



SCOPE OF ACCREDITATION

SGS CANADA INC.- MINERALS - LAKEFIELD
P.O. Box 4300, 185 Concession Street
Lakefield, ON
K0L 2H0

Accredited Laboratory No. 184
(Conforms with requirements of ISO/IEC 17025:2017, RG-MINERAL)

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URL:	http://www.sgs.ca/
CLIENTS SERVED:	All interested parties
FIELDS OF TESTING:	Chemical/Physical
PROGRAM SPECIALTY AREA:	Mineral Analysis
INITIAL ACCREDITATION DATE	1995-03-06
SCOPE ISSUED ON:	2019-05-27
ACCREDITATION VALID TO:	2023-03-06

SCC GROUP ACCREDITATION

This laboratory is a party to a SCC Group Accreditation with the following facilities, with each facility having its own accreditation scope:

Laboratory Name and Address	Accredited Laboratory No.
SGS CANADA INC.- MINERALS - LAKEFIELD P.O. Box 4300, 185 Concession Street, Lakefield, ON K0L 2H0	184
SGS CANADA INC. MINERALS - BURNABY 3260 Production Way Suite E, Burnaby, BC V5A4W4	744
SGS CANADA INC., MINERALS - ENERGY 7500 76th Street, Delta , BC V4G 1E6	807
SGS CANADA INC. MINERALS COCHRANE 1 First Avenue, Cochrane, ON P0L 1C0	841
SGS Canada Inc., MINERALS - RED LAKE 16A Young St., P.O. Box 1349, Red Lake, ON P0V 2M0	598



METALLIC ORES AND PRODUCTS

Concentrates, Metallic Liquors and Other Process Products:

Metallic Ores:

Metal Powders
Precious Metals
Rocks and Ores
Sediments

Mineral Analysis Testing:

Assay, Umpire assay work
Contract Settlement Assaying
Geotechnical Testing
Mineral Assaying

G_PHY02V	The Preparation and Determination of LOI, LOD or % solids in various products at various temperatures by LECO TGA 701 [LOI, TGA]
G_PHY03V	The preparation and determination of specific gravity using gas pycnometer
G_PHY09B	Determination of Combined Water in Exploration Samples by Gravimetric Analysis [H ₂ O+]
GC/GO_AAS93A	Preparation and Determination of Refractory Metals (Aluminum, Calcium, Chromium, Iron, Magnesium, Manganese, Silica, Tin, Titanium, Vanadium in Ores and Metallurgical Samples by Sodium Peroxide Fusion and Atomic Absorption Spectrometry [Al, Ca, Cr, Fe, Mg, Mn, Si, Sn, Ti, V, AAS]
GC/GT_AAS42V	Preparation and Determination of Silver in Ores, Concentrates and Metallurgical Products by Acid Digest and Atomic Absorption Spectroscopy [Ag, AAS, HNO ₃ , HCL, HCLO ₄ , HF]
GC/GT_CLA37V	Determination of Total Calcium, Calcium Carbonate and Calcium Fluoride in Fluorspar by Complexometric Titration [Ca, CaCO ₃ , CaF ₂ : EDTA; modified from ASTM]
GC/GT_CON03V	Preparation and Determination of Total Copper in Ores, Concentrates, Metallurgical Products and Metals by Separation and Electrogravimetry of Acid Solubles and Fusion-Atomic Absorption Spectrophotometry of Acid Insolubles [Cu: Electrogravimetry, ICP, AAS]
GC/GT_CON07V	Preparation and Determination of Nickel by Electrogravimetry and Atomic Absorption Spectrometry [Ni, DMG; AAS, ICP]
GC/GT_CON08V	The Preparation and Determination of Iron in Ores, Concentrates and Metallurgical Products by Fusion, Separation and Titration [Fe]
GC/GT_CON11V	Preparation and Determination of Lead in Ores, Concentrates, Metallurgical Products and Metal Alloys by Precipitation and Titration



	of Acid Solubles and Fusion-Atomic Absorption Spectrophotometry of Acid Insolubles [Pb: EDTA, AAS]
GC/GT_CON12V	Preparation and Determination of Zinc in Ores, Concentrates, Metallurgical Products and Metals by Separation, Precipitation and Titration of Acid Solubles: Fusion-Atomic Absorption Spectrometry of Acid Insolubles [Zn: EDTA, AAS]
GC/GT_CVA20C	Preparation and Determination of Mercury in Ores, Concentrates, Metallurgical Products by Strong Acid digest and Cold Vapour-Atomic Absorption Spectrometry [Hg, CV-AAS]
GC/GT_FAA35V	Preparation and Determination of Gold, Platinum and Palladium in Concentrates and Metallurgical products by Lead Fusion and Atomic Absorption Spectrometry [Au, Pt, Pd; AAS]
GC/GT_FAI34V	Preparation and Determination of Gold, Platinum and Palladium in Concentrates and Metallurgical products by Lead Fusion and Inductively Coupled Plasma - Optical Emission Spectroscopy [Au, Pt, Pd; ICP-OES]
GC/GT_ICP11V	Preparation and Determination of Arsenic, Antimony, Selenium, Cadmium, Lead and Zinc in Ores, Concentrates and Metallurgical Products by Microwave Digest and Inductively Coupled Plasma - Optical Emission Spectroscopy [As, Sb, Se, Cd, Pb, Zn; ICP-OES]
GC/GT_ISE05V	Preparation and Determination of Fluoride by KOH Fusion for Ores, Metallurgical Products, Battery Scraps, and Low Grade Fluorspar, ISE Probe [F: ISE]
GC_CLA35V	Preparation and Determination of Fe ²⁺ and Fe ³⁺ in Process Control Samples by Sulphuric/HF acid Digest, Potassium Dichromate Titration [Fe ²⁺ : K ₂ Cr ₂ O ₇ , Fe ³⁺ Calculation]
GC_ICP46C	Multi-Element Preparation and Determination of Thirty (30) Elements in Highly Mineralized Samples by Strong Acid Digest with Fusion and ICP-OES (ores, concentrates and metallurgical test products) [silver, Ag; aluminum, Al; arsenic, As; barium, Ba; beryllium, Be; bismuth, Bi; cadmium, Cd; calcium, Ca; chromium, Cr; cobalt, Co; copper, Cu; iron, Fe; potassium, K; lithium, Li; magnesium, Mg; manganese, Mn; molybdenum, Mo; sodium, Na; nickel, Ni; phosphorous, P; lead, Pb; antimony, Sb; selenium, Se; tin, Sn; strontium, Sr; thallium, Tl; titanium, Ti; vanadium, V; yttrium, Y; zinc, Zn; ICP-OES]
GC_IMS93A	Preparation and Determination of Rare Earth Elements in Concentrates and Metallurgical Products by Sodium Peroxide Fusion and Inductively Coupled Plasma - Mass Spectroscopy [Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Tb, Th, Tm, U, Yb, ICP-MS]
GC_SOL84T	Preparation and Determination of Cadmium, Cobalt, Copper, Iron, Nickel and Zinc in Acidic Metallurgical Process Solutions by Atomic Absorption Spectrometry [Cd, Co, Cu, Fe, Ni, Zn; AAS]
GC_XRF76B	Preparation and Determination of Uranium by Borate Fusion-Internal Standard and Xray Fluorescence Spectrometry [U3O8; XRF]



GE/GO/ GC/GT_CSA06V	The Preparation and Determination of Sulfur and Carbon in Exploration, Ores, Concentrates and Metallurgical Samples by Combustion - Infrared Detection [S, C; IR]
GE/GO/GC_CLA01V	Preparation and Determination of Ferrous Iron (FeO) in Exploration, Ore Grade and Process Control samples by Sulphuric/HF acid Digest, Potassium Dichromate Titration [FeO: K ₂ Cr ₂ O ₇]
GE_AAS12E	Preparation and Determination of Silver in Exploration Samples by Nitric and Hydrochloric Acid Digest and Atomic Absorption Spectroscopy [Ag; HNO ₃ ; HCL; AAS]
GE_AAS21E	Preparation and Determination of Silver in Exploration Samples by three acid Digest and Atomic Absorption Spectroscopy [Ag; AAS; HF; HCL; HNO ₃]
GE_CVA20A	Determination of Mercury in Exploration Samples using Multi-Acid Digestion and Cold Vapour – Atomic Absorption Spectrometry [Hg; CV_AAS]
GE_FAA313/515	Preparation and Determination of Gold in Exploration Samples by Lead Fusion Fire Assay and Atomic Absorption Spectrometry [30g/50g; Au; AAS]
GE_FAI313/515	Preparation and Determination of Gold, Platinum and Palladium in Exploration Samples by Lead Fusion Fire Assay and Inductively Coupled Plasma - Optical Emission Spectrometry [30g/50g; Au, Pt, Pd; ICP-OES]
GE_FAI323	Determination of Exploration Grade Gold, Platinum and Palladium by Lead Fusion Fire Assay and Inductively Coupled Plasma - Optical Emission Spectrometry [30g; Au; Pt; Pd; ICP-OES]
GE_HAS90A	Determination of Hydride Elements in Exploration Samples using Sodium Peroxide Fusion and Hydride Generation Atomic Absorption Spectrometry (HAAS) [As;Bi;Sb]
GE_ICM12B	Determination of Fifty-Two (52) Elements in Exploration Samples using Nitric and Hydrochloric Acid Digestion and a combination of Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) and Inductively Coupled Plasma - Mass Spectroscopy (ICP-MS) [HNO ₃ ;HCL;Ag;Al;As;Ba;Be;Bi;B;Ca;Cd;Ce;Co;Cr;Cs;Cu;Fe;Ga;Ge;Hf;Hg;In;K;La;Li;Lu;Mg;Mn;Mo;Na;Nb;Ni;P;Pb;Rb;S;Sb;Se;Sc;Sn;Sr;Ta;Te;Tb;Th;Tl;Ti;U;V;W;Y;Yb;Zn;Zr]
GE_ICM40B	Preparation and Determination of Forty Nine (49) Elements in Exploration Samples using Multi-Acid Digestion and a combination of Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) and Inductively Coupled Plasma - Mass Spectroscopy (ICP-MS) [HNO ₃ ;HCL;HF;HCLO ₄ ;Ag;Al;As;Ba;Be;Bi;Ca;Cd;Ce;Co;Cr;Cs;Cu;Fe;Ga;Hf;In;K;La;Li;Lu;Mg;Mn;Mo;Na;Nb;Ni;P;Pb;Rb;S;Sb;Sc;Se;Sn;Sr;Ta;Te;Tb;Th;Tl;Ti;U;V;W;Y;Yb;Zn;Zr]
GE_ICM90A	Determination of Fifty-Five (56) Elements in Exploration Samples using Sodium Peroxide Fusion and a combination of Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) and



	Inductively Coupled Mass Spectroscopy (ICP-MS) [Na ₂ O ₂ ;HNO ₃ ;C ₄ H ₆ O ₃ ;Ag;Al;As;Ba;Be;Bi;Ca;Cd;Ce; Co;Cr;Cs;Cu;Dy;Er;Eu;Fe;Ga;Gd;Ge;Hf;Ho;In;K; La;Li;Lu;Mg;Mn;Mo;Nb;Nd;Ni;P;Pb;Pr;Rb;Sb;Sc; Si; Sm;Sn;Sr;Ta;Tb;Th;Tl;Ti;Tm;U;V;W;Y;Yb;Zn;Zr]
GE_ICP12B	Determination of Thirty Four (34) Elements in Exploration Samples using Nitric and Hydrochloric Acid Digestion and Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) [HNO ₃ ;HCL;Ag;Al;As;Ba;Be;Bi;Ca;Cd;Co;Cr; Cu;Fe;Hg;K;La;Li;Mg;Mn;Mo;Na;Ni;P;Pb;Sb;Sc; Sn;Sr;S;Ti;V;W;Y;Zn;Zr]
GE_ICP40B	Preparation and Determination of Thirty Three (33) Elements in Exploration Samples using a Multi-Acid Digestion and Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) [HNO ₃ ;HCl;HF;HClO ₄ ;Ag;Al;As;Ba;Be;Bi;Ca;Cd; Co;Cr;Cu;Fe;K;La;Li;Mg;Mn;Mo;Na;Ni;P;Pb;S;Sb;Sc; Sn;Sr;Ti;W;V;Y;Zn;Zr]
GO/ GC/GT_FAG323	Preparation and Determination of Silver by Lead fusion, Gravimetric and Gold by Lead Fusion and Atomic Absorption Spectrometry in Ores, Concentrates and Metallurgical Products [Au, Ag; AAS]
GO/ GC/GT_XRF76V / R	Preparation and Determination of Major Element Oxides, LOI and Rare Earth Oxides by Borate Fusion and Xray Fluorescence Spectrometry [SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MgO, CaO, Na ₂ O, K ₂ O, P ₂ O ₅ , MnO, TiO ₂ , Cr ₂ O ₃ ; V ₂ O ₅ ; LOI; additions BaO; Ce ₂ O ₃ ; Nd ₂ O ₃ , La ₂ O ₃ ; Pr ₂ O ₃ , Sm ₂ O ₃ ; Nb ₂ O ₅ ,ThO ₂ , Ta ₂ O ₅ ; SnO ₂ ; SrO; ZrO ₂ ; HfO ₂ ; Y ₂ O ₃ ; WO ₃ ; U ₃ O ₈ ; Co; Ni ; XRF]
GO/GC/GT_CON13V	Preparation and Determination of Total Copper by Short Iodide Titration and Atomic Absorption Spectrometry [Cu, Titration, AAS]
GO/GC/GT_FAM363	Preparation and Determination of Platinum, Palladium, Rhodium, Ruthenium and Iridium by Nickel Sulfide Fusion and Inductively Coupled Plasma - Mass Spectroscopy [Pt, Pd, Rh, Ru, Ir; ICP-MS]
GO/GC_AAS21C	Preparation and Determination of Low Level Metals (silver, bismuth, cadmium, cobalt, copper, indium, nickel, lead, zinc) in Ores and Metallurgical Samples by Triple Acid Digestion and Atomic Absorption Spectrometry [Ag, Bi, Cd, Co,Cu, In, Ni, Pb, Zn; AAS]
GO/GC_AAS21E	Preparation and Determination of Low Level Silver in Ores and Metallurgical Samples by Triple Acid Digestion and Atomic Absorption Spectrometry [Ag; AAS]
GO/GC_CVA20B	Preparation and Determination of Mercury in Ores and Metallurgical samples by CETAC Cold Vapor Atomic Absorption Spectroscopy [Hg, CETAC CVAAS]
GO/GC_XRF75F	Preparation and Determination of Arsenic, Tin, Antimony, Tantalum, Thorium and Uranium in Ores and Metallurgical Products by Xray Fluorescence Spectrometry using Internal Standard Addition [As, Sn, Ta, Th, U; XRF]
GO/GC_XRF77B	Preparation and Determination of Base Metals (Copper, Nickel, Cobalt, Iron, Lead, Zinc, Chromium, Manganese and Molybdenum) in



	Sulphide Ores and Metallurgical Products by Potassium Pyrosulfate Fusion and Xray Fluorescence Spectrometry [Cu, Ni, Co, Fe, Pb, Zn, Cr, Mn, Mo; XRF]
GO_FAG303/505	Preparation and Determination of Ore Grade Gold by Lead Fusion Fire Assay and Gravimetric Finish [30g/50g; Au]
GO_FAI303	The Preparation and Determination of Ore Grade Gold, Platinum and Palladium by Lead Fusion Fire Assay and Inductively Coupled Plasma Optical Emission
GO_ICP90Q	Preparation and Determination of Various Elements in Ore Grade Samples using Sodium Peroxide Fusion and Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES) [Co;Cu;Pb;Mo;Ni;Zn; ICP-OES]
GT_BUL36V	Gravimetric Determination of Au and Ag for Au Bullion [Au, Ag; Gravimetric modified from ASTM E1335.08]
GT_CLA18V	Preparation and Determination of Platinum, Palladium and Rhodium in Automotive and Petroleum Catalysts by Sodium Peroxide Fusion, Tellurium collection and Atomic Absorption Spectrometry [Pt, Pd, Rh; Na ₂ O ₂ ; AAS]
GT_CON22V	Preparation and Determination of Arsenic and Antimony in Ores Concentrates and Metallurgical Products by Strong Acid Digest and Inductively Coupled Plasma - Optical Emission Spectroscopy [As, Sb, ICP-OES]
GT_SOL88V	Gravimetric Determination of Rhodium using Sodium Borohydride in Concentrate Solutions [Rh, Gravimetric]
GT_SOL89V	Gravimetric Determination of Palladium using Dimethylglyoxime in Palladium Concentrate Solutions [Pd, Gravimetric]
GT_SOL90V	Gravimetric Determination of Platinum Using Hydrazine in Concentrated Platinum Solutions [Pt, Gravimetric]
ME-LR-MIN-MET-DS-A02	Determining Bulk Density [Wax Core]
ME-LR-MIN-MET-MN-D01	Qualitative Mineral Identification By XRD (X-Ray Diffraction Analysis) [XRD, Qualitative, Mineralogy, Crystallinity]
ME-LR-MIN-MET-MN-D03	Semi-Quantitative Mineral Identification by X-Ray Diffraction Analysis [XRD, Semi-Quantitative, Mineralogy, Crystallinity]
ME-LR-MIN-MET-MN-D04	Clay Speciation by X-Ray Diffraction [XRD, Mineralogy, Clay]
ME-LR-MIN-MET-MN-D05	Quantitative Rietveld Method of Mineral Identification by X-Ray Diffraction Analysis [XRD, Quantitative, Mineralogy, Crystallinity]
ME-LR-MIN-MET-MN-G01	Determination of Precious Metal Department (Au, Ag and PGE) using Optical Microscopy and SEM/EDS [Gold, PGE]
ME-LR-MIN-MET-MS-A01	Measuring Magnetics by Satmagan Saturation Magnetization Analyzer [Magnetic Iron, Fe ₃ O ₄]
ME-LR-MIN-MET-MS-A02	Low Intensity Magnetic Separation (LIMS) by Davis Tube [Davis Tube, LIMS, Magnetic Separation]



Notes:

The physical sample preparation involving accredited test methods as listed on the scope of accreditation may be performed on location or at offsite SGS locations – which are monitored regularly for quality control and quality assurance practices.

ISO/IEC 17025:2017: General Requirements for the Competence of Testing and Calibration Laboratories

RG-MINERAL: SCC Requirements and Guidance for the Accreditation of Mineral Analysis Testing Laboratories

Elias Rafoul, Vice President
Accreditation Services

Date: 2019-05-27

Number of Scope Listings: 61
SCC 1003-15/254
Partner File #0
Partner: SCC