

## ANALYTICAL CAPABILITIES

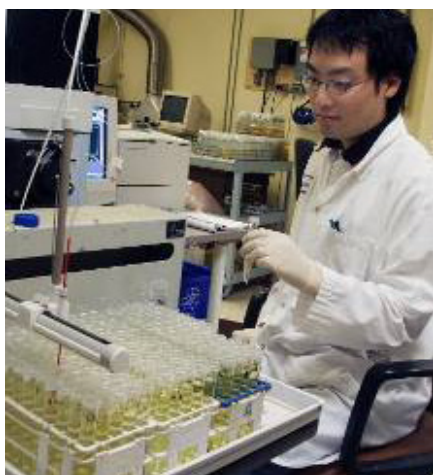
### NORTH AMERICAN ANALYTICAL LABORATORIES

#### CAPABILITY

The SGS Group of companies was founded in 1878, and is recognized as a global leader in inspection, verification and monitoring for international trade in the mineral, agricultural, petroleum and consumer product sectors. With over 65,000 employees, SGS operates a network of over 1,250 offices and laboratories around the world.

SGS Minerals provides support to its clients both as a strategic partner and technical advisor. Through our global network of operations and laboratories, we deliver a broad spectrum of independent quality and quantification services for:

- Minerals
- Geochemical metallurgical materials
- Coal and coke, bio-fuels, non-ferrous metals, steel and steel making raw materials
- Fertilizers
- Cement
- Industrial minerals



The SGS Minerals Services Group has a unique base of expertise and experience which is available from our worldwide network.

All SGS geochemical laboratories worldwide have standardized methods, method codes and sample preparation techniques. This allows the client to have the same method performed at each of our laboratories globally. This also allows SGS to funnel samples from one lab to another during high sample flow load with prior consent from the client.

Below is a brief description of our North American Geochemical Services structure as well as the Quality Management System.

### NORTH AMERICAN LABS

#### TORONTO, ONTARIO

SGS Minerals Services in Toronto is the Centre of Excellence for geochemical analysis and has provided decades of independent analytical testing to the global mining industry. The Company was founded in 1954 as X-Ray Assay Laboratories to exploit the multielement capabilities of newly developed X-Ray fluorescence instruments. In the seventies, we began to use instrumentation neutron activation analysis for multi-element trace analysis. In the eighties and nineties, we used ICP and ICP-MS technology for increasingly sensitive multi-element analysis.

The introduction of each of these new techniques has been in response to industry needs for multi-element geochemistry. The latest method we offer is the Mobile Metal Ion Process (MMI), a highly innovative geochemical technique that can detect the surface expression of

buried mineral deposits.

X-Ray Assay Laboratories was purchased by the SGS Group in 1988.

With over 25,000 square feet of laboratory space, 100+ employees including chemists, scientists and technicians, the laboratory provides high quality analytical services to geologists, mining companies, geological surveys, universities and Technical Institutes worldwide. This can mean the determination of any one or more of 60 elements, ranging in concentration from parts per trillion to 100%. To do this, SGS Minerals Services uses a wide range of techniques and the latest in instrumentation.



SGS Minerals Services in Toronto is accredited to ISO/IEC 17025. This accreditation is the standard for analytical testing laboratories. Not only does it incorporate a Quality Management System but it specifically accredits the individual methods used for the analyses.

## LAKEFIELD, ONTARIO

In 2002, SGS purchased Lakefield Research Limited. The SGS lab in Lakefield continues to be recognized world-wide as a premier testing and consulting group in the industry, developing mineral extraction and processing techniques through bench and pilot plant metallurgical testing programs.

The geochemical analytical capabilities at the Lakefield facility serve the mineral processing / metallurgical group, smelters, mines and exploration companies.

The Lakefield lab is also accredited to ISO/IEC 17025. With a wide range of equipment and expertise, the laboratory is capable of handling all types of material from exploration through to the complete metallurgical processes involved in ore beneficiation to umpire analysis.

## SUDBURY, ONTARIO

SGS's facility in Sudbury Ontario has been providing sample preparation services to northern Ontario communities since 2003. The facility provides full sample preparation, specific gravity measurements and bench-top XRF analysis. It also has the capability to provide bulk sample reduction utilizing two discrete sampling towers.

The facility is 7000 square feet in size, employs about 25 experienced staff and operates around the clock to provide



excellent capacity for clients.

## RED LAKE, ONTARIO

The Red Lake laboratory started out in 2000 as a dedicated mine site lab for the

Goldcorp Mine. Since then, it has nearly doubled in size and now also services other exploration clients in the Red Lake district.

The laboratory can analyze up to 700 samples per day, from complete sample preparation of mine / mill samples and exploration drill cores to fire assay for gold.

The SGS Red Lake laboratory has received ISO/IEC 17025 accreditation.

## ELKO, NEVADA

The SGS lab in Elko, Nevada has 7500 square feet of laboratory and office space. The highly qualified lab staff is capable of drying, sieving, crushing and pulverizing preparing well over 600 samples per day. All samples prepared at this laboratory are sent to the Toronto facility for analyses.

## DURANGO, MEXICO

The SGS facility in Durango provides high volume sample preparation, with capacity in excess of 1,000 samples per day. Analyses can be completed by ICP-OES or AAS with these instruments running 24 hours a day to provide the turnaround time you expect. The facility also features an 84 pot multi-pour Fire Assay fusion furnace operating 24 hours a day, 5 days a week with capacity to process more than 1,500 samples/day for precious metal analysis with gravimetric, AAS, and ICP-OES finishes. The SGS Durango lab received ISO/IEC 17025 accreditation in 2009.

The Durango facility also offers trade related commercial settlement analyses and bankable bench-scale metallurgical and geometallurgy testing in support of scope and prefeasibility projects.

## VANCOUVER, BRITISH COLUMBIA

With the acquisition of Assayers Canada in 2010, the SGS Vancouver facility offers a full range of geochemistry and metallurgical services including sample preparation, fire assay, pulp metallics, environmental analysis, ICP-AES and ICP-MS, cyanide leach, aqua regia leach, multi-acid and ore assays. The

SGS Vancouver lab holds Certificates of Laboratory Proficiency from Standards Council of Canada for precious and base metals analysis as well as ISO 9001:2008.

This lab also strengthens our geochemical analysis expertise in by adding to the existing exploration, metallurgical, mineralogy and water treatment services that SGS offers here in Vancouver.

## COMMITMENT

SGS Minerals Services is committed to satisfying your needs by providing geochemical analysis of the appropriate accuracy and precision in a timely fashion. Our quality management objectives at SGS Minerals Services require us to:

- Provide our customers with excellent service by continuous attention to eliminating those problems, which cause shortcomings in our service delivery.
- Identify and apply the most appropriate quality tools to measure our performance and the quality of our results.
- Continuously improve our performance to maximize our business success.
- Create a work environment that encourages Quality, Customer Service, and individual and group excellence.

## INTERNAL QUALITY CONTROL

A brief overview of SGS Mineral Service's global QA/QC procedures and data acceptance criteria is presented below. All the laboratories have formally documented QA/QC and data acceptance systems that are contained in on-site Quality and SOP manuals. Where the laboratories are accredited or going through the accreditation process these documents have been audited repeatedly by the Standards Council of Canada as part of the ISO/IEC 17025 accreditation program.

## LABORATORY INFORMATION MANAGEMENT SYSTEMS

All SGS laboratories run sophisticated LIMS systems that form the “spine” of the laboratories. All activities are orchestrated and controlled through the LIMS systems.

The Toronto and Lakefield laboratories have been networked together and have been configured so that they can share files and seamlessly port information back and forth.

The IT systems in all laboratories have also been designed around 100% redundancy and continuous backups. In the event of a tragic, cascading hardware failure, the worst situation would see the laboratories’ LIMS lose 12 hours of data. Such data would still be available in on-board analytical instrument systems so file re-construction would be a trivial matter once a successful LIMS re-start was accomplished.

## ACCEPTABILITY OF RESULTS – INCLUDING CALIBRATION SOLUTIONS, STANDARDS AND DUPLICATES

The precision and accuracy of results is monitored continuously in SGS labs through the use of analytical standards and blanks.

Accuracy and bias is monitored through the use of standards (SRM or CRM) which are run with each batch of samples.

Precision is measured through the use of sample duplicates, which are also run with every sample batch. Batch size varies with the analytical technique employed and the instrument used.

The laboratory’s LIMS system summarizes the QC data at the end of the batch showing the percentage variation of the SRM values from the recommended values and the percentage differences between duplicates. If these are acceptable, i.e., within the criteria for the method, then the job is released. If not, the batch, or a series within the batch, is repeated.

The acceptance criteria vary for different analytical techniques and preparation/ extraction methods. Method uncertainty

varies with the nearness of the result to the detection limit.

The Toronto, Lakefield and Red Lake laboratories have completed exhaustive Measurement Uncertainty calculations for all ISO/IEC 17025 accredited methods. As per our accreditation, complete Uncertainty Data for each accredited method is available to our clients on request. All Uncertainty Data has been calculated by concentration range.

## QUALITY MANAGEMENT SYSTEM

### RESPONSIBILITY AND AUTHORITY FOR QUALITY MANAGEMENT

The Director of Analytical Services is responsible for the overall stewardship of SGS performance, including quality performance.

### QUALITY MANAGER / OPERATIONS MANAGER

The Quality Manager is responsible for the development, implementation, and monitoring of the Quality System in accordance with ISO/IEC 17025.

### ISO MANAGEMENT REPRESENTATIVE

The ISO Management Representative is responsible for the design and maintenance of the Quality System.

### QUALITY DOCUMENT COORDINATOR

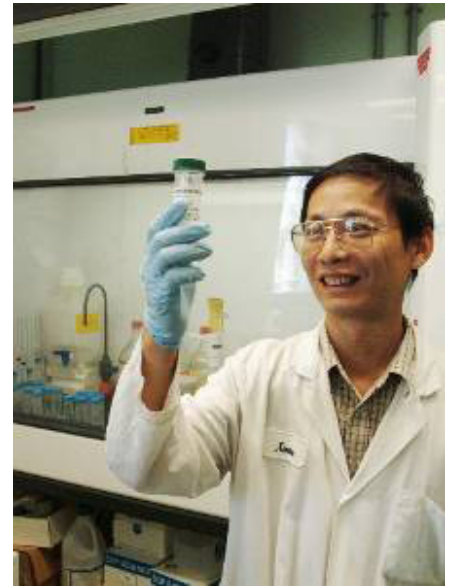
The Quality Document Coordinator is responsible for the development, control, and disposition of all Quality Documents. He/she is also the Incident Report Coordinator.

### INTERNAL AUDITS

Internal Audits are performed as necessary.

### MANAGEMENT REVIEWS

Management Reviews are performed once per year, or more frequently, as deemed necessary by Executive SGS Management. They will involve, as a



minimum, the Operations Manager and the Quality Manager. Management Reviews will include:

- Organizational structure, including the adequacy of staffing and resources, conclusions regarding the implementation and effectiveness of the Quality System and its conformity to ISO/IEC 17025 requirements
- Quality performance
- Internal and customer feedback on quality performance
- Audits
- Effectiveness of corrective and preventative actions

Minutes will be distributed and discussed by the Quality Committee as needed.

### QUALITY IDEAS

All personnel can submit ideas for quality improvement, either by direct communication (verbal or written) to the Operations Manager. The Quality Committee will review these ideas.

### QUALITY COMMITTEE

Quality Committee Meetings will be held quarterly, with the minutes of the meeting released to the appropriate personnel. Corrective actions, customer complaints, internal audits, and quality planning will be discussed at each meeting. The Quality Committee consists of the Quality Manager (Operations Manager), the ISO

Management Representative, and the Quality Document Coordinator.

#### SGS Quality System

The structure of the Quality System is as follows:

Level One: SGS Canada Inc. Corporate Quality Manual

Level Two: SGS Minerals Services Laboratories Operating Procedures

This manual contains seventeen procedures covering all elements of ISO/IEC 17025 requirements:

Level Three: Laboratory Test Methods, and/or Work Instructions, Good Laboratory Practice, generally accepted test methods, including but not limited to:

- Customer Supplied Methods.
- In-house documented test methods.
- Methods developed by any other nationally or international recognized professional organizational, such as ASTM.

This section contains seventy-six (76) Work Instructions that document exactly how various tasks at SGS laboratories are to be carried out. They cover operations in each of the following departments:

Sample Receiving, Sample Preparation, Data Centre, Sample Weighing, and Digestion, Wet Chemistry, ICP, ICPMS, AA, XRF/XRD.

## PARTICIPATION IN PROFICIENCY TESTING SCHEMES

One of the requirements of laboratory quality systems is participation in regular inter-laboratory proficiency tests set up to follow ISO/IEC 17025. SGS Minerals Services participates in the following tests:

- International Proficiency tests of geoanalytical laboratories GEOPT, once a year.

- CANMET Proficiency Test program-Mineral Analysis Labs, twice a year. (PTP-MAL)
- CANMET Interlab program for certification of standards.
- CANMET PT scheme for alpha quartz determinations by XRD, twice a year.
- GEOSTATS round robin, twice a year.
- LQSI international proficiency test program for mineral ash, and limestone, on a monthly basis.
- Internal round robins, monthly, for Au and base metals
- Rocklabs proficiency test for reference material production.

### CONTACT INFORMATION

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WHEN YOU NEED TO BE SURE

