



SPECIALIST AMD SERVICES USING KINETIC HUMIDITY CELLS

INTRODUCTION

When exposed to air and water, waste rock containing sulfidic minerals such as pyrites can generate sulfuric acid. These changes in pH increase the solubility of compounds in the rock and produce a highly acidic and metalliferous leachate. There are a number of site specific details (physical, biological and geochemical) which impact a rocks ability to generate acid (or even alkaline) conditions. The assessment and prediction of the drainage chemistry becomes particularly important in circumstances where land is disturbed and potentially impacts the surrounding environment.



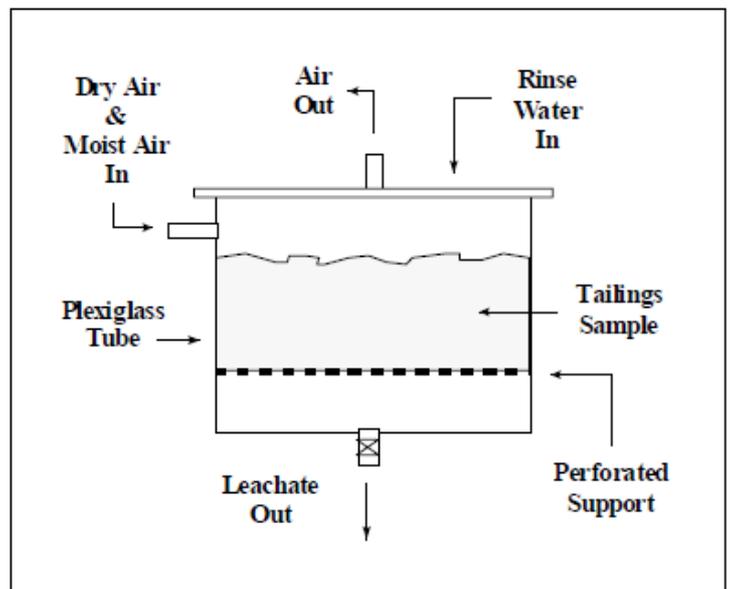
When conducting laboratory assessments for evaluating the AMD potential, there are two testing categories, Static and Kinetic tests. Static tests are undertaken to understand acid based accounting and elemental composition of the sample. In addition to these, kinetic (continuous or repetitive) testing may be explored on specific samples where a more in-depth evaluation is required. Kinetic column leaching is one of the common forms of kinetic testing. The two options for kinetic column leaching include free draining leach columns (AMIRA 2002) and humidity cells. (MEND 2009).

ALS KINETIC AMD TESTING OPTIONS

This EnviroMail presents an alternative option to AMIRA (2002) free draining column method as a means of evaluating drainage chemistry (EnviroMail™ No. 33). The concept and use of humidity cells has been extensive in North America and projects located in high humidity and wet climatic environments e.g. PNG. ALS in North America have provided this service routinely to mines and consultants. Using the expertise in North America, ALS now offers this service in Australia.

BRIEF OVERVIEW OF HUMIDITY CELL PROCEDURE

One kilogram of sample is placed in the humidity cell (pictured below) and is wetted/flushed. Each humidity cell (HC) receives repetitive weekly cycles of 3 days dry air pumped continuously through the cell, then 3 days of humid/moist air and on the final day is flushed with 500ml of distilled/deionised water. The leachate is collected, filtered if required and analysed in the laboratory.



Picture and description - MEND 2009.

Brisbane, Sydney, Melbourne (Springvale), Perth, Newcastle, Roma, Darwin, Adelaide, Townsville, Mackay, Gladstone, Wollongong, Nowra, Mudgee, Chinchilla, Emerald Water Resources Group: Canberra, Bendigo, Geelong, Melbourne (Scoresby), Wangaratta, Traralgon

ANALYSIS OF LEACHATE

The leachate produced each week can then be analysed for a range of parameters that can include but are not limited to pH, electrical conductivity, sulfate, alkalinity/acidity, chloride, cations and metals.

DURATION OF HUMIDITY CELL PROJECTS

The duration of a humidity cell trial can range from 5 weeks to many years. ALS is equipped to accommodate projects of any length.

PROJECT MANAGEMENT AND PLANNING

Customised and complex projects such as these often require additional organization and planning. Throughout the project the trained ALS staff will assist in scheduling, managing the set up, operation and maintenance of these projects for you.

For more information please contact alsenviro.brisbane@alsglobal.com



REFERENCES

1. MEND Report 1.20.1 (2009) Prediction Manual for drainage chemistry from sulfidic geologic materials.
2. Price (2009) Guidelines and Recommended Methods for the Precipitation of Metals Leaching and Acid Rock Drainage at Mine sites in British Columbia
3. ASTM Method D5744, Standard Method for Accelerated Weathering of Solids Materials Using a Modified Humidity Cell.
4. AMIRA (2002), ARD Test Handbook: Prediction and Kinetic Control of Acid Mine Drainage, May 2002.

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