ORE RESEARCH & EXPLORATION

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CERTIFICATE OF ANALYSIS FOR

Cu-Ag CONCENTRATE REFERENCE MATERIAL

OREAS 99b

Summary Statistics

Constituent	Certified Value	1SD
Umpire Labs		
Copper, Cu (wt.%)	28.90	0.10
Silver, Ag (ppm)	81.1	2.5
Commercial Labs: 4-Acid Digestion		
Copper, Cu (wt.%)	28.90	0.68
Iron, Fe (wt.%)	30.18	2.01
Silver, Ag (ppm)	77.0	3.2
Sulphur, S (wt.%)	30.8	0.5
Bismuth, Bi (ppm)	215	24
Cobalt, Co (ppm)	157	18
Lead, Pb (ppm)	619	23
Antimony, Sb (ppm)	21	5
Selenium, Se (ppm)	321	48
Tin, Sn (ppm)	342	44
Zinc, Zn (wt.%)	0.220	0.014
Commercial Labs: Aqua Regia Digestion		
Copper, Cu (wt.%)	28.74	0.78
Iron, Fe (wt.%)	31.08	0.95
Silver, Ag (ppm)	78.6	1.8
Sulphur, S (wt.%)	29.9	2.2
Bismuth, Bi (ppm)	209	14
Cobalt, Co (ppm)	142	13
Lead, Pb (ppm)	625	83
Antimony, Sb (ppm)	~20	IND
Selenium, Se (ppm)	268	36
Tin, Sn (ppm)	328	52
Zinc, Zn (wt.%)	0.216	0.024
Sulphur by IRC, S (wt.%)	31.6	0.7

Prepared by ORE Research & Exploration Pty Ltd, September 2011

SOURCE MATERIAL

OREAS 99b is a copper-silver concentrate matrix-matched certified reference material (MMCRM) prepared and certified by Ore Research & Exploration for copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc. The material used to prepare OREAS 99b was sourced from the CSA mine in Cobar, New South Wales.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material was prepared in the following manner:

a) *drying to constant mass at 65°C;*
b *milling to 100% minus 40 microns;*
c) *final homogenisation;*
d *packaging into 10g lots sealed under nitrogen in laminated foil pouches.*

ANALYSIS OF OREAS 99b

Ten commercial laboratories participated in the analytical program to characterise copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc in OREAS 99b. Ten umpire laboratories also determined copper and silver by 'classical' methods. Results together with uncorrected means, medians, one sigma standard deviations, relative standard deviations and percent deviation of lab means from the corrected mean of means (PDM^3) are presented in the appendix (Tables A2 to A26). The parameter PDM^3 is a measure of laboratory accuracy while the relative standard deviation is an effective measure of analytical precision where homogeneity of the test material has been confirmed.

Each of the ten commercial laboratories received 5 samples of 20g each sealed under nitrogen. Each set of subsamples submitted to each laboratory was taken at regular intervals during packaging of the standard in order to maximise their representation.

The elemental suite was determined in five replicate assays via both ore grade 4-acid digest and aqua regia digest with ICP-OES, ICP-MS or AAS finish. Lab C used a modified aqua regia digest and their data has been included with the other aqua regia analyses. Sulphur was also determined via infra-red combustion furnace.

Each of the ten umpire laboratories received 1 sample of 80g sealed under nitrogen and determined copper in three to ten trials using an acid digest with short iodide titration (7 labs) or electro-gravimetry (3 labs). Silver was determined via full reference fire assay with gravimetric finish. The analytical methods employed by each laboratory are explained, together with other abbreviations used, in Table A1 (Appendix).

Certified values and statistics for Cu and Ag have been determined separately for the classical (umpire) and instrumental (commercial) methods due to the distinct differences in trueness and precision. For copper there is excellent agreement between the commercial lab certified value (4-acid data) and the umpire lab certified value. However, there is a marked difference in accuracy with the umpire lab group demonstrating superior trueness and precision. For silver the 4-acid digestion results for the commercial lab group can be compared with the umpire lab data. There appears to be a slight low bias in the Ag results by 4-acid digestion.

STATISTICAL EVALUATION OF ANALYTICAL DATA FOR OREAS 99b

Certified Value and Confidence Limits

The certified value is the mean of means of accepted replicate values of accepted participating laboratories computed according to the formulae

$$\bar{x}_i = \frac{1}{n_i} \sum_{j=1}^{n_i} x_{ij}$$

$$\ddot{x} = \frac{1}{p} \sum_{i=1}^{p} \bar{x}_i$$

where

x_{ij} *is the jth result reported by laboratory i;*

p *is the number of participating laboratories;*

n_i *is the number of results reported by laboratory i;*

$\bar{x}_i$ *is the mean for laboratory i;*

$\ddot{x}$ *is the mean of means.*

The confidence limits were obtained by calculation of the variance of the consensus value (mean of means) and reference to Student's-*t* distribution with degrees of freedom (*p*-1).

$$\hat{V}(\ddot{x}) = \frac{1}{p(p-1)} \sum_{i=1}^{p} (\bar{x}_i - \ddot{x})^2$$

$$\text{Confidence limits} = \ddot{x} \pm t_{1-x/2}(p-1)(\hat{V}(\ddot{x}))^{1/2}$$

where

$t_{1-x/2}(p-1)$ *is the 1-x/2 fractile of the t-distribution with (p-1) degrees of freedom.*

The distributions of the values are assumed to be symmetrical about the mean in the calculation of the confidence limits.

The test for rejection of individual outliers from each laboratory data set and of outlying laboratory means was based primarily on *z* scores (rejected if $|z_i| > 2.5$) computed from the robust estimators of location and scale, *T* and *S*, respectively, according to the formulae

$$S = 1.483 \underset{j=1.\ldots.n}{\text{median}} / x_j - \underset{i=1.\ldots.n}{\text{median}} (x_i) /$$

$$z_i = \frac{x_i - T}{S}$$

where

T is the median value in a data set;
S is the median of all absolute deviations from the sample median multiplied by 1.483, a correction factor to make the estimator consistent with the usual parameter of a normal distribution.

Table 1. Certified Values and 95% Confidence Intervals for OREAS 99b.

Constituent	Certified Value	95% Confidence Interval	
		Low	High
Umpire Labs			
Copper, Cu (wt.%)	28.90	28.83	28.97
Silver, Ag (ppm)	81.1	79.2	83.1
Commercial Labs: 4-Acid Digestion			
Copper, Cu (wt.%)	28.90	28.43	29.37
Iron, Fe (wt.%)	30.18	28.62	31.74
Silver, Ag (ppm)	77.0	74.4	79.6
Sulphur, S (wt.%)	30.8	30.0	31.6
Bismuth, Bi (ppm)	215	197	233
Cobalt, Co (ppm)	157	144	170
Lead, Pb (ppm)	619	606	633
Antimony, Sb (ppm)	21	17	24
Selenium, Se (ppm)	321	284	358
Tin, Sn (ppm)	342	308	377
Zinc, Zn (wt.%)	0.220	0.209	0.230
Commercial Labs: Aqua Regia Digestion			
Copper, Cu (wt.%)	28.74	28.12	29.36
Iron, Fe (wt.%)	31.08	30.19	31.97
Silver, Ag (ppm)	78.6	77.0	80.1
Sulphur, S (wt.%)	29.9	27.1	32.7
Bismuth, Bi (ppm)	209	199	219
Cobalt, Co (ppm)	142	129	154
Lead, Pb (ppm)	625	558	691
Antimony, Sb (ppm)	~20	IND	IND
Selenium, Se (ppm)	268	237	299
Tin, Sn (ppm)	328	277	379
Zinc, Zn (wt.%)	0.216	0.195	0.238
Sulphur by IRC, S (wt.%)	31.6	30.9	32.3

Note - intervals may appear asymmetric due to rounding

The z-score test is used in combination with a second method of individual outlier detection that determines the percent deviation of the individual value from the median. Outliers in

general are selected on the basis of z-scores > 2.5 and with percent deviations > 3%. In certain instances statistician's prerogative has been employed in discriminating outliers.
Each laboratory data set mean is tested for outlying status based on z-score discrimination and rejected if $|z_i|$ > 2.5. After individual and laboratory data set (batch) outliers have been eliminated a non-iterative 3 standard deviation filter is applied, with those values lying outside this window also relegated to outlying status.
Individual outliers and, more rarely, laboratory data sets deemed to be outlying are shown left justified and in bold in the tabulated results (see Appendix) and have been omitted in the determination of certified values.
The magnitude of the confidence interval is inversely proportional to the number of participating laboratories and interlaboratory agreement. It is a measure of the reliability of the certified value. A 95% confidence interval indicates a 95% probability that the true value of the analyte under consideration lies between the upper and lower limits.

Statement of Homogeneity
The standard deviation of each laboratory data set includes error due to both the imprecision of the analytical method employed and to possible inhomogeneity of the material analysed. The standard deviation of the pooled individual analyses of all commercial laboratories includes error due to the imprecision of each analytical method, to possible inhomogeneity of the material analysed and, in particular, to deficiencies in accuracy of each analytical method. In determining tolerance intervals for copper that component of error attributable to measurement inaccuracy was eliminated by transformation of the individual results of each data set to a common mean (the uncorrected grand mean) according to the formula

$$x'_{ij} = x_{ij} - \bar{x}_i + \frac{\sum_{i=1}^{p}\sum_{j=1}^{n_i} x_{ij}}{\sum_{i=1}^{p} n_i}$$

where

x_{ij} *is the jth raw result reported by laboratory i*;
x'_{ij} *is the jth transformed result reported by laboratory i*;
n_i *is the number of results reported by laboratory i*;
p *is the number of participating laboratories*;
$\bar{x}_i$ *is the raw mean for laboratory i*.

The homogeneity of each constituent was determined from tables of factors for two-sided tolerance limits for normal distributions (ISO 3207) in which

$$\text{Lower limit is } \ddot{x} - k'_2(n,p,1-\alpha)s''_g$$
$$\text{Upper limit is } \ddot{x} + k'_2(n,p,1-\alpha)s''_g$$

where

n *is the number of results*;

$1-\alpha$ *is the confidence level*;

p *is the proportion of results expected within the tolerance limits*;

k_2' *is the factor for two-sided tolerance limits* (m, α *unknown*);

s_g'' *is the corrected grand standard deviation.*

The meaning of these tolerance limits may be illustrated for Cu by 4-acid digestion with instrumental finish (commercial labs), where 99% of the time at least 95% of subsamples will have concentrations lying between 28.36 and 29.45 wt.%. Put more precisely, this means that if the same number of subsamples were taken and analysed in the same manner repeatedly, 99% of the tolerance intervals so constructed would cover at least 95% of the total population, and 1% of the tolerance intervals would cover less than 95% of the total population (IS0 Guide 35).
The corrected grand standard deviation, s_g'', used to compute the tolerance intervals is the weighted means of standard deviations of all commercial lab data sets for a particular constituent according to the formula

$$s_g'' = \frac{\sum_{i=1}^{p}\left(s_i\left(1-\frac{s_i}{s_g'}\right)\right)}{\sum_{i=1}^{p}\left(1-\frac{s_i}{s_g'}\right)}$$

where

$1-\left(\frac{s_i}{2s_g'}\right)$ *is the weighting factor for laboratory* i *;*

s_g' *is the grand standard deviation computed from the transformed (i.e. means - adjusted) results*

according to the formula

$$s_g' = \left[\frac{\sum_{i=j}^{p}\sum_{j=i}^{n_i}\left(x_{ij}'-\bar{x}_i'\right)^2}{\sum_{i=1}^{p} n_i - 1}\right]^{1/2}$$

where $\bar{x}_i'$ *is the transformed mean for laboratory* i

The weighting factors were applied to compensate for the considerable variation in analytical precision amongst the commercial laboratories. Hence, weighting factors for each data set have been constructed so as to be inversely proportional to the standard deviation of that data set. Outliers were removed prior to the calculation of s_g' and a weighting factor of zero was applied to those data sets where $s_i / 2s_g' > 1$ (i.e. where the weighting factor $1- s_i / 2s_g' < 0$).

It is important to note that estimates of tolerance by this method are considered conservative as a significant proportion of the observed variance, even in those laboratories exhibiting the best analytical precision, can presumably be attributed to measurement error.

Table 2. Certified Values and Tolerance Limits for OREAS 99b.

Constituent	Certified Value	Tolerance Limits 1-α=0.99, ρ=0.95	
		Low	High
Umpire Labs			
Copper, Cu (wt.%)	28.90	28.85	28.95
Silver, Ag (ppm)	81.1	80.1	82.1
Commercial Labs: 4-Acid Digestion			
Copper, Cu (wt.%)	28.90	28.36	29.45
Iron, Fe (wt.%)	30.18	29.19	31.17
Silver, Ag (ppm)	77.0	75.1	78.8
Sulphur, S (wt.%)	30.8	30.0	31.6
Bismuth, Bi (ppm)	215	204	225
Cobalt, Co (ppm)	157	150	164
Lead, Pb (ppm)	619	599	640
Antimony, Sb (ppm)	21	19	22
Selenium, Se (ppm)	321	307	335
Tin, Sn (ppm)	342	332	353
Zinc, Zn (wt.%)	0.220	0.214	0.225
Commercial Labs: Aqua Regia Digestion			
Copper, Cu (wt.%)	28.74	28.25	29.23
Iron, Fe (wt.%)	31.08	30.70	31.47
Silver, Ag (ppm)	78.6	76.6	80.6
Sulphur, S (wt.%)	29.9	28.7	31.1
Bismuth, Bi (ppm)	209	198	220
Cobalt, Co (ppm)	142	135	149
Lead, Pb (ppm)	625	600	649
Antimony, Sb (ppm)	~20	IND	IND
Selenium, Se (ppm)	268	254	282
Tin, Sn (ppm)	328	317	339
Zinc, Zn (wt.%)	0.216	0.208	0.225
Sulphur by IRC, S (wt.%)	31.6	31.1	32.2

Note – tolerances based on commercial lab data only; intervals may appear asymmetric due to rounding

Performance Gates

Performance gates provide an indication of a level of performance that might reasonably be expected from a laboratory being monitored by this CRM in a QA/QC program. They take into account errors attributable to measurement and CRM variability. For an effective CRM the contribution of the latter should be negligible in comparison to measurement errors. Sources of measurement error include inter-lab bias, analytical precision (repeatability) and inter-batch bias (reproducibility).

Two methods have been employed to calculate performance gates. The first method uses the same filtered data set used to determine the certified value, i.e. after removal of all individual, lab dataset (batch) and 3SD outliers. These outliers can only be removed after the absolute homogeneity of the CRM has been independently established, i.e. the outliers must be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM. The standard deviation is then calculated for each analyte from the pooled individual analyses generated from the certification program. These SD's include all sources of error (between-lab bias, within-lab precision and CRM inhomogeneity). Table 3 shows performance gates calculated for two and three standard deviations. As a guide these intervals may be regarded as warning or rejection for multiple 2SD outliers, or rejection for individual 3SD outliers in QC monitoring, although their precise application should be at the discretion of the QC manager concerned.

A second method utilises a 5% window calculated directly from the certified value. Standard deviation is also shown in relative percent for one, two and three relative standard deviations (1RSD, 2RSD and 3RSD) to facilitate an appreciation of the magnitude of these numbers and a comparison with the 5% window. Caution should be exercised when concentration levels approach lower limits of detection of the analytical methods employed as performance gates calculated from standard deviations tend to be excessively wide whereas those determined by the 5% method are too narrow.

PARTICIPATING LABORATORIES

Activation Laboratories, Ancaster, Ontario, Canada
AH Knight, Merseyside, UK
ALS, Brisbane, QLD, Australia
ALS, North Vancouver, BC, Canada
ALS Chemex, Perth, WA, Australia
Amdel – Bureau Veritas, Adelaide, SA, Australia
Ammtec Laboratories, Perth, WA, Australia
Bachelet Laboratories, Angleur, Belgium
Genalysis Laboratory Services, Perth, WA, Australia
Independent Assays Laboratory, Perth, WA, Australia
Inspectorate Int. Ltd., Witham, Essex, UK
Intertek Testing Services, Jakarta, Indonesia
Ledoux & Company, Teaneck, NJ, USA
LSI, Rotterdam, Netherlands
SGS, Perth, WA, Australia
SGS, Lakefield, ON, Canada
SRL, Perth, WA, Australia
Stewart Inspection and Analysis, Knowsley, Merseyside, UK
Walker & Whyte, New York, USA

Table 3. Performance Gates for OREAS 99b

Constituent	Certified Value	Absolute Standard Deviations					Relative Standard Deviations			5% window	
		1SD	2SD Low	2SD High	3SD Low	3SD High	1RSD	2RSD	3RSD	Low	High
Umpire Labs											
Cu (wt.%)	28.90	0.10	28.69	29.1	28.6	29.2	0.36%	0.72%	1.08%	27.5	30.3
Ag (ppm)	81.1	2.5	76.2	86.0	73.8	88.5	3.02%	6.05%	9.07%	77.1	85.2
Commercial Labs: 4-Acid Digestion											
Cu (wt.%)	28.90	0.68	27.55	30.26	26.87	30.93	2.34%	4.68%	7.02%	27.46	30.35
Fe (wt.%)	30.18	2.01	26.17	34.19	24.16	36.20	6.65%	13.30%	19.95%	28.67	31.69
Ag (ppm)	77.0	3.2	70.5	83.4	67.3	86.7	4.20%	8.40%	12.59%	73.1	80.8
S (wt.%)	30.8	0.5	29.8	31.8	29.3	32.3	1.61%	3.23%	4.84%	29.2	32.3
Bi (ppm)	215	24	167	262	144	286	11.02%	22.04%	33.07%	204	225
Co (ppm)	157	18	121	193	103	211	11.51%	23.02%	34.54%	149	165
Pb (ppm)	619	23	574	665	551	687	3.67%	7.34%	11.00%	588	650
Sb (ppm)	21	5	11	30	6	35	23.41%	46.81%	70.22%	20	22
Se (ppm)	321	48	225	417	177	465	14.95%	29.89%	44.84%	305	337
Sn (ppm)	342	44	254	431	209	476	12.97%	25.93%	38.90%	325	360
Zn (wt.%)	0.220	0.014	0.191	0.248	0.177	0.262	6.45%	12.89%	19.34%	0.209	0.231
Commercial Labs: Aqua Regia Digestion											
Cu (wt.%)	28.74	0.78	27.18	30.30	26.39	31.09	2.72%	5.44%	8.16%	27.30	30.18
Fe (wt.%)	31.08	0.95	29.18	32.99	28.23	33.94	3.06%	6.13%	9.19%	29.53	32.64
Ag (ppm)	78.6	1.8	74.9	82.2	73.1	84.0	2.32%	4.64%	6.96%	74.6	82.5
S (wt.%)	29.9	2.2	25.5	34.3	23.4	36.4	7.30%	14.59%	21.89%	28.4	31.4
Bi (ppm)	209	14	182	237	168	250	6.56%	13.11%	19.67%	199	220
Co (ppm)	142	13	116	168	102	181	9.27%	18.54%	27.81%	135	149
Pb (ppm)	625	83	458	792	374	875	13.36%	26.73%	40.09%	593	656
Sb (ppm)	~20	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
Se (ppm)	268	36	197	339	161	374	13.28%	26.57%	39.85%	254	281
Sn (ppm)	328	52	223	432	171	485	15.94%	31.89%	47.83%	311	344
Zn (wt.%)	0.216	0.024	0.168	0.265	0.144	0.289	11.21%	22.42%	33.62%	0.206	0.227
S - IRC (wt.%)	31.6	0.7	30.1	33.1	29.4	33.9	2.35%	4.70%	7.06%	30.1	33.2

Note - intervals may appear asymmetric due to rounding

PREPARER OF THE CERTIFIED REFERENCE MATERIAL

The certified reference material OREAS 99b has been prepared and certified by:

Ore Research & Exploration Pty Ltd
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AUSTRALIA

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Email	*info@ore.com.au*	*Web*	*www.ore.com.au*

The material has been packaged in 10g units and sealed under nitrogen in laminated foil pouches.

INTENDED USE

OREAS 99b is a reference material intended for the following:

i) for the calibration of instruments used in the determination of the concentration of copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc;
ii) for the verification of analytical methods for copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc;
iii) for the preparation of internal reference materials of similar composition for copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc;
iv) for the monitoring of laboratory performance in the analysis copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc in geological samples.

STABILITY AND STORAGE INSTRUCTIONS

OREAS 99b is a sulphide-rich reference material (S via IRC = 31.6%) and is reactive under normal atmospheric conditions. To inhibit oxidation and prolong its shelf life it has been sealed under nitrogen in robust laminated foil pouches. In its unopened state under normal conditions of storage it has a shelf life beyond five years.

INSTRUCTIONS FOR THE CORRECT USE OF CRM OREAS 99b

Commercial Labs:
The certified values for OREAS 99b refer to the concentration levels of copper, silver, iron, sulphur, bismuth, cobalt, lead, antimony, selenium, tin and zinc in its packaged state. It should not be dried prior to weighing and analysis.

Umpire Labs:
The certified values for OREAS 99b refer to the concentration levels of Cu and Ag on a dry basis. All analyses were performed on the samples as received (without drying) and moisture content at 105°C was determined on separate subsamples. The data was then corrected to dry basis based on the moisture value. Moisture content varied amongst the labs from 0.10 – 0.36% with an average of 0.22% (excluding one lab which reported a mean of 0.899%).

LEGAL NOTICE

Ore Research & Exploration Pty Ltd has prepared and statistically evaluated the property values of this reference material to the best of its ability. The Purchaser by receipt hereof

releases and indemnifies Ore Research & Exploration Pty Ltd from and against all liability and costs arising from the use of this material and information.

CERTIFYING OFFICER

Craig Hamlyn (B.Sc. Hons - Geology), Technical Manager - **ORE**

REFERENCES

ISO Guide 35 (2006), Reference materials - General and statistical principals for certification

ISO Guide 35 (1985), Certification of reference materials - General and statistical principals.

ISO Guide 3207 (1975), Statistical interpretation of data - Determination of a statistical tolerance interval.

APPENDIX

Analytical Data for OREAS 99b

Table A1. Key to abbreviations used in Tables A2 – A26.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM[3]	percent deviation of lab mean from corrected mean of means
SIT	short iodide titration
EGRAV	electro-gravimetry
FA	Pb fire assay collection
OES	inductively coupled plasma optical emission spectrometry
AAS	atomic absorption spectrometry
GRAVC	gravimetry with full corrections
4A	4-acid digestion (HNO_3-HCl-$HClO_4$-HF)
MAD	mixed acid digestion
MAR	modified aqua regia digestion
AR	aqua regia digestion
IRC	infra red combustion furnace

UMPIRE LAB ANALYSES

Table A2. Analytical results for Cu in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Trial No.	Lab K SIT	Lab L SIT	Lab M SIT	Lab N SIT	Lab O SIT	Lab P SIT	Lab Q EGRAV	Lab R EGRAV	Lab S EGRAV	Lab T SIT
1	28.77	28.92	29.00	28.88	29.00	28.91	28.74	28.68	28.89	29.07
2	28.89	28.93	29.02	28.70	28.98	28.95	28.78	28.69	28.92	28.96
3	29.02	28.93	28.98	28.72	29.02	28.93	28.70	28.87	28.86	29.04
4				28.86	28.99	28.91	28.82	28.71	28.94	
5				28.89		28.95	28.83		28.90	
6				28.84		28.91	28.74			
7						28.91	28.80			
8						28.93	28.73			
9						28.93				
10						28.95				
Mean	28.89	28.93	29.00	28.82	29.00	28.93	28.77	28.74	28.90	29.02
Median	28.89	28.93	29.00	28.85	29.00	28.93	28.76	28.70	28.90	29.04
Std.Dev.	0.13	0.01	0.02	0.08	0.02	0.02	0.05	0.09	0.03	0.06
Rel.Std.Dev.	0.43%	0.02%	0.07%	0.29%	0.06%	0.06%	0.16%	0.31%	0.10%	0.20%
PDM[3]	-0.02%	0.09%	0.34%	-0.28%	0.34%	0.10%	-0.45%	-0.56%	0.01%	0.43%

Table A3. Analytical results for Ag in OREAS 99b (abbreviations as in Table A1; values in ppm).

Trial No.	Lab K FA*GRAVC	Lab L AR*AAS	Lab M MAD*AAS	Lab N MAD*AAS	Lab O FA*GRAVC	Lab P FA*GRAVC	Lab Q FA*GRAVC	Lab R MAD*OES	Lab S FA*GRAVC	Lab T FA*GRAVC
1	82.08	84.80	84.13	83.17	80.00	81.91	76.00	80.30	76.00	90.81
2	80.88	84.90	83.14	83.17	81.00	82.58	78.00	80.80	79.00	91.82
3	78.78	85.00	84.15	81.17	80.00	83.25	78.00	**82.50**	79.00	90.81
4				83.24	80.00	82.50	77.00	81.00		
5				82.24		81.34	77.00	80.70		
6				82.24				80.10		
Mean	80.58	84.90	83.81	82.54	80.25	82.32	77.20	80.90	78.00	**91.15**
Median	80.88	84.90	84.13	82.71	80.00	82.50	77.00	80.75	79.00	90.81
Std.Dev.	1.67	0.10	0.58	0.82	0.50	0.72	0.84	0.85	1.73	0.58
Rel.Std.Dev.	2.07%	0.12%	0.69%	0.99%	0.62%	0.88%	1.08%	1.05%	2.22%	0.64%
PDM[3]	-0.68%	4.65%	3.30%	1.74%	-1.09%	1.46%	-4.84%	-0.28%	-3.86%	12.34%

COMMERCIAL LAB ANALYSES: 4-Acid Digestion

Table A4. 4-Acid digest results for Cu in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C -	Lab D 4A*ICP	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*AAS	Lab J -
1	29.20	28.50	NR	28.40	29.30	30.40	27.90	29.35	26.90	NR
2	28.70	28.40	NR	29.00	29.40	29.30	28.10	29.69	28.10	NR
3	**30.20**	28.30	NR	28.60	29.50	29.00	27.80	29.42	29.40	NR
4	29.00	28.70	NR	28.80	29.60	30.00	28.30	29.39	29.00	NR
5	28.90	28.40	NR	28.70	29.70	29.60	28.90	29.17	28.40	NR
Mean	29.20	28.46		28.70	29.50	29.66	28.20	29.40	28.36	
Median	29.00	28.40		28.70	29.50	29.60	28.10	29.39	28.40	
Std.Dev.	0.59	0.15		0.22	0.16	0.55	0.44	0.19	0.96	
Rel.Std.Dev.	2.01%	0.53%		0.78%	0.54%	1.87%	1.55%	0.63%	3.39%	
PDM[3]	1.02%	-1.54%		-0.71%	2.06%	2.61%	-2.44%	1.73%	-1.88%	

Table A5. 4-Acid digest results for Fe in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C -	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*OES	Lab I 4A*AAS	Lab J PF*AAS
1	29.00	30.60	NR	29.00	32.30	31.00	27.30	33.21	27.00	29.60
2	29.20	30.80	NR	30.40	33.30	31.50	29.10	33.52	26.70	30.60
3	29.80	30.50	NR	29.70	33.70	30.70	28.30	32.02	26.30	30.30
4	28.70	31.00	NR	31.50	33.20	31.70	27.60	32.80	26.50	29.80
5	28.90	30.90	NR	30.70	32.10	31.20	27.80	31.82	27.20	29.20
Mean	29.12	30.76		30.26	32.92	31.22	28.02	32.67	26.74	29.90
Median	29.00	30.80		30.40	33.20	31.20	27.80	32.80	26.70	29.80
Std.Dev.	0.42	0.21		0.96	0.69	0.40	0.70	0.74	0.36	0.56
Rel.Std.Dev.	1.44%	0.67%		3.16%	2.09%	1.27%	2.52%	2.26%	1.36%	1.86%
PDM[3]	-3.51%	1.92%		0.27%	9.08%	3.45%	-7.16%	8.27%	-11.40%	-0.93%

Table A6. 4-Acid digest results for Ag in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C -	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*AAS	Lab J -
1	76	78	NR	76	80	72	74	79	72	NR
2	78	78	NR	79	80	70	**80**	81	74	NR
3	78	77	NR	78	81	72	77	82	75	NR
4	75	78	NR	82	81	74	76	81	72	NR
5	75	78	NR	81	81	72	77	80	75	NR
Mean	76	78		79	81	72	77	81	74	
Median	76	78		79	81	72	77	81	74	
Std.Dev.	2	0		2	1	1	2	1	2	
Rel.Std.Dev.	1.99%	0.57%		3.07%	0.64%	1.96%	2.68%	1.11%	2.06%	
PDM[3]	-0.75%	1.07%		2.47%	4.78%	-6.47%	-0.26%	4.58%	-4.39%	

Table A7. 4-Acid digest results for S in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C -	Lab D 4A*MS	Lab E 4A*OES	Lab F -	Lab G 4A*MS	Lab H 4A*OES	Lab I -	Lab J -
1	31	23	NR	>10.0	31	NR	>10.0	32	NR	NR
2	31	23	NR	>10.0	31	NR	>10.0	32	NR	NR
3	**32**	23	NR	>10.0	30	NR	>10.0	31	NR	NR
4	30	23	NR	>10.0	31	NR	>10.0	31	NR	NR
5	31	23	NR	>10.0	30	NR	>10.0	31	NR	NR
Mean	31	**23**			30			31		
Median	31	23			31			31		
Std.Dev.	0	0			0			1		
Rel.Std.Dev.	1.44%	0.64%			0.78%			2.13%		
PDM[3]	0.36%	-24.99%			-0.94%			1.17%		

Table A8. 4-Acid digest results for Bi in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J -
1	225	239	206	175	232	180	177	211	235	NR
2	205	**207**	201	184	238	190	206	217	235	NR
3	233	248	211	170	239	200	199	212	250	NR
4	216	246	209	213	236	190	191	212	260	NR
5	203	251	209	192	235	190	189	209	250	NR
Mean	216	238	207	187	236	190	192	212	246	
Median	216	246	209	184	236	190	191	212	250	
Std.Dev.	13	18	4	17	3	7	11	3	11	
Rel.Std.Dev.	5.93%	7.55%	1.82%	9.14%	1.16%	3.72%	5.67%	1.29%	4.41%	
PDM[3]	0.78%	10.93%	-3.54%	-13.1%	9.9%	-11.52%	-10.49%	-1.15%	14.56%	

Table A9. 4-Acid digest results for Co in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J 4A*OES
1	182	142	149	145	181	145	153	165	163	132
2	178	142	141	149	186	140	160	170	161	133
3	187	143	144	147	182	145	158	172	173	133
4	188	143	144	150	181	140	153	165	176	130
5	197	147	141	154	186	135	156	167	169	138
Mean	186	143	144	149	183	141	156	168	168	133
Median	187	143	144	149	182	140	156	167	169	133
Std.Dev.	7	2	3	3	3	4	3	3	6	3
Rel.Std.Dev.	3.84%	1.45%	2.20%	2.13%	1.41%	2.97%	1.93%	1.86%	3.79%	2.21%
PDM[3]	18.66%	-9.03%	-8.64%	-5.34%	16.62%	-10.24%	-0.82%	6.82%	7.20%	-15.2%

Table A10. 4-Acid digest results for Pb in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J 4A*OES
1	671	601	626	599	603	645	578	612	478	616
2	596	625	**613**	623	609	635	**623**	623	466	605
3	687	614	638	611	644	645	597	610	492	603
4	630	613	637	652	623	635	577	612	500	595
5	600	615	640	638	615	635	583	606	484	626
Mean	637	614	631	625	619	639	592	613	**484**	609
Median	630	614	637	623	615	635	583	612	484	605
Std.Dev.	41	9	11	21	16	5	19	6	13	12
Rel.Std.Dev.	6.45%	1.39%	1.81%	3.37%	2.57%	0.86%	3.26%	1.03%	2.69%	1.99%
PDM[3]	2.83%	-0.92%	1.86%	0.86%	-0.08%	3.19%	-4.47%	-1.08%	-21.84%	-1.66%

Table A11. 4-Acid digest results for Sb in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J 4A*OES
1	20.7	22.5	20.6	15.5	13.0	19.2	23.9	24.5	26.0	13.0
2	24.0	22.5	21.8	15.8	12.0	19.7	25.9	24.7	25.0	15.0
3	20.1	22.8	18.6	16.2	12.0	19.2	25.2	24.8	26.0	17.0
4	25.6	23.1	**15.6**	16.3	13.0	18.8	24.7	24.8	26.0	17.0
5	31.1	23.7	21.7	17.3	11.0	18.8	25.5	25.6	26.0	15.0
Mean	24.3	22.9	19.7	16.2	12.2	19.1	25.0	24.9	25.8	15.4
Median	24.0	22.8	20.6	16.2	12.0	19.2	25.2	24.8	26.0	15.0
Std.Dev.	4.4	0.5	2.6	0.7	0.8	0.4	0.8	0.4	0.4	1.7
Rel.Std.Dev.	18.24%	2.19%	13.27%	4.09%	6.86%	1.94%	3.09%	1.69%	1.73%	10.87%
PDM[3]	17.64%	10.96%	-4.82%	-21.53%	-40.94%	-7.34%	21.2%	20.45%	24.90%	-25.45%

Table A12. 4-Acid digest results for Se in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E -	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J MD*OES
1	363	324	289	307	NR	235	357	327	346	286
2	367	**289**	285	316	NR	230	388	326	342	291
3	398	311	285	316	NR	240	379	333	373	289
4	381	318	286	319	NR	230	371	335	378	280
5	397	338	292	**332**	NR	225	382	331	360	**307**
Mean	381	316	287	318		232	375	330	360	291
Median	381	318	286	316		230	379	331	360	289
Std.Dev.	16	18	3	9		6	12	4	16	10
Rel.Std.Dev.	4.28%	5.72%	1.05%	2.84%		2.46%	3.19%	1.16%	4.42%	3.46%
PDM[3]	18.71%	-1.59%	-10.49%	-0.97%		-27.75%	16.91%	2.89%	12.05%	-9.50%

Table A13. 4-Acid digest results for Sn in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C 4A*MS	Lab D 4A*MS	Lab E 4A*OES	Lab F -	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*OES	Lab J 4A*OES
1	408	309	318	327	350	NR	311	387	375	277
2	397	**335**	315	335	350	NR	330	387	369	269
3	421	321	316	331	350	NR	323	387	399	254
4	402	316	314	**347**	360	NR	313	392	398	252
5	403	315	318	327	360	NR	323	394	388	275
Mean	406	319	316	333	354		320	389	386	265
Median	403	316	316	331	350		323	387	388	269
Std.Dev.	9	10	2	8	5		8	3	13	12
Rel.Std.Dev.	2.25%	3.07%	0.60%	2.49%	1.55%		2.46%	0.86%	3.49%	4.42%
PDM[3]	18.62%	-6.79%	-7.73%	-2.64%	3.37%		-6.56%	13.71%	12.66%	-22.50%

Table A14. 4-Acid digest results for Zn in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A 4A*MS	Lab B 4A*MS	Lab C -	Lab D 4A*MS	Lab E 4A*OES	Lab F 4A*OES/MS	Lab G 4A*MS	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*OES
1	0.227	0.210	NR	0.216	0.218	0.242	0.197	0.222	0.228	0.198
2	0.222	**0.227**	NR	0.229	0.215	0.239	0.209	0.226	0.221	0.196
3	0.238	0.211	NR	0.223	0.215	0.244	0.202	0.220	0.236	0.202
4	0.232	0.212	NR	0.228	0.217	0.234	0.196	0.218	0.239	0.193
5	0.235	0.211	NR	0.232	0.213	0.234	0.201	0.232	0.233	0.204
Mean	0.231	0.214		0.226	0.216	0.238	0.201	0.224	0.231	0.199
Median	0.232	0.211		0.228	0.215	0.239	0.201	0.222	0.233	0.198
Std.Dev.	0.006	0.007		0.006	0.002	0.005	0.005	0.005	0.007	0.004
Rel.Std.Dev.	2.76%	3.36%		2.78%	0.90%	1.94%	2.56%	2.45%	3.15%	2.24%
PDM[3]	5.12%	-2.44%		2.75%	-1.80%	8.60%	-8.45%	1.82%	5.42%	-9.55%

COMMERCIAL LAB ANALYSES: Aqua Regia Digestion

Table A15. Aqua Regia digest results for Cu in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A AR*OES	Lab B AR*ICP	Lab C MAR*OES	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*OES	Lab H AR*OES	Lab I SIT	Lab J AR*AAS
1	29.10	27.80	28.03	>1	>1	29.20	27.90	**30.38**	28.90	28.60
2	30.20	27.50	28.10	>1	>1	29.20	27.70	29.66	28.90	28.60
3	30.10	27.50	28.02	>1	>1	29.90	27.40	29.40	28.70	29.50
4	29.70	28.10	28.34	>1	>1	29.70	27.70	29.14	28.70	29.70
5	28.70	28.20	27.93	>1	>1	29.40	28.20	29.16	28.80	28.90
Mean	29.56	27.82	28.08			29.48	27.78	29.55	28.80	29.06
Median	29.70	27.80	28.03			29.40	27.70	29.40	28.80	28.90
Std.Dev.	0.65	0.33	0.15			0.31	0.29	0.51	0.10	0.51
Rel.Std.Dev.	2.19%	1.18%	0.55%			1.06%	1.06%	1.73%	0.35%	1.76%
PDM[3]	2.85%	-3.20%	-2.28%			2.57%	-3.34%	2.80%	0.21%	1.11%

Table A16. Aqua Regia digest results for Fe in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A AR*OES	Lab B AR*ICP	Lab C MAR*OES	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*OES	Lab I AR*MS	Lab J -
1	31.70	30.20	30.36	32.70	>10	30.50	30.60	30.60	36.30	NR
2	31.70	30.00	29.76	32.80	>10	30.90	30.70	31.23	36.60	NR
3	31.60	29.80	30.13	33.20	>10	31.50	30.70	31.67	36.80	NR
4	31.60	30.10	30.18	32.00	>10	31.30	30.70	30.93	35.80	NR
5	31.80	30.40	29.95	33.40	>10	31.20	30.50	31.51	**33.70**	NR
Mean	31.68	30.10	30.07	32.82		31.08	30.64	31.19	**35.84**	
Median	31.70	30.10	30.13	32.80		31.20	30.70	31.23	36.30	
Std.Dev.	0.08	0.22	0.23	0.54		0.39	0.09	0.43	1.25	
Rel.Std.Dev.	0.26%	0.74%	0.76%	1.65%		1.25%	0.29%	1.39%	3.50%	
PDM[3]	1.92%	-3.16%	-3.24%	5.59%		-0.01%	-1.43%	0.34%	15.30%	

Table A17. Aqua Regia digest results for Ag in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*OES	Lab B AR*ICP	Lab C MAR*OES	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*AAS
1	80	76	79	96	65	76	81	82	>50	76
2	81	75	79	99	64	79	81	78	>50	77
3	80	75	80	100	64	78	80	79	>50	77
4	79	77	81	94	65	78	80	79	>50	76
5	79	77	79	98	65	79	80	80	>50	78
Mean	80	76	80	**97**	**65**	78	80	79		77
Median	80	76	79	98	65	78	80	79		77
Std.Dev.	1	1	1	2	1	1	1	1		1
Rel.Std.Dev.	1.05%	1.32%	1.12%	2.29%	1.10%	1.57%	0.86%	1.78%		0.70%
PDM[3]	1.56%	-3.27%	1.31%	23.79%	-17.81%	-0.73%	2.38%	1.11%		-2.36%

Table A18. Aqua Regia digest results for S in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A AR*OES	Lab B AR*ICP	Lab C MAR*OES	Lab D AR*MS	Lab E AR*OES	Lab F -	Lab G AR*MS	Lab H AR*OES	Lab I AR*MS	Lab J -
1	27.4	29.8	32.0	NR	32.5	NR	NR	31.6	>2.5	NR
2	25.2	29.8	31.8	NR	31.6	NR	NR	30.2	>2.5	NR
3	24.6	29.6	31.6	NR	31.5	NR	NR	29.5	>2.5	NR
4	25.8	30.4	31.5	NR	31.4	NR	NR	29.3	>2.5	NR
5	27.8	30.5	31.3	NR	31.4	NR	NR	29.3	>2.5	NR
Mean	26.2	30.0	31.6		31.7			30.0		
Median	25.8	29.8	31.6		31.5			29.5		
Std.Dev.	1.4	0.4	0.3		0.5			1.0		
Rel.Std.Dev.	5.31%	1.34%	0.88%		1.47%			3.19%		
PDM[3]	-12.50%	0.41%	5.82%		5.96%			0.31%		

Table A19. Aqua Regia digest results for Bi in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	268	200	200	226	191	190	202	202	222	NR
2	274	204	210	217	194	200	201	206	226	NR
3	279	241	222	226	200	190	194	213	228	NR
4	271	207	228	215	194	195	202	208	224	NR
5	258	**238**	226	221	194	195	202	209	230	NR
Mean	**270**	218	217	221	195	194	200	208	226	
Median	271	207	222	221	194	195	202	208	226	
Std.Dev.	8	20	12	5	3	4	4	4	3	
Rel.Std.Dev.	2.90%	9.09%	5.48%	2.28%	1.69%	2.16%	1.86%	2.02%	1.40%	
PDM[3]	29.08%	4.22%	3.81%	5.65%	-6.97%	-7.25%	-4.34%	-0.78%	8.04%	

Table A20. Aqua Regia digest results for Co in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	152	140	71	163	131	132	144	126	42	NR
2	153	147	74	161	131	138	140	113	44	NR
3	148	146	87	165	133	138	142	122	39	NR
4	159	145	97	157	132	144	141	118	41	NR
5	158	144	105	163	134	138	143	123	41	NR
Mean	154	144	**87**	162	132	138	142	121	**41**	
Median	153	145	87	163	132	138	142	122	41	
Std.Dev.	5	3	14	3	1	4	2	5	2	
Rel.Std.Dev.	2.94%	1.95%	16.61%	1.85%	0.99%	3.07%	1.23%	4.28%	3.97%	
PDM[3]	8.61%	1.63%	-38.84%	14.04%	-6.76%	-2.67%	0.08%	-14.93%	-70.76%	

Table A21. Aqua Regia digest results for Pb in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	591	568	625	745	463	639	588	608	709	NR
2	602	570	650	754	457	669	576	611	710	NR
3	616	574	689	762	457	660	577	636	728	NR
4	595	578	712	726	464	627	577	616	708	NR
5	570	560	703	754	469	666	592	627	728	NR
Mean	595	570	676	748	462	652	582	620	717	
Median	595	570	689	754	463	660	577	616	710	
Std.Dev.	17	7	37	14	5	18	7	12	10	
Rel.Std.Dev.	2.83%	1.19%	5.47%	1.84%	1.10%	2.81%	1.28%	1.94%	1.46%	
PDM[3]	-4.77%	-8.74%	8.20%	19.79%	-26.03%	4.42%	-6.82%	-0.79%	14.73%	

Table A22. Aqua Regia digest results for Sb in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	31.6	25.7	8.8	21.1	10.0	20.1	25.1	19.7	32.3	NR
2	31.4	28.3	10.3	21.0	10.0	13.6	24.3	18.7	30.8	NR
3	30.2	27.6	7.7	20.8	11.0	13.9	24.1	19.1	32.3	NR
4	31.4	28.1	10.9	19.4	12.0	13.3	24.4	19.1	31.7	NR
5	30.2	28.1	10.7	20.4	12.0	12.7	24.5	19.1	31.5	NR
Mean	31.0	27.6	9.7	20.5	11.0	14.7	24.5	19.1	31.7	
Median	31.4	28.1	10.3	20.8	11.0	13.6	24.4	19.1	31.7	
Std.Dev.	0.7	1.1	1.4	0.7	1.0	3.0	0.4	0.4	0.6	
Rel.Std.Dev.	2.26%	3.89%	14.25%	3.47%	9.09%	20.65%	1.54%	1.95%	1.97%	
PDM[3]	46.81%	30.69%	-54.10%	-2.65%	-47.84%	-30.20%	16.08%	-9.20%	50.41%	

Table A23. Aqua Regia digest results for Se in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	316	290	217	280	240	249	260	315	79	NR
2	314	290	215	280	240	246	240	302	79	NR
3	303	290	212	290	240	249	240	316	72	NR
4	317	290	199	270	240	252	250	310	72	NR
5	320	280	195	280	250	240	270	312	69	NR
Mean	314	288	208	280	242	247	252	311	**74**	
Median	316	290	212	280	240	249	250	312	72	
Std.Dev.	7	4	10	7	4	5	13	6	5	
Rel.Std.Dev.	2.08%	1.55%	4.88%	2.53%	1.85%	1.84%	5.17%	1.79%	6.13%	
PDM[3]	17.28%	7.57%	-22.40%	4.58%	-9.62%	-7.67%	-5.88%	16.16%	-72.29%	

Table A24. Aqua Regia digest results for Sn in OREAS 99b (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C AR*MS	Lab D AR*MS	Lab E AR*OES	Lab F -	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J -
1	401	326	279	333	240	NR	346	383	530	NR
2	400	339	284	323	239	NR	346	375	524	NR
3	384	338	274	322	247	NR	346	389	538	NR
4	398	337	265	299	248	NR	347	380	532	NR
5	393	332	266	309	243	NR	353	390	540	NR
Mean	395	334	274	317	243		348	384	**533**	
Median	398	337	274	322	243		346	383	532	
Std.Dev.	7	5	8	13	4		3	6	6	
Rel.Std.Dev.	1.77%	1.62%	3.00%	4.18%	1.66%		0.88%	1.67%	1.20%	
PDM[3]	20.54%	1.99%	-16.55%	-3.25%	-25.76%		6.02%	17.02%	62.51%	

Table A25. Aqua Regia digest results for Zn in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A AR*MS	Lab B AR*MS	Lab C MAR*OES	Lab D AR*MS	Lab E AR*OES	Lab F AR*OES/MS	Lab G AR*MS	Lab H AR*OES	Lab I AR*MS	Lab J -
1	0.199	0.204	0.222	0.241	0.185	0.235	0.197	0.245	0.047	NR
2	0.191	0.206	0.222	0.239	0.184	0.248	0.191	0.252	0.049	NR
3	0.185	0.206	0.224	0.242	0.186	0.246	0.191	0.249	0.044	NR
4	0.191	0.211	0.226	0.232	0.188	0.246	0.193	0.248	0.045	NR
5	0.194	0.200	0.228	0.243	0.183	0.241	0.198	0.245	0.045	NR
Mean	0.192	0.205	0.224	0.239	0.185	0.243	0.194	0.248	**0.046**	
Median	0.191	0.206	0.224	0.241	0.185	0.246	0.193	0.248	0.045	
Std.Dev.	0.005	0.004	0.003	0.004	0.002	0.005	0.003	0.003	0.002	
Rel.Std.Dev.	2.66%	1.94%	1.16%	1.84%	1.04%	2.16%	1.71%	1.27%	4.92%	
PDM[3]	-11.29%	-5.10%	3.68%	10.61%	-14.43%	12.37%	-10.37%	14.53%	-78.73%	

Table A26. Infra-red combustion results for S in OREAS 99b (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A IRC	Lab B IRC	Lab C IRC	Lab D IRC	Lab E IRC	Lab F IRC	Lab G IRC	Lab H -	Lab I IRC	Lab J IRC
1	30.6	31.8	32.4	32.3	31.3	34.3	28.7	NR	32.0	31.9
2	30.4	**30.1**	32.4	32.3	31.3	**33.2**	29.2	NR	31.5	31.2
3	30.1	32.6	32.3	32.2	31.4	34.3	28.1	NR	31.8	31.4
4	29.9	32.1	32.3	32.3	31.5	34.4	29.5	NR	31.3	31.1
5	30.2	32.6	32.3	**36.8**	31.1	34.5	29.3	NR	31.5	31.3
Mean	30.2	31.8	32.3	33.2	31.3	**34.1**	**29.0**		31.6	31.4
Median	30.2	32.1	32.3	32.3	31.3	34.3	29.2		31.5	31.3
Std.Dev.	0.3	1.0	0.1	2.0	0.1	0.5	0.6		0.3	0.3
Rel.Std.Dev.	0.89%	3.24%	0.18%	6.10%	0.47%	1.56%	1.95%		0.88%	0.99%
PDM[3]	-4.40%	0.65%	2.18%	4.89%	-0.99%	7.92%	-8.45%		-0.04%	-0.80%