

SCOPE OF ACCREDITATION

SGS
SGS LAKEFIELD RESEARCH LIMITED – MINERALS SERVICES
P.O. Box 4300, 185 Concession Street
Lakefield, ON
K0L 2H0

Accredited Laboratory No. 184
(Conforms with requirements of CAN-P-1579 , CAN-P-4E (ISO/IEC 17025:2005))

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CLIENTS SERVED: All interested parties

FIELDS OF TESTING: Chemical/Physical

PROGRAM SPECIALTY Mineral Analysis
AREA:

ISSUED ON: 2009-03-26

VALID TO: 2013-03-06

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

8.0.1; based on SGS–Lakefield Research	Extraction and Recovery of Diamonds by Caustic Dissolution
8.3.1; based on SGS–Lakefield Research	Preparation of mineral concentrated by size classification, gravity and magnetic separation, and chemical leaching
8.3.2; based on SGS–Lakefield Research	Extraction and Recovery of Diamond Indicator Minerals
8.5.1; based on Hutchison, 1974, Craig & Vaughan 1981, Ramhdor, 1986	Determination of Precious Metal Department in crushed ores, composites and metallurgical products using Mineralogical Techniques
8.8.1; based on Hutchison, 1974	Qualitative Mineral Identification By X–ray Diffraction Using Pulverized Grain Mounts
8.9.1; based on SGS–Lakefield Research	Selection and Identification of Diamonds
8.9.2; based on Hutchison, 1974	Selection and Identification of Diamond Indicator Minerals
9.11.1; based on ISO 9389	Preparation and Determination of Cobalt by Acid digestion; Titration and Atomic Absorption Spectrometry [Co, AAS]
9.11.12; based on Young 1971, ISO 12169; Hillebrand 1953	Preparation and Determination of Nickel by Electrogravimetry and Atomic Absorption Spectrometry [Ni, AAS]
9.11.15	Preparation and Determination of Silver in Concentrates and Ores by Acid Digest and Atomic Absorption Spectroscopy [Ag, AAS, HNO ₃ , HCL, HCLO ₄ , HF]
9.11.17; based on Young 1971; Hillebrand 1953	Preparation and Determination of Arsenic, Antimony, Selenium, Cadmium, Lead and Zinc in Ores and Concentrates by Microwave Digest and Inductively Coupled Plasma – Optical Emission Spectroscopy [As, Sb, Se, Cd, Pb, Zn ICP–OES]
9.11.3; based on Hillebrand 1962; Young 1971	Preparation and Determination of Zinc by Acid digestion; Titration and Atomic Absorption Spectrometry [Zn, AAS]
9.11.4; based on ISO 13545	Preparation and Determination of Lead by Precipitation, Titration, Fusion and Atomic Absorption Spectrometry [Pb, AAS]
9.11.40; based on Hatch, 1972; SGS–Lakefield and Varian	Preparation and Determination of Mercury in Ores, Concentrates, Metallurgical and exploration samples by Strong Acid digest and Cold Vapour–Atomic Absorption Spectrometry [Hg, CV–AAS]
9.11.6; based on Young 1971; Scott 1939	Preparation and Determination of Total Copper by Short Iodide Titration and Atomic Absorption Spectrometry [Cu, AAS]

9.11.62; based on Applied Inorganic Analysis and SGS–Lakefield Research	Preparation and Determination of Arsenic and Antimony in Ores and Concentrates by Strong Acid Digest and Inductively Coupled Plasma – Optical Emission Spectroscopy [As, Sb, ICP–OES]
9.11.69	Preparation and Determination of Antimony, Arsenic, Bismuth, Iron, Lead, Nickel, Selenium, Silver, Tellurium and Tin in Electrolytic copper cathode by Acid digestion followed by Graphite Furnace Atomic Absorption Spectroscopy [Sb, As, Bi, Fe, Pb, Ni, Se, Ag, Te, Sn; GFAAS]
9.11.7; based on ISO 10469	Preparation and Determination of Total Copper by Electrogravimetry and Atomic Absorption Spectrometry [Cu; AAS]
9.11.70	Preparation and Determination of Total Molybdenum in Molybdenite and Ferromolybdenum by Separation, Precipitation and Gravimetric Finish [Mo]
9.11.8; based on Young 1971; Scott 1939	The Preparation and Determination of Iron in Ores, Concentrates and Metallurgical Products by Fusion, Separation and Titration [Fe, AAS]
9.25.11	Preparation and Determination of Uranium in Highly Mineralized Samples by Strong Acid Digest and ICP–MS (ores, concentrates and metallurgical test products) [U, ICP–MS]
9.3.1; based on Beamish & van Loon, 1977, Smith 1947	Preparation and Determination of Gold, Platinum and Palladium by Lead Fusion and Atomic Absorption Spectrometry [Au, Pt, Pd; AAS]
9.3.10	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]
9.3.13; based on Beamish and van Loon, 1977; Varian AAS	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]
9.3.14; based on Beamish and van Loon, 1977; Varian Vista	Preparation and Determination of Platinum, Palladium and Rhodium in Automotive and Petroleum Catalysts by Sodium Peroxide Fusion, Tellurium collection and Inductively Coupled Plasma – Optical Emission Spectroscopy [Pt, Pd, Rh; Na ₂ O ₂ ; ICP–OES]
9.3.3; based on Beamish & van Loon, 1977, Smith, 1947	Preparation and Determination of Gold and Silver by Lead fusion, Gravimetric and Atomic Absorption Spectrometry [Au, Ag; AAS]
9.3.4; based on Beamish & van Loon, 1977; Bugbee 1938; Varian and SGS–Lakefield	Preparation and Determination of Gold, Platinum and Palladium by Lead Fusion and Inductively Coupled Plasma – Optical Emission Spectroscopy [Au, Pt, Pd; ICP–OES]
9.3.5; based on Beamish & van Loon, 1977; Varian AAS	Preparation and Determination of Gold in Party–Umpire Samples by Lead Fusion and Atomic Absorption Spectrometry [Au; AAS]

9.4.40; based on Bock, 1971; Varian Vista Multi-Element	Preparation and Determination of Thirty (30) Elements in Highly Mineralized Samples by Strong Acid Digest 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, K; lead, Pb; antimony, Sb; selenium, Se; tin, Sn; strontium, Sr; thallium, Tl; titanium, Ti; vanadium, V; yttrium, Y; zinc, Zn; ICP-OES]
9.6.1; based on Claisse 1995; Rouseau 1990	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 , La ₂ O ₃ , Ce ₂ O ₃ , Nd ₂ O ₃ , Pr ₂ O ₃ , Sm ₂ O ₃ , BaO, SrO, ZrO ₂ , HfO ₂ , Y ₂ O ₃ , Nb ₂ O ₅ , ThO ₂ , Ta ₂ O ₅ , SnO, WO ₃ , U ₃ O ₈ , V ₂ O ₅ ; Co; Ni; LOI; XRF]
9.6.2; based on Bertin 1970; in-house	Determination of Arsenic, Tin, Antimony, Tantalum, Thorium and Uranium by Xray Fluorescence Spectrometry using Internal Standard Addition [As, Sn, Ta, Th, U; XRF]
9.6.6; based on Bertin, 1970; Willis 1995; Rouseau 1990	Determination of Base Metals (Copper, Nickel, Cobalt, Iron, Lead, Zinc, Chromium, Manganese and Molybdenum) in Sulphide Ores by Potassium Pyrosulfate Fusion and Xray Fluorescence Spectrometry [Cu, Ni, Co, Fe, Pb, Zn, Cr, Mn, Mo; XRF]
9.8.51; In-house; Varian	Preparation and Determination of Refractory Metals (Aluminum, Beryllium, Calcium, Cadmium, Copper, Chromium, Iron, Magnesium, Manganese, Silicon, Tin, Titanium, Vanadium, Tungsten) in Geological Samples, Mill Products and Ores by Sodium Peroxide Fusion and Atomic Absorption Spectrometry [Al, Be, Ca, Cd, Cu, Cr, Fe, Mg, Mn, Si, Sn, Ti, V, W; AAS]
9.8.53	Preparation and Determination of Mercury in Ores, Geological Samples, Metallurgical samples by CETAC Cold Vapor Atomic Absorption Spectroscopy [Hg, CETAC CVAAS]
9.8.56; based on SGS-Lakefield; Varian AAS	Preparation and Determination of Low Level Metals (silver, bismuth, cadmium, cobalt, copper, indium, nickel, lead, zinc) in Metallurgical and Geological Samples by Triple Acid Digestion and Atomic Absorption Spectrometry [Ag, Bi, Cd, Co, Cu, In, Ni, Pb, Zn; AAS]
9.8.71; In-house; Varian AAS	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]
9.9.1; based on ASTM E1915-01	The Preparation and Determination of Sulfur and Carbon in Ores, Concentrates, Exploration, Metallurgical and Metal Samples by Combustion – Infrared Detection [S,

C; IR]

Notes:

The physical sample preparation involving accredited test methods as listed on the scope of accreditation may be performed at SGS Minerals Services – Lakefield laboratory or at off site sample preparation locations that are monitored regularly for quality control and quality assurance practices.

CAN-P-4E (ISO/IEC 17025:2005): General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025: 2005)

CAN-P-1579 Guidelines for the Accreditation of Mineral Analysis Testing Laboratories

P. Paladino, P. Eng., Director, Conformity Assessment

Date: 2009-03-26

Number of Scope Listings: 37

SCC 1003-15/254

Partner File #0

Partner: SCC