African Mineral Standards

REFERENCE MATERIAL FOR AFRICAN ORES

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Certificate of Analysis

Copper Sulphide Ore
Reference Material from Kansanshi, Zambia

AMIS0041

Recommended Concentration and two "Between Laboratory" Standard Deviations

Certified Concentrations

Cu (P)	2.009	+-	0.138	%
Cu (T/ICP)	2.032	+-	0.147	%
Co (P)	19	+-	2	ppm

Indicated Mean

Co (T/ICP)	20.8	ppm

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Intended Use: AMIS0041 is suitable to monitor the accuracy of a single analysis of sulphide copper ore. The material can be used for routine quality control by inserting within a batch of samples, method development and for the calibration of equipment.

The recommended mean and "Between Lab" standard deviations for this standard reflect the average results from the laboratories that participated in the round robin. Slight variations in analytical procedures between laboratories will reflect as slight biases to the recommended concentrations and this is acceptable. Good laboratories however will report results within the two standard deviation levels with a failure of <10 %.

Origin of Material: This standard was made using sulphide ore sourced from the Kansanshi project, located in the North Western Province of Zambia, approximately 15 kilometres north of the town of Solwezi and 16 kilometres south of the Democratic Republic of Congo border. The Kansanshi project is majority owned by Cyprus Amax Kansanshi Holdings Limited, which is 100% owned by First Quantum Minerals Ltd (FQM).

The Kansanshi deposit occurs within the Lufilian arc, a major tectonic province characterized by broadly north directed fold and thrust structures, which hosts the world class Central African Copperbelt. The property geology is dominated by the northwest-trending Kansanshi Antiform, which exposes rocks of the Late Proterozoic Kansanshi Mine Formation in the core of a major refolded fold. Copper mineralization occurs both in and between steeply dipping, generally north-south trending quartz-carbonate veins and vein swarms, and as foliation parallel stratabound mineralization, within albite and carbonate altered phyllitic rocks of the Mine Formation.

Deep tropical weathering has resulted in supergene enrichment and subsequent partial oxidation of the deposit. Mineralization comprises copper oxide and mixed copper oxide/chalcocite mineralization hosted by saprolitized phyllites, decalcified marbles and schists. This secondary mineralization is underlain by a large tonnage of primary sulphide mineralization, with chalcopyrite and subordinate bornite as the dominant minerals. Oxide and mixed oxide/sulphide copper mineralization grading plus 0.5% copper occurs principally within two essentially flat lying orebodies, separated by a mostly barren marble unit. In some areas, the marble unit has been completely decalcified during weathering and in these cases the two ore bodies are combined. Deeper primary sulphide mineralization occurs in other discrete flat lying phyllite units.

(for more information, refer to the First Quantum Minerals Ltd Kansanshi Fact Sheet, Sept 2006, www.first-quantum.com.)

Appearance: The material is a very fine greenish grey powder (Corstor Colour Gauge – 5Y 7/2).

Method of Preparation: The material was crushed, dry-milled and air-classified to 100% <54um. Wet sieve particle size analysis of random samples confirmed the material was 100% <54um. It was then blended in a bi-conical mixer, systematically divided and then sealed into 1kg Laboratory Packs. Explorer Packs are subdivided from the Laboratory packs as required. Samples were randomly selected for homogeneity testing and third party analysis. Statistical analysis of both homogeneity and the consensus test results were carried out by an independent statistician.

Methods of Analysis: Co, Cu by multi-acid digestion, including HF, with ICP-OES or ICP-MS (T). Also aqua regia digestion with ICP-OES or ICP-MS (P).

Method of Certification: Seventeen laboratories were each given eight randomly selected packages of sample. Results from the thirteen laboratories that reported back timeously were used for the determinations below:

Lab Code	Cu (T) ppm	Cu (P) ppm	Co (T) ppm	Co (P) ppm
A		19640		20
A		19340		20
A		19400		20
A		19690		20
A		19500		20
A		19430		20
A		19330		20
A		19680		20
B	19500	21300	10	
B	21000	19300	10	
B	19600	19100	10	
B	20400	18800	10	
B	20200	20600	10	
B	19800	20700	10	
B	20800	21100	20	
B	18600	20800	10	
C	19800	19300	20	17
C	19550	19400	20	19
C	19600	19550	20	15
C	19300	19850	20	17
C	19400	19850	20	20
C	19300	19600	20	19
C	19650	19950	20	20
C	19500	22200	20	16
D	20706	18950	21	17
D	19874	20530	22	17
D	19708	19940	22	17
D	20727	20520	23	18
D	20519	20140	19	18
D	19900	21590	18	21
D	20592	20760	23	21
D	19594	20340	19	19
E				
E				
E				
E				
E				
E				
E				
E				
F	20947	19676	21	19
F	20906	19719	21	19
F	20781	19227	21	19
F	21105	19648	21	20
F	20865	19607	21	19
F	20512	19934	20	20
F	21044	19777	20	19
F	21181	19474	21	19
G		20500		20
G		21000		18
G		20300		17
G		21100		18
G		20900		18
G		20900		18
G		20700		20
G		20500		18
H	21600		19	17
H	21800		20	17
H	21700		21	17
H	21800		21	16
H	21100		20	17
H	21700		20	17
H	21700		19	16
H	21100		20	19

Lab Code	Cu (T) ppm	Cu (P) ppm	Co (T) ppm	Co (P) ppm
I	21200	21230	31	18
I	20649	20543	31	19
I	20691	21537	30	19
I	20437	21619	30	19
I	20098	20472	31	18
I	21868	20574	31	18
I	20095	21517	30	19
I	20744	21373	31	19
J	20500		30	
J	21200		30	
J	20600		34	
J	21100		29	
J	20500		25	
J	20400		30	
J	20200		28	
J	21400		28	
K	19100	19900	22	20
K	20200	19400	21	20
K	19600	20400	22	20
K	20400	19300	22	20
K	19300	19200	21	20
K	19600	18800	22	20
K	20100	20100	21	20
K	20000	19500	21	20
L				
L				
L				
L				
L				
L				
L				
L				
M	18900	19100	19	19
M	19100	19000	19	21
M	19200	18700	20	20
M	19000	18900	20	21
M	19300	18500	21	21
M	19600	18700	20	20
M	19400	18500	20	20
M	19400	18700	19	18
N	20600	20500	30	19
N	20300	20100	20	20
N	20300	20100	25	20
N	20600	20400	20	22
N	20600	20900	25	21
N	21000	20800	20	20
N	20900	20200	20	20
N	21000	20400	20	20
O	20800	20300	10	
O	20000	19900	20	
O	19500	20500	10	
O	19800	20000	10	
O	20000	19800	20	
O	20200	19900	10	
O	20800	19200	10	
O	20300	19500	10	

The mean and standard deviation for all data was calculated. Outliers were defined as samples beyond the mean ± 2 Standard Deviations from all data. These outliers were removed from the data and a new mean and standard deviation was determined. Total results from some laboratories that reported significant failures were also removed. This method is different from that used to calculate the Confidence Interval shown on many Government-produced standards in that the actual "between-laboratory" standard deviation is used in the calculations. This produces upper and lower limits that reflect actual individual analyses rather than a grouped set of analyses. The limits can therefore be used to monitor accuracy from individual analyses, unlike the Certified Limits published on other standards which quote a Confidence Interval.

Participating Laboratories: (Not in the same order as in the table of assays)

1. ACME Analytical Laboratories Ltd., (Canada).
2. Alex Stewart International Corporation (Zambia)
3. ALS Chemex South Africa (Pty) Ltd.
4. ALS Chemex, (Vancouver, Canada).
5. Ammtec Ltd., (Western Australia).
6. Assayers Canada, (Vancouver).
7. Genalysis Laboratory Services (Pty) Ltd., (Australia).
8. Geoservice Centre, Geolaboratory, (GTK. Finland).
9. Pt Intertek Utama Services (Intertek, Indonesia)
10. Set Point Laboratories (Pty) Ltd (South Africa)
11. SGS Lakefield Research Africa (Pty) Ltd. (Joburg, South Africa)
12. SGS Welshpool (Australia).
13. Ultra Trace (Pty) Ltd. (Australia).

Availability: This product is available in Laboratory Packs containing 1kg of material or in Explorer Packs containing client specified weights of material (from 50g up to 250g). Laboratory Packs are sealed bottles delivered in sealed foil pouches. Explorer Packs contain material in standard geochem envelopes placed into foil pouches that are nitrogen flushed and vacuum sealed.

Legal Notice: This certificate and the reference material described in it have been prepared with due care and attention. However AMIS, Set Point Technology (Pty) Ltd, Mike McWha, Dr Barry Smee and Smee and Associates Ltd; accept no liability for any decisions or actions taken following the use of the reference material.

28 May 2007

Certifying Officers:

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