2.1	2.1	2.1	1.9	**1.5**
D11	2.9	0.3	0.3	4.3	3.8	**2**
D12	3.4	0.8	0.8	2.3	3.8	**3.9**

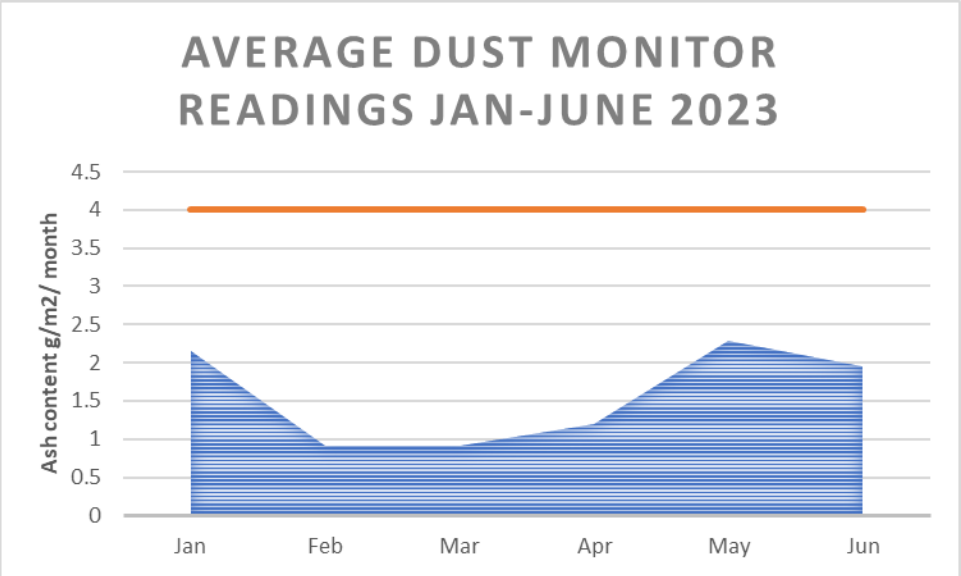

Figure 6 CSA dust monitor averages (average of 14 monitors for 6 months period) Jan to Jun 2023

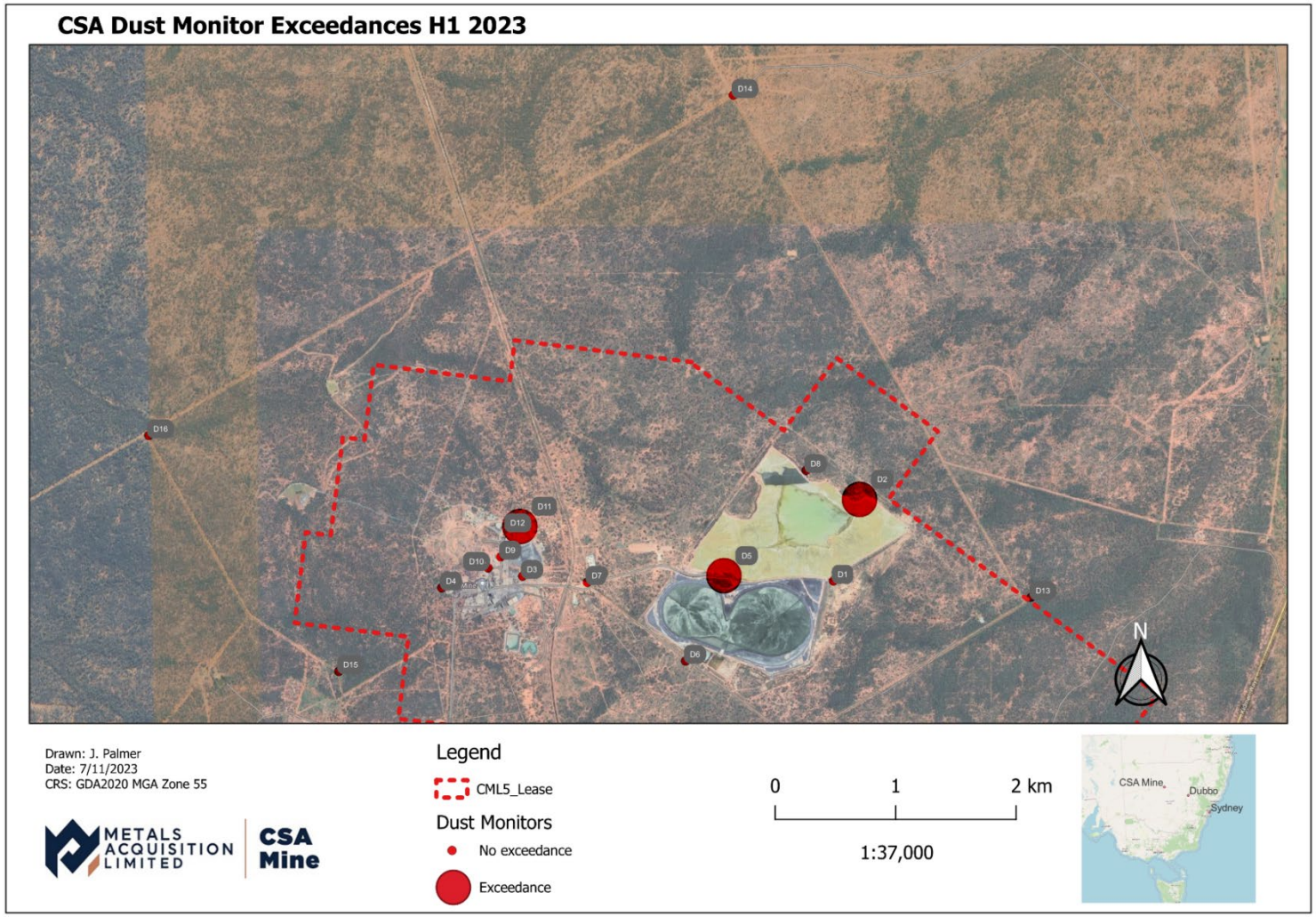

Figure 7 CSA Dust Monitor Locations

Stationary Air Quality Monitoring

The stationary air quality monitoring station at CSA was under maintenance in H1 of 2023. Alternate solutions are being investigated for future monitoring periods.

Water Quality

Surface Water

CSA retains several surface water dams and catchments, including naturally formed dams, in addition to manmade water storage structures. Water storages are tested for quality to assess for any potential environmental contamination which may occur through operations. The main metric which is assessed in testing is copper contamination. This is to ensure that environmental impacts are not spreading outside mining lease boundary. Copper and Zinc levels are assessed against the Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Irrigation and General Use. These stipulate an upper limit of 5mg/L of copper and zinc contamination in water.

Testing in the former half of 2023 was minimal due to many dams being empty due to the prolonged dry period experienced in western NSW, however it is anticipated that these sites will all be tested at least twice over the course of 2024. Surface water monitoring locations can be seen in **Figure 8** below.

No testing was undertaken in the months of February and June of 2023, however results for copper and zinc in samples taken in remaining months can be seen in Tables 2 and 3 below. Note that due to weather constraints, testing was not conducted in a uniform manner across sites. As mentioned, some sites were not tested due to not containing enough water to accurately sample (this occurred with Mt Brown Sediment Dams 2 through 4, and Tanks 1, 2, 4 and 6).

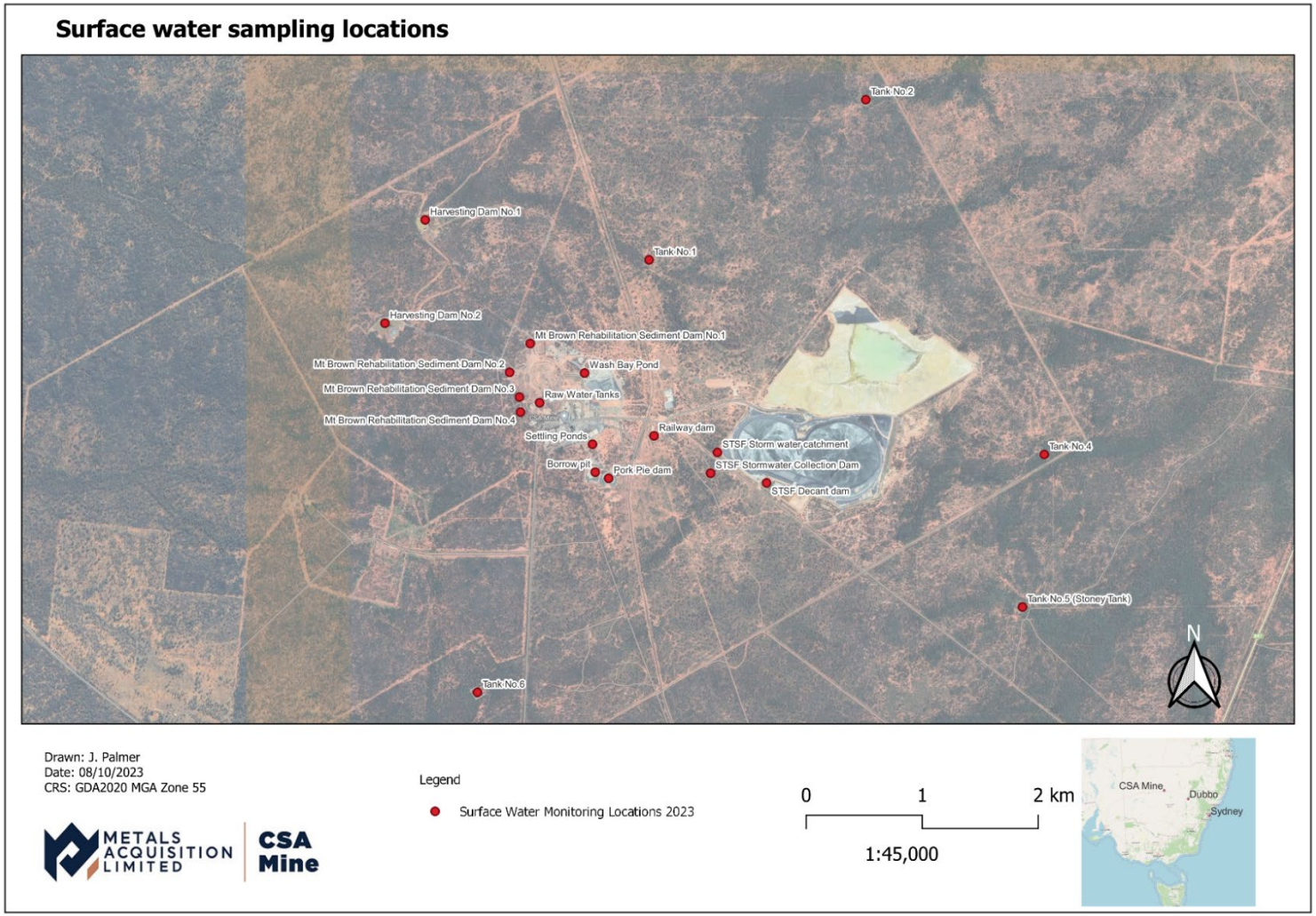

Figure 8 CSA surface water sampling sites

Table 2 Copper levels in surface water in mg/L

DESCRIPTION	Jan	Mar	Apr	May
Mt Brown Rehabilitation Sediment Dam No.1	13.5	16.2		
Raw Water Tanks	0.013			
STSF Stormwater Collection Dam	0.028			
Borrow pit	0.262			
STSF Decant dam				0.382
Wash Bay Pond				
Tank No.1				
Railway dam		9.68		
Mt Brown Rehabilitation Sediment Dam No.4				
Mt Brown Rehabilitation Sediment Dam No.2				
STSF Storm water catchment		0.148		
Mt Brown Rehabilitation Sediment Dam No.3				
Pork Pie dam			0.186	
Harvesting Dam No.1			0.026	
Harvesting Dam No.2			0.008	
Tank No.6				
Settling Ponds				
Tank No.5 (Stoney Tank)				0.032
Tank No.4				
Tank No.2				

Table 3 Zinc levels in surface water in mg/L

DESCRIPTION	Jan	Mar	Apr	May
Mt Brown Rehabilitation Sediment Dam No.1	58.5	63.4		
Raw Water Tanks	0.052			
STSF Stormwater Collection Dam	0.022			
Borrow pit	1.08			
STSF Decant dam				0.623
Wash Bay Pond				
Tank No.1				
Railway dam		4.82		
Mt Brown Rehabilitation Sediment Dam No.4				
Mt Brown Rehabilitation Sediment Dam No.2				
STSF Storm water catchment		0.026		
Mt Brown Rehabilitation Sediment Dam No.3				
Pork Pie dam			1.76	
Harvesting Dam No.1			0.057	
Harvesting Dam No.2			0.005	
Tank No.6				
Settling Ponds				
Tank No.5 (Stoney Tank)				0.026
Tank No.4				
Tank No.2				

Results of sampling did show some slight exceedances from the ANZECC Guidelines, highlighted in red in **Table 2** and **Table 3**. These exceedances in Mt Brown Dam 1 are expected, as this is run off from the excised area which is a known area of contamination from historic mining operations. The railway dam March Copper level can be seen to be an anomaly caused by low water levels skewing results due to increased concentration of metals. Low water levels can be seen to skew results at or below the 25% level. Due to the semi-arid climate of Cobar, this is a common occurrence and thus dams will be sampled regardless, but with increased concentration taken into account when assessing results.

Surface water levels of dissolved metals, in addition to pH and other factors, vary greatly seasonally due to levels of precipitation impacting the concentration gradient. Due to this, quarterly testing of sites is planned, which will then be compared to previous seasons and not between seasons within the same year. Longer term cycles of climate and weather such as drought periods have a significant impact on surface water volumes and should be considered when analysing and comparing data.

Potable Water

CSA's Potable water is tested fortnightly with a microbiological analysis, and bi-annually with a full chemical analysis. Microbiological analysis mainly focusses on coliforms, ensuring no faecal coliforms are present, and monitoring baseline levels of other coliforms. Sampling is conducted on 12 potable water taps across site, which are seen to be representative locations. Coliform measurement is by membrane filtration (MF). Testing of the potable water treatment plant occurs daily including chlorine levels, and the occurrence of this is checked by the mine environmental team through an online form. Any exceedances that occur are immediately reported to the surface maintenance team, and if necessary, external contractors are engaged to assess any issues occurring with the on-site treatment plant.

As can be seen in **Figure 9** below, there was a large jump in coliform numbers in February, however this was quickly managed and brought back to manageable levels by surface maintenance teams. No health incidents occurred due to this, as escheria col coliforms and faecal coliforms were not present, and present colonies were not of the nature wherein they could impact human health.

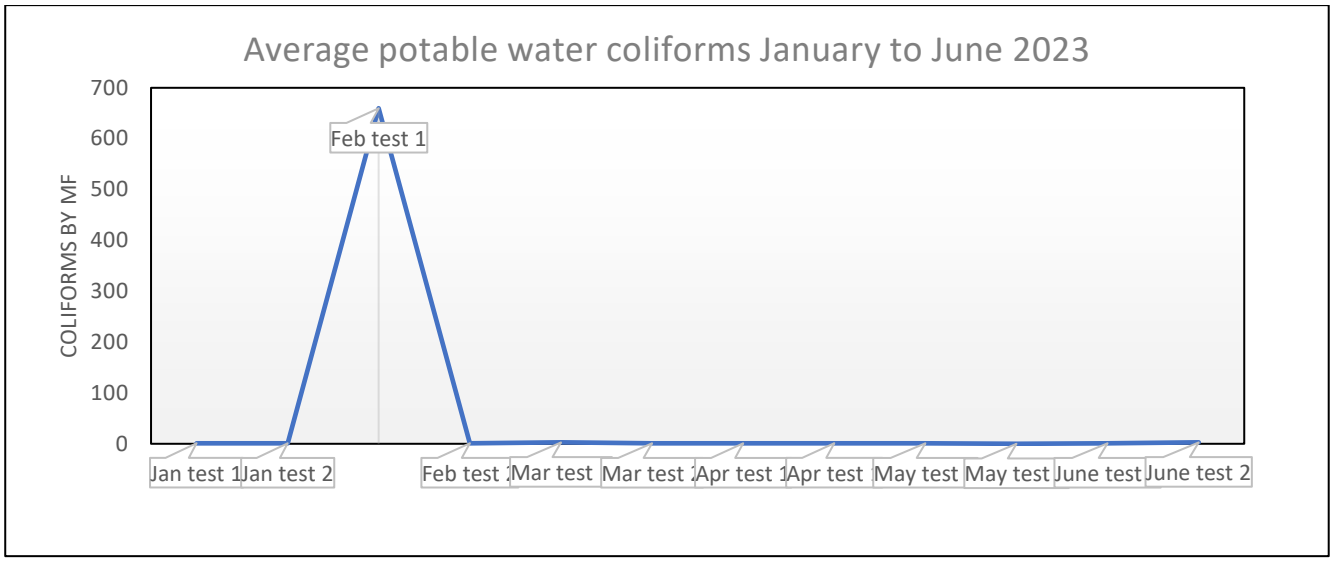

Figure 9 CSA Potable water testing results for coliforms Jan-June 2023

Groundwater quality

No groundwater quality testing was conducted between January and June of 2023. It is known that groundwater of the region is brackish and high in sulphur and other minerals and resides in highly fractured aquifers.

Groundwater levels

CSA currently has 63 Vibrating Wire Piezometers (VWPs) in place on and adjacent to the South TSF. These are monitored on an ongoing basis by the tailings management team and external consultants, largely to assess for lateral or vertical leaching of tailings water into soil and groundwater. These are not ideally located to assess for groundwater levels or overarching groundwater monitoring, as the aquifer is non-homogenous, highly fractured, and has a fault running through it. In addition, VWPs were not installed for the express purpose of groundwater level monitoring.

Automated groundwater monitoring bores are planned for construction in order to provide more accurate and useful environmental data regarding groundwater uptake and recharge times, however there is currently no baseline data as to the original groundwater levels and quality due to a lack of data in construction records regarding historic infrastructure.

Groundwater levels for the 64 VWPs CSA operates on site can be seen below in **Figure 10**, with the locations of each VWP in relation to the STSF plotted in **Figure 11**. It is noted that there has been no reduction or rise in groundwater levels of note within the timeframe this report covers.

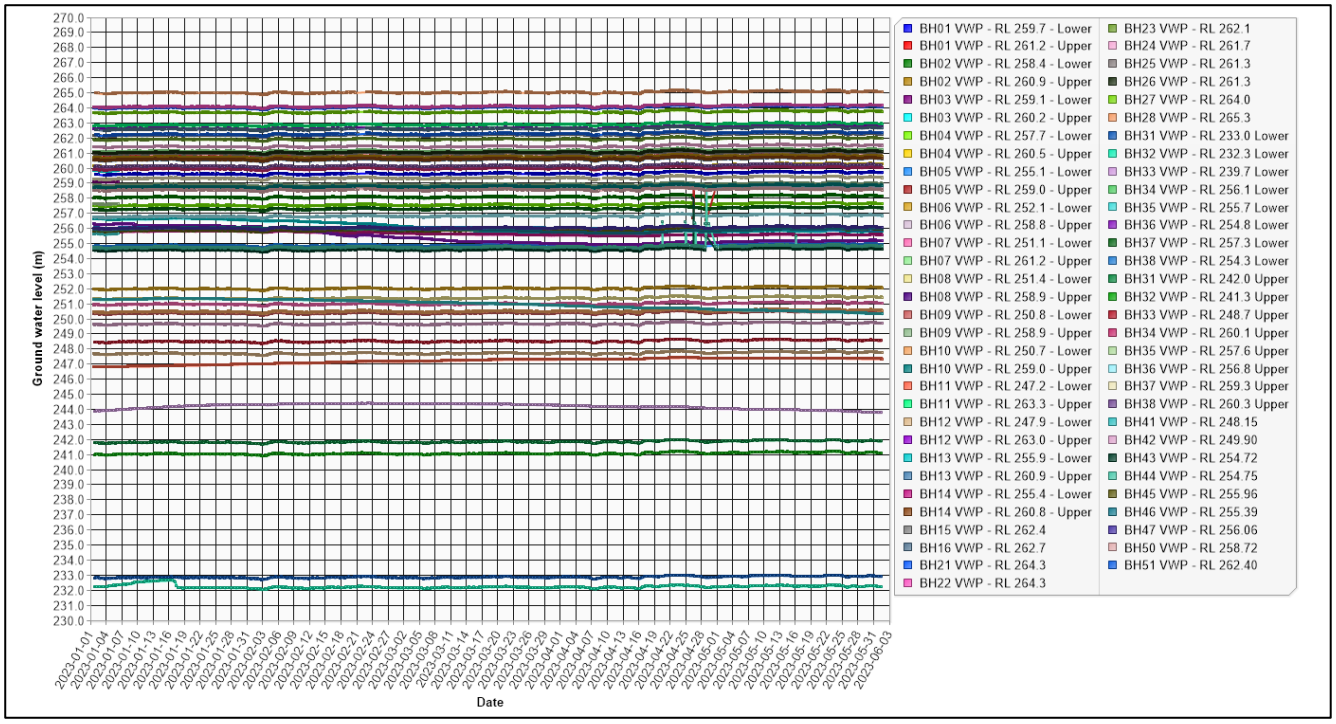

Figure 10 *CSA VWP constant groundwater level data H1 2023*

Figure 11 *South TSF and CSA VWP locations*

Soil

Soil testing is conducted at several locations across CSA in order to ensure soil contamination is not occurring as a result of ongoing operations, through spills, dust settling, leaching, and other adverse events which may occur. Regular testing locations are shown in **Figure 12**.

When an environmental incident is known to have occurred, extra testing is conducted with a baseline site also tested for comparison. Soil samples are generally conducted at the same sites as stationary dust monitor stations, in order to ensure a comprehensive coverage of all corners of site and monitor for cumulative effects of dust and other features of ongoing operations. The major analytes assessed within this sampling are copper, zinc, and lead.

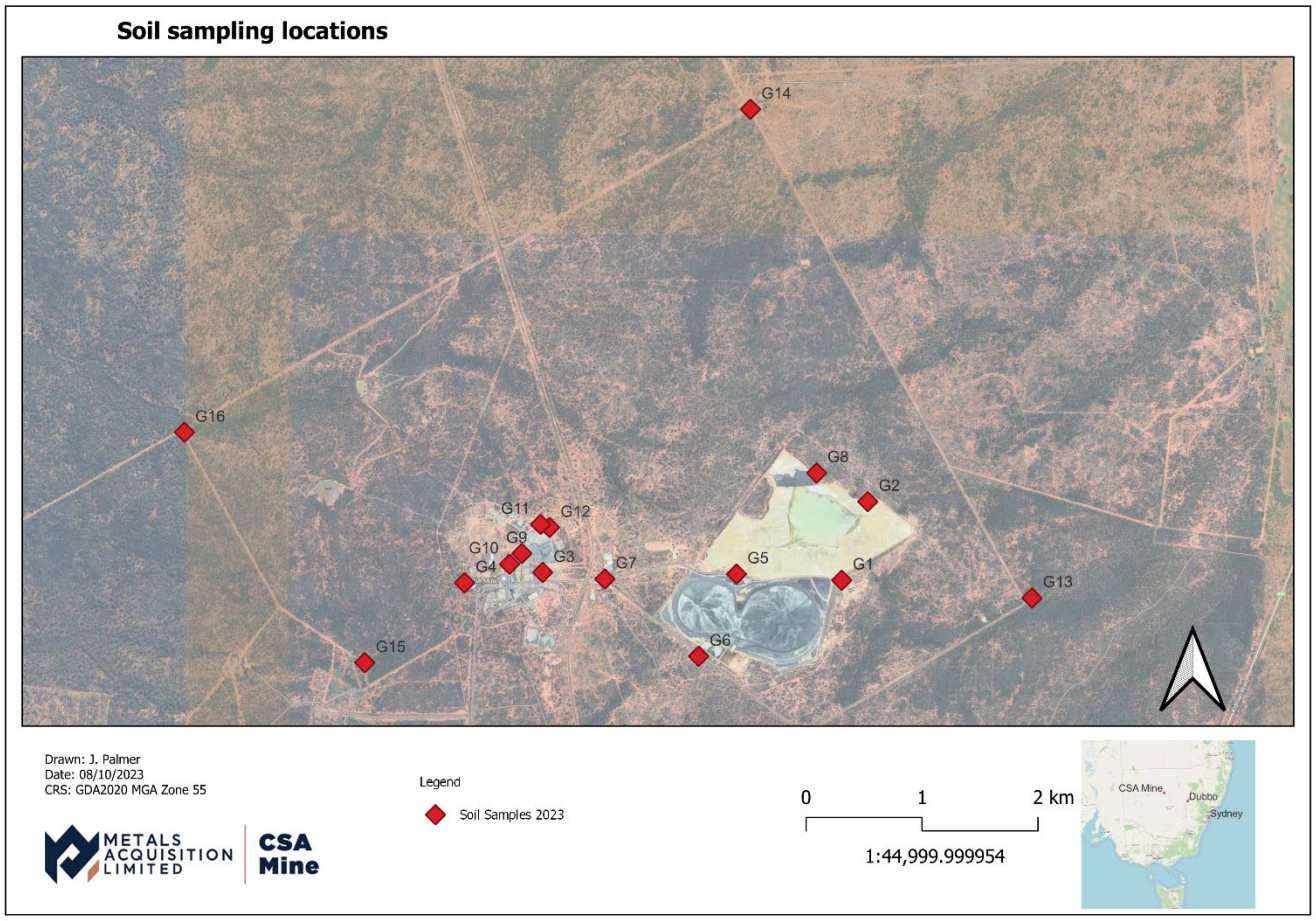

Figure 12 CSA soil sampling locations

Testing was only undertaken in the months of March and May. Testing was not conducted in a uniform manner across sites during this period. Sites that were tested are displayed in Tables 4 through 6 below.

Table 4 Copper in CSA soil samples in mg/k

DESCRIPTION	Mar	May
G16	21	
G15	40	
G4	498	
G14	5	
G6/DECANT		10800
G12		1230
G11		611

Table 5 Zinc in CSA soil samples in mg/kg

DESCRIPTION	Mar	May
G16	**24**	
G15	**53**	
G4	**127**	
G14	**5**	
G6/DECANT		**301**
G12		**167**
G11		**178**

Table 6 Lead in CSA soil samples in mg/kg

DESCRIPTION	Mar	May
G16	**20**	
G15	**41**	
G4	**620**	
G14	**5**	
G6/DECANT		**1630**
G12		**334**
G11		**147**

Sites such as the decant dam had easily explainable elevated levels of copper, zinc, and lead, due to known contamination through proximity to tailings infrastructure and haul roads. G4 resides within close proximity to natural outcrops of lead rock and other deposits, which appear on the surface and do not represent contamination from mining activities. G12 and G11 are expected to have slightly elevated levels of contamination due to their proximity to a major haul road within the mine disturbance area. G15 and G16, as seen in Figure 12, are outside the mine disturbance footprint, and tested as due diligence. These areas should have very low levels of metals, and this is reflected in testing results.

Waste rock sampling

No waste rock sampling was conducted between January and June of 2023.

Conclusions

There were no exceedances of environmental concern from January through June of 2023. Any data which presented as elevated above the norm for CSA were investigated, and origins of said exceedances found to be easily explained. Follow-up assessments were carried out where necessary.

Appendix A

Table 7 Legislation

Legislation	Associated regulation (if any)
Protection of the Environment Operations Act 1997	Protection of the Environment Operations (Clean Air) Regulation 2022 Protection of the Environment Operations (General) Regulation 2009 Protection of the Environment Operations (Waste) Regulation 2014
Contaminated Land Management Act 1997	Contaminated Land Management Regulation 2022
Environment Protection and Biodiversity Conservation Act 1999	
Environmentally Hazardous Chemicals Act 1985	Environmentally Hazardous Chemicals Regulation 2017
Mining Act 1992	Mining Regulation 2016
Pesticides Act 1999	Pesticides Regulation 2017
Contaminated Land Management Act 1997	Contaminated Land Management Regulation 2022