

ENVIRONMENTAL TESTING SERVICES

SGS MINERALS SERVICES

SGS Lakefield Orestest Pty Ltd (SGS) was originally founded in 1993 as Orestest Pty Ltd. SGS has since developed into a major metallurgical services organization located in a purpose-built laboratory in Perth, Western Australia.

The laboratory is dedicated to providing high quality metallurgical testing across the broad spectrum of the minerals industry including:

- Gold ores
- Nickel laterites
- Base metal
- Iron ore
- Mineral sands
- PGM ores
- Rare-earths and other exotics
- Diamond ores
- Environmental services

SGS provides a comprehensive range of test work capabilities including bacterial leaching, crushing, screening, grinding, ultra fine grinding, gravity, magnetic & electrostatic separation, solvent extraction, electrowinning, flotation, pressure leaching, pressure oxidation, pressure acid leach and cyanide speciation. Pre-feasibility studies, on-site diagnostic metallurgical services, environmental testing and analytical services are also included in our range of capabilities.



INTRODUCTION

SGS provides a range of testing and consultancy services in the environmental area, and has a range of testing facilities for all unit processes in mineral processing operations from ore pre-treatment through to tailings treatment and testing. As such, SGS has developed testing procedures ranging from the Toxicity Characteristic Leaching Procedure (TCLP), through to Acid Mine Drainage (AMD) Prediction Tests, Cyanide measurement, speciation and detoxification testing by a range of technologies, and arsenic waste stabilisation and control. Our clients include a large range of mining companies in Australia, Asia and the Pacific.

FACILITIES AT SGS

TCLP

The Toxicity Characteristic Leaching Procedure is used to determine the amount of metal that is likely to be available for leaching in a tailings dam or municipal landfill. SGS was one of the first laboratories in Western Australia to use the technique, and is now recognised by the Department of Environmental Protection as a leading independent provider of TCLP testing for municipal landfills. The test is increasingly also being applied to mine tailings.

Acid Mine Drainage Prediction Tests

SGS's laboratory offers the full range of AMD Prediction Tests ranging from simple Acid-Base Accounting Tests, through to Acid Neutralisation Capacity (ANC), Net Acid Production Potential (NAPP), Net Acid Generation (NAG) Tests, Sulphur and Sulphate assays. In addition, longer-term kinetic testing tests such as Humidity Cells and Lysimeter Tests are available. These services are backed by mineralogical services to assist in interpretation of the tests.

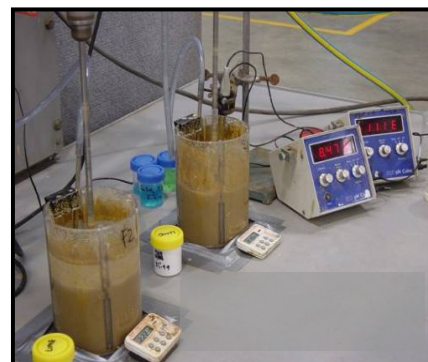
Cyanide Speciation

The toxicity of cyanide in mine tailings and effluents is very dependent on the speciation of the cyanide present. SGS can offer analytical and consulting services to assist in the measurement and interpretation of cyanide speciation. Analyses include total cyanide, weak acid dissociable cyanide, free cyanide, thiocyanate, cyanate, pH, Eh and total metals, from which the whole range of metal cyanide complex speciation is obtained. This information is essential in the choice of appropriate cyanide removal or recovery technologies.

Cyanide Detoxification

SGS offers testing and consulting services in the area of cyanide detoxification covering all common technologies from Alkaline Chlorination to Hydrogen Peroxide, Caro's Acid (*Efflox Process*), Sulphur Dioxide/Air (*Inco Process*), DTOX and Ferrous Sulphate to bacterially-assisted detoxification. Cyanide recovery technologies such as AVR and resin and carbon adsorption are also covered. SGS has an agreement in place to test the Inco technology on its behalf in the Asia-Pacific region.

Oretest assists further in the correct choice of detoxification technology by using the extensive experience of its staff in this field. Economic and environmental compliance factors are used in this regard.



Arsenic Stabilisation

The stabilisation of arsenic in tailings dams and landfills is of extreme importance to prevent leaching of this very mobile element into waterways and groundwaters. SGS has particular expertise in means for treating arsenical wastes from the chemical and mining industries to prevent re-mobilisation into the surrounding environment. Methods employed include the formation of insoluble arsenic(v) compounds and the use of encapsulating media such as cement and other mixtures.

MAIN CLIENTS HAVE BEEN:

- Routine AMD prediction testing for Boddington gold mine, Homestake Gold Mines Ltd, Mount Morgans gold mine, and Gosowong gold mine in Indonesia.
- Cyanide speciation and detoxification studies have been performed for Gold Ridge Mining, Solomon Islands, Gosowong Mine and the Rawas gold mine Indonesia.
- Arsenic stabilisation work has been performed for Kanowna Belle gold mine, Wesfarmers CSBP, Pasminco, South Australia, and the Ashanti gold mine in Africa.

For more information, please contact us:

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