

How is an Air Quality Assessment undertaken?

Understanding Air Quality Impacts

The SEARs for the Bowdens Silver Project require a detailed, quantitative assessment of potential air quality impacts. The assessment is being undertaken in six steps.

Step 1: Establish existing air quality levels – through a comprehensive air quality monitoring network.

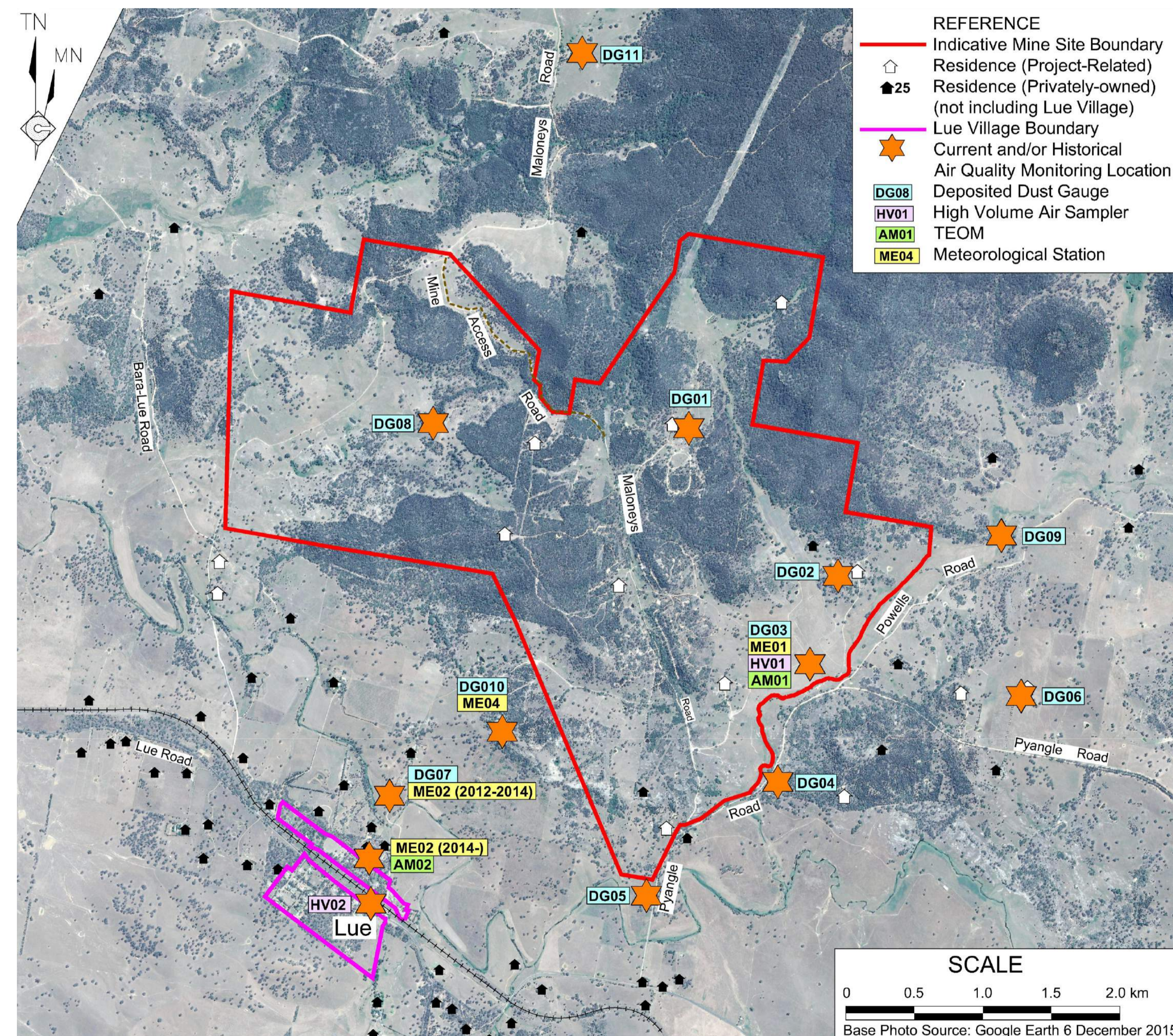
Step 2: Identify potential impacts and receivers that could be affected by changes to air quality.

Step 3: Establish relevant air quality criteria which are based largely upon potential health impacts.

Step 4: Undertake computer modelling taking into account total dust generated on site and dust sizes, weather conditions, topography and mitigation measures to be adopted on site.

Step 5: Identify the need to adopt any additional mitigation measures to ensure air quality criteria are satisfied.

Step 6: Predict air quality levels at surrounding rural residences and properties and at residences in Lue.



Current and/or historical air quality monitoring locations

How is an Air Quality Assessment undertaken?

What are the potential sources of dust?

- Drilling and Blasting
- Trucks travelling on internal roads
- Crushing and Grinding
- Landform Construction
- Surface of the Tailings Storage Facility
- Open Exposed areas

What types of dust are there?

- TSP – 0-40+ micrometre in diameter (associated with dust deposition nuisance impacts)
- PM₁₀ – 0-10 micrometre in diameter (relevant to human health impacts, generally associated with material handling, haul truck movements and wind erosion)
- PM_{2.5} – 0-2.5 micrometre in diameter (relevant to human health impacts, generally associated with combustion sources)

How is dust monitored?

- Bowdens Silver has established an air quality monitoring network at 14 locations surrounding the Mine Site comprising:
- Two Tapered Element Oscillating Microbalance (TEOM) units recording PM₁₀ and PM_{2.5}
- Two High Volume Air Sampler (HVAS) for the recording of TSP, PM₁₀ and lead concentrations
- Twelve dust deposition gauges for recording monthly dust deposition rates and metals content (arsenic, lead and zinc).
- Other pollutants such as arsenic, lead and zinc naturally occurring in the Lue area are identified and measured.



Air Quality Monitoring devices

What is Involved in an Air Quality Assessment?

What Air Quality Criteria would the Project need to comply with?

Impact assessment criteria are designed to maintain ambient air quality that allows for the adequate protection of human health and well-being.)

PM Metric	Averaging Period	Concentration ($\mu\text{g}/\text{m}^3$)
TSP	Annual	90
PM ₁₀	24 hours	50
	Annual	25
PM _{2.5}	24 hours	25
	Annual	8
Lead	Annual	0.5

Dust Deposition Criteria

Averaging Period	Maximum Increase in Dust Deposition	Maximum Total Dust Deposition
Annual	2g/m ² /month	4g/m ² /month

What controls could the Mine adopt to reduce dust levels?

- Maximising separation distance
- Minimising cleared/open areas
- Water trucks on haul roads
- Controlling vehicle speeds
- Equipment enclosures/dust collection
- Progressive rehabilitation
- Predictive meteorological forecasting

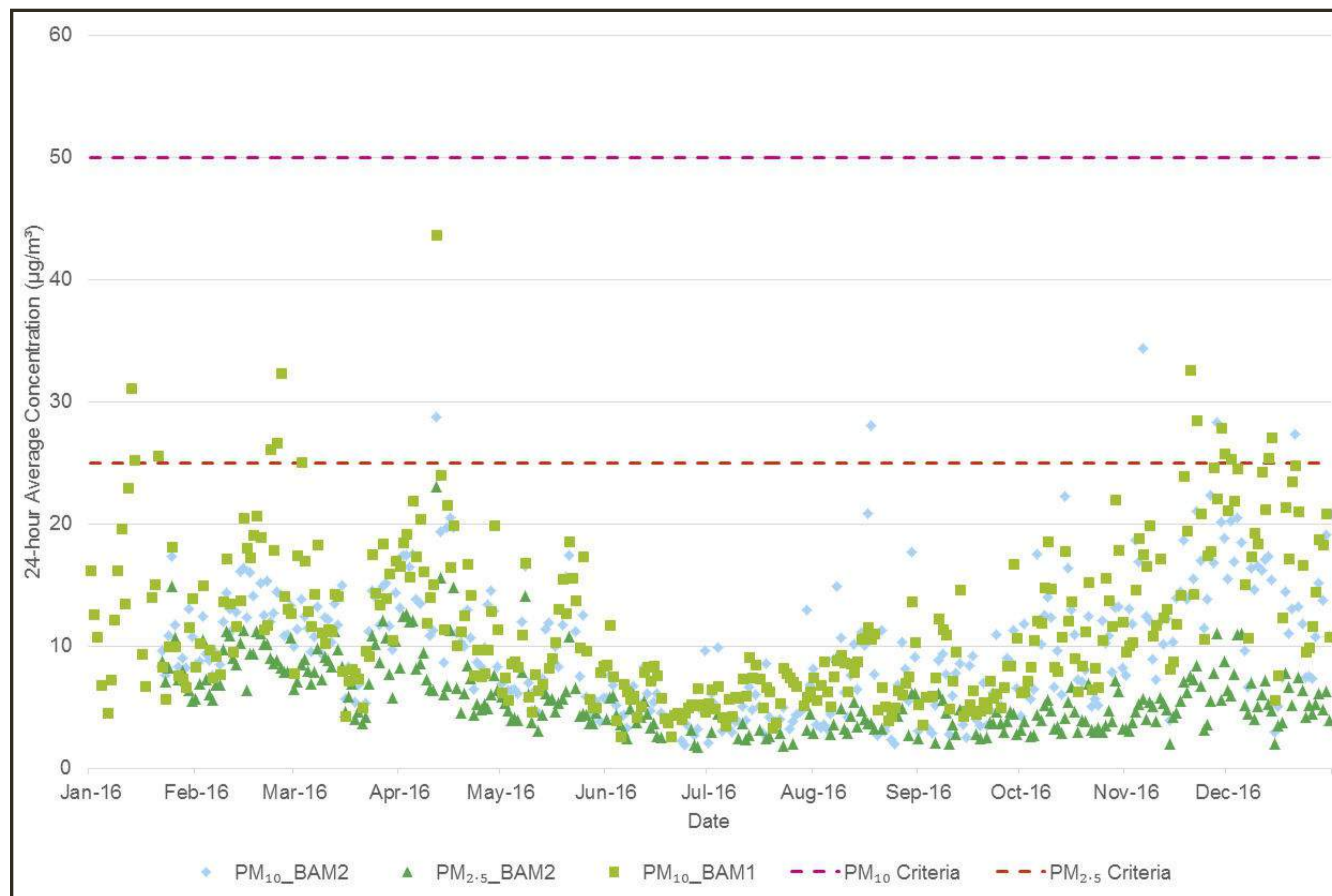
What monitoring may be undertaken?

- Real time PM₁₀ monitoring in Lue Village
- Continue PM_{2.5} PM10 / Deposited dust at selected surrounding residences.
- Analyses for lead in dust.

The Bowdens Silver Project will be designed to ensure all air quality criteria at surrounding privately-owned residences are satisfied.

Air Quality Monitoring

24-hour average PM₁₀ and PM_{2.5} concentrations 2016 (on site)



Annual average dust deposition

