



WHAT ARE TAILINGS?

Put simply, tailings are ground up rock minus the gold. Rocks mined from underground which contain gold are called ore.

Processing involves crushing the ore into sand to liberate and recover the gold. What's left over is called tailings.

Approximately 95% of the tailings are generated from gravity separation methods, which are chemical free and exploit the difference in density between gold and quartz, just as the old-timers did with their pans and sluices.

The remaining tailings is generated via a chemical leaching process which uses small quantities of Cyanide to extract fine gold from sulphide minerals which co-exist in the ore.

These processes are water based, meaning tailings from the mill are pumped as a slurry to the Tailings Storage Facility (TSF) where they are stored in fully engineered clay lined dams.



1. Tailings

Ballarat Gold Mine is committed to ensuring that tailings produced from our operation pose no threat to people or the environment.

Robust management and monitoring processes are in place to comply with all licence conditions and permits necessary for the safe storage of tailings.

WHAT IS IN TAILINGS?

Aside from gold, whatever minerals were present in the rock when it was underground, remain with the tailings in the TSF.

At Ballarat Gold Mine, the predominant minerals are quartz, shale and sandstone with a smattering of sulphide minerals containing iron, sulphur, arsenic, zinc, copper and antimony.

Although the concentration of these secondary metals is low and of no economic value, their existence prevents the tailings sands from being reused off site as a building material.

The tailings may also contain traces of chemicals that are used in the gold recovery process, the most notable being cyanide. Cyanide is one of the few chemicals that can dissolve gold. At Ballarat Gold Mine, cyanide is chemically destroyed to harmless levels before the tailings is deposited in the TSF.

ARSENIC

Arsenic is a naturally occurring element within the rock mined underground. Unlike cyanide, which is not a chemical reagent purposely added to extract gold.

Unlike cyanide, arsenic cannot be destroyed or detoxified and so remains within the tailings. Arsenic can be toxic and therefore is contained in clay lined dams to prevent any seepage. It also requires acidic conditions to solubilise and become mobile in water.

At Ballarat Gold Mine the tailings are kept slightly alkaline to hold the arsenic in the solid form. However this also means the prevention of dust is an important aspect of TSF management.

For more information go to the EPA Vic facts sheets:

Arsenic

<https://www.epa.vic.gov.au/your-environment/land-and-groundwater/arsenic>

Arsenic in mine tailings, sand and rock

<https://www.epa.vic.gov.au/our-work/publications/publication/2009/june/iwrg431>

Are you living in an area with mine tailings?

<https://www.epa.vic.gov.au/our-work/publications/publication/2018/june/1706>