

**Slides supporting presentation to IPC 15 February
2023**

**Statement on 'Proposed Bowden's silver mine at
Lue'**

Barry N Noller

BSc, MChem, PhD FRACI, FRSC, FFACS, FIUPAC

on behalf of the Lue Action Group

1. The review of the HHRA

- The HHRA has been conducted and independently reviewed but most detail raised about issues have not survived the review processes. This implies that the community should have confidence in the process applied.
- Monitoring and management measures for HHRA need to be in place to reduce risk to human health with sufficient reliable monitoring occurring as the project moves through its different stages of development.
- The LAG believes that IPC approval cannot be granted without all SEARs having been addressed. Monitoring risks to human health by refusing to measure baseline and ongoing blood lead levels in the community is a key item noting that HHRA address how the project development and environmental impacts in relation to air quality and monitoring and management measures to reduce risk to human health.
- This is the principal role of monitoring rather than solely relying on modelling, and intended to validate the modelling as an independent measuring activity.

2. Dust deposition measurement

- Attention will be required with selecting dust monitoring methods to provide sufficient detail to enable management measures to be put in place to assess lead exposure at Lue.
- Figure 1 shows size of dust particles for ingestion and inhalation exposure.
- TSP in air used in modelling is measured to <50 μm diameter in NSW or 100 μm in QLD.
- Ingestion pathway up to <250 μm (Figure 1) is applicable for lead. Therefore TSP underestimates dust particle size in the fraction >50 μm to <250 μm for lead ingestion.
- Figure 2 shows examples of particle size distribution of mine dust from Mt Isa and shows the proportion of dust particles.

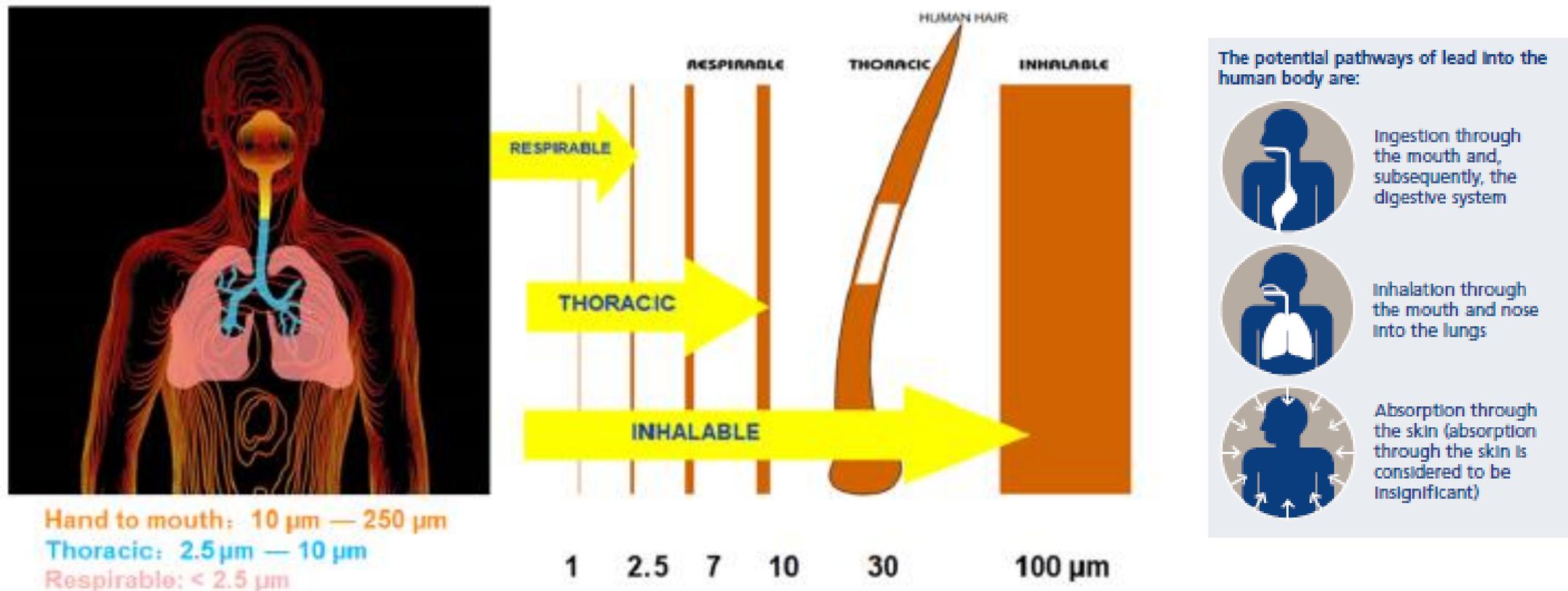


Figure 1 Size of dust particles for ingestion and inhalation.

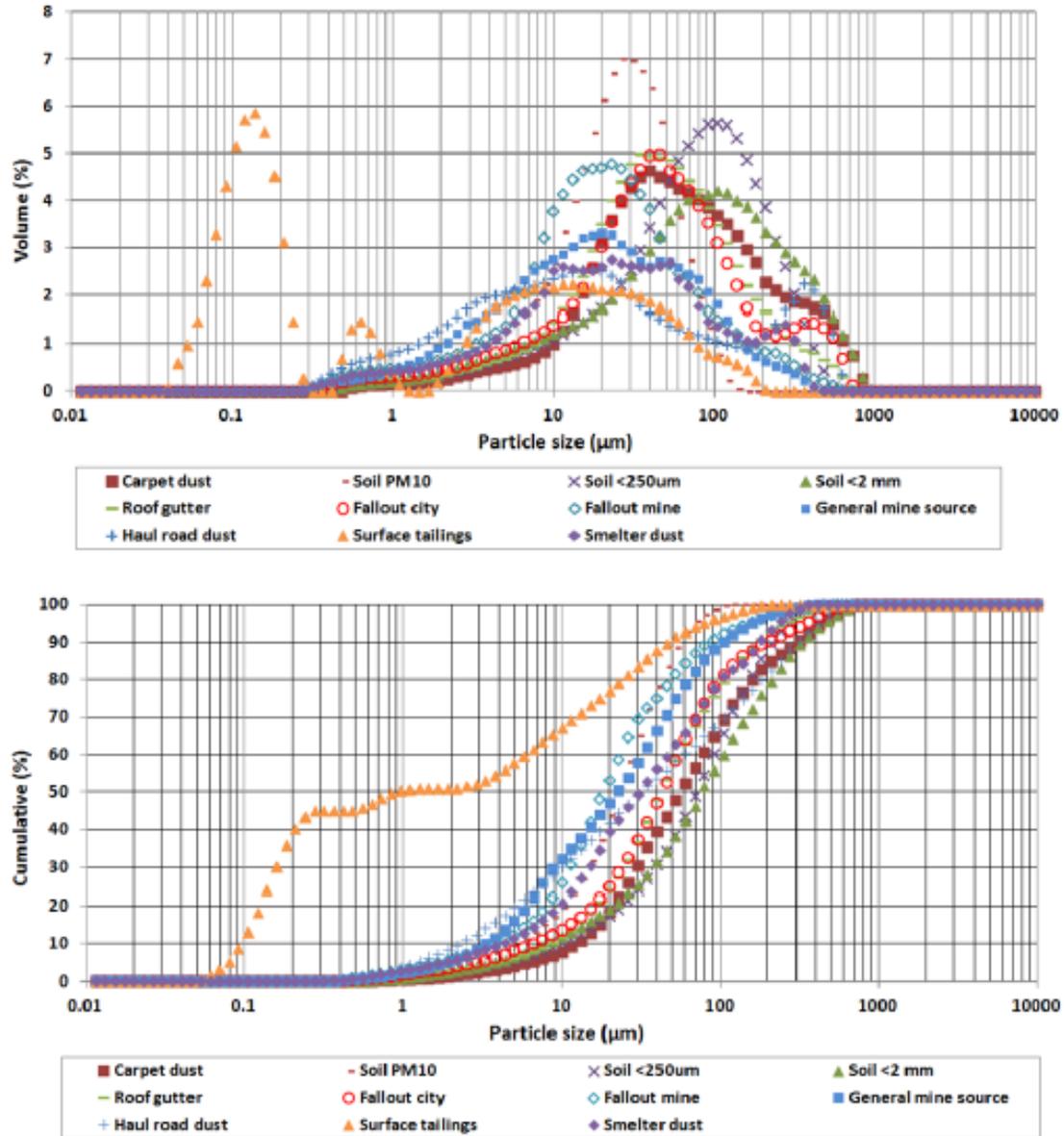


Figure 2
Example of particle size analysis of mine dust by Malvern Mastersizer 2000 from Mt Isa.
TSP < 50 µm only excludes >50 µm to <250 µm

Figure 62 Summary of particle size distribution of samples from the mine site and the city's residential area as volume (%) and cumulative (%)

2. Dust deposition measurement cont

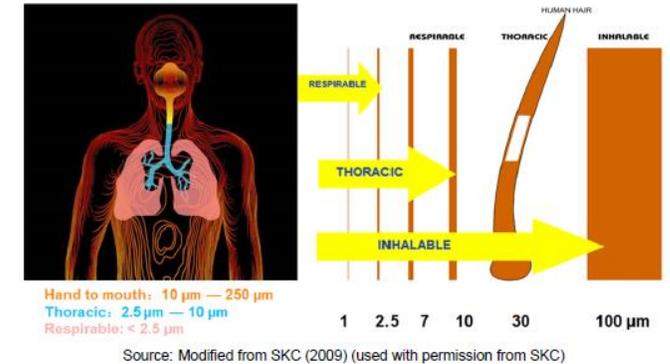
- During drier episodes such as the drought period 2017 – 2019 there is more potential to have dust generated for dry surface materials. Evidence for an accompanying reduction in stored water for dust suppression and dispersion of dry surface dust with non-availability of sufficient stored water for dust suppression may result in increased dust dispersion increasing lead. Evidence for this is given in Shireen Baguley's report for LAG.

3. Blood lead of Lue community

- NSW EPA uses an outdated guideline for assessing building contamination from lead and does not have a current floor contamination method for lead that meets a blood lead level of 5 ug/dL, as does the USEPA lead floor standard.
- The USEPA lead floor standard. needs to be applied to monitoring floor surface lead in homes and the school at Lue but is not stipulated by the NSW EPA.
- NSW Health has the measurement of blood lead as the gold standard for lead exposure. However, NSW Health does not advise blood lead monitoring as a routine monitoring tool for assessing lead exposure in child or adult, unless a medical doctor advises that an exposed individual has been diagnosed with effects from lead exposure.
- These shortcomings with the NSW Government agencies need the attention of the IPC to monitor lead exposure of all residents and particularly children tested for blood lead.
- The HHRA claims from air modelling to show no risk from lead to the community before or during mining activities.
- The principal role of monitoring is to validate the modelling as an independent measuring activity rather than rely solely relying on modelling. It remains important to get all residents and particularly children tested for blood lead.

4. Crystalline silica in air

- One of the most important potential contaminants in air at Bowden's silver project is crystalline silica. Dispersion of respirable crystalline silica (as PM2.5 annual average) derived from Project operations current require regular monitoring to meet the standard of $50 \mu\text{g}/\text{m}^3$ at the mine site.
- In the community the Victoria (EPA Victoria 2007) applies $3 \mu\text{g}/\text{m}^3$ as the guideline based on the California EPA Office. This is measured in the PM2.5 fraction and follows international best practice.
- Evidence from coal mining in the Hunter Valley also shows that heavy vehicles on mine sites creates PM2.5 particulates by action of tyres driving over sedimentary rock and releases silica particles.
- It is appropriate to apply $3 \mu\text{g}/\text{m}^3$ in the PM2.5 fraction as the guideline to assess respirable crystalline silica exposure at Lue and follow international best practice.



See Figure 1 Size of dust particles for ingestion and inhalation.

5. Consequences of Acid Mine Drainage

- Acid mine drainage (AMD) prediction and control requires the highest level of testing for acid generation properties before reliable monitoring can be undertaken. There can be no flexibility with data requirements for ensuring no risk of AMD generation.
- Representative sampling for AMD testing rather than averaging is imperative in order to predict reliably if AMD generation will occur and create acid drainage in the future.
- Surface water coupled with any generation of AMD is likely to severely impact tributary creeks such as Lawson's Creek. The risk of AMD getting into Lawson's Creek and the Cudgegong River is that it may lead to damage to the isolated aquatic ecosystems beyond the point of restoration.
- Discharge strategies will need to be developed in the future but should not be allowed when surface runoff is in contact with PAF waste rock. Water discharge has to meet NSW EPA requirements.
- TSF material requires detailed kinetic testing to establish if acid formation will occur in the future when breakthrough in acid neutralisation ceases.
- Pit void water treatment and potential for overflow of acid water requires critical management. Increased pit water volume and enlargement of the final void to increase pit volume for store excess water and may lead to a requirement for continuous water treatment into the future, to avoid damage to creeks like Lawson's Creek and the Cudgegong River.
- SEARS are not being met with respect to AMD in identified key 'mine viability-determining' areas.

6. Conclusions

- The principal role of monitoring is to validate modelling as an independent measuring activity rather than place reliance on modelling alone.
- Dust monitoring methods need sufficient detail to enable management measures to be put in place to assess lead exposure at Lue.
- Deficiencies in lead contamination monitoring of the community that meets a blood lead level of 5 ug/dL need to be overcome and include testing for blood lead.
- Monitoring of dispersion of respirable crystalline silica (as PM2.5 annual average) to the community is required to meet a suitable guideline such as that used in Victoria.
- The IPC Commissioners have not been provided with insufficient evidence to make a fully-informed decision and the project is not approval-ready.
- Key unanswered questions remain regarding conditions of Consent.
- It would be a failure of due process for the IPC proceed without seeing revised management plans and confirming that SEARS have been met.