



# TSF

The mining industry is full of acronyms – lots of letters strung together used as a shorthand for a mining process or term. One of these is **TSF**, which is shorthand for **Tailings Storage Facility**. What is a TSF, and why don't we just call it a tailings dam? In this *Update* we explain why there is no 'tailings dam' in Waihi.

What would happen in an earthquake or a huge rainstorm?

## TAILINGS dam? TAILINGS impoundment?

What's the difference?

**Tailings, or tails, is the finely ground rock left over** after precious metals like gold and silver have been extracted. The crushed rock can be as fine as talcum powder.

A tailings *dam* is just that. It is a dam built out of tailings. The crushed rock is formed into a bund and allowed to dry. Wet tailings in the form of a muddy slurry are pumped in behind the bund, which is gradually raised to provide more capacity.

In comparison, the tailings from the Waihi mines are stored in tailings *impoundments*. There is a big difference. Waihi's tailings impoundments are carefully

engineered rock structures made up of several separate layers and designed to the same specifications as a water-retaining structure.

Our tailings impoundments are **designed to withstand earthquake loads** with a return period of 10,000 years. In comparison, normal buildings, including residential houses, are designed for earthquake ground motions with an average return period of 500 years. Structures that may contain large numbers of people including schools are designed for 1,000 years, and structures with special post-disaster functions (e.g., hospitals, fire and police stations) and vital infrastructure (e.g., state highway bridges) are designed for 2,500 years.

The tailings impoundments operate with a freeboard of just over three metres, this is the distance between the water level and the crest of the impoundment. If required, the water from TSF1A can be pumped to the Water Treatment Plant. Water from TSF2 is allowed to be discharged into the river.

## CONSTRUCTION AND OPERATION

**As the impoundments are raised**, each level must meet strict performance criteria relating to material type, construction, depth and compaction. Different types of waste rock are placed in specific locations before the embankment is capped with clay and topsoil. As the embankment is constructed, drainage systems and monitoring bores are incorporated into the design.

Over time the tails settle and consolidate. Drilling in one of our tailings impoundments has shown that the tails have already consolidated to become a firm mud.

The consent conditions stipulate the requirements for the reporting of data to the appropriate regulatory authorities. The design engineer prepares an annual inspection report to confirm that the embankments are in a safe and stable condition. An independent peer review panel, consisting of experts in the fields of geotechnical engineering, geochemistry, hydrogeology and rehabilitation, also carry out inspections on a regular basis. They review data and reports, and they then provide reports to the regulatory agencies.

**From site selection to construction**, monitoring and independent peer reviews by recognised experts, the construction of Waihi's tailings impoundments has been closely followed and reported on. There is strong regulatory involvement from Waikato Regional Council and Hauraki District Council through the consent conditions.

Who checks what we are doing?

## CLOSURE

When the tailings impoundments are finally closed they will be partially capped leaving a wetland / small lake on the top.

A variety of land uses is possible for the remaining area.

## Long term

**When mining is completed** the Martha Trust will take over responsibility for the tailings impoundments. The company will fund the trust to allow it to carry out its functions. The sum provided will generate annual interest sufficient to allow the trust to manage, monitor and maintain the site.