CERTIFICATE OF ANALYSIS FOR

SILTSTONE REFERENCE
MATERIAL OREAS 91

SUMMARY STATISTICS OREAS 91

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High	Low	High
4 Acid					
Silver, Ag (ppm)	<0.3	IND	IND	IND	IND
Bismuth, Bi (ppm)	1.01	0.94	1.08	0.91	1.11
Cobalt, Co (ppm)	14.2	13.8	14.7	13.8	14.7
Copper, Cu (ppm)	265	258	271	260	270
Lead, Pb (ppm)	5.16	4.74	5.59	4.79	5.53
Sulphur, S (ppm)	841	799	882	794	887
Antimony, Sb (ppm)	0.85	0.80	0.89	0.78	0.91
Selenium, Se (ppm)	1.28	0.84	1.73	1.06	1.51
Tin, Sn (ppm)	7.47	7.08	7.87	7.16	7.79
Zinc, Zn (ppm)	66.4	62.7	70.0	64.1	68.7
Aqua Regia					
Silver, Ag (ppm)	0.10	0.08	0.11	0.08	0.11
Bismuth, Bi (ppm)	1.07	0.98	1.15	0.97	1.16
Cobalt, Co (ppm)	14.2	13.5	14.9	13.8	14.6
Copper, Cu (ppm)	264	255	273	260	268
Lead, Pb (ppm)	4.29	4.03	4.55	4.04	4.54
Sulphur, S (ppm)	793	742	844	780	806
Antimony, Sb (ppm)	0.46	0.40	0.53	0.42	0.51
Selenium, Se (ppm)	0.97	0.87	1.08	0.87	1.08
Tin, Sn (ppm)	1.52	1.39	1.64	1.39	1.64
Zinc, Zn (ppm)	60.9	58.6	63.1	59.7	62.0

*IND = Indeterminate; 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 91 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 91 (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	67.5	As	6.3	Ni	36.9
Al_2O_3	14.7	Ba	428	Pr	39.3
CaO	0.78	Be	2.8	Rb	10.2
Fe_2O_3	6.2	Cd	<0.5	Re	198
K_2O	3.5	Ce	89	Sb	<0.1
MgO	2.6	Cs	6.5	Sc	0.83
Na_2O	0.77	Dy	5.1	Sm	13.0
P_2O_5	0.16	Er	2.9	Sr	7.0
SO_3	0.21	Eu	1.3	Ta	34.8
TiO_2	0.73	Ga	16	Tb	0.90
MnO	0.09	Gd	5.9	Te	0.87
LOI	2.7	Hf	3.7	Th	<0.2
		Ho	1.0	Tl	16.1
C	0.11	In	0.14	Tm	1.0
		La	43.9	U	0.40
		Li	25.2	W	3.3
		Lu	0.38	Y	2.5
		Mo	<0.5	Yb	25.8
		Nb	13.3	Zr	2.7
		Nd	36.9		122

The approximate major and trace element composition of OREAS 91 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 91 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 91

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 91

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).

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

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

where $t_{1\text{-}x/2}(p\text{-}1)$ 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 91

Constituent	Recommended value	95% Confidence Interval	
		Low	High
4 Acid			
Silver, Ag (ppm)	<0.3	IND	IND
Bismuth, Bi (ppm)	1.01	0.94	1.08
Cobalt, Co (ppm)	14.2	13.8	14.7
Copper, Cu (ppm)	265	258	271
Lead, Pb (ppm)	5.16	4.74	5.59
Sulphur, S (ppm)	841	799	882
Antimony, Sb (ppm)	0.85	0.80	0.89
Selenium, Se (ppm)	1.28	0.84	1.73
Tin, Sn (ppm)	7.47	7.08	7.87
Zinc, Zn (ppm)	66.4	62.7	70.0
Aqua Regia			
Silver, Ag (ppm)	0.10	0.08	0.11
Bismuth, Bi (ppm)	1.07	0.98	1.15
Cobalt, Co (ppm)	14.2	13.5	14.9
Copper, Cu (ppm)	264	255	273
Lead, Pb (ppm)	4.29	4.03	4.55
Sulphur, S (ppm)	793	742	844
Antimony, Sb (ppm)	0.46	0.40	0.53
Selenium, Se (ppm)	0.97	0.87	1.08
Tin, Sn (ppm)	1.52	1.39	1.64
Zinc, Zn (ppm)	60.9	58.6	63.1

*IND - indeterminate; 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:

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

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 exp*ected within the tolerance* lim*its;*

k'_2 *is the factor for two* $-$ *sided tolerance* lim*its* (m, α *unknown*);

s''_g *is the corrected grand s* tan*dard 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 260 and 270 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:

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

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:

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

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

Table 3. Recommended values and tolerance limits for OREAS 91

Constituent	Recommended value	Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High
4 Acid			
Silver, Ag (ppm)	<0.3	IND	IND
Bismuth, Bi (ppm)	1.01	0.91	1.11
Cobalt, Co (ppm)	14.2	13.8	14.7
Copper, Cu (ppm)	265	260	270
Lead, Pb (ppm)	5.16	4.79	5.53
Sulphur, S (ppm)	841	794	887
Antimony, Sb (ppm)	0.85	0.78	0.91
Selenium, Se (ppm)	1.28	1.06	1.51
Tin, Sn (ppm)	7.47	7.16	7.79
Zinc, Zn (ppm)	66.4	64.1	68.7
Aqua Regia			
Silver, Ag (ppm)	0.10	0.08	0.11
Bismuth, Bi (ppm)	1.07	0.97	1.16
Cobalt, Co (ppm)	14.2	13.8	14.6
Copper, Cu (ppm)	264	260	268
Lead, Pb (ppm)	4.29	4.04	4.54
Sulphur, S (ppm)	793	780	806
Antimony, Sb (ppm)	0.46	0.42	0.51
Selenium, Se (ppm)	0.97	0.87	1.08
Tin, Sn (ppm)	1.52	1.39	1.64
Zinc, Zn (ppm)	60.9	59.7	62.0

*IND - indeterminate; 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.

Table 4. Performance gates for OREAS 91

Constituent	Recommended value	Performance Gates							
		1σ		2σ		3σ		5%	
		Low	High	Low	High	Low	High	Low	High
4 Acid									
Silver, Ag (ppm)	<0.3	IND	IND	IND	IND	IND	IND	IND	IND
Bismuth, Bi (ppm)	1.01	0.88	1.14	0.75	1.27	0.62	1.40	0.96	1.06
Cobalt, Co (ppm)	14.2	13.4	15.0	12.6	15.9	11.8	16.7	13.5	14.9
Copper, Cu (ppm)	265	252	278	239	291	226	304	252	278
Lead, Pb (ppm)	5.16	4.31	6.01	3.46	6.86	2.61	7.72	4.90	5.42
Sulphur, S (ppm)	841	763	918	686	995	608	1073	798	883
Antimony, Sb (ppm)	0.85	0.75	0.94	0.66	1.03	0.57	1.12	0.80	0.89
Selenium, Se (ppm)	1.28	0.72	1.85	0.15	2.41	0.00	2.98	1.22	1.35
Tin, Sn (ppm)	7.47	6.81	8.13	6.16	8.79	5.50	9.44	7.10	7.85
Zinc, Zn (ppm)	66.4	60.4	72.4	54.3	78.5	48.3	84.5	63.1	69.7
Aqua Regia									
Silver, Ag (ppm)	0.10	0.06	0.13	0.03	0.16	0.00	0.20	0.09	0.10
Bismuth, Bi (ppm)	1.07	0.90	1.23	0.74	1.40	0.57	1.56	1.01	1.12
Cobalt, Co (ppm)	14.2	12.9	15.5	11.5	16.9	10.2	18.2	13.5	14.9
Copper, Cu (ppm)	264	248	280	232	296	216	312	251	277
Lead, Pb (ppm)	4.29	3.81	4.78	3.32	5.26	2.83	5.75	4.08	4.50
Sulphur, S (ppm)	793	704	882	615	971	526	1060	753	833
Antimony, Sb (ppm)	0.46	0.35	0.57	0.25	0.68	0.14	0.79	0.44	0.49
Selenium, Se (ppm)	0.97	0.82	1.13	0.67	1.28	0.51	1.44	0.93	1.02
Tin, Sn (ppm)	1.52	1.28	1.75	1.04	1.99	0.81	2.23	1.44	1.59
Zinc, Zn (ppm)	60.9	56.4	65.3	52.0	69.7	47.6	74.2	57.8	63.9

*IND - indeterminate; values may appear asymmetric due to rounding

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.

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 91 has been prepared and certified and is supplied by:

Ore Research & Exploration Pty Ltd
6-8 Gatwick Road
Bayswater North, VIC 3153
AUSTRALIA

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

INTENDED USE

OREAS 91 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 91 has been prepared from a 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 91 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 91

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 91 (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 -
1	<0.5	0.1	0.10	<0.02	<0.01	0.103	0.1	<0.05	0.26	0.326	0.011	0.12	0.4	<0.5	0.18	NR
2	<0.5	<0.1	0.07	<0.02	<0.01	0.077	0.1	<0.05	0.24	0.304	0.015	0.13	0.2	<0.5	0.15	NR
3	<0.5	<0.1	0.08	<0.02	0.020	0.095	<0.1	<0.05	0.24	0.249	0.015	0.15	0.2	<0.5	0.15	NR
4	<0.5	<0.1	0.07	<0.02	<0.01	0.078	0.1	<0.05	0.28	0.394	0.015	0.14	0.2	<0.5	0.13	NR
5	<0.5	<0.1	0.07	**0.210**	0.020	0.084	<0.1	<0.05	0.26	0.273	0.022	0.12	0.3	<0.5	0.22	NR
Mean	<0.5	<0.1	0.078	<0.02	<0.01	0.087	0.100	<0.05	0.256	0.309	0.016	0.132	0.260	<0.5	0.166	
Median	<0.5	<0.1	0.070	<0.02	<0.01	0.084	0.100	<0.05	0.260	0.304	0.015	0.130	0.200	<0.5	0.150	
Std.Dev.	-	-	0.013	-	-	0.011	0.000	-	0.017	0.06	0.00	0.01	0.09	-	0.04	
Rel.Std.Dev.	-	-	16.7%	-	-	12.9%	0.00%	-	6.54%	18.0%	26.4%	9.88%	34.4%	-	21.1%	
PDM[3]	-	-	-50.0%	-	-	-44.0%	-35.9%	-	64.1%	98%	-89.9%	-15.41%	66.6%	-	6.4%	

Table A3. Analytical results for 4 acid bismuth in OREAS 91 (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 4A*MS
1	0.8	0.96	1.09	0.91	1.02	1.04	1.2	0.237	0.88	0.89	0.90	1.15	1.1	NR	1.09	NR
2	0.7	**1.19**	0.99	**1.21**	1.12	1.13	1.0	0.321	0.85	0.84	1.00	1.34	1.0	NR	0.99	NR
3	0.9	1.04	1.11	0.93	1.11	1.15	1.1	0.336	0.83	0.78	0.98	1.26	1.2	NR	1.04	NR
4	1.1	0.96	1.08	0.89	1.07	1.06	1.0	0.261	0.88	0.83	0.98	1.26	1.1	NR	1.01	NR
5	0.9	0.98	**0.88**	0.93	**0.84**	0.93	0.9	0.207	0.85	0.98	0.89	1.16	1.2	NR	1.09	NR
Mean	0.880	1.03	1.03	0.974	1.03	1.06	1.04	**0.272**	0.858	0.86	0.95	1.23	1.12		1.04	
Median	0.900	0.98	1.08	0.930	1.07	1.06	1.00	0.261	0.850	0.84	0.98	1.26	1.10		1.04	
Std.Dev.	0.15	0.10	0.10	0.13	0.11	0.09	0.11	0.05	0.02	0.07	0.05	0.08	0.08		0.05	
Rel.Std.Dev.	16.9%	9.49%	9.29%	13.7%	11.1%	8.19%	11.0%	20.2%	2.53%	8.60%	5.38%	6.42%	7.47%		4.37%	
PDM[3]	-12.6%	1.84%	2.24%	-3.32%	2.44%	5.42%	3.23%	-73.0%	-14.8%	-14.4%	-5.79%	22.5%	11.2%		3.63%	

Table A4. Analytical results for 4 acid cobalt in OREAS 91 (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 -
1	14	**14.9**	14.0	13.6	16.4	15.2	16.5	14.29	15.0	13.7	14.28	13.6	13.2	14	13.5	NR
2	14	15.5	13.8	13.4	16.6	16.1	15.5	14.01	15.0	13.6	13.98	13.9	13.9	14	13.8	NR
3	14	15.6	13.9	13.7	16.2	15.6	15.9	12.84	14.5	**12.4**	14.13	14.0	13.5	15	13.6	NR
4	15	15.7	14.3	13.6	16.1	15.7	16.7	12.78	16.0	13.8	14.13	14.0	14.0	13	13.4	NR
5	14	15.4	14.5	13.4	**14.8**	15.4	16.4	13.72	16.0	13.8	13.66	14.3	14.4	14	13.9	NR
Mean	14.2	15.4	14.1	13.5	**16.0**	15.6	**16.2**	13.5	15.3	13.5	14.0	14.0	13.8	14.0	13.6	
Median	14.0	15.5	14.0	13.6	16.2	15.6	16.4	13.7	15.0	13.7	14.1	14.0	13.9	14.0	13.6	
Std.Dev.	0.45	0.31	0.29	0.13	0.71	0.34	0.49	0.69	0.67	0.58	0.24	0.25	0.46	0.71	0.21	
Rel.Std.Dev.	3.15%	2.02%	2.07%	0.99%	4.42%	2.17%	3.02%	5.09%	4.38%	4.31%	1.69%	1.80%	3.36%	5.05%	1.52%	
PDM[3]	-0.20%	8.37%	-0.90%	-4.84%	12.6%	9.64%	13.9%	-4.92%	7.53%	-5.40%	-1.35%	-1.89%	-3.01%	-1.61%	-4.14%	

Table A5. Analytical results for 4 acid copper in OREAS 91 (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	275	269	256	**272**	244	284	**285**	278	260	275	262	254	240	281	252	NR
2	**269**	276	258	264	243	279	273	273	265	273	254	250	259	276	256	NR
3	277	272	257	262	245	286	272	**264**	260	270	262	251	253	274	273	NR
4	274	273	262	259	240	287	273	274	255	273	270	**241**	243	278	265	NR
5	273	273	259	260	**234**	278	**256**	275	255	**279**	242	248	263	277	**306**	NR
Mean	274	273	258	263	241	283	272	273	259	274	258	249	252	277	270	
Median	274	273	258	262	243	284	273	274	260	273	262	250	253	277	265	
Std.Dev.	3	3	2	5	4	4	10	5	4	3	11	5	10	3	22	
Rel.Std.Dev.	1.08%	0.92%	0.89%	1.97%	1.84%	1.45%	3.80%	1.98%	1.62%	1.19%	4.08%	1.96%	3.95%	0.93%	7.95%	
PDM[3]	3.34%	2.96%	-2.40%	-0.51%	-8.90%	6.81%	2.66%	3.04%	-2.17%	3.55%	-2.59%	-6.03%	-4.97%	4.70%	2.13%	

Table A6. Analytical results for 4 acid lead in OREAS 91 (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 -
1	4	6	5.1	4.8	5.1	5.23	5	4.74	5	6.2	4.13	6	4.0	6	5.6	NR
2	4	6	5.0	4.9	4.8	5.50	5	5.03	5	7.4	4.12	7	4.0	7	**4.9**	NR
3	4	6	4.8	4.8	4.7	5.91	5	5.15	5	6.5	4.18	5	4.1	5	5.4	NR
4	4	6	5.1	4.6	5.0	5.01	6	4.78	5	7.4	4.18	5	4.4	6	5.5	NR
5	4	5	4.9	4.5	4.3	5.31	7	4.85	5	6.6	4.34	5	4.2	6	5.4	NR
Mean	4.00	5.80	4.98	4.72	4.78	5.39	5.60	4.91	5.00	6.83	4.19	5.60	4.14	6.00	5.36	
Median	4.00	6.00	5.00	4.80	4.80	5.31	5.00	4.85	5.00	6.59	4.18	5.00	4.10	6.00	5.40	
Std.Dev.	0.00	0.45	0.13	0.16	0.31	0.34	0.89	0.17	0.00	0.56	0.09	0.89	0.17	0.71	0.27	
Rel.Std.Dev.	0.00%	7.71%	2.62%	3.48%	6.52%	6.28%	16.0%	3.52%	0.00%	8.24%	2.11%	16.0%	4.04%	11.79%	5.04%	
PDM[3]	-22.5%	12.4%	-3.51%	-8.55%	-7.39%	4.47%	8.50%	-4.84%	-3.12%	32.4%	-18.9%	8.50%	-19.8%	16.3%	3.85%	

Table A7. Analytical results for 4 acid and Leco (2 labs) sulphur in OREAS 91 (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	860	876	800	800	900	700	980	875	900	597	1669	765	710	900	800	600
2	860	888	800	800	900	700	990	**1019**	900	**551**	1722	745	760	900	800	700
3	940	859	800	800	800	800	960	976	900	592	1574	750	730	800	800	600
4	940	874	800	800	800	800	990	837	900	600	1816	755	760	800	800	600
5	900	904	800	800	800	700	940	857	900	575	**1289**	745	820	900	1000	600
Mean	900	880	800	800	840	740	972	913	900	**583**	**1614**	752	756	860	840	**620**
Median	900	876	800	800	800	700	980	875	900	592	1669	750	760	900	800	600
Std.Dev.	40	17	0	0	55	55	22	80	0	20	202	8	42	55	89	45
Rel.Std.Dev.	4.44%	1.91%	0.00%	0.00%	6.52%	7.40%	2.23%	8.76%	0.00%	3.51%	12.5%	1.11%	5.50%	6.37%	10.6%	7.21%
PDM[3]	7.08%	4.72%	-4.82%	-4.82%	-0.06%	-12.0%	15.6%	8.6%	7.08%	-30.6%	92.0%	-10.5%	-10.1%	2.32%	-0.06%	-26.2%

Table A8. Analytical results for 4 acid antimony in OREAS 91 (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	0.9	0.86	1.05	0.89	0.86	0.90	1.3	0.930	0.82	0.723	0.733	0.8	0.9	NR	0.82	NR
2	0.9	0.88	0.89	0.83	**0.96**	0.97	1.2	0.950	0.86	0.817	**0.804**	0.8	0.8	NR	0.83	NR
3	0.8	0.85	0.83	0.96	0.86	0.90	1.2	0.935	0.84	0.706	0.721	0.8	0.8	NR	0.82	NR
4	1.0	0.91	0.91	0.87	0.87	0.90	1.2	0.916	0.89	0.771	0.723	0.9	0.5	NR	0.80	NR
5	1.0	0.88	0.96	0.91	0.82	0.81	1.2	0.965	0.80	0.783	0.770	0.8	0.6	NR	**0.88**	NR
Mean	0.920	0.876	0.928	0.892	0.874	0.896	**1.22**	0.939	0.842	0.760	0.750	0.820	0.720		0.830	
Median	0.900	0.880	0.910	0.890	0.860	0.900	1.20	0.935	0.840	0.771	0.733	0.800	0.800		0.820	
Std.Dev.	0.084	0.023	0.083	0.048	0.052	0.057	0.045	0.019	0.035	0.045	0.036	0.045	0.164		0.030	
Rel.Std.Dev.	9.09%	2.63%	8.90%	5.40%	5.92%	6.34%	3.67%	2.01%	4.15%	5.93%	4.81%	5.45%	22.8%		3.61%	
PDM[3]	8.73%	3.53%	9.67%	5.42%	3.29%	5.89%	44.2%	11.0%	-0.49%	-10.2%	-11.3%	-3.09%	-14.9%		-1.91%	

Table A9. Analytical results for 4 acid selenium in OREAS 91 (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 -	Lab O 4A*MS	Lab P -
1	<5	<2	2	1.8	2	NR	<10	0.966	0.66	0.59	1.339	0.8	1.3	NR	<2	NR
2	<5	2	2	1.6	2	NR	<10	0.868	0.67	0.63	1.442	0.8	1.7	NR	<2	NR
3	<5	<2	2	1.8	2	NR	<10	0.709	0.62	0.63	1.353	0.9	1.9	NR	<2	NR
4	<5	<2	2	1.9	2	NR	<10	0.847	0.63	0.59	1.353	0.8	1.0	NR	<2	NR
5	<5	<2	2	1.7	2	NR	<10	0.790	0.60	0.53	1.294	0.7	1.9	NR	<2	NR
Mean	<5	<2.00	2.00	1.76	2.00		<10	0.836	0.636	0.592	1.356	0.800	1.560		<2	
Median	<5	<2.00	2.00	1.80	2.00		<10	0.847	0.630	0.587	1.353	0.800	1.700		<2	
Std.Dev.	-		0.00	0.11	0.00		-	0.10	0.03	0.04	0.05	0.07	0.40		-	
Rel.Std.Dev.	-		0.00%	6.48%	0.00%		-	11.37%	4.53%	7.14%	3.96%	8.84%	25.48%		-	
PDM[3]	-		56.0%	37.3%	56.0%		-	-34.8%	-50.4%	-53.8%	5.7%	-37.6%	21.7%		-	

Table A10. Analytical results for 4 acid tin in OREAS 91 (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	6	7.5	7.5	7.5	7.5	7.5	9.0	5.74	7	8.42	10.7	7.9	6.7	NR	7.3	NR
2	6	7.4	7.4	7.6	7.7	7.9	8.6	5.87	6	8.21	10.4	7.9	7.2	NR	7.2	NR
3	7	7.7	7.4	7.8	7.5	7.5	8.4	5.32	6	7.79	10.4	7.8	7.2	NR	7.2	NR
4	7	7.5	7.5	7.7	7.5	7.6	8.8	5.53	7	8.58	10.4	7.8	7.2	NR	6.8	NR
5	7	7.4	7.8	7.4	7.0	7.2	8.5	6.55	6	8.20	9.13	7.7	7.5	NR	7.4	NR
Mean	6.60	7.50	7.52	7.60	7.44	7.54	8.66	5.80	6.40	8.24	10.2	7.82	7.16		7.18	
Median	7.00	7.50	7.50	7.60	7.50	7.50	8.60	5.74	6.00	8.21	10.4	7.80	7.20		7.20	
Std.Dev.	0.55	0.12	0.16	0.16	0.26	0.25	0.24	0.47	0.55	0.30	0.61	0.08	0.29		0.23	
Rel.Std.Dev.	8.30%	1.63%	2.19%	2.08%	3.50%	3.33%	2.78%	8.06%	8.56%	3.59%	5.96%	1.07%	4.02%		3.18%	
PDM[3]	-11.67%	0.38%	0.65%	1.72%	-0.42%	0.92%	15.9%	-22.3%	-14.34%	10.3%	36.6%	4.7%	-4.17%		-3.90%	

Table A11. Analytical results for 4 acid zinc in OREAS 91 (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	69	96	62	66	60	88	73	66.3	65	76.3	61.9	59	60	74	72	NR
2	66	102	64	63	61	87	72	65.2	70	78.2	63.6	58	60	74	71	NR
3	68	99	63	62	60	90	**81**	64.3	70	77.4	62.5	58	59	74	71	NR
4	68	98	63	61	59	85	75	66.8	75	77.7	63.8	58	57	72	70	NR
5	70	99	64	61	57	85	72	65.6	65	75.9	63.8	57	62	72	71	NR
Mean	68.2	**98.8**	63.2	62.6	59.4	**87.0**	74.6	65.6	69.0	77.1	63.1	58.0	59.6	73.2	71.0	
Median	68.0	99.0	63.0	62.0	60.0	87.0	73.0	65.6	70.0	77.4	63.6	58.0	60.0	74.0	71.0	
Std.Dev.	1.5	2.2	0.8	2.1	1.5	2.1	3.8	1.0	4.2	1.0	0.9	0.7	1.8	1.1	0.7	
Rel.Std.Dev.	2.17%	2.19%	1.32%	3.31%	2.55%	2.44%	5.07%	1.50%	6.06%	1.26%	1.39%	1.22%	3.05%	1.50%	1.00%	
PDM[3]	2.7%	48.8%	-4.8%	-5.7%	-10.5%	31.0%	12.4%	-1.1%	3.9%	16.2%	-4.9%	-12.6%	-10.2%	10.3%	6.9%	

Table A12. Analytical results for aqua regia silver in OREAS 91 (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	0.05	0.03	0.09	0.05	0.08	0.09	<0.1	0.050	0.11	0.152	0.138	0.10	0.15	<0.5	0.12	<0.5
2	0.05	0.05	0.09	0.05	0.09	0.09	<0.1	0.054	0.11	0.131	0.161	0.10	0.15	<0.5	0.13	<0.5
3	0.05	0.07	0.09	0.05	0.13	0.08	<0.1	0.053	0.11	0.133	0.126	0.10	0.13	<0.5	0.12	<0.5
4	0.05	0.08	0.09	0.05	0.09	0.08	<0.1	0.080	0.11	0.121	0.148	0.09	0.12	<0.5	0.12	<0.5
5	0.05	0.07	0.09	0.06	0.09	0.09	<0.1	0.075	0.12	0.115	0.131	0.14	0.15	<0.5	0.08	<0.5
Mean	0.05	0.06	0.09	0.05	0.10	0.09	<0.1	0.06	0.11	0.13	0.14	0.11	0.14	<0.5	0.11	<0.5
Median	0.05	0.07	0.09	0.05	0.09	0.09	<0.1	0.05	0.11	0.13	0.14	0.10	0.15	<0.5	0.12	<0.5
Std.Dev.	0.00	0.02	0.00	0.00	0.02	0.01	-	0.01	0.00	0.01	0.01	0.02	0.01	-	0.02	-
Rel.Std.Dev.	0.00%	33.3%	0.00%	8.60%	20.31%	5.88%	-	22.5%	3.99%	10.9%	9.93%	18.4%	10.1%	-	17.1%	-
PDM[3]	-47.6%	-37.1%	-5.66%	-45.5%	0.63%	-9.44%	-	-34.4%	17.4%	36.6%	47.8%	11.1%	46.7%	-	19.5%	-

Table A13. Analytical results for aqua regia bismuth in OREAS 91 (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 -	Lab O AR*MS	Lab P -
1	1.02	0.79	**1.10**	1.04	0.97	1.19	1.0	0.984	1.22	0.99	1.25	1.15	1.20	NR	1.01	NR
2	1.06	0.82	0.85	0.95	**1.66**	1.17	1.1	0.898	1.18	1.01	1.27	1.06	1.10	NR	1.01	NR
3	1.02	0.80	0.82	0.88	1.02	1.14	1.2	1.50	1.11	1.14	1.42	1.08	1.20	NR	1.08	NR
4	1.02	0.91	0.83	0.95	1.08	**1.01**	1.2	1.16	1.09	0.82	1.38	**1.00**	1.20	NR	1.10	NR
5	**0.94**	0.90	0.82	0.82	1.06	1.24	1.2	1.13	1.19	0.93	1.54	1.10	1.10	NR	**0.750**	NR
Mean	1.01	0.84	0.88	0.93	1.16	1.15	1.14	1.14	1.16	0.97	1.373	1.08	1.16		0.990	
Median	1.02	0.82	0.83	0.95	1.06	1.17	1.20	1.13	1.18	0.99	1.385	1.08	1.20		1.010	
Std.Dev.	0.04	0.06	0.12	0.08	0.28	0.09	0.09	0.23	0.06	0.12	0.12	0.05	0.05		0.14	
Rel.Std.Dev.	4.33%	6.73%	13.73%	8.93%	24.50%	7.51%	7.85%	20.44%	4.78%	11.97%	8.64%	5.10%	4.72%		14.16%	
PDM[3]	-5.2%	-20.9%	-17.2%	-13.0%	8.5%	7.8%	6.8%	6.4%	8.5%	-8.6%	28.7%	1.0%	8.7%		-7.2%	

Table A14. Analytical results for aqua regia cobalt in OREAS 91 (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	14.5	**15.9**	15.2	11.6	14.5	14.1	15.2	15.86	15.5	14.1	14.46	12.9	13.3	13	12.5	13
2	14.5	16.7	15.5	11.8	14.5	**14.8**	14.9	16.49	15.0	14.6	14.14	12.9	13.6	13	12.8	14
3	14.0	17.2	15.6	11.4	14.4	**13.5**	15.7	15.89	15.0	14.3	13.89	12.8	14.0	13	12.7	14
4	15.0	16.7	14.8	11.9	14.4	14.0	14.4	17.03	15.5	14.1	13.40	12.9	13.9	12	12.9	13
5	14.5	16.9	15.2	11.6	15.2	14.0	14.8	15.35	15.5	14.3	13.25	13.0	14.4	13	**9.5**	13
Mean	14.5	16.7	15.3	11.7	14.6	14.1	15.0	16.1	15.3	14.3	13.8	12.9	13.8	12.8	12.1	13.4
Median	14.5	16.7	15.2	11.6	14.5	14.0	14.9	15.9	15.5	14.3	13.9	12.9	13.9	13.0	12.7	13.0
Std.Dev.	0.35	0.48	0.31	0.19	0.34	0.47	0.48	0.65	0.27	0.20	0.50	0.07	0.42	0.45	1.45	0.55
Rel.Std.Dev.	2.44%	2.89%	2.05%	1.67%	2.32%	3.31%	3.23%	4.01%	1.79%	1.42%	3.65%	0.55%	3.01%	3.49%	12.0%	4.09%
PDM[3]	2.14%	17.5%	7.5%	-17.9%	2.85%	-0.82%	5.66%	13.6%	7.78%	0.68%	-2.59%	-9.13%	-2.51%	-9.83%	-14.9%	-5.61%

Table A15. Analytical results for aqua regia copper in OREAS 91 (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	271	287	268	253	233	264	270	271	290	272	258	260	**234**	277	246	251
2	270	284	269	257	234	266	269	292	295	268	254	259	241	276	242	254
3	269	293	268	257	239	260	270	290	285	270	262	260	242	**270**	247	249
4	275	286	265	255	234	258	**264**	278	285	273	252	257	241	277	252	246
5	271	285	271	258	**244**	260	269	287	300	268	262	262	242	281	245	245
Mean	271	287	268	256	237	262	268	284	291	270	257	260	240	276	246	249
Median	271	286	268	257	234	260	269	287	290	270	258	260	241	277	246	249
Std.Dev.	2	4	2	2	5	3	3	9	7	2	4	2	3	4	4	4
Rel.Std.Dev.	0.84%	1.23%	0.81%	0.78%	1.97%	1.26%	0.94%	3.13%	2.24%	0.88%	1.72%	0.70%	1.41%	1.43%	1.48%	1.48%
PDM[3]	2.70%	8.69%	1.57%	-3.05%	-10.3%	-0.93%	1.64%	7.42%	10.2%	2.37%	-2.56%	-1.69%	-9.11%	4.60%	-6.69%	-5.70%

Table A16. Analytical results for aqua regia lead in OREAS 91 (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	4	4	4.0	3.8	4.0	4.24	4	4.48	4.5	4.06	1.43	6.4	4.0	6	4.8	6
2	4	4	4.0	3.9	4.4	4.06	4	4.83	4.5	4.03	1.00	6.1	4.0	5	4.4	6
3	4	4	4.2	3.5	4.5	3.88	5	5.47	4.5	3.84	0.87	6.1	4.0	5	4.5	6
4	4	4	3.8	3.8	4.1	4.03	5	4.40	4.5	3.62	1.88	6.3	4.3	5	4.7	6
5	4	4	4.0	3.5	4.1	**4.77**	5	5.10	4.5	3.97	1.75	6.1	4.4	5	**3.1**	6
Mean	4.00	4.00	4.00	3.70	4.22	4.20	4.60	4.86	4.50	3.90	**1.39**	**6.20**	4.14	5.20	4.30	**6.00**
Median	4.00	4.00	4.00	3.80	4.10	4.06	5.00	4.83	4.50	3.97	1.43	6.10	4.00	5.00	4.50	6.00
Std.Dev.	0.00	0.00	0.14	0.19	0.22	0.35	0.55	0.44	0.00	0.18	0.45	0.14	0.19	0.45	0.69	0.00
Rel.Std.Dev.	0.00%	0.00%	3.54%	5.06%	5.14%	8.23%	11.9%	9.16%	0.00%	4.61%	32.1%	2.28%	4.71%	8.60%	16.0%	0.00%
PDM[3]	-6.76%	-6.76%	-6.76%	-13.8%	-1.64%	-2.19%	7.22%	13.2%	4.89%	-9.02%	-67.7%	44.5%	-3.50%	21.2%	0.23%	39.9%

Table A17. Analytical results for aqua regia sulphur in OREAS 91 (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*MS	Lab E AR*MS	Lab F AR*MS	Lab G AR*MS	Lab H AR*MS	Lab I AR*MS	Lab J AR*OES	Lab K AR*MS	Lab L AR*OES	Lab M AR*OES	Lab N AR*MS	Lab O AR*OES	Lab P -
1	850	**843**	800	1400	7600	800	895	730	700	697	957	710	**704**	900	900	NR
2	900	833	700	1300	12400	800	841	786	700	703	943	700	729	900	800	NR
3	850	**865**	700	1200	6900	700	871	781	700	693	978	700	737	900	800	NR
4	900	833	800	1100	2100	800	848	745	700	691	927	700	733	800	800	NR
5	850	832	800	1000	6200	700	876	741	600	688	976	700	**750**	900	800	NR
Mean	870	841	760	**1200**	**7040**	760	866	757	680	694	956	702	731	880	820	
Median	850	833	800	1200	6900	800	871	745	700	693	957	700	733	900	800	
Std.Dev.	27	14	55	158.11	3680	55	22	25	45	6	22	4	17	45	45	
Rel.Std.Dev.	3.15%	1.67%	7.21%	13.2%	52.3%	7.21%	2.53%	3.35%	6.58%	0.84%	2.28%	0.64%	2.30%	5.08%	5.45%	
PDM[3]	9.7%	6.1%	-4.18%	51.3%	788%	-4.18%	9.2%	-4.59%	-14.27%	-12.46%	20.5%	-11.49%	-7.89%	10.9%	3.4%	

Table A18. Analytical results for aqua regia antimony in OREAS 91 (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 -
1	0.46	0.44	0.40	0.51	0.28	0.41	0.5	0.551	0.60	0.57	0.603	<0.5	0.3	NR	0.29	NR
2	0.44	0.42	0.43	0.53	0.28	0.40	0.5	0.586	0.63	0.54	0.559	<0.5	0.3	NR	0.27	NR
3	0.46	0.48	0.39	0.50	0.33	0.44	0.6	0.595	0.66	0.51	0.592	<0.5	0.4	NR	0.31	NR
4	0.48	0.48	0.39	0.51	0.31	0.41	0.5	0.512	0.65	0.52	0.599	<0.5	0.4	NR	0.31	NR
5	0.44	0.48	0.38	0.51	0.28	0.44	0.5	0.512	0.65	0.54	0.620	<0.5	0.4	NR	0.23	NR
Mean	0.456	0.460	0.398	0.512	0.296	0.420	0.520	0.551	0.638	0.535	0.595	<0.5	0.360		0.282	
Median	0.460	0.480	0.390	0.510	0.280	0.410	0.500	0.551	0.650	0.537	0.599	<0.5	0.400		0.290	
Std.Dev.	0.017	0.028	0.019	0.011	0.023	0.019	0.045	0.039	0.024	0.022	0.022	-	0.055		0.033	
Rel.Std.Dev.	3.67%	6.15%	4.83%	2.14%	7.78%	4.45%	8.60%	7.14%	3.74%	4.07%	3.76%	-	15.2%		11.9%	
PDM[3]	-1.74%	-0.88%	-14.2%	10.3%	-36.2%	-9.5%	12.1%	18.8%	37.5%	15.4%	28.2%	-	-22.4%		-39.2%	

Table A19. Analytical results for aqua regia selenium in OREAS 91 (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 -	Lab O AR*MS	Lab P -
1	<1	1	1.1	1.1	1.1	0.5	<5	1.03	0.75	0.56	0.836	0.9	1.6	NR	<1	NR
2	<1	1	0.9	1.0	1.2	0.5	<5	1.23	0.73	0.61	0.933	0.9	1.7	NR	<1	NR
3	<1	1	1.0	1.0	1.2	0.6	<5	1.28	0.75	**<0.5**	1.10	0.9	1.5	NR	<1	NR
4	<1	1	1.0	1.1	1.2	0.6	<5	0.771	0.81	0.52	0.933	0.9	1.5	NR	<1	NR
5	<1	1	1.0	1.0	1.2	0.5	<5	0.640	0.72	0.59	0.854	0.9	1.5	NR	<1	NR
Mean	<1	1.00	1.00	1.04	1.18	**0.540**	<5	0.989	0.752	**0.570**	0.931	0.900	**1.56**		<1	
Median	<1	1.00	1.00	1.00	1.20	0.500	<5	1.028	0.750	0.576	0.933	0.900	1.50		<1	
Std.Dev.	-	0.00	0.07	0.05	0.04	0.05	-	0.28	0.03	0.04	0.10	0.00	0.09		-	
Rel.Std.Dev.	-	0.00%	7.07%	5.27%	3.79%	10.1%	-	28.2%	4.64%	6.55%	11.2%	0.00%	5.73%		-	
PDM[3]	-	2.67%	2.67%	6.77%	21.1%	-44.6%	-	1.56%	-22.8%	-41.5%	-4.41%	-7.60%	60.2%		-	

Table A20. Analytical results for aqua regia tin in OREAS 91 (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 -	Lab O AR*MS	Lab P -
1	1.2	**1.87**	1.5	1.6	1.50	1.4	1	1.94	1.7	1.83	1.50	1.7	1.6	NR	1.2	NR
2	1.2	2.07	1.4	1.6	1.50	1.6	1	1.90	1.8	1.72	1.34	1.6	1.6	NR	1.2	NR
3	1.2	2.03	1.4	1.6	1.50	1.4	1	1.90	1.7	1.88	1.47	1.6	1.7	NR	1.2	NR
4	1.4	2.16	1.4	1.6	1.50	1.4	1	1.18	1.6	1.79	1.42	1.7	1.7	NR	1.2	NR
5	1.2	2.08	1.4	1.6	1.60	1.4	1	0.98	1.6	1.85	1.44	1.7	1.8	NR	0.8	NR
Mean	1.24	**2.04**	1.42	1.60	1.52	1.44	**1.00**	1.58	1.68	1.81	1.436	1.66	1.68		1.12	
Median	1.20	2.07	1.40	1.60	1.50	1.40	1.00	1.90	1.70	1.83	1.443	1.70	1.70		1.20	
Std.Dev.	0.09	0.11	0.04	0.00	0.04	0.09	0.00	0.46	0.08	0.06	0.06	0.05	0.08		0.18	
Rel.Std.Dev.	7.21%	5.24%	3.15%	0.00%	2.94%	6.21%	0.00%	29.18%	4.98%	3.42%	4.16%	3.30%	4.98%		15.97%	
PDM[3]	-18.2%	34.7%	-6.3%	5.5%	0.3%	-5.0%	-34.0%	4.3%	10.8%	19.7%	-5.3%	9.5%	10.8%		-26.1%	

Table A21. Analytical results for aqua regia zinc in OREAS 91 (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	60	65	56	55	55	60	65	64.4	62	64.5	66.4	57.0	55	68	66	57
2	57	67	56	56	55	61	66	67.3	68	64.9	64.1	57.1	57	68	59	57
3	59	64	57	55	56	57	65	66.5	63	**64.1**	65.1	57.4	57	67	62	57
4	58	62	56	56	56	61	63	63.4	67	64.7	61.8	56.9	56	68	61	57
5	57	60	56	57	58	58	65	62.6	72	64.7	63.5	57.3	57	68	59	57
Mean	58.2	63.6	56.2	55.8	56.0	59.4	64.8	64.8	66.4	64.6	64.2	57.1	56.4	67.8	61.4	57.0
Median	58.0	64.0	56.0	56.0	56.0	60.0	65.0	64.4	67.0	64.7	64.1	57.1	57.0	68.0	61.0	57.0
Std.Dev.	1.30	2.70	0.45	0.84	1.22	1.82	1.10	2.0	4.04	0.32	1.72	0.21	0.89	0.45	2.88	0.00
Rel.Std.Dev.	2.24%	4.25%	0.80%	1.50%	2.19%	3.06%	1.69%	3.08%	6.08%	0.49%	2.69%	0.36%	1.59%	0.66%	4.69%	0.00%
PDM[3]	-4.4%	4.5%	-7.7%	-8.3%	-8.0%	-2.4%	6.5%	6.5%	9.1%	6.1%	5.4%	-6.1%	-7.3%	11.4%	0.9%	-6.4%