Tel: +2711 923 7000 Fax: +2711 923 7027 e-mail: info@amis.co.za web: www.amis.co.za
30 Electron Avenue, Isando, 1600. P.O. Box 856, Isando, 1600, South Africa.

AMIS0109

Certified Reference Material

Low grade Gold Ore

Certificate of Analysis

Recommended Concentrations and two "Between Laboratory" Standard Deviations

Provisional Concentration

Au Pb Collection	0.14	±	0.02	g/t

Certified Concentration

Specific Gravity	2.72	±	0.06

Directors: GJ Horsfield (CEO), MD Evers (CFO)(British), ND Kennelly, SJ Ingram, MC Louw, Dr CJ Rademeyer, N Robinson, MJ Smith, MH Snelling, J Vassiloudis, D Williams

Major Elements, Recommended Concentrations and two “Between Laboratory” Standard Deviations

Certified Concentrations

Al2O3	4.45	±	0.12	%
CaO	0.43	±	0.04	%
Fe2O3	3.50	±	0.08	%
K2O	0.65	±	0.01	%
MgO	0.73	±	0.08	%
SiO2	87.49	±	0.90	%
TiO2	0.25	±	0.01	%

Provisional Concentrations

Cr2O3	0.097	±	0.02	%
LOI	1.89	±	0.36	%
MnO	0.05	±	0.01	%

Informational value

Na2O	0.15	%

1. Intended Use: AMIS0109 is a certified reference material which may be used to demonstrate the validity of measurement results of a single analysis of gold tailings material or low grade gold ores, hosted by a siliceous matrix rock, with a similar grade and matrix; when measured in parallel to the unknown to be characterised. 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 material property values based on a measurement campaign (round robin) and reflect the average results from the laboratories that participated in the round robin, after examination of the data set and removal of technically and statistically invalid results (see Clause 9 - this certificate). 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 %.

2. Origin of Material: This standard was made from tailings material supplied by Gold Fields Limited from Driefontein Gold Mine situated in the Gauteng Province of South Africa approximately 80km west of Johannesburg. The orebodies mined on this Witwatersrand operation were the Carbon Leader and Ventersdorp Contact Reef.

3. Approximate Mineral and Chemical Composition: AMIS0109 comprises quartz with minor clays and sulphides. The gold occurs as micron-sized grains associated with the clays and rarely within the sulphides. The major element chemistry has been certified. Some U determinations gathered during the round robin have been included in the results table.

4. Appearance: The material is a very fine powder. It is colored a Yellowish Grey (Corstor 5Y 8/2).

5. Handling instructions: The material is packaged in Laboratory Packs and Explorer Packs that must be shaken or otherwise agitated before use. Normal safety precautions for handling fine

particulate matter are suggested, such as the use of safety glasses, breathing protection, gloves and a laboratory coat.

6. Method of Preparation: The material was crushed, dry-milled and air-classified to <54um. Wet sieve parti**c**le size analysis of random samples confirmed the material was 98.5% <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 independent statisticians.

7. Methods of Analysis requested:

1. Au – Pb collection ICP-OES or ICP-MS.
2. Majors - XRF fusion.
3. SG - gas pycnometer .

8. Information requested:

1. Aliquots used for all determinations.
2. QC data, to include replicates, blanks and certified reference materials used.
3. Analytical techniques used.

9. Method of Certification: Twenty six laboratories were each given eight randomly selected packages of sample. Twenty three of the laboratories submitted results in time for the certification.

The final limits were calculated after a three step examination of the data, first removing incompatible data outside a spread normally expected for similar analytical methods done by reputable laboratories. Then, data from any one laboratory was removed from further calculations, if the mean of all analyses from that laboratory failed a t-test of the global means of the other laboratories. Next, data that fell outside of the 2 standard deviations were removed. The mean and standard deviations were then re-calculated.

Analytes with an RSD of near or less than 5 % are reported as “Certified Concentrations” with limits at two “Between Laboratory” standard deviations. Those with RSD’s of between near 5 % and 15 % are reported as “Provisional Concentrations” with limits at two “Between Laboratory” standard deviations. Those with RSD’s over 15 % are reported as “Informational Values”.

This method is different from that used by Government agencies 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 Confidence Limits published on other standards**.**

10. Participating Laboratories: The 23 laboratories that provided results timeously were (not in same order as in the table of assays):

1. ACME Analytical Laboratories Ltd CA
2. Activation Laboratories Pty Ltd (ActLabs) CA
3. ALS Chemex Laboratory Group Johannesburg SA
4. ALS Chemex Laboratory Group Vancouver CA
5. Ammtec Limited WA
6. Anglo Gold Ashanti - Navachab Gold Mine Laboratory Namibia
7. Anglo Gold Ashanti - Vaal River Laboratory SA
8. Anglo Research (Crown Campus)
9. Assayers Canada
10. Genalysis Laboratory Services WA

11. Goldfields Driefontein Assay Laboratory (South Africa)
12. Intertek Utama Services (Indonesia)
13. OMAC Laboratories Limited (Ireland)
14. Performance Labs (Welkom)
15. Ready Lead Assay Laboratory
16. Set Point Laboratories (Isando) SA
17. SGS Australia Pty Ltd (Newburn) WA
18. SGS Lakefield Research Africa (Pty) Ltd (Barberton SA)
19. SGS Lakefield Research Africa (Pty) Ltd (Booysens SA)
20. SGS Mineral Services Lakefield (Canada)
21. Super Laboratory - Klerksdorp
22. Super Laboratory Services SA
23. Ultra Trace (Pty) Ltd WA

11. Assay Data: Data as received from the laboratories is set out below.

Lab Code	Au Pb Coll g/t	SG	Al2O3 XRF %	CaO XRF %	Cr2O3 XRF %	Fe2O3 XRF %	K2O XRF %	MgO XRF %	MnO XRF %	Na2O XRF %	P2O5 XRF %	SiO2 XRF %	TiO2 XRF %	S ICP %	LOI %	U ppm M ICP
Grade check																9.7
Grade check																9.1
Grade check																9.0
A	0.09		4.49	0.42	0.10	3.52	0.65	0.72	0.05	0.19		87.80	0.25	0.29	1.73	
A	0.09		4.46	0.41	0.10	3.52	0.65	0.72	0.05	0.18		87.80	0.25	0.29	1.76	
A	0.09		4.46	0.41	0.10	3.51	0.65	0.72	0.05	0.18		87.80	0.25	0.29	1.74	
A	0.09		4.47	0.41	0.10	3.52	0.65	0.72	0.05	0.17		87.70	0.25	0.29	1.79	
A	0.09		4.45	0.41	0.10	3.52	0.65	0.71	0.05	0.18		87.80	0.25	0.29	1.75	
A	0.09		4.46	0.41	0.10	3.53	0.65	0.72	0.05	0.18		87.70	0.25	0.29	1.74	
A	0.09		4.46	0.42	0.10	3.52	0.65	0.71	0.05	0.19		87.70	0.25	0.29	1.76	
A	0.09		4.48	0.41	0.10	3.53	0.66	0.72	0.05	0.19		87.80	0.25	0.29	1.74	
B	0.36															
B	0.44															
B	0.36															
B	0.36															
B	0.20															
B	0.28															
B	0.24															
B	0.16															
C	0.14	2.66	4.36	0.41	0.22	3.51	0.65	0.71	0.06	0.17	0.03	88.30	0.25		2.02	
C	0.13	2.68	4.32	0.41	0.10	3.49	0.64	0.70	0.04	0.20	0.02	88.40	0.24		2.00	
C	0.13	2.68	4.42	0.41	0.09	3.53	0.65	0.70	0.05	0.10	0.04	88.00	0.25		2.04	
C	0.15	2.70	4.32	0.42	0.10	3.51	0.64	0.67	0.05	0.10	0.04	88.40	0.24		2.02	
C	0.14	2.69	4.36	0.41	0.09	3.49	0.66	0.66	0.05	0.06	0.03	88.10	0.25		1.97	
C	0.14	2.68	4.40	0.41	0.10	3.51	0.65	0.71	0.06	0.11	0.03	88.80	0.25		2.04	
C	0.14	2.69	4.43	0.41	0.08	3.49	0.64	0.70	0.05	0.09	0.03	87.90	0.25		2.00	
C	0.12	2.70	4.36	0.42	0.10	3.48	0.64	0.75	0.05	0.13	0.02	88.00	0.25		2.08	
D	0.14	2.74	4.51	0.42	0.08	3.48		0.75	0.04	0.17	0.03	86.60	0.26		1.88	
D	0.13	2.74	4.47	0.43	0.08	3.47		0.74	0.05	0.18	0.02	87.40	0.25		1.91	
D	0.15	2.70	4.54	0.43	0.08	3.52		0.77	0.05	0.15	0.03	88.20	0.26		2.06	
D	0.14	2.73	4.55	0.42	0.08	3.43		0.75	0.05	0.16	0.03	87.00	0.25		2.04	
D	0.13	2.70	4.54	0.43	0.08	3.48		0.73	0.05	0.17	0.02	87.50	0.25		2.28	
D	0.14	2.75	4.47	0.42	0.08	3.45		0.73	0.05	0.15	0.03	86.00	0.25		2.13	
D	0.14	2.73	4.57	0.42	0.08	3.50		0.76	0.06	0.14	0.03	87.10	0.26		2.05	
D	0.15	2.70	4.58	0.40	0.11	3.36		0.72	0.04	0.16	0.03	86.90	0.25			
E	0.15	2.69	4.50	0.41	0.09	3.39	0.65	0.76	0.05	0.16	0.04	87.22	0.26		2.11	
E	0.14	2.54	4.51	0.40	0.09	3.36	0.64	0.75	0.05	0.17	0.03	87.12	0.26		2.09	
E	0.14	2.64	4.48	0.40	0.09	3.38	0.65	0.75	0.05	0.17	0.04	87.10	0.26		2.09	
E	0.16	2.63	4.54	0.41	0.09	3.40	0.65	0.76	0.05	0.17	0.04	87.25	0.25		2.09	
E	0.12	2.69	4.54	0.40	0.09	3.38	0.65	0.76	0.05	0.17	0.04	87.33	0.26		2.11	
E	0.13	2.71	4.50	0.40	0.09	3.36	0.64	0.75	0.05	0.17	0.04	87.13	0.25		2.08	
E	0.15	2.67	4.56	0.40	0.09	3.37	0.66	0.76	0.05	0.17	0.04	87.30	0.25		2.15	
E	0.14	2.70	4.51	0.41	0.09	3.40	0.64	0.76	0.05	0.16	0.04	86.97	0.26		2.09	
F	0.16	2.77														
F	0.14	2.78														
F	0.12	2.79														
F	0.14	2.79														
F	0.13	2.77														
F	0.13	2.76														
F	0.14	2.78														
F	0.15	2.79														
G	0.11													0.25		
G	0.11													0.25		
G	0.12													0.25		
G	0.12													0.26		
G	0.12													0.25		
G	0.11													0.26		
G	0.13													0.28		
G	0.11													0.26		

Assay Data (cont)

Lab Code	Au Pb Coll g/t	SG	Al2O3 XRF %	CaO XRF %	Cr2O3 XRF %	Fe2O3 XRF %	K2O XRF %	MgO XRF %	MnO XRF %	Na2O XRF %	P2O5 XRF %	SiO2 XRF %	TiO2 XRF %	S ICP %	LOI %	U ppm M ICP
H	0.13															
H	0.13															
H	0.14															
H	0.13															
H	0.13															
H	0.14															
H	0.13															
H	0.14															
I	0.13															
I	0.13															
I	0.13															
I	0.12															
I	0.13															
I	0.13															
I	0.12															
I	0.14															
J	0.14															
J	0.16															
J	0.18															
J	0.14															
J	0.14															
J	0.14															
J	0.16															
J	0.14															
K	0.16															
K	0.16															
K	0.15															
K	0.18															
K	0.14															
K	0.18															
K	0.18															
K	0.16															
L	0.11	2.71	4.44	0.43	0.10	3.48	0.66	0.74	0.05	0.18		87.56	0.25		1.32	
L	0.11	2.70	4.43	0.43	0.10	3.46	0.66	0.74	0.05	0.18		87.59	0.24		1.30	
L	0.11	2.74	4.44	0.43	0.10	3.46	0.66	0.74	0.05	0.18		87.61	0.25		1.27	
L	0.10	2.72	4.46	0.43	0.10	3.44	0.66	0.74	0.05	0.18		87.53	0.25		1.25	
L	0.11	2.72	4.45	0.43	0.10	3.45	0.65	0.74	0.05	0.18		87.54	0.25		1.32	
L	0.11	2.75	4.44	0.43	0.10	3.45	0.66	0.74	0.05	0.18		87.66	0.25		1.24	
L	0.10	2.75	4.45	0.43	0.10	3.47	0.65	0.73	0.04	0.18		87.54	0.24		1.31	
L	0.11	2.75	4.44	0.43	0.09	3.46	0.66	0.73	0.05	0.18		87.62	0.25		1.36	
N	0.14		4.46	0.45	0.10	3.49	0.66	0.75	0.06	0.17		86.71	0.25	0.27	1.70	
N	0.14		4.49	0.45	0.11	3.57	0.66	0.76	0.07	0.18		87.37	0.26	0.27	1.70	
N	0.15		4.48	0.45	0.11	3.56	0.66	0.77	0.06	0.19		87.37	0.26	0.27	1.70	
N	0.14		4.45	0.45	0.11	3.51	0.65	0.76	0.06	0.18		86.97	0.26	0.27	1.60	
N	0.14		4.49	0.45	0.11	3.53	0.66	0.75	0.06	0.18		86.98	0.26	0.26	1.70	
N	0.14		4.46	0.45	0.12	3.52	0.65	0.76	0.06	0.18		86.91	0.26	0.27	1.70	
N	0.15		4.48	0.45	0.11	3.55	0.66	0.77	0.06	0.19		87.20	0.26	0.27	1.70	
N	0.15		4.47	0.45	0.11	3.56	0.66	0.76	0.06	0.20		87.04	0.26	0.28	1.60	
P	0.14	2.74												0.31		9.11
P	0.15	2.66												0.31		8.34
P	0.16	2.71												0.32		8.89
P	0.14	2.72												0.31		6.35
P	0.15	2.66												0.31		7.80
P	0.15	2.66												0.32		6.82
P	0.14	2.72												0.32		5.70
P	0.15	2.73												0.31		6.66
Q	0.14															
Q	0.14															
Q	0.12															
Q	0.12															
Q	0.13															
Q	0.12															
Q	0.12															
Q	0.13															
R	0.14															
R	0.14															
R	0.16															
R	0.14															
R	0.15															
R	0.17															
R	0.17															
R	0.15															
S	0.12	2.73		0.43		3.73	0.64	0.80	0.04	0.10	0.01	87.40	0.27		1.92	
S	0.12	2.73		0.43		3.74	0.64	0.80	0.04	0.10	0.02	87.40	0.26		1.90	
S	0.13	2.73		0.43		3.74	0.65	0.80	0.04	0.10	0.01	87.40	0.26		1.91	
S	0.14	2.72		0.42		3.73	0.65	0.80	0.04	0.10	0.01	87.40	0.26		1.91	
S	0.13	2.72		0.44		3.76	0.65	0.80	0.04	0.10	0.01	87.40	0.26		1.88	
S	0.13	2.73		0.44		3.75	0.65	0.80	0.04	0.10	0.01	87.40	0.26		1.88	
S	0.12	2.72		0.44		3.75	0.65	0.80	0.04	0.10	0.01	87.40	0.26		1.88	
S	0.14	2.72		0.43		3.73	0.65	0.80	0.04	0.10	0.01	87.50	0.26		1.88	

Assay Data (cont)

Lab Code	Au Pb Coll g/t	SG	Al2O3 XRF %	CaO XRF %	Cr2O3 XRF %	Fe2O3 XRF %	K2O XRF %	MgO XRF %	MnO XRF %	Na2O XRF %	P2O5 XRF %	SiO2 XRF %	TiO2 XRF %	S ICP %	LOI %	U ppm M ICP
T	0.13															
T	0.10															
T	0.12															
T	0.12															
T	0.12															
T	0.13															
T	0.12															
T	0.12															
U	0.13	2.62	4.45	0.41	0.10	3.53	0.66	0.68	0.05	0.13	0.03	86.86	0.25		2.10	
U	0.14	2.61	4.40	0.48	0.11	3.54	0.65	0.67	0.05	0.14	0.03	87.23	0.26		2.07	
U	0.13	2.55	4.34	0.45	0.10	3.52	0.66	0.67	0.05	0.14	0.03	87.31	0.26		2.08	
U	0.13	2.57	4.33	0.43	0.10	3.52	0.65	0.67	0.05	0.12	0.03	86.71	0.25		2.11	
U	0.12	2.66	4.36	0.43	0.10	3.52	0.65	0.67	0.05	0.14	0.03	86.60	0.25		2.09	
U	0.13	2.64	4.36	0.42	0.11	3.51	0.66	0.68	0.05	0.13	0.03	87.02	0.25		2.11	
U	0.12	2.61	4.42	0.42	0.10	3.54	0.65	0.68	0.05	0.15	0.03	87.24	0.25		2.03	
U	0.13	2.61	4.31	0.51	0.10	3.54	0.66	0.67	0.05	0.13	0.04	87.16	0.25		2.06	
V	0.13	2.69	4.43	0.44			0.66	0.66		0.16		88.27	0.26	0.28	1.63	
V	0.15	2.73	4.42	0.44			0.65	0.67		0.15		87.93	0.27	0.28	1.63	
V	0.13	2.74	4.39	0.43			0.65	0.66		0.15		87.34	0.25	0.28	1.64	
V	0.13	2.72	4.43	0.44			0.65	0.67		0.16		88.43	0.26	0.28	1.63	
V	0.13	2.74	4.39	0.44			0.65	0.66		0.15		87.66	0.25	0.28	1.65	
V	0.15	2.70	4.40	0.44			0.65	0.66		0.15		87.95	0.25	0.28	1.61	
V	0.12	2.73	4.42	0.44			0.65	0.65		0.15		88.32	0.25	0.27	1.62	
V	0.14	2.77	4.40	0.44			0.66	0.66		0.15		88.14	0.25	0.28	1.61	
X	0.10															
X	0.11															
X	0.12															
X	0.10															
X	0.11															
X	0.10															
X	0.11															
X	0.13															
Y	0.14															
Y	0.14															
Y	0.14															
Y	0.14															
Y	0.15															
Y	0.14															
Y	0.14															
Y	0.16															
Z	0.12	2.70														
Z	0.14	2.72														
Z	0.14	2.74														
Z	0.13	2.73														
Z	0.14	2.71														
Z	0.16	2.72														
Z	0.13	2.71														
Z	0.13	2.70														

12. Measurement of Uncertainty: The samples used in this certification process have been selected in such a way as to represent the entire batch of material and were taken from the final packaged units; therefore all possible sources of uncertainty (sample uncertainty and measurement uncertainty) are included in the final combined standard uncertainty determination. The uncertainty measurement takes into consideration the between lab and the within lab variances and is calculated from the square roots of the variances of these components using the formula:

Combined standard uncertainty=sqrt((between lab.var/no of labs) + (mean square within lab.var /no of assays))

These uncertainty measurements may be used by laboratories as a component for calculating the total uncertainty for method validation according to ISO guidelines.

Analyte	CSU	unit
Au	0.001	PPM
SG	0.008	
Al2O3	0.016	%
CaO	0.004	%
Cr2O3	0.003	%
Fe2O3	0.016	%
K2O	0.002	%
MgO	0.012	%
MnO	0.002	%
Na2O	0.007	%
P2O5	0.004	%
SiO2	0.117	%
TiO2	0.001	%
S ICP	0.009	%
LOI	0.058	%

CSU= Combined standard uncertainty

13. Uncertified values: The Certified and Provisional values listed on p1 and 2 of this certificate fulfill the AMIS statistical criteria regarding agreement for certification and have been independently validated by Dr Barry Smee.

14. Metrological Traceability: The values quoted herein are based on the consensus values derived from statistical analysis of the data from an inter laboratory measurement program. Traceability to SI units is via the standards used by the individual laboratories the majority of which are accredited and who have maintained measurement traceability during the analytical process.

15. Certification: AMIS0109 is a new material.

16. Period of validity: The certified values are valid for this product, while still sealed in its original packaging, until notification to the contrary. The stability of the material will be subject to continuous testing for the duration of the inventory. Should product stability become an issue, all customers will be notified and notification to that effect will be placed on the www.amis.co.za website.

17. Minimum sample size: The majority of laboratories reporting used a 30g sample size for the fire assay. These are the recommended minimum sample sizes for the use of this material.

18. Availability: This product is available in Laboratory Packs containing 1kg of material and Explorer Packs containing custom weights (from 50 to 250g) of material. The Laboratory Packs are sealed bottles delivered in sealed foil pouches. The Explorer Packs contain material in standard geochem envelopes, nitrogen flushed and vacuum sealed in foil pouches.

19. 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.

29 June 2009

Certifying Officers:

African Mineral Standards:_____

Mike McWha
BSc (Hons), FGSSA, MAusIMM, Pr.Sci.Nat

Geochemist:_____

Barry W. Smee
BSc, PhD, P.Geo, (B.C.)