CERTIFICATE OF ANALYSIS FOR

MINERALISED SILTSTONE REFERENCE
MATERIAL OREAS 92

SUMMARY STATISTICS OREAS 92

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High	Low	High
4 Acid					
Silver, Ag (ppm)	0.70	0.64	0.77	0.66	0.75
Bismuth, Bi (ppm)	2.44	2.31	2.57	2.28	2.59
Cobalt, Co (ppm)	16.3	15.8	16.9	15.9	16.8
Copper, Cu (ppm)	2294	2223	2365	2244	2345
Lead, Pb (ppm)	9.78	9.25	10.31	9.21	10.36
Sulphur, S (ppm)	3101	2964	3238	3009	3192
Antimony, Sb (ppm)	1.16	1.10	1.23	1.08	1.25
Selenium, Se (ppm)	3.75	2.82	4.67	3.37	4.13
Tin, Sn (ppm)	10.6	10.1	11.1	10.2	11.0
Zinc, Zn (ppm)	88	83	92	85	91
Aqua Regia					
Silver, Ag (ppm)	0.74	0.69	0.79	0.71	0.77
Bismuth, Bi (ppm)	2.56	2.41	2.71	2.43	2.69
Cobalt, Co (ppm)	16.1	15.3	16.9	15.5	16.7
Copper, Cu (ppm)	2352	2298	2406	2315	2388
Lead, Pb (ppm)	9.23	8.71	9.75	8.54	9.92
Sulphur, S (ppm)	3076	2922	3230	3017	3136
Antimony, Sb (ppm)	0.68	0.58	0.79	0.64	0.72
Selenium, Se (ppm)	3.14	2.78	3.51	2.97	3.32
Tin, Sn (ppm)	4.50	4.31	4.68	4.37	4.62
Zinc, Zn (ppm)	81.0	78.1	84.0	78.7	83.4

* values may appear asymmetric due to rounding

Prepared by:
Ore Research & Exploration Pty Ltd
February 2006

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INTRODUCTION

OREAS certified reference materials (CRMs) are intended to provide a low cost method of evaluating and improving the quality of precious and base metal analysis of geological samples. To the analyst they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures. To the geologist they provide a means of implementing quality control in analytical data sets generated in exploration, from the grass roots level through to prospect evaluation, and in grade control at mining operations.

SOURCE MATERIAL

Reference material OREAS 92 is one of a suite of nine copper CRMs (OREAS 90 to OREAS 98) prepared from material from the CSA mine located near the town Cobar in central western New South Wales, Australia. The copper ore body is hosted by the Early Devonian CSA Siltstone, a thinly bedded turbiditic sequence of carbonaceous siltstones and mudstones with minor coarser units. The CSA Siltstone is part of the Cobar Supergroup, consisting of lower syn-rift sediments and upper post-rift sag phase sediments. The mineralisation is structurally controlled and confined to a number of steeply dipping bodies within a major shear zone on the eastern margin of the Early Devonian Cobar Basin. It is characterised by low-grade greenschist alteration and epigenetic low-grade mineralisation enveloping higher-grade shoots of vein complexes or sub-massive to massive sulphides. The sulphides include chalcopyrite, pyrrhotite, pyrite, sphalerite, galena, bornite and cubanite. Iron-rich chlorite and silica are prominent alterations in the siltstone host.

Table 1. Indicative (uncertified) major and trace element composition of OREAS 92 (values are means of duplicate determinations; SiO_2 to C in wt.%, As to Zr in ppm).

Constituent	Mean value	Constituent	Mean value	Constituent	Mean value
SiO_2	65.7	As	6.0	Ni	39.3
Al_2O_3	15.1	Ba	451	Pr	10.6
CaO	0.71	Be	2.9	Rb	207
Fe_2O_3	6.7	Cd	<0.5	Re	<0.1
K_2O	3.6	Ce	93	Sb	1.20
MgO	2.6	Cs	7.1	Sc	13.7
Na_2O	0.72	Dy	5.45	Sm	7.3
P_2O_5	0.15	Er	2.9	Sr	33.7
SO_3	0.78	Eu	1.4	Ta	0.97
TiO_2	0.74	Ga	17.3	Tb	0.93
MnO	0.09	Gd	6.3	Te	<0.2
LOI	2.8	Hf	4.0	Th	17.0
		Ho	1.1	Tl	1.1
C	0.08	In	0.35	Tm	0.43
		La	45.5	U	3.4
		Li	25.8	W	2.5
		Lu	0.41	Y	27.4
		Mo	<0.5	Yb	2.8
		Nb	13.7	Zr	129
		Nd	38.9		

The approximate major and trace element composition of OREAS 92 has been determined by various total methods. These values, presented in Table 1, are based on the means of duplicate determinations at one laboratory and are uncertified. The constituents SiO_2 to MnO (excluding Na_2O) have been determined by borate fusion X-ray fluorescence analysis, LOI by thermo-gravimetric analysis, C by total combustion analysis, Na_2O, Co, Ni and Sc by 4-acid ICPOES and the remaining trace constituents by 4-acid ICP-MS.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 92 was prepared in the following manner:

> a)   *drying to constant mass at 105^0 C;*
> b)   *crushing;*
> c)   *milling to minus 75 microns;*
> d)   *homogenisation;*
> e)   *packaging into 10g lots in laminated foil pouches.*

ANALYTICAL PROGRAM FOR OREAS 92

Sixteen commercial laboratories participated in the analytical program to certify Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn by both total and partial methods. Their 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 an appendix (Tables A2 – A21). The analytical methods employed by each laboratory are indicated as codes at the head of each laboratory data set and explained in Table A1 of the appendix.

The intent of the certification program was to characterise the analytes by a) total methods (mainly HF-HCl-HNO_3-$HClO_4$ digest ICP-OES and ICP-MS), and b) aqua regia digest ICP-OES, ICP-MS or AAS. A batch of five dried and vacuum-packed samples were submitted to each of the participating laboratories for analysis. Each batch was composed of two 10g sub-samples scoop-split from each of two separate 1kg test units taken during the bagging stage and immediately following homogenisation. This two-stage nested design for the interlaboratory programme was amenable to analysis of variance (ANOVA) treatment and enables a comparative assessment of within- and between-unit homogeneity. A fifth randomly chosen sample was included from a third 1kg test unit to make up batches of five samples.

STATISTICAL EVALUATION OF OREAS 92

Recommended 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

$$\overline{x_i} \;=\; \frac{1}{n_i} \sum_{j=1}^{n_i} x_{ij}$$

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

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).

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

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

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

The distribution 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 was based 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

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

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

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.

Individual outliers and, more rarely, laboratory means deemed to be outlying are shown in bold in the tabulated results (Appendix) and have been omitted in the determination of recommended 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 recommended value, i.e. the narrower the confidence interval the greater the certainty in the recommended value.

Table 2. Recommended values and 95% confidence intervals for OREAS 92

Constituent	Recommended value	95% Confidence Interval	
		Low	High
4 Acid			
Silver, Ag (ppm)	0.70	0.64	0.77
Bismuth, Bi (ppm)	2.44	2.31	2.57
Cobalt, Co (ppm)	16.3	15.8	16.9
Copper, Cu (ppm)	2294	2223	2365
Lead, Pb (ppm)	9.78	9.25	10.31
Sulphur, S (ppm)	3101	2964	3238
Antimony, Sb (ppm)	1.16	1.10	1.23
Selenium, Se (ppm)	3.75	2.82	4.67
Tin, Sn (ppm)	10.6	10.1	11.1
Zinc, Zn (ppm)	88	83	92
Aqua Regia			
Silver, Ag (ppm)	0.74	0.69	0.79
Bismuth, Bi (ppm)	2.56	2.41	2.71
Cobalt, Co (ppm)	16.1	15.3	16.9
Copper, Cu (ppm)	2352	2298	2406
Lead, Pb (ppm)	9.23	8.71	9.75
Sulphur, S (ppm)	3076	2922	3230
Antimony, Sb (ppm)	0.68	0.58	0.79
Selenium, Se (ppm)	3.14	2.78	3.51
Tin, Sn (ppm)	4.50	4.31	4.68
Zinc, Zn (ppm)	81.0	78.1	84.0

* values may appear asymmetric due to rounding

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 participating 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 the 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:

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

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

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

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 copper by 4 acid digest, where 99% of the time at least 95% of subsamples will have concentrations lying between 2244 and 2345 ppm (see Table 3). 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 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

> $1 - \left(\dfrac{s_i}{2s'_g} \right)$ *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:

$$s'_g = \left[\dfrac{\displaystyle\sum_{i=j}^{p} \sum_{j=i}^{n_i} \left(x'_{ij} - \overline{x}'_i \right)^2}{\displaystyle\sum_{i=1}^{p} n_i - 1} \right]^{1/2}$$

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

Table 3. Recommended values and tolerance limits for OREAS 92

Constituent	Recommended value	Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High
4 Acid			
Silver, Ag (ppm)	0.70	0.66	0.75
Bismuth, Bi (ppm)	2.44	2.28	2.59
Cobalt, Co (ppm)	16.3	15.9	16.8
Copper, Cu (ppm)	2294	2244	2345
Lead, Pb (ppm)	9.78	9.21	10.36
Sulphur, S (ppm)	3101	3009	3192
Antimony, Sb (ppm)	1.16	1.08	1.25
Selenium, Se (ppm)	3.75	3.37	4.13
Tin, Sn (ppm)	10.6	10.2	11.0
Zinc, Zn (ppm)	88	85	91
Aqua Regia			
Silver, Ag (ppm)	0.74	0.71	0.77
Bismuth, Bi (ppm)	2.56	2.43	2.69
Cobalt, Co (ppm)	16.1	15.5	16.7
Copper, Cu (ppm)	2352	2315	2388
Lead, Pb (ppm)	9.23	8.54	9.92
Sulphur, S (ppm)	3076	3017	3136
Antimony, Sb (ppm)	0.68	0.64	0.72
Selenium, Se (ppm)	3.14	2.97	3.32
Tin, Sn (ppm)	4.50	4.37	4.62
Zinc, Zn (ppm)	81.0	78.7	83.4

* values may appear asymmetric due to rounding

The weighting factors were applied to compensate for the considerable variation in analytical precision amongst participating 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. A weighting factor of zero was applied to those data sets where $s_l / 2s_g' > 1$ (i.e. where the weighting factor $1- s_l / 2s_g' < 0$). It should be noted 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. Outliers were removed prior to the calculation of tolerance intervals and a weighting factor of zero was applied to those data sets where $s_l / 2s_g' > 1$ (i.e. where the weighting factor $1- s_l / 2s_g' < 0$).

Performance Gates

Performance gates provide an indication of a level of performance that might reasonably be expected for a particular analyte from a laboratory being monitored by this standard in a QA/QC program. They incorporate errors attributable to measurement (analytical bias and precision) and standard variability. For an effective standard the contribution of the latter should be negligible in comparison to measurement errors. Two methods have been employed to calculate performance gates.

The first method uses the standard deviation of the pooled individual analyses generated from the certification program. All individual and lab dataset (batch) outliers are removed prior to determination of the standard deviation. These outliers can only be removed if they can be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM. Performance gates have been calculated for one, two and three standard deviations of the accepted pool of certification data and are presented in Table 4. As a guide these intervals may be regarded as informational (1σ), warning or rejection for multiple outliers (2σ), or rejection for individual outliers (3σ) in QC monitoring although their precise application should be at the discretion of the QC manager concerned.

For the second method a ±5% error bar on the recommended value is used as the window of acceptability (refer Table 4).

Both methods should be used with caution 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.

Table 4. Performance gates for OREAS 92

Constituent	Recommended value	Performance Gates							
		1σ		2σ		3σ		5%	
		Low	High	Low	High	Low	High	Low	High
4 Acid									
Silver, Ag (ppm)	0.70	0.47	0.94	0.23	1.18	0.00	1.42	0.67	0.74
Bismuth, Bi (ppm)	2.44	2.20	2.67	1.96	2.91	1.73	3.14	2.31	2.56
Cobalt, Co (ppm)	16.3	15.2	17.5	14.1	18.6	12.9	19.7	15.5	17.2
Copper, Cu (ppm)	2294	2164	2425	2033	2555	1902	2686	2179	2409
Lead, Pb (ppm)	9.78	8.67	10.9	7.55	12.0	6.43	13.1	9.29	10.3
Sulphur, S (ppm)	3101	2848	3353	2596	3606	2343	3858	2946	3256
Antimony, Sb (ppm)	1.16	1.05	1.28	0.93	1.39	0.81	1.51	1.10	1.22
Selenium, Se (ppm)	3.75	2.36	5.14	0.97	6.52	0.00	7.91	3.56	3.93
Tin, Sn (ppm)	10.6	9.8	11.4	8.9	12.3	8.1	13.1	10.1	11.1
Zinc, Zn (ppm)	87.7	79.4	96.0	71.1	104.2	62.8	112.5	83.3	92.0
Aqua Regia									
Silver, Ag (ppm)	0.74	0.65	0.83	0.56	0.92	0.47	1.01	0.70	0.78
Bismuth, Bi (ppm)	2.56	2.28	2.84	1.99	3.13	1.71	3.41	2.43	2.69
Cobalt, Co (ppm)	16.1	14.5	17.7	13.0	19.2	11.4	20.8	15.3	16.9
Copper, Cu (ppm)	2352	2237	2467	2122	2581	2007	2696	2234	2469
Lead, Pb (ppm)	9.23	8.26	10.2	7.30	11.2	6.33	12.1	8.77	9.69
Sulphur, S (ppm)	3076	2810	3342	2543	3609	2277	3875	2922	3230
Antimony, Sb (ppm)	0.68	0.52	0.85	0.35	1.02	0.18	1.19	0.65	0.72
Selenium, Se (ppm)	3.14	2.58	3.71	2.02	4.27	1.45	4.84	2.99	3.30
Tin, Sn (ppm)	4.50	4.14	4.85	3.79	5.20	3.43	5.56	4.27	4.72
Zinc, Zn (ppm)	81.0	75.7	86.4	70.3	91.7	64.9	97.1	77.0	85.1

* values may appear asymmetric due to rounding

PARTICIPATING LABORATORIES

Acme Analytical Laboratories, Vancouver, BC, Canada
Activation Laboratories, Ancaster, ON, Canada
Actlabs Pacific, Redcliffe, WA, Australia
ALS Chemex, Malaga, WA, Australia
ALS Chemex, Stafford, QLD, Australia
ALS Chemex, North Vancouver, BC, Canada
Amdel Laboratories, Thebarton, SA, Australia
Amdel Laboratories, Wangara, WA, Australia
Genalysis Laboratory Services, Maddington, WA, Australia
Intertek Testing Services, Jakarta, Indonesia
Kalgoorlie Assay Laboratories, Kalgoorlie WA, Australia
McPhar Geoservices (Phil.) Inc., Makati, Philippines
OMAC Laboratories, Loughrea, Co. Galway, Ireland
SGS, Don Mills, Ontario, Canada
SGS, Welshpool, WA, Australia
Ultra Trace Laboratories, Canning Vale, WA, Australia

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

The siltstone reference material OREAS 92 has been prepared and certified and is supplied by:

Ore Research & Exploration Pty Ltd
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AUSTRALIA

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It is available in unit sizes of 10g in laminated foil packets.

INTENDED USE

OREAS 92 is a reference material intended for the following:

i)   for the calibration of instruments used in the determination of the concentration of Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn;
ii)   for the verification of analytical methods for Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn;
iii)   for the preparation of secondary reference materials of similar composition;

STABILITY AND STORAGE INSTRUCTIONS

OREAS 92 has been prepared from a lightly mineralised siltstone sample. Because of its low sulphide content and packaging in robust foil laminate it is considered to have long-term stability under normal storage conditions.

INSTRUCTIONS FOR THE CORRECT USE OF THE REFERENCE MATERIAL

The recommended values for OREAS 92 refer to the concentration levels of Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn after removal of hygroscopic moisture by drying in air to constant mass at 105^0 C. If the reference material is not dried prior to analysis, the recommended value should be corrected to the moisture-bearing basis.

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

Dr Paul Hamlyn

CERTIFICATION DATE

February 25, 2006

REFERENCES

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.
Kleeman, A. W. (1967), *J. Geol. Soc. Australia*,

APPENDIX

Analytical Results for OREAS 92

Table A1. Explanation of abbreviations used in Tables A2 – A21.

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
-	outlying values shown in bold
AF	alkali fusion
BF	borate fusion
4A	four acid (HF-HNO3 -HClO4 -HCl) digestion
AR	aqua regia digest
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry
AAS	atomic absorption spectrometry
Leco	Leco infrared furnace

Table A2. Analytical results for 4 acid silver in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N 4A*OES	Lab O 4A*MS	Lab P 4A*MS
1	0.5	0.5	0.72	0.39	0.70	0.75	0.8	0.32	0.83	1.052	0.50	0.71	0.7	0.8	0.72	NR
2	0.5	0.6	0.77	0.43	**0.63**	0.72	0.8	0.35	0.82	1.083	0.48	0.73	0.8	0.8	0.77	NR
3	0.5	0.6	0.76	0.47	0.72	0.74	0.7	0.39	0.79	1.048	0.50	0.72	0.8	0.8	0.70	NR
4	0.5	0.7	0.79	0.46	0.71	0.77	0.7	0.39	0.81	**1.151**	0.54	0.72	0.8	0.8	0.74	NR
5	0.5	0.7	0.81	0.45	0.75	0.73	0.7	0.40	0.82	1.045	0.52	0.71	0.7	0.9	0.75	NR
Mean	0.50	0.62	0.77	**0.44**	0.70	0.74	0.74	**0.37**	0.81	**1.08**	0.51	0.72	0.76	0.82	0.74	
Median	0.50	0.60	0.77	0.45	0.71	0.74	0.70	0.39	0.82	1.05	0.50	0.72	0.80	0.80	0.74	
Std.Dev.	0.00	0.08	0.03	0.03	0.04	0.02	0.05	0.04	0.02	0.04	0.02	0.01	0.05	0.04	0.03	
Rel.Std.Dev.	0.00%	13.5%	4.40%	7.19%	6.32%	2.79%	7.40%	9.60%	1.86%	4.16%	4.71%	1.17%	7.21%	5.45%	3.67%	
PDM[3]	-29.0%	-11.9%	9.40%	-37.5%	-0.26%	5.11%	5.14%	-47.5%	15.7%	52.9%	-27.8%	2.02%	7.98%	16.5%	4.57%	

Table A3. Analytical results for 4 acid bismuth in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N -	Lab O 4A*MS	Lab P -
1	2.3	2.30	2.45	2.36	2.54	2.52	2.5	1.334	2.41	2.03	2.21	2.82	2.7	NR	2.35	NR
2	2.4	2.45	2.54	**3.09**	2.39	2.68	2.5	1.528	2.38	2.11	2.27	2.75	2.7	NR	**2.69**	NR
3	2.1	2.24	2.40	2.15	2.59	2.40	2.3	1.526	2.37	2.24	2.38	2.75	2.9	NR	2.55	NR
4	2.1	2.39	2.51	2.20	2.86	**3.36**	2.3	1.443	2.36	2.01	2.31	2.93	2.9	NR	2.39	NR
5	2.1	2.34	2.72	2.30	2.75	2.40	2.2	1.715	2.38	2.22	2.35	2.70	3.0	NR	2.39	NR
Mean	2.20	2.34	2.52	2.42	2.63	2.67	2.36	**1.51**	2.38	2.12	2.31	2.79	2.84		2.47	
Median	2.10	2.34	2.51	2.30	2.59	2.52	2.30	1.53	2.38	2.11	2.31	2.75	2.90		2.39	
Std.Dev.	0.14	0.08	0.12	0.38	0.18	0.40	0.13	0.14	0.02	0.11	0.07	0.09	0.13		0.14	
Rel.Std.Dev.	6.43%	3.45%	4.84%	15.8%	6.98%	15.0%	5.68%	9.26%	0.79%	5.06%	2.96%	3.20%	4.72%		5.78%	
PDM[3]	-9.68%	-3.77%	3.62%	-0.65%	7.81%	9.70%	-3.11%	-38.0%	-2.29%	-12.8%	-5.35%	14.5%	16.6%		1.57%	

Table A4. Analytical results for 4 acid cobalt in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N 4A*MS	Lab O 4A*MS	Lab P 4A*MS
1	16	16.9	15.8	15.0	17.7	17.3	18.1	15.39	18.0	15.1	**16.43**	15.7	17.4	16	15.6	NR
2	16	17.1	16.2	15.1	17.2	16.7	17.8	15.14	17.0	16.2	15.98	15.8	15.2	16	15.4	NR
3	16	16.7	15.3	15.4	19.0	17.6	18.1	**14.73**	17.0	15.7	16.14	16.0	16.0	15	15.3	NR
4	15	17.6	17.3	14.9	18.1	16.9	17.7	15.20	17.5	15.1	16.01	15.9	17.8	14	15.6	NR
5	15	17.4	16.7	15.2	18.6	17.5	18.6	15.20	18.5	15.8	16.07	15.9	16.7	15	15.8	NR
Mean	15.6	17.1	16.3	15.1	18.1	17.2	18.1	15.1	17.6	15.6	16.1	15.9	16.6	15.2	15.5	
Median	16.0	17.1	16.2	15.1	18.1	17.3	18.1	15.2	17.5	15.7	16.1	15.9	16.7	15.0	15.6	
Std.Dev.	0.55	0.36	0.78	0.19	0.71	0.39	0.35	0.24	0.65	0.47	0.18	0.11	1.05	0.84	0.19	
Rel.Std.Dev.	3.51%	2.13%	4.78%	1.27%	3.93%	2.25%	1.94%	1.60%	3.70%	2.99%	1.13%	0.72%	6.32%	5.50%	1.25%	
PDM[3]	-4.57%	4.86%	-0.53%	-7.50%	10.9%	5.22%	10.5%	-7.42%	7.67%	-4.63%	-1.33%	-2.97%	1.67%	-7.01%	-4.93%	

Table A5. Analytical results for 4 acid copper in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*MS	Lab D 4A*OES	Lab E 4A*OES	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*OES	Lab K 4A*OES	Lab L 4A*OES	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES	Lab P -
1	2410	2364	2310	2330	2090	2431	2180	2370	2300	2383	2304	2091	2270	2400	2070	NR
2	2420	2318	2320	2360	2030	2449	2210	2500	2250	2395	2271	2048	2220	2398	2080	NR
3	2480	2418	2230	2410	2170	2465	2210	2370	2250	2395	2327	2013	2140	2381	2080	NR
4	2470	2335	2400	**2240**	2060	**2382**	2240	2410	2300	2405	2275	2050	2430	2382	2100	NR
5	2460	2384	2280	2350	2180	2435	**2340**	2300	2250	2425	2332	2100	2320	2382	**2040**	NR
Mean	2448	2364	2308	2338	2106	2432	2236	2390	2270	2400	2302	2060	2276	2389	2074	
Median	2460	2364	2310	2350	2090	2435	2210	2370	2250	2395	2304	2050	2270	2382	2080	
Std.Dev.	31	40	62	62	67	31	62	73	27	16	28	35	109	10	22	
Rel.Std.Dev.	1.27%	1.68%	2.70%	2.66%	3.16%	1.28%	2.77%	3.06%	1.21%	0.66%	1.24%	1.72%	4.78%	0.40%	1.06%	
PDM[3]	6.70%	3.03%	0.60%	1.91%	-8.20%	6.02%	-2.54%	4.18%	-1.05%	4.63%	0.33%	-10.2%	-0.79%	4.11%	-9.60%	

Table A6. Analytical results for 4 acid lead in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*OES	Lab M 4A*MS	Lab N 4A*MS	Lab O 4A*MS	Lab P 4A*MS
1	8	10	9.7	8.8	9.3	10.2	10	**9.29**	11	10.4	8.60	10	8.9	11	10.4	NR
2	8	10	9.7	9.0	9.7	9.80	10	10.09	10	11.0	8.47	9	8.6	12	10.1	NR
3	8	10	9.4	9.2	10.0	9.67	10	10.04	11	11.4	8.02	10	9.2	10	10.1	NR
4	8	13	10.2	9.0	10.4	10.3	9	9.97	10	10.4	8.33	9	9.1	10	**11.8**	NR
5	8	14	**11.0**	9.1	10.0	9.93	10	9.74	11	11.6	7.85	9	8.5	10	10.5	NR
Mean	8.00	11.4	10.0	9.02	9.88	9.97	9.80	9.83	10.6	11.0	8.25	9.40	8.86	10.6	10.6	
Median	8.00	10.0	9.70	9.00	10.0	9.93	10.0	9.97	11.0	11.0	8.33	9.00	8.90	10.0	10.4	
Std.Dev.	0.00	1.95	0.63	0.15	0.41	0.26	0.45	0.33	0.55	0.55	0.31	0.55	0.30	0.89	0.70	
Rel.Std.Dev.	0.00%	17.1%	6.28%	1.64%	4.14%	2.60%	4.56%	3.34%	5.17%	5.04%	3.79%	5.83%	3.44%	8.44%	6.66%	
PDM[3]	-18.2%	16.5%	2.23%	-7.79%	1.00%	1.96%	0.18%	0.44%	8.36%	12.0%	-15.6%	-3.91%	-9.43%	8.36%	8.16%	

Table A7. Analytical results for 4 acid and Leco (2 labs) sulphur in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*MS	Lab D 4A*OES	Lab E 4A*OES	Lab F LECO	Lab G 4A*AAS	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*OES	Lab K 4A*OES	Lab L 4A*OES	Lab M 4A*OES	Lab N 4A*AAS	Lab O 4A*OES	Lab P LECO
1	3320	3226	3100	3100	3200	3100	3280	3428	3300	2617	4606	**5880**	3070	3000	2800	3000
2	3220	3112	3100	3200	3100	3000	3350	3350	3400	2600	4449	2770	2930	3000	**2500**	3000
3	3340	3105	2900	3300	3300	3100	3390	3793	3200	2695	4240	2760	2920	3000	2800	3000
4	3280	3157	3300	3100	3100	3100	3400	3848	3300	2627	4418	2800	3220	2900	2800	3000
5	3260	3208	3000	3200	3300	3000	3490	3591	3300	2651	4639	2800	3070	3000	2800	3100
Mean	3284	3162	3080	3180	3200	3060	3382	3602	3300	2638	**4471**	3402	3042	2980	2740	3020
Median	3280	3157	3100	3200	3200	3100	3390	3591	3300	2627	4449	2800	3070	3000	2800	3000
Std.Dev.	48	55	148	84	100	55	77	218	71	37	160	1385	123	45	134	45
Rel.Std.Dev.	1.45%	1.73%	4.82%	2.63%	3.13%	1.79%	2.27%	6.06%	2.14%	1.40%	3.59%	40.7%	4.05%	1.50%	4.90%	1.48%
PDM[3]	5.91%	1.96%	-0.67%	2.55%	3.20%	-1.32%	9.07%	16.2%	6.42%	-14.9%	44.2%	9.71%	-1.90%	-3.90%	-11.6%	-2.6%

Table A8. Analytical results for 4 acid antimony in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N 4A*MS	Lab O 4A*MS	Lab P 4A*MS
1	1.2	1.18	1.17	1.08	1.20	1.26	1.5	1.17	1.07	1.02	0.953	1.0	0.7	NR	1.08	NR
2	1.2	1.32	1.16	1.05	1.14	1.14	1.4	1.30	1.09	1.05	0.994	1.1	1.1	NR	1.09	NR
3	1.2	1.14	1.19	1.12	1.29	1.22	1.4	1.32	1.08	1.08	0.985	1.1	0.7	NR	1.07	NR
4	1.2	1.17	1.25	1.05	1.22	1.16	1.3	1.29	1.09	1.04	0.952	1.1	0.9	NR	1.14	NR
5	1.2	1.25	1.35	1.14	1.28	1.26	1.3	1.28	1.10	1.03	0.975	1.1	0.6	NR	1.19	NR
Mean	1.20	1.21	1.22	1.09	1.23	1.21	1.38	1.27	1.09	1.04	0.97	1.08	**0.80**		1.11	
Median	1.20	1.18	1.19	1.08	1.22	1.22	1.40	1.29	1.09	1.04	0.97	1.10	0.70		1.09	
Std.Dev.	0.00	0.07	0.08	0.04	0.06	0.06	0.08	0.06	0.01	0.02	0.02	0.04	0.20		0.05	
Rel.Std.Dev.	0.00%	5.99%	6.42%	3.76%	5.01%	4.62%	6.06%	4.69%	1.05%	2.21%	1.92%	4.14%	25.0%		4.52%	
PDM[3]	3.27%	4.30%	5.34%	-6.37%	5.51%	3.96%	18.8%	9.43%	-6.54%	-10.1%	-16.4%	-7.06%	-31.2%		-4.13%	

Table A9. Analytical results for 4 acid selenium in OREAS 92 (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*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N 4A*MS	Lab O 4A*MS	Lab P 4A*MS
1	<5	5	5	4.0	5	NR	<10	3.26	2.78	2.39	3.13	2.0	5.2	NR	2	NR
2	<5	6	5	4.1	5	NR	<10	2.72	2.82	2.66	3.47	2.0	4.0	NR	3	NR
3	<5	5	5	4.2	5	NR	<10	2.82	2.88	2.48	3.54	2.1	5.3	NR	2	NR
4	<5	7	5	4.3	5	NR	<10	2.89	2.79	2.38	3.86	2.0	6.7	NR	2	NR
5	<5	6	5	4.3	5	NR	<10	2.64	2.95	2.56	3.60	2.0	5.8	NR	2	NR
Mean	<5	5.80	5.00	4.18	5.00		<10	2.87	2.84	2.49	3.518	2.02	5.40		2.20	
Median	<5	6.00	5.00	4.20	5.00		<10	2.82	2.82	2.48	3.537	2.00	5.30		2.00	
Std.Dev.	-	0.84	0.00	0.13	0.00		-	0.24	0.07	0.12	0.26	0.04	0.98		0.45	
Rel.Std.Dev.	-	14.4%	0.00%	3.12%	0.00%		-	8.43%	2.49%	4.79%	7.53%	2.21%	18.2%		20.3%	
PDM[3]	-	54.8%	33.4%	11.5%	33.4%		-	-23.5%	-24.1%	-33.5%	-6.1%	-46.1%	44.1%		-41.3%	

Table A10. Analytical results for 4 acid tin in OREAS 92 (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*MS	Lab G 4A*MS	Lab H 4A*MS	Lab I 4A*MS	Lab J 4A*MS	Lab K 4A*MS	Lab L 4A*MS	Lab M 4A*MS	Lab N 4A*MS	Lab O 4A*MS	Lab P 4A*MS
1	10	10.5	10.7	10.4	10.6	11.0	11.9	9.4	10	12.0	14.4	11.0	10.6	NR	10.1	NR
2	10	10.5	10.7	10.6	10.2	10.4	48.2	9.5	10	11.8	14.3	11.2	10.1	NR	10.2	NR
3	9	10.6	10.5	10.8	11.1	10.6	11.5	9.3	9	12.0	14.7	11.1	10.1	NR	10.0	NR
4	9	10.9	11.7	10.6	11.0	10.7	11.4	9.0	9	11.8	13.8	11.0	11.2	NR	10.3	NR
5	9	10.8	11.7	10.8	11.2	10.2	11.6	8.7	11	12.2	16.5	11.2	10.4	NR	10.5	NR
Mean	9.40	10.7	11.1	10.6	10.8	10.6	18.9	9.2	9.80	12.0	14.7	11.1	10.5		10.2	
Median	9.00	10.6	10.7	10.6	11.0	10.6	11.6	9.3	10.0	12.0	14.4	11.1	10.4		10.2	
Std.Dev.	0.55	0.18	0.59	0.17	0.41	0.30	16.37	0.30	0.84	0.16	1.07	0.10	0.45		0.19	
Rel.Std.Dev.	5.83%	1.70%	5.33%	1.57%	3.83%	2.87%	86.5%	3.29%	8.54%	1.32%	7.30%	0.90%	4.34%		1.88%	
PDM[3]	-11.3%	0.58%	4.35%	0.39%	2.09%	-0.18%	78.5%	-13.4%	-7.54%	13.0%	38.8%	4.73%	-1.12%		-3.57%	

Table A11. Analytical results for 4 acid zinc in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*MS	Lab D 4A*OES	Lab E 4A*OES	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*OES	Lab K 4A*OES	Lab L 4A*OES	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES	Lab P 4A*OES
1	87	118	85	82	77	107	90	89.3	90	98	83.7	76	81	90	91	NR
2	88	118	85	85	77	101	96	90.9	90	99	81.0	73	77	88	**88**	NR
3	89	113	79	84	82	104	94	88.4	85	98	84.9	73	78	89	92	NR
4	94	118	87	81	77	103	94	**98.7**	85	97	80.6	73	**96**	**84**	92	NR
5	94	122	81	83	81	104	99	84.2	95	98	83.3	74	85	90	93	NR
Mean	90.4	**118**	83.4	83.0	78.8	103.8	94.6	90.3	89.0	98.1	82.7	73.8	83.4	88.2	91.2	
Median	89.0	118.0	85.0	83.0	77.0	104.0	94.0	89.3	90.0	98.1	83.3	73.0	81.0	89.0	92.0	
Std.Dev.	3.4	3.2	3.3	1.6	2.5	2.2	3.3	5.3	4.2	0.9	1.8	1.3	7.7	2.5	1.9	
Rel.Std.Dev.	3.72%	2.71%	3.94%	1.90%	3.16%	2.09%	3.47%	5.88%	4.70%	0.92%	2.21%	1.77%	9.23%	2.82%	2.11%	
PDM[3]	3.12%	34.4%	-4.87%	-5.32%	-10.1%	18.4%	7.91%	3.03%	1.52%	11.9%	-5.67%	-15.8%	-4.87%	0.61%	4.03%	

Table A12. Analytical results for aqua regia silver in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	0.70	0.55	0.75	0.51	0.73	0.67	0.8	0.712	0.82	0.78	0.871	0.71	0.71	0.8	0.73	0.5
2	0.65	0.63	0.75	0.54	0.76	0.68	0.8	0.718	0.81	0.80	0.841	0.71	0.73	0.8	0.75	0.6
3	0.70	0.54	0.75	0.55	0.76	0.69	0.8	0.693	0.81	0.80	1.03	0.71	0.74	0.8	0.75	0.6
4	0.70	0.73	0.74	0.56	0.76	0.70	0.8	0.700	0.80	0.78	0.955	0.71	0.77	0.9	0.75	0.5
5	0.70	0.73	0.76	0.58	0.73	0.69	0.8	0.668	0.80	0.79	0.819	0.70	0.77	0.8	0.77	0.5
Mean	0.69	0.64	0.75	0.55	0.75	0.69	0.80	0.70	0.81	0.79	0.90	0.71	0.74	0.82	0.75	**0.54**
Median	0.70	0.63	0.75	0.55	0.76	0.69	0.80	0.70	0.81	0.79	0.87	0.71	0.74	0.80	0.75	0.50
Std.Dev.	0.02	0.09	0.01	0.03	0.02	0.01	0.00	0.02	0.01	0.01	0.09	0.00	0.03	0.04	0.01	0.05
Rel.Std.Dev.	3.24%	14.6%	0.94%	4.72%	2.20%	1.57%	0.00%	2.79%	1.04%	1.10%	9.79%	0.63%	3.50%	5.45%	1.89%	10.1%
PDM[3]	-6.60%	-13.9%	1.52%	-25.8%	1.25%	-6.90%	8.29%	-5.50%	9.38%	6.87%	22.3%	-4.16%	0.71%	11.0%	1.52%	-26.9%

Table A13. Analytical results for aqua regia bismuth in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	2.38	2.21	2.05	2.18	2.68	2.84	2.70	3.07	2.78	2.20	2.83	2.57	2.70	NR	2.82	NR
2	2.46	**2.67**	2.01	2.38	2.68	2.94	2.90	2.63	2.78	2.14	2.81	2.59	2.70	NR	2.56	NR
3	2.30	2.26	2.06	2.45	2.47	2.61	2.70	3.18	2.87	2.31	2.83	2.58	2.80	NR	2.62	NR
4	2.32	2.28	2.03	2.13	2.61	2.75	2.80	2.49	2.84	2.26	2.76	**2.73**	3.00	NR	2.69	NR
5	2.28	2.51	2.10	2.20	2.52	2.66	2.70	2.53	2.92	**2.49**	2.80	2.56	3.10	NR	2.63	NR
Mean	2.35	2.39	2.05	2.27	2.59	2.76	2.76	2.78	2.84	2.28	2.81	2.61	2.86		2.66	
Median	2.32	2.28	2.05	2.20	2.61	2.75	2.70	2.63	2.84	2.26	2.81	2.58	2.80		2.63	
Std.Dev.	0.07	0.20	0.03	0.14	0.09	0.13	0.09	0.32	0.06	0.14	0.03	0.07	0.18		0.10	
Rel.Std.Dev.	3.11%	8.23%	1.65%	6.12%	3.65%	4.84%	3.24%	11.6%	2.12%	5.94%	1.01%	2.69%	6.35%		3.70%	
PDM[3]	-8.29%	-6.80%	-19.9%	-11.4%	1.25%	7.81%	7.81%	8.53%	10.9%	-11.0%	9.65%	1.79%	11.7%		4.06%	

Table A14. Analytical results for aqua regia cobalt in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	16.5	19.8	17.1	13.1	17.0	16.0	17.1	19.6	17.0	16.5	14.9	14.3	16.1	16.0	14.8	15.0
2	16.5	18.9	17.4	13.4	16.7	15.9	16.7	18.1	17.0	16.5	15.0	14.0	16.3	14.0	14.6	15.0
3	17.0	18.0	17.7	13.1	16.3	16.7	16.9	18.3	16.5	16.7	15.7	14.1	15.3	14.0	14.6	15.0
4	16.5	19.8	17.1	13.1	16.3	16.9	17.1	19.0	17.0	16.2	15.4	14.2	15.9	15.0	15.1	14.0
5	16.0	19.0	17.3	13.8	16.0	16.3	17.3	17.7	16.5	16.5	14.7	13.9	15.6	16.0	**15.6**	15.0
Mean	16.5	19.1	17.3	13.3	16.5	16.4	17.0	18.6	16.8	16.5	15.2	14.1	15.8	15.0	14.9	14.8
Median	16.5	19.0	17.3	13.1	16.3	16.3	17.1	18.3	17.0	16.5	15.0	14.1	15.9	15.0	14.8	15.0
Std.Dev.	0.35	0.75	0.25	0.31	0.39	0.43	0.23	0.76	0.27	0.19	0.39	0.16	0.40	1.00	0.42	0.45
Rel.Std.Dev.	2.14%	3.92%	1.44%	2.32%	2.38%	2.65%	1.34%	4.07%	1.63%	1.15%	2.59%	1.12%	2.51%	6.67%	2.82%	3.02%
PDM[3]	2.50%	18.6%	7.59%	-17.4%	2.25%	1.63%	5.73%	15.3%	4.4%	2.30%	-5.83%	-12.4%	-1.60%	-6.82%	-7.19%	-8.06%

Table A15. Analytical results for aqua regia copper in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*OES	Lab B AR*OES	Lab C AR*MS	Lab D AR*OES	Lab E AR*OES	Lab F AR*OES	Lab G AR*OES	Lab H AR*OES	Lab I AR*OES	Lab J AR*OES	Lab K AR*OES	Lab L AR*OES	Lab M AR*OES	Lab N AR*OES	Lab O AR*OES	Lab P AR*OES
1	2440	2440	2350	2280	2150	2328	2310	2485	2450	2358	2319	2352	2140	2368	2230	2290
2	2420	**2377**	2390	2260	2140	2335	2290	2596	2500	**2385**	2273	2296	2150	2356	2230	2250
3	2400	2441	2410	2320	2080	2370	2370	2593	2450	2356	2321	2292	2150	2354	2210	2270
4	2450	2456	2360	2290	2070	2302	2390	2502	2600	2367	2352	2326	**2110**	2351	2280	2250
5	2430	2457	2400	2380	2070	2361	2400	2400	2550	2358	2326	2263	2180	2360	2230	2250
Mean	2428	2434	2382	2306	2102	2339	2352	2515	2510	2365	2318	2306	2146	2358	2236	2262
Median	2430	2441	2390	2290	2080	2335	2370	2502	2500	2358	2321	2296	2150	2356	2230	2250
Std.Dev.	19	33	26	47	40	27	49	82	65	12	28	34	25	7	26	18
Rel.Std.Dev.	0.79%	1.35%	1.09%	2.02%	1.89%	1.16%	2.09%	3.26%	2.60%	0.50%	1.22%	1.48%	1.17%	0.28%	1.17%	0.79%
PDM[3]	3.24%	3.51%	1.29%	-1.94%	-10.6%	-0.53%	0.01%	6.95%	6.73%	0.56%	-1.42%	-1.95%	-8.75%	0.26%	-4.92%	-3.81%

Table A16. Analytical results for aqua regia lead in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*OES	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	8	8	9.1	7.8	8.7	8.32	9	11.40	10.5	8.91	1.79	12.0	9.1	10	9.0	10
2	8	9	8.5	8.1	8.8	9.09	10	11.05	10.5	8.17	1.49	12.0	11.7	9	9.3	10
3	8	9	8.8	8.1	8.6	8.51	9	10.68	10.0	9.06	0.633	11.5	10.0	9	8.9	11
4	8	9	8.5	7.9	8.5	9.14	10	10.33	11.0	8.20	0.542	11.6	9.9	10	9.5	10
5	8	9	8.9	8.3	8.3	8.36	10	11.11	10.0	8.36	0.195	11.5	9.1	9	10.0	10
Mean	8.00	8.80	8.76	8.04	8.58	8.68	9.60	10.9	10.4	8.54	**0.930**	**11.7**	9.96	9.40	9.34	10.2
Median	8.00	9.00	8.80	8.10	8.60	8.51	10.0	11.1	10.5	8.36	0.633	11.6	9.90	9.00	9.30	10.0
Std.Dev.	0.00	0.45	0.26	0.19	0.19	0.40	0.55	0.41	0.42	0.42	0.68	0.26	1.06	0.55	0.44	0.45
Rel.Std.Dev.	0.00%	5.08%	2.98%	2.42%	2.24%	4.61%	5.71%	3.79%	4.02%	4.89%	72.8%	2.21%	10.7%	5.83%	4.70%	4.38%
PDM[3]	-13.3%	-4.66%	-5.09%	-12.9%	-7.04%	-5.92%	4.01%	18.3%	12.7%	-7.47%	-89.9%	27.0%	7.91%	1.84%	1.19%	10.5%

Table A17. Analytical results for aqua regia sulphur in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*AES	Lab B AR*OES	Lab C AR*MS	Lab D AR*MS	Lab E AR*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*OES	Lab M AR*OES	Lab N AR*MS	Lab O AR*MS	Lab P -
1	3250	3155	3300	3300	**17800**	3000	3130	2850	3300	2652	3539	2710	2800	3000	3100	NR
2	3250	3097	3200	3400	**11000**	2800	3110	3007	3300	2641	3536	2680	2830	3000	3100	NR
3	3300	3172	3200	3400	4300	3000	3210	3004	3300	2613	3568	2680	2770	3000	3100	NR
4	3150	**3227**	3200	3300	4600	2900	3180	2927	3300	2627	3622	2680	2780	3000	3000	NR
5	3150	3154	3100	3500	5200	3100	3270	2731	3300	2629	3603	2630	**2680**	3100	3100	NR
Mean	3220	3161	3200	3380	**8580**	2960	3180	2904	3300	2632	3574	2676	2772	3020	3080	
Median	3250	3155	3200	3400	5200	3000	3180	2927	3300	2629	3568	2680	2780	3000	3100	
Std.Dev.	67	47	71	84	5841	114	64	116	0	15	38	29	56	45	45	
Rel.Std.Dev.	2.08%	1.47%	2.21%	2.48%	68.1%	3.85%	2.01%	4.00%	0.00%	0.56%	1.07%	1.08%	2.03%	1.48%	1.45%	
PDM[3]	4.68%	2.76%	4.03%	9.9%	179%	-3.77%	3.38%	-5.60%	7.28%	-14.4%	16.2%	-13.0%	-9.89%	-1.82%	0.13%	

Table A18. Analytical results for aqua regia antimony in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	0.66	0.67	0.55	0.77	0.37	0.59	0.8	0.831	0.91	0.68	0.883	<0.5	0.5	NR	0.44	NR
2	0.68	0.68	0.57	0.79	0.39	0.61	0.8	0.842	0.92	0.75	0.834	<0.5	0.5	NR	0.45	NR
3	0.70	**0.60**	0.61	0.77	0.42	0.61	0.8	0.863	0.91	0.81	0.888	<0.5	0.5	NR	0.42	NR
4	0.70	0.70	0.58	0.83	0.43	0.62	0.9	0.845	0.89	0.74	0.969	<0.5	0.5	NR	0.46	NR
5	0.64	0.71	0.55	0.80	0.40	0.63	0.8	**0.775**	0.92	0.69	0.898	<0.5	0.5	NR	0.41	NR
Mean	0.68	0.67	0.57	0.79	0.40	0.61	0.82	0.83	0.91	0.73	0.89	<0.5	0.50		0.44	
Median	0.68	0.68	0.57	0.79	0.40	0.61	0.80	0.84	0.91	0.74	0.89	<0.5	0.50		0.44	
Std.Dev.	0.03	0.04	0.02	0.02	0.02	0.01	0.04	0.03	0.01	0.05	0.05	-	0.00		0.02	
Rel.Std.Dev.	3.86%	6.44%	4.35%	3.14%	5.94%	2.42%	5.45%	4.02%	1.35%	7.13%	5.43%	-	0.00%		4.76%	
PDM[3]	-1.09%	-1.67%	-16.3%	15.9%	-41.2%	-10.5%	20.0%	21.6%	33.2%	7.49%	30.9%	-	-26.8%		-36.2%	

Table A19. Analytical results for aqua regia selenium in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	2	4	3.8	3.4	4.0	2.9	<5	3.35	2.96	**2.42**	2.74	2.8	4.8	NR	3	NR
2	2	4	3.7	3.4	4.0	3.0	<5	3.62	2.97	2.75	**2.56**	2.8	4.3	NR	3	NR
3	2	4	3.8	3.2	3.8	2.9	<5	3.74	3.05	2.68	2.80	2.8	5.4	NR	3	NR
4	2	4	3.7	3.2	3.7	2.9	<5	3.76	3.00	2.80	2.89	2.9	4.6	NR	3	NR
5	2	4	3.6	3.3	3.8	3.0	<5	3.55	2.98	2.68	2.76	2.7	**7.7**	NR	3	NR
Mean	2.00	4.00	3.72	3.30	3.86	2.94	<5	3.60	2.99	2.66	2.75	2.80	**5.36**		3.00	
Median	2.00	4.00	3.70	3.30	3.80	2.90	<5	3.62	2.98	2.68	2.76	2.80	4.80		3.00	
Std.Dev.	0.00	0.00	0.08	0.10	0.13	0.05	-	0.17	0.04	0.15	0.12	0.07	1.37		0.00	
Rel.Std.Dev.	0.00%	0.00%	2.25%	3.03%	3.48%	1.86%	-	4.65%	1.19%	5.52%	4.40%	2.53%	25.5%		0.00%	
PDM[3]	-36.4%	27.2%	18.3%	4.95%	22.8%	-6.5%	-	14.5%	-4.85%	-15.3%	-12.6%	-11.0%	70.5%		-4.59%	

Table A20. Analytical results for aqua regia tin in OREAS 92 (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*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*MS	Lab K AR*MS	Lab L AR*MS	Lab M AR*MS	Lab N AR*MS	Lab O AR*MS	Lab P AR*MS
1	4.0	4.91	4.4	4.6	4.5	4.8	4	4.66	4.9	4.65	4.48	4.3	4.4	NR	4.0	NR
2	3.8	4.91	4.5	4.7	4.5	4.8	4	4.40	5.0	4.62	4.55	4.2	4.5	NR	3.9	NR
3	4.0	4.84	4.5	4.7	4.4	4.6	4	4.39	4.9	**4.75**	4.71	4.3	4.4	NR	3.7	NR
4	4.0	5.01	4.4	4.7	4.5	4.9	5	4.34	4.9	4.63	4.86	4.4	4.6	NR	3.8	NR
5	3.8	5.11	4.5	4.8	4.4	4.8	5	4.20	5.0	4.67	4.64	4.3	4.5	NR	3.9	NR
Mean	3.92	4.96	4.46	4.70	4.46	4.78	4.40	4.40	4.94	4.67	4.65	4.30	4.48		3.86	
Median	4.00	4.91	4.50	4.70	4.50	4.80	4.00	4.39	4.90	4.65	4.64	4.30	4.50		3.90	
Std.Dev.	0.11	0.11	0.05	0.07	0.05	0.11	0.55	0.16	0.05	0.05	0.15	0.07	0.08		0.11	
Rel.Std.Dev.	2.79%	2.12%	1.23%	1.50%	1.23%	2.29%	12.4%	3.74%	1.11%	1.11%	3.14%	1.64%	1.87%		2.95%	
PDM[3]	-12.8%	10.2%	-0.81%	4.53%	-0.81%	6.31%	-2.14%	-2.17%	9.87%	3.77%	3.42%	-4.37%	-0.36%		-14.2%	

Table A21. Analytical results for aqua regia zinc in OREAS 92 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A AR*OES	Lab B AR*OES	Lab C AR*MS	Lab D AR*OES	Lab E AR*OES	Lab F AR*OES	Lab G AR*OES	Lab H AR*OES	Lab I AR*OES	Lab J AR*OES	Lab K AR*OES	Lab L AR*OES	Lab M AR*OES	Lab N AR*OES	Lab O AR*OES	Lab P AR*OES
1	80	85	74	73	80	78	84	88	**80**	87	88	**79**	76	86	82	78
2	77	83	74	73	79	80	83	92	100	86	88	76	78	86	79	76
3	77	81	76	74	79	81	86	92	98	88	90	77	76	85	79	76
4	80	**71**	75	74	78	83	88	90	100	**93**	92	76	76	84	79	75
5	77	84	75	76	77	80	87	86	97	85	91	75	78	85	81	77
Mean	78.2	80.8	74.8	74.0	78.6	80.4	85.6	89.6	**95.0**	87.9	89.9	76.5	76.8	85.2	80.0	76.4
Median	77.0	83.0	75.0	74.0	79.0	80.0	86.0	89.9	98.0	87.1	90.5	76.1	76.0	85.0	79.0	76.0
Std.Dev.	1.6	5.7	0.8	1.2	1.1	1.8	2.1	2.8	8.5	3.1	1.5	1.3	1.1	0.8	1.4	1.1
Rel.Std.Dev.	2.10%	7.02%	1.12%	1.66%	1.45%	2.26%	2.42%	3.08%	8.93%	3.52%	1.71%	1.68%	1.43%	0.98%	1.77%	1.49%
PDM[3]	-3.48%	-0.27%	-7.68%	-8.66%	-2.99%	-0.76%	5.65%	10.6%	17.3%	8.49%	10.9%	-5.60%	-5.21%	5.16%	-1.26%	-5.70%