



## How the 20 tons of mine waste per gold ring figure was calculated

In calculating the figure and developing the methodology, we consulted a number of experts with statistical, technical, academic, and scientific backgrounds. It is given in short tons, and represents the average amount of mine wastes generated by gold mines around the world, in order to produce an average for an 18 karat, 0.333 oz gold ring. It is based on a representative sampling of publicly available mine data that is reported by mining companies to their shareholders, and data published by [www.infomine.com](http://www.infomine.com) and the US Geological Survey at [minerals.usgs.gov](http://minerals.usgs.gov).

The following components were factored into the number:

1. The average amount of waste produced per ounce for underground mines (see "*a conservative estimate*" below) and for open pit mines.
2. The total amount of gold produced for each type of mine in 2001
3. The weight and purity of a gold ring

### Types of wastes included

It includes the following types of mine wastes:

1. **waste rock** -- which usually includes the target mineral – in this case, gold – in unprofitably low concentrations, along with toxic heavy metals and metalloids;
2. **ore** -- rock containing the gold in profitable concentrations. Often distinguishable from waste rock only by that characteristic. Also contains toxic heavy metals and metalloids.

Despite the fact that mining companies report waste rock as waste in their own annual reports to shareholders, the mining industry lobby refuses to publicly characterize waste rock as mine waste. Waste rock dumped by the mining industry in the United States alone contains hundreds of millions, if not billions, of pounds of toxics (source: U.S. Environmental Protection Agency, [www.epa.gov/triexplorer](http://www.epa.gov/triexplorer)).

### A conservative estimate

In developing this estimate, we took a conservative approach:

- It does not include an estimate for waste rock from underground mines. Although underground mines do generate waste rock in tonnages roughly equivalent to ore mined, we did not find publicly available data for waste rock from underground mines, and so *did not include waste rock from underground mines* in our calculations. Because of this omission of waste rock for underground mines, the 20 tons figure is certainly underestimated.
- The figure *does not include any waste reported as overburden*, which is the soil and rock on the earth's surface that is moved to reach the ore.