

IM4DC

Action Research Report

SUMMARY

Researchers:

Andy Fourie and Alsidqi Hasan

School/Centre:

School of Civil, Environmental and Mining Engineering

University/Institutions:

The University of Western Australia

Key themes:

Community and Environmental Sustainability
Operational Effectiveness

Key countries:

Africa and general application

Completion:

March 2015

Research aims:

This research sought to prepare lecture materials for use by partner institutions in Africa for teaching mine waste management based on examples of failure. Materials include:

- a summary document describing the background theory
- Powerpoint presentations of case studies
- tutorial exercises with worked solutions

For further information on this action research:

Teaching material:

Andy Fourie andy.fourie@uwa.edu.au

Learning through Failures: Preparation of a Series of Lectures for Teaching of Mine Waste Management Best Practice

Valuable learning can result from studying engineering failures. Such an approach is particularly valuable when teaching mine waste management, where the failure of a Tailings Storage Facility (TSF) can be catastrophic, resulting in environmental damage and sometimes human fatalities. Teaching best-practice mine waste management using case studies of actual failures also enlivens the teaching environment and can be used to both interest and motivate students.

This project developed teaching material that draws on documented TSF failures. Particular failures were chosen that illustrate specific topics that are usually taught in an undergraduate Geotechnical Engineering Unit. These were problems with:

- slope stability
- piping
- overtopping

For each of the three topics, a Powerpoint presentation and a Word document were prepared. The Powerpoint file contains a description of particular failures and the associated Word document contains a number of tutorial examples that were chosen to complement the theory covered in each Powerpoint file as well as solutions to the tutorial questions.

All teaching material is available from the project contact: Andy Fourie.