RASP MINE – BROKEN HILL
Environment Protection Licence 12559
Monitoring Data

The *Protection of the Environment Legislation Amendment Act 2011* introduced new reporting requirements for monitoring results collected under an environment protection licence. Broken Hill Operations Pty Ltd is the holder of an environment protection licence for the Rasp Mine and is required to publish monitoring data on its website. The Rasp Mine is also required to publish monitoring data, a complaints register and environmental documentation under its Project Approval.

Environment Protection (EP) Licence 12559 requires the Rasp Mine to collect monitoring data for ambient air, dust deposition, surface and ground waters, and vibration and overpressure from blasting activities.

AIR

The EP Licence and Project Approval require a number of parameters, with the potential to affect air quality, to be sampled and analysed at various monitoring locations. Figure 1.1 provides an aerial view indicating the monitoring locations for air sampling. Table 1.1 lists the parameters to be sampled, their frequency and location.

The Project Approval for the Rasp Mine has a number of conditions related to monitoring and lists criteria or limits for parameters. These are outlined in Table 1.2, criteria apply to off site locations and not on CML7. Where specific criteria for ambient air have not been listed in the Project Approval, the Rasp Mine has referenced guidelines outlined in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Department of Environment and Conservation, 2005).

Figure 1.1 – Air Monitoring Locations

Table 1.1 – Dust Monitoring Details

Rasp ID	EPA ID	Parameter	Frequency	Location
VS (Not yet installed)	1	- Oxides of Nitrogen (as NO_2) - Total solid particles (TSP) - Type 1 and 2 substances in aggregate (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V) - Volatile organic compounds	Real time	Ventilation Shaft (CML7)
CR (Not yet commissioned)	2	- Total solid particles (TSP) - Type 1 and 2 substances in aggregate (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V)	Real time	Crusher (CML7)
DG1	3	Insoluble solids (deposited dust), Lead	Monthly	St Johns Enclosure (CML7)
DG2	4	Insoluble solids (deposited dust), Lead	Monthly	Block 10 Hill (CML7)
DG3	5	Insoluble solids (deposited dust), Lead	Monthly	Thompsons Shaft (CML7)
DG4	6	Insoluble solids (deposited dust), Lead	Monthly	Brown's No 1 Residence (CML7)
DG5	7	Insoluble solids (deposited dust), Lead	Monthly	Silver Tank (CML7)
DG7	8	Insoluble solids (deposited dust), Lead	Monthly	Casuarina Ave
DG6	9	Insoluble solids (deposited dust), Lead	Monthly	Blackwood Pit (CML7)
TSP-HVAS	10	Total solid particles, Lead	Every 6 days	Silver Tank (CML7)
PM10-HVAS1	11	PM_{10}, Lead	Every 6 days	Silver Tank (CML7)
PM10-HVAS2	12	PM_{10}, Lead	Every 6 days	Blackwood Pit (CML7)
TEOM1	13	PM_{10}, Wind Speed/Direction	Continuous	Essential Water Enclosure
TEOM2	14	PM_{10}, Wind Speed/Direction	Continuous	Blackwood Pit (CML7)

Note: CML7 = Rasp Mine Lease – Consolidated Mine Lease 7, NO_2 = Nitrogen Dioxide, TSP = Total Solid Particles , PM_{10} = Particulate matter with a diameter of 10 micrometres or less, Sb = Antimony, As = Arsenic, Cd = Cadmium, Pb = Lead, Hg = Mercury, Be = Beryllium, Cr = Chromium, CO = Carbon Monoxide, Mn = Magnesium, Ni = Nickel, Se = Selenium, V = Vanadium)

Table 1.2 – Project Approval – Criteria

Pollutant	Type	Averaging Period	[d] Criterion	
Total solid particles (TSP)	Ambient Air	Annual	[a] 90 µg/m^3	
Particulate matter< 10 microns (PM_{10})	Ambient Air	Annual	[a] 30 µg/m^3	
Particulate matter< 10 microns (PM_{10})	Ambient Air	24 hour	[a] 50 µg/m^3	
Oxides of Nitrogen (as NO^2)	Stack	At any time	350 mg/m^3	
Total solid particles (TSP)[(e)]	Stack	At any time	20 mg/m^3	
Type 1 and 2 substances in aggregate (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V) [(e)]	Stack	At any time	1 mg/m^3	
Volatile organic compounds[(e)]	Stack	At any time	40 mg/m^3	
Lead	Ambient Air	Annual	[f] 0.5 µg/m^3	
			Maximum Project Contribution	**Maximum Total**
Deposited Dust		Month	[b] 2 g/m^2	[a] 4 g/m^2

Notes to Table:
(a) Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources).
(b) Incremental impact (i.e. incremental increase in concentrations due to the project on its own).
(c) Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
(d) Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with EPA.
(e) The limit must be proposed by the Proponent and agreed by the Director-General in consultation with EPA and be based on the results of post-commissioning test results. The limit must be proposed prior to the second sampling occurrence at Point 2. Not yet commissioned at June 2012.
(f) There is no criteria listed in the Project Approval for lead dust, the Rasp Mine has referenced the annual average guideline for lead dust outlined in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Department of Environment and Conservation, 2005).

WATER

The EP Licence and Project Approval require a number of parameters for surface and ground waters to be sampled and analysed at various monitoring locations. With the exception of monitoring points in creeks downstream and upstream from the mine site and at the historic disused Eyre Street Dam, surface and groundwater monitoring points are within the Rasp Mining Lease – Consolidated Mine Lease 7. Figure 2.1 provides an aerial view indicating the monitoring locations for water sampling. Table 2.1 lists the parameters to be sampled, their frequency and location.

The Rasp Mine does not have approval to discharge waters from the mine site and therefore has no criteria or limits for water parameters listed in the Project Approval or Environment Protection Licence. The Rasp Mine will review water quality data over time to discern any trends and/or impacts from its mining activities on water quality.

Figure 2.1 – Water Monitoring Locations

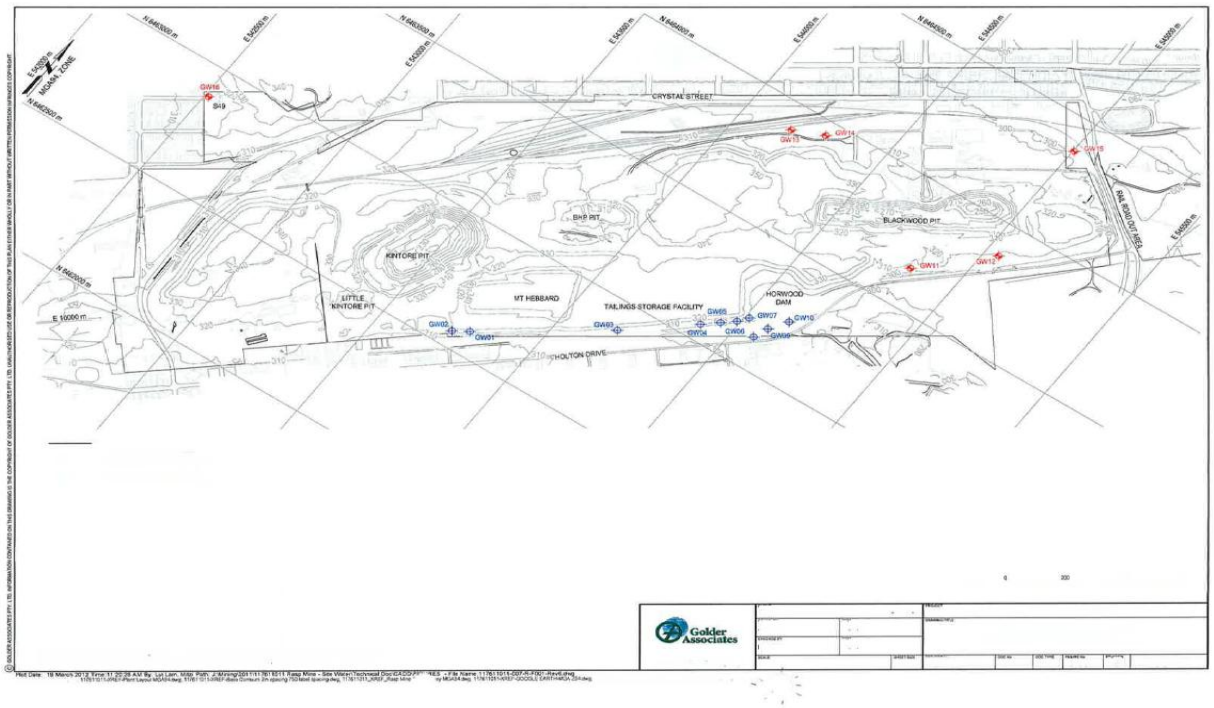

Table 2.1 – Water Monitoring Details

Rasp ID	EPA ID	Type	Parameter	Frequency	Location
SW2, SW3	29	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	S31-1 (CML7)
SW4	30	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	S44 (CML7)
SW5	31	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	S49 (CML7)
SW1	32	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	S1-A (CML7)
SW6, SW7	33	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	S9B-1, S9B-2 (CML7)
SW8	34	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When contain water (at least 2 per 12 months)	Horwood Dam (CML7)
Upstream Monitoring Location 1	35	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When flowing (at least 2 per 12 months)	Creek near airport
Downstream Monitoring Location 2	36	Surface Water	pH, EC, TDS, SO4, Cl, Na, Cd, Pb, Mn, Zn	When flowing (at least 2 per 12 months)	Creek crossing on Menindee Rd
GW01	37	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	South-east of Mt Hebbard (CML7)
GW02	38	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	South-east of Mt Hebbard (CML7)
GW4	40	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Road to Horwood Dam (CML7)
GW5	41	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Road to Horwood Dam (CML7)
GW6	42	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Road to Horwood Dam (CML7)
GW7	43	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Road to Horwood Dam (CML7)
GW8	44	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Historic disused Eyre Street Dam
GW9	45	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Historic disused Eyre Street Dam
GW10	46	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb,	Quarterly	Downstream of Horwood Dam

Rasp ID	EPA ID	Type	Parameter	Frequency	Location
			Mn, Zn		
GW11	47	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Downstream of TSF2 (Blackwood Pit) (CML7)
GW12	48	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Downstream of TSF2 (Blackwood Pit) (CML7)
GW13	49	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Adjacent S31-1 (CML7)
GW14	50	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Adjacent historic slag heap (CML7)
GW15	51	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Adjacent rail load out area (S44) (CML7)
GW16	52	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Quarterly	Adjacent S49 (CML7)
Shaft 7	53	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Monthly	From Shaft 7 collected in S22 (CML7)
Kintore Pit	54	Groundwater	pH, EC, TDS, SO4, Cl, Ca, Mg, Na, Fe, Cd, Pb, Mn, Zn	Monthly	From mine dewatering collected in S22 (CML7)

Note: CML7 = Rasp Mine Lease – Consolidated Mining Lease 7, EC = Electrical Conductivity, TDS = Total Dissolved Solids, SO4 = Sulphate, Cd = Cadmium , Cl = Chloride, Ca = Calcium, Mg = Magnesium, Na = Sodium, Fe = Iron , Pb = Lead, Mn = Manganese, Zn = Zinc.

BLASTING

The Licence and Project Approval require that blast overpressure and ground vibration resulting from blasting activities comply with the listed criteria in Tables 3.1 and 3.2. Figure 3.1 provides an aerial view indicating the monitoring locations.

Figure 3.1 – Blasting Monitoring Locations

Table 3.1 - Airblast Overpressure Criteria

Airblast Overpressure (dB(Lin Peak))	Allowable Exceedance
115	5% of the total number of blasts over a 12-month period
120	Never

Table 9: Peak Particle Velocity Criteria

Peak Particle Velocity (mms^{-1})	Allowable Exceedance
5	5% of the total number of blasts over a 12-month period
10	Never