SASKATCHEWAN RESEARCH COUNCIL

Geoanalytical Laboratories

2017 Services Schedule

www.src.sk.ca

ISO/IEC 17025: 2005
Accredited Facility

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Contents

Saskatchewan Research Council

Geoanalytical Laboratories Background

This year will mark 70 years of Saskatchewan Research Council being in business. Through those years SRC has seen many changes, but the driving force to help improve life in Saskatchewan has never changed.

In 1947 SRC was established as a treasury board Crown Corporation owned by the Province of Saskatchewan. The concept that science and technology could be an instrument to build a better life for Saskatchewan people was very attractive.

By the early 1970's SRC adopted a more client-centered approach to its work. Rather that structuring along academic discipline lines groups were restructured into sectorial units, thus in 1972 the Mining and Minerals Division came into being.

The Mining and Mineral Division of SRC can provide services from mineral exploration, to geochemical analysis and mineral processing.

Contact us to find out more.

The Geoanalytical Laboratories (The Laboratory) is continually expanding its facilities to match the growth in the exploration and mining industry sectors. The Laboratories has recently expanded its facilities in Saskatoon to include:

- A dedicated Uranium / Base Metal analysis laboratory
- Kimberlite Indicator Mineral (KIM) processing and recovery facility
- Radioactive sample preparation facility
- Macro and Micro Diamond Recovery facility
- Dense Media Separation (DMS) facility
- Potash preparation and analysis facility
- XRD and XRF facility
- Electron microprobe and QEMSCAN facility
- Petrographic services

Geoanalytical Laboratories strive to keep up with the growth in industry and the needs of our customers. We invite you to tour our lab to see what makes us stand out from the rest.

Locations and Contacts

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Using this Fee Schedule

This fee schedule has been designed to provide all relevant information regarding sample processing at the SRC's Geoanalytical Laboratories. It also summarizes methods, procedures, quality control protocols used, and provides information and links for easy use. The layout of the Fee Schedule is broken into colour-coded sections: Sample Preparation, Exploration Geochemistry, Gold and Precious Metals, Diamond Services, Advanced Microanalysis Centre™, Mineral Processing, and Non-Routine Analyses.

This document is aimed toward exploration geoscientists to provide simple and effective analytical solutions (packages) specific to industry. It is advised that the requester discuss the proposed method for sample analysis or recovery with the Laboratory prior to analysis, so that the final results will be consistent with the objectives of the analytical program. For example, detection limits for some elements can be improved by using alternate methods, depending upon the nature and composition of the sample.

The diversity of services we offer goes well beyond the scope of this document. Highlighted in the fee schedule are routine methods or packages, which are most commonly used, and non-routine methods that are offered subject to availability. We are committed to providing a wide spectrum of services to the exploration and mining industries that are relevant, timely, and cost effective. It is our desire to provide services that are technically up to date, relevant, and worth your investment. Should you require services not listed in this fee schedule please feel free to contact the Laboratory for further assistance.

Pricing policy, liability and other conditions of services are located in the Terms and Conditions section at the end of this document.

Quality Assurance

Quality Management System

The quality management system at the Laboratory operates in accordance with ***ISO/IEC 17025:2005*** (CAN-P-4E), General Requirements for the Competence of Mineral Testing and Calibration Laboratories; and is also compliant to CAN-P-1579, Guidelines for Mineral Analysis Testing Laboratories. The management system and selected methods are accredited by the Standards Council of Canada (Scope of accreditation # 537).

The laboratory is assessed on a regular basis, both internally and externally, to ensure that it continues to meet these requirements. Contact the Laboratory for further information.

Quality Policy:

"It is the purpose of the Management System at the Geoanalytical Laboratories of the Saskatchewan Research Council to provide a high standard of service to all its Customers through good professional practice and Top Management's commitment to quality: by continually assessing and improving the effectiveness of all aspects of the Management System with compliance to ISO/IEC 17025:2005 and CAN-P-1579."

Audit Program

As part of the laboratory's commitment to continually assess the effectiveness of the services it offers its customers, all processes are subject to internal, second party, and third party audits.

- All methods are internally audited by qualified personnel at least once a year.
- The laboratory may also be audited by customers for the processing of their samples on an unscheduled basis.
- The laboratory accreditation body (Standards Council of Canada) conducts regular surveillance audits of the accredited methods.

Quality Assurance Components

There are many components to the Quality Assurance Department at SRC Geoanalytical Laboratories; these reflect the minimum requirements of the ISO/IEC 17025/2005 Standard and include:

- Top management commitment
- Review of customer feedback
- Internal quality audits
- Personnel training and competence
- Supplier evaluations
- Quality Control (QC)
- Participation in proficiency and inter-laboratory testing programs (certificates on website)
- Facility and equipment inspection and preventive maintenance
- Corrective and Preventive Action (CAPA) and a continual improvement program

Quality Control

The processes in the Laboratory ensure at least one QC measure is applied to each batch of samples to assure the quality of the results generated. These measures include: sample preparation QC checks; analysis of Certified Reference Material and/or in-house reference materials and standards; preparation and analysis of pulp duplicates, blanks, and replicates; traceable calibration standards for instrumentation; spiking of samples to monitor process recoveries; and QC monitoring.

The quality control measures applied to all methods within The Laboratory have been established to ensure they are compliant with the requirements of **ISO/IEC 17025:2005**. The quality control measures which are applied may vary from method to method and are selected on their suitability.

All quality control measures applied at The Laboratory are checked by supervisory and/or quality assurance personnel prior to reporting results. If results are found to be outside quality control limits, actions are taken to ensure that the samples are reprocessed and the required quality limits are met.

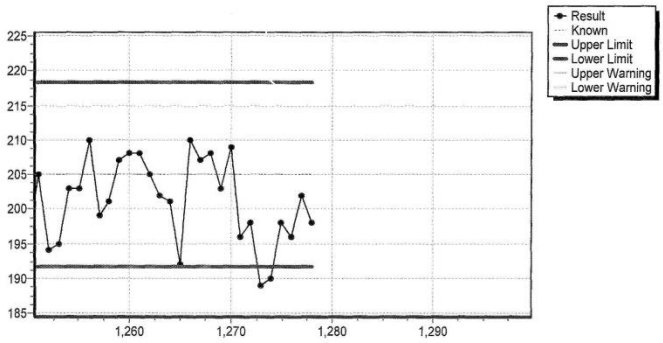
Refer to the package/analysis description for a breakdown of specific QC protocol used in individual analyses. **Customers inserting their own quality control samples are advised to review The Laboratory's Quality Control Policy**.

Monitoring Quality

To ensure that the long term quality of each process is maintained the results from all quality control measures and internal quality control testing for each method is monitored.

Control charting is used to determine the continued suitability of the process and to monitor for bias within the results.

Slight changes in quality control results are continually analyzed to ensure that there are no underlying problems with the method that may reduce confidence in the results.



Ethics and Security

SRC considers customer confidentiality and security of utmost importance and takes appropriate steps to protect the integrity of sample processing at all stages from sample receipt, storage and handling to preparation and analysis of samples to transmission of results. All electronic information is password protected and backed up on a daily basis. Electronic results are transmitted with additional security features. Access to SRC Geoanalytical Laboratories' premises is restricted by an electronic security system. The facilities at the main lab are regularly patrolled by security guards 24 hours a day.

High-Security Diamond Facility

The Diamond Services Laboratory has 24-hour video surveillance, independent security monitoring and audited security measures to protect our customers' interest.

Levels of security can be tailored to meet customer requirements, contact The Laboratory to find out more.

Code of Conduct and Ethics

SRC serves all its customers in a professional manner. A strict Code of Conduct and Ethics policy is enforced at SRC for both employees and subcontractors to ensure a high integrity service is applied to sample processing. Our goals relating to the highest level of ethical conduct and professionalism are based on the following principles:

- Honesty of Conduct
- Confidentiality
- Trading
- Outside Activities, Employment and Business Involvement
- Gifts, Entertainment
- Workplace Conduct
- Ownership of Intellectual Property and Records
- Privacy
- Conflict of Interest / Commitment
- Corporate Opportunities
- Political Activities
- Corporate Property
- Disclosure
- Information Technology

Laboratory Safety

Safety in the workplace is the over-riding priority at SRC

The different processes that are performed at the Geoanalytical Laboratories are strictly monitored to ensure the safety of personnel in that area. Depending on requirements, customers may be working on-site as part of a project. Our goal is to ensure that all personnel are given the required tools to keep them safe.

Safety Training

As with most laboratory environments, hazards pose a potential health and safety risk to personnel in the area. All personnel employed by The Laboratory, all subcontractors, and all on-site customers are informed of the potential hazards in The Laboratory and are provided with the appropriate personal protective equipment and training prior to entering hazardous areas. SRC promotes safety training and development programs for laboratory personnel.

Radiation Safety

SRC provides a Canadian Nuclear Safety Commission (CNSC) licensed facility for processing radioactive samples. In some areas of The Laboratory, additional radiation safety training is required as well as the provision of a personal dosimeter to monitor the exposure to radioactive materials. Personnel working at the radioactive sample preparation facility and laboratory are classified as Nuclear Energy Workers (NEW) and have their exposures closely monitored by regulatory agencies.

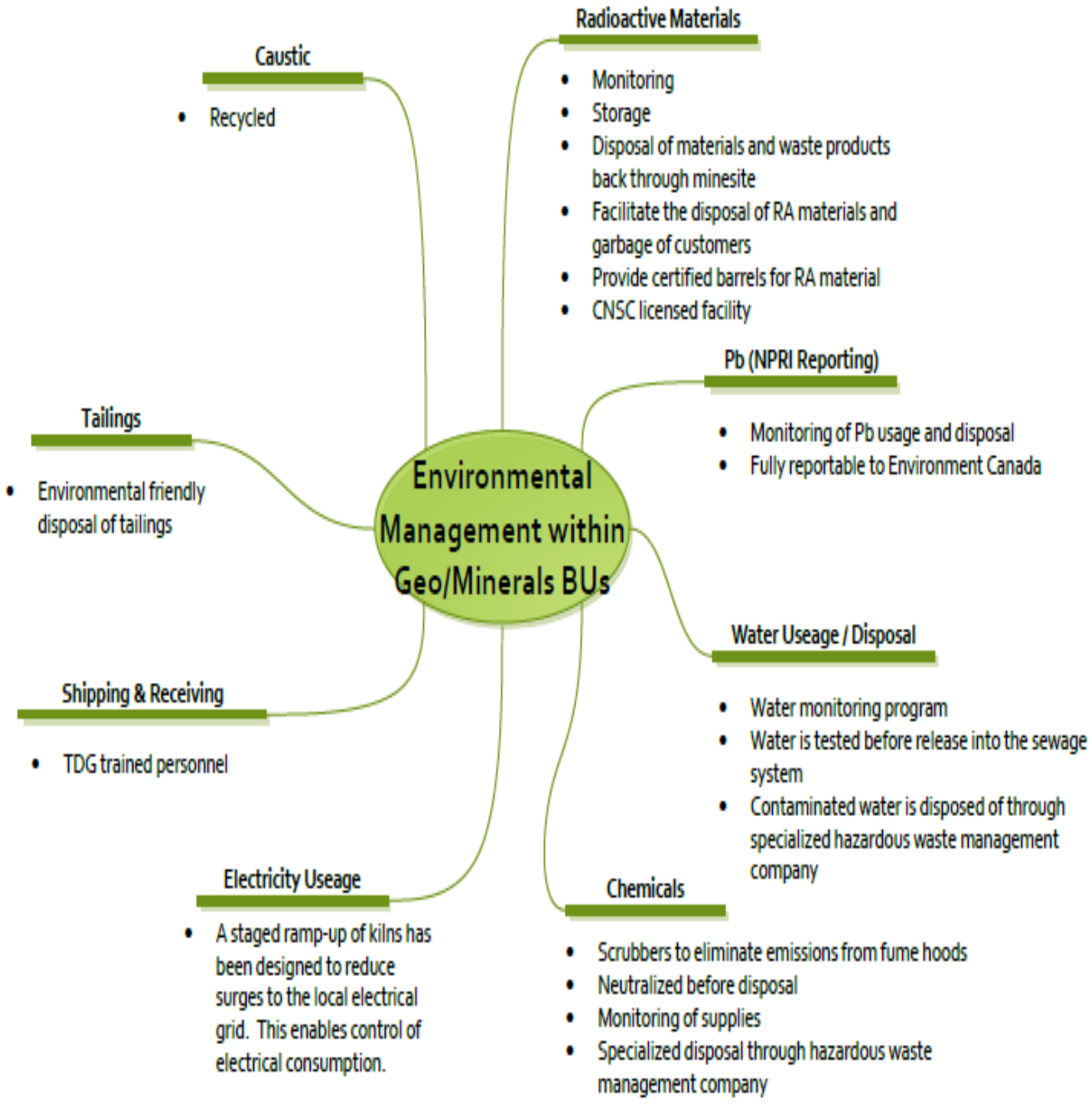
Transportation Safety

Select personnel at The Laboratory have training in the Transportation of Dangerous Goods (TDG). This skill is vital for the transport of hazardous materials for testing and the chemicals needed to process samples.

Monitoring Safety and Continual Improvement

The Laboratory has an active safety audit program and is also monitored by SRC and external bodies to ensure the continued safety of its employees and personnel on-site. Through audits and risk assessments, The Laboratory strives for continual safety improvements for all its processes.

Environmental Management



Sample Preparation

Sample Shipment

Request for analysis forms are available on our website. Please ensure that all samples are clearly marked with waterproof ink.

Please identify matrix type of samples
(e.g. sandstone or basement, etc.)

All international shipments must be clearly marked:
"Test samples for analysis. No commercial value."

Chain of Custody

If required, a chain of custody can be established with The Laboratory to ensure the integrity of sample handling. Please contact The Laboratory for further information or complete the Chain of Custody form available on our website.

Radioactive Shipments

Not only do samples arrive by transport from various parts of Canada but also from around the world. If you require information on the shipping of radioactive samples please contact us for the broker information.

The Laboratory is licensed by the Canadian Nuclear Safety Commission (CNSC) to receive, process, and store radioactive materials. Please contact The Laboratory for more information on our licensing.

Sampling Supplies

We purchase large quantities of sampling supplies and provide these to our customers at cost. Sampling supplies available are listed below:

- Plastic bags 6 mil 8 X 13
- Tyvek bags 5½ X 10½
- Plastic bags 6 mil 12 X 20
- Bar-coded sample tags*
- Plastic pails 5 gallon
- Pre-addressed shipping labels*
- Kraft paper bags
- Kimberlite bags one cubic metre (1.5 tonne capacity)

*Provided for your convenience at no charge.
Custom sample tags are available
Contact The Laboratory for prices for sampling supplies.
Email: geolab@src.sk.ca

Sample Preparation

Samples are prepared in facilities specifically designed for each method or process. Key preparation areas are separated from each other to reduce the possibility of cross matrix contamination:

- Sandstone preparation area
- Basement preparation area (low radioactivity)
- Radioactive preparation area (high radioactivity)
- Potash preparation area
- Kimberlite Indicator Mineral preparation area
- Diamond processing and recovery facility

The primary purpose of sample preparation is to produce homogeneous sub-samples that are representative of the material submitted to The Laboratory for analysis. Therefore, preparation is very important to obtaining quality, meaningful results from the analysis.

All samples received at the main lab will be checked upon receipt for radioactivity levels and sorted accordingly. Sample processing is dependent on radioactivity and will be automatically prepared according to defined SRC Geoanalytical Laboratories' procedures.

Sample Preparation Packages	

Sandstone Rock / Core

Description	Code
Non-Radioactive - Crush, Split, Agate Grind	C/S/A
Non-Radioactive - Crush, Split, Mild steel Grind	C/S/G

Basement / Mineralized Rock / Core

Description	Code
Non-Radioactive - Crush, Split, Agate Grind	C/S/A
Non-Radioactive - Crush, Split, Mild Steel Grind	C/S/G
Radioactive – Crush, Split, Agate Grind* (low level RA ONLY)	RA/C/S/A
Radioactive – Crush, Split, Mild Steel Grind*	RA/C/S/G
*Radioactive Decontamination Costs (average 4 hours)	RA/DC

Soil and Sediment

Description	Code
Dry, Mortar, Sieve – 180 µm	
Dry, Grind	
Wet Sieve – 106 µm	
Roller pinning @ -2 mm	

Other

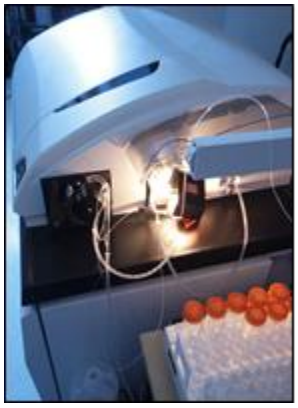
Description	Code
Clay Separation Centrifuge	
Micro/Macro Diamond processing (See Page 40)	DIA
KIM processing	KIM2
Extra Split	

Exploration Geochemistry Packages

With 45 years' experience in servicing the uranium exploration industry, SRC Geoanalytical Laboratories has put together analytical packages that meet the needs of its customers. Personnel at The Laboratory are available to discuss your unique exploration needs. Although founded on the Saskatchewan exploration model, our packages can be transferred to exploration programs around the world. If you would like to discuss your individual exploration needs or selection of packages please contact us.

A range of routine packages and individual analyses are available:

- Multi-element ICP-OES packages
- Multi-element ICP-MS packages
- U_3O_8 Assay (wt%)
- Potash Assay
- Whole Rock analysis (wt% and ppm)
- Rare Earth Element (REE) analysis (wt%)
- Fire Assay
- Carbon & Sulphur analysis (wt%)
- Lead Isotopes



Preparation techniques used at The Laboratory:

- Aqua Regia ($HCl:HNO_3$)
- Partial Digestion ($HNO_3:HCl$)
- Total Digestion ($HF:HNO_3:HClO_4$)
- Lithium Metaborate Fusion
- Special digestions (if required)

Both the aqua regia leach and the partial digestion will not dissolve all of the elements completely. Some elements such as Ag, As, Bi, Cd, Co, Cu, Hg, Mo, Mn, Ni, P, Pb, U, V, and Zn will be very "near" to total dissolution. Other elements are more refractory in nature and will only be partially dissolved.

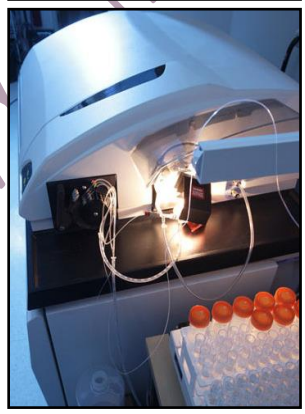
The tri-acid digestion will completely dissolve most elements since the crystalline matrix of the sample is destroyed. Occluded minerals in the matrix are exposed and dissolved by the acids. Only those elements found in refractory minerals may not be dissolved.

Quality Control:

- In an average set of 40 samples there are at least 2 standards and 1 replicate pulp analysis. All QC results are entered into the Laboratory Information Management System (LIMS).
- The limits for the QC parameters are monitored and all samples which do not meet requirements are flagged for repeat preparation and analysis.
- All QC controls must pass before the results for the sample can be reported. QC results are contained in the final report.

Instruments used at The Laboratory:

- Perkin Elmer ICP-OES (models: Optima 5300DV, 8300DV)
- Perkin Elmer Sciex Elan DRC II ICP-MS
- Perkin Elmer Sciex NexION 300s
- Perkin Elmer PinAAcle 900F Absorption Spectrometer
- LECO Induction Furnace
- ELTRA HELIOS Induction Furnace
- Claisse TheOx® Electric Fusion Instrument



The laboratory strives to meet your individual needs. Contact us if you require further assistance in the selection of packages or if you have any special requests.

Multi-Element Uranium Exploration Package (code ICP1)

Total Digestion ICP-OES

Total digestions are performed on an aliquot of sample pulp for the analysis of the requested elements by ICP-OES. The aliquot is digested to dryness in a Teflon tube within a hot block digestion system using a mixture of concentrated HF:HNO_3:$HClO_4$. The residue is dissolved in dilute HNO_3.

Detection Limits (DL)

Element	Sandstone DL	Basement DL	Element	Sandstone DL	Basement DL
Al_2O_3	0.01%	0.01%	Nd	1 ppm	1 ppm
Ba	1 ppm	1 ppm	Ni	1 ppm	1 ppm
Be	0.2 ppm	0.2 ppm	Nb	1 ppm	1 ppm
Cd	0.2 ppm	1 ppm	P_2O_5	0.002%	0.01%
CaO	0.01%	0.01%	K_2O	0.002%	0.01%
Ce	1 ppm	1 ppm	Pr	1 ppm	1 ppm
Cr	1 ppm	1 ppm	Sm	0.5 ppm	1 ppm
Co	1 ppm	1 ppm	Sc	1 ppm	1 ppm
Cu	1 ppm	1 ppm	Ag	0.2 ppm	0.2 ppm
Dy	0.2 ppm	0.2 ppm	Na_2O	0.01%	0.01%
Er	0.2 ppm	0.2 ppm	Sr	1 ppm	1 ppm
Eu	0.2 ppm	0.2 ppm	Ta	1 ppm	1 ppm
Gd	0.5 ppm	1 ppm	Tb	0.3 ppm	1 ppm
Ga	1 ppm	1 ppm	Th	1 ppm	1 ppm
Hf	0.5 ppm	1 ppm	Sn	1 ppm	1 ppm
Ho	0.4 ppm	1 ppm	TiO_2	0.001%	0.01%
Fe_2O_3	0.01%	0.01%	W	1 ppm	1 ppm
La	1 ppm	1 ppm	U	2 ppm	2 ppm
Pb	1 ppm	1 ppm	V	1 ppm	1 ppm
Li	1 ppm	1 ppm	Yb	0.1 ppm	0.1 ppm
MgO	0.001%	0.01%	Y	1 ppm	1 ppm
MnO	0.001%	0.01%	Zn	1 ppm	1 ppm
Mo	1 ppm	1 ppm	Zr	1 ppm	1 ppm

Partial Digestion ICP-OES

Partial digestions are performed on an aliquot of sample for the analysis of the requested elements by ICP-OES. An aliquot of pulp is digested in a test tube in a mixture of HNO_3:HCl, in a hot water bath and then diluted using de-ionized water.

Detection Limits

Element	Sandstone DL	Basement DL	Element	Sandstone DL	Basement DL
As	0.2 ppm	1ppm	Ni	0.1 ppm	1 ppm
Sb	0.2 ppm	1 ppm	Pb	0.02 ppm	1 ppm
Bi	0.2 ppm	1 ppm	Se	0.2 ppm	1 ppm
Co	0.1 ppm	1 ppm	Ag	0.1 ppm	0.2 ppm
Cu	0.1 ppm	1 ppm	Te	0.2 ppm	1 ppm
Ge	0.2 ppm	1 ppm	U	0.5 ppm	1 ppm
Hg	0.2 ppm	1 ppm	V	0.1 ppm	1 ppm
Mo	0.1 ppm	1 ppm	Zn	0.1 ppm	1 ppm

Multi-Element Exploration Package (code ICP4)

Total Digestion ICP-OES

Total digestions are performed on an aliquot of sample pulp for the analysis of the requested elements by ICP-OES. The aliquot is digested to dryness in a Teflon tube within a hot block digestion system using a mixture of concentrated $HF:HNO_3:HClO_4$. The residue is dissolved in dilute HNO_3.

Detection Limits

Element	Symbol	DL	Element	Symbol	DL
Aluminum	Al_2O_3	0.01%	Nickel	Ni	1 ppm
Barium	Ba	1 ppm	Niobium	Nb	1 ppm
Beryllium	Be	0.2 ppm	Phosphorous	P_2O_5	0.01%
Cadmium	Cd	1 ppm	Potassium	K_2O	0.01%
Calcium	CaO	0.01%	Praseodymium	Pr	1 ppm
Cerium	Ce	1 ppm	Samarium	Sm	1 ppm
Chromium	Cr	1 ppm	Scandium	Sc	1 ppm
Cobalt	Co	1 ppm	Silver	Ag	0.2 ppm
Copper	Cu	1 ppm	Sodium	Na_2O	0.01%
Dysprosium	Dy	0.2 ppm	Strontium	Sr	1 ppm
Erbium	Er	0.2 ppm	Sulphur	S	10 ppm
Europium	Eu	0.2 ppm	Tantalum	Ta	1 ppm
Gadolinium	Gd	1 ppm	Terbium	Tb	1 ppm
Gallium	Ga	1 ppm	Thorium	Th	1 ppm
Hafnium	Hf	1 ppm	Tin	Sn	1 ppm
Holmium	Ho	1 ppm	Titanium	TiO_2	0.01%
Iron	Fe_2O_3	0.01%	Tungsten	W	1 ppm
Lanthanum	La	1 ppm	Uranium	U	2 ppm
Lead	Pb	1 ppm	Vanadium	V	1 ppm
Lithium	Li	1 ppm	Ytterbium	Yb	0.1 ppm
Magnesium	MgO	0.01%	Yttrium	Y	1 ppm
Manganese	MnO	0.01%	Zinc	Zn	1 ppm
Molybdenum	Mo	1 ppm	Zirconium	Zr	1 ppm
Neodymium	Nd	1 ppm			

Aqua Regia Digestion ICP-OES

Partial digestions are performed on an aliquot of sample for the analysis of the requested elements by ICP-OES. An aliquot of pulp is digested in a test tube in a mixture of $HCl:HNO_3$, in a hot water bath and then diluted using de-ionized water.

Detection Limits

Element	Symbol	DL	Element	Symbol	DL
Arsenic	As	1 ppm	Nickel	Ni	1 ppm
Antimony	Sb	1 ppm	Selenium	Se	1 ppm
Bismuth	Bi	1 ppm	Silver	Ag	0.2 ppm
Cobalt	Co	1 ppm	Sulphur	S	10 ppm
Copper	Cu	1 ppm	Tellurium	Te	1 ppm
Germanium	Ge	1 ppm	Uranium	U	1 ppm
Lead	Pb	1 ppm	Vanadium	V	1 ppm
Mercury	Hg	1 ppm	Zinc	Zn	1 ppm
Molybdenum	Mo	1 ppm			

ICPMS Exploration Package

ICPMS Exploration Package

Generally samples analyzed by this package are non-radioactive, non-mineralized sandstones or basements.

Codes

Sandstone Exploration Package	**ICPMS1**
Basement Exploration Package	**ICPMS2**

The detection limits achievable by ICP-MS for sandstone samples are lower than that for regular ICP-OES analyses. A detection limit of at least 10 times more sensitivity than that from ICP-OES can be achieved for elements such as Cu, Ni, Pb, Co, V, As, Mo, and U. To aid in the sensitivity of the analysis, ultra-pure acids are used for the ICP-MS digestions. This ensures that potential contamination for incompatible elements is reduced and leads to a greater sensitivity during analysis.

The package consists of three separate analyses:

- One ICP-MS analysis on the partial digestion
- One ICP-OES analysis for major and minor elements on the total digestion
- One ICP-MS analysis for trace elements on the total digestion

The ICP-MS detection limits for total analysis will include all elements except the following:
Al_2O_3, CaO, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, TiO_2, Ba, Ce, Cr, La, Li, Sr, and Zr.
These elements will be analyzed only by ICP-OES on the total digestion.
As, Ge, Hg, Sb, Se, and Te will be done on the partial digestion only; these elements are not suited to the total digestion analysis.
In addition, the package includes several extra elements analyzed by ICP-MS on both the partial and total digestions:
Lead isotopes (^{204}Pb, ^{206}Pb, ^{207}Pb, and ^{208}Pb), Cs, and Rb.

Total Digestion

Total digestions are performed on an aliquot of sample pulp. The aliquot is digested to dryness in a Teflon tube within a hot block digestion system using a mixture of concentrated HF:HNO_3:$HClO_4$. The residue is dissolved in dilute HNO_3.

Partial Digestion

Partial digestions are performed on an aliquot of sample pulp. The aliquot is digested in a mixture of concentrated nitric: hydrochloric acid (HNO_3:HCl) in a test tube in a hot water bath, then diluted using de-ionized water.

Quality Control

The following quality control protocols are applied to the package:

- *Instrumental*: Two calibration blanks and two calibration standards.
- *Analytical*: One blank, two QC/QA standards and one replicate (pulp) are digested with each group of samples.

The in-house standards used to monitor the sample analysis are:

- ASR316

Total Digestion

Element	Sandstone DL	Basement DL	Element	Sandstone DL	Basement DL
Al_2O_3	*0.01%	*0.01%	MnO	*0.001%	*0.001%
Ba	*1 ppm	*1 ppm	Mo	0.02 ppm	0.02 ppm
Be	0.1 ppm	0.1 ppm	Nd	0.1 ppm	0.1 ppm
Bi	0.1 ppm	0.1 ppm	Ni	0.1 ppm	0.1 ppm
Cd	0.1 ppm	0.1 ppm	Nb	0.1 ppm	0.1 ppm
CaO	*0.01%	*0.01%	P_2O_5	*0.002%	*0.002%
Ce	*0.1 ppm	*0.1 ppm	K_2O	*0.002%	*0.002%
Cs	0.1 ppm	0.1 ppm	Pr	0.1 ppm	0.1 ppm
Cr	*1 ppm	*1 ppm	Rb	0.1 ppm	0.1 ppm
Co	0.02 ppm	0.02 ppm	Sm	0.1 ppm	0.1 ppm
Cu	0.1 ppm	0.1 ppm	Sc	0.1 ppm	0.1 ppm
Dy	0.02 ppm	0.02 ppm	Ag	0.02 ppm	0.02 ppm
Er	0.02 ppm	0.02 ppm	Na_2O	*0.01%	*0.01%
Eu	0.02 ppm	0.02 ppm	Sr	*1 ppm	*1 ppm
Gd	0.1 ppm	0.1 ppm	Ta	0.1 ppm	0.1 ppm
Ga	0.1 ppm	0.1 ppm	Tb	0.02 ppm	0.02 ppm
Hf	0.1 ppm	0.1 ppm	Th	0.02 ppm	0.02 ppm
Ho	0.02 ppm	0.02 ppm	Sn	0.02 ppm	0.02 ppm
Fe_2O_3	*0.01%	*0.01%	TiO_2	*0.001%	*0.001%
La	*1 ppm	*1 ppm	W	0.1 ppm	0.1 ppm
Pb	0.02 ppm	0.02 ppm	U	0.02 ppm	0.02 ppm
^{204}Pb	0.01 ppm	0.01 ppm	V	0.1 ppm	0.1 ppm
^{206}Pb	0.02 ppm	0.02 ppm	Yb	0.02 ppm	0.02 ppm
^{207}Pb	0.02 ppm	0.02 ppm	Y	0.1 ppm	0.1 ppm
^{208}Pb	0.02 ppm	0.02 ppm	Zn	1 ppm	1 ppm
Li	*1 ppm	*1 ppm	Zr	*1 ppm	*1 ppm
MgO	*0.001%	*0.001%			

*Analysis carried out on ICP-OES

Partial Digestion

Element	DL ICPMS1 & 2	Element	DL ICPMS1 & 2	Element	DL ICPMS1 & 2
As	0.01 ppm	Hf	0.01 ppm	Se	0.1 ppm
Ag	0.01 ppm	Hg	0.01 ppm	Sm	0.01 ppm
Sb	0.01 ppm	Ho	0.01 ppm	Sn	0.01 ppm
Be	0.01 ppm	Mo	0.01 ppm	Ta	0.01 ppm
Bi	0.01 ppm	Nb	0.01 ppm	Tb	0.01 ppm
Cd	0.01 ppm	Nd	0.01 ppm	Te	0.01 ppm
Co	0.01 ppm	Ni	0.01 ppm	Th	0.01 ppm
Cs	0.01 ppm	Pb	0.02 ppm	U	0.01 ppm
Cu	0.01 ppm	^{204}Pb	0.01 ppm	V	0.1 ppm
Dy	0.01 ppm	^{206}Pb	0.02 ppm	W	0.1 ppm
Er	0.01 ppm	^{207}Pb	0.02 ppm	Y	0.01 ppm
Eu	0.01 ppm	^{208}Pb	0.02 ppm	Yb	0.01 ppm
Ga	0.01 ppm	Pr	0.01 ppm	Zn	0.1 ppm
Gd	0.01 ppm	Rb	0.01 ppm	Zr	0.01 ppm
Ge	0.01 ppm	Sc	0.1 ppm		

U3O8 Assay

U_3O_8 wt% Assay

This analyte may also be selected for high uranium samples as part of a comprehensive exploration package. Arsenic (ICP-OES finish) and selenium (ICP-MS finish) may be added to this assay.

The laboratory also offers an ***ISO/IEC 17025:2005 accredited method*** for the determination of U_3O_8 wt% in geological samples. The U_3O_8 assay has been developed by The Laboratory to deliver quality assay results for the uranium industry. We are one of the few laboratories in the world that can provide this service.

	Detection Limit
U_3O_8	0.001 Wt%

Method Summary

An aliquot of sample pulp is digested in concentration HCl:HNO_3.
The digested volume is then made up to 100 mLs for analysis by ICP-OES.

Quality Control

QC measures and data verification procedures applied include the preparation and analysis of standards, duplicates, and blanks. The selection of standards is based on the radioactivity level of the samples to be analyzed. An additional certified Fe_2O_3 standard is analyzed to correct for interference of iron in the analysis. Instruments are recalibrated after every 20 samples; multiple standards are analyzed before and after each recalibration.

The standards used are:

- BL-4a (CANMET)
- BL-2a (CANMET)
- BL-5 (CANMET)
- SRC U02 (an in-house prepared standard)
- CUP-2 (CANMET)

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This method is ***ISO/IEC 17025:2005*** accredited by the Standards Council of Canada.

	Detection Limit
As when added to U_3O_8	0.001 wt%
Se when added to U_3O_8	1 ppm

Additional Analyses

The following analyses may also be selected as part of a comprehensive exploration package:

Boron

Method Summary

An aliquot of pulp is fused in a mixture of $Na_2O_2/NaCO_3$ in a muffle oven. The fused melt is dissolved in DI Water. The fusion solution is analyzed by ICP-OES.

	Detection Limit
Boron	2 ppm

Quality Control

A blank, internal QC standards and one replicate are fused with each group of samples. Equipment calibration standards are made from a 1000 ppm B commercial certified solution.

Uranium by ICP-MS

Method Summary

Total Digestion

An aliquot of pulp sample is digested to dryness in a Teflon tube within a hot block digestion system using a mixture of concentrated $HF:HNO_3:HClO_4$. The residue is dissolved in dilute HNO_3.

Partial Digestion

An aliquot of pulp sample is digested in a mixture of concentrated nitric:hydrochloric acid (HNO_3:HCl) in a test tube in a hot water bath, then diluted using de-ionized water.

	Detection Limit
Uranium (Total)	0.01 ppm
Uranium (Partial)	0.01 ppm

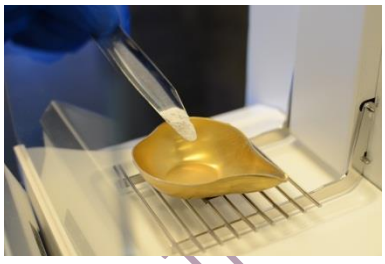
Quality Control

In an average set of 40 samples there are at least 2 standards and 1 replicate pulp analysis. The limits for the QC parameters are monitored and all samples which do not meet requirements are flagged for repeat preparation and analysis. QC results are contained in the final report.

Codes
B
U-ICPMS1 (Total)
U-ICPMS2 (Partial)
U-ICPMS3 (Partial) when added to ICP1 or ICP4 Package
U-ICPMS4 (Total) when added to the ICP1 or ICP4 Package

In addition to our regular packages directed at the exploration industry, The Laboratory offers a further range of analyses that addresses specific project needs:

- Carbon (%) analysis (total, graphite, organic and inorganic)
- Sulphur (%) analysis (total, sulphate, sulphide)
- Ferrous iron content
- Density measurements (pyknometer method, dry bulk, etc.)
- Loss on Ignition (LOI) and moisture determinations (wt%)
- Lead (Pb) isotope analysis ($^{208/206}$Pb, $^{207/206}$Pb, $^{206/204}$Pb, $^{207/204}$Pb, $^{208/204}$Pb)



The Laboratory is always searching for new ways in which to serve its customers.

Please contact The Laboratory if you have any special requirements.

CODE	Element	Symbol	Method	Det. Limit
C%	Carbon**	C	LECO Induction Furnace	0.01%
GC%	Graphite Carbon	GC	LECO Induction Furnace	0.01%
OC%	Organic Carbon	C	LECO Induction Furnace	0.01%
FeO%	Ferrous Iron	FeO	HF/H_2SO_4 titration	0.1%
LOI%	Loss on Ignition	LOI	1000ºC	0.1%
DEN1	Density	DEN1	Pyknometer method	0.01
DEN2	Density	DEN2	Volume Displacement	0.01
DEN3	Density	DEN3	Dry Bulk method	0.01
DEN4	Density	DEN4	Wax & Oven Dry method	0.01
S%	Sulphur**	S	LECO Induction Furnace	0.01%
SO2%	Sulphate	SO^2	LECO Induction Furnace	0.01%
S2%	Sulphide	S^2	LECO Induction Furnace	0.01%
PbICPMS	Pb Isotopes ^{204}Pb, ^{206}Pb, ^{207}Pb, ^{208}Pb	PbISO	ICP-MS	*
*SRM 981 precision available upon request **Carbon and Sulphur (conbined)				

Whole Rock & Trace Element Analysis Package (WR/TR1)

Whole Rock* and Trace Element by Lithium Metaborate Fusion and ICP-OES and ICP-MS analysis

This package offers analysis of 13 analytes by ICP-OES and 48 analytes by ICP-MS. The Trace Element analysis can be carried out as a stand-alone analysis.

Method Summary

An aliquot of sample is fused with lithium metaborate in a graphite crucible. The bead is then dissolved in dilute HNO_3 for analysis by ICP-MS and ICP-OES.

Quality Control

QC measures and data verification procedures applied include the preparation and analysis of 3 standards, a replicate, and a blank.

This package includes Loss on Ignition (LOI).

Detection Limits

Lithium Metaborate Fusion by ICP-OES

Element	Symbol	Detection Limit	Element	Symbol	Detection Limit
Aluminium	Al_2O_3	0.01%	Potassium	K_2O	0.01%
Calcium	CaO	0.01%	Scandium	Sc	2 ppm
Chromium	Cr	2 ppm	Silica	SiO_2	0.1%
Iron	Fe_2O_3	0.01%	Sodium	Na_2O	0.01%
Magnesium	MgO	0.01%	Titanium	TiO_2	0.01%
Manganese	MnO	0.01%	Vanadium	V	2 ppm
Phosphorous	P_2O_5	0.01%			

*This Whole Rock lithium metaborate fusion analysis forms part of the Whole Rock & Trace Element package.

Trace Elements by ICP-MS

Element	Symbol	Detection Limit	Element	Symbol	Detection Limit
Antimony	Sb	1 ppm	Mercury	Hg	0.1 ppm
Arsenic	As	0.1 ppm	Molybdenum	Mo	0.1 ppm
Barium	Ba	1 ppm	Niobium	Nb	1 ppm
Beryllium	Be	0.1 ppm	Neodymium	Nd	0.1 ppm
Bismuth	Bi	0.1 ppm	Nickel	Ni	1 ppm
Cadmium	Cd	0.1 ppm	Praseodymium	Pr	0.01 ppm
Cerium	Ce	1 ppm	Rubidium	Rb	0.1 ppm
Cesium	Cs	0.1 ppm	Selenium	Se	1 ppm
Cobalt	Co	0.1 ppm	Samarium	Sm	0.01 ppm
Copper	Cu	0.1 ppm	Silver	Ag	0.1 ppm
Dysprosium	Dy	0.01 ppm	Strontium	Sr	1 ppm
Erbium	Er	0.01 ppm	Tantalum	Ta	0.01 ppm
Europium	Eu	0.01 ppm	Terbium	Tb	0.01 ppm
Gadolinium	Gd	0.01 ppm	Tellurium	Te	0.1 ppm
Gallium	Ga	0.1 ppm	Tin	Sn	0.1 ppm
Germanium	Ge	0.1 ppm	Thorium	Th	0.01 ppm
Hafnium	Hf	0.1 ppm	Thallium	Tl	0.01 ppm
Holmium	Ho	0.01 ppm	Thulium	Tm	0.01 ppm
Lanthanum	La	1 ppm	Tungsten	W	1 ppm
Lead	Pb	0.02 ppm	Uranium	U	0.01 ppm
Lead204	^{204}Pb	0.01 ppm	Ytterbium	Yb	0.01 ppm
Lead206	^{206}Pb	0.02 ppm	Yttrium	Y	0.01 ppm
Lead207	^{207}Pb	0.02 ppm	Zinc	Zn	1 ppm
Lead208	^{208}Pb	0.02 ppm	Zirconium	Zr	1 ppm
Lutetium	Lu	0.01 ppm			

Loss on Ignition (LOI)

An aliquot of pulp is heated to 1000°C and the weight loss is calculated.

Detection Limit

	Detection Limit
Loss on Ignition (LOI)	0.1%

Ore Grade Rare Earth Element Trace Analysis (REE1)

Rare Earth Element Trace Analysis by Lithium Metaborate and ICP-OES Finish

This package offers 21 analytes and is designed for the analysis of refractory REE ores.

Method Summary

An aliquot of sample is fused with lithium metaborate in a graphite crucible. The bead is then dissolved in dilute HNO_3 for analysis by ICP-OES.

Quality Control

Quality control measures applied include the preparation and analysis of three standards, a replicate, and a blank.

Detection Limits

Element	Symbol	Detection Limit	Element	Symbol	Detection Limit
Cerium	Ce	0.002%	Neodymium	Nd	0.002%
Dysprosium	Dy	0.002%	Praseodymium	Pr	0.002%
Erbium	Er	0.002%	Samarium	Sm	0.002%
Europium	Eu	0.002%	Scandium	Sc	0.002%
Gadolinium	Gd	0.002%	Terbium	Tb	0.002%
Gallium	Ga	0.002%	Thorium	Th	0.002%
Hafnium	Hf	0.002%	Thulium	Tm	0.002%
Holmium	Ho	0.002%	Uranium	U	0.002%
Lanthanum	La	0.002%	Ytterbium	Yb	0.002%
Lutetium	Lu	0.002%	Yttrium	Y	0.002%
Niobium	Nb	0.002%			

Trace Grade Rare Earth Analysis (REE2)

Method Summary

An aliquot of sample is fused with lithium metaborate in a graphite crucible. The bead is then dissolved in dilute HNO_3 for analysis by ICP-MS.

Quality Control

Quality control measures applied include the preparation and analysis of three standards, a replicate, and a blank.

Detection Limits

Element	Symbol	Detection Limit	Element	Symbol	Detection Limit
Cerium	Ce	1 ppm	Praseodymium	Pr	0.01 ppm
Dysprosium	Dy	0.01 ppm	Samarium	Sm	0.01 ppm
Erbium	Er	0.01 ppm	Tantalum	Ta	0.01 ppm
Europium	Eu	0.01 ppm	Terbium	Tb	0.01 ppm
Gadolinium	Gd	0.01 ppm	Thorium	Th	0.01 ppm
Holmium	Ho	0.01 ppm	Thallium	Tl	0.01 ppm
Lanthanum	La	1 ppm	Thulium	Tm	0.01 ppm
Lutetium	Lu	0.01 ppm	Uranium	U	0.01 ppm
Niobium	Nb	1 ppm	Ytterbium	Yb	0.01 ppm
Neodymium	Nd	0.1 ppm	Yttrium	Y	0.01 ppm

Additional Analysis

The following addition analyte may be selected as part of a comprehensive package:

Scandium by Whole Rock Fusion and ICP-OES

An aliquot of sample is fused with lithium metaborate in a graphite crucible. The bead is then dissolved in dilute HNO_3 for analysis by ICP-OES.

Detection Limit

Element	Symbol	Detection Limit
Scandium	Sc	2 ppm

Whole Rock Analysis (WR1)

Whole Rock Analysis by Lithium Metaborate Fusion and ICP-OES

This package offers a total rock analysis for 16 analytes.

Method Summary

An aliquot of sample is fused with lithium metaborate in a graphite crucible. The bead is then dissolved in dilute HNO_3 for analysis by ICP-OES.

Detection Limits

Element	Symbol	Detection Limit	Element	Symbol	Detection Limit
Aluminium	Al_2O_3	0.01%	Potassium	K_2O	0.01%
Barium	Ba	2 ppm	Scandium	Sc	2 ppm
Calcium	CaO	0.01%	Silica	SiO_2	0.1%
Chromium	Cr	2 ppm	Sodium	Na_2O	0.01%
Iron	Fe_2O_3	0.01%	Strontium	Sr	2 ppm
Magnesium	MgO	0.01%	Titanium	TiO_2	0.01%
Manganese	MnO	0.01%	Yttrium	Y	2 ppm
Phosphorous	P_2O_3	0.01%	Zirconium	Zr	2 ppm

Potash Exploration Packages

The Geoanalytical Laboratories have a potash preparation and analysis laboratory.

The Laboratory offers an **ISO/IEC 17025:2005 accredited method** for the determination of water soluble CaO, K_2O Na_2O, and MgO (wt%) in addition to other analytes that are of interest in the exploration of potash.

The Potash Assay has been developed by the laboratory to deliver quality assay results for the potash industry. We are one of the few laboratories in the world that can provide this service.

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Potash Exploration Assay Grade (ICP2 Assay)

Sample Preparation

Rock samples are jaw crushed to 95% at -2 mm and 100 to 200 g sub sample split out using a riffler. The sub sample is then pulverized to 95% at -106 µm using a puck and ring grinding mill. The pulp is then transferred to a labeled plastic snap top vial.

Soluble & Insoluble digestion and ICP-OES analysis

An aliquot of pulp is placed in a volumetric flask with DI water; the volumetric flask is placed in a water bath. The sample is shaken and then vacuum filtered. The filters are dried in a low temperature oven then cooled in a desiccator and weighed. The soluble solution is then analyzed by ICP-OES.

Detection Limits

Element	Detection Limit	Element	Detection Limit	Element	Detection Limit
Ag	0.2 ppm	Hf	1 ppm	Sc	1 ppm
Al_2O_3	0.01%	Ho	1 ppm	Sm	1 ppm
Ba	1 ppm	K_2O	0.01%	Sn	1 ppm
Be	0.2 ppm	La	1 ppm	Sr	1 ppm
CaO	0.01%	Li	1 ppm	Ta	1 ppm
Cd	1 ppm	MgO	0.01%	Tb	1 ppm
Ce	1 ppm	MnO	0.01%	Th	1 ppm
Co	1 ppm	Mo	1 ppm	TiO_2	0.01%
Cr	1 ppm	Na_2O	0.01%	U	2 ppm
Cu	1 ppm	Nb	1 ppm	V	1 ppm
Dy	0.2 ppm	Nd	1 ppm	W	1 ppm
Er	0.2 ppm	Ni	1 ppm	Y	1 ppm
Eu	0.2 ppm	P_2O_5	0.01%	Yb	0.1 ppm
Fe_2O_3	0.01%	Pb	1 ppm	Zr	1 ppm
Ga	1 ppm	Pr	1 ppm	Zn	1 ppm
Gd	1 ppm	S	10 ppm		

	Detection Limit
Insoluble	0.1%

Moisture (wt%)

An aliquot of sample is placed into a pre-weighed crucible and heated overnight. The sample is then reweighed and the moisture is calculated as wt%.

	Detection Limit
Moisture	0.01%

Quality Control

QC measures and data verification procedures applied include the preparation and analysis of standards, duplicates, and blanks. All glassware is calibrated according to ISO/IEC 17025 requirements. Instruments are recalibrated after every 20 samples; multiple standards are analyzed before and after each recalibration. All quality control results must be within specified limits otherwise corrective action is taken.

Additional Analysis

The following analyses may also be selected as part of a comprehensive exploration package:

- Total Digestion and ICP-OES geochemistry analysis
- Chloride and Bromine by ICP-MS
- Sulfate by Ion Chromatography

Detection Limits

Element	Detection Limit
Chloride	0.01%
Bromine	0.01%

Contact The Laboratory for more information.

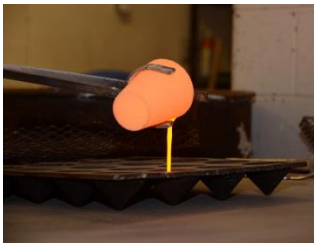
For potash samples from outside of Canada please contact The Laboratory for details.

Gold and Precious Metals

Fire Assay Techniques

Method Summary

An aliquot of sample pulp is mixed with our standard fire assay flux in a clay crucible and a silver inquart added prior to fusion.



After the mixture is fused, the melt is poured into a form which is cooled. The lead bead is then recovered and cupelled until only the precious metal bead remains. The bead is then parted in dilute HNO_3. The precious metals are dissolved in aqua regia and then diluted for analysis by ICP-OES and/or Atomic Absorption Spectrometry (AAS).

The Laboratory participates in CANMET (CCRMP/PTP-MAL) proficiency testing for elements assayed using this method. Certificates are available on our website.

Gold by Fire Assay

CODE	Grade	Weight	Detection Limit	Finish
AU1	Low	15 g	2 ppb	ICP-OES / AAS
AU2	Low	30 g	1 ppb	ICP-OES / AAS
AU3	High	1 AT	0.01 g/tonne	Gravimetric

Gold, Platinum, and Palladium by Fire Assay

CODE	Weight	Detection Limit			Finish
		Au	Pt	Pd	
AU4	15 g	2 ppb	2 ppb	2 ppb	Axial ICP
AU5	30 g	1 ppb	1 ppb	1 ppb	Axial ICP

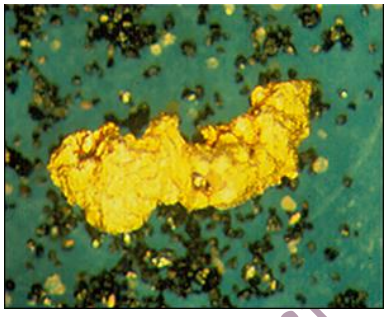
Rhodium by Fire Assay

CODE	Weight	Detection Limit	Finish
RHFA1	15 g	2 ppb	Axial ICP
RHFA2	30 g	1 ppb	Axial ICP

Silver by Aqua Regia or Fire Assay

CODE	Method	Grade g/ton	Weight	Detection Limit	Finish
AGAR	Aqua Regia	<100	1 g	0.2 ppm	ICP-OES
AGFA	Fire Assay	>100	30 g	1 g/tonne	Gravimetric

Gold Grain Recovery



Gold prospecting by recovering, counting, and examining the metallic gold grain in till samples has proven to be several magnitudes more sensitive than typical gold analysis of soils. Till samples are subject to the various gravity and magnetic processes that will extract gold grains as small as 10 µm. Gold grains are identified using a binocular microscope.

CODE	Analysis
AU6	Tills ~ 7 Kg
AU7	Gold Grain Documentation

Fine Gold Determination

Till samples may contain very fine gold (<10 µm) or absorbed gold. For this procedure till are wet sieved at ±106 µm. The -106 µm fraction is then fire assayed for gold.

CODE	Analysis
AU8	Tills wet sieved ±106 µm
AU1	Au Fire Assay 15 g sub sample

Metallic Gold Assaying

Method Summary

The sample is completely crushed, ground, and sieved at ±106 µm.

All the +106 µm material is fire assayed. Two 30 g replicates are fire assayed from the -106 µm fraction.

All weights, assays, and calculations are reported.

Quotes for various sample sizes are available. Please contact The Laboratory for more details.

CODE	Analysis
AU9	Metallic Gold Assay

Base Metal Exploration Package (ICP3)

ICP3 Package

This package was specifically designed for the gold/base metal exploration industry.

The package includes a total of 35 analyses of ICP-OES when combined with a Fire Assay Technique this will produce an effective exploration tool.

Please inform The Laboratory of any requested changes from the original ICP3 package.

Method Summary - Aqua Regia Digestion ICP-OES

Partial digestions are performed on an aliquot of sample for the analysis of the requested elements by ICP-OES. An aliquot of pulp is digested in a test tube in a mixture of HNO_3:HCl, in a hot water bath and then diluted to 15 ml using de-ionized water.

Quality Control

The following Quality Control protocols are applied to the package:

- *Instrumental*: Two calibration blanks and two calibration standards.
- *Analytical*: One blank, two QA/QC standards and one replicate (pulp) are digested with each group of samples.

The in-house standards used to monitor the sample analysis are:

- LS4 (Basement / Mineralized / Lake sediments)

Detection Limits

Element	Symbol	DL	Element	Symbol	DL
Aluminum	Al_2O_3	0.01%	Nickel	Ni	1 ppm
Antimony	Sb	1 ppm	Phosphorous	P_2O_5	0.001%
Arsenic	As	1 ppm	Potassium	K_2O	0.01%
Barium	Ba	1 ppm	Scandium	Sc	1 ppm
Beryllium	Be	0.2 ppm	Selenium	Se	1 ppm
Bismuth	Bi	1 ppm	Silver	Ag	0.2 ppm
Cadmium	Cd	1 ppm	Sodium	Na_2O	0.01%
Calcium	CaO	0.01%	Strontium	Sr	1 ppm
Chromium	Cr	1 ppm	Sulphur	S	10 ppm
Cobalt	Co	1 ppm	Tin	Sn	1 ppm
Copper	Cu	1 ppm	Titanium	TiO_2	0.01%
Iron	Fe_2O_3	0.01%	Tungsten	W	1 ppm
Lanthanum	La	1 ppm	Uranium	U	1 ppm
Lead	Pb	1 ppm	Vanadium	V	1 ppm
Magnesium	MgO	0.001%	Yttrium	Y	1 ppm
Manganese	MnO	0.001%	Zinc	Zn	1 ppm
Mercury	Hg	1 ppm	Zirconium	Zr	1 ppm
Molybdenum	Mo	1 ppm			

Diamond Services

SRC Geoanalytical Laboratories has grown with the diamond exploration industry and is proud to meet the needs of customers from all over the world. With services ranging from kimberlite indicator mineral recovery, to micro diamond recovery using our **ISO/IEC 17025:2005 accredited caustic fusion method** or macro diamond recovery using dense media separation and x-ray sorting techniques to our latest expansion for Applied Diamond Services, which includes diamond typing and colour classification reporting.

Recent developments in technologies are matched with an increase in capacity and security offered to our customers.

In 2007, SRC Geoanalytical Laboratories opened a new high security diamond facility to increase assurance of security and quality for the diamond industry. With this expansion also came a new macro diamond processing facility for diamonds greater than 0.5mm. The Dense Media Separation (DMS) facility is a 5 ton/hour processing plant capable of efficiently separating denser minerals and diamonds from bulk kimberlite material.

The twin stage (double pass) Flow Sort® X-ray diamond sorting plant with additional grease table reclamation, when used with the DMS, allows for efficient kimberlite processing.

The plant may also be used for audit purposes.

All operations at the Diamond Services Laboratory are performed under strict security conditions.

The expansion of The Laboratory means that it is one of the largest commercial diamond processing facilities in the world. Already a lab of choice for major exploration companies, the reputation of the diamond services offered to industry continues to grow.

Contact the Kimberlite Indicator Mineral Laboratory or Diamond Services Laboratory for more information.

Kimberlite Indicator Minerals

Overview

Kimberlite Indicator Minerals (KIM) processing is available on till and rock samples. The processing of samples is clearly defined through a process flowchart, depending on the requirements of the customer.

Method Summary

Upon receipt, the sample is disaggregated and sieved into separate size fractions:

- +1.00 mm
- -1.00 mm +0.50 mm
- -0.50 mm +0.25 mm

The -1.00 to +0.50 mm and the -0.50 to +0.25 mm size fractions are then processed through the micro-DMS with a cut-point of 2.7 specific gravity (SG). The DMS sink material with a SG >2.7 of these fractions is then dried, weighed, and bagged for heavy liquid processing.

Heavy Liquid Processing

The samples are further processed through Methylene Iodide (MI).

All MI sink material with a SG 3.23 or 3.3 (depending on processing requirements) are then sent for further magnetic separation.

The remaining fractions are then observed under microscope for kimberlite indicator minerals.

Quality Control

All stages of processing have quality control measures in place to ensure that the equipment, reagents, and observation are monitored.

Examples include:

- Sieves are inspected and checked using calibrated beads
- The micro-DMS specific gravity is verified using specific gravity tracers ranging from 2.4 to 3.1
- The SG of the MI is checked prior to using at heavy liquid processing

Kimberlite Indicator Minerals

Observation

The observation requirements are based on each customer's needs. Generally the minerals that are observed are:

- Peridotitic & eclogitic pyropes
- Olivines
- Chrome diopside
- Chromite
- Mg-ilmenite

We also identify background and indicator minerals associated with gold and base metals.

At least 10% of each group has a second pass observation verification. All results are reviewed by the laboratory supervisor before reporting.

Electron Microprobe Analysis

Microprobe analysis is available on selected grains. Typical analytes are: SiO_2, TiO_2, Al_2O_3, Cr_2O_3, V_2O_3, FeO, MnO, NiO, ZnO, MgO, CaO, Na_2O, K_2O, Nb_2O_5; customized routines are available on request. More information.

If you require high volume sample processing contact the Kimberlite Indicator Minerals (KIM) Laboratory Supervisor, Cristiana Mircea, for further information.

CODE	KIM Processing
KIM1	25 kg Till Sample*
KIM2	1 kg Rock Sample

Diamond Recovery Services

Micro Diamond Processing

- Caustic Fusion and Chemical Processing
- Diamond Observation and Weighing
- Diamond Description and Photography

Method Summary

An 8 kilogram sample is fused in a kiln containing caustic soda. The hot residue is then poured through sieves and the remaining material is then chemically treated to reduce the residue to a manageable size. The residues are then observed and the diamonds are recovered.

Quality Control

The quality of the method is monitored by assessing the recoveries of synthetic diamonds added to the sample during the caustic fusion and chemical treatment processes. The method allows for 95% confidence of recoveries of 80% or better.

Samples are spiked with up to 2 sets of synthetic diamonds. The addition of the tracers/spikes is used to monitor the performance of the method. If customers are considering spiking their own samples, as an additional quality control measure (blind spikes), please consult The Laboratory for the correct type/ quality of synthetic spike to be used. If the blind additions are identical to The Laboratory's QC spikes it is impossible to distinguish between the in-house and blind QC spikes which may give an inaccurate result.

Observation

Observations of diamonds are based on CIM guidelines for reporting diamond results and documented in-house procedures.

Weighing

The weighing of diamonds is performed using Ultra Micro Analytical balances which have scheduled external **ISO/IEC 1725:2005** calibrations and daily calibration checks to assure traceability.

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This method is ISO/IEC 17025:2005 Accredited by the Standards Council of Canada.

Code	Diamond Recovery
DIA1	**>106 micron -** up to 8.5 kilograms
DIA2	**>75 micron -** up to 8.5 kilograms
DIA3	**>500 micron -** up to 16 kilograms

*Observation costs included are based on 1 diamond per kilogram weighed and described.

- Individual samples >8.5 kg will be split.
- Various diamond sorting packages are available, please contact The Laboratory for details.

Sorting Description
Individual weight with description and measurement
Individual weight (no description or measurement)
Collectively weighed and described
Collectively weighed (no description or measurement)

Diamond Recovery Services

Macro Diamond Processing

The expansion to the Geoanalytical Laboratories Diamond Services facility has increased the processing capabilities for micro diamond recovery and has also introduced an efficient macro diamond recovery processing plant. This plant was designed and commissioned using industry standards.

Dense Media Separation (DMS) Plant

- 5 ton per hour capacity
- 150 mm cyclone for recovery up to 12 mm
- High security facility
- Quality control check of equipment performed regularly to assure efficiency of processing.

X-ray sorting of DMS concentrate

- Twin stage (double pass) Flow Sort® diamond sorting system
- Grease table screening after X-ray sorting
- High security facility
- Quality control check of equipment performed regularly to assure efficiency of processing

Diamond Observation

- Sizing and description of recovered diamonds to CIM standards
- High security facility
- External and internal security personnel

For further information on diamond processing
Contact the Diamond Services Laboratory Supervisor
Michael McCubbing

High Security Facility

- The facility is under 24-hour video surveillance to ensure that due diligence is taken to protect the integrity of processing
- Samples are processed in a “hands-free” environment
- Additional security measures are available for each project upon request
- All SRC personnel and subcontractors must comply with the SRC Code of Ethics Policy, and sign a confidentiality agreement prior to working for SRC

Contact the Diamond Services Laboratory for more information on Security and Processing

Additional Diamond Recovery Services

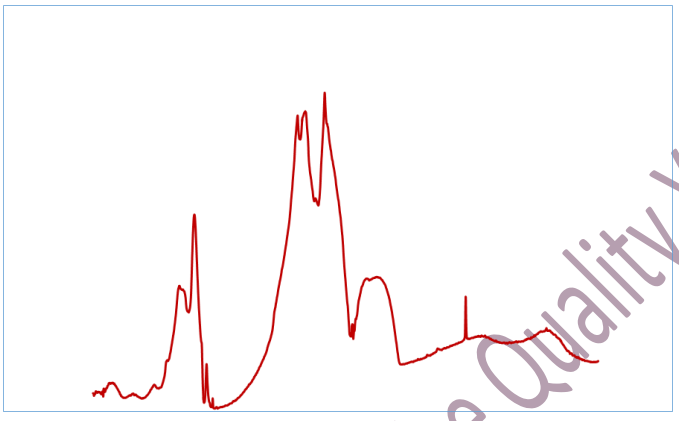
Digital Photography

Digital photography is an additional service offered for select diamonds. Photographs can be used for record keeping and promotional use.

MACRO-DIAMONDS

Natural Diamond Verification

Occasionally some natural microdiamonds or fragments may be visually indistinct from synthetic diamonds. Fourier-transform infrared spectroscopy (FT-IR) can be used to verify which fragments are natural diamonds. Infrared spectra of synthetic diamonds are distinctive and can be used to uniquely identify them



FT-IR spectrum of a natural gem diamond

CODE	Service	Notes
ADD1	Digital Photography	
ADD2	FT-IR Analysis and interpretation	
ADD5	Microprobe KIMs analysis	<80 ppm DL
ADD6	Grain Mounting and Polishing	100 – 200 grains

Contact The Laboratory for more information.

Applied Diamond Services

- Breakage studies
  - Examination of diamond surfaces with optical microscope and SEM in secure facility
  - Diamond reconstruction from matching fragments
  - Estimate original diamond size and percent loss
  - Data compilation and reporting with images
- Diamond typing and color classification
  - Nitrogen, boron, hydrogen contaminant analysis by microscope FT-IR
  - Diamond typing from N-data (1aA, 1aB, 1aAB, 1b, or 2)
  - Nitrogen concentration
  - Objective gemological colour classification (F-50 Zvi Yehuda colorimeter)
- Diamond inclusion and xenolith studies
  - Extraction and analysis of silicate/oxide and sulfide inclusions in diamonds
  - FT-IR analysis of host diamond
  - Xenolith thin sectioning for major- and trace-element analysis
  - Texture imaging and mineral associations using QEMSCAN
  - Data analysis and reporting
- X-ray Luminescence Measurements
  - Intensity response of individual diamonds
  - Intensity response of gangue minerals
  - Decay time of diamonds and minerals
  - X-ray recovery unit settings for deposits
- Densimetric Analysis
  - Calculating percent sinks at various densities of crushed ore samples
  - Quantity misplace material of dense media separation (DMS) floats
  - 3 Curve analysis for dense media separation (DMS) cyclones
- Size Frequency Distribution
  - Estimate largest diamond size for a kimberlite
  - Calculate top diamond size for equipment selection
- Audits
  - Technical audit of processes for equipment selection
  - Complete audit of processing plants

Please contact Dr. Lucy Hunt for more information and price quotation.

Advanced Microanalysis Centre™

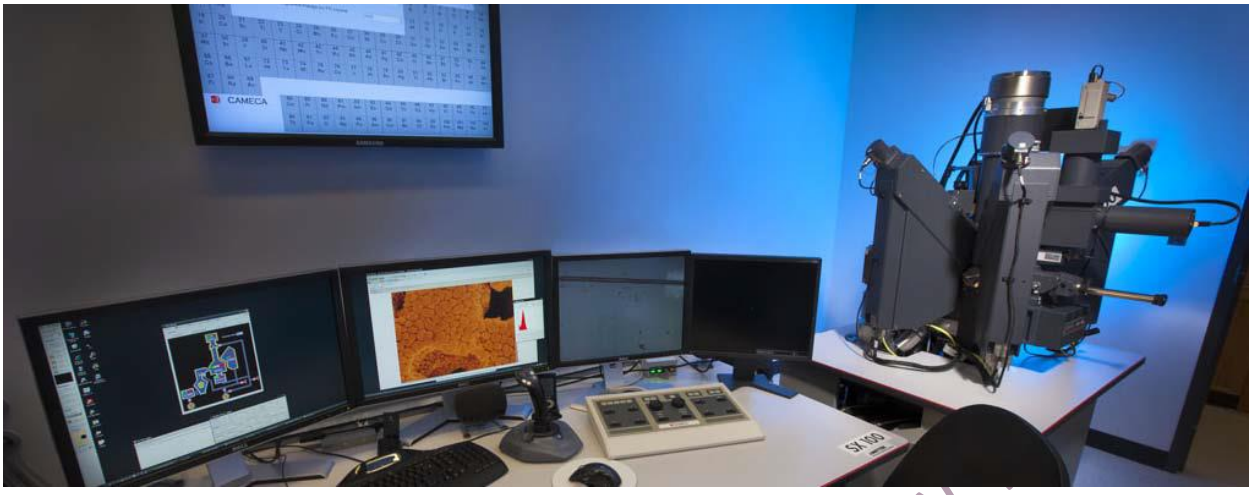
The Advanced Microanalysis Centre lab equipment is operated and maintained by a highly-skilled group of scientists and technicians dedicated to providing the best quality data and services to the mining industry and other sectors.
International clients using the SRC Advanced Microanalysis Centre™ represent several mineral sectors including: diamonds uranium, gold, base-metals, potash, rare earth elements, and petroleum.

The Advanced Microanalysis Centre™ includes:

- Electron microprobe analysis (Cameca SX-100)
- QEMSCAN®
- SEM (FEI Quanta 650 field-emission)
- Laser-ablation (NewWave UP213)
- High-resolution ICP-MS (Nu Attom)
- XRF (Bruker S8 Tiger)
- XRD (Bruker D4 Endeavor
- Polished thin sectioning
- Radioactive thin section preparation
- Digital electron
- Core splitting and polishing

Contact
Advanced Microanalysis Centre
Saskatchewan Research Council
125-15 Innovation Blvd.
Saskatoon, SK, S7N 2X8
T: 306-385-4066
F: 306-933-5656
E: microlab@src.sk.ca

Electron Probe Micro-analyzer (EPMA)



Services, Features and Equipment

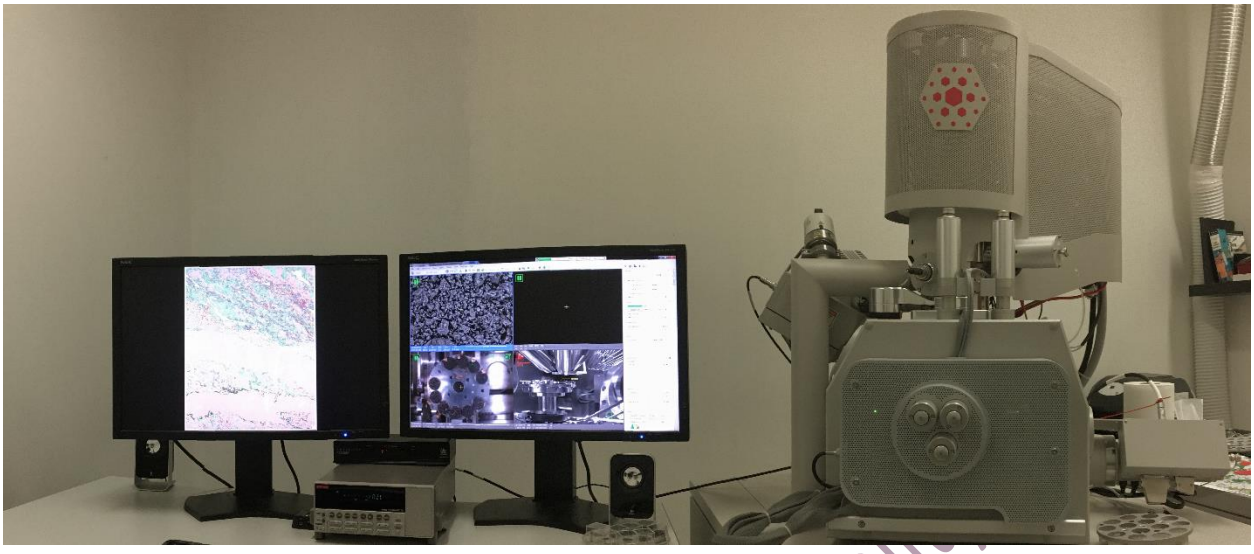
Cameca SX-100 electron microprobe equipped with five wavelength dispersive spectrometers and fitted with a variety of large area diffraction crystals provides the greatest possible sensitivity for quantitative analysis from boron to uranium. Typical uses include:

Usage examples:
Diamond indicator mineral chemistry
Minor and trace gold in sulfide minerals (cryptic gold)
Purity of metal alloy catalysts
Quantification of deleterious elements in high-purity materials
Rare earth element (REE) analysis of heavy mineral concentrates
Element diffusion profiles in metals and minerals
Forensic analysis of process contaminants (e.g. Pb in plumbing solder)
U-Th-Pb analysis for chemical dating of uranium minerals

EPMA is available on a fee-for-service.
A minimum fee for kimberlite indicator minerals may apply.

For further information on Microprobe Analysis
Contact the AMC Research Scientist
Advanced Microanalysis Centre

QEMSCAN® Analysis

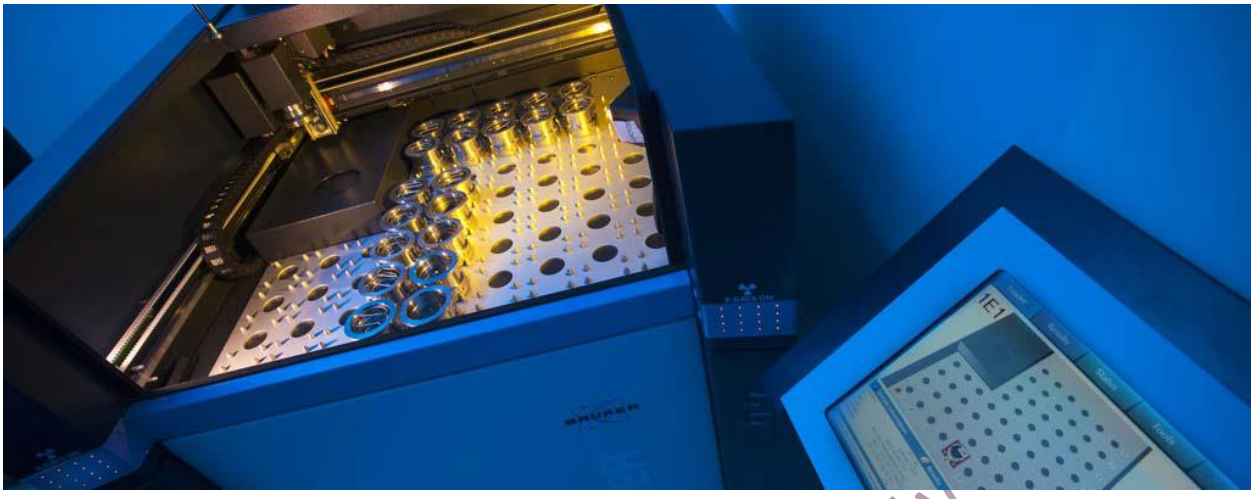


QEMSCAN® is used in mineral processing to assess the key characteristics of targeted minerals in order to design efficient recovery process. In mineral exploration, QEMSCAN® can be used to provide a quantitative modal analysis and virtual petrography on thin sections and core for target prioritization. QEMSCAN® analysis in oil and gas exploration can be used to quantify and characterize the porosity of fine-grained reservoir rocks as part of the virtual petrography and modal mineralogical analysis.

Services Available:
Sample preparation:
30 mm diameter (metallurgical) block mount preparation
Pseudo-core preparation (for very coarse-grained samples)
Analytical:
Mineral database localization
Proprietary mineral database development
Rapid modal mineral abundance
Quantitative modal mineralogy
Elemental deportment
Grain size distribution
Target mineral liberation and associations
Grade recovery prediction
Digital petrography of thin sections and core
Quantitative mineral chemical composition by electron microprobe analysis
Data compilation and report preparation

For further information on QEMSCAN®
Contact the AMC Research Scientist
Advanced Microanalysis Centre

X-ray Florescence Spectrometer (XRF) Analysis



Sample Preparation Methods:

XRF Sample Preparation:
Loose Powder (LP):
Finely ground material is homogenized and placed in a polypropylene cup fitted with a 6 µm thick mylar window and analyzed in a He atmosphere. Typical MDL: 100 ppm
Pressed Pellet (PP):
Finely ground material is mixed with a binding agent and homogenized. The mixture is hydraulically pressed into a pellet 40 mm in diameter and 5 mm thick. Pressed pellets are analyzed under vacuum. Typical MDL: 1-10 ppm.
Fused Bead (FB):
Finely ground material is mixed with a lithium borate flux, melted together at 1100°C and quenched to a glass bead in a 40 mm diameter Pt mold. Fused glass beads are analyzed under vacuum. Typical MDL: 10-50 ppm.
Aqueous Solutions:
Dissolved material is analyzed in polypropylene cups with a 6 µm mylar window under in a He atmosphere. Typical MDL: 10-100 ppm.

Analysis options for XRF include pre-made packages (following pages) or custom designed analytical routines. Minimum sample fees may apply.

Custom packages are designed in consultation with the client with calibration standards derived from clients' samples for maximum compatibility between standards and unknowns.

Quality Control

Instrument drift checks are carried out daily, using a certified XRF Drift Monitor. Analytical performance checks are performed weekly, using certified reference materials.

Pre-made Packages:

Uranium Assay

Analyte	Lower Limit of Detection (LLD)
U_3O_8	0.001%

Uranium Leach Liquids

Analyte	LLD	Analyte	LLD
V	1 ppm	As	1 ppm
Fe	1 ppm	Mo	1 ppm
Ni	1 ppm	Pb	1 ppm
Cu	1 ppm	U	2 ppm

Majors (LP)

Analyte	LLD	Analyte	LLD
Na_2O	0.01%	CaO	0.01%
MgO	0.01%	TiO_2	0.01%
Al_2O_3	0.01%	MnO	0.01%
SiO_2	0.01%	Fe_2O_3	0.01%
P_2O_5	0.01%	S	0.01%
K_2O	0.01%		

Majors Plus (PP)

Analyte	LLD	Analyte	LLD
Na_2O	0.005%	TiO_2	0.005%
MgO	0.005%	MnO	0.005%
Al_2O_3	0.005%	Fe_2O_3	0.005%
SiO_2	0.01%	F	0.01%
P_2O_5	0.005%	S	0.01%
K2O	0.005%	Cl	0.01%
CaO	0.005%		

Majors (FB)

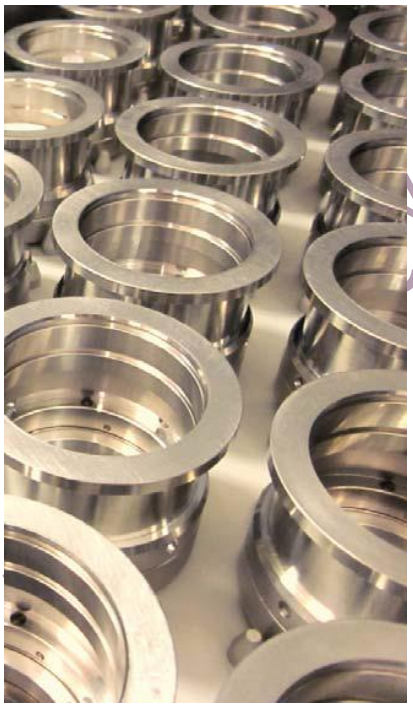
Analyte	LLD	Analyte	LLD
Na_2O	0.005%	CaO	0.001%
MgO	0.005%	TiO_2	0.001%
Al_2O_3	0.005%	MnO	0.001%
SiO_2	0.005%	Fe_2O_3	0.001%
P_2O_5	0.001%	LOI	0.01%
K_2O	0.002%		

Potash Plus (PP)

Analyte	LLD	Analyte	LLD
Na_2O	0.005%	TiO_2	0.005%
MgO	0.005%	MnO	0.005%
Al_2O_3	0.005%	Fe_2O_3	0.005%
SiO_2	0.01%	F	0.01%
P_2O_5	0.005%	S	0.01%
K_2O	0.005%	Cl	0.01%
CaO	0.005%	Br	10 ppm

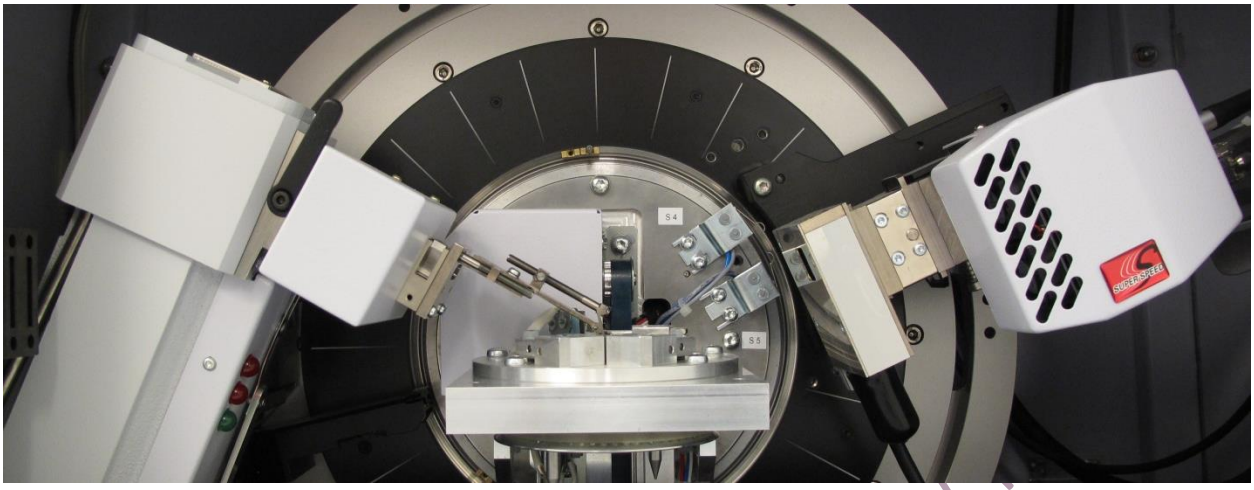
Potash Liquids

Analyte	LLD	Analyte	LLD
Na	0.005%	K	0.001%
Mg	0.001%	Ca	0.001%
Al	0.001%	Ti	0.001%
Si	0.001%	Mn	0.001%
P	0.001%	Fe	0.001%
S	0.001%	Br	0.001%
Cl	0.001%		



For further information on XRF
Contact the AMC Research Scientist
Advanced Microanalysis Centre

X-ray Diffraction (XRD) Analysis



The X-ray diffraction (XRD) system is a powerful tool used to characterize crystalline materials. It permits both qualitative and quantitative analysis of minerals or other crystalline compounds present in samples.

Features

- Effective method for determining the bulk/clay mineralogy using random or semi-oriented mounts.
- Automatic sample changer with three types of sample holders for powder and clay samples (back-packed, vacuum filtered and zero background).
- Data analyses and interpretation using algorithms in MDI Product JADE v.9 software including search/match and whole pattern fitting plug-ins.
- Reference data from the American Mineralogist Crystal Structure Database with empirically derived relative intensity ratios.

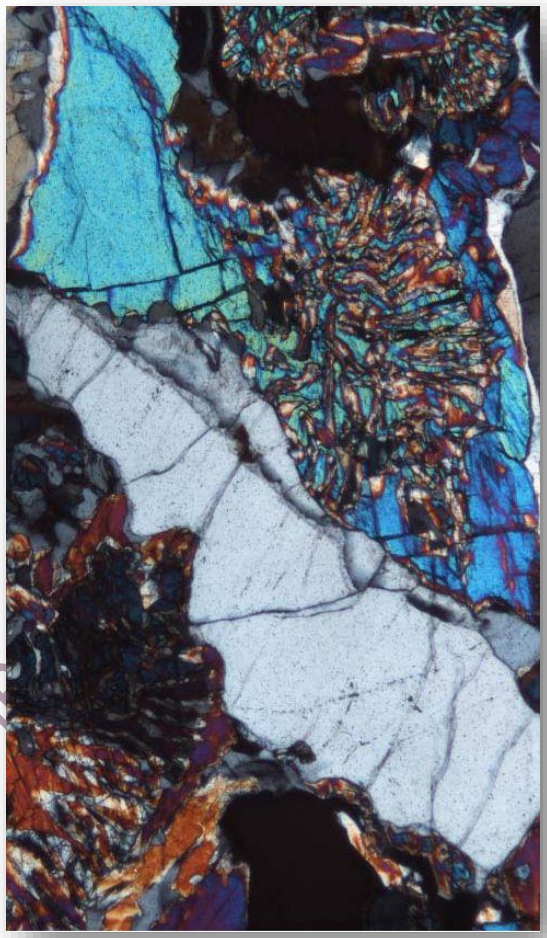
XRD Services

Service	Descripton
Quantitative XRD	***Analysis*** – This technique is used to determine the abundance of minerals in a sample. Minerals present in low abundance (<2%) may not be reliably identified or quantified. Amorphous material cannot be quantified. ***Sample*** – Requires a minimum sample of 25 g.
Semi-oriented XRD	***Analysis*** – This analysis method involves preparation of a semi-oriented slide by vacuum filtration. Clay mineral abundances are determined using proprietary reference diffractograms. ***Sample*** – Requires a minimum sample of 25 g.

Note: Hand samples, picked chips or ground powders can be submitted. Some sample types may require lengthy preparation and/or clean-up procedures. In such cases, an additional sample preparation charge may be applied.

For further information regarding the XRD please contact the Advanced Microanalysis Centre.

Petrographic Services



The Advanced Microanalysis Centre™ provides a range of petrographic services, from preparing premium polished and standard thin sections to complete petrographic reporting.

Thin sections are prepared to high standards with an emphasis on preparations involving difficult to work with geologic materials such as:

- clay-altered samples
- uranium ore and other radioactive materials (CNSC lisenced facility)
- kimberlite
- base-metal sulphide ores

All thin sections and grain mounts are highly polished for reflected light microscopy, SEM, EPMA and laser ablation ICP-MS analysis.

Petrographic analysis and sample descriptions are conducted using reflected and transmitted light microscopy and may also be supplemented with qualitative compositional data collected using the Advanced Microanalysis Centre™ scanning electron microscope (SEM-EDX). Petrographic reporting services include hand specimen descriptions, estimates of mineral abundance, detailed descriptions of minerals, crystal habit, rock textures and fabrics, as well as diagenetic/paragenetic sequences and rock classification.

List for Petrographic Services

Grain mount preparation (submicron finish)

Description
Kimberlite indicator minerals (per 100 grains)
Detrital zircon (per 100 grains)

Petrographic Thin Section (30 µm thick)

Description	Size
Non-Radioactive	27 x 46 mm
Radioactive	27 x 46 mm

Samples Requiring Special Processing

Description
Ethylene glycol abrasive solution (per 12 slides)
Surface epoxy treatments
Extra cutting (oversized samples)
Difficult samples [1]
Staining available upon request [2]
Unusual samples or preparations

[1] As determined by SRC technician, in consultation with the client

[2] Calcite, iron rich calcite, potassium feldspar and plagioclase feldspar

Petrography *

Description
Transmitted and reflected light
Transmitted and reflected light with SEM/EDS analysis
Hard copies of report

*Reports include photomicrographs of representative features and are provided in PDF format.

Additional Laboratory Services

Description
Polished off-cuts
Polished slabs *
Polish core *

Non-Routine Analyses

The Laboratory offers a further range of analyses that addresses specific project needs:

- Carbonate analysis (Ca and Mg)
- Sand, silt, and clay fractionation
- Conductivity testing

These analyses are subject to availability, please contact The Laboratory for more information.

CODE	Analyte	Symbol	Method	DL
CaMg%	Carbonates	Ca, Mg	Dilute HCl, ICP	0.01%
SSC	Sand, Silt, & Clay	SSC	Pipette Method	0.10%
			EEM (5 extra sand fractions)	0.10%
COND			Conductivity Testing	

Assays

Subject to availability, The Laboratory offers single analyte assays for specialized geochemical analysis. The methods used for the assays may vary, contact The Laboratory for information.

Element	Symbol	DL	Element	Symbol	DL
Aluminum	Al_2O_3	0.01%	Neodymium	Nd	0.01%
Antimony	Sb	0.01%	Nickel	Ni	0.01%
Arsenic	As	0.01%	Niobium	Nb	0.01%
Barium	Ba	0.01%	Phosphorous	P_2O_5	0.01%
Beryllium	Be	0.01%	Potassium	K_2O	0.01%
Bismuth	Bi	0.01%	Rubidium	Rb	0.01%
Boron	B	0.01%	Selenium	Se	0.01%
Cadmium	Cd	0.01%	Silicon	SiO_2	0.01%
Calcium	CaO	0.01%	Silver	Ag	0.2 ppm
Carbon Total	C	0.01%	Sodium	Na_2O	0.01%
Cerium	Ce	0.01%	Strontium	Sr	0.01%
Chromium	Cr	0.01%	Sulfur Total	S	0.01%
Cobalt	Co	0.01%	Tantalum	Ta	0.01%
Copper Total	Cu	0.01%	Tellurium	Te	0.01%
Gallium	Ga	0.01%	Thorium	Th	0.01%
Germanium	Ge	0.01%	Tin	Sn	0.01%
Iron Total	Fe_2O_3	0.01%	Titanium	Ti	0.01%
Lanthanum	La	0.01%	Tungsten	W	0.01%
Lead Total	Pb	0.01%	Vanadium	V	0.01%
Lithium	Li	0.01%	Yttrium	Y	0.01%
Magnesium	MgO	0.01%	Zinc Total	Zn	0.01%
Molybdenum	Mo	0.01%	Zirconium	Zr	0.01%
Manganese	MnO	0.01%			

Sample and Data Handling

Sample Handling and Archiving

SRC's Geoanalytical Laboratories appreciates that samples can be costly to obtain, so The Laboratory has documented procedures to ensure the safe, confidential handling of samples throughout the process. Chain of Custodies are available if required.

All samples must be labeled clearly with the sample number and SRC group number or shall be clearly traceable to this.

Sample Storage & Long Term Sample Archiving

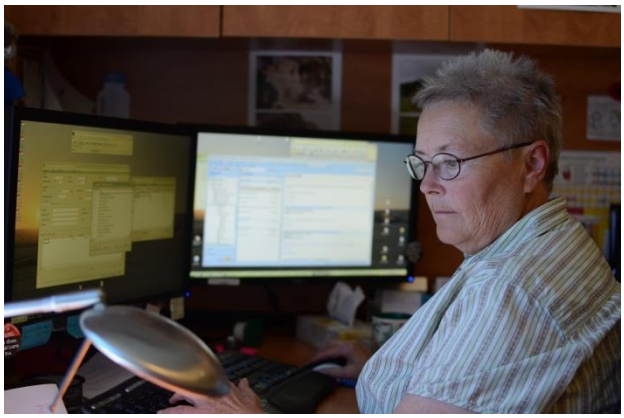
Samples are very expensive to collect but storing them is relatively inexpensive. Individual geologists within a company are generally responsible for looking after their own samples. As technology improves, archived samples can become an important resource when extra analysis may provide additional valuable information pointing to mineral deposits.

SRC's Geoanalytical Laboratories can also archive radioactive samples to comply with safety and regulatory requirements.

Contact The Laboratory for storage and archiving prices.

Please refer to the Terms and Conditions section at the back of this document for current sample handling procedures.

Reporting and Data Handling



All reporting and data handling is done using the Laboratory Information Management System (LIMS) to ensure consistency. The raw data generated by The Laboratory for the analysis is stored in a secure location for easy retrieval. The raw data is disposed of in a regulated timeframe according to designated laboratory practices.

All final official reports are approved by the area supervisor prior to the report being released to the customer. All signed hard copies of final reports are mailed or couriered to customers. Our liabilities will be limited to this certified report for the samples analyzed.

The report can also be presented to customers electronically by e-mail or fax in Excel or CSV spreadsheet and/or PDF format. Please contact us if you have any special reporting requests.

SRC uses password encryptions to protect the electronic transmission of sensitive data. Please contact The Laboratory to find out more.

If additional e-mail recipients are required, please e-mail the laboratory with the authorization to release the results. The Laboratory will only release confidential reports to approved personnel.

Mineral Processing

Mineral Processing, Hydrometallurgical Testing

The Mineral Processing and Metallurgical Testing Services team at the Saskatchewan Research Council (SRC) identifies solutions to improve productivity in an environmentally and economically sustainable way. We assist industry by developing mineral processing and metallurgical testing solutions to maximize recovery while minimizing costs and environmental impacts of mine and mill operations. Our knowledge, methods, and technologies can be applied to operations throughout the world.

Key Services

- Mineral processing and hydrometallurgy
- Process development and metallurgical testing for:
  - Uranium, potash, rare earth elements, gold, base metals, and other minerals
- Pilot plant testing and process engineering
- Plant optimization
- Environmental sustainability process development
- Mine water and process effluent treatment

Key Features

- Implementing, improving, or modifying processes to maximize recovery for specific ores
- Increasing process efficiencies resulting in less cost, waste, and environmental effect
- Efficient environmentallly sustainable processing treatment of tailings and slimes

Mineral Processing Pilot Plant

The pilot plant and SRC's existing mineral processing expertise, laboratory, and testing facilities ensure clients have leading-edge support capabilities to develop mineral deposits in effective and efficient ways, while minimizing costs and environmental impacts. The pilot plant enables SRC's clients to develop, test, scale-up, and demonstrate processing methods knowledge and technology for most minerals.

Mineral pilot processing we perform

- Applied research, development, process design, scale-up, and pilot-scale demonstration
- New and improved processes for the recovery of minerals and metals including rare earths
- Technologies for future mills for uranium, potash, rare earth elements, and other minerals

Programs, Projects, and Pricing

A proposal or quotation is prepared based on the client's requirements and includes a detailed work plan, timeline, and itemized cost estimate of time and material charges.

Uranium

SRC has the facilities and experience to design and perform all stages of uranium processing and metallurgical testing work for the uranium industry.

- Preliminary tests – to help determine the technical and economic feasibility of uranium deposit.
- Detailed tests – to help develop suitable process to produce quality yellow cake (U_3O_8).
- Pilot plant tests – functional testing to ensure a full scale project based on proven processes.
- Effluent treatment – the removal of contaminates by chemical, physical, and/or microbiological treatment.
- Waste rock and tailing management – waste rock consolidation, pore water monitoring, heavy metals immobilization, tailings, and waste rock co-disposal.

Capabilities

- Leaching
- Solvent extraction
- Solid-liquid separation
- Precipitation
- Fine particle dewatering
- Effluent treatment
- Waste rock management

Potash

SRC is a recognized global leader in potash process metallurgical testing. SRC has the facilities and expertise to design and perform potash processing and metallurgical testing work for the potash industry. SRC's mineral processing laboratories offer all stages of testing, from preliminary, detailed, and pilot testing, to tailings characterization.

Capabilities

- Potash liberation
- Insoluble liberation
- Attrition-scrubbing
- Floatation: rougher, cleaner, scavenger, bench (D-12), pilot pneumatic and mechanical flotation of potassium minerals i.e. Sylvite, Kainite, Carnallite, Halite
- Reagent screening and optimization
- Potash dissolution test
- Mass balance and process simulation
- Potash product de-dusting and anti-caking tests
- Clay settling test
- Potassium Sulphate, Chloride production

Rare Earth Elements

SRC has experts on rare earth mineral processing and hydrometallurgy and working with mining companies to develop rare earth properties through laboratory, bench scale, pilot testing, and field implementation. We offer all stages of rare earth metallurgical tests from preliminary, detailed, pilot plant testing, to effluent and tailing treatments, and rare earth element separation.

Capabilities

- Gravity separation
- Magnetic separation
- Electrostatic separation
- Flotation
- Acid roasting
- Caustic cracking
- Leaching
- Solvent extraction
- Fractional precipitation
- Effluent treatment
- Tailings characterization
- Element separation

Contact
Minerals
Saskatchewan Research Council
125-15 Innovation Blvd.
Saskatoon, SK, S7N 2X8
T: 306-385-4107
F: 306-933-5656
E: minerals@src.sk.ca

Terms and Conditions

The terms and conditions below apply to the services requested by the Customer and together with Requisition for Analysis, Request for Diamond Services & Chain of Custody Form or the Chain of Custody Form, as applicable, shall become the agreement between SRC and the Customer (the "**Agreement**").

1. **Provision of Services**: SRC shall carry out the services promptly, diligently and in a professional manner in accordance with generally accepted analytical laboratory principles and practices. SRC shall comply with all applicable federal, provincial and municipal laws in relation to the services.
2. **Sample Submission**: Samples should be stored and preserved by the Customer in accordance with the guidelines set out in SRC's current price guide. Failure to adhere to SRC's current guidelines for the storage and preservation of samples may mean that SRC is unable to provide the services. Samples must be submitted to SRC via prepaid delivery unless prior arrangements have been made. A completed and executed Requisition for Analysis, Request for Diamond Services & Chain of Custody Form, as applicable, must accompany all samples. Failure to complete and execute such forms may result in delay in the service.
3. **Payment Terms:** The Customer agrees to pay to SRC the applicable fees for all services the Customer has requested. A minimum fee for service may be applicable. Fees may be subject to change without notice. The Customer will pay all invoices in Canadian funds without any deduction or set off. Amounts payable by the Customer to SRC shall be grossed-up to the extent necessary so that the net amount paid by the Customer to SRC, after the deduction of withholding taxes or such other amounts as the Customer may be required to deduct, is equal to the amount charged by SRC prior to any such deductions. Payment is due upon receipt of invoice. Interest will be charged at the rate of 1.5% per month (18.00% per annum) on all invoices overdue thirty (30) calendar days or more from the invoice date. All applicable taxes, both federal and provincial, will be automatically added to invoices. SRC may not release test results or work product unless all fees have been paid in full.
4. **Confidentiality**: All data, reports and other information relating to the services shall be treated by SRC as the confidential property of the Customer., The obligation of confidentiality set out in this section shall not apply to any information that: (i) is required by law to be disclosed; (ii) was in SRC's possession prior to receipt from the Customer; (iii) was lawfully obtained by SRC from a third party under no obligation of confidentiality to the Customer; or (iv) is or becomes part of the public domain through no act or failure of SRC.
5. **Reports**: All reports provided by SRC to the Customer regarding the results of the services are the confidential property of the Customer. SRC shall be entitled to retain a copy of all data and reports relating to the services provided always that the obligations of confidentiality set out in this Agreement shall continue to apply for so long as SRC retains a copy of such data or reports.
6. **Publicity**: The Customer shall not use SRC's name, logo, or other identifying marks in any news release, public statement, or announcement or in connection with any sale, offer for sale, advertisement or promotion of any article, product, or company, except with the prior written consent of SRC.
7. **No Warranty**: SRC makes no representations or warranties, express, implied, statutory or otherwise, as to any matter, including, but not limited to, the quality, merchantability or fitness for any purpose of any goods, services or products to be delivered pursuant to this Agreement. Test results are dependent on the quality of samples submitted by the Customer and Customer's compliance with the submission procedure instructed to the Customer by SRC. The Customer accepts the results of the services as is and acknowledges that any use or interpretation of the information contained in any report provided by SRC is at the Customer's own risk.
8. **Limitation of Liability**: Prior to acceptance of delivery by SRC, SRC shall not be responsible for the Customer's samples. In particular, SRC shall not be responsible for any consequences arising from the Customer's failure to properly collect, handle, store, preserve, transport, mark and/or identify a sample which is submitted to SRC for services. SRC's liability shall be limited to, at SRC's option, repayment of the amount paid by the Customer for the services that are proven to be defective or re-performance of the services claimed by the Customer to be defective. IN NO EVENT SHALL SRC BE LIABLE TO THE CUSTOMER FOR LOST PROFITS, PUNITIVE DAMAGES OR OTHER INDIRECT OR CONSEQUENTIAL DAMAGES.
9. **Force Majeure**: Either Party shall be excused from performance of any obligations under this Agreement when and to the extent that performance is delayed or prevented by any cause, except lack of finance, beyond its reasonable control.
10. **Termination**: This Agreement may be terminated by either party by giving two (2) calendar days prior written notice, at which time any services completed to the date of termination will become due and payable together with any other costs incurred by SRC in respect of the services, including, but not limited to, the costs of any materials purchased specifically for the services.
11. **Governing Laws and Jurisdiction**: This Agreement shall be governed by and interpreted in accordance with the laws of the Province of Saskatchewan and the laws of Canada as applicable and the parties shall attorn to the exclusive jurisdiction of the Courts of the Province of Saskatchewan and all courts competent to hear appeals therefrom.
12. **Dispute Resolution**: If any dispute should arise between SRC and the Customer, the parties shall settle such dispute by arbitration in Saskatoon, Saskatchewan in accordance with the Arbitration Act (Saskatchewan) or the International Commercial Arbitration Act (Saskatchewan) where applicable.
13. **On-Site Requirements**: If the Customer and/or its employees, agents or representatives attend on-site at SRC's premises, the Customer and/or its employees, agents or representatives, while on SRC's premises, agree to abide by SRC's code of ethics and its health and safety and security policies and procedures. If the Customer and/or its employees, agents or representatives are given access to SRC's network or information technology resources, the Customer and/or its employees, agents or representatives agree to abide by SRC's information technology policies and procedures.
14. **Sample Ownership, Storage and Archiving**: All samples provided to SRC by the Customer shall remain the property of the Customer. The Customer shall provide SRC with instructions regarding the return, disposal or archiving of samples, reject materials and pulp materials. If the Customer requests that samples, reject materials or pulp materials be archived, returned or disposed of, the Customer shall pay to SRC the applicable archival fees or any costs incurred by SRC for the return or disposal of such samples, reject materials or pulp materials. The following rules apply to the archiving and disposal of samples, reject materials and pulp materials unless alternate instructions are received by SRC from the Customer.

    a) All samples, other than those arising from potash exploration activities, will be stored by SRC for two calendar years following the services (the "Sample Storage Period") and are subject to archival fees. Following the Sample Storage Period, samples may be disposed of at SRC's discretion. SRC will not store samples arising from potash exploration activities and such samples may be disposed of at SRC's discretion.

    b) Uranium, gold or potash reject material and pulp material will be stored by SRC until January of the calendar year following the services (the "Uranium/Gold/Potash Storage Period") and are subject to archival fees. Following the Uranium/Gold/Potash Storage Period, uranium, gold or potash reject material and pulp material may be disposed of at SRC's discretion.

    c) DMS tailings, Flow Sort tailings and any diamonds recovered through diamond processing will be stored by SRC indefinitely and are subject to archival fees. Caustic residues will be stored by SRC for two calendar years following the services (the "Caustic Storage Period") and are subject to archival fees. Following the Caustic Storage Period, caustic residues may be disposed of at SRC's discretion.

    d) The archival fees set out in paragraphs (a), (b) and (c) above shall apply upon thirty (30) calendar days following provision by SRC of the report regarding the results of the services.

Periodic Table