

# Treatment of Arsenic Contaminated Mining Residues

One of Western Australia's largest gold producers generates 600 tonnes per annum of a highly hazardous residue containing up to 50% arsenic by weight. This residue is generated as the fume from the roasting of arsenic rich gold ore. The arsenic is present in the waste in the leachable form of arsenic pentoxide ( $As_2O_5$ ) with ASLP leaching at 6000 mg/L.

Entech has developed the use of the Dolocrete® technology to immobilise the arsenic so that it is safe for disposal. The treatment involves the mixing of Dolocrete® with the residue using Dolomatrix's mobile treatment plant.

## The Problem

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It is a requirement of the Western Australian Environment Protection Authority that wastes require treatment to reduce the leachability down to less than 7 mg/L. Providing the waste can be treated to achieve this requirement, the material can be placed back down the mine workings where the original ore was extracted.

## Our Solution

Entech has developed the use of the Dolocrete® technology to immobilise the arsenic so that it is safe for disposal. The treatment involves the mixing of Dolocrete® with the residue using Dolomatrix's mobile treatment plant.

Dolocrete® is a magnesium oxide-based binder prepared to a patented process from very high magnesium carbonate content dolomite or magnetite material. Depending on the waste material, a selection of proprietary catalysts can be used to facilitate the formation of chemical bonds in a mineral matrix. Dolocrete® additives and special binders work synergistically to form "a double layer" barrier, trapping the waste and repelling moisture.

Once the treated residue is treated the waste is cured for 14 days after which the leachability is assessed using a NATA accredited laboratory. Typically the treated waste exhibits a ASLP leachability of approximately 1 mg/L. Once the treated waste is validated it is disposed of back down the mine workings.

#### The Outcome

A full time turnkey treatment operation has been established in Western Australia on an initial 3 year contract. The operation is successfully treating 7 tonnes per day of arsenic residue in conformance with the requirements of the Western Australian EPA. The treatment of arsenic impacted wastes using Dolocrete® is seen as a world best practice.

The treatment of mercury impacted wastes using the Dolocrete® technology provided a safe, reliable and economic treatment solution.