

IM4DC

Action Research Report

SUMMARY

Researchers:

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School/Centre:

Centre for Mined Land Rehabilitation
* School of Chemistry

University/Institutions:

Sustainable Minerals Institute
The University of Queensland
* Universidad Nacional Autónoma de México

Key themes:

Governance and Regulation
Community and Environmental Sustainability

Key countries:

Mexico

Completion:

February 2015

Research aims:

The objectives of this research were to:

- collect non-weathered tailings samples from one mine site in Northern Mexico and two sites in Central Queensland.
- characterize arsenic bearing tailings in terms of physicochemical variables related to predicting attenuation of arsenic and secondary minerals formation
- simulate the extreme wet and dry conditions both in kinetic conditions for tailings and obtain chemical variables relevant to geochemical modelling

For further information on this action research:

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Final report available on request from:
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Controlled and Monitored Natural Attenuation Strategies for Arsenic Pollution in Mining Environments

Arsenic exposure is a world health concern and mining activities are one of the main causes of exposure to it. Natural attenuation mechanisms of arsenic include adsorption over iron oxides. Mexico and Australia share particular environments in which arsenic attenuation processes knowledge is cutting edge for various reasons: the hydric regime, the neutral to alkaline conditions and very specific mineralogy. The extreme wet and dry conditions in the mining environment take to the limit solubility and precipitation cycle reactions, as opposed to high and regular rain and runoff, for arsenic attenuation.

Three samples of tailings with distinctive mineralogy were collected, characterised and weathered to detect natural attenuation mechanisms.