

**INQUIRY INTO CURRENT AND POTENTIAL IMPACTS OF
GOLD, SILVER, LEAD AND ZINC MINING ON HUMAN
HEALTH, LAND, AIR AND WATER QUALITY IN NEW
SOUTH WALES**

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Date Received: 5 September 2023

**NSW Upper House
Portfolio Committee No2 – Toxic Dust Air and Environment
Rylstone Olive Press**

Portfolio Committee No. 2 inquire into and report on current and future impacts of gold, silver, lead and zinc mining on human health, land, air and water quality in New South Wales,

Submitted by: Mrs Jayne Bentivoglio

Contact:

Date: 5 September 2023

We challenge the current process and regulatory framework for reviewing and approving applications for underground and open cut mining in NSW. With the following terms of reference.

- a. **The impact on the health of local residents and mine workers, including through biomagnification and bioaccumulation**
- b. **The adequacy of the response and any compliance action taken by the regulatory authorities in response to complaints and concerns from communities affected by mining activities,**
- c. **The effectiveness of the current regulatory framework in terms of monitoring, compliance, risk management and harm reduction from mining activities,**

Recommendations

Suspend the Independent Planning Commission's (IPC) approval of Bowden Silver Mine at Lue until the outcome of this Parliamentary Inquiry is available, to determine whether the current approval process and regulatory framework for heavy metals mining is putting the health and economy of communities in Central Western NSW at risk.

Note the metal to be extracted from the proposed Bowden Silver Mine is estimated to comprise 47% lead, 52% zinc and less than 1% silver.

Note as specified by WHO (World Health Organisation) there is no safe level of (Pb) Lead exposure for humans.

Note approval of a new mine without comprehensive draft Management Plans available for review to confirm the potential risks can be managed, exacerbates the risks to the health of the community.

Note Although Cadia Gold Mine near Orange is managed by an experienced mining company there have been numerous breaches over the operating mine years in relation to toxic air quality and excessive trace element mineral levels in blood levels of local residents (including children).

The management plans in this instance appear to have failed, therefore it is baffling that the IPC would approve Bowden's Mine without sighting any Management Plans.

Review the independent reports submitted by Mudgee Regional Action Group, Mr Andrew Baulch, Air and Environment Pty Ltd, Professor Mark Taylor and any other submission relating to the IPC and relating to Bowden Silver Mine.

These reports detail the risks to human health, land, soil, air and water quality on our region and our olive groves, grape vineyards and our business in the Mudgee region should Bowden Silver Mine proceed.

Executive Summary

We do not agree that we should continue using the environment as a subsidy for corporate profit.

Bowdens EIS has relied on the Ramboll report for their dust dispersion. However, our Air expert Mr Andrew Baulch, Air and Environment Pty Ltd makes this clarification, based on their review of the Ramboll report.

The model presented in the Ramboll report and used for the EIS, predicts ground levels of concentrations or deposition of dust across the grid in each hour of the year based on the hourly meteorology.

As the dust exposure criteria is based on the daily (24 hour) average, the worst day at each grid and sensitive receptor location is calculated for assessment against the criterion. It is not an average, its assessed against the maximum or worst case.

The most conservative assumptions tend to get used to assess the worst case impacts. This results in layers and layers of conservatism built into the assessment method.

The model becomes technically unrealistic and unlikely to occur. If the predictions do not exceed the criteria for the realistic worse case, then adverse impacts are very unlikely to occur.

3.1 Model inputs page 25 *Air and Environment report September 2023*

An analysis of the reported model input settings was conducted. An inconsistency was identified in the report regarding the configuration of the CALMET diagnostic meteorological model, which uses data derived from the TAPM model to drive the CALMET starting conditions. It was stated in the report that the CALMET domain size was 90 km by 100 km at a 1 km grid resolution, whilst the number of grid points within the model, was listed as 120 by 120. These statements are inconsistent and likely reflect an error in the report preparation and not the modelling.

3.1.2 CALMET page 26 *Air and Environment Report September 2023*

A summary of the provided CALMET modelling inputs as well as relevant comments made by Air Environment are presented in Table 3-2. In general CALMET was configured well, in accordance with the recommendations provided in the *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System* (Barclay and Scire 2011). There are however, some issues in regards to the domain size and resolution.

- The provided grid domain size does not match the number of grid points. The listed domain was 90 km by 100 km with a 1 km resolution, whilst the listed number of grid cells was 120 by 120. This should not be possible, and it is likely an error in the report preparation rather than the modelling. Either the domain was 90 km by 100 km or 120 km by 120 km.

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- The wind vector map on page 2-37 of the Ramboll report does not match the resolution of the CALMET modelling inputs. As can be seen in Figure 3-1. The CALMET model was stated to be set at a 1 km resolution, however the wind vectors presented in Ramboll's report are ~200 m. It is not possible to have wind vectors at a resolution smaller than that of the model. It is possible that the wind vector map presented was generated for the purpose of demonstration, but it could not be derived directly from the model data.
- A 1 km CALMET resolution may not pick up the fine detail in the complex terrain of the region, which would reduce the quality of the wind field in the area surrounding the mine site. As is presented in Figure 3-2 and Figure 3-3.

The Lue School is approximately 2km south of the mine. The minimal impacts reported by Ramboll based on layers and layers of conservatism built into their report may put all the children at risk at the Lue school, when they haven't taken worst case scenarios in their modelling criteria.

Mark Taylor's report May 2020 page 9 states

- The background value promulgated in the EIS of 1000 $\mu\text{g}/\text{m}^2/\text{month}$ (33.3 $\mu\text{g}/\text{m}^2/\text{day}$) is over 100 times greater than the average of the data collected by Macquarie University in Lue in 2017/18. Moreover the predicted rates of lead dust deposition during the operations, even at their peak, appears to be uncharacteristically low (**Table 6**), especially given that dust has been identified by Bowdens Silver as the primary pollutant from the mine (Bowdens Silver 2020).
- It is not clear what dust gauge data was used for the EIS modelling, the time frames, and the locations identified in the EIS (**Figure 2**). This needs to be clarified in the EIS and statistical assessment of the mean and confidence interval around the mean provided along with their values and locations.
- Analysis of HVAS samples for concentrations of arsenic, cadmium, chromium, copper, nickel, zinc and selenium are from a very short period during July and August 2017 and February 2018. It is not clear if this data is representative of long-term averages. These analyses reported ambient concentrations of arsenic, cadmium and selenium below the respective limits of detection. Mean concentrations of chromium, copper, nickel and zinc were 0.001 $\mu\text{g}/\text{m}^3$, 0.007 $\mu\text{g}/\text{m}^3$, 0.001 $\mu\text{g}/\text{m}^3$ and 0.009 $\mu\text{g}/\text{m}^3$, respectively.
- The modelling of project impacts in the EIS predicts very low values of lead in air along with deposited lead in dust. Given that all mine sites generate significant fugitive emissions and that operations extracting lead will inevitably cause surface contamination (as evidenced by dust emissions from fugitive sources at Broken Hill, Port Pirie and Mount Isa), it seems inconceivable that the predicted aerosol emissions of dust (**Table 7**) and its lead concentrations will be so low (**Table 8**) during the active phase of operations. Indeed, these low values estimated during operations versus existing values results in a conclusion that the impact of the operations will be trivial (e.g. **Figure 5.4, 7-80 of the EIS**).
- The key sources of lead dust are the soils on the mine site (maximum of 1380 mg/kg; **Table 4.49 (page 4-181 in the EIS)**) and the lead ore concentrations recoverable from the pit operation 0.32% or 3,200 mg/kg (**p. 2-13 of the EIS**), which would be subject to remobilisation as dust during the operations. In addition, **p. 3 – 127** of the EIS shows waste geochemistry samples from weathered ignimbrite to contain up to 4,160 ppm of lead from samples at 13-14 m depth, further suggesting that waste materials at the site which are remobilised as dust would be very elevated in lead. It is unclear how the EIS modelling has accounted for the mobilisation of soils and mine waste with these high concentrations.
- Moreover, the proposed mitigation strategies for dust management e.g. during high wind events, lack specific details in regard to triggers and thresholds for total dust and its trace metal concentrations (**Table 4.25, p. 4-84 of the EIS**). Thus, the impact of high wind events on the broader area is overlooked.

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All the residences with their drinking water roof catchment and the properties surrounding the mine will be impacted by the Pb dust deposits. The dust will accumulate in their tanks and Pb exceedances will be in their drinking water, see below calculations for Rylstone Olive Press drinking water results after 12 months.

Mt Isa Mine has ambient air quality Pb Lead Limits/ trigger values for monitors state 100ug/M2/day. This figure is far too high for our area and will cause exceedances in our drinking water by 3 times the allowable Pb in drinking water.

We request the trigger limits/values be set at 30ug/M2/day for Pb Lead dust deposit.

Bentivoglio Olives grove is 5km from the mine and Rylstone Olive Press is situated 6km from Bowden's mine on the property at 25 Mossy Rock Lane Monivae .

This toxic dust will contaminate at Bentivoglio Olives and Rylstone Olive Press:-

- our family home drinking water,
 - our dam and irrigation water
 - our conference centre drinking water
 - office drinking water.
 - Olive potable washing water
 - Olive potable processing water
 - Olive Trees – no photosynthesis, no crop, no business
 - Olive oil – will qualify as Lampante oil – inedible oil
 - Our high quality extra virgin olive oil will not exist
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- Bentivoglio Olives and Rylstone Olive Press has 8,000 trees – 5 km from Bowden's Lead mine and a 1.2 ton hour continuous olive oil extraction plant on the property at 6km from the Bowden site.
 - DPE Recommendations for Conditions of Consent page 13 Table 6 states, the acceptable level of total dust deposit is 4gm/m2/month.
 - This will be accumulative and is prohibitive to clean and green agriculture and human health, WHO states ***there is no safe level of lead.***
 - DPE have taken Bowden's EIS demands on toxic dust deposits.
 - ***There has been no consultation with agriculture enterprises surrounding the mine***
 - The DPE and Bowden's EIS toxic insoluble and fine particle dust deposit 4gm/m2/month provided no data of what percentage will be Lead, Arsenic, cadmium, cyanide, zinc other toxic metals

This allowable DPE/Bowden's recommended measurement allows 52.9kg per year of toxic dust in our home drinking water.

The measurement allows 62ton of toxic dust deposit on our 8,000 trees, our employees, in our dams, in our drinking water and in our olive processing water.

In fact, 72kg toxic dust will contaminate our olive processing water annually.

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The EPA states,

Ms Sandie Jones, A/Director NSW EPA, in meeting at Rylstone Olive Press, with our community, 28 August 2023,

“No dust will be allowed to leave the (Mine) property”

There is no mine site in the world that does not have off-site impacts.

The question is whether what leaves the site is at levels that pose a significant immediate or cumulative risk. This is the unknown. This has not been demonstrated by any of Bowden's experts. In fact, Dr Roger Drew, in his Peer review report for Government, first comment about the HHRA report

Dr Drew, Toxicologist Peer review report 2020 remarks, 2.3a in the HHRA peer review ***"how frustrating is the absence of dust and Pb dispersion maps and in the main text, lack of explicit description of the modelled data used in the calculations (This stems from the absence of summary lists of contaminant concentrations predicted by the air dispersion modelling)"***

EnRisk response 12 April 2021 to Dr Drew Report responded to Dr Drew's comments with ***The HHRA includes all the relevant details to allow the assumptions and calculations to be tracked and replicated. Contour maps are provided (?) in the air quality assessment AQA and it is not common practice to repeat them.***

The ability to do this is limited.....

In addition, it is our experience that the details of the air quality modelling may not be easily understood by some members of the community, hence their inclusion may decrease HHRA readability.

If we were to use the Pb dust trigger monitor values set for Mt Isa of 100ug/M2/day, these values we have calculated for our 1100 sqm roof catchment at our house at Rylstone Olive Press will cause the a Lead exceedance in our drinking water after 12 months to be 36.5/dL Therefore the triggers for any Pb dust monitoring should stay at 30ug/M2/day to keep the accumulation of Pb Lead dust from contaminating our drinking water.

Air Environment states that Ramboll uses an equation which does not account for minimum wind speed which does not account for dust lift off, and this results in their report showing little to no emissions and there is no open cut mine in the world that does not have off-site impacts.

- The equation used for “wind erosion and maintenance of stockpile and ROM pads” (1.8 x wind speed, kg/ha/hr of TSP) is a very conservative equation that is dependent upon wind speed. Whilst normally it would be beneficial to have an equation that scales wind erosion emissions based upon the current wind speed, the equation referenced by Ramboll does not account for a minimum wind speed required for dust lift off, which can cause the resulting emissions to be overly-conservative at low wind speeds. It also produces an emission rate comparable to those used for “Wind erosion from exposed ground” under calm wind speeds (<0.5 m/s) as an input, which in theory should be below dust lift off wind speeds and as such should not produce little to no emissions.

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Attachments

1. *Air Environment Report Air Quality Impact Assessment 4 September 2023*
2. *Ecoaccess report Page 14/134 Pb Trigger Values Mt Isa Mines*
3. *Map of West east wind direction*
4. *Comments and assessment of potential lead exposure risks reported in the Bowdens Silver EIS Mark P Taylor.*
5. *Graphs of Monitors A and B Rylstone Olive Press report*
6. *Dust Monitoring Report Rylstone Olive Press*