

## SGS SERVICES FOR MINERALOGY

### AN OVERVIEW OF SGS' MINERALOGY CAPABILITIES

The SGS Advanced Mineralogy Network offers unmatched expertise and automated, state-of-the-art technologies. Our Advanced Mineralogy Facilities (AMFs) are equipped with a wide variety of expertise including:

- X-ray diffractometers
- Scanning electron microscopes
- Electron microprobe capabilities
- Reflected and transmitted light microscopes
- Optical image analysis systems
- QEMSCAN® systems.

Our AMFs provide automated High Definition Mineralogy to industrial sectors needing detailed material, product or residue assessments. While our data supports investigations in many disciplines, we specialize in applications rooted in the minerals sector. Our services provide key input into strategic decisions during:

- Mineral exploration and resource development
- Metallurgical testing
- Commodity trade
- Sustainable development activities.

### MINERAL EXPLORATION AND RESOURCE DELINIATION

#### EXPLOMIN™

Developed by SGS, EXPLOMIN™ is a trademarked set of packages which provide automated mineralogy for exploration and early project development. The value of EXPLOMIN™ is its ability to provide vast amounts of objective, quantified mineralogy efficiently and economically.

#### PARTICLE MAPPING

Particle mapping techniques and Trace Mineral Searches provide information on the distribution and spatial relationships of minerals, including liberation and association data and textural images. Advanced analysis can include grade vs. recovery relationships and mineral release curves.

### METALLURGICAL TESTING FOR OPERATIONS AND PLANTS

#### ORE CHARACTERIZATION

Whether a deposit is economically viable is dependent on mineral composition, department and texture. Processing methods and flowsheet design also take such data into account. SGS offers a variety of measurement packages and Field Scan analyses to help you delineate these crucial parameters.

#### PROCESS MINERALOGY

Process mineralogy focuses on the relationships between ore and gangue minerals. The data generated from such studies optimize recovery and selectivity. We can clarify reasons for poor mineral recovery or grade and understand the influence of physical ore characteristics on metallurgical grade and recovery.

#### PLANT AUDITS

Characterization of metallurgical products is essential to evaluating, developing and optimizing metallurgical flowsheets and improving of plant efficiency. High Definition Mineralogy provides an automated, statistically superior determination of bulk sample mineralogy, and mineral liberation.



### COMMODITY-SPECIFIC APPLICATIONS

#### INDICATOR MINERALS (DIAMONDS)

High Definition Mineralogy technology simplifies indicator mineral identification by automating the examination of heavy mineral concentrates. SGS' Rapid Indicator Mineral Scan (RIMSCAN) can use of smaller samples and provides fully automated, rapid, objective identification of the full indicator mineral suite (kimberlite and base metal indicator minerals, gold, uranium, etc.).

**GOLD**

SGS offers Automated Digital Imaging System (ADIS) using a petrographic microscope to produce gold grain size distribution and mineralogical association. This will allow characterization of feed, tailings and concentrate. We can also quantify the presence of microscopic and submicroscopic gold locked in various minerals in a sample. This data can be used to generate a gold balance and troubleshoot low recovery.

**CLAY**

Clay minerals are ultra fine grained and require special analytical techniques. SGS offers clay speciation by X-ray diffraction (XRD) analysis. The Rietveld method can be used with semi-quantitative XRD analysis to reconcile and report a whole rock analysis plus the analysis of other major elements in the sample. The Rietveld method is very useful for clays as it can be extended to complex systems and improves the accuracy of quantitative results.

**INDUSTRIAL MINERALS**

With industrial minerals, product quality drives marketability and price. Often, physical or chemical upgrading can enhance market value. SGS High Definition Mineralogy helps define many process options.

**CONTACT INFORMATION**

Email us at [minerals@sgs.com](mailto:minerals@sgs.com)  
[www.sgs.com/mining](http://www.sgs.com/mining)

**CATALYSTS**

SGS provides reliable characterization services to the autocatalyst industry. We have a range of optical and electronic imaging tools that give insight into automotive catalyst performance.

**COAL PETROGRAPHY**

SGS provides a full range of coal, coke, and by-product petrographic services including rank and type determination and complete coke and by-product analysis.

**PHYSICAL METALLOGRAPHY /  
CORROSION STUDIES**

SGS provides technical expertise in consulting, engineering, and testing in the fields of failure analysis, corrosion and the identification of mode and root cause of metal failure.

**SUSTAINABLE  
DEVELOPMENT  
CONSIDERATIONS****ENVIRONMENTAL APPLICATIONS**

High Definition Mineralogy can quantify waste rock, tailings and soil composition, map deleterious mineral assemblages (As, Pb, Se), assist with forensic determinations to establish the source of contaminants. Industrial hygiene analysis (respirable silica and asbestos determinations) is also available.

