GeoPT23 — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 23 (Separation Lake pegmatite, OU-9) and 23A (Manganese nodule, FeMn-1) / August 2008

Peter C. Webb[1]*, Michael Thompson[2], Philip J. Potts[1]

John S. Watson[1] and C. Kriete[3]

[1]Department of Earth Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

[2]Department of Chemistry, Birkbeck College, Gordon House, London, WC1H 0PP, UK.

[3]Bundesanstalt für Geowissenschaften und Rohstoffe, Stilleweg 2, 30655 Hannover.

*Corresponding author: e-mail p.c.webb@open.ac.uk

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Abstract

Results are presented for round twenty-three of GeoPT, the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. Two samples were distributed for this round: OU-9, a pegmatite, prepared at the Open University from material supplied by F. Breaks of the Ontario Geological Survey, Canada, and a supplementary sample, FeMn-1, a manganese nodule supplied by C. Kriete of BGR (Bundesanstalt für Geowissenschaften und Rohstoffe), Hannover. In this report, contributed data are listed, together with an assessment of consensus values, z-scores and charts showing the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This twenty-third round of the international proficiency testing programme, GeoPT, was conducted in a similar manner to earlier rounds. The programme is designed to be part of the routine quality assurance scheme of analytical geochemistry laboratories and the aims of the programme can be reviewed at http://www.geoanalyst.org/geopt.html. The programme is organised by the International Association of Geoanalysts and is conducted in accordance with a published protocol (http://www.geoanalyst.org/GeoPt-protocol.pdf). The overall aim of the programme is to provide participating laboratories with z-score information for each reported elemental determination, from which participating laboratories can decide whether the quality of their data is satisfactory in relation to both their chosen fitness-for-purpose criteria and results submitted by all the other laboratories contributing to the round and, therefore, choose to take corrective action if this appears justified.

Steering Committee for Round 23: P.C. Webb (results coordinator), M. Thompson (statistician), and P.J. Potts (advisor).

Sample details

(i) GeoPT23: OU-9, a pegmatite, from the Separation Lake pegmatite field was supplied as a coarsely crushed bulk sample by F. Breaks of the Ontario Geological Survey and was ground, homogenised and packeted at The Open University. The test material was analysed by WDXRF at the Open University for a range of major and trace elements and the data tested for consequential degree of heterogenity according to the Fearn test. In none of the cases for which valid data were obtained was any significant lack of homogeneity found, therefore the sample was considered suitable for use in the GeoPT proficiency testing programme.

(ii) GeoPT23A: FeMn-1, manganese nodule, was prepared as a candidate reference material by C. Kriete of BGR (Bundesanstalt für Geowissenschaften und Rohstoffe), Hannover. The material was produced from a mix of nodule samples obtained from the Peru Basin in the Pacific Ocean. Testing for homogeneity was carried out by the originating laboratory and the material considered suitable for use as a supplementary sample in the GeoPT proficiency testing programme.

Special instructions were issued to analysts in respect of FeMn-1. On account of the material being hygroscopic, the direction was issued that it must be dried for 48 h at 105 °C and then kept in a dessicator prior to analysis. Warning was given of the high cobalt content and the possibility that the material might sinter during LOI determination.

Timetable for round 23:

Distribution of samples: March 2008.
Deadline for submitting analytical results: 13th June 2008.
Distribution of draft report: September 2008

Submission of results

Results were submitted for GeoPT23 (OU-9) by 80 laboratories and are listed in Table 1. Results were submitted for GeoPT23A (FeMn-1) by 67 laboratories and are listed in Table 4. All of these data were used for the assessment of the respective assigned values. Data are also listed for two laboratories (X69 and X110) that submitted too late for inclusion in the data analysis.

Assigned values

Following procedures described in earlier rounds, a robust statistical procedure was used to derive assigned concentration values [X_a], these being judged to be the best estimates of the true composition of this sample. Values were assigned on the basis that: (i) sufficient laboratories had contributed data for an element, (ii) the statistical assessment gave confidence that the results distribution showed a central portion approximating to a normal distribution. Part of this assessment involved examining a bar chart of contributed data for each element to judge the distribution of results.

In this round, both samples were expected to be analytically challenging: the supplementary sample, FeMn-1, has a matrix that is unlike most samples analysed routinely in geochemical laboratories and the sample is more comparable to an oxide (or hydrated oxide) than a silicate; whereas OU-1, although a 'normal' silicate, has unusually high concentrations of several elements, yet many others are at very low concentrations. With unexpected matrix effects, some elemental concentrations outside the routine calibration ranges of many laboratories, many concentrations very close to detection limits, and the potential for incompatibility with routine QA procedures, it would not be surprising if the contributed results for many elements are of poorer quality than usual. This effect would be reflected by distributions of results characterised by greater dispersion than usual, and was indeed found to be true. Consequently, fewer values than normal could be assigned, and an unusually large number of values were designated provisional.

Table 2 lists for sample GeoPT23 the assigned and provisional values for 10 major element components and for 29 trace elements. Similarly, Table 5 lists for sample GeoPT23A the assigned and provisional values for 9 major element components and for 39 trace elements. Tables 2 and 5 show that one reason for a large number of values being identified as provisional was due to many uncertainty factors (sdm/H_a) being high (>0.6). However, in some cases when sdm/H_a values appeared acceptable (<0.6), the bar charts (Figures 1 and 4) revealed a tendency towards bi- or even multi- modal distributions and the best option was to designate these values as provisional only. Bimodality could be because groups of labs used different techniques for analysis or different procedures for calibration. In many more cases than usual, data distributions were significantly skewed, and a median value was often the preferred choice to be the consensus value rather than the robust mean. The preferred choices are listed for GeoPT23 and GeoPT23A respectively in Tables 2 and 5.

GeoPT23

Bar charts for 39 elements/components of GeoPT23 that were judged to have satisfactory distributions for assigned or provisional values to be given are shown in Figure 1, namely: SiO_2, *TiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO, CaO, *P_2O_5, *LOI, *Ba, *Ce, *Cs, Dy, Er, *Eu, Ga, Gd, *Ge, Ho, *La, *Li, Lu, *Nb, *Nd, Pr, Rb, Sb, Sc, Sm, *Ta, Tb, Th, Tl, Tm, U, *W, *Y and Zn. Of these, only provisional values could be given to those marked '*'.

Bar charts for the 26 elements/components: Fe(II)O, MgO, H_2O^+, CO_2, Ag, As, B, Be, Bi, Cd, Cl, Co, Cr, Cu, F, Hf, Mo, Ni, Pb, S, Se, Sn, Sr, V, Yb and Zr are plotted in Figure 2 for information only, where the data were not amenable to a reliable determination of a consensus.

Many distributions were characterised by greater dispersion of results than usual. This may have been a result of several factors creating more challenging analytical demands: such as concentrations near detection limits; unexpected interferences not taken into account; or, because this sample contains accessory/ore minerals such as columbite, tantalite and cassiterite, each containing high concentrations of trace elements, there may be a 'nugget' effect. The latter effect occurs when analysis has been carried out on small sub-samples, giving the impression that the sample is inhomogeneous. It should be remembered that any rock sample consisting of mineral grain fragments is inhomogeneous if sampled on a scale that

accommodates only small numbers of mineral grains, and in small analytical samples there may be very few accessory mineral grains, leading to a potential for larger sampling variations than usual.

For most major elements consensus values were assigned and based on robust means (Table 2). Some distributions (Figure 1) had the appearance of multimodality, largely on account of truncation of data reported at low concentrations: this applies especially to *TiO_2, *Fe_2O_3T, CaO and K_2O. The severity of the problem for MgO was such that no consensus value could be defined.

A large number of trace element results distributions were unusually dispersed, some were severely affected by the different performance of different techniques. In particular, at low concentrations XRF determinations commonly gave much higher values than ICP-MS measurements. This applied to a good many elements, most of which could only be reported as 'for information only'. A procedure for identifying mixed populations of data can be used to supply values that could represent an appropriate a consensus for such populations (Thompson, 2006). Estimated consensus values for some elements affected in this way are: for Hf, 1.12 ppm; for Mo, 0.22 ppm,; for Ni, 1.68 ppm; for Pb, 5.46 ppm, for V, 1.33 ppm;, and for Zr, 5.56 ppm. The same procedure gives populations for Sr centred at 9.54 ppm and 35.65 ppm. On inspection of the methods used to produce these data, the lower value largely represents ICP-MS data and the higher value largely represents XRF data. In this case it is clear that the unusually high Sr results are obtained by XRF on account of a severe Ta interference, not a significant problem in routinely analysed silicates and not normally taken into account, therefore the low value consensus is likely to be the more reliable. Nb also has a bimodal distribution with populations centred on 141.66 ppm and 171.11 ppm. A provisional value had been set between these, at 155.3 ppm. It turns out that low values of Nb are mainly derived from XRF analysis of powder pellets, high values by ICP-MS analysis with acid digestion. Curiously, in between there are some XRF and ICP-MS results by fusion. Low XRF results could be the result of unaccounted absorption of x-rays in the relatively high density ore mineral grains that contain Nb. There may also be differences in analytical calibration procedures that could account for the bimodality in this case.

GeoPT23A

Bar charts for 48 elements/components of GeoPT23A that were judged to have satisfactory distributions for assigned or provisional values to be given are shown in Figure 4, namely: *SiO_2, *TiO_2, *Al_2O_3, *Fe_2O_3T, *MnO, MgO, CaO, *P_2O_5, *LOI, *Ba, *Bi, *Cd, Ce, Co, *Cs, *Cu, Dy, Er, Eu, Gd, Hf, Ho, La, *Li, *Lu, *Mo, Nb, Nd, *Ni, Pb, *Pr, *Rb, *Sb, *Sc, Sm, Sr, *Ta, Tb, *Th, Tl, Tm, U, *V, *W, Y, Yb, Zn, and Zr. Of these, only provisional values could be given to those marked '*'.

Bar charts for the 16 elements/components: Na_2O, K_2O, CO_2, Ag, As, B, Be, Br, Cl, Cr, Ga, Ge, S, Se, Sn and Te are plotted in Figure 5 for information only, where the data were not amenable to a reliable determination of the consensus.

Most major elements were characterised by greater dispersion of results than usual, and most values were designated provisional. Only for MgO and CaO with smaller uncertainties were values assigned. In some instances, such as Al_2O_3, part of the data distribution pointed to a consensus, but a clear bimodality meant that at best the most believable consensus could only be regarded as provisional. In the case of TiO_2, apparent bimodality is caused by over-rounding of submitted data. For Na_2O and K_2O there was no clear consensus among slightly skewed distributions and not even a provisional value could be justified. Of trace elements, most of the REEs were assigned, though the less dispersed distributions might only reflect a more restricted range of analytical procedures in use. However, in some cases, a distinct bimodality, e.g. Pr, Lu meant that the preferred consensus value was regarded as provisional rather than assigned. In some instances, values were assigned on account of well-

defined normal distributions at the centre of the overall distribution, despite heavy tails, e.g. Hf, Th, thought to be due to the use of techniques with significantly poorer detection limits. One element for which surprisingly poor data was reported was Cr: although a good number of labs reported values around 10 ppm, more than a half reported over 20 ppm, and over a quarter in excess of 50 ppm (see Figure 5.

Like GeoPT23, there is evidence to believe that different analytical methods may be responsible for extended ranges and bimodality of some GeoPT23A results distributions. Further work is planned to evaluate this.

Z-score analysis

As in previous rounds, laboratories were invited to choose one of two performance standards against which their analytical results would be judged:

Data quality 1 for laboratories working to a 'pure geochemistry' standard of performance, where analytical results are designed for geochemical research and where care is taken to provide data of high precision and accuracy, sometimes at the expense of a reduced sample throughput rate. For GeoPT23, 1131 results of data quality 1 were submitted. For GeoPT23A, 1000 results of data quality 1 were submitted.

Data quality 2 for laboratories working to an 'applied geochemistry' standard of performance, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected, for example, as part of geochemical mapping projects or geochemical exploration programmes. For GeoPT23, 1527 results of data quality 2 were submitted. For GeoPT23A, 1489 results of data quality 2 were submitted.

The target standard deviation (H_a) for each element assessed was calculated from a modified form of the Horwitz function as follows:

$H_a = k.X_a^{0.8495}$

Where X_a is the concentration of the element expressed as a *fraction*, and the factor k = 0.01 for pure geochemistry labs and k=0.02 for applied geochemistry labs.

Z-scores were calculated for each elemental result submitted by each laboratory from:

$z = [X - X_a] / H_a$

where: X is the contributed result, X_a is the assigned value and H_a is the target standard deviation.

Z-score results for contributors to GeoPT23 are listed in Table 3 and for contributors to GeoPT23A in Table 6. Participating laboratories are invited to assess their performance using the following criterion:–

Z-score results in the range $-2<z<2$ are considered to be 'satisfactory' (in the sense that no action is called for by the participant). If the z-score for any element falls outside this range, it would be advisable for contributing laboratories to examine their procedures, and if necessary, take action to ensure that determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories in this round is plotted in multiple z-score charts for GeoPT23 in Figure 3 and for GeoPT23A in Figure 6. In these charts, the z-score performance for each element is distinguished by symbols that make it simple to identify whether the results were satisfactory or gave z-scores that exceeded the action limits. This chart is designed to help individual laboratories to judge their overall performance in this proficiency testing round.

It should be noted that in this round, the samples distributed were unusual in presenting non-routine analytical problems and a challenge to analysts. While participants should consider reasons for having unsatisfactory z-scores, their performance in the analysis of GeoPT23A does not necessarily reflect their routine performance in the analysis of silicate samples. Likewise, although GeoPT23 is a silicate sample and participants should expect to be able to analyse many of the elements successfully,

the presence of unusual concentrations means that an apparent unsatisfactory performance may not reflect routine performance in the analysis of more normal silicate samples. Guidance can be found in AMC Technical Briefs, No 11-Understanding and acting on scores obtained in proficiency testing schemes, and No 16-Proficiency testing: assessing z-scores in the longer term, which can be downloaded gratis from www.rsc.org/amc.

Participants should always review their z-scores in accord with their own fitness-for-purpose criteria.

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the GeoPT24 round, the sample for which is to be distributed during September 2008.

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The GeoPT programme is organised on behalf of the International Association of Geoanalysts.

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GeoPT22 - an international proficiency test for analytical geochemistry laboratories - report on round 22 / Jan 2008 (Basalt, MBL-1). International Association of Geoanalysts: Unpublished report.

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		2	2	1	1	2	2	1	2	1	1	2	2
SiO2	% m/m	76.61	80.1	79.8	74.24	79.86	79.45	79.98	76.5	77.72	80.010	80.16	79.71
TiO2	% m/m	0.07			0.07	0.052	0.064	0.08	0.0579	0.06	0.055	0.052	0.05
Al2O3	% m/m	12.33	12.7	12.3	14.25	12.42	12.44	12.53	12.8	11.83	12.308	12.10	12.34
Fe2O3	% m/m	0.72	0.753	0.77	1	0.734	0.742	0.71	0.761	0.78	0.722	0.58	0.74
Fe(II)O	% m/m						0.68			0.58			
MnO	% m/m	0.1048		0.11	0.14	0.111	0.11	0.11	0.107	0.11	0.107	0.102	0.108
MgO	% m/m	0		0.11	0.23	0.115	0.209			0.18	0.095	0.21	0.11
CaO	% m/m	0.35		0.29	0.46	0.332	0.299	0.48	0.319	0.35	0.284	0.26	0.29
Na2O	% m/m	4.1	4.28	4.29	6.83	4.18	4.205	4.16		4.15	4.161	4.19	4.11
K2O	% m/m	1.34	1.32	1.37	1.43	1.38	1.382	1.38	1.57	1.32	1.359	1.28	1.38
P2O5	% m/m	0.04		0.03	0.03	0.032	0.037			0.01	0.027	0.046	0.03
H2O+	% m/m												
CO2	% m/m												
LOI	% m/m	0.86		0.79	0.86	0.78	0.74	0.76		0.75	0.77	0.41	0.71
Ag	mg kg^{-1}				3.312								
As	mg kg^{-1}				2.747								
Au	mg kg^{-1}												
B	mg kg^{-1}				5.307								
Ba	mg kg^{-1}				6.192		13.9		7.2			63	
Be	mg kg^{-1}				71.510		75.7						
Bi	mg kg^{-1}				0.052								
Br	mg kg^{-1}								89.8				
Cd	mg kg^{-1}				0.029		1.1		1.3				
Ce	mg kg^{-1}	21			5.890		7.44		8.9				
Cl	mg kg^{-1}												
Co	mg kg^{-1}				0.272		0.6						4
Cr	mg kg^{-1}	7			12.627		52		77.9			19	10
Cs	mg kg^{-1}		383.2		424.966				509				
Cu	mg kg^{-1}				1.462		2.53		50.3				16
Dy	mg kg^{-1}				1.013		1.74						
Er	mg kg^{-1}				0.178		0.31						
Eu	mg kg^{-1}				0.031								
F	mg kg^{-1}												
Ga	mg kg^{-1}	58	60.0		56.532				61.6			56	
Gd	mg kg^{-1}				1.921		2.5						
Ge	mg kg^{-1}				4.290				7.2				
Hf	mg kg^{-1}				0.864		1.1						
Hg	mg kg^{-1}				1.827								
Ho	mg kg^{-1}				0.091		0.15						
I	mg kg^{-1}								9.7				
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	28			1.380		1.64		2.2				
Li	mg kg^{-1}				452.167		895						
Lu	mg kg^{-1}				0.022		0.03						
Mo	mg kg^{-1}				0.177		0.15						
N	mg kg^{-1}												
Nb	mg kg^{-1}	215	141.5		167.297		149		149			141	
Nd	mg kg^{-1}				4.224				6.8				
Ni	mg kg^{-1}	36			1.048				4.6				
Os	mg kg^{-1}												
Pb	mg kg^{-1}	15	13.9		4.321		5.7		13.1				
Pd	mg kg^{-1}				0.135								
Pr	mg kg^{-1}				0.977		5.31						
Pt	mg kg^{-1}				0.006								
Rb	mg kg^{-1}	2399	2590.8		2561.742		0.66		2854			2507	
Re	mg kg^{-1}												
Rh	mg kg^{-1}				0.007								
Ru	mg kg^{-1}												
S	mg kg^{-1}											11	
Sb	mg kg^{-1}				7.651		7.6						
Sc	mg kg^{-1}				2.654		2.61						
Se	mg kg^{-1}				0.189								
Sm	mg kg^{-1}				2.732		3.61						
Sn	mg kg^{-1}		134.8		93.759		105.2						
Sr	mg kg^{-1}	45	35.4		7.834		36		39.6			35	38
Ta	mg kg^{-1}		92.1		112.970				94.9				
Tb	mg kg^{-1}				0.289		0.5						
Te	mg kg^{-1}								3				
Th	mg kg^{-1}				4.465		5.6						
Tl	mg kg^{-1}		16.2		13.709								
Tm	mg kg^{-1}				0.026		0.05						
U	mg kg^{-1}		7.2		3.749		4.75						
V	mg kg^{-1}				1.277		4.4						
W	mg kg^{-1}				5.162								
Y	mg kg^{-1}	634			3.675		6.9					10	
Yb	mg kg^{-1}				0.187		0.35						
Zn	mg kg^{-1}	27	27.5		28.293		27.1		35.4			30	28
Zr	mg kg^{-1}	34			4.438		9.5		2.6				7

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X13	X14	X15	X15	X16	X17	X18	X19	X20	X21	X22	X23
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		1	1	1	2	2	2	2	2	1	1	1	1
SiO2	% m/m	82.975		79.96		79.26	82.498	80.05	77.23	79.18		79.57	79.99
TiO2	% m/m	0.061		0.062		0.05589		0.0544	0.42	0.055		0.04	0.05
Al2O3	% m/m	12.946		12.31		12.21	11.762	12.21	11.73	12.36		12.36	12.49
Fe2O3	% m/m	0.696		0.71		0.7184	0.73	0.679	2.93	0.731		0.78	0.76
Fe(II)O	% m/m							0.428	0.58				
MnO	% m/m	0.114			0.10	0.106	0.104	0.1006	0.06	0.105		0.11	0.11
MgO	% m/m				0.13	0.09232		0.088	0.25	0.131		0.1	0.13
CaO	% m/m	0.313				0.293		0.2828	1.23	0.307		0.3	0.28
Na2O	% m/m	4.206		4.12		4.092	3.796	4.475	3.85	4.21		4.25	4.2
K2O	% m/m	1.365		1.32		1.362	1.207	1.325	2.26	1.363		1.39	1.39
P2O5	% m/m	0.043			0.035	0.02839		0.0297	0.05	0.032		0.03	0.03
H2O+	% m/m								0.5				
CO2	% m/m							0.134	0.07				
LOI	% m/m	1.000			0.5	0.308		0.777	0.75	0.768		0.82	0.75
Ag	mg kg^{-1}				0.025						1.65		
As	mg kg^{-1}							3.870		4.1	2.57		
Au	mg kg^{-1}												
B	mg kg^{-1}				7.14								
Ba	mg kg^{-1}		7.99			15.1	6.9		8.3	8.10	9.12	8	8.33
Be	mg kg^{-1}				77.9		74.5	67.90	72.5		84.3	82.2	83.8
Bi	mg kg^{-1}										0.047		
Br	mg kg^{-1}									2			
Cd	mg kg^{-1}				0.015				0.02				0.03
Ce	mg kg^{-1}	22.0	7.6				6.77	6.900	9.4	8.73	7.41	7.55	7.76
Cl	mg kg^{-1}							148.0					
Co	mg kg^{-1}	0.1			0.35				0.3		0.29	0.33	0.26
Cr	mg kg^{-1}	2.6			17.5	10.5	9.8	10.80		11.8	11.9	15.7	15.3
Cs	mg kg^{-1}		350	280		383	399.78	395.0	374.9		390	424	462
Cu	mg kg^{-1}		5.22		2.18				2		0.64	1.08	1.82
Dy	mg kg^{-1}		1.86		1.75		1.56	1.710	1.8	1.99	1.57	1.81	1.67
Er	mg kg^{-1}		0.34		0.33			0.360	0.31	0.354	0.3	0.33	0.307
Eu	mg kg^{-1}		0.05		0.029				0.043	0.0445	0.047	0.044	0.045
F	mg kg^{-1}				2800								
Ga	mg kg^{-1}	72.3	63.1		54	58.1	54.79	53.60	52.49	57.5	55.9	55.2	57.14
Gd	mg kg^{-1}		2.96		2.68		2.41	2.860	2.86	3.30	2.1	2.68	2.74
Ge	mg kg^{-1}				3.74	1.8		5.300		5	5.06	5.44	
Hf	mg kg^{-1}	4.5	1.11		1.072		0.88	0.970	0.95	1.1	1.15	0.96	0.94
Hg	mg kg^{-1}												
Ho	mg kg^{-1}		0.17		0.16			0.160	0.164	0.185	0.14	0.17	0.151
I	mg kg^{-1}												
In	mg kg^{-1}										0.055		
Ir	mg kg^{-1}												
La	mg kg^{-1}	32.8	2.13					1.850	2.32	2.36	1.99	1.96	2.08
Li	mg kg^{-1}			720				710.0	725		712	788	620
Lu	mg kg^{-1}		0.04		0.04				0.042	0.043	0.034	0.04	0.036
Mo	mg kg^{-1}				0.34				0.2		0.31		0.16
N	mg kg^{-1}												
Nb	mg kg^{-1}	201.4	162		186	140	149.5	174.0	173.49	136	177	171	179
Nd	mg kg^{-1}	16.9	5.11		3.26		4.85	4.790	6.06	6.39	4.78	4.98	5.35
Ni	mg kg^{-1}	32.3			2	14.7		6.030		8.0	2.22	1.69	7
Os	mg kg^{-1}							-					
Pb	mg kg^{-1}	5.1				13.8		5.100	5.5	10.5	9.45	5.26	12
Pd	mg kg^{-1}							-					
Pr	mg kg^{-1}		1.25				1.14	1.070	1.4	1.56	1.17	1.18	1.29
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	3345.5	2290	2100		2510	2469.87	2390.0	2173.5	2582	2310	2605	2666
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}												
Sb	mg kg^{-1}				2.36			6.300	7.52	7.83	7.82		8.4
Sc	mg kg^{-1}	12.7			3.74		2.5	3.130	2.7		3.45	2.91	2.67
Se	mg kg^{-1}												
Sm	mg kg^{-1}		3.440		2.35		3.42	3.060	4	4.22	3.32	3.44	3.63
Sn	mg kg^{-1}				190	146	185.69	134.0		156	166		
Sr	mg kg^{-1}	18.1	8.46			31.5	6.68	29.90		35.4	9.33	9.11	
Ta	mg kg^{-1}	141.5	137		149	83.3	119.99	132.0	269	93.5	141	130	143
Tb	mg kg^{-1}		0.49		0.44		0.43	0.460	0.488	0.562	0.39	0.49	0.49
Te	mg kg^{-1}												0.24
Th	mg kg^{-1}	29.9	5.06		4.93		4.97	4.530	6.09	5.98	5.41	5.39	5.9
Tl	mg kg^{-1}				12		11.45	13.70	17.071	12.5	14.4		19.58
Tm	mg kg^{-1}		0.05		0.05				0.051	0.0538	0.045	0.052	0.045
U	mg kg^{-1}		4.42		3.75	7	4.11	4.180	4.71	4.61	5.06	4.53	4.54
V	mg kg^{-1}	7.1	1.53		3.4					2	0.32	1.27	4.9
W	mg kg^{-1}					5.4		6.520	5.7	5	6.62		6.35
Y	mg kg^{-1}	184.3	7.18		6	16.9	6.4	7.590	8.14	8.50	6.51	8.53	7.04
Yb	mg kg^{-1}		0.34		0.33			0.290	0.341	0.364	0.31	0.35	0.307
Zn	mg kg^{-1}	37.7	28.6		27	27.1	30	39.40	24	27.5	30.1	27.1	27.3
Zr	mg kg^{-1}	55.7	6.05		6.0	2.2	6.99	3.300	6	4.0	5.48	5.29	4.95

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X24	X25	X26	X27	X28	X29	X30	X31	X31	X32	X33	X34
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		2	2	2	2	2	1	2	1	2	2	1	1
SiO2	% m/m	79.69		79.975	79.36	77.26		79.043	79.7		79.32	77.2	*79.06*
TiO2	% m/m	0.05		0.0733	0.051	0.06		0.060	0.061		0.053	0.07	0.053
Al2O3	% m/m	12.33		11.750	12.25	12.69		12.257	12.38		12.48	12.49	12.181
Fe2O3	% m/m	0.70		0.738	0.72	0.79		0.744	0.763		0.76	0.74	0.774
Fe(II)O	% m/m	0.56											1.27
MnO	% m/m	0.11		0.0719	0.104	0.120		0.099	0.172		0.114	0.100	0.102
MgO	% m/m	0.13		0.151	0.11	0.10		0.139			0.11	0.18	0.12
CaO	% m/m	0.34		0.294	0.294	0.3		0.298	0.296		0.307	0.31	0.274
Na2O	% m/m	4.21		4.155	4.74	4.55		4.161	4.13		4.13	2.83	4.25
K2O	% m/m	1.40		1.302	1.32	1.4		1.398	1.351		1.36	1.5	1.369
P2O5	% m/m	0.03		0.0120	0.039	0.05		0.030			0.028		0.047
H2O+	% m/m	0.54											
CO2	% m/m												
LOI	% m/m	0.77		0.940	0.72	2.82		0.817	0.82		0.88		0.7
Ag	mg kg^{-1}												
As	mg kg^{-1}		2.82					1.0		2.4			
Au	mg kg^{-1}												
B	mg kg^{-1}												
Ba	mg kg^{-1}	8.79		31.7			8.7			16.5		14.2	8.19
Be	mg kg^{-1}	51.3	75.41	17			72			25			
Bi	mg kg^{-1}		0.07							2		3	
Br	mg kg^{-1}												
Cd	mg kg^{-1}	0.013										2.6	
Ce	mg kg^{-1}	6.67	7.55	3.36			6.73			6		13.9	7.99
Cl	mg kg^{-1}			96									
Co	mg kg^{-1}	0.31		2			0.47			0.25			0.23
Cr	mg kg^{-1}	21.0		15			13.3	11.3		21		19.8	11.79
Cs	mg kg^{-1}	418	419	371.80			338				398	438.7	385.9
Cu	mg kg^{-1}	1.27		8.4			1.32			1		3.9	1.006
Dy	mg kg^{-1}	1.67	1.62	1.12			1.8		1.7				1.769
Er	mg kg^{-1}	0.39	0.27	0.25			0.32		0.3				0.299
Eu	mg kg^{-1}	0.049	0.05	0.04			0.043						0.04
F	mg kg^{-1}			3344									
Ga	mg kg^{-1}	56.5	55.7				52.4	57.0		58	60	59.3	55.34
Gd	mg kg^{-1}	2.53	2.39	1.25			2.53		2.61				2.91
Ge	mg kg^{-1}		7.03	1.53								4.9	
Hf	mg kg^{-1}	1.10	1.26	1.63			0.93			2		3	1.196
Hg	mg kg^{-1}										0.0005		
Ho	mg kg^{-1}	0.18	0.15	0.12			0.17		0.16				0.164
I	mg kg^{-1}												
In	mg kg^{-1}											2.1	
Ir	mg kg^{-1}												
La	mg kg^{-1}	2.15	2.14	0.62			1.76	18.3		1.87		19	2.087
Li	mg kg^{-1}	788		644					1130				
Lu	mg kg^{-1}	0.052	0.04	0.04			0.037						0.042
Mo	mg kg^{-1}	0.23		2.80						0.12			
N	mg kg^{-1}												
Nb	mg kg^{-1}	186	157	172			160	142.3		140		128.4	179.38
Nd	mg kg^{-1}	4.08	4.79	2.50			4.64		5.05			15.2	5.7
Ni	mg kg^{-1}	1.38		4.60			1.13			2		1.8	0.554
Os	mg kg^{-1}												
Pb	mg kg^{-1}	5.11		13			5.31	14.0		10	20	4.6	5.98
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	1.08	1.19	12.75			1.17		1.18				1.398
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	2613		2377	2490		2346	2523.7		2500	2512	2424	2322
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}			71								58.6	
Sb	mg kg^{-1}											13.8	
Sc	mg kg^{-1}	2.87		3.6			2.7			2.5	3		1.216
Se	mg kg^{-1}											0.200	
Sm	mg kg^{-1}	2.86	3.12	1.74			3.18		3.42				3.760
Sn	mg kg^{-1}	99.8		160							204	189.2	
Sr	mg kg^{-1}	8.79		43			10.3	29.3		35	34	34.4	8.75
Ta	mg kg^{-1}		137	147.70			83.8			91	134	128.2	128.94
Tb	mg kg^{-1}	0.49	0.45	0.27			0.47		0.47				0.498
Te	mg kg^{-1}												
Th	mg kg^{-1}	4.81	5.59	4.60			4.95	1.3		4	11	14.9	5.16
Tl	mg kg^{-1}	16.0		12.62								10.5	
Tm	mg kg^{-1}	0.058	0.05	0.04			0.047						0.048
U	mg kg^{-1}	4.27	4.15	4.55			4.29			1.6		1.9	4.05
V	mg kg^{-1}			5.2			1.45	5.3		4		19.6	0.33
W	mg kg^{-1}	8.62	6.52	11.1						7		11.8	
Y	mg kg^{-1}	7.89	7.91	3.62			8.14	35.0		14	11	18.2	7.83
Yb	mg kg^{-1}	0.42	0.34	0.23			0.33		0.36				0.32
Zn	mg kg^{-1}	27.4					26.3	27.7		26	31	31.5	23
Zr	mg kg^{-1}	5.52		10			5.17	12.7		4.5	9	2.4	5.81
													SiO2 rev 6/10/08

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X35	X36	X37	X38	X39	X40	X40	X41	X41	X42	X43	X44
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		1	2	2	2	2	1	2	1	2	1	2	1
SiO2	% m/m	79.69	80.14	80.07	79.35	79.3		87.71	79.50		78.63	79.24	80.51
TiO2	% m/m	0.044	0.0534	0.06	0.053	0.059		0.05	0.05		0.08	0.056	0.07
Al2O3	% m/m	12.25	12.08	12.3	12.53	12.4	12.28		12.38		12.23	12.74	12.39
Fe2O3	% m/m	0.72	0.7513	0.75	0.73	0.80	0.74		0.72		0.76	0.72	0.85
Fe(II)O	% m/m		0.7						0.60				
MnO	% m/m	0.10	0.1052	0.11	0.11	0.054	0.10		0.107		0.1	0.104	0.111
MgO	% m/m	0.091	0.1247	0.09	0.022	0.043			0.09		0.117	0.113	0.14
CaO	% m/m	0.276	0.4362	0.29	0.378	0.32		0.22	0.27		0.32	0.327	0.29
Na2O	% m/m	4.16	4.098	3.99	4.318	4.07	4.26		4.20		4.11	4.13	3.43
K2O	% m/m	1.34	1.38	1.31	1.416	1.38	1.47		1.35		1.36	1.39	1.34
P2O5	% m/m	0.025		0.03	0.024	0.030			0.021		0.016	0.024	0.023
H2O+	% m/m												
CO2	% m/m												
LOI	% m/m		0.76	0.83	1.095	0.81			0.76		0.87	0.868	0.75
Ag	mg kg^{-1}												
As	mg kg^{-1}		1.20			2.48		2.6					7.2
Au	mg kg^{-1}												
B	mg kg^{-1}											95	
Ba	mg kg^{-1}		9.3	18	22.00	4.16			8.40		7.62	10	14
Be	mg kg^{-1}		44.7			53.2			80		39.27		
Bi	mg kg^{-1}					0.19							
Br	mg kg^{-1}						2.0						
Cd	mg kg^{-1}										0.41		
Ce	mg kg^{-1}		7.80			3.66	8.0		8.32		6.807	13	
Cl	mg kg^{-1}		118		120	122		170		82			
Co	mg kg^{-1}		0.437			0.23		0.32		3	0.698	0.5	1.6
Cr	mg kg^{-1}		18.6	12	4.70	16	12.3		18		15.3	10	17
Cs	mg kg^{-1}		416		438	298	409		443		393.67		397
Cu	mg kg^{-1}		4.08	6	0.60	1.3				6		9	
Dy	mg kg^{-1}		1.62			0.492	2.0		1.70		1.71		
Er	mg kg^{-1}		0.31			0.083			0.32		0.293		
Eu	mg kg^{-1}		0.42			0.02		0.16	0.05		0.061		
F	mg kg^{-1}		2780			2495			3208			2900	
Ga	mg kg^{-1}		48.4	54	65.70	47.2	50		68		58.73	46	57
Gd	mg kg^{-1}		2.64			0.90			3.03		5.057		
Ge	mg kg^{-1}		4.85	7									
Hf	mg kg^{-1}		1.35			0.97	1.18		1.06		1.033	2	5.7
Hg	mg kg^{-1}												
Ho	mg kg^{-1}		0.15			0.043			0.16		0.463		
I	mg kg^{-1}												
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}		2.09			0.893	1.85		2.12		1.94	2	
Li	mg kg^{-1}		33.233	656		1040					672.3	695	
Lu	mg kg^{-1}		0.038			0.013		0.045	0.04		0.041		
Mo	mg kg^{-1}		0.89			0.27						3	
N	mg kg^{-1}												
Nb	mg kg^{-1}		199	140	166.80	180			169		104.67	30	132
Nd	mg kg^{-1}		5.55			2.25			5.89		6.053	7	
Ni	mg kg^{-1}		6.76			1.6					3.083	0.5	10
Os	mg kg^{-1}												
Pb	mg kg^{-1}		6.39	16		4.87			7.47		6.323	15	5.9
Pd	mg kg^{-1}												
Pr	mg kg^{-1}		1.33			0.546			1.44				
Pt	mg kg^{-1}												
Rb	mg kg^{-1}		3030	2538	2725.00	2040	2520		2520		2433.3		2469
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}					177						238	
Sb	mg kg^{-1}		6.4	8	7.70	7.04	7.5				7.99		
Sc	mg kg^{-1}		8.753		2.70	5.1	2.73		3.08		2.56		
Se	mg kg^{-1}										0.1		1.2
Sm	mg kg^{-1}		3.44			1.37	2.93		3.95		3.75		
Sn	mg kg^{-1}		179	146	185.2	103							
Sr	mg kg^{-1}		46.1	34	14.7				36		33.8	36	33
Ta	mg kg^{-1}		132	123	91.7	117	125		126		151		87
Tb	mg kg^{-1}		0.47			0.15	0.45		0.52		0.538		
Te	mg kg^{-1}												
Th	mg kg^{-1}		5.23		1.7	2.26	4.72		6.25		5.12		
Tl	mg kg^{-1}		8.17			12.9					15.6		16
Tm	mg kg^{-1}		0.045			0.01			0.05				
U	mg kg^{-1}		5.72		0.6	2.7	4.2		4.73		4.66		5.7
V	mg kg^{-1}		6.76								0.867	1	
W	mg kg^{-1}		4.95	8		6.38	6.8				6.36		3.9
Y	mg kg^{-1}		9.69	35	7.60	1.56			7.95		17.67	12	
Yb	mg kg^{-1}		0.29			0.10			0.32		0.376		
Zn	mg kg^{-1}		29.7	26	24.80	24			29		23.33	27	25
Zr	mg kg^{-1}		6.9	4	4.60				5.20		7.67	6	2.2

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X45	X46	X47	X48	X49	X50	X51	X52	X53	X54	X55	X56
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		2	1	1	2	2	2	2	2	2	2	1	1
SiO2	% m/m		77.11	78.14	79.51	77.1	78.8	78.73		79.798	79.48	79.50	79.82
TiO2	% m/m	0.05	0.07	0.069	0.058	0.08	0.05	0.054		0.059	0.06	0.06	0.054
Al2O3	% m/m	11.27	11.91	10.08	12.41	13.1	12.3	12.7		12.457	*12.48*	13.60	13.33
Fe2O3	% m/m	0.68	0.7	0.66	0.73	0.9	0.76	0.75	0.786	0.854	0.82	0.79	0.57
Fe(II)O	% m/m		0.93								0.55		
MnO	% m/m	0.10	0.11	0.08	0.108	0.11	0.11	0.103	0.109	0.115	0.098	0.10	0.108
MgO	% m/m	0.08	0	0.96	0.075	0.09		0.09		0.265	0.13	0.13	0.06
CaO	% m/m	0.29	0.26	0.38	0.29	0.46	0.3	0.3	0.256	0.285	0.3	0.39	0.30
Na2O	% m/m	4.23	4.23	2.64	3.97	4.31	4	4.17		4.353	4.17	3.68	3.81
K2O	% m/m	1.34	1.45	1.28	1.36	2.13	1.3	1.34	1.156	1.371	1.39	1.30	1.22
P2O5	% m/m	0.02	0.02		0.031	0.05		0.033		0.048	0.04	0.05	0.058
H2O+	% m/m		0.64			0.01							
CO2	% m/m		0.08				0.1			0.264			
LOI	% m/m		0.72		0.73	0.97	0.73			0.813	0.78	0.74	0.74
Ag	mg kg^{-1}												
As	mg kg^{-1}		9										3
Au	mg kg^{-1}												
B	mg kg^{-1}						15						
Ba	mg kg^{-1}	5.73	6	22	16		10				380		189
Be	mg kg^{-1}			40			69						
Bi	mg kg^{-1}		8	95							5		
Br	mg kg^{-1}												
Cd	mg kg^{-1}		18	0.35							1.175		
Ce	mg kg^{-1}	5.0	0		17		7.8						
Cl	mg kg^{-1}		57		110	278		0.325					
Co	mg kg^{-1}	0.25	6	0.6			0.4				29		5
Cr	mg kg^{-1}	12.25	21	1.5	15	73	17				26		22
Cs	mg kg^{-1}	354.7	452		240						470		
Cu	mg kg^{-1}	0.75	3	13		90.3		32					2
Dy	mg kg^{-1}	1.1	2			61.6	1.6						
Er	mg kg^{-1}	0.2	2				0.3						
Eu	mg kg^{-1}	0.02	1				0.1						
F	mg kg^{-1}		2829		3200								
Ga	mg kg^{-1}	58	66		59	81.1	43	60	58		73		
Gd	mg kg^{-1}	1.8	1				2.1						
Ge	mg kg^{-1}						4.1						
Hf	mg kg^{-1}		2		2.7		1.1						
Hg	mg kg^{-1}												
Ho	mg kg^{-1}	0.10	0				0.2						
I	mg kg^{-1}												
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	1.2	0		29		2				32		
Li	mg kg^{-1}	626		775			713						
Lu	mg kg^{-1}	0.02											
Mo	mg kg^{-1}		6	2.3	4		0.2	6.6					
N	mg kg^{-1}												
Nb	mg kg^{-1}		167		137	269	203	130	149		159		58
Nd	mg kg^{-1}	3.3	7		1.4		4.9						
Ni	mg kg^{-1}	1.06	9	2.7		73.9	14	9			2		11
Os	mg kg^{-1}												
Pb	mg kg^{-1}	2.7	21	1.75	21		5.3	12			0.7		11
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	0.8	2		3		1.2						
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	2223	2880		2512	4180	2600	2443	2650		2524		2774
Re	mg kg^{-1}					87.2							
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}		0			147				250			130
Sb	mg kg^{-1}		35				8.7						
Sc	mg kg^{-1}	2.57	3		11	55.3							
Se	mg kg^{-1}			1									
Sm	mg kg^{-1}	2.2	1		1.5		3.1						
Sn	mg kg^{-1}		17		130		154				216		
Sr	mg kg^{-1}	31.58	41	28	37	73	38	19	37		34		38
Ta	mg kg^{-1}		121		135		118	119			131		
Tb	mg kg^{-1}	0.3	1				0.5						
Te	mg kg^{-1}												
Th	mg kg^{-1}	2.2	15		6		4.4	25					
Tl	mg kg^{-1}						14				13		
Tm	mg kg^{-1}	0.03											
U	mg kg^{-1}	2.2	3		3		4.6				14		
V	mg kg^{-1}	1.44	5		2						30		27
W	mg kg^{-1}		2		20						5		
Y	mg kg^{-1}	5.6	126		15	292	6.4	14	15		9		157
Yb	mg kg^{-1}	0.2	0										
Zn	mg kg^{-1}	32.77	34	26	31	67.3	33	37	37		30		37
Zr	mg kg^{-1}	5.78	26		4	7.2		11					10
											Al_2O_3 rev'd 9/10/08		

Table 1		GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)											
Lab identifier		X57	X57	X58	X59	X60	X61	X62	X63	X65	X66	X66	X67
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		1	2	2	2	1	2	1	1	2	1	2	2
SiO2	% m/m	79.80		78.776	80.165	78.63	79.3	78.053		80.3	79.52		83.57
TiO2	% m/m	0.059		0.055	0.05	0.06	0.06	0.0549		0.05	0.06		0.049
Al2O3	% m/m	12.28		12.326	12.549	12.30	12.4	12.124		12.33	12.24		11.1
Fe2O3	% m/m	0.72		0.779	0.729	0.66	0.75	0.736		0.73	0.701		0.656
Fe(II)O	% m/m										0.37		
MnO	% m/m	0.104		0.105	0.11	0.10	0.12	0.1090		0.11	0.106		0.051
MgO	% m/m	0.11		0.055	0.114	0.17	0.13	0.098		0.13	0.11		0.038
CaO	% m/m	0.30		0.293	0.293	0.29	0.29	0.282		0.28	0.28		0.168
Na2O	% m/m	4.12		4.145	4.248	4.23	4.42	4.117		4.21	4.17		1.73
K2O	% m/m	1.38		1.38	1.392	1.37	1.39	1.352		1.39	1.41		1.16
P2O5	% m/m	0.032		0.029	0.026	0.035	0.03	0.0313		0.03	0.027		0.033
H2O+	% m/m										0.76		0.855
CO2	% m/m												0.313
LOI	% m/m	0.84		0.775	0.788	1.28	0.78	0.720		0.91	0.75		1.2
Ag	mg kg^{-1}									0.5			0.02
As	mg kg^{-1}				1.8					3.5	2.07		2.4
Au	mg kg^{-1}												0.004
B	mg kg^{-1}									366			2
Ba	mg kg^{-1}	8.0		10.2	8.349	7.82	6.7	9.3	5.393	7.4			2
Be	mg kg^{-1}				58.65		27						0.08
Bi	mg kg^{-1}				0.0959					0.06	0.325		0.01
Br	mg kg^{-1}												2
Cd	mg kg^{-1}				0.7	0.04							0.02
Ce	mg kg^{-1}	7.44			6.46	7.83	7	7.682	4.565	6.7			0.03
Cl	mg kg^{-1}												304
Co	mg kg^{-1}	0.51		0.6	0.2195	0.52	3.2			0.4			0.16
Cr	mg kg^{-1}	15.07			8.6	7.02		15.5		12	12		7
Cs	mg kg^{-1}	414.0			404	419		405.8	375.33	421			386
Cu	mg kg^{-1}	3.1		5.48	2.4	2.00	3.7	0.6		6			5
Dy	mg kg^{-1}	2.12			1.533	1.43	0.9	2.042	1.12				0.15
Er	mg kg^{-1}	0.38			0.2397	0.24		0.332	0.206				0.02
Eu	mg kg^{-1}	0.045			0.0298	0.044		0.052	0.026				0.002
F	mg kg^{-1}										2390		
Ga	mg kg^{-1}	57.58			58.6	42.0		38.5		57.9			30
Gd	mg kg^{-1}	3.17			2.468	2.51	1.7	3.068	1.658	1.8			1.2
Ge	mg kg^{-1}				5.3					4.8			0.16
Hf	mg kg^{-1}	1.10			0.9444	0.900		1.083	0.849	0.99			0.18
Hg	mg kg^{-1}												0.001
Ho	mg kg^{-1}	0.19			0.1533	0.126		0.187	0.103				0.01
I	mg kg^{-1}												1
In	mg kg^{-1}												0.01
Ir	mg kg^{-1}												0.00002
La	mg kg^{-1}	4.40			1.753	1.84	1.3	2.051	1.111				0.2
Li	mg kg^{-1}				690	209	620			700	680		330
Lu	mg kg^{-1}	0.04			0.0496	0.032		0.039	0.031				0.02
Mo	mg kg^{-1}					0.34	0.7						0.19
N	mg kg^{-1}												
Nb	mg kg^{-1}	146.2			153.6	142		174.1	166.05	186	141		139
Nd	mg kg^{-1}	5.22			4.593	5.31		5.267	3.212				2.6
Ni	mg kg^{-1}	3.1		6.54	6.8	1.03	2	0.0		3	107		0.9
Os	mg kg^{-1}												0.0000009
Pb	mg kg^{-1}	7.45		28.9	5.305	5.06	5.3	6.889	4.499	8.5			3
Pd	mg kg^{-1}												0.0008
Pr	mg kg^{-1}	1.27			1.016	1.30		1.281	0.71				0.03
Pt	mg kg^{-1}												0.00001
Rb	mg kg^{-1}	2547			2628.2	2200		2551.7	2072.3	2495			2510
Re	mg kg^{-1}												0.00001
Rh	mg kg^{-1}												0.00002
Ru	mg kg^{-1}												0.000005
S	mg kg^{-1}												10
Sb	mg kg^{-1}				8.25	7.10	6.6			6.86	3.29		2.7
Sc	mg kg^{-1}	20.32			2.5	1.46		2.90					0.16
Se	mg kg^{-1}												0.3
Sm	mg kg^{-1}	3.65			2.955		3	3.676	2.04				0.8
Sn	mg kg^{-1}		191.5		186.7	3.47	210					200	170
Sr	mg kg^{-1}	9.18		37.1	36.6	7.52	26	9.7	5.92	8.34	36		4
Ta	mg kg^{-1}	135.9			112.1	43.3		140.4	110.1	137			150
Tb	mg kg^{-1}	0.59			0.4537	0.408	0.3	0.553	0.287				0.03
Te	mg kg^{-1}												0.15
Th	mg kg^{-1}	5.17			4.437	5.05	4	5.324	3.96				0.9
Tl	mg kg^{-1}				13.93	13.6	14	14.01					1.6
Tm	mg kg^{-1}	0.055			0.0493	0.038		0.055	0.032				0.01
U	mg kg^{-1}	4.44			4.364	4.15	4	4.382	3.41	3.9			2.6
V	mg kg^{-1}	1.35			2.1	1.72		1.9					0.1
W	mg kg^{-1}				6.151	5.20				6.45			0.4
Y	mg kg^{-1}	8.98			5.816	4.85	7.8	8.163	4.66				2.4
Yb	mg kg^{-1}	0.40			0.3685	0.274	0.2	0.338	0.231				0.02
Zn	mg kg^{-1}	25.7		37.2	29.4	18.50	27	28.0		34	38		7
Zr	mg kg^{-1}	5.02			4	3.36		5.7	4.93	11.6			0.9

Table 1		**GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)**											
Lab identifier		X68	**X69/late**	X70	X71	X72	X73	X73	X74	X75	X75	X76	X77
Sample		OU-9	**OU-9**	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality		2	**2**	2	2	2	1	2	2	1	2	2	1
SiO2	% m/m		*84.81*	79.29	75.5	79.15			79.54	79.617		79.25	79.76
TiO2	% m/m	0.047	*0.06*		0.05	0.055		0.0522	0.049	0.058		0.053	0.06
Al2O3	% m/m	11.9	*12.51*	12.61	12.15	12.31		11.43	12.27	12.483		12.435	12.25
Fe2O3	% m/m	0.717	*0.95*	0.73	0.69	0.77		0.645	0.72	0.72		0.736	0.74
Fe(II)O	% m/m					0.49			0.6				0.58
MnO	% m/m	0.108	*0.14*		0.11	0.11		0.1048	0.102	0.107		0.1055	0.11
MgO	% m/m	0.109	*0.17*		0.1	0.07		0.0925	0.102	0.136		0.125	0.09
CaO	% m/m	0.306	*0.33*	0.29	0.29	0.29		0.288	0.3	0.292		0.2895	0.3
Na2O	% m/m	4.20		4.27	4	4.14			4.26	4.212		4.34	4.14
K2O	% m/m		*1.07*	1.32	1.35	1.37			1.34	1.406		1.3885	1.35
P2O5	% m/m			0.03		0.025			0.025	0.031		0.028	0.03
H2O+	% m/m				0.7	0.58							
CO2	% m/m								0.18				
LOI	% m/m			0.71	0.79	0.84			0.81	0.79		0.86	0.72
Ag	mg kg^{-1}												
As	mg kg^{-1}		*221*	3.8	3.3	2.52							
Au	mg kg^{-1}												
B	mg kg^{-1}		*248*						6				
Ba	mg kg^{-1}	3.56	*13*	7.7	9	7.9	8				30.1		11
Be	mg kg^{-1}	72.9	*85*	66.1	65	69			64.7				
Bi	mg kg^{-1}		*< 20*		0.09								
Br	mg kg^{-1}												
Cd	mg kg^{-1}		*< 2*										
Ce	mg kg^{-1}	6.34		7.5	6.7	7.29	6.44						
Cl	mg kg^{-1}				190	114							
Co	mg kg^{-1}	0.27	*< 7*					0.261					
Cr	mg kg^{-1}	12	*59*			24.5					10.5	13	28
Cs	mg kg^{-1}	434		389	395	339	411.7		410				
Cu	mg kg^{-1}		*31*					1.4		3.3			
Dy	mg kg^{-1}			2.02	1.96	1.75	1.54						
Er	mg kg^{-1}			0.38	0.35	0.308	0.263						
Eu	mg kg^{-1}					0.042	0.0439						
F	mg kg^{-1}				2710	3000							
Ga	mg kg^{-1}			55.1	55	57.5			57		58.7		54
Gd	mg kg^{-1}			2.72	2.77	2.57	2.45						
Ge	mg kg^{-1}		*58*		6	5.27							
Hf	mg kg^{-1}					0.93	0.97						
Hg	mg kg^{-1}												
Ho	mg kg^{-1}			0.21	0.19	0.162	0.143						
I	mg kg^{-1}												
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	2.21			1.8	1.91	1.66						
Li	mg kg^{-1}	701	*633*	720	680	741		632	662				
Lu	mg kg^{-1}					0.04	0.0346						
Mo	mg kg^{-1}	0.80	*10*										
N	mg kg^{-1}												
Nb	mg kg^{-1}		*326*	*187*	194	151		168	148	134			145
Nd	mg kg^{-1}			5.1	5	4.86	4.35						
Ni	mg kg^{-1}					4.8				2.3			7
Os	mg kg^{-1}												
Pb	mg kg^{-1}	6.5	*60*			6.83	7.292		9		8.9	2	6
Pd	mg kg^{-1}												
Pr	mg kg^{-1}			1.39	1.23	1.19	1.051						
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	2527		2100	2560	2557	2495		2510	2558.3		2770	2520
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}		*300*										
Sb	mg kg^{-1}	8.3	*< 32*	7.81	7.3	7.99			8				
Sc	mg kg^{-1}	2.3		3	2.6				2.8				
Se	mg kg^{-1}		*< 40*										
Sm	mg kg^{-1}			3.46	3.4	3.36	3						
Sn	mg kg^{-1}	118	*340*		170	205			181				
Sr	mg kg^{-1}	37.4	*38*	9.3	40	8.6	8.73			37.7			39
Ta	mg kg^{-1}				151	143		121.3					150
Tb	mg kg^{-1}			0.56	0.51	0.474	0.441						
Te	mg kg^{-1}												
Th	mg kg^{-1}	5.04		5.28	4.9	5.39	4.58				4.6	2	
Tl	mg kg^{-1}	15.34			14.4								
Tm	mg kg^{-1}					0.049	0.0415						
U	mg kg^{-1}	4.72		4.74	4.62	4.42	4.39				4.6	9	18
V	mg kg^{-1}												22
W	mg kg^{-1}		*< 23*		6	6.13							
Y	mg kg^{-1}	6.57	*14*	8.3	8	8.11	6.2			15			8
Yb	mg kg^{-1}				0.4	0.334	0.294						
Zn	mg kg^{-1}	27.3	*18*	30	28	29.2		29.8	33	27.2		37	28
Zr	mg kg^{-1}				6.1	4.97	5.91			11.1			7
			Data not incl. in analysis	*Nb rev'd 6/10/08*									

Table 1		**GeoPT23 Analytical results for Separation Lake pegmatite, OU-9, as submitted (June 2008)**											
Lab identifier		X78	X79	X80	X81	X81	X82	**X110/late**					
Sample		OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	**OU-9**					
Data quality		1	2	2	1	2	1	**1**					
SiO2	% m/m		79.64	79.8	79.16			*79.263*					
TiO2	% m/m		0.05	0.06	0.07			*0.094*					
Al2O3	% m/m		12.5	17.2	12.32			*12.637*					
Fe2O3	% m/m	0.74	0.75	0.68	0.74			*0.178*					
Fe(II)O	% m/m												
MnO	% m/m		0.11	0.22	0.1			*0.29*					
MgO	% m/m		0.12	1.59	0.13			*0.077*					
CaO	% m/m		0.29	0.29	0.33			*0.615*					
Na2O	% m/m	4.12	4.08	6.66	4.19			*2.077*					
K2O	% m/m		1.36	1.49	1.35			*2.628*					
P2O5	% m/m		0.03	0.12	0.03			*0.354*					
H2O+	% m/m												
CO2	% m/m	0.104											
LOI	% m/m					0.93		*0.702*					
Ag	mg kg^{-1}			0.3	0								
As	mg kg^{-1}			5.54	4								
Au	mg kg^{-1}												
B	mg kg^{-1}												
Ba	mg kg^{-1}			376.4	9		8.99						
Be	mg kg^{-1}												
Bi	mg kg^{-1}				0		0.211						
Br	mg kg^{-1}				1								
Cd	mg kg^{-1}				0								
Ce	mg kg^{-1}				2		8.265						
Cl	mg kg^{-1}			28.04	70			*0.021*					
Co	mg kg^{-1}	6.5		8.74	0								
Cr	mg kg^{-1}	18	12	26.61	13								
Cs	mg kg^{-1}	457	446	2200	320		424.5						
Cu	mg kg^{-1}	0.92		5.4	6								
Dy	mg kg^{-1}						1.344						
Er	mg kg^{-1}						0.415						
Eu	mg kg^{-1}						0.209						
F	mg kg^{-1}												
Ga	mg kg^{-1}		62	14.97	56								
Gd	mg kg^{-1}						2.443						
Ge	mg kg^{-1}				4								
Hf	mg kg^{-1}				1		10.63						
Hg	mg kg^{-1}												
Ho	mg kg^{-1}						0.153						
I	mg kg^{-1}				0								
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	1.72			4		2.254						
Li	mg kg^{-1}		720				796.7						
Lu	mg kg^{-1}	0.02					0.071						
Mo	mg kg^{-1}				1		1.819						
N	mg kg^{-1}												
Nb	mg kg^{-1}		169	81.83	134		195.6	*0.037*					
Nd	mg kg^{-1}				7		6.339						
Ni	mg kg^{-1}		7	13.36	3								
Os	mg kg^{-1}												
Pb	mg kg^{-1}		15	58.86	17		7.51						
Pd	mg kg^{-1}												
Pr	mg kg^{-1}						1.388						
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	2655	2548	42.85	2540		2437.5	*0.617*					
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}	10		61380	40								
Sb	mg kg^{-1}	15.1			10								
Sc	mg kg^{-1}	2.7		3.15	0								
Se	mg kg^{-1}				0								
Sm	mg kg^{-1}	4.16			3		4.047						
Sn	mg kg^{-1}		209		121								
Sr	mg kg^{-1}		35	23.11	39		8.737						
Ta	mg kg^{-1}	156	134	8.19	125		118.21						
Tb	mg kg^{-1}	0.6					0.422						
Te	mg kg^{-1}				0								
Th	mg kg^{-1}	5.4	9		4		11.816						
Tl	mg kg^{-1}				13		14.16						
Tm	mg kg^{-1}						0.115						
U	mg kg^{-1}	6	6		1		4.711						
V	mg kg^{-1}			41	2								
W	mg kg^{-1}				0								
Y	mg kg^{-1}			2110	11		3.582						
Yb	mg kg^{-1}				0		0.506						
Zn	mg kg^{-1}		27	51.03	30								
Zr	mg kg^{-1}		7	37.17	6		14.504						
								Data not incl. in analysis					

Table 2 GeoPT23 Assigned values and statistical summary for contributed data (Separation Lake pegmatite, OU-9)

	X_a	H_a	n	sdm	sdm/H_a	Status	Assigned value is:
	% m/m	% m/m		% m/m			
SiO2	79.5	0.823	69	0.0821	0.100	Assigned	Median
TiO2	0.057	0.002	68	0.0010	0.543	Provisional	Robust mean
Al2O3	12.35	0.169	72	0.0339	0.200	Assigned	Robust mean
Fe2O3	0.74	0.015	74	0.0047	0.303	Assigned	Robust mean
MnO	0.11	0.003	71	0.0007	0.236	Assigned	Robust mean
CaO	0.29	0.007	70	0.0019	0.266	Assigned	Median
Na2O	4.17	0.067	71	0.0155	0.230	Assigned	Robust mean
K2O	1.36	0.026	71	0.0055	0.209	Assigned	Robust mean
P2O5	0.03	0.001	59	0.0006	0.569	Provisional	Median
LOI	0.78	0.016	59	0.0097	0.596	Provisional	Median
	mg/kg	mg/kg		mg/kg			
Ba	8.75	0.505	52	0.308	0.611	Provisional	Median
Ce	7.24	0.430	45	0.252	0.587	Provisional	Robust mean
Cs	403.3	13.08	48	6.002	0.459	Assigned	Robust mean
Dy	1.70	0.126	38	0.038	0.307	Assigned	Median
Er	0.30	0.029	34	0.012	0.397	Assigned	Robust mean
Eu	0.05	0.006	30	0.003	0.562	Provisional	Robust mean
Ga	56.6	2.47	56	0.681	0.276	Assigned	Robust mean
Gd	2.53	0.176	37	0.080	0.457	Assigned	Median
Ge	4.95	0.311	20	0.250	0.804	Provisional	Median
Ho	0.15	0.016	34	0.006	0.388	Assigned	Robust mean
La	2.03	0.146	45	0.105	0.719	Provisional	Robust mean
Li	694.6	20.75	33	14.80	0.713	Provisional	Robust mean
Lu	0.04	0.005	30	0.001	0.182	Assigned	Median
Nb	155.3	5.81	60	3.158	0.543	Provisional	Median
Nd	5.07	0.318	40	0.224	0.705	Provisional	Robust mean
Pr	1.24	0.096	34	0.044	0.456	Assigned	Robust mean
Rb	2501	61.6	64	22.17	0.360	Assigned	Robust mean
Sb	7.67	0.451	30	0.210	0.465	Assigned	Robust mean
Sc	2.77	0.190	38	0.064	0.336	Assigned	Median
Sm	3.15	0.212	39	0.117	0.552	Assigned	Robust mean
Ta	124.7	4.83	50	3.270	0.678	Provisional	Robust mean
Tb	0.46	0.041	38	0.016	0.383	Assigned	Robust mean
Th	5.08	0.318	50	0.172	0.540	Assigned	Robust mean
Tl	13.80	0.743	27	0.386	0.519	Assigned	Robust mean
Tm	0.05	0.006	27	0.001	0.185	Assigned	Median
U	4.37	0.280	52	0.158	0.566	Assigned	Robust mean
W	6.10	0.372	28	0.332	0.893	Provisional	Robust mean
Y	8.14	0.475	57	0.420	0.885	Provisional	Median
Zn	28.15	1.362	64	0.353	0.259	Assigned	Median

where: X_a = Consensus value
H_a = Horwitz Target value
n = no. of contributed data
sdm = Uncertainty of assigned value
sdm/Ha = Uncertainty/Horwitz Target value

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	2	1	1	2	2	1	2	1	1	2
SiO2	-1.76	0.36	0.36	-6.39	0.22	-0.03	0.58	-1.82	-2.16	0.62	0.40
TiO2	3.61	*	*	7.21	-1.50	1.90	12.89	0.17	1.54	-1.30	-1.50
Al2O3	-0.06	1.03	-0.30	11.23	0.21	0.26	1.06	1.33	-3.08	-0.25	-0.74
Fe2O3	-0.57	0.50	2.10	17.00	-0.12	0.14	-1.78	0.76	2.75	-1.01	-5.10
MnO	-0.26	*	1.22	11.29	0.78	0.61	1.22	0.11	1.22	0.22	-0.73
CaO	3.96	*	-0.57	23.48	2.69	0.35	26.31	1.77	7.92	-1.41	-2.40
Na2O	-0.50	0.84	1.83	39.62	0.10	0.28	-0.10	*	-0.25	-0.09	0.17
K2O	-0.46	-0.84	0.23	2.54	0.31	0.35	0.62	3.96	-1.69	-0.19	-1.61
P2O5	4.92	*	0.00	0.00	0.98	3.44	*	*	-19.67	-2.95	7.87
LOI	2.47	*	0.62	4.94	0.00	-1.24	-1.24	*	-1.85	-0.62	-11.42
Ba	*	*	*	-5.06	*	5.11	*	-1.53	*	*	53.75
Ce	16.01	*	*	-3.14	*	0.23	*	1.93	*	*	*
Cs	*	-0.77	*	1.66	*	*	*	4.04	*	*	*
Dy	*	*	*	-5.47	*	0.16	*	*	*	*	*
Er	*	*	*	-4.31	*	0.12	*	*	*	*	*
Eu	*	*	*	-2.53	*	*	*	*	*	*	*
Ga	0.28	0.69	*	-0.03	*	*	*	1.01	*	*	-0.12
Gd	*	*	*	-3.46	*	-0.09	*	*	*	*	*
Ge	*	*	*	-2.12	*	*	*	3.61	*	*	*
Ho	*	*	*	-3.84	*	-0.11	*	*	*	*	*
La	89.02	*	*	-4.45	*	-1.33	*	0.59	*	*	*
Li	*	*	*	-11.68	*	4.83	*	*	*	*	*
Lu	*	*	*	-3.47	*	-0.96	*	*	*	*	*
Nb	5.14	-1.19	*	2.06	*	-0.54	*	-0.54	*	*	-1.23
Nd	*	*	*	-2.68	*	*	*	2.71	*	*	*
Pr	*	*	*	-2.71	*	21.27	*	*	*	*	*
Rb	-0.82	0.73	*	0.99	*	-20.29	*	2.87	*	*	0.05
Sb	*	*	*	-0.04	*	-0.08	*	*	*	*	*
Sc	*	*	*	-0.59	*	-0.41	*	*	*	*	*
Sm	*	*	*	-1.99	*	1.08	*	*	*	*	*
Ta	*	-3.38	*	-2.44	*	*	*	-3.09	*	*	*
Tb	*	*	*	-4.10	*	0.51	*	*	*	*	*
Th	*	*	*	-1.94	*	0.81	*	*	*	*	*
Tl	*	1.62	*	-0.12	*	*	*	*	*	*	*
Tm	*	*	*	-3.73	*	0.08	*	*	*	*	*
U	*	5.05	*	-2.22	*	0.68	*	*	*	*	*
W	*	*	*	-2.53	*	*	*	*	*	*	*
Y	658.98	*	*	-9.40	*	-1.31	*	*	*	*	1.96
Zn	-0.42	-0.24	*	0.11	*	-0.38	*	2.66	*	*	0.68

† *Source data not included in analysis*

N.B. See text before interpreting these results

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X12	X13	X14	X15	X15	X16	X17	X18	X19	X20	X21
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	1	1	1	2	2	2	2	2	1	1
SiO2	0.13	4.22	*	0.56	*	-0.15	1.82	0.33	-1.38	-0.39	*
TiO2	-2.07	2.10	*	2.67	*	-0.40	*	-0.82	102.93	-1.30	*
Al2O3	-0.03	3.52	*	-0.24	*	-0.42	-1.74	-0.42	-1.83	0.06	*
Fe2O3	0.08	-2.69	*	-1.78	*	-0.62	-0.24	-1.90	70.99	-0.42	*
MnO	0.28	2.56	*	*	-1.07	-0.06	-0.40	-0.97	-7.78	-0.46	*
CaO	-0.28	2.69	*	*	*	-0.07	*	-0.79	66.20	1.84	*
Na2O	-0.42	0.58	*	-0.70	*	-0.56	-2.76	2.29	-2.36	0.64	*
K2O	0.31	0.04	*	-1.69	*	-0.04	-3.01	-0.75	17.21	-0.04	*
P2O5	0.00	12.78	*	*	2.46	-0.79	*	-0.15	9.83	1.97	*
LOI	-2.16	13.59	*	*	-8.65	-14.57	*	-0.09	-0.93	-0.74	*
Ba	*	*	-1.50	*	*	6.30	-1.83	*	-0.44	-1.28	0.74
Ce	*	34.34	0.84	*	*	*	-0.55	-0.39	2.51	3.47	0.40
Cs	*	*	-4.07	-9.43	*	-0.77	-0.13	-0.32	-1.08	*	-1.01
Dy	*	*	1.28	*	0.20	*	-0.56	0.04	0.40	2.31	-1.04
Er	*	*	1.27	*	0.46	*	*	0.98	0.12	1.75	-0.11
Eu	*	*	0.74	*	-1.44	*	*	*	-0.23	-0.20	0.23
Ga	*	6.37	2.64	*	-0.53	0.31	-0.37	-0.61	-0.83	0.37	-0.28
Gd	*	*	2.44	*	0.43	*	-0.34	0.94	0.94	4.38	-2.44
Ge	*	*	*	*	-1.94	-5.06	*	0.56	*	0.16	0.35
Ho	*	*	1.01	*	0.20	*	*	0.20	0.32	1.93	-0.84
La	*	210.94	0.69	*	*	*	*	-0.61	1.00	2.27	-0.27
Li	*	*	*	1.22	*	*	*	0.37	0.73	*	0.84
Lu	*	*	0.00	*	0.00	*	*	*	0.19	0.58	-1.16
Nb	*	7.93	1.15	*	2.64	-1.32	-0.50	1.61	1.56	-3.32	3.73
Nd	*	37.20	0.11	*	-2.85	*	-0.35	-0.45	1.55	4.14	-0.93
Pr	*	*	0.14	*	*	*	-0.50	-0.87	0.86	3.38	-0.69
Rb	*	13.71	-3.42	-6.50	*	0.08	-0.25	-0.90	-2.66	1.32	-3.09
Sb	*	*	*	*	-5.88	*	*	-1.52	-0.17	0.36	0.33
Sc	*	52.35	*	*	2.57	*	-0.70	0.96	-0.17	*	3.61
Sm	*	*	1.35	*	-1.89	*	0.63	-0.22	2.00	5.03	0.79
Ta	*	3.47	2.54	*	2.51	-4.29	-0.49	0.75	14.95	-6.47	3.37
Tb	*	*	0.78	*	-0.22	*	-0.34	0.03	0.37	2.53	-1.65
Th	*	77.95	-0.08	*	-0.24	*	-0.18	-0.87	1.58	2.81	1.02
Tl	*	*	*	*	-1.21	*	-1.58	-0.06	2.20	-1.74	0.81
Tm	*	*	0.16	*	0.08	*	*	*	0.16	0.78	-0.65
U	*	*	0.18	*	-1.11	4.70	-0.46	-0.34	0.61	0.86	2.47
W	*	*	*	*	*	-0.94	*	0.56	-0.54	-2.96	1.40
Y	*	370.96	-2.02	*	-2.25	9.22	-1.83	-0.58	0.00	0.76	-3.43
Zn	-0.05	7.01	0.33	*	-0.42	-0.38	0.68	4.13	-1.52	-0.47	1.43

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X22	X23	X24	X25	X26	X27	X28	X29	X30	X31	X31
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	1	1	2	2	2	2	2	1	2	1	2
SiO2	0.09	0.60	0.12	*	0.29	-0.09	-1.36	*	-0.28	0.24	*
TiO2	-9.81	-4.14	-2.07	*	4.54	-1.79	0.77	*	0.77	2.10	*
Al2O3	0.06	0.82	-0.06	*	-1.77	-0.30	1.00	*	-0.28	0.17	*
Fe2O3	2.75	1.45	-1.22	*	0.01	-0.57	1.70	*	0.21	1.65	*
MnO	1.22	1.22	0.61	*	-5.78	-0.40	2.29	*	-1.23	22.03	*
CaO	0.85	-1.98	3.25	*	0.00	0.00	0.42	*	0.28	0.28	*
Na2O	1.24	0.49	0.32	*	-0.09	4.26	2.85	*	-0.04	-0.55	*
K2O	1.00	1.00	0.69	*	-1.19	-0.84	0.69	*	0.65	-0.50	*
P2O5	0.00	0.00	0.00	*	-8.85	4.42	9.83	*	0.00	*	*
LOI	2.47	-1.85	-0.31	*	4.94	-1.85	62.99	*	1.14	2.47	*
Ba	-1.48	-0.82	0.05	*	22.74	*	*	-0.09	*	*	7.68
Ce	0.72	1.21	-0.66	0.36	-4.51	*	*	-1.18	*	*	-1.44
Cs	1.59	4.49	0.56	0.60	-1.20	*	*	-4.99	*	*	*
Dy	0.88	-0.24	-0.12	-0.32	-2.31	*	*	0.80	*	0.00	*
Er	0.92	0.13	1.49	-0.57	-0.92	*	*	0.58	*	-0.11	*
Eu	-0.29	-0.12	0.29	0.37	-0.49	*	*	-0.46	*	*	*
Ga	-0.57	0.22	-0.02	-0.18	*	*	*	-1.70	0.08	*	0.28
Gd	0.85	1.19	0.00	-0.40	-3.64	*	*	0.00	*	0.45	*
Ge	1.57	*	*	3.34	-5.49	*	*	*	*	*	*
Ho	1.01	-0.16	0.81	-0.11	-1.03	*	*	1.01	*	0.39	*
La	-0.47	0.35	0.42	0.38	-4.83	*	*	-1.84	55.77	*	-0.54
Li	4.50	-3.59	2.25	*	-1.22	*	*	*	*	20.98	*
Lu	0.00	-0.77	1.16	0.00	0.00	*	*	-0.58	*	*	*
Nb	2.70	4.08	2.64	0.15	1.44	*	*	0.81	-1.12	*	-1.32
Nd	-0.30	0.87	-1.57	-0.45	-4.05	*	*	-1.37	*	-0.08	*
Pr	-0.59	0.56	-0.82	-0.24	60.11	*	*	-0.69	*	-0.59	*
Rb	1.69	2.68	0.91	*	-1.00	-0.09	*	-2.51	0.19	*	-0.01
Sb	*	1.62	*	*	*	*	*	*	*	*	*
Sc	0.76	-0.50	0.28	*	2.20	*	*	-0.34	*	*	-0.70
Sm	1.35	2.25	-0.69	-0.08	-3.33	*	*	0.13	*	1.26	*
Ta	1.09	3.78	*	1.27	2.38	*	*	-8.48	*	*	-3.50
Tb	0.78	0.78	0.39	-0.09	-2.28	*	*	0.30	*	0.30	*
Th	0.96	2.56	-0.43	0.79	-0.76	*	*	-0.42	-5.94	*	-1.70
Tl	*	7.78	1.48	*	-0.79	*	*	*	*	*	*
Tm	0.49	-0.65	0.73	0.08	-0.73	*	*	-0.32	*	*	*
U	0.57	0.61	-0.18	-0.39	0.32	*	*	-0.29	*	*	-4.95
W	*	0.67	3.39	0.56	6.73	*	*	*	*	*	1.21
Y	0.82	-2.32	-0.26	-0.24	-4.76	*	*	0.00	28.28	*	6.17
Zn	-0.77	-0.62	-0.27	*	*	*	*	-1.36	-0.16	*	-0.79

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X32	X33	X34	X35	X36	X37	X38	X39	X40	X40	X41
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	1	1	1	2	2	2	2	1	2	1
SiO2	-0.11	-2.79	*-0.53*	0.23	0.39	0.35	-0.09	-0.12	*	4.99	0.00
TiO2	-1.22	7.21	-2.44	-7.54	-1.11	0.77	-1.22	0.48	*	-2.07	-4.14
Al2O3	0.38	0.82	-1.00	-0.59	-0.80	-0.15	0.53	0.15	-0.42	*	0.17
Fe2O3	0.73	0.16	2.36	-1.14	0.45	0.40	-0.24	2.02	0.16	*	-1.14
MnO	1.28	-2.13	-1.46	-2.13	-0.19	0.61	0.61	-8.78	-2.13	*	0.22
CaO	0.92	2.26	-2.83	-2.55	10.06	-0.28	5.94	1.84	*	-5.23	-3.40
Na2O	-0.27	-19.89	1.24	-0.10	-0.51	-1.32	1.12	-0.72	1.39	*	0.49
K2O	-0.08	5.23	0.19	-0.92	0.31	-1.04	1.00	0.31	4.07	*	-0.54
P2O5	-0.98	*	16.72	-4.92	*	0.00	-2.95	0.00	*	*	-8.85
LOI	3.09	*	-4.94	*	-0.62	1.54	9.73	0.93	*	*	-1.24
Ba	*	10.81	-1.10	*	0.55	9.17	13.13	-4.54	*	*	-0.68
Ce	*	15.50	1.75	*	0.65	*	*	-4.16	1.77	*	2.51
Cs	-0.20	2.71	-1.33	*	0.49	*	1.33	-4.03	0.44	*	3.04
Dy	*	*	0.55	*	-0.32	*	*	-4.81	2.39	*	0.00
Er	*	*	-0.15	*	0.12	*	*	-3.79	*	*	0.58
Eu	*	*	-0.98	*	32.19	*	*	-2.21	*	9.83	0.74
Ga	0.69	1.10	-0.51	*	-1.66	-0.53	1.85	-1.91	-2.67	*	4.62
Gd	*	*	2.16	*	0.31	*	*	-4.63	*	*	2.84
Ge	*	-0.16	*	*	-0.16	3.29	*	*	*	*	*
Ho	*	*	0.64	*	-0.11	*	*	-3.40	*	*	0.39
La	*	116.34	0.40	*	0.21	*	*	-3.89	-1.23	*	0.63
Li	*	*	*	*	-15.94	-0.93	*	8.32	*	*	*
Lu	*	*	0.39	*	-0.19	*	*	-2.60	*	0.48	0.00
Nb	*	-4.63	4.14	*	3.76	-1.32	0.99	2.12	*	*	2.36
Nd	*	31.85	1.97	*	0.75	*	*	-4.44	*	*	2.56
Pr	*	*	1.69	*	0.49	*	*	-3.60	*	*	2.13
Rb	0.09	-1.24	-2.90	*	4.30	0.30	1.82	-3.74	0.31	*	0.31
Sb	*	13.58	*	*	-1.41	0.37	0.03	-0.70	-0.37	*	*
Sc	0.62	*	-8.16	*	15.78	*	-0.17	6.15	-0.18	*	1.66
Sm	*	*	2.86	*	0.68	*	*	-4.20	-1.05	*	3.75
Ta	0.96	0.72	0.87	*	0.75	-0.18	-3.42	-0.80	0.05	*	0.26
Tb	*	*	0.98	*	0.15	*	*	-3.74	-0.19	*	1.51
Th	9.29	30.83	0.24	*	0.23	*	-5.31	-4.44	-1.14	*	3.66
Tl	*	-4.43	*	*	-3.78	*	*	-0.60	*	*	*
Tm	*	*	-0.16	*	-0.32	*	*	-3.16	*	*	0.16
U	*	-8.82	-1.14	*	2.41	*	-6.73	-2.98	-0.61	*	1.29
W	*	15.33	*	*	-1.55	2.56	*	0.38	1.88	*	*
Y	3.01	21.18	-0.65	*	1.63	28.28	-0.57	-6.93	*	*	-0.40
Zn	1.05	2.46	-3.78	*	0.57	-0.79	-1.23	-1.52	*	*	0.63
			SiO2 rev'd 6/10/08								

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X41	X42	X43	X44	X44	X45	X46	X47	X48	X49	X50
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	1	2	1	2	2	1	1	2	2	2
SiO2	*	-1.06	-0.16	1.23	*	*	-2.90	-1.65	0.01	-1.46	-0.43
TiO2	*	12.89	-0.37	7.21	*	-2.07	7.21	6.64	0.20	6.44	-2.07
Al2O3	*	-0.71	1.15	0.23	*	-3.19	-2.60	-13.42	0.18	2.21	-0.15
Fe2O3	*	1.45	-0.57	7.28	*	-1.86	-2.43	-5.02	-0.24	5.26	0.73
MnO	*	-2.13	-0.40	1.56	*	-1.07	1.22	-8.84	0.28	0.61	0.61
CaO	*	3.68	2.33	-0.57	*	-0.28	-4.81	12.17	-0.28	11.74	0.42
Na2O	*	-0.85	-0.27	-10.96	*	0.47	0.94	-22.71	-1.46	1.06	-1.24
K2O	*	-0.15	0.50	-0.92	*	-0.46	3.30	-3.23	-0.08	14.71	-1.23
P2O5	*	-13.77	-2.95	-6.88	*	-4.92	-9.83	*	0.49	9.83	*
LOI	*	5.56	2.72	-1.85	*	*	-3.71	*	-1.54	5.87	-1.54
Ba	*	-2.23	1.24	10.41	*	-2.99	-5.44	26.26	7.19	*	1.24
Ce	*	-1.01	6.70	*	*	-2.60	-16.84	*	11.35	*	0.65
Cs	*	-0.73	*	-0.48	*	-1.86	3.73	*	-6.24	*	*
Dy	*	0.08	*	*	*	-2.39	2.39	*	*	238.58	-0.40
Er	*	-0.35	*	*	*	-1.78	58.46	*	*	*	-0.06
Eu	*	2.63	*	*	*	-2.21	164.13	*	*	*	4.67
Ga	*	0.87	-2.15	0.16	*	0.28	3.81	*	0.49	4.97	-2.76
Gd	*	14.36	*	*	*	-2.07	-8.69	*	*	*	-1.22
Ge	*	*	*	*	*	*	*	*	*	*	*
Ho	*	19.00	*	*	*	-1.65	-9.43	*	*	*	1.42
La	*	-0.61	-0.10	*	*	-2.84	-13.91	*	92.45	*	-0.10
Li	*	-1.07	0.01	*	*	-1.65	*	3.87	*	*	0.44
Lu	*	0.19	*	*	*	-1.93	*	*	*	*	*
Nb	*	-8.71	-10.78	-4.01	*	*	2.01	*	-1.57	9.78	4.10
Nd	*	3.08	3.03	*	*	-2.79	6.06	*	-5.78	*	-0.28
Pr	*	*	*	*	*	-2.28	7.98	*	9.21	*	-0.19
Rb	*	-1.09	*	-0.51	*	-2.25	6.16	*	0.09	13.63	0.81
Sb	*	0.71	*	*	*	*	60.54	*	*	*	1.14
Sc	*	-1.08	*	*	*	-0.51	1.24	*	21.70	138.42	*
Sm	*	2.81	*	*	*	-2.25	-10.15	*	-3.90	*	-0.13
Ta	*	5.44	*	-7.82	*	*	-0.78	*	1.06	*	-0.70
Tb	*	1.95	*	*	*	-1.92	13.17	*	*	*	0.51
Th	*	0.11	*	*	*	-4.53	31.15	*	1.44	*	-1.07
Tl	*	2.43	*	2.96	*	*	*	*	*	*	0.14
Tm	*	*	*	*	*	-1.54	*	*	*	*	*
U	*	1.04	*	4.75	*	-3.88	-4.89	*	-2.45	*	0.41
W	*	0.70	*	-5.92	*	*	-11.03	*	18.70	*	*
Y	*	20.07	4.06	*	*	-2.67	248.19	*	7.22	298.88	-1.83
Zn	*	-3.54	-0.42	-2.31	*	1.70	4.30	-1.58	1.05	14.37	1.78

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X51	X52	X53	X54	X55	X56	X57	X57	X58	X59	X60
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	2	2	2	1	1	1	2	2	2	1
SiO2	-0.47	*	0.18	-0.01	0.00	0.39	0.36	*	-0.44	0.40	-1.06
TiO2	-0.93	*	0.48	0.77	1.54	-1.87	0.97	*	-0.65	-2.07	1.54
Al2O3	1.03	*	0.31	6.29	7.38	5.79	-0.42	*	-0.07	0.59	-0.30
Fe2O3	0.40	1.57	3.77	2.67	3.40	-10.85	-1.14	*	1.34	-0.28	-5.02
MnO	-0.56	0.44	1.45	-1.40	-2.13	0.55	-0.79	*	-0.23	0.61	-2.13
CaO	0.42	-2.69	-0.64	0.42	13.58	0.85	0.85	*	-0.07	-0.07	-0.57
Na2O	0.02	*	1.38	0.02	-7.24	-5.31	-0.70	*	-0.16	0.60	0.94
K2O	-0.46	-3.99	0.14	0.50	-2.46	-5.53	0.62	*	0.31	0.54	0.23
P2O5	1.47	*	8.85	4.92	19.67	27.53	1.97	*	-0.49	-1.97	4.92
LOI	*	*	1.02	0.00	-2.47	-2.47	3.71	*	-0.15	0.25	30.88
Ba	*	*	*	367.81	*	357.16	-1.48	*	1.44	-0.39	-1.83
Ce	*	*	*	*	*	*	0.47	*	*	-0.91	1.37
Cs	*	*	*	2.55	*	*	0.82	*	*	0.03	1.20
Dy	*	*	*	*	*	*	3.35	*	*	-0.67	-2.15
Er	*	*	*	*	*	*	2.65	*	*	-1.09	-2.18
Eu	*	*	*	*	*	*	-0.12	*	*	-1.37	-0.29
Ga	0.69	0.28	*	3.33	*	*	0.40	*	*	0.41	-5.92
Gd	*	*	*	*	*	*	3.64	*	*	-0.18	-0.11
Ge	-1.37	*	*	*	*	*	*	*	*	*	0.56
Ho	*	*	*	*	*	*	2.24	*	*	-0.01	-1.69
La	*	*	*	102.73	*	*	16.26	*	*	-0.95	-1.29
Li	*	*	*	*	*	*	*	*	*	-0.11	-23.40
Lu	*	*	*	*	*	*	0.00	*	*	0.92	-1.54
Nb	-2.18	-0.54	*	0.32	*	-16.74	-1.57	*	*	-0.15	-2.29
Nd	*	*	*	*	*	*	0.46	*	*	-0.76	0.74
Pr	*	*	*	*	*	*	0.35	*	*	-1.15	0.67
Rb	-0.47	1.21	*	0.19	*	4.44	0.75	*	*	1.04	-4.88
Sb	*	*	*	*	*	*	*	*	*	0.64	-1.26
Sc	*	*	*	*	*	*	92.51	*	*	-0.70	-6.88
Sm	*	*	*	*	*	*	2.34	*	*	-0.47	*
Ta	-0.60	*	*	0.65	*	*	2.31	*	*	-1.31	-16.88
Tb	*	*	*	*	*	*	3.21	*	*	-0.05	-1.21
Th	31.28	*	*	*	*	*	0.27	*	*	-1.02	-0.11
Tl	*	*	*	-0.54	*	*	*	*	*	0.09	-0.26
Tm	*	*	*	*	*	*	0.97	*	*	0.02	-1.78
U	*	*	*	17.20	*	*	0.25	*	*	-0.01	-0.79
W	*	*	*	-1.48	*	*	*	*	*	0.07	-2.42
Y	6.17	7.22	*	0.91	*	313.47	1.77	*	*	-2.45	-6.93
Zn	3.25	3.25	*	0.68	*	6.50	-1.80	*	3.32	0.46	-7.08

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X61	X62	X63	X65	X66	X66	X67	X68	**X69†**	X70	X71
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	**OU-9**	OU-9	OU-9
Data quality	2	1	1	2	1	2	2	2	**2**	2	2
SiO2	-0.12	-1.76	*	0.49	0.02	*	2.47	*	*3.23*	-0.13	-2.43
TiO2	0.77	-1.36	*	-2.07	1.54	*	-2.35	-2.92	*1.71*	*	-2.07
Al2O3	0.15	-1.34	*	-0.06	-0.65	*	-3.70	-1.33	*0.48*	0.77	-0.59
Fe2O3	0.40	-0.10	*	-0.24	-2.37	*	-2.64	-0.67	*6.88*	-0.24	-1.54
MnO	2.29	0.89	*	0.61	-0.12	*	-9.29	0.28	*6.20*	*	0.61
CaO	-0.28	-1.70	*	-0.99	-1.98	*	-8.91	0.85	*2.55*	-0.28	-0.28
Na2O	1.88	-0.74	*	0.32	0.05	*	-18.12	0.25	*	0.77	-1.24
K2O	0.50	-0.46	*	0.50	1.77	*	-3.92	*	*-5.71*	-0.84	-0.27
P2O5	0.00	1.28	*	0.00	-2.95	*	1.47	*	*	0.00	*
LOI	0.00	-3.71	*	4.01	-1.85	*	12.97	*	*	-2.16	0.31
Ba	-2.03	1.10	-6.64	-1.33	*	*	-6.68	-5.14	*4.22*	-1.04	0.25
Ce	-0.28	1.03	-6.22	-0.63	*	*	-8.39	-1.05	*	0.30	-0.63
Cs	*	0.19	-2.14	0.68	*	*	-0.66	1.18	*	-0.55	-0.32
Dy	-3.19	2.72	-4.62	*	*	*	-6.17	*	*	1.28	1.04
Er	*	0.99	-3.35	*	*	*	-4.88	*	*	1.32	0.81
Eu	*	1.09	-3.39	*	*	*	-3.76	*	*	*	*
Ga	*	-7.34	*	0.26	*	*	-5.39	*	*	-0.30	-0.32
Gd	-2.36	3.06	-4.96	-2.07	*	*	-3.78	*	*	0.54	0.68
Ge	*	*	*	*	-0.24	*	*	-7.70	*85.23*	*	1.69
Ho	*	2.05	-3.11	*	*	*	-4.41	*	*	1.73	1.12
La	-2.50	0.15	-6.29	*	*	*	-6.27	0.62	*	*	-0.78
Li	-1.80	*	*	0.13	-0.70	*	-8.78	0.15	*-1.48*	0.61	-0.35
Lu	*	-0.19	-1.73	*	*	*	-1.93	*	*	*	*
Nb	*	3.23	1.85	2.64	-2.46	*	-1.40	*	*14.68*	*2.73*	3.33
Nd	*	0.60	-5.86	*	*	*	-3.89	*	*	0.04	-0.12
Pr	*	0.47	-5.49	*	*	*	-6.30	*	*	0.80	-0.03
Rb	*	0.83	-6.95	-0.05	*	*	0.08	0.21	*	-3.25	0.48
Sb	-1.18	*	*	-0.90	-9.70	*	-5.50	0.70	*	0.16	-0.41
Sc	*	0.71	*	*	*	*	-6.86	-1.23	*	0.62	-0.44
Sm	-0.36	2.46	-5.25	*	*	*	-5.55	*	*	0.72	0.58
Ta	*	3.24	-3.03	1.27	*	*	2.62	*	*	*	2.72
Tb	-1.92	2.31	-4.15	*	*	*	-5.19	*	*	1.24	0.63
Th	-1.70	0.75	-3.53	*	*	*	-6.57	-0.07	*	0.31	-0.29
Tl	0.14	0.29	*	*	*	*	-8.20	1.04	*	*	0.41
Tm	*	0.97	-2.76	*	*	*	-3.16	*	*	*	*
U	-0.66	0.04	-3.43	-0.84	*	*	-3.16	0.63	*	0.66	0.45
W	*	*	*	0.47	*	*	-7.67	*	*	*	-0.14
Y	-0.36	0.05	-7.33	*	*	*	-6.04	-1.65	*6.17*	0.17	-0.15
Zn	-0.42	-0.11	*	2.15	7.23	*	-7.76	-0.31	*-3.72*	0.68	-0.05
									Traces amended	*Nb rev'd* 6/10/08	

† *Source data not included in analysis*

N.B. See text before interpreting these results

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X72	X73	X73	X74	X75	X75	X76	X77	X78	X79	X80
Sample	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9	OU-9
Data quality	2	1	2	2	1	2	2	1	1	2	2
SiO2	-0.21	*	*	0.02	0.14	*	-0.15	0.32	*	0.09	0.18
TiO2	-0.65	*	-1.45	-2.35	0.40	*	-1.22	1.54	*	-2.07	0.77
Al2O3	-0.12	*	-2.72	-0.24	0.78	*	0.25	-0.59	*	0.44	14.33
Fe2O3	1.05	*	-3.00	-0.57	-1.14	*	-0.05	0.16	0.16	0.40	-1.86
MnO	0.61	*	-0.26	-0.73	0.22	*	-0.14	1.22	*	0.61	19.07
CaO	-0.28	*	-0.42	0.42	-0.28	*	-0.32	0.85	*	-0.28	-0.28
Na2O	-0.20	*	*	0.69	0.67	*	1.29	-0.40	-0.70	-0.65	18.54
K2O	0.12	*	*	-0.46	1.61	*	0.47	-0.54	*	-0.08	2.42
P2O5	-2.46	*	*	-2.46	0.98	*	-0.98	0.00	*	0.00	44.25
LOI	1.85	*	*	0.93	0.62	*	2.47	-3.71	*	*	*
Ba	-0.84	-1.48	*	*	*	21.16	*	4.47	*	*	364.24
Ce	0.06	-1.86	*	*	*	*	*	*	*	*	*
Cs	-2.46	0.65	*	0.26	*	*	*	*	4.11	1.63	68.71
Dy	0.20	-1.28	*	*	*	*	*	*	*	*	*
Er	0.08	-1.39	*	*	*	*	*	*	*	*	*
Eu	-0.32	-0.31	*	*	*	*	*	*	*	*	*
Ga	0.18	*	*	0.08	*	0.43	*	-1.05	*	1.10	-8.44
Gd	0.11	-0.45	*	*	*	*	*	*	*	*	*
Ge	0.51	*	*	*	*	*	*	*	*	*	*
Ho	0.26	-0.65	*	*	*	*	*	*	*	*	*
La	-0.41	-2.53	*	*	*	*	*	*	-2.12	*	*
Li	1.12	*	-1.51	-0.79	*	*	*	*	*	0.61	*
Lu	0.00	-1.04	*	*	*	*	*	*	-3.85	*	*
Nb	-0.37	*	1.09	-0.63	-3.66	*	*	-1.77	*	1.18	-6.32
Nd	-0.34	-2.28	*	*	*	*	*	*	*	*	*
Pr	-0.24	-1.93	*	*	*	*	*	*	*	*	*
Rb	0.46	-0.09	*	0.08	0.94	*	2.19	0.31	2.51	0.38	-19.95
Sb	0.36	*	*	0.37	*	*	*	*	16.46	*	*
Sc	*	*	*	0.09	*	*	*	*	-0.34	*	1.01
Sm	0.49	-0.72	*	*	*	*	*	*	4.74	*	*
Ta	1.89	*	-0.36	*	*	*	*	5.23	6.48	0.96	-12.08
Tb	0.20	-0.41	*	*	*	*	*	*	3.45	*	*
Th	0.48	-1.58	*	*	*	-0.76	-4.84	*	0.99	6.15	*
Tl	*	*	*	*	*	*	*	*	*	*	*
Tm	0.00	-1.22	*	*	*	*	*	*	*	*	*
U	0.09	0.07	*	*	*	0.41	8.27	48.69	5.82	2.91	*
W	0.04	*	*	*	*	*	*	*	*	*	*
Y	-0.03	-4.09	*	*	14.45	*	*	-0.29	*	*	2213.09
Zn	0.39	*	0.61	1.78	-0.69	*	3.25	-0.11	*	-0.42	8.40

Table 3 GeoPT23 Z-scores for analytical results submitted (June 2008) (Separation Lake pegmatite, OU-9)

Lab code	X81	X81	X82	**X110†**
Sample	OU-9	OU-9	OU-9	**OU-9**
Data quality	1	2	1	**1**
SiO2	-0.41	*	*	*-0.29*
TiO2	7.21	*	*	*20.83*
Al2O3	-0.18	*	*	*1.69*
Fe2O3	0.16	*	*	*-36.24*
MnO	-2.13	*	*	*61.62*
CaO	5.09	*	*	*45.41*
Na2O	0.34	*	*	*-31.09*
K2O	-0.54	*	*	*48.56*
P2O5	0.00	*	*	*318.59*
LOI	*	4.63	*	*-4.82*
Ba	0.51	*	0.49	*
Ce	-12.19	*	2.39	*
Cs	-6.37	*	1.63	*
Dy	*	*	-2.84	*
Er	*	*	3.85	*
Eu	*	*	28.09	*
Ga	-0.24	*	*	*
Gd	*	*	-0.49	*
Ge	-3.05	*	*	*
Ho	*	*	-0.04	*
La	13.51	*	1.54	*
Li	*	*	4.92	*
Lu	*	*	5.97	*
Nb	-3.66	*	6.93	*-26.71*
Nd	6.06	*	3.98	*
Pr	*	*	1.59	*
Rb	0.64	*	-1.02	*-40.58*
Sb	5.16	*	*	*
Sc	-14.57	*	*	*
Sm	-0.72	*	4.21	*
Ta	0.05	*	-1.35	*
Tb	*	*	-0.87	*
Th	-3.41	*	21.15	*
Tl	-1.07	*	0.49	*
Tm	*	*	10.70	*
U	-12.04	*	1.22	*
W	-16.41	*	*	*
Y	6.02	*	-9.60	*
Zn	1.36	*	*	*

† *Source data not included in analysis*

N.B. See text before interpreting these results

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X04	X06	X07	X08	X09	X10	X11	X12	X13	X13	X14	X15
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		1	2	1	2	1	1	2	2	1	2	1	1
SiO2	% m/m	7.64	10.02	10.5	11.83	10.29	9.901	10.99	10.55		11.46		
TiO2	% m/m	0.32	0.32	0.31	0.46	0.30	0.262	0.326	0.29		0.3		
Al2O3	% m/m	1.96	3.62	3.03		1.94	2.721	3.04	2.96		3.29		
Fe2O3	% m/m	10.32	9.28	8.6	9.78	9.16	7.793	10.02	8.88		9.17		
Fe(II)O	% m/m												
MnO	% m/m	47.6	43.29	44.44	43.62	45.12	50.703	48.920	41.75		44.41		
MgO	% m/m	0.63	3.11	2.87		2.54	2.631	2.27	2.91		2.55		
CaO	% m/m	1.86	2.62	2.58	3.46	2.55	2.316	2.97	2.6		2.68		
Na2O	% m/m	1	1.86	3.18		3.25	2.905	2.95	3.33		3.71		4.05
K2O	% m/m	0.81	1.02	0.67	1.06	0.95	0.522	1.10	0.65		1.04		1.20
P2O5	% m/m	0.17	0.42	0.35		0.09	0.327	0.363	0.36		0.38		
H2O+	% m/m												
CO2	% m/m												
LOI	% m/m	23.65	14.45	16.39		17.23	16.9		15.7	17.090			
Ag	mg kg-1	0.420											
As	mg kg-1	59.948		79	106			104		14.7			
Au	mg kg-1	0.258											
B	mg kg-1	95.036											
Ba	mg kg-1	3187.431	2959	3027	2850		3019	4527	3480				
Be	mg kg-1	1.593	1.31										
Bi	mg kg-1	2.850											
Br	mg kg-1				36.8								
Cd	mg kg-1	0.497	7.3		13.8								
Ce	mg kg-1	120.565	105.6		92.7					69.1		107	115
Cl	mg kg-1				15600						1030		
Co	mg kg-1	503.113		509	524		411	586	507	120.7			
Cr	mg kg-1	27.845	8.35	171	1360			304		26.9			
Cs	mg kg-1	0.740			14.7								
Cu	mg kg-1	5450.953	722	6084	6060		5161	9423	5865	1927.2			
Dy	mg kg-1	14.090	15.75									16.1	
Er	mg kg-1	8.537	10.26									9.8	
Eu	mg kg-1	3.133	3.91									3.75	
F	mg kg-1												
Ga	mg kg-1	31.824			11			39		36.6			
Gd	mg kg-1	13.324	15.81									16.4	
Ge	mg kg-1	0.789											
Hf	mg kg-1	3.732	4.72										
Hg	mg kg-1	32.043											
Ho	mg kg-1	3.026	3.38									3.32	3.71
I	mg kg-1				38.6								
In	mg kg-1												
Ir	mg kg-1	0.019											
La	mg kg-1	70.366	69.6		57.1			107		43		65.9	
Li	mg kg-1	303.092	307.84										290
Lu	mg kg-1	1.389	1.7									1.46	
Mo	mg kg-1	596.200	542	578	591		447	846				536	
N	mg kg-1												
Nb	mg kg-1	12.905	11	12	9.1			19					
Nd	mg kg-1	57.552	63.67		62.5					30.2		60.8	
Ni	mg kg-1	12509.51		13273	13000		12007	20851	13660	5723.7			
Os	mg kg-1												
Pb	mg kg-1	125.197	90	136	92.6		186	201		22.7			
Pd	mg kg-1	8.005											
Pr	mg kg-1	13.249	14.11		21.2							13.9	
Pt	mg kg-1	0.090											
Rb	mg kg-1	11.820	4		10.9			28		9			9.0
Re	mg kg-1												
Rh	mg kg-1	0.104											
Ru	mg kg-1	0.039											
S	mg kg-1				3550						1540		
Sb	mg kg-1	53.535			86.6			82					
Sc	mg kg-1	7.828	6.81					11		12.7			
Se	mg kg-1	2.061											
Sm	mg kg-1	12.422	14.02									13.7	14.5
Sn	mg kg-1	1.070	1.29										
Sr	mg kg-1	759.640	428	724	737		609	984	770	466.5		665	
Ta	mg kg-1	0.192	0.36										
Tb	mg kg-1	2.102										2.43	
Te	mg kg-1	1.263			2.9								
Th	mg kg-1	6.608	6.67										
Tl	mg kg-1	130.664		149	141			240					
Tm	mg kg-1	1.303	1.59									1.48	
U	mg kg-1	4.070	4.14										
V	mg kg-1	514.063	325	513			448	564	616	633.8			
W	mg kg-1	67.208											
Y	mg kg-1	73.487		63	68.5		39	110	139			62.5	
Yb	mg kg-1	8.683	10.69									9.65	
Zn	mg kg-1	1569.394		1805	1810		1703	2583	1935	1890.4			
Zr	mg kg-1	348.368	83	340	354			474	366	103.8			
		† Data submitted too late to be included in data processing											

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X15	X16	X18	X19	X20	X21	X23	X23	X24	X26	X31	X31
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		2	2	2	2	1	1	1	2	2	2	1	2
SiO2	% m/m		10.5	10.26	11.92	10.55		10.51					9.97
TiO2	% m/m		0.288	0.2824	0.29	0.307		0.23			0.28		0.29
Al2O3	% m/m		2.93	2.974	2.7	2.979		2.95			2.66		2.77
Fe2O3	% m/m		8.89	9.063	8.31	9.177		8.72			8.68		8.6
Fe(II)O	% m/m												
MnO	% m/m		45	44.08	46.67	45.67		44.81					46.9
MgO	% m/m		2.92	2.836	3.17	2.695		2.8			2.56		2.61
CaO	% m/m		2.51	2.379	2.89	2.620		2.5			2.58		2.5
Na2O	% m/m		2.76	3.593	2.92	1.553		3.53			2.51		3.07
K2O	% m/m		0.688	0.9139	0.43	0.584		0.93			0.83		0.87
P2O5	% m/m		0.352	0.3191	0.39	0.354		0.31			0.42		0.34
H2O+	% m/m												
CO2	% m/m		0.705	0.614	0.52								
LOI	% m/m		16.4	16.66	16.87	16.12		15.75					16.33
Ag	mg kg-1	0.037	39.6				0.19						
As	mg kg-1	21	88.1	63.80		74.5	53	75.9					68.7
Au	mg kg-1												
B	mg kg-1												
Ba	mg kg-1	3391	11900	3207.0	3177.9	2769	3135	3466		3068	2923		3289
Be	mg kg-1	4.9			1.32		1.63	1.99		1.39			1.47
Bi	mg kg-1			3.250	3.298	1.5	2.66	0.3		2.50			2.5
Br	mg kg-1					35.0							
Cd	mg kg-1		20.1	16.80	8.56	23.5				19.0			
Ce	mg kg-1		289	113.0	111.5	115.1	117	107.6		98.7			126
Cl	mg kg-1		19600	7991.0							14500		
Co	mg kg-1	440	468	471.0	388.4	509	310	514		459	389		471
Cr	mg kg-1	35	8	7.890			6.71	3.87		15.0	7.5		163
Cs	mg kg-1		13.7	0.800	0.867	39	0.85	0.83		0.95			
Cu	mg kg-1	5450	5720	5110.0	4459	5880	3172	6366		5090	5510		5750
Dy	mg kg-1	17.6		17.70	16.7	16.48	16.8	16.86		15	14.07	15.2	
Er	mg kg-1	10.8		10.600	9.74	10.24	10.5	10.62		9.43	8.75	9.81	
Eu	mg kg-1	3.69		4.020	3.954	4.07	3.79	4.03		3.82	3.73	4.11	
F	mg kg-1	150											
Ga	mg kg-1	20	29.2	60.60	27.04	23.5	35.6			42.5			23
Gd	mg kg-1	18		18.90	16.31	16.58	14.4	16.99		15.7	12.74	15.5	
Ge	mg kg-1			1.480			1.15				1.53		
Hf	mg kg-1	4.59		4.820	4.75	4.65	4.93	4.9		5.08	4.59		24.5
Hg	mg kg-1	0.02											
Ho	mg kg-1			3.660	3.565	3.51	3.63	3.64		3.24	3.25	3.23	
I	mg kg-1					45							
In	mg kg-1						0.06						
Ir	mg kg-1												
La	mg kg-1		279	68.80	69.85	71.98	73.5	68.67		65.5			64.4
Li	mg kg-1				294.6		254	367		295		532	
Lu	mg kg-1	1.58		1.640	1.659	1.62	1.59	1.64		1.50	1.51	1.49	
Mo	mg kg-1		455	508.0	632.02	518	471						468
N	mg kg-1												
Nb	mg kg-1	30.0	14	13.30	13.3	13.5	12.6		13.8	15.5	10.2		14
Nd	mg kg-1	60.9	43.6	67.30	66.62	66.60	65.2	67.62		62.3		59.4	
Ni	mg kg-1	11714	13100	14378.0	10132	13796	7860	13800		11770	9554		12661
Os	mg kg-1												
Pb	mg kg-1	240	89.7	130.0	140.3	128	132		139	131	69		130
Pd	mg kg-1												
Pr	mg kg-1	14.1		14.80	14.76	14.89	15.1	15.66		13.6		13.6	
Pt	mg kg-1												
Rb	mg kg-1		16.5	12.10	12.8	13	12.8	12.6		12.0	11		16
Re	mg kg-1												
Rh	mg kg-1												
Ru	mg kg-1												
S	mg kg-1		614	1150.0	1000						1090		
Sb	mg kg-1		44	51.60	60.77	68.5	62.3	54.2					
Sc	mg kg-1		31.1	8.680	7.2	39.0	7.19	9.02		7.15			37
Se	mg kg-1												
Sm	mg kg-1		34.1	14.60	14.45	14.57	14.7	15.06		14.2	14.01	13.2	
Sn	mg kg-1			1.860	1.22		72.1		0.92	1.19	0.80		
Sr	mg kg-1	659	638	700.0	717	667	644	698		653	610		620
Ta	mg kg-1	0.26		0.240	0.3	0.18	0.35	0.065			0.317		39
Tb	mg kg-1	2.69		2.920	2.611	2.60	2.53	2.79		2.52	2.23	2.47	
Te	mg kg-1		35.5										
Th	mg kg-1	7.64	5.4	6.980	7.59	6.73	6.73	7.23		6.00	5.6		4.3
Tl	mg kg-1			136.0	157.402	114	116	124		128	0.76		
Tm	mg kg-1	1.63		1.600	1.563	1.57	1.61	1.63		1.46	1.29		
U	mg kg-1	4.05	17.8	4.540	4.77	4.58	4.52	4.71		4.35	3.48		7
V	mg kg-1	400	1670	439.0	371	1739	303	528			355		459
W	mg kg-1		90	75.20	71.2	81.5	75.3	1.25					58
Y	mg kg-1	64.5	65.1	73.30	76.9	73.20	69.9	72.1		63.4	71		66
Yb	mg kg-1	10.9	307	11.00	10.378	10.53	10.1	10.59		9.57	8.21	9.88	
Zn	mg kg-1	2270	1860	1910.0	1545	1939	1326	2061		1606			1803
Zr	mg kg-1	298	310	316.0	327	330	315	328		298	288		298

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X32	X33	X34	X35	X36	X37	X38	X41	X41	X43	X44	X44
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		2	1	1	2	2	2	2	1	2	2	1	2
SiO2	% m/m	10.37	13.34	10.42	10.05	11.12	9.8	12.53	10.40			11.78	
TiO2	% m/m	0.27	0.34	0.64	0.28	0.326	0.26	0.2846	0.28		0.24	0.35	
Al2O3	% m/m	2.98	1.77	3.007	2.73	3.14	2.90	3.101	2.91			3.38	
Fe2O3	% m/m	8.66	9.78	8.224	8.42	7.79	9.3	8.77	8.55		8.08	9.15	
Fe(II)O	% m/m												
MnO	% m/m	45.83	61.750	41.340	43.40	48.7	44	48.3	43.13		41.22	44.39	
MgO	% m/m	2.93	2.89	3.23	2.81	2.93	2.72	2.882	2.63		2.61	3.29	
CaO	% m/m	2.4	2.79	2.458	2.42	2.71	2.61	2.501	2.51		2.09	3.43	
Na2O	% m/m	3.39	2.6	3.61	3.35	3.69	3.7	2.54	3.59		3.1	3.01	
K2O	% m/m	0.929	1.27	0.779	0.94	0.981	0.94	0.906	0.99		0.835	0.74	
P2O5	% m/m	0.356	0.36	0.372	0.34	0.352	0.46	0.3438	0.34		0.323	0.451	
H2O+	% m/m												
CO2	% m/m												
LOI	% m/m	17.57		12.97		14.2	16.8		18.75			18.19	
Ag	mg kg-1					19.86							
As	mg kg-1	76	92.5			58.46		88.6				35	
Au	mg kg-1												
B	mg kg-1												
Ba	mg kg-1	3220	3564	3301		3500	3000	2537.00	3158		2940		3000
Be	mg kg-1					1.878				5.4			
Bi	mg kg-1		4.9										
Br	mg kg-1							43.7				26	
Cd	mg kg-1		58.1			25.86		16.7			15		
Ce	mg kg-1	104	110.9	111.9		102.2			101		90	127	
Cl	mg kg-1							802	6585				
Co	mg kg-1	515		505		555.3	497	172.00	458		380	424	
Cr	mg kg-1		181			14.06		19.00			10	43	
Cs	mg kg-1		28.1	0.57		0.899				0.8		12	
Cu	mg kg-1	6322	7486	8670		6512	5300	7083.00	5781		5650	5212	
Dy	mg kg-1			18.08		15.28			14.5				
Er	mg kg-1			11.39		9.724			9.28				
Eu	mg kg-1			4.37		3.817			3.36				
F	mg kg-1												
Ga	mg kg-1	23	33.8	50.14		46.17	15	22.60			32	19	
Gd	mg kg-1			18.5		15.25			14.6				
Ge	mg kg-1					2.003							
Hf	mg kg-1			5.57		4.646			4.42		1	20	
Hg	mg kg-1	0.0135											
Ho	mg kg-1			4.09		3.268			3.30				
I	mg kg-1												
In	mg kg-1												
Ir	mg kg-1												
La	mg kg-1	77	66.5	70.76		65.75			62.3		65		
Li	mg kg-1						314				292		
Lu	mg kg-1			1.93		1.594			1.51				
Mo	mg kg-1	595	687.3			595.5		543.00			480	470	
N	mg kg-1												
Nb	mg kg-1	15	16.8	15.15		24.98	10	7.20	13.5		17	12	
Nd	mg kg-1	134	480	73.2		60.17			62.8		60	61	
Ni	mg kg-1	13737	16110	12990		14237	11000	13330.00	10528		12500		13000
Os	mg kg-1												
Pb	mg kg-1	133	158.6	129		147.5	118	145.20	114		118	90	
Pd	mg kg-1												
Pr	mg kg-1			17.25		13.56			14.2				
Pt	mg kg-1												
Rb	mg kg-1	26	11.8	12.25		12.77	12	13.10	14.1			12	
Re	mg kg-1												
Rh	mg kg-1												
Ru	mg kg-1												
S	mg kg-1		1322							1216	15200		
Sb	mg kg-1	68	98.1			40.26	60	46.90					
Sc	mg kg-1	8		42.5		8.449			7.22			25	
Se	mg kg-1												
Sm	mg kg-1			16.060		13.4			13.5				
Sn	mg kg-1		7			1.419							
Sr	mg kg-1	702	786.2	766.4		776	673	668.5	717		630	566	
Ta	mg kg-1			0.318		0.166				0.2		18	
Tb	mg kg-1			2.98		2.544			2.44				
Te	mg kg-1												
Th	mg kg-1	33	24.9	8.17		10.49	10		6.83			13	
Tl	mg kg-1		91.7									105	
Tm	mg kg-1			1.84		1.387			1.49				
U	mg kg-1		10.5	5.3		6.65		0.7	4.38			3.2	
V	mg kg-1	446	587	558		458	1892	469	473			1542	
W	mg kg-1		74			56.07						186	
Y	mg kg-1	76	87.1	80.79		78.92	65	108.70	65		59	59	
Yb	mg kg-1	88		12.12		10.35			9.48				
Zn	mg kg-1	1923	2344	1711		1899	1400	1942.00	1423		1780	1638	
Zr	mg kg-1	336	393.9	336.7		381.9	311	43.30	298		286	264	

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X45	X46	X49	X50	X51	X52	X53	X55	X56	X58	X59	X60
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		2	1	2	2	2	2	2	1	1	2	2	1
SiO2	% m/m		12.56	9.44				11.9050	12.75	12.88	10.419	10.466	
TiO2	% m/m	0.28	0.42	0.36			0.46	0.3480	0.28	0.416	0.254	0.275	
Al2O3	% m/m	2.79	3.3	2.75				3.6100	2.90	2.74	3.261	2.935	
Fe2O3	% m/m	8.18	11.39	9.6			7.78	10.1150	9.10	8.57	8.827	8.511	
Fe(II)O	% m/m		0.98										
MnO	% m/m	41.61	27.63	36.6			34.17	56,825	43.87	43.81	42.324	44.044	
MgO	% m/m	2.81	3.03	1.76				2.6600	2.83	2.73	2.999	2.872	
CaO	% m/m	2.47	3.55	2.95			2.25	3.0700	2.51	1.76	2.52	2.472	
Na2O	% m/m	3.19	3.65	2.1				3.5750	3.18	2.71	3.567	3.535	
K2O	% m/m	0.88	1.28	1.08			0.77	1.1350	1.07	1.05	0.974	0.939	
P2O5	% m/m		0.43	0.39				0.436	0.35	0.404	0.338	0.346	
H2O+	% m/m			0.01									
CO2	% m/m		0.49		0.62			0.624					
LOI	% m/m		18.25	25.3						18.60	23.9	16.109	
Ag	mg kg-1			200									
As	mg kg-1		0	116		88	48		69			67.7	
Au	mg kg-1								0.02				
B	mg kg-1				130							91.05	
Ba	mg kg-1	3347.2	4292	4750	3130	5129		4125	2800		2837	3657.9	3170
Be	mg kg-1				2							1.239	
Bi	mg kg-1		11		55	49						1.025	
Br	mg kg-1											31.5	
Cd	mg kg-1	19.6	39		28				24			18.32	20.0
Ce	mg kg-1	102.6	154		111				110			98.12	111
Cl	mg kg-1		4750	10600				11400					
Co	mg kg-1	571.6	430	551	433	448		675	466	520	436	420	515
Cr	mg kg-1		0	51	77		1050		24.5			8.4	9.03
Cs	mg kg-1	0.58	5									0.5728	0.99
Cu	mg kg-1	6327.7	6200	6900	5913	10717	6240	7525	6200	8310	5557	6015	5900
Dy	mg kg-1	10.47	0	17600	16				13.6			14.83	15.6
Er	mg kg-1	6.14	0		10				6.56			9.053	9.15
Eu	mg kg-1	2.82	3	2390	4.1				3.58			3.153	3.56
F	mg kg-1		1585										
Ga	mg kg-1		25		266	23						22.4	
Gd	mg kg-1	11.5	9		16				15.3			14.56	15.5
Ge	mg kg-1				10								
Hf	mg kg-1		10			16						4.636	4.56
Hg	mg kg-1												
Ho	mg kg-1	2.09	5		3.4				2			2.996	3.27
I	mg kg-1											34.2	
In	mg kg-1												
Ir	mg kg-1												
La	mg kg-1	64	0		68				69.6			59.64	67.3
Li	mg kg-1	260.6			279							268	349
Lu	mg kg-1	0.81			1.5				0.79			1.388	1.50
Mo	mg kg-1	572.8	587	909	569	546.9	560	845	576	575		503.2	575
N	mg kg-1												
Nb	mg kg-1		36		62	10			13.3	20		11.4	13.2
Nd	mg kg-1	56.1	69						64.8			55.4	62.4
Ni	mg kg-1	13419.2	16007	13500	12500	13010	13570	17950	11750	14670	11429	13532	13100
Os	mg kg-1												
Pb	mg kg-1		121	247	146	103	155	175	181		108	123.4	126
Pd	mg kg-1								0.003				
Pr	mg kg-1	13	29		14				14.9			12.69	14.2
Pt	mg kg-1								0.057				
Rb	mg kg-1	18.5	12		16	16	12					11.5	15.4
Re	mg kg-1			210									
Rh	mg kg-1												
Ru	mg kg-1												
S	mg kg-1		825	2010	1065			1574	1385	800			
Sb	mg kg-1		27		62				68			55.39	58.8
Sc	mg kg-1	6.9	11						9.63			11.5	8.09
Se	mg kg-1												
Sm	mg kg-1	11.7	0		14				14.7			12.48	13.6
Sn	mg kg-1		6									1.386	0.6
Sr	mg kg-1	685.4	629	991	662	627	690		767	857	645	649	713
Ta	mg kg-1		0		0.3								0.25
Tb	mg kg-1	1.73	2		2.9				2.35			2.168	2.43
Te	mg kg-1				2.7								
Th	mg kg-1		5		6.8	9			25.4			6.258	6.66
Tl	mg kg-1			197	128		130					125	126
Tm	mg kg-1	0.86			1.5				0.89			1.337	1.42
U	mg kg-1		1		4.2	2.2						4.104	4.18
V	mg kg-1	513.2	588	469	467	834		534	448	327		422	468
W	mg kg-1		15		136				64.4			19.46	83.1
Y	mg kg-1	69.7	59	101	63	60	58		75.6			66.8	70.8
Yb	mg kg-1	5.6	0		10				5.47			9.171	9.71
Zn	mg kg-1	1743.6	1820	2000	1690	1647	1945	2265	1885	1719	1675	1864	1850
Zr	mg kg-1	279.1	341	421	337	319	310		305	300		305.2	333

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X61	X63	X64	X65	X66	X67	X68	X69†	X70	X72	X73	X73
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		2	1	2	2	1	2	2	2	2	2	1	2
SiO2	% m/m	10.2		8.96	10.2	8.75	15.89		10.39	12.05	10.14		
TiO2	% m/m	0.26		0.61	0.3	0.29	0.311	0.218	0.32	0.28	0.28		0.268
Al2O3	% m/m	2.92		2.47	2.89	2.62	2.64	2.68	2.69	3.13	3.07		2.731
Fe2O3	% m/m	8.61		7.97	8.69	8.34	9.61	7.60	10.83	8.78	8.31		7.925
Fe(II)O	% m/m												
MnO	% m/m	43.4		38.02	44.75	43.50	44.38	25.6	42.55	45.55	47.71		47.34
MgO	% m/m	2.76			3.02	2.91	2.75	2.67	4.15	2.81	2.76		2.674
CaO	% m/m	2.45			2.51	2.69	2.23	2.24	2.63	2.48	2.5		2.347
Na2O	% m/m	3.68			3.86	3.47	1.82	3.14		3.82	3.52		
K2O	% m/m	0.94			0.96	0.95	1.03		0.72	0.93	0.98		
P2O5	% m/m	0.35		0.09	0.36	0.31	0.277			0.372	0.39		
H2O+	% m/m						10.48				9.24		
CO2	% m/m					0.76	0.926				0.67		
LOI	% m/m	16.6			18.56	15.89	18.5			14.9	15.67		
Ag	mg kg-1	0.7					0.5						
As	mg kg-1	75			77.5		76.2	64	441	85.2	84.5		
Au	mg kg-1												
B	mg kg-1				796		170		74				
Ba	mg kg-1	2600	2758.9		3324	2723	4074	2867	3716	2880	3138	3022	
Be	mg kg-1	1.1			1.48		1.1			1.77			
Bi	mg kg-1	3.3			3.42		2.55	2.94		3.91	4.28		
Br	mg kg-1						1						
Cd	mg kg-1	18			21.2		17.7	19.3	42	21.1	24.9		21.1
Ce	mg kg-1	97	99.05		107.93		69	93.1			113	113.4	
Cl	mg kg-1						9840				8210		
Co	mg kg-1	460			497		385	410	404	475	488		483.4
Cr	mg kg-1	18			12		24.5	5.49	63		10.6		
Cs	mg kg-1		0.672		1.32		12	0.80		0.89	0.72	0.835	
Cu	mg kg-1	5000			6127		5725	5085	5052	6340	5394		5762
Dy	mg kg-1	15	16.76		15.9		5.2			15.35	15.8	16.53	
Er	mg kg-1	9.1	10.04		9.6		7.25			10.15	9.43	10.38	
Eu	mg kg-1	3.5	3.48		3.82		2.45			3.74	4.07	3.833	
F	mg kg-1					615					180		
Ga	mg kg-1				46.3		1.2			30.2	51.9		
Gd	mg kg-1	15	15.81		15.55		9.5			15.4	15.3	16.45	
Ge	mg kg-1				1.3		0.36		98		2.01		
Hf	mg kg-1		2.08		4.59		6.8			4.2	4.8	4.893	
Hg	mg kg-1						0.26						
Ho	mg kg-1	3.1	3.49		3.54		0.01			3.71	3.28	3.596	
I	mg kg-1						3						
In	mg kg-1						0.06			0.089	0.4		
Ir	mg kg-1						0.00001						
La	mg kg-1	62	64.06		69.4		60	75.2		66.2	70.7	70.25	
Li	mg kg-1	280			292	302	268	286	269	331	305		324.6
Lu	mg kg-1	1.5	1.69		1.64		0.75			1.73	1.62	1.668	
Mo	mg kg-1	490			533.6		484	513	811	542	649		551
N	mg kg-1												
Nb	mg kg-1				13.85		12		88		12.8		13.16
Nd	mg kg-1	58	65.47		61.76		23			63.1	64.1	66.5	
Ni	mg kg-1	11000			13900		10780	10590		13100	12480		13370
Os	mg kg-1						5E-06						
Pb	mg kg-1	110	33.8		131		125	116	225	157.5	153	127.5	
Pd	mg kg-1												
Pr	mg kg-1	13	13.63		14.11		5.5			15.9	14.9	15.02	
Pt	mg kg-1												
Rb	mg kg-1		11.68		15.2		7.6	11.3			12.5	12.25	
Re	mg kg-1						0.00007						
Rh	mg kg-1						0.00001						
Ru	mg kg-1						5E-06						
S	mg kg-1			0.08	1000	1130	2350				2300		
Sb	mg kg-1	65			57.35		69	55.8	124	67.7	73		
Sc	mg kg-1				7		5.5	6.96		8.2			
Se	mg kg-1				2		0.2		93				
Sm	mg kg-1	13	13.22		13.47		1.1			14.1	14.4	14.46	
Sn	mg kg-1						1.5		58		1.65		
Sr	mg kg-1	600	643.4		713	710	490	626	679		697	679.3	
Ta	mg kg-1		0.035		0.37		2.1				0.28		0.1875
Tb	mg kg-1	2.3	2.46		2.65		0.2			2.71	2.53	2.592	
Te	mg kg-1				2.05		1.5						
Th	mg kg-1	6			7		1.9	6.28		6.87	6.93	6.694	
Tl	mg kg-1	130			142.85		139	124					141
Tm	mg kg-1	1.3	1.54		1.54		0.9			1.62	1.5	1.566	
U	mg kg-1	3.9			4.5		3.5	4.18		4.7	4.49	4.237	
V	mg kg-1	380			476		335	380		454	450		
W	mg kg-1						51		137	85.4	93.3		
Y	mg kg-1	64	74.7		67.5		51	64.0	79		73.6	67.18	
Yb	mg kg-1	9.1	10		9.47		3.3				10.3	10.48	
Zn	mg kg-1	1500			1803		1650	1201	2932	1840	1955		1887
Zr	mg kg-1						289				323	327.1	

† Data submitted too late to be included in data processing

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)											
Round code		X74	X76	X77	X77	X78	X79	X80	X81	X81	X82	X102	X103
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality		2	2	1	2	1	2	2	1	2	1	2	1
SiO2	% m/m	11.23	10.465		8.3		10.65	26.35	10.24			11.3	
TiO2	% m/m	0.286	0.2885		0.2		0.28	0.18	0.54			0.289	0.240
Al2O3	% m/m	3.13	2.7		2.3		3	4.6	2.9			3.02	
Fe2O3	% m/m	8.49	8.683		23.3	8.3	7.77	11.1	9.15			8.91	
Fe(II)O	% m/m												
MnO	% m/m	47.38	44.612		37.4		43.62	58.82	50.85			45.8	41.368
MgO	% m/m	3	2.825		3		3.07	2.19	2.86			3.05	
CaO	% m/m	2.5	2.438		1.9		2.49	1.25	2.49			2.65	
Na2O	% m/m	3.47	3.66		2.3	3.41	3.09	5.78	3.47			3.79	
K2O	% m/m		0.952		0.5		0.88	0.302	0.87			0.981	
P2O5	% m/m		0.346		0.3		0.46	0.305	0.34			0.388	
H2O+	% m/m												
CO2	% m/m					0.73							
LOI	% m/m	15.13	16.57	17.17			18.76			15.51		15.5	
Ag	mg kg-1							2.25	0			0.73	
As	mg kg-1					76	59	28.09	60			82	
Au	mg kg-1											0.045	
B	mg kg-1	78										85	
Ba	mg kg-1	3648	3140		2350	3246	3020		12751		3914.5	3230	2960
Be	mg kg-1											1.7	
Bi	mg kg-1						23		4		3.629	3.95	3.58
Br	mg kg-1								29			42	
Cd	mg kg-1	18.8							18			20.9	21.6
Ce	mg kg-1					94	116		211		109.384	118	111.7
Cl	mg kg-1							202	18543			2000	
Co	mg kg-1	400	500			502	537	74.88	452			533	487
Cr	mg kg-1				56	24		135.67	0			8.62	
Cs	mg kg-1								0		1.561	0.85	0.725
Cu	mg kg-1	5770	6300		7800	5530	6314	595	5876			6410	4181
Dy	mg kg-1										16.266	16.7	15.37
Er	mg kg-1										9.804	11.3	10.18
Eu	mg kg-1					3.9					3.782	4.42	3.49
F	mg kg-1						24200						
Ga	mg kg-1						22	40.03	15			26.1	
Gd	mg kg-1										15.086	18.1	15.15
Ge	mg kg-1								0			2.3	
Hf	mg kg-1					4.7			2		12.79	6.9	4.92
Hg	mg kg-1											0.41	
Ho	mg kg-1					4					3.333	3.63	3.65
I	mg kg-1								27			11	
In	mg kg-1												
Ir	mg kg-1											0.0007	
La	mg kg-1	61				67.8	72		285		67.207	74.9	68.1
Li	mg kg-1										276.8	335	304
Lu	mg kg-1					1.7					1.454	1.81	1.63
Mo	mg kg-1	627	545				546	1900	463		591.3	590	449
N	mg kg-1												
Nb	mg kg-1						17	57.18	13		15.161	13.5	12.09
Nd	mg kg-1					68	670		86		63.679	68	62.8
Ni	mg kg-1	12300	13280		13800	14180	13333	13800	13557			14700	12189
Os	mg kg-1											0.002	
Pb	mg kg-1	141					123	75.63	119		123.16	139	126
Pd	mg kg-1											0.021	
Pr	mg kg-1						114				14.081	159	13.89
Pt	mg kg-1											0.08	
Rb	mg kg-1				21		7	42.85	13		13.69	12.7	11.52
Re	mg kg-1											0.0017	
Rh	mg kg-1											0.007	
Ru	mg kg-1											0.006	
S	mg kg-1		1245			1066	1161	1430	40			2260	
Sb	mg kg-1					69			55			66.9	
Sc	mg kg-1	7.3				7.9		7.69	36			8.1	16.74
Se	mg kg-1								0			2.7	
Sm	mg kg-1					15	35		18		14.107	15.1	13.69
Sn	mg kg-1								1			1.1	
Sr	mg kg-1	697	675		430		668	746.33	639		603.46	760	681
Ta	mg kg-1								0		0.484	0.22	
Tb	mg kg-1					2.6					2.491	2.83	2.11
Te	mg kg-1								0			1.94	
Th	mg kg-1					7.3	8		12		13.508	7.1	7.33
Tl	mg kg-1							288.69	105		121.04	142	
Tm	mg kg-1										1.475	1.47	1.56
U	mg kg-1					5.6			3		4.534	4.65	4.70
V	mg kg-1	361	540		330		472	19.43	1808			498	510
W	mg kg-1						88		1			85	70.3
Y	mg kg-1	72					69		64		56.779	70.3	64.6
Yb	mg kg-1					10.1			0		9.685	10.8	10.41
Zn	mg kg-1	1752	1930		1990	1910	1914	1770	1813			2050	
Zr	mg kg-1		370		400	483	303	415	311		300.73	340	321

Table 4		GeoPT23A Analytical results for Mn nodule, FeMn-1, as submitted (June 2008)										
Round code		X104	X105	X106	X106	X107	X108	X109	X110†			
Sample		FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1			
Data quality		1	1	1	2	2	2	1	1			
SiO2	% m/m						10.8	11.3	18.2			
TiO2	% m/m		0.278	0.354			0.28	0.29	0.309			
Al2O3	% m/m		2.89				3.17	3.11	1.79			
Fe2O3	% m/m	6.931	8.52				8.41	9.63	13.94			
Fe(II)O	% m/m											
MnO	% m/m	28.803	43.1		44.22		45.84	48.6	72.50			
MgO	% m/m		2.80				2.83	3.11				
CaO	% m/m		2.40		2.767		2.5	2.79				
Na2O	% m/m	2.978	3.40				2.47	3.93				
K2O	% m/m				1.059		0.52	1.07				
P2O5	% m/m		0.353				0.33	0.39	0.415			
H2O+	% m/m							0				
CO2	% m/m			0.642								
LOI	% m/m			16.85			16.32	17.8	20.24			
Ag	mg kg-1						50.7	0.06				
As	mg kg-1	66.13		74		69	91	72				
Au	mg kg-1											
B	mg kg-1											
Ba	mg kg-1	2450	2781	3896			3257	2871				
Be	mg kg-1						3	1.5				
Bi	mg kg-1					3.2	7.4	3.58				
Br	mg kg-1	21.19				35						
Cd	mg kg-1		16.5	16.9		32		20.7				
Ce	mg kg-1	86.38	108		127		108	131				
Cl	mg kg-1											
Co	mg kg-1	403.04	483				479	513	1500			
Cr	mg kg-1			4.1								
Cs	mg kg-1		0.78				0.8					
Cu	mg kg-1		5988	6671		6550	6320	6920	4900			
Dy	mg kg-1		16.0				15.5	19.3				
Er	mg kg-1		10.1				9.8	11.9				
Eu	mg kg-1		3.61				3.87	4.26				
F	mg kg-1											
Ga	mg kg-1						46	34.9				
Gd	mg kg-1		16.1				16.2	20.7				
Ge	mg kg-1						1	0.7				
Hf	mg kg-1		4.60				5	0.35				
Hg	mg kg-1							*0.018*				
Ho	mg kg-1		3.43				3.2	4.2				
I	mg kg-1											
In	mg kg-1							0.09				
Ir	mg kg-1			*0.00057*								
La	mg kg-1	56.38	67.3		82.2		73.8	84				
Li	mg kg-1		311					356				
Lu	mg kg-1		1.61				1.53	1.88				
Mo	mg kg-1	441.22	547	321		574		608				
N	mg kg-1											
Nb	mg kg-1		13.2	18.6		14	13	1.9				
Nd	mg kg-1		61.0				55.1	74.7				
Ni	mg kg-1		13008			13846			31400			
Os	mg kg-1											
Pb	mg kg-1		121	104.9		123	125	137				
Pd	mg kg-1			*0.00457*								
Pr	mg kg-1		14.1				13.3	17.8				
Pt	mg kg-1		*0.039*	*0.0694*								
Rb	mg kg-1		12.2			14	12	13.4				
Re	mg kg-1											
Rh	mg kg-1			*0.00268*								
Ru	mg kg-1			*0.00578*								
S	mg kg-1			924					1010			
Sb	mg kg-1	51.23		70.3			59.5	55.3				
Sc	mg kg-1	6.756	7.58				8	8.6				
Se	mg kg-1							0.6				
Sm	mg kg-1	11.94	13.4				13.9	16.4				
Sn	mg kg-1						1	1.0				
Sr	mg kg-1		687	765		686	715	773				
Ta	mg kg-1		0.23				0.2					
Tb	mg kg-1	2.927	2.49				2.6	3.06				
Te	mg kg-1							1.8				
Th	mg kg-1	6.12	6.58			4.2	6.8	7.6				
Tl	mg kg-1					116	94.9	142				
Tm	mg kg-1		1.48				1.45	1.86				
U	mg kg-1		4.28			5	4.5	4.8				
V	mg kg-1		431	526			414	462	660			
W	mg kg-1	65.27	80.5			87	72	77.8				
Y	mg kg-1		67.2	72.6		72	73	79.9				
Yb	mg kg-1	8.55	10.4				9.6	12				
Zn	mg kg-1	1628.2	1896	1912		2061	2010	1595				
Zr	mg kg-1		338	382		325	327	312				
		† Data subm	*Pt rev'd*	*PGE rev'd*				*Hg rev'd*				
			2/10/08	30/10/08				2/10/08				

Table 5 GeoPT23A Assigned values and statistical summary for contributed data (Manganese nodule, FeMn-1)

	X_a	H_a	n	sdm	sdm/H_a	Status	Assigned value
	% m/m	% m/m		% m/m			is:
SiO2	10.5	0.1474	47	0.1295	0.879	Provisional	Median
TiO2	0.2888	0.007	56	0.0042	0.598	Provisional	Median
Al2O3	2.93	0.0498	51	0.0394	0.791	Provisional	Median
Fe2O3	8.6865	0.1255	56	0.0917	0.731	Provisional	Median
MnO	44.385	0.5016	56	0.3483	0.694	Provisional	Median
MgO	2.817	0.0482	51	0.0295	0.612	Assigned	Robust mean
CaO	2.5005	0.0436	54	0.0231	0.530	Assigned	Median
P2O5	0.352	0.0082	48	0.0057	0.688	Provisional	Median
LOI	16.66	0.2182	39	0.2279	1.045	Provisional	Median
	mg/kg	mg/kg		mg/kg			
Ba	3158	75.12	59	53.66	0.710	Provisional	Median
Bi	3.42	0.227	27	0.22	0.954	Provisional	Median
Cd	19.6	1.0018	33	0.70	0.696	Provisional	Median
Ce	110	4.337	45	1.64	0.377	Assigned	Median
Co	475	15.026	55	7.80	0.519	Assigned	Median
Cs	0.85	0.07	31	0.04	0.497	Provisional	Median
Cu	5956.92	128.79	60	110.47	0.860	Provisional	Robust mean
Dy	15.8	0.8	35	0.30	0.300	Assigned	Robust mean
Er	9.802	0.5561	34	0.14	0.252	Assigned	Median
Eu	3.8	0.25	36	0.06	0.230	Assigned	Median
Gd	15.6251	0.8263	34	0.28	0.345	Assigned	Robust mean
Hf	4.735	0.2997	34	0.06	0.195	Assigned	Median
Ho	3.4233	0.2275	35	0.06	0.247	Assigned	Robust mean
La	68.2226	2.8902	46	0.97	0.337	Assigned	Robust mean
Li	302.796	10.25	27	6.14	0.599	Provisional	Robust mean
Lu	1.592	0.11873	34	0.02	0.197	Provisional	Median
Mo	549	16.993	50	9.24	0.544	Provisional	Median
Nb	13.4	0.7252	46	0.33	0.452	Assigned	Median
Nd	62.95	2.699	42	0.82	0.305	Assigned	Median
Ni	13100	251.5	56	138.70	0.600	Provisional	Median
Pb	126.75	4.892	56	2.48	0.506	Assigned	Median
Pr	14.11	0.7577	35	0.20	0.261	Provisional	Median
Rb	12.5	0.6836	47	0.21	0.310	Provisional	Median
Sb	60.9644	2.6268	32	1.91	0.729	Provisional	Robust mean
Sc	8.095	0.4726	36	0.25	0.533	Provisional	Median
Sm	14.0279	0.754	39	0.20	0.266	Assigned	Robust mean
Sr	683.302	20.465	61	8.82	0.431	Assigned	Robust mean
Ta	0.261	0.026	27	0.03	1.166	Provisional	Median
Tb	2.5186	0.1753	35	0.05	0.294	Assigned	Robust mean
Th	6.87	0.4111	43	0.17	0.401	Assigned	Robust mean
Tl	129	4.965	30	3.52	0.709	Provisional	Median
Tm	1.4867	0.112	32	0.03	0.231	Assigned	Robust mean
U	4.3912	0.2811	39	0.13	0.449	Assigned	Robust mean
V	468.5	14.851	52	12.85	0.865	Provisional	Median
W	74.6	3.1181	28	2.97	0.953	Provisional	Median
Y	69.1071	2.922	53	1.13	0.387	Assigned	Robust mean
Yb	10	0.566	38	0.14	0.238	Assigned	Median
Zn	1845	47.58	58	20.58	0.430	Assigned	Median
Zr	325.072	10.887	53	5.22	0.479	Assigned	Robust mean

where: X_a = Consensus value
H_a = Horwitz Target value
n = no. of contributed data
sdm = Uncertainty of assigned value
sdm/Ha = Uncertainty/Horwitz Target value

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X4	X6	X7	X8	X9	X10	X11	X12	X13	X13
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	1	2	1	2	1	1	2	2	1	2
SiO2	-19.40	-1.63	0.00	4.51	-1.42	-4.06	1.66	0.17	*	3.26
TiO2	4.49	2.24	3.05	12.30	1.62	-3.84	2.68	0.09	*	0.81
Al2O3	-19.46	6.92	2.01	*	-19.86	-4.19	1.10	0.30	*	3.61
Fe2O3	13.02	2.37	-0.69	4.36	3.77	-7.12	5.31	0.77	*	1.93
MnO	6.41	-1.09	0.11	-0.76	1.47	12.60	4.52	-2.63	*	0.02
MgO	-45.37	3.04	1.10	*	-5.75	-3.86	-5.67	0.96	*	-2.77
CaO	-14.70	1.37	1.82	11.01	1.14	-4.24	5.39	1.14	*	2.06
P2O5	-22.09	4.13	-0.24	*	-31.81	-3.04	0.67	0.49	*	1.70
LOI	32.04	-5.06	-1.24	*	2.61	1.10	*	-2.20	1.97	*
Ba	0.39	-1.33	-1.74	-2.05	*	-1.85	9.11	2.14	*	*
Bi	-2.51	*	*	*	*	*	*	*	*	*
Cd	-19.07	-6.14	*	-2.89	*	*	*	*	*	*
Ce	2.44	-0.51	*	-2.00	*	*	*	*	-9.43	*
Co	1.87	*	2.26	1.63	*	-4.26	3.69	1.07	-23.58	*
Cs	-1.58	*	*	99.40	*	*	*	*	*	*
Cu	-3.93	-20.32	0.99	0.40	*	-6.18	13.46	-0.36	-31.29	*
Dy	-2.00	0.00	*	*	*	*	*	*	*	*
Er	-2.27	0.41	*	*	*	*	*	*	*	*
Eu	-2.69	0.21	*	*	*	*	*	*	*	*
Gd	-2.78	0.11	*	*	*	*	*	*	*	*
Hf	-3.35	-0.03	*	*	*	*	*	*	*	*
Ho	-1.75	-0.10	*	*	*	*	*	*	*	*
La	0.74	0.24	*	-1.92	*	*	6.71	*	-8.73	*
Li	0.03	0.25	*	*	*	*	*	*	*	*
Lu	-1.71	0.45	*	*	*	*	*	*	*	*
Mo	2.78	-0.21	1.71	1.24	*	-6.00	8.74	*	*	*
Nb	-0.68	-1.65	-1.93	-2.96	*	*	3.86	*	*	*
Nd	-2.00	0.13	*	-0.08	*	*	*	*	-12.13	*
Ni	-2.30	*	0.70	-0.20	*	-4.30	15.40	1.10	-29.30	*
Pb	-0.32	-3.76	1.89	-3.49	*	12.11	7.59	*	-21.27	*
Pr	-1.14	0.00	*	4.68	*	*	*	*	*	*
Rb	-0.99	-6.22	*	-1.17	*	*	11.34	*	-5.12	*
Sb	-2.83	*	*	4.88	*	*	4.00	*	*	*
Sc	-0.56	-1.36	*	*	*	*	3.07	*	9.74	*
Sm	-2.13	-0.01	*	*	*	*	*	*	*	*
Sr	3.73	-6.24	1.99	1.31	*	-3.63	7.35	2.12	-10.59	*
Ta	-2.69	1.94	*	*	*	*	*	*	*	*
Tb	-2.38	*	*	*	*	*	*	*	*	*
Th	-0.64	-0.24	*	*	*	*	*	*	*	*
Tl	0.34	*	4.03	1.21	*	*	11.18	*	*	*
Tm	-1.64	0.46	*	*	*	*	*	*	*	*
U	-1.14	-0.45	*	*	*	*	*	*	*	*
V	3.07	-4.83	3.00	*	*	-1.38	3.22	4.97	11.13	*
W	-2.37	*	*	*	*	*	*	*	*	*
Y	1.50	*	-2.09	-0.10	*	-10.30	7.00	11.96	*	*
Yb	-2.33	0.61	*	*	*	*	*	*	*	*
Zn	-5.79	*	-0.84	-0.37	*	-2.98	7.75	0.95	0.95	*
Zr	2.14	-11.12	1.37	1.33	*	*	6.84	1.88	-20.32	*

† *Source data not included in analysis*

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X14	X15	X15	X16	X18	X19	X20	X21	X23	X23
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	1	1	2	2	2	2	1	1	1	2
SiO2	*	*	*	0.00	-0.81	4.82	0.34	*	0.07	*
TiO2	*	*	*	-0.05	-0.46	0.09	2.62	*	-8.44	*
Al2O3	*	*	*	0.00	0.44	-2.31	0.98	*	0.40	*
Fe2O3	*	*	*	0.81	1.50	-1.50	3.91	*	0.27	*
MnO	*	*	*	0.61	-0.30	2.28	2.56	*	0.85	*
MgO	*	*	*	1.07	0.20	3.66	-2.53	*	-0.35	*
CaO	*	*	*	0.11	-1.39	4.47	2.74	*	-0.01	*
P2O5	*	*	*	0.00	-2.00	2.31	0.24	*	-5.10	*
LOI	*	*	*	-0.60	0.00	0.48	-2.48	*	-4.17	*
Ba	*	*	1.55	58.19	0.33	0.13	-5.18	-0.31	4.10	*
Bi	*	*	*	*	-0.37	-0.27	-8.45	-3.34	-13.73	*
Cd	*	*	*	0.25	-1.40	-5.51	3.89	*	*	*
Ce	-0.69	1.15	*	20.64	0.35	0.17	1.18	1.61	-0.55	*
Co	*	*	-1.17	-0.23	-0.13	-2.88	2.26	-10.98	2.60	*
Cs	*	*	*	92.22	-0.36	0.12	547.59	0.00	-0.29	*
Cu	*	*	-1.97	-0.92	-3.29	-5.82	-0.60	-21.62	3.18	*
Dy	0.40	*	1.10	*	1.20	0.60	0.90	1.20	1.30	*
Er	0.00	*	0.90	*	0.72	-0.06	0.79	1.26	1.47	*
Eu	-0.22	*	-0.23	*	0.44	0.30	1.07	-0.05	0.91	*
Gd	0.94	*	1.44	*	1.98	0.41	1.16	-1.48	1.65	*
Hf	*	*	-0.24	*	0.14	0.03	-0.28	0.65	0.55	*
Ho	-0.45	1.26	*	*	0.52	0.31	0.38	0.91	0.95	*
La	-0.80	*	*	36.46	0.10	0.28	1.30	1.83	0.15	*
Li	*	-1.25	*	*	*	-0.40	*	-4.76	6.26	*
Lu	-1.11	*	-0.05	*	0.20	0.28	0.24	-0.02	0.40	*
Mo	-0.77	*	*	-2.77	-1.21	2.44	-1.82	-4.59	*	*
Nb	*	*	11.44	0.41	-0.07	-0.07	0.14	-1.10	*	0.28
Nd	-0.80	*	-0.38	-3.58	0.81	0.68	1.35	0.83	1.73	*
Ni	*	*	-2.80	0.00	2.50	-5.90	2.80	-20.80	2.80	*
Pb	*	*	11.58	-3.79	0.33	1.39	0.26	1.07	*	1.25
Pr	-0.28	*	-0.01	*	0.46	0.43	1.03	1.31	2.05	*
Rb	*	-5.12	*	2.93	-0.29	0.22	0.73	0.44	0.15	*
Sb	*	*	*	-3.23	-1.78	-0.04	2.87	0.51	-2.58	*
Sc	*	*	*	24.34	0.62	-0.95	65.39	-1.91	1.96	*
Sm	-0.43	0.63	*	13.31	0.38	0.28	0.72	0.89	1.37	*
Sr	-0.89	*	-0.59	-1.11	0.41	0.82	-0.80	-1.92	0.72	*
Ta	*	*	-0.02	*	-0.41	0.77	-3.16	3.50	-7.67	*
Tb	-0.51	*	0.49	*	1.14	0.26	0.46	0.07	1.55	*
Th	*	*	0.94	-1.79	0.13	0.88	-0.34	-0.34	0.88	*
Tl	*	*	*	*	0.71	2.86	-3.02	-2.62	-1.01	*
Tm	-0.06	*	0.64	*	0.51	0.34	0.74	1.10	1.28	*
U	*	*	-0.61	23.85	0.26	0.67	0.67	0.46	1.13	*
V	*	*	-2.31	40.45	-0.99	-3.28	85.55	-11.14	4.01	*
W	*	*	*	2.47	0.10	-0.55	2.21	0.22	-23.52	*
Y	-2.26	*	-0.79	-0.69	0.72	1.33	1.40	0.27	1.02	*
Yb	-0.62	*	0.80	262.56	0.88	0.33	0.94	0.18	1.04	*
Zn	*	*	4.47	0.16	0.68	-3.15	1.98	-10.91	4.54	*
Zr	*	*	-1.24	-0.69	-0.42	0.09	0.45	-0.93	0.27	*

Code error amenle error amended

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X24	X26	X31	X31	X32	X33	X34	X35	X36	X37
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	2	1	2	2	1	1	2	2	2
SiO2	*	*	*	-1.80	-0.44	19.27	-0.54	-1.53	2.10	-2.37
TiO2	*	-0.63	*	0.09	-1.35	7.36	50.45	-0.63	2.68	-2.06
Al2O3	*	-2.71	*	-1.61	0.50	-23.27	1.54	-2.01	2.11	-0.30
Fe2O3	*	-0.03	*	-0.34	-0.11	8.72	-3.69	-1.06	-3.57	2.44
MnO	*	*	*	2.51	1.44	34.62	-6.07	-0.98	4.30	-0.38
MgO	*	-2.67	*	-2.15	1.17	1.51	8.57	-0.07	1.17	-1.01
CaO	*	0.91	*	-0.01	-1.15	6.65	-0.98	-0.92	2.40	1.26
P2O5	*	4.13	*	-0.73	0.24	0.97	2.43	-0.73	0.00	6.56
LOI	*	*	*	-0.76	2.09	*	-16.91	*	-5.64	0.32
Ba	-0.60	-1.56	*	0.87	0.41	5.41	1.90	*	2.28	-1.05
Bi	-2.02	*	*	-2.02	*	6.51	*	*	*	*
Cd	-0.30	*	*	*	*	38.43	*	*	3.12	*
Ce	-1.30	*	*	1.85	-0.69	0.21	0.44	*	-0.90	*
Co	-0.53	-2.86	*	-0.13	1.33	*	2.00	*	2.67	0.73
Cs	0.72	*	*	*	*	391.13	-4.02	*	0.35	*
Cu	-3.37	-1.74	*	-0.80	1.42	11.87	21.07	*	2.16	-2.55
Dy	-0.50	-1.00	-0.70	*	*	*	2.80	*	-0.30	*
Er	-0.33	-0.95	0.01	*	*	*	2.86	*	-0.07	*
Eu	0.03	-0.15	1.23	*	*	*	2.28	*	0.03	*
Gd	0.05	-1.75	-0.15	*	*	*	3.48	*	-0.23	*
Hf	0.58	-0.24	*	32.97	*	*	2.79	*	-0.15	*
Ho	-0.40	-0.38	-0.85	*	*	*	2.93	*	-0.34	*
La	-0.47	*	*	-0.66	1.52	-0.60	0.88	*	-0.43	*
Li	-0.38	*	22.36	*	*	*	*	*	*	0.55
Lu	-0.39	-0.35	-0.86	*	*	*	2.85	*	0.01	*
Mo	*	*	*	-2.38	1.35	8.14	*	*	1.37	*
Nb	1.45	-2.21	*	0.41	1.10	4.69	2.41	*	7.98	-2.34
Nd	-0.12	*	-1.32	*	13.16	154.51	3.80	*	-0.52	*
Ni	-2.60	-7.00	*	-0.90	1.30	12.00	-0.40	*	2.30	-4.20
Pb	0.43	-5.90	*	0.33	0.64	6.51	0.46	*	2.12	-0.89
Pr	-0.34	*	-0.67	*	*	*	4.14	*	-0.36	*
Rb	-0.37	-1.10	*	2.56	9.87	-1.02	-0.37	*	0.20	-0.37
Sb	*	*	*	*	1.34	14.14	*	*	-3.94	-0.18
Sc	-1.00	*	*	30.58	-0.10	*	72.79	*	0.37	*
Sm	0.11	-0.01	-1.10	*	*	*	2.70	*	-0.42	*
Sr	-0.74	-1.79	*	-1.55	0.46	5.03	4.06	*	2.27	-0.25
Ta	*	1.10	*	758.64	*	*	2.24	*	-1.86	*
Tb	0.00	-0.82	-0.28	*	*	*	2.63	*	0.07	*
Th	-1.06	-1.54	*	-3.13	31.78	43.85	3.16	*	4.40	3.81
Tl	-0.10	-12.91	*	*	*	-7.51	*	*	*	*
Tm	-0.12	-0.88	*	*	*	*	3.15	*	-0.45	*
U	-0.07	-1.62	*	4.64	*	21.73	3.23	*	4.02	*
V	*	-3.82	*	-0.32	-0.76	7.98	6.03	*	-0.35	47.93
W	*	*	*	-2.66	*	-0.19	*	*	-2.97	*
Y	-0.98	0.32	*	-0.53	1.18	6.16	4.00	*	1.68	-0.70
Yb	-0.38	-1.58	-0.21	*	68.96	*	3.75	*	0.31	*
Zn	-2.51	*	*	-0.44	0.82	10.49	-2.82	*	0.57	-4.68
Zr	-1.24	-1.70	*	-1.24	0.50	6.32	1.07	*	2.61	-0.65

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X38	X41	X41	X43	X44	X44	X45	X46	X49	X50
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	1	2	2	1	2	2	1	2	2
SiO2	6.89	-0.68	*	*	8.68	*	*	13.98	-3.60	*
TiO2	-0.30	-1.26	*	-3.50	8.80	*	-0.63	18.85	5.12	*
Al2O3	1.72	-0.40	*	*	9.03	*	-1.40	7.42	-1.81	*
Fe2O3	0.33	-1.09	*	-2.42	3.69	*	-2.02	21.55	3.64	*
MnO	3.90	-2.50	*	-3.16	0.01	*	-2.77	-33.41	-7.76	*
MgO	0.67	-3.88	*	-2.15	9.81	*	-0.07	4.42	-10.96	*
CaO	0.01	0.22	*	-4.71	21.34	*	-0.35	24.09	5.16	*
P2O5	-0.50	-1.46	*	-1.76	12.02	*	*	9.47	2.31	*
LOI	*	9.58	*	*	7.01	*	*	7.29	19.80	*
Ba	-4.13	0.00	*	-1.45	*	-1.05	1.26	15.10	10.60	-0.19
Bi	*	*	*	*	*	*	*	33.34	*	113.45
Cd	-1.45	*	*	-2.30	*	*	0.00	19.37	*	4.19
Ce	*	-2.08	*	-2.31	3.92	*	-0.85	10.15	*	0.12
Co	-10.08	-1.13	*	-3.16	-3.39	*	3.21	-3.00	2.53	-1.40
Cs	*	*	-0.36	*	160.04	*	-1.94	59.57	*	*
Cu	4.37	-1.37	*	-1.19	-5.78	*	1.44	1.89	3.66	-0.17
Dy	*	-1.50	*	*	*	*	-3.20	-18.90	10556.80	0.10
Er	*	-0.94	*	*	*	*	-3.29	-17.63	*	0.18
Eu	*	-1.78	*	*	*	*	-1.98	-3.23	4795.24	0.60
Gd	*	-1.24	*	*	*	*	-2.50	-8.02	*	0.23
Hf	*	-1.05	*	-6.23	50.93	*	*	17.57	*	*
Ho	*	-0.54	*	*	*	*	-2.93	6.93	*	-0.05
La	*	-2.05	*	-0.56	*	*	-0.73	-23.61	*	-0.04
Li	*	*	*	-0.53	*	*	-2.06	*	*	-1.16
Lu	*	-0.69	*	*	*	*	-3.29	*	*	-0.39
Mo	-0.18	*	*	-2.03	-4.65	*	0.70	2.24	10.59	0.59
Nb	-4.27	0.14	*	2.48	-1.93	*	*	31.16	*	33.51
Nd	*	-0.06	*	-0.55	-0.72	*	-1.27	2.24	*	*
Ni	0.50	-10.20	*	-1.20	*	-0.20	0.60	11.60	0.80	-1.20
Pb	1.89	-2.61	*	-0.89	-7.51	*	*	-1.18	12.29	1.97
Pr	*	0.12	*	*	*	*	-0.73	19.65	*	-0.07
Rb	0.44	2.34	*	*	-0.73	*	4.39	-0.73	*	2.56
Sb	-2.68	*	*	*	*	*	*	-12.93	*	0.20
Sc	*	-1.85	*	*	35.77	*	-1.26	6.15	*	*
Sm	*	-0.70	*	*	*	*	-1.54	-18.60	*	-0.02
Sr	-0.36	1.65	*	-1.30	-5.73	*	0.05	-2.65	7.52	-0.52
Ta	*	*	-1.19	*	694.79	*	*	-10.21	*	0.77
Tb	*	-0.45	*	*	*	*	-2.25	-2.96	*	1.09
Th	*	-0.10	*	*	14.91	*	*	-4.55	*	-0.09
Tl	*	*	*	*	-4.83	*	*	*	6.85	-0.10
Tm	*	0.03	*	*	*	*	-2.80	*	*	0.06
U	-6.57	-0.04	*	*	-4.24	*	*	-12.06	*	-0.34
V	0.02	0.30	*	*	72.28	*	1.51	8.05	0.02	-0.05
W	*	*	*	*	35.73	*	*	-19.11	*	9.85
Y	6.78	-1.41	*	-1.73	-3.46	*	0.10	-3.46	5.46	-1.05
Yb	*	-0.92	*	*	*	*	-3.89	-17.68	*	0.00
Zn	1.02	-8.87	*	-0.68	-4.35	*	-1.07	-0.53	1.63	-1.63
Zr	-12.94	-2.49	*	-1.79	-5.61	*	-2.11	1.46	4.41	0.55

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X51	X52	X53	X55	X56	X58	X59	X60	X61	X63
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	2	2	1	1	2	2	1	2	1
SiO2	*	*	4.77	15.26	16.15	-0.27	-0.12	*	-1.02	*
TiO2	*	12.30	4.26	-1.26	18.28	-2.50	-0.99	*	-2.06	*
Al2O3	*	*	6.82	-0.60	-3.81	3.32	0.05	*	-0.10	*
Fe2O3	*	-3.61	5.69	3.30	-0.93	0.56	-0.70	*	-0.30	*
MnO	*	-10.18	12.40	-1.03	-1.15	-2.05	-0.34	*	-0.98	*
MgO	*	*	-1.63	0.27	-1.80	1.89	0.57	*	-0.59	*
CaO	*	-2.88	6.54	0.22	-17.00	0.22	-0.33	*	-0.58	*
P2O5	*	*	5.10	-0.24	6.31	-0.85	-0.36	*	-0.12	*
LOI	*	*	*	*	8.89	16.59	-1.26	*	-0.14	*
Ba	13.12	*	6.44	-4.77	*	-2.14	3.33	0.16	-3.71	-5.31
Bi	100.25	*	*	*	*	*	-5.27	*	-0.26	*
Cd	*	*	*	4.39	*	*	-0.64	0.40	-0.80	*
Ce	*	*	*	0.00	*	*	-1.37	0.23	-1.50	-2.53
Co	-0.90	*	6.66	-0.60	3.00	-1.30	-1.83	2.66	-0.50	*
Cs	*	*	*	*	*	*	-1.99	2.01	*	-2.56
Cu	18.48	1.10	6.09	1.89	18.27	-1.55	0.23	-0.44	-3.72	*
Dy	*	*	*	-2.60	*	*	-0.60	-0.20	-0.50	1.20
Er	*	*	*	-5.83	*	*	-0.67	-1.17	-0.63	0.43
Eu	*	*	*	-0.90	*	*	-1.31	-0.98	-0.61	-1.30
Gd	*	*	*	-0.39	*	*	-0.64	-0.15	-0.38	0.22
Hf	18.79	*	*	*	*	*	-0.17	-0.58	*	-8.86
Ho	*	*	*	-6.26	*	*	-0.94	-0.67	-0.71	0.29
La	*	*	*	0.48	*	*	-1.48	-0.32	-1.08	-1.44
Li	*	*	*	*	*	*	-1.70	4.51	-1.11	*
Lu	*	*	*	-6.75	*	*	-0.86	-0.77	-0.39	0.83
Mo	-0.06	0.32	8.71	1.59	1.53	*	-1.35	1.53	-1.74	*
Nb	-2.34	*	*	-0.14	9.10	*	-1.38	-0.28	*	*
Nd	*	*	*	0.69	*	*	-1.40	-0.20	-0.92	0.93
Ni	-0.20	0.90	9.60	-5.40	6.20	-3.30	0.90	0.00	-4.20	*
Pb	-2.43	2.89	4.93	11.09	*	-1.92	-0.34	-0.15	-1.71	-19.00
Pr	*	*	*	1.04	*	*	-0.94	0.12	-0.73	-0.63
Rb	2.56	-0.37	*	*	*	*	-0.73	4.24	*	-1.20
Sb	*	*	*	2.68	*	*	-1.06	-0.82	0.77	*
Sc	*	*	*	3.25	*	*	3.60	-0.01	*	*
Sm	*	*	*	0.89	*	*	-1.03	-0.57	-0.68	-1.07
Sr	-1.38	0.16	*	4.09	8.49	-0.94	-0.84	1.45	-2.04	-1.95
Ta	*	*	*	*	*	*	*	-0.42	*	-8.84
Tb	*	*	*	-0.96	*	*	-1.00	-0.51	-0.62	-0.33
Th	2.59	*	*	45.07	*	*	-0.74	-0.51	-1.06	*
Tl	*	0.10	*	*	*	*	-0.40	-0.60	0.10	*
Tm	*	*	*	-5.33	*	*	-0.67	-0.60	-0.83	0.48
U	-3.90	*	*	*	*	*	-0.51	-0.75	-0.87	*
V	12.31	*	2.21	-1.38	-9.53	*	-1.57	-0.03	-2.98	*
W	*	*	*	-3.27	*	*	-8.84	2.73	*	*
Y	-1.56	-1.90	*	2.22	*	*	-0.39	0.58	-0.87	1.91
Yb	*	*	*	-8.01	*	*	-0.73	-0.51	-0.80	0.00
Zn	-2.08	1.05	4.41	0.84	-2.65	-1.79	0.20	0.11	-3.63	*
Zr	-0.28	-0.69	*	-1.84	-2.30	*	-0.91	0.73	*	*

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X64	X65	X66	X67	X68	X69†	X70	X72	X73	X73
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	2	1	2	2	2	2	2	1	2
SiO2	-5.22	-1.02	-11.87	18.28	*	*-0.38*	5.26	-1.22	*	*
TiO2	23.07	0.81	0.18	1.60	-5.08	*2.48*	-0.63	-0.63	*	-1.49
Al2O3	-4.61	-0.40	-6.22	-2.91	-2.51	*-2.37*	2.01	1.40	*	-2.00
Fe2O3	-2.86	0.01	-2.76	3.68	-4.33	*8.53*	0.37	-1.50	*	-3.03
MnO	-6.35	0.36	-1.76	-0.01	-18.73	*-1.83*	1.16	3.31	*	2.95
MgO	*	2.11	1.93	-0.69	-1.52	*13.86*	-0.07	-0.59	*	-1.48
CaO	*	0.11	4.35	-3.10	-2.99	*1.45*	-0.24	-0.01	*	-1.76
P2O5	-15.90	0.49	-5.10	-4.55	*	*	1.21	2.31	*	*
LOI	*	4.35	-3.53	4.22	*	*	-4.03	-2.27	*	*
Ba	*	1.11	-5.79	6.10	-1.94	*3.71*	-1.85	-0.13	-1.81	*
Bi	*	0.00	*	-1.91	-1.06	*	1.08	1.89	*	*
Cd	*	0.80	*	-0.95	-0.15	*11.11*	0.75	2.65	*	0.75
Ce	*	-0.24	*	-4.73	-1.95	*	*	0.35	0.78	*
Co	*	0.73	*	-3.00	-2.16	*-2.35*	0.00	0.43	*	0.28
Cs	*	3.37	*	80.02	-0.36	*	0.29	-0.93	-0.22	*
Cu	*	0.66	*	-0.90	-3.39	*-3.51*	1.49	-2.19	*	-0.76
Dy	*	0.10	*	-6.30	*	*	-0.30	0.00	0.90	*
Er	*	-0.18	*	-2.29	*	*	0.31	-0.33	1.04	*
Eu	*	0.03	*	-2.72	*	*	-0.13	0.54	0.12	*
Gd	*	-0.05	*	-3.71	*	*	-0.14	-0.20	1.00	*
Hf	*	-0.24	*	3.45	*	*	-0.89	0.11	0.53	*
Ho	*	0.26	*	-7.50	*	*	0.63	-0.31	0.76	*
La	*	0.20	*	-1.42	1.21	*	-0.35	0.43	0.70	*
Li	*	-0.53	-0.08	-1.70	-0.82	*-1.67*	1.38	0.11	*	1.06
Lu	*	0.20	*	-3.55	*	*	0.58	0.12	0.64	*
Mo	*	-0.45	*	-1.91	-1.06	*7.70*	-0.21	2.94	*	0.06
Nb	*	0.31	*	-0.97	*	*51.61*	*	-0.41	*	-0.17
Nd	*	-0.22	*	-7.40	*	*	0.03	0.21	1.32	*
Ni	*	1.60	*	-4.60	-5.00	*	0.00	-1.20	*	0.50
Pb	*	0.43	*	-0.18	-1.10	*-1.67*	3.14	2.68	0.15	*
Pr	*	0.00	*	-5.68	*	*	1.18	0.52	1.20	*
Rb	*	1.97	*	-3.58	-0.88	*	*	0.00	-0.37	*
Sb	*	-0.69	*	1.53	-0.98	*12.08*	1.28	2.29	*	*
Sc	*	-1.16	*	-2.75	-1.20	*	0.11	*	*	*
Sm	*	-0.37	*	-8.57	*	*	0.05	0.25	0.57	*
Sr	*	0.73	1.31	-4.72	-1.40	*-0.10*	*	0.34	-0.20	*
Ta	*	2.14	*	36.02	*	*	*	0.38	*	-1.44
Tb	*	0.37	*	-6.61	*	*	0.55	0.03	0.42	*
Th	*	0.16	*	-6.04	-0.72	*	0.00	0.07	-0.43	*
Tl	*	1.40	*	1.01	-0.50	*	*	*	*	1.21
Tm	*	0.24	*	-2.62	*	*	0.59	0.06	0.71	*
U	*	0.19	*	-1.59	-0.38	*	0.55	0.18	-0.55	*
V	*	0.25	*	-4.50	-2.98	*	-0.49	-0.62	*	*
W	*	*	*	-3.78	*	*10.05*	1.73	3.00	*	*
Y	*	-0.28	*	-3.10	-0.87	*1.62*	*	0.77	-0.66	*
Yb	*	-0.47	*	-5.92	*	*	*	0.27	0.85	*
Zn	*	-0.44	*	-2.05	-6.77	*11.43*	-0.05	1.16	*	0.44
Zr	*	*	*	-1.66	*	*	*	-0.10	0.19	*

† *Source data not included in analysis*

N.B. See text before interpreting these results

Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

Lab code	X74	X76	X77	X77	X78	X79	X80	X81	X81	X82
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	2	1	2	1	2	2	1	2	1
SiO2	2.48	-0.12	*	-7.46	*	0.51	53.76	-1.76	*	*
TiO2	-0.20	-0.02	*	-6.37	*	-0.63	-7.81	36.09	*	*
Al2O3	2.01	-2.31	*	-6.32	*	0.70	16.75	-0.60	*	*
Fe2O3	-0.78	-0.01	*	58.23	-3.08	-3.65	9.62	3.69	*	*
MnO	2.99	0.23	*	-6.96	*	-0.76	14.39	12.89	*	*
MgO	1.90	0.08	*	1.90	*	2.62	-6.50	0.89	*	*
CaO	-0.01	-0.72	*	-6.89	*	-0.12	-14.35	-0.24	*	*
P2O5	*	-0.36	*	-3.16	*	6.56	-2.85	-1.46	*	*
LOI	-3.51	-0.21	2.34	*	*	4.81	*	*	-2.64	*
Ba	3.26	-0.12	*	-5.38	1.17	-0.92	*	127.70	*	10.07
Bi	*	*	*	*	*	43.07	*	2.55	*	0.92
Cd	-0.40	*	*	*	*	*	*	-1.60	*	*
Ce	*	*	*	*	-3.69	0.69	*	23.29	*	-0.14
Co	-2.50	0.83	*	*	1.80	2.06	-13.31	-1.53	*	*
Cs	*	*	*	*	*	*	*	-12.20	*	10.21
Cu	-0.73	1.33	*	7.16	-3.31	1.39	-20.82	-0.63	*	*
Dy	*	*	*	*	*	*	*	*	*	0.60
Er	*	*	*	*	*	*	*	*	*	0.00
Eu	*	*	*	*	0.39	*	*	*	*	-0.09
Gd	*	*	*	*	*	*	*	*	*	-0.65
Hf	*	*	*	*	-0.12	*	*	-9.13	*	26.88
Ho	*	*	*	*	2.53	*	*	*	*	-0.40
La	-1.25	*	*	*	-0.15	0.65	*	75.01	*	-0.35
Li	*	*	*	*	*	*	*	*	*	-2.54
Lu	*	*	*	*	0.91	*	*	*	*	-1.16
Mo	2.30	-0.12	*	*	*	-0.09	39.75	-5.06	*	2.49
Nb	*	*	*	*	*	2.48	30.18	-0.55	*	2.43
Nd	*	*	*	*	1.87	112.45	*	8.54	*	0.27
Ni	-1.60	0.40	*	1.40	4.30	0.50	1.40	1.80	*	*
Pb	1.46	*	*	*	*	-0.38	-5.23	-1.58	*	-0.73
Pr	*	*	*	*	*	65.91	*	*	*	-0.04
Rb	*	*	*	6.22	*	-4.02	22.20	0.73	*	1.74
Sb	*	*	*	*	3.06	*	*	-2.27	*	*
Sc	-0.84	*	*	*	-0.41	*	-0.43	59.04	*	*
Sm	*	*	*	*	1.29	13.91	*	5.27	*	0.10
Sr	0.34	-0.20	*	-6.19	*	-0.37	1.54	-2.17	*	-3.90
Ta	*	*	*	*	*	*	*	-10.21	*	8.74
Tb	*	*	*	*	0.46	*	*	*	*	-0.16
Th	*	*	*	*	1.05	1.37	*	12.48	*	16.15
Tl	*	*	*	*	*	*	16.08	-4.83	*	-1.60
Tm	*	*	*	*	*	*	*	*	*	-0.10
U	*	*	*	*	4.30	*	*	-4.95	*	0.51
V	-3.62	2.41	*	-4.66	*	0.12	-15.12	90.19	*	*
W	*	*	*	*	*	2.15	*	-23.60	*	*
Y	0.50	*	*	*	*	-0.02	*	-1.75	*	-4.22
Yb	*	*	*	*	0.18	*	*	-17.68	*	-0.56
Zn	-0.98	0.89	*	1.52	1.37	0.73	-0.79	-0.67	*	*
Zr	*	2.06	*	3.44	14.51	-1.01	4.13	-1.29	*	-2.24

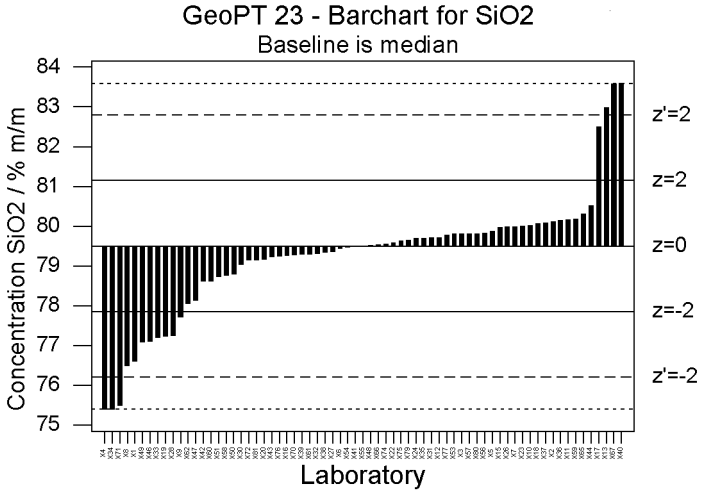
N.B. See text before interpreting these results

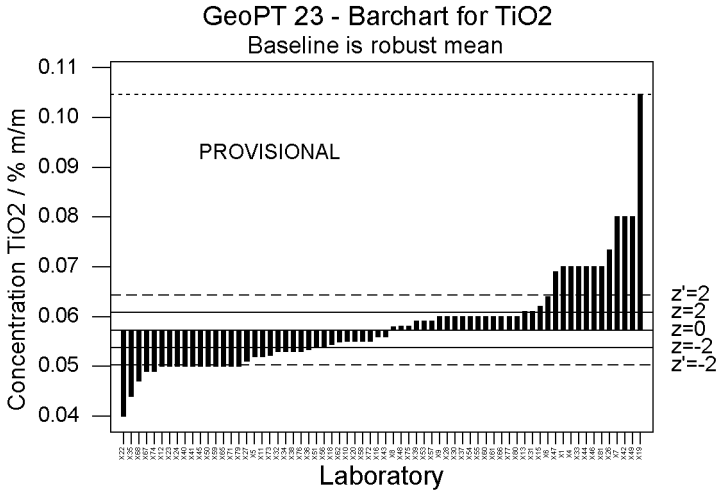
Table 6 GeoPT23A Z-scores for analytical results submitted (June 2008) FeMn-1, Mn nodule

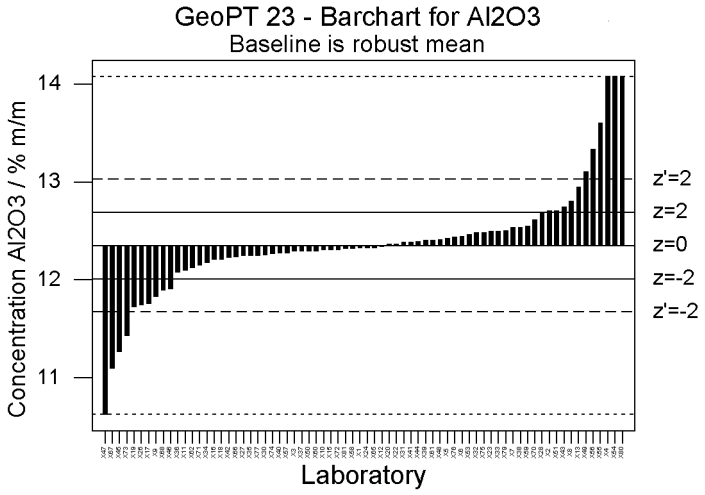
Lab code	X102	X103	X104	X105	X106	X106	X107	X108	X109	X110†
Sample	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1	FeMn-1
Data quality	2	1	1	1	1	2	2	2	1	1
SiO2	2.71	*	*	*	*	*	*	1.02	5.43	*52.13*
TiO2	0.02	-7.00	*	-1.54	9.37	*	*	-0.63	0.18	*2.85*
Al2O3	0.90	*	*	-0.80	*	*	*	2.41	3.61	*-22.77*
Fe2O3	0.89	*	-13.99	-1.33	*	*	*	-1.10	7.52	*41.87*
MnO	1.41	-6.02	-31.07	-2.56	*	-0.16	*	1.45	8.40	*56.06*
MgO	2.42	*	*	-0.35	*	*	*	0.13	6.08	*
CaO	1.72	*	*	-2.31	*	3.06	*	-0.01	6.65	*
P2O5	2.19	*	*	0.12	*	*	*	-1.34	4.61	*7.62*
LOI	-2.66	*	*	*	0.87	*	*	-0.78	5.23	*16.41*
Ba	0.48	-2.64	-9.43	-5.02	9.82	*	*	0.66	-3.82	*
Bi	1.17	0.70	*	*	*	*	-0.48	8.75	0.70	*
Cd	0.65	2.00	*	-3.09	-2.70	*	6.19	*	1.10	*
Ce	0.92	0.39	-5.45	-0.46	*	1.96	*	-0.23	4.84	*
Co	1.93	0.80	-4.79	0.53	*	*	*	0.13	2.53	*68.21*
Cs	0.00	-1.79	*	-1.01	*	*	*	-0.36	*	*
Cu	1.76	-13.79	*	0.24	5.54	*	2.30	1.41	7.48	*-8.21*
Dy	0.60	-0.50	*	0.30	*	*	*	-0.20	4.20	*
Er	1.35	0.68	*	0.54	*	*	*	0.00	3.77	*
Eu	1.24	-1.26	*	-0.78	*	*	*	0.13	1.83	*
Gd	1.50	-0.58	*	0.57	*	*	*	0.35	6.14	*
Hf	3.61	0.62	*	-0.45	*	*	*	0.44	-14.63	*
Ho	0.45	1.00	*	0.03	*	*	*	-0.49	3.41	*
La	1.16	-0.04	-4.10	-0.32	*	2.42	*	0.96	5.46	*
Li	1.57	0.12	*	0.80	*	*	*	*	5.19	*
Lu	0.92	0.32	*	0.15	*	*	*	-0.26	2.43	*
Mo	1.21	-5.89	-6.34	-0.12	-13.42	*	0.74	*	3.47	*
Nb	0.07	-1.81	*	-0.28	7.17	*	0.41	-0.28	-15.86	*
Nd	0.94	-0.06	*	-0.72	*	*	*	-1.45	4.35	*
Ni	3.20	-3.60	*	-0.40	*	*	1.50	*	*	*72.75*
Pb	1.25	-0.15	*	-1.18	-4.47	*	-0.38	-0.18	2.10	*
Pr	95.61	-0.29	*	-0.01	*	*	*	-0.53	4.87	*
Rb	0.15	-1.43	*	-0.44	*	*	1.10	-0.37	1.32	*
Sb	1.13	*	-3.71	*	3.55	*	*	-0.28	-2.16	*
Sc	0.01	18.29	-2.83	-1.09	*	*	*	-0.10	1.07	*
Sm	0.71	-0.45	-2.77	-0.83	*	*	*	-0.08	3.15	*
Sr	1.87	-0.11	*	0.18	3.99	*	0.07	0.77	4.38	*
Ta	-0.80	*	*	-1.20	*	*	*	-1.19	*	*
Tb	0.89	-2.33	2.33	-0.16	*	*	*	0.23	3.09	*
Th	0.28	1.12	-1.82	-0.71	*	*	-3.25	-0.09	1.78	*
Tl	1.31	*	*	*	*	*	-1.31	-3.43	2.62	*
Tm	-0.07	0.65	*	-0.06	*	*	*	-0.16	3.33	*
U	0.46	1.10	*	-0.40	*	*	1.08	0.19	1.45	*
V	0.99	2.79	*	-2.53	3.87	*	*	-1.84	-0.44	*12.89*
W	1.67	-1.38	-2.99	1.89	*	*	1.99	-0.42	1.03	*
Y	0.20	-1.54	*	-0.65	1.20	*	0.50	0.67	3.69	*
Yb	0.71	0.73	-2.56	0.71	*	*	*	-0.35	3.54	*
Zn	2.15	*	-4.56	1.07	1.41	*	2.27	1.73	-5.25	*
Zr	0.69	-0.37	*	1.19	5.23	*	0.00	0.09	-1.20	*

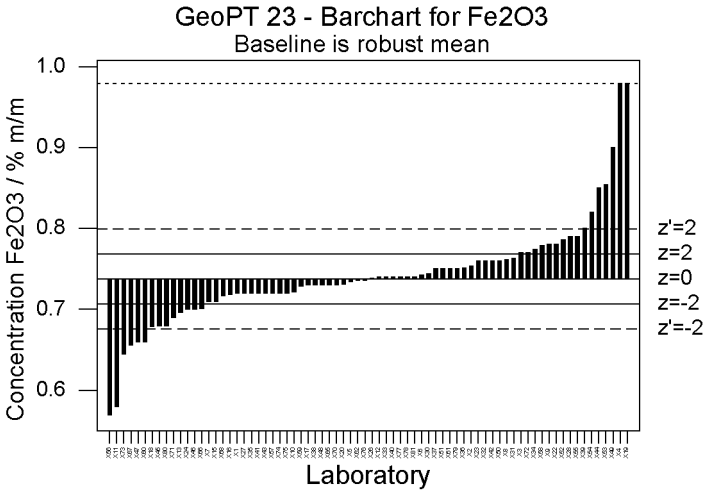
† *Source data not included in analysis*

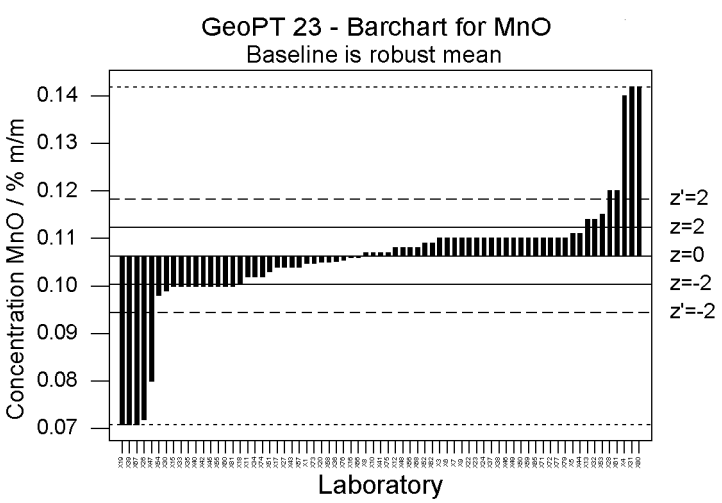
N.B. See text before interpreting these results

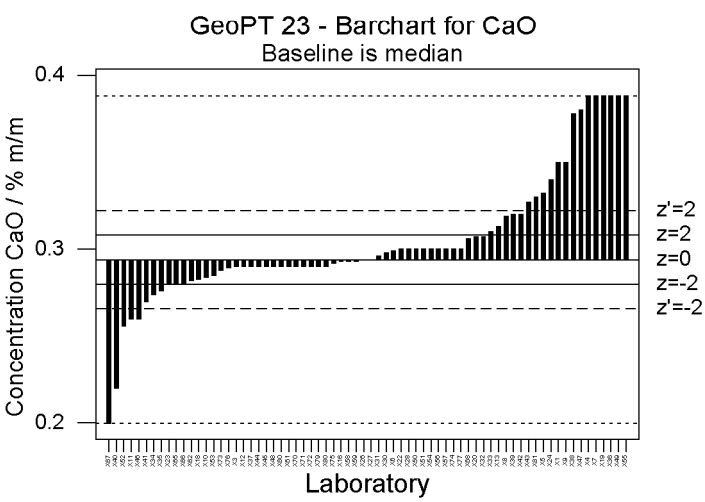


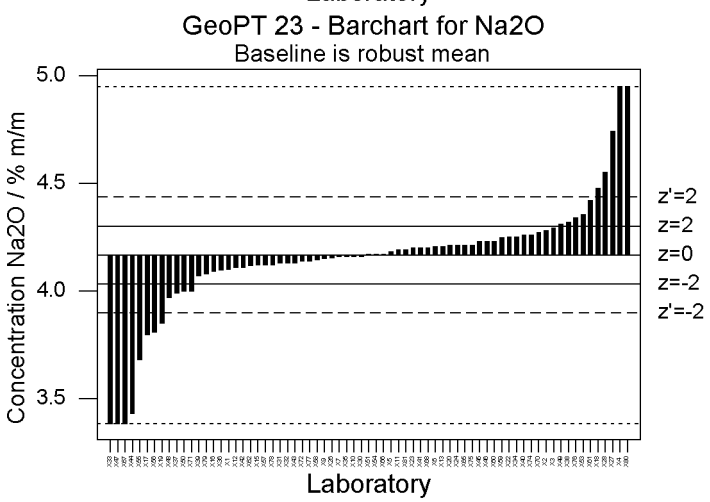


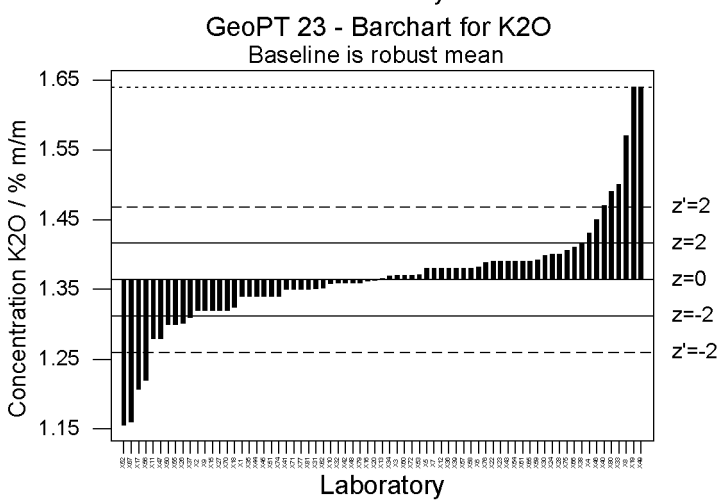












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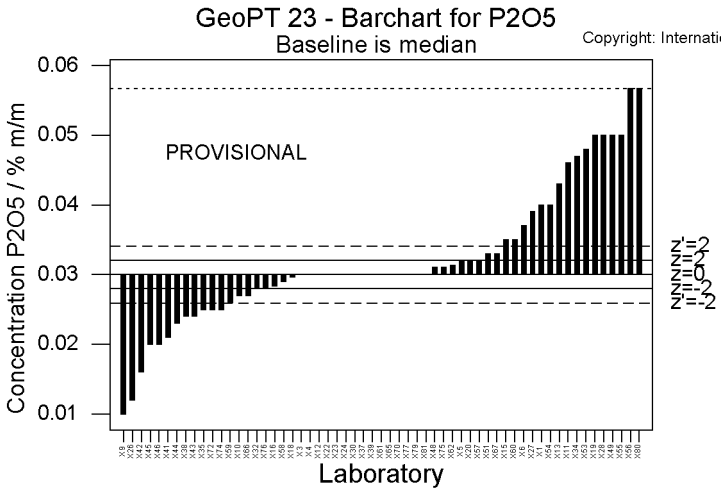


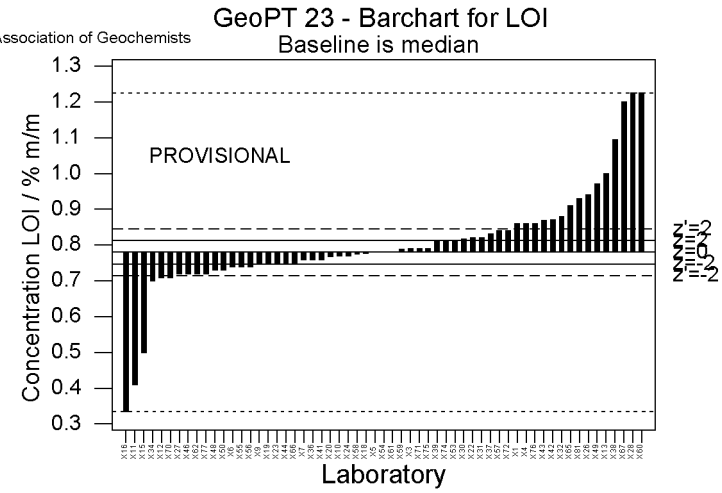
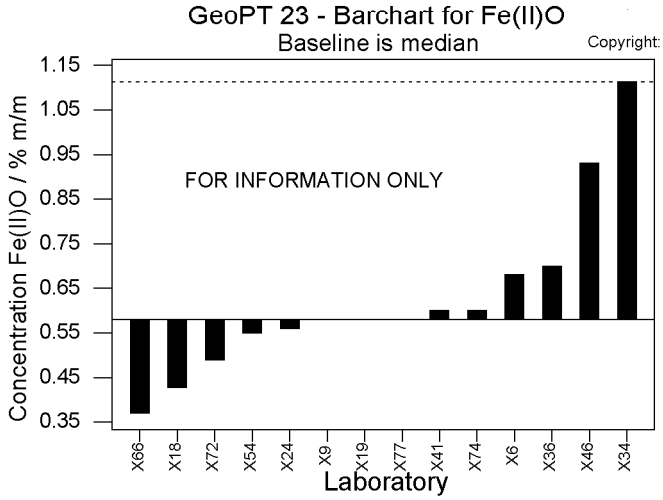
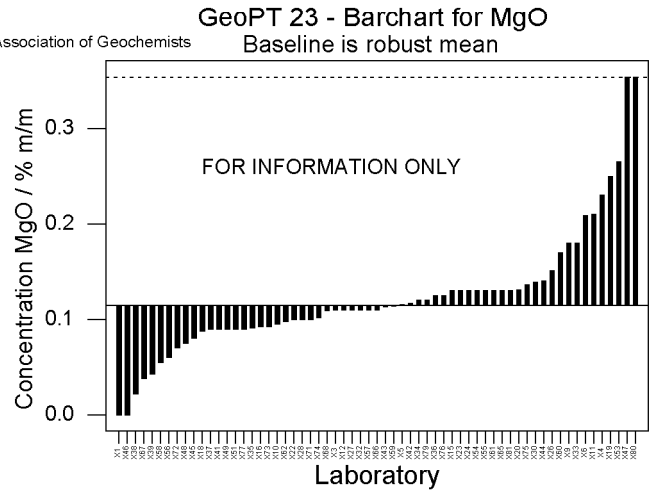
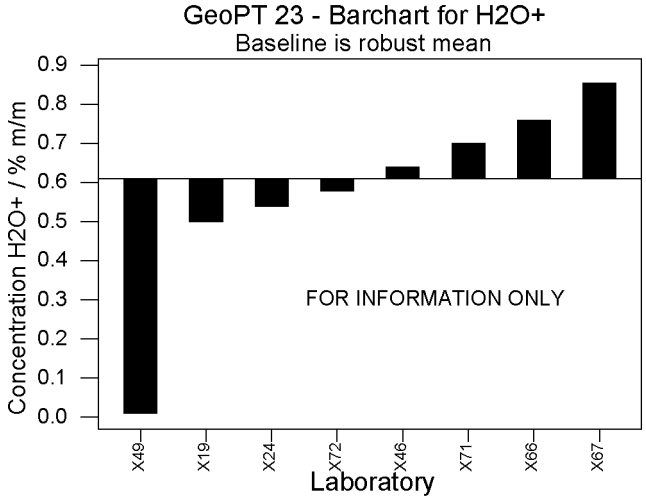
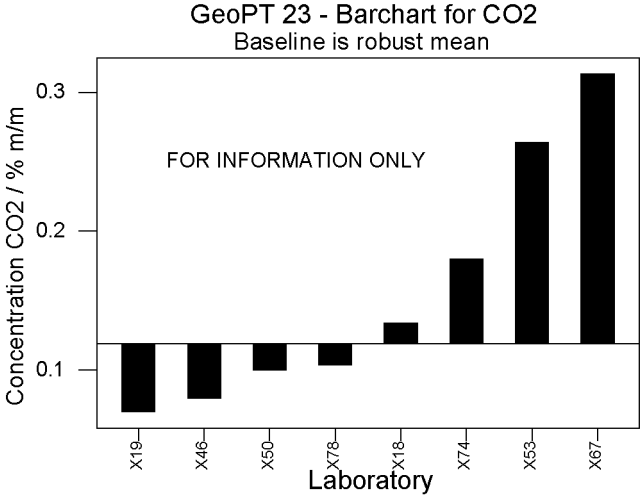


Figure 1: GeoPT23 – Separation Rapids Pegmatite, OU-9. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).









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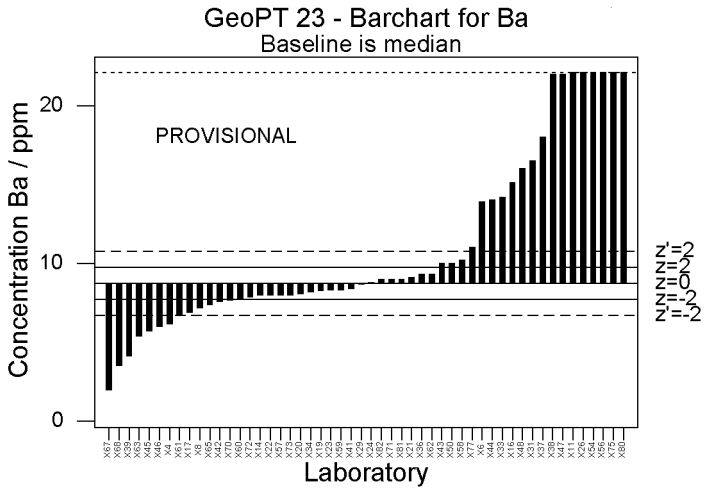

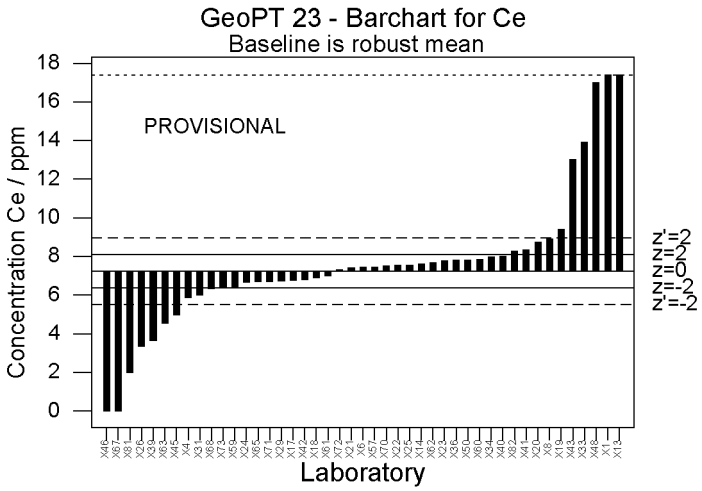

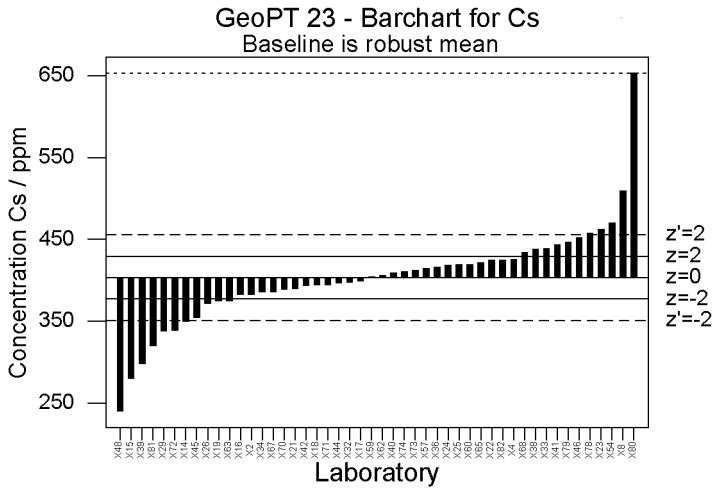

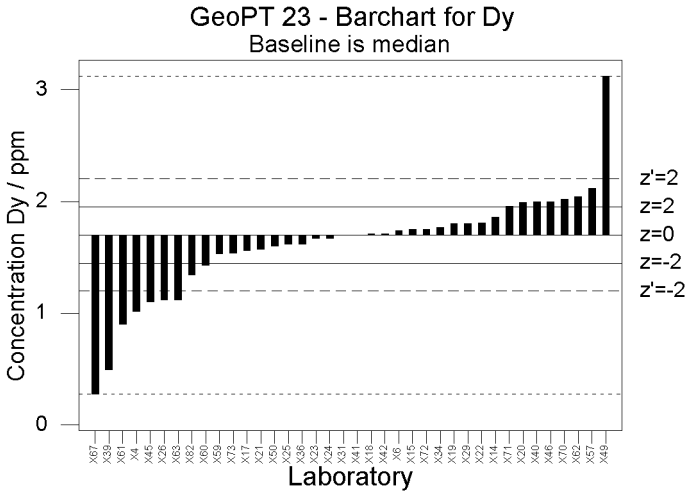

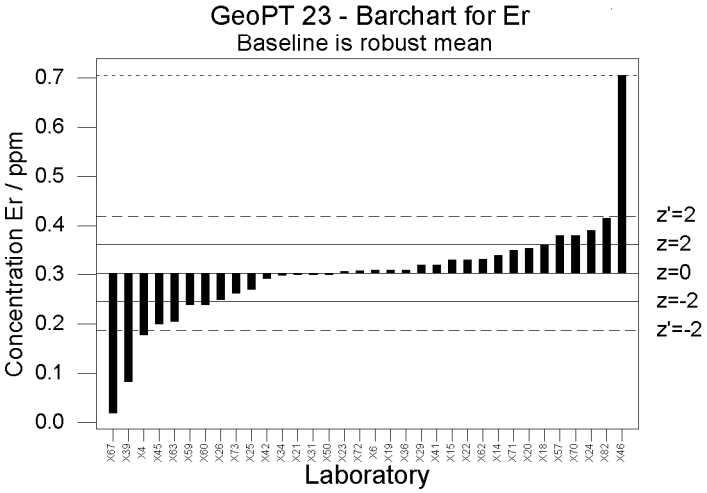

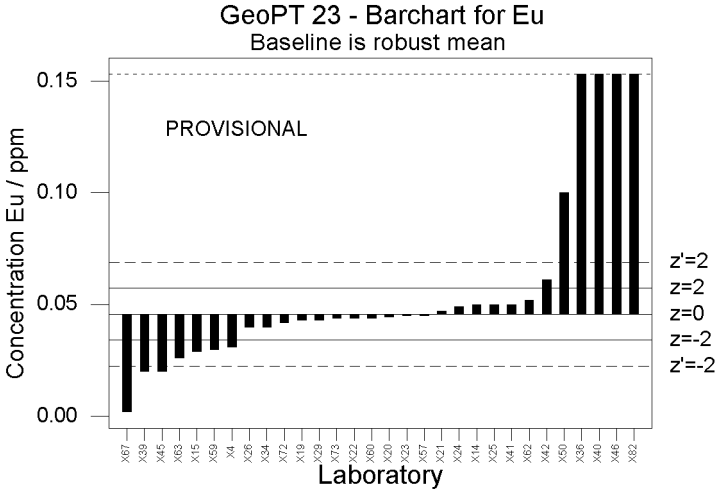

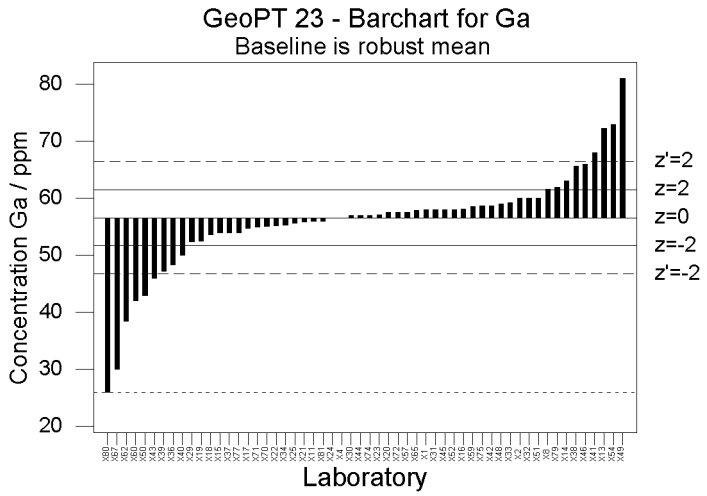

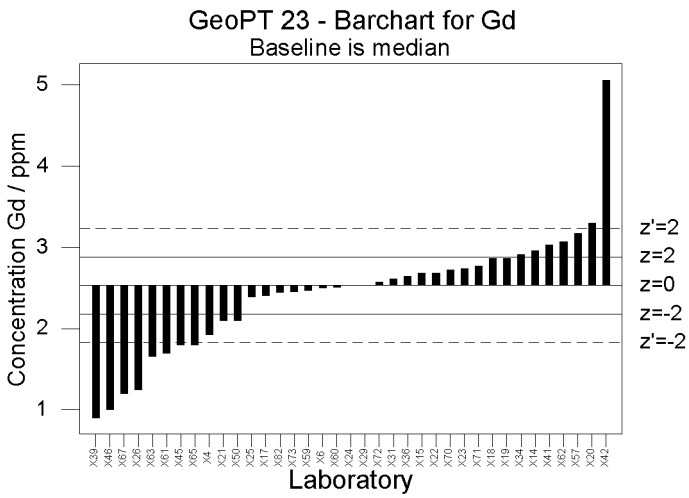

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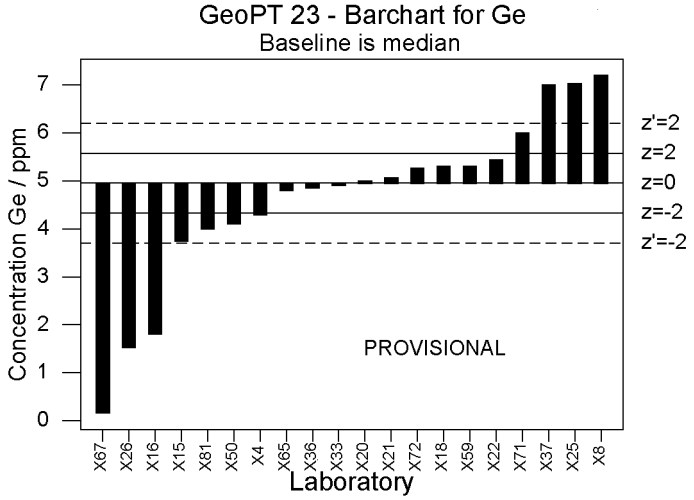

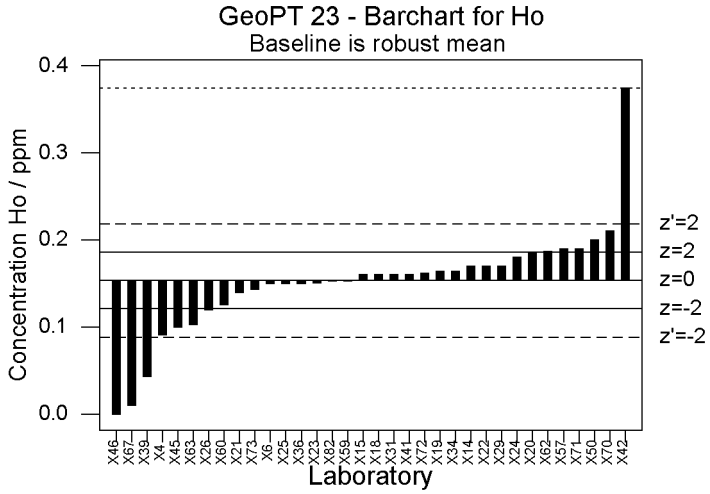

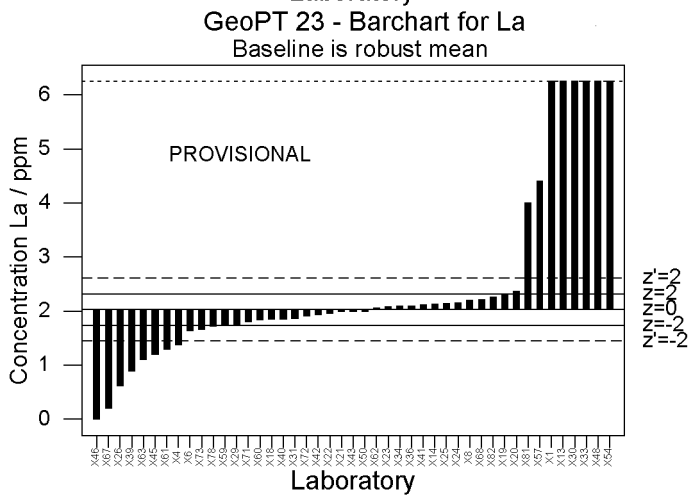

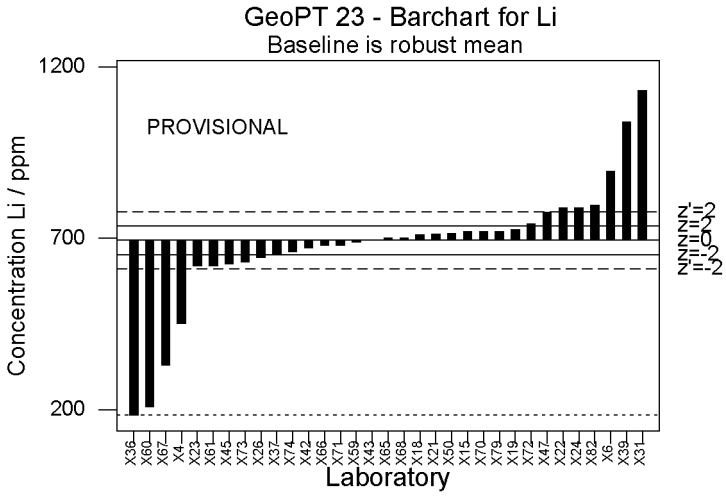

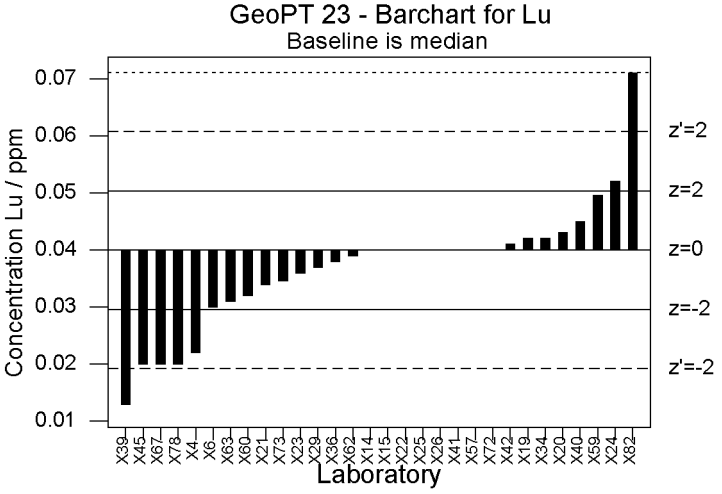

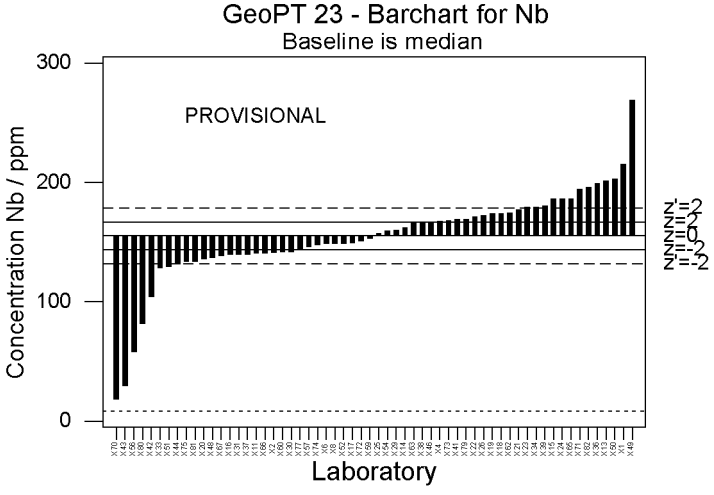

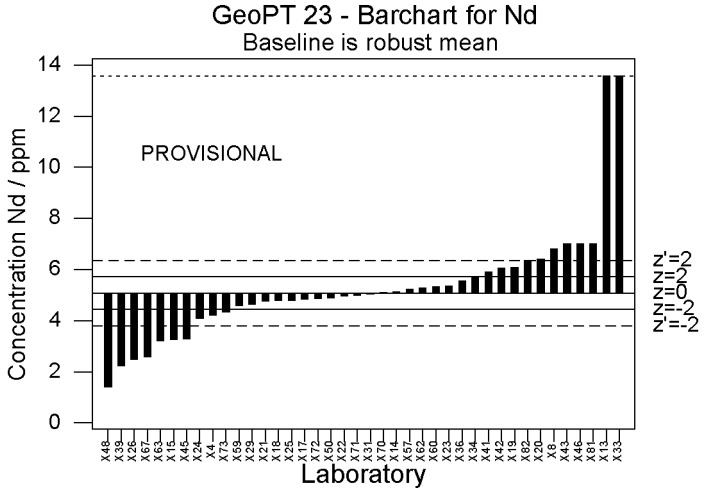

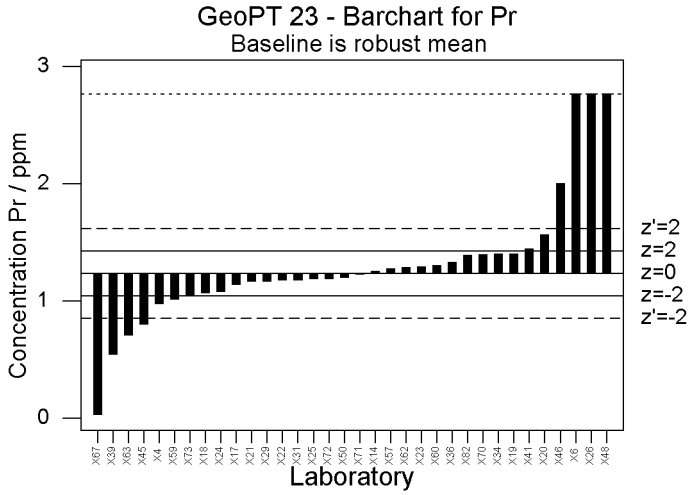

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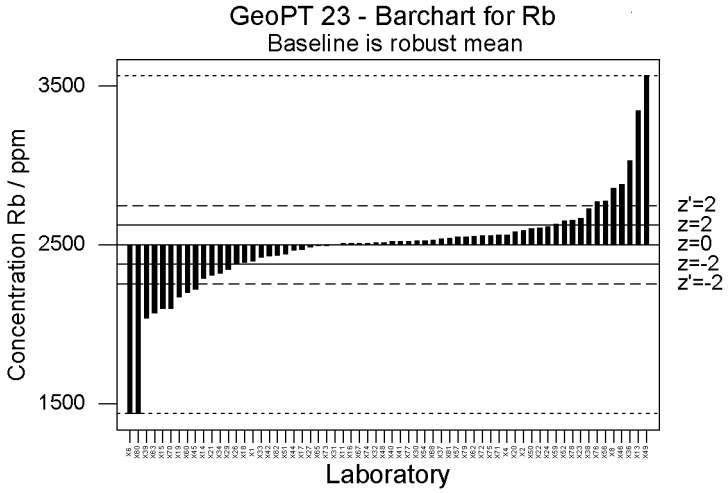

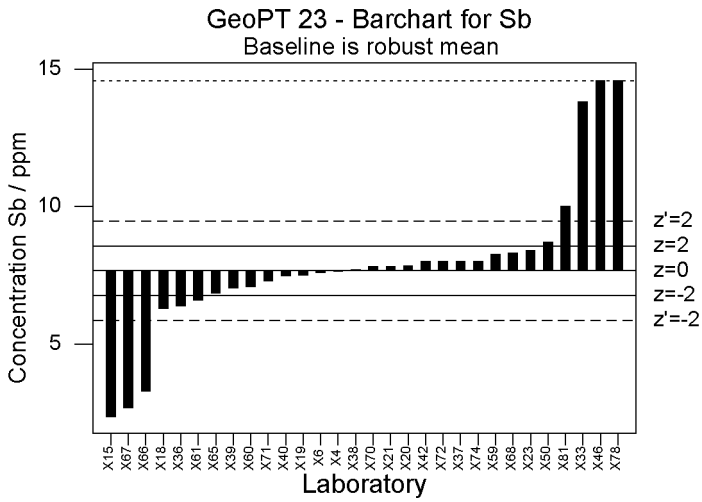

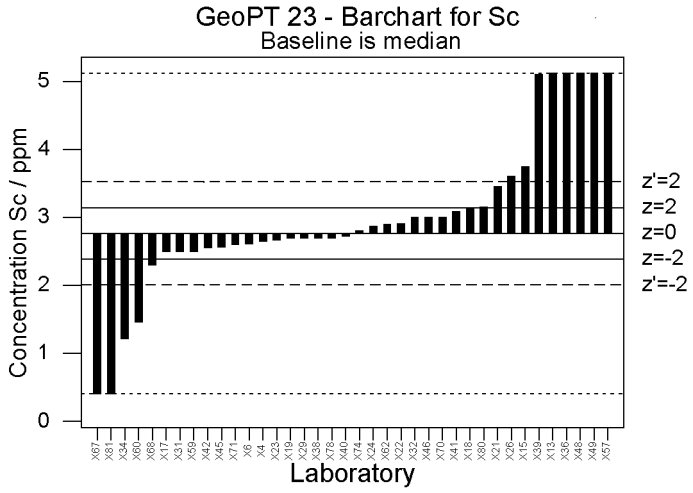

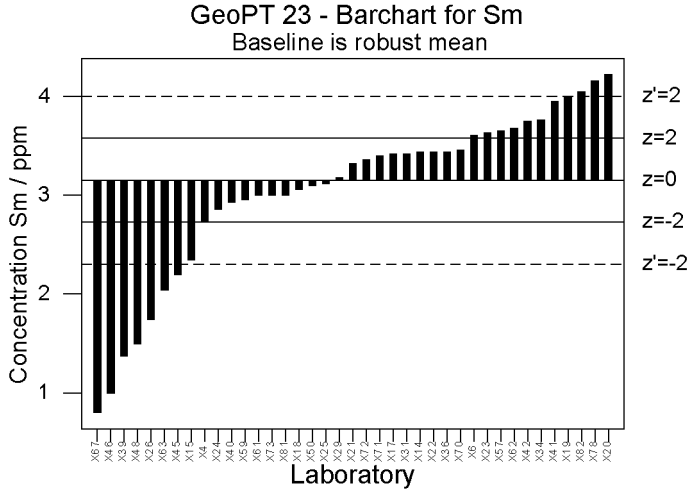

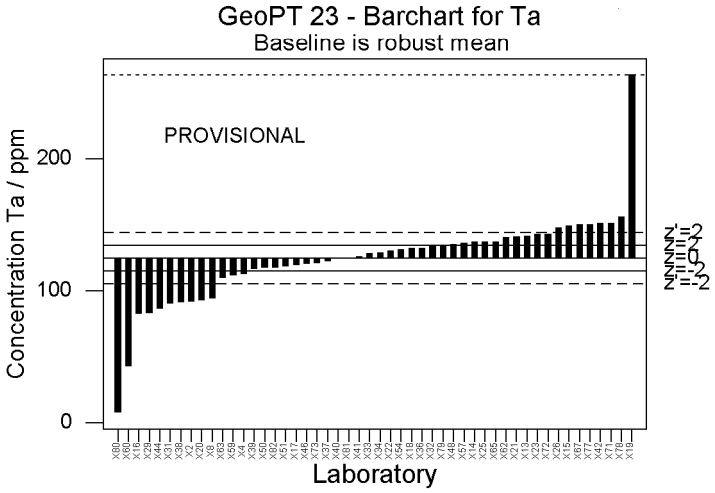

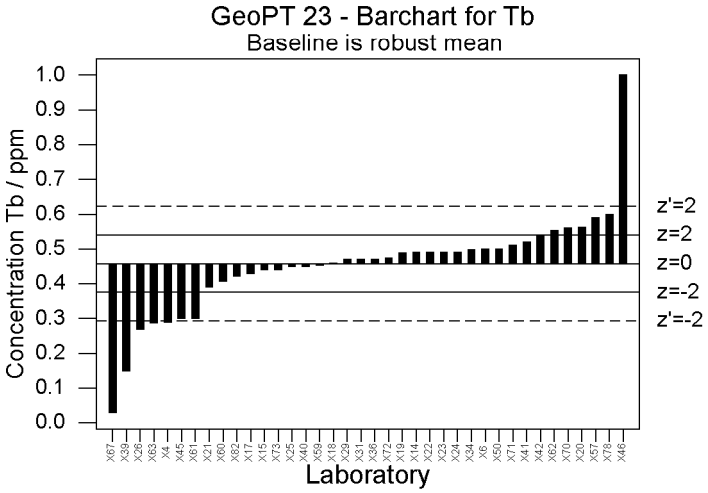

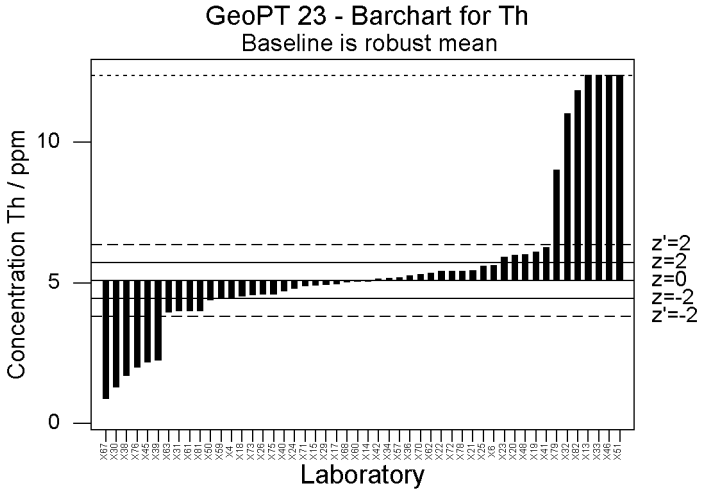

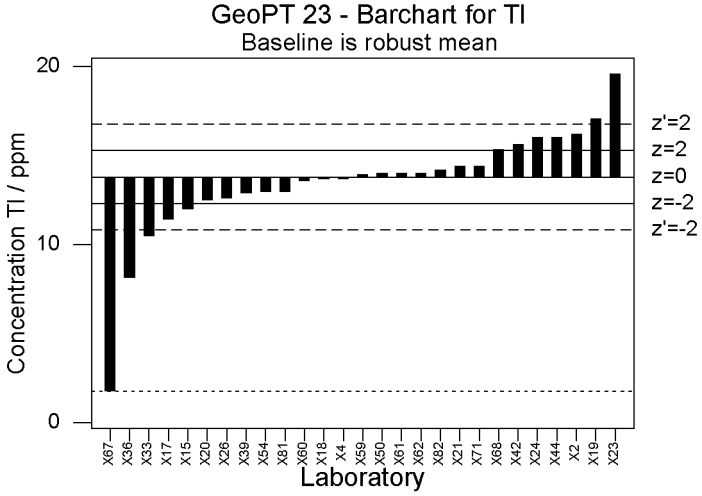

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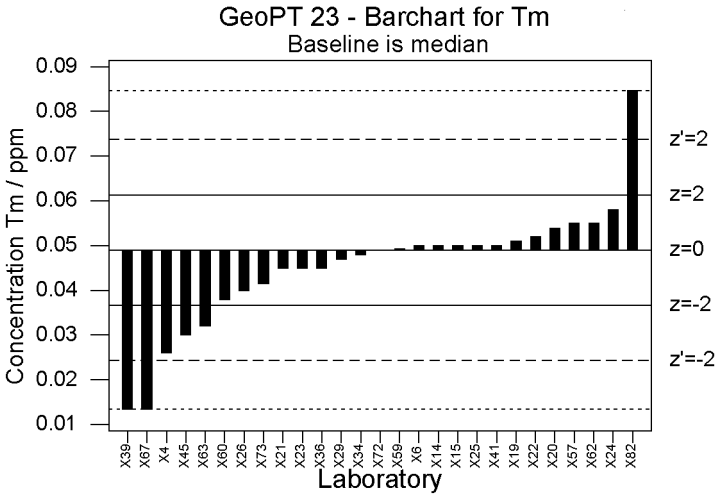

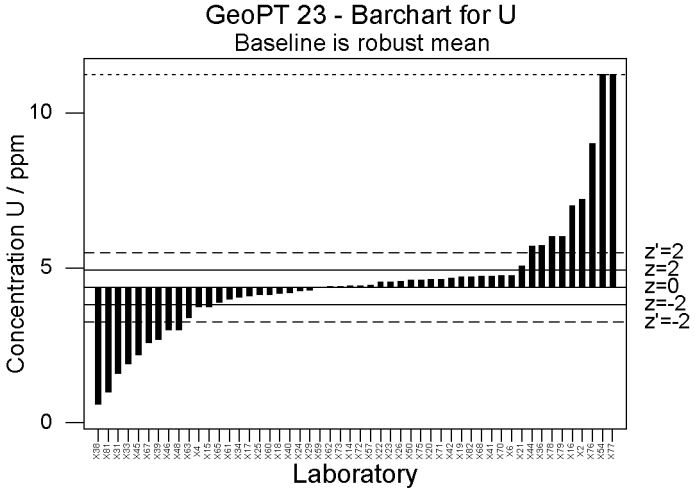

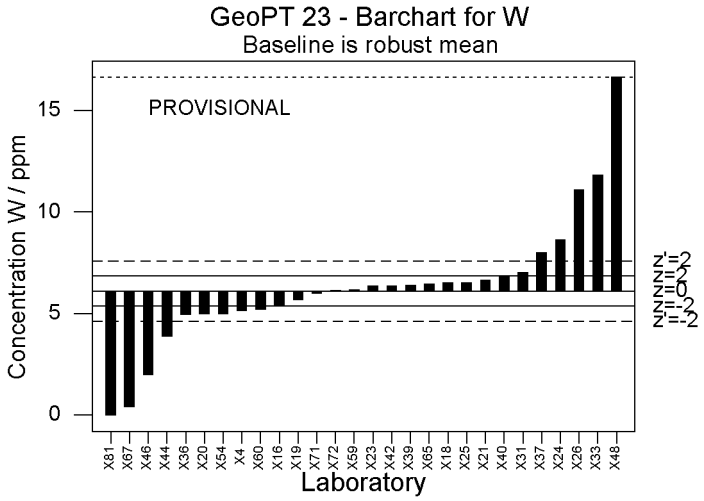

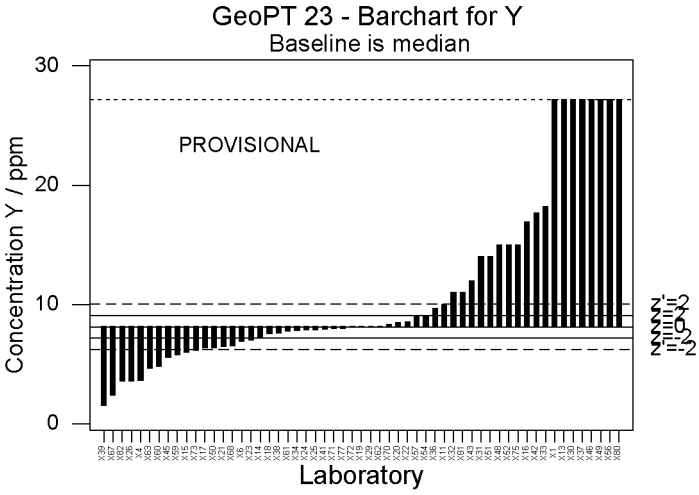

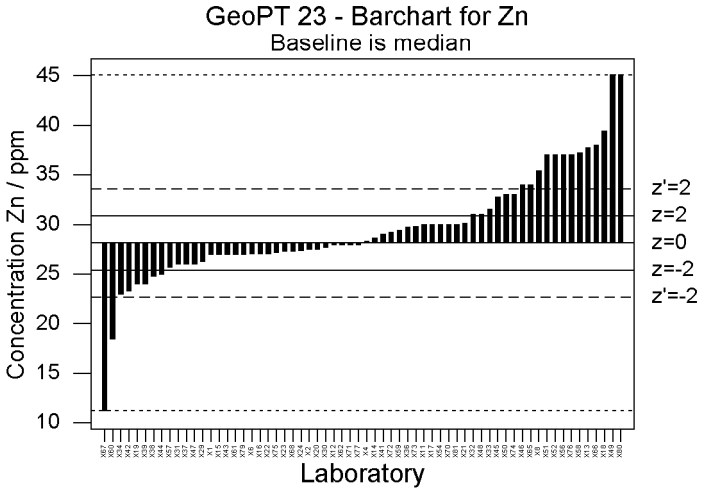

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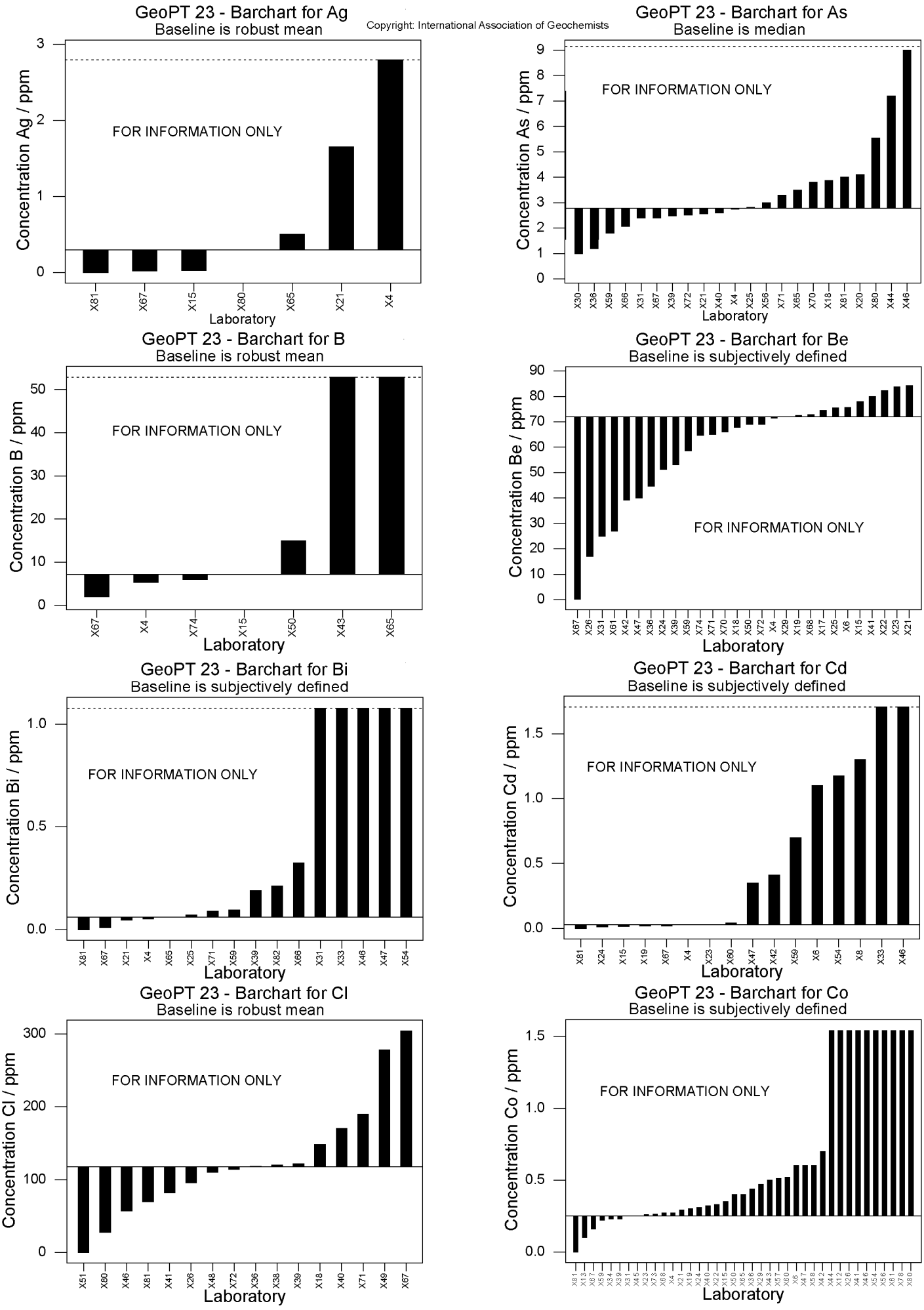

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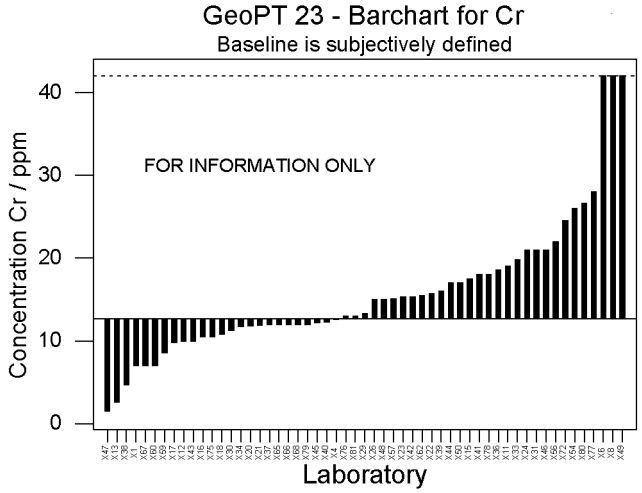
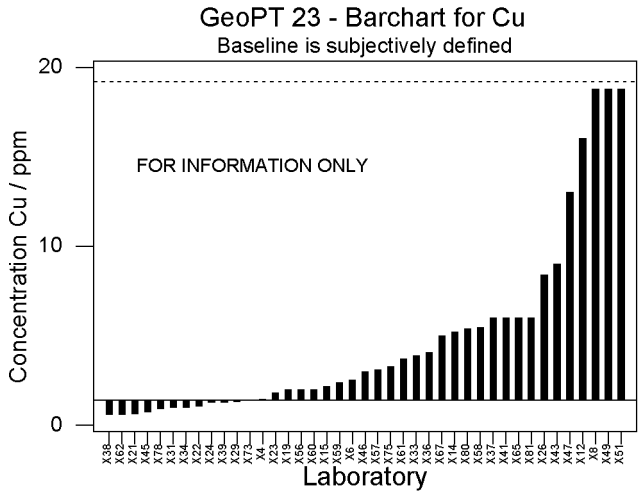
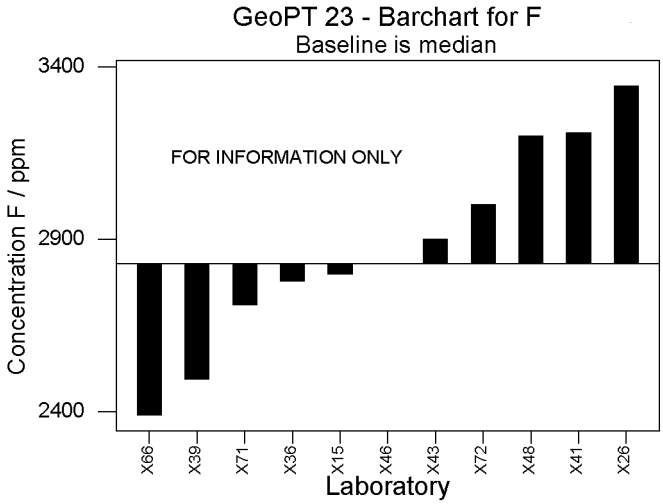
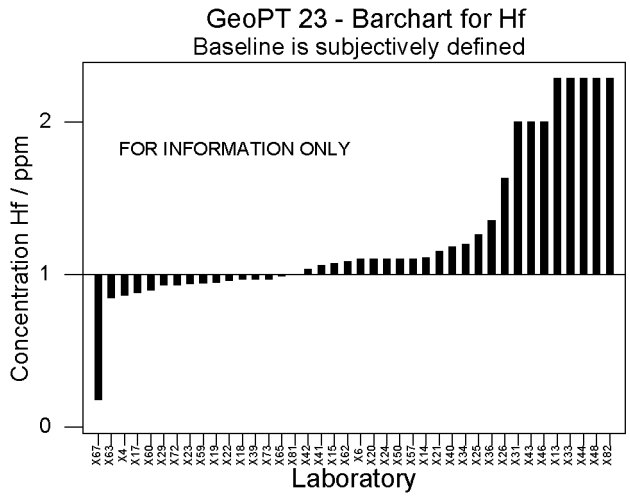
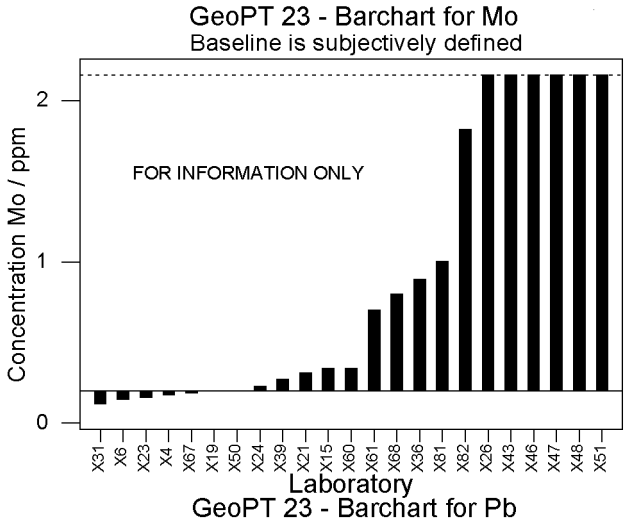
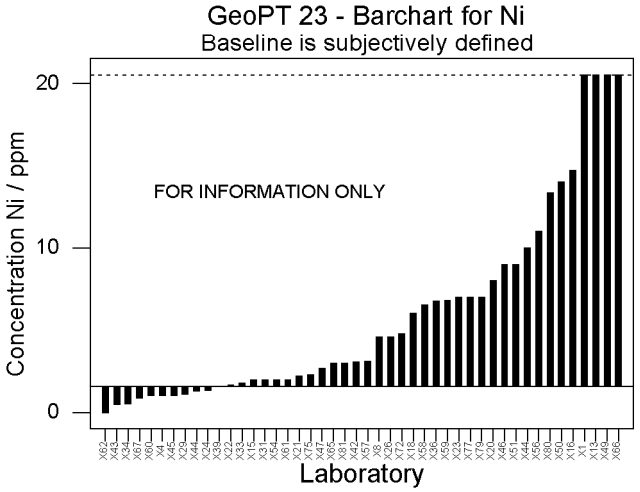


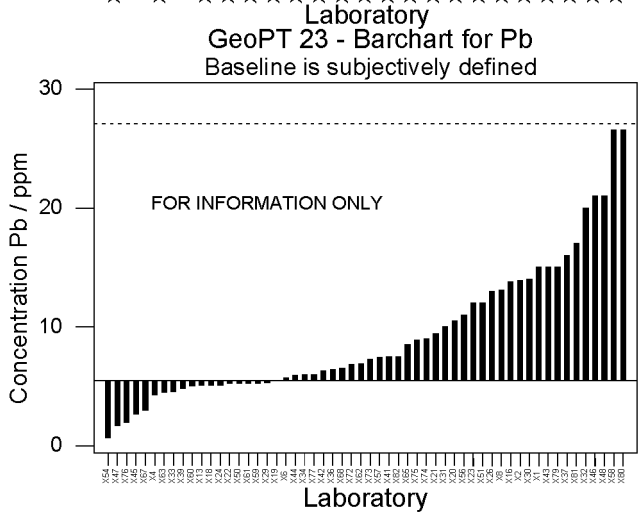












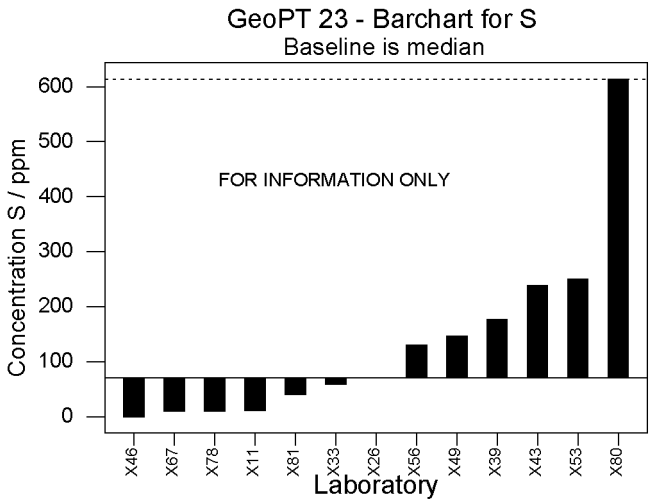
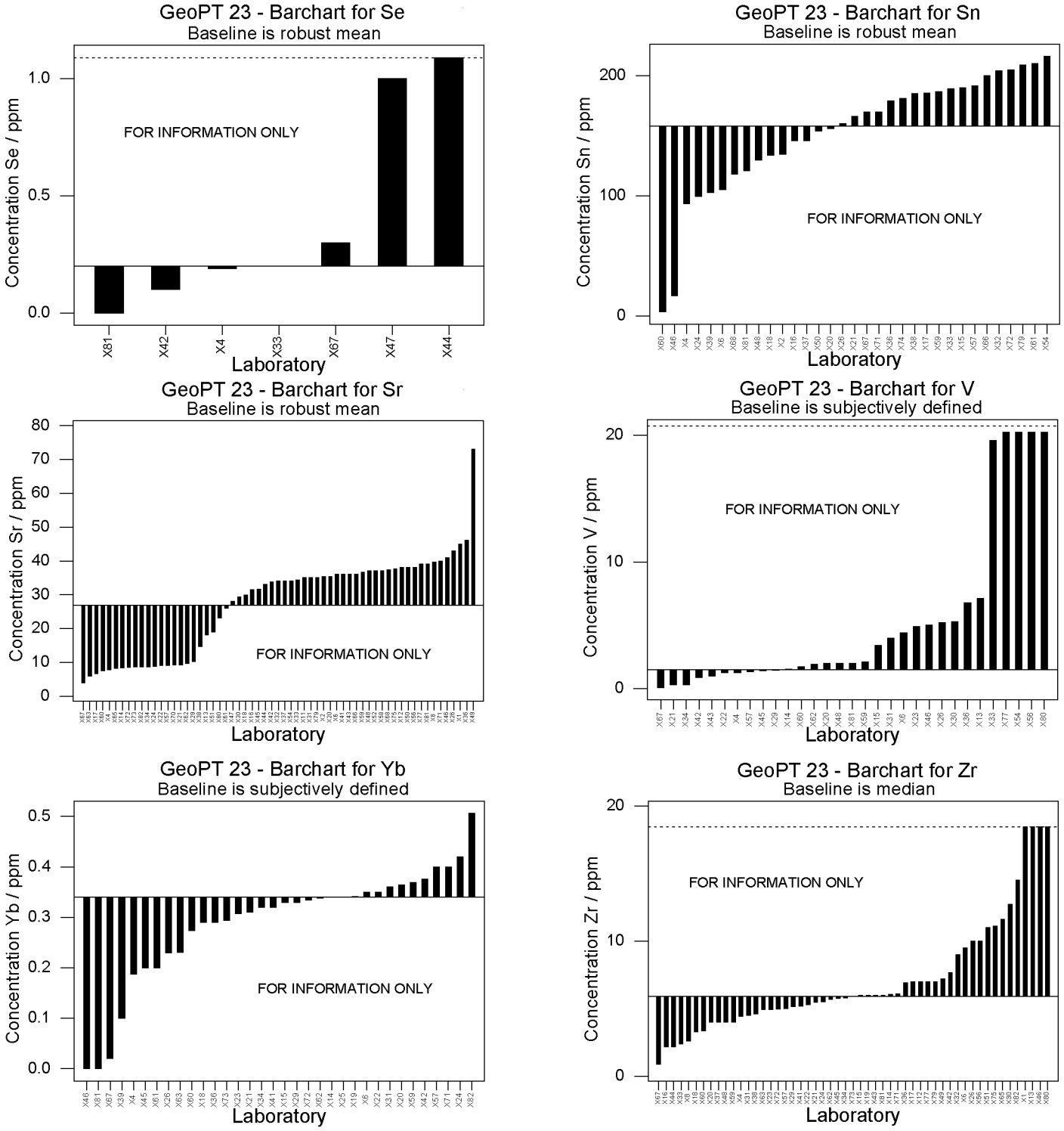


Figure 2: GeoPT23 – Separation Rapids Pegmatite, OU-9. Data distribution charts for information only for elements for which values could not be assigned.



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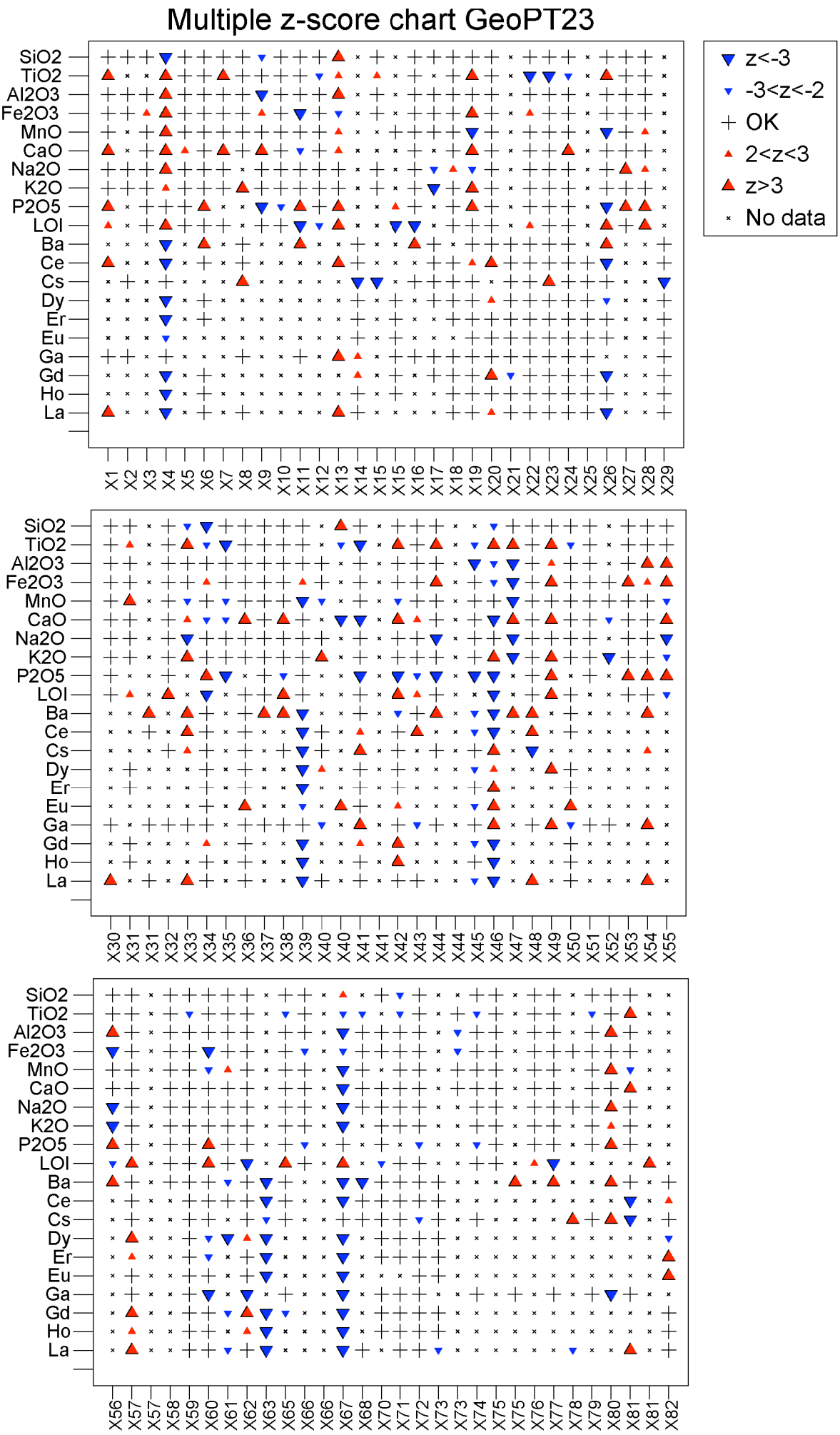


Figure 3: GeoPT23 – Pegmatite OU-9. Multiple z-score charts for laboratories participating in the GeoPT23 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▲), Z>+3 (▲).

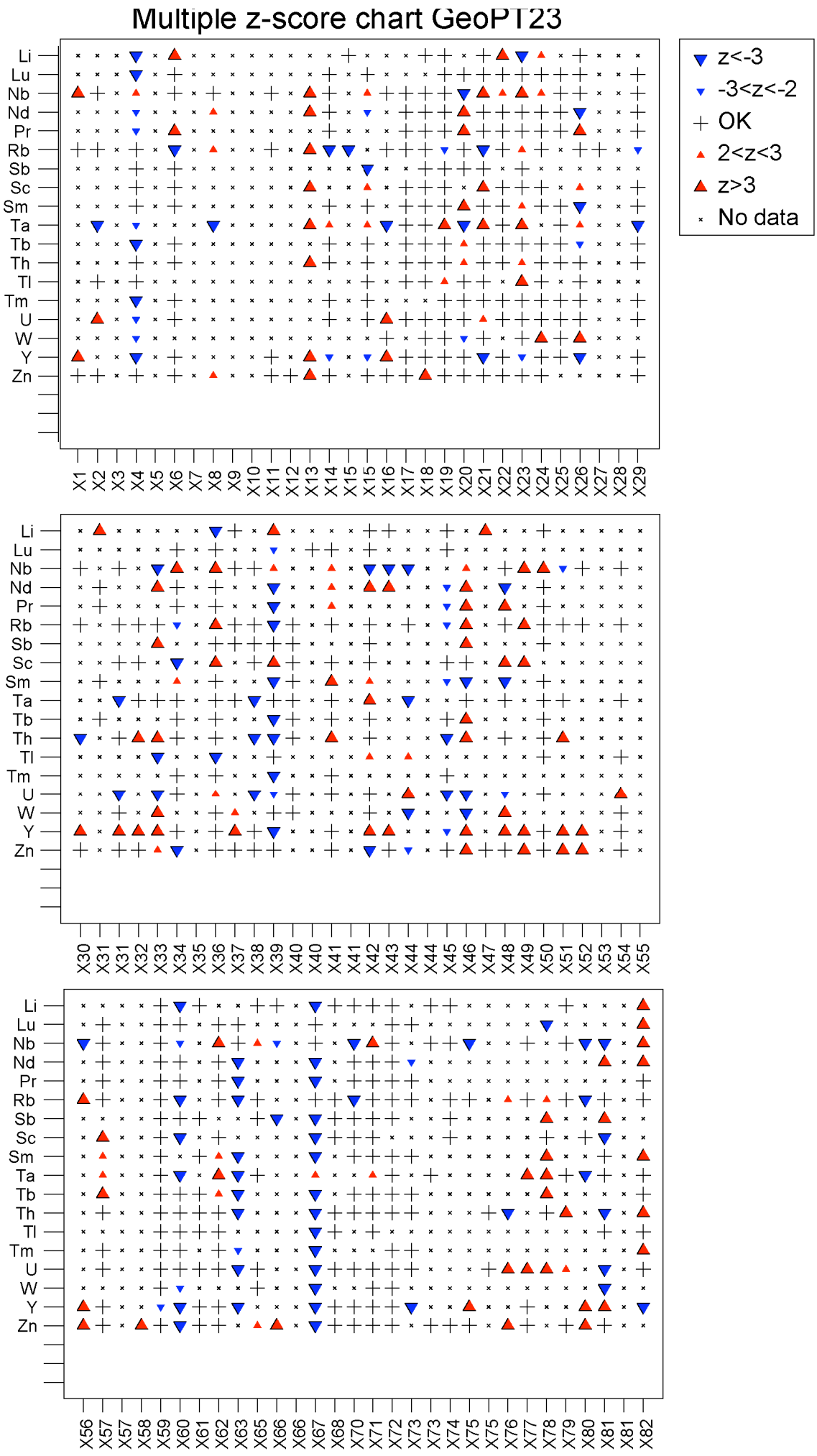


Figure 3b: GeoPT23 – Pegmatite OU-9. Multiple z-score charts for laboratories participating in the GeoPT23 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▴), Z>+3 (▲).

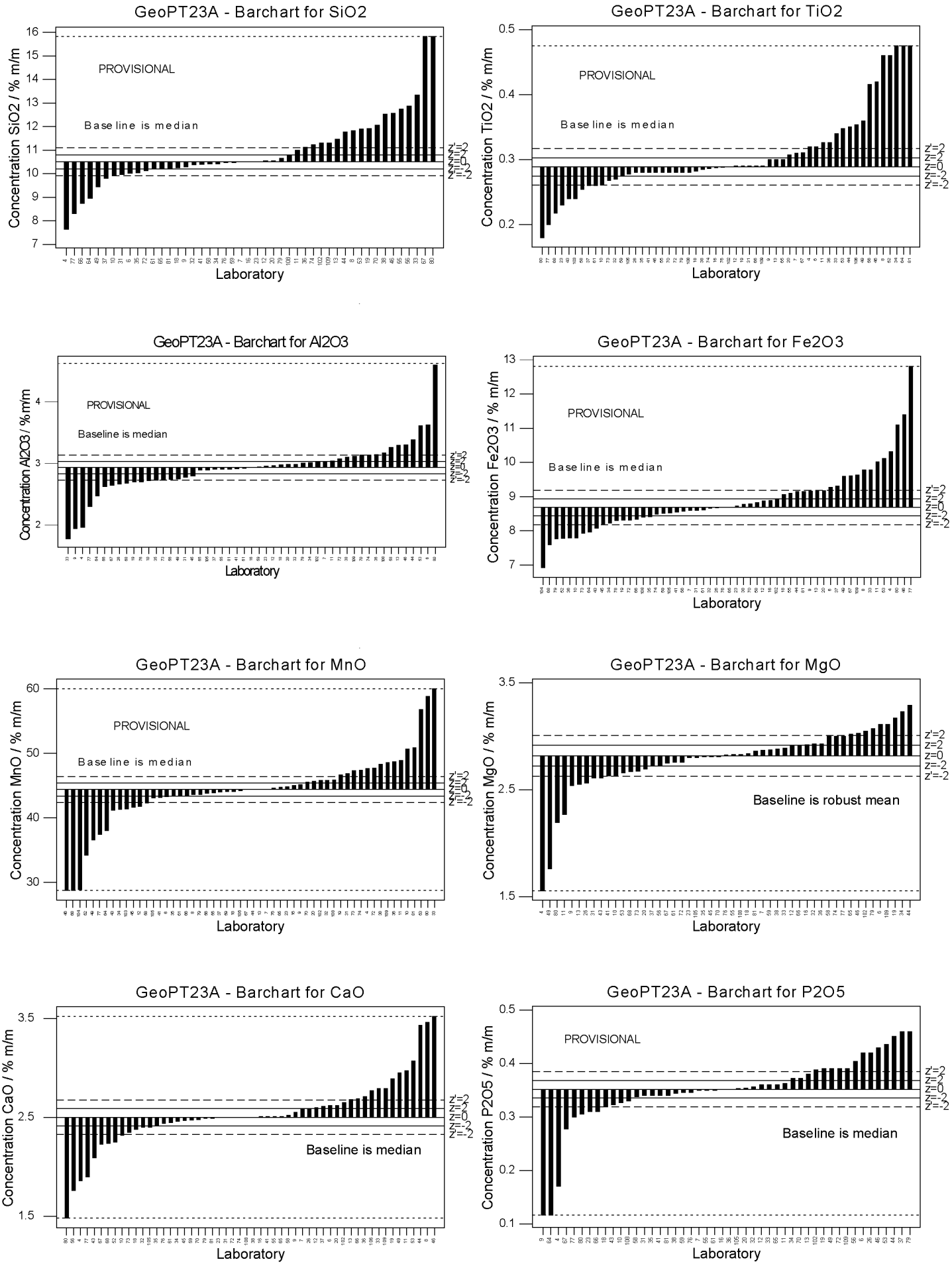


Figure 4a: GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

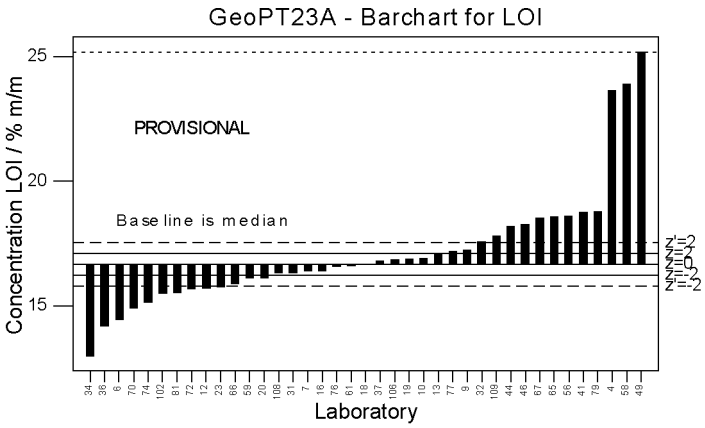
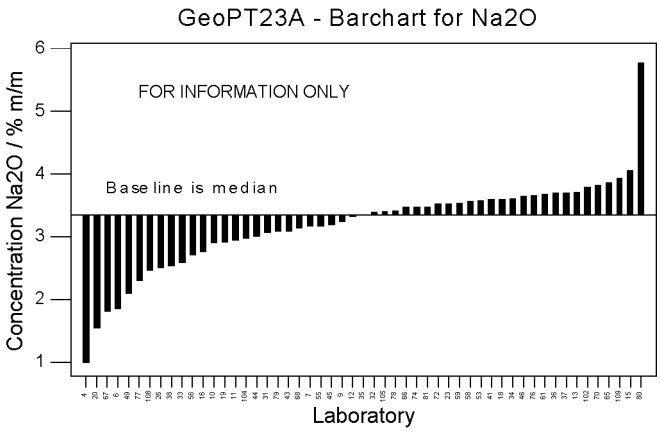
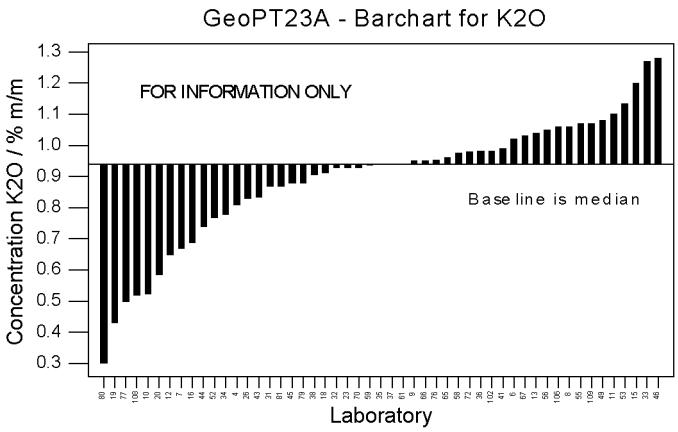


Figure 4a: GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).





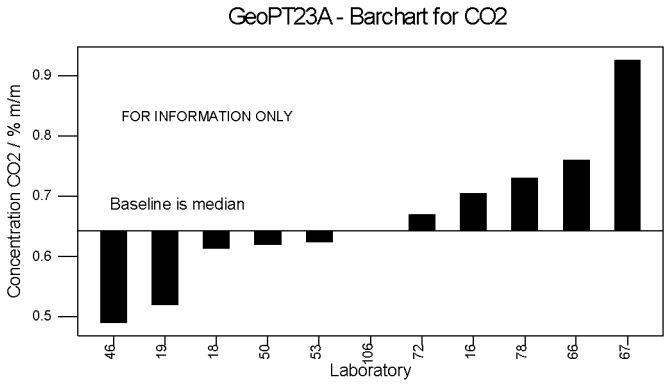


Figure 5a: GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for information only for elements for which values could not be assigned.

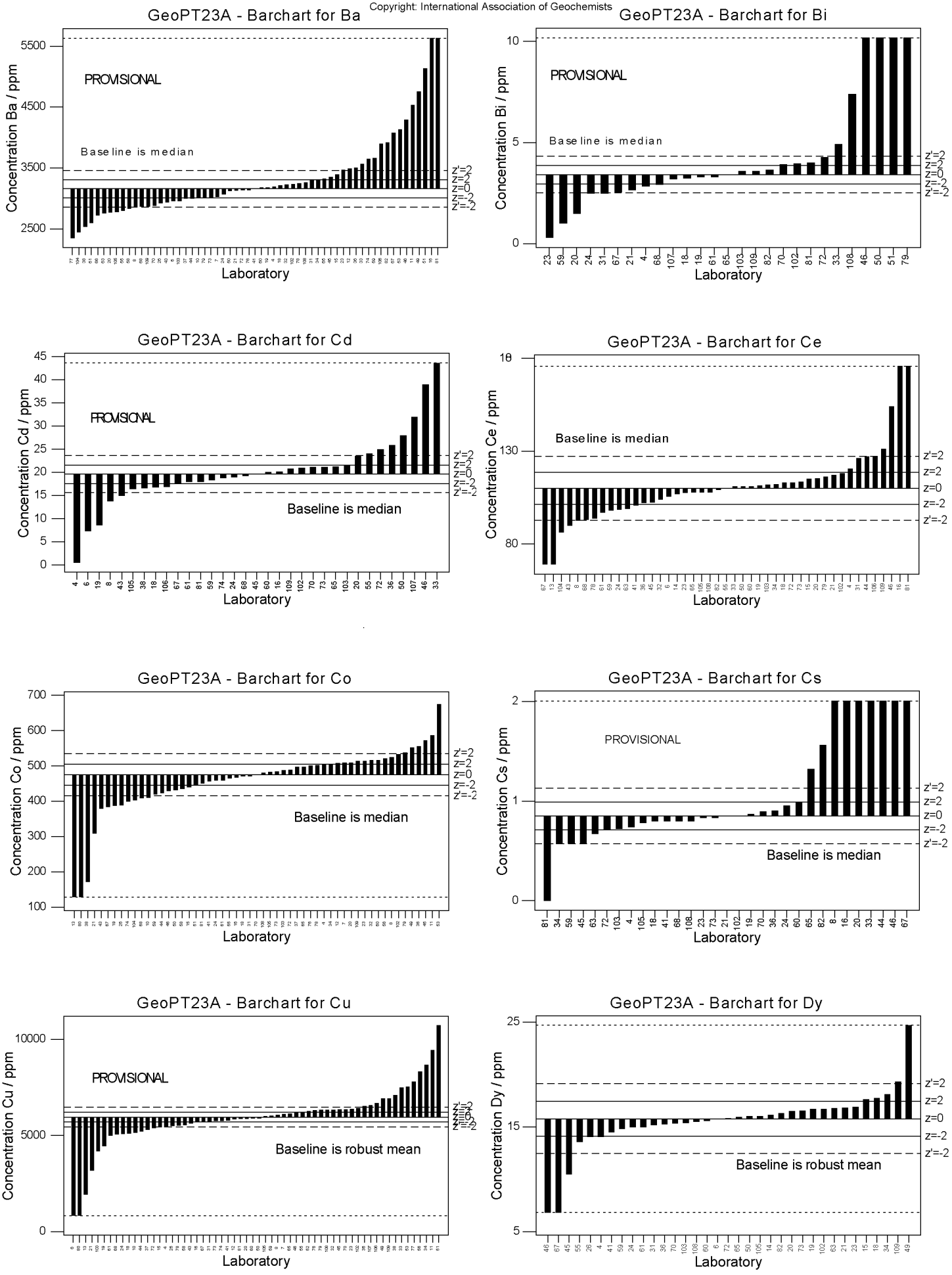


Figure 4b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

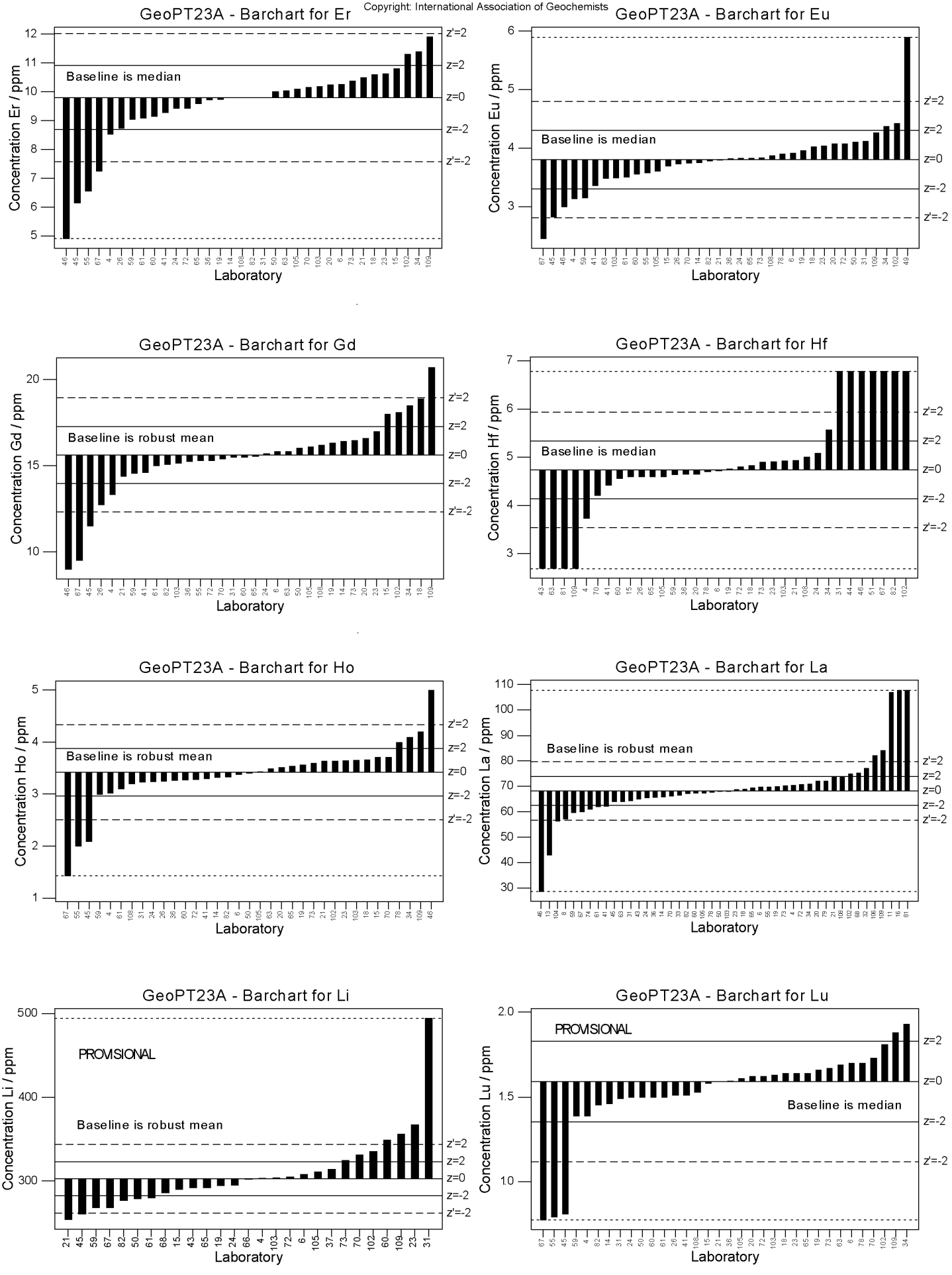


Figure 4b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

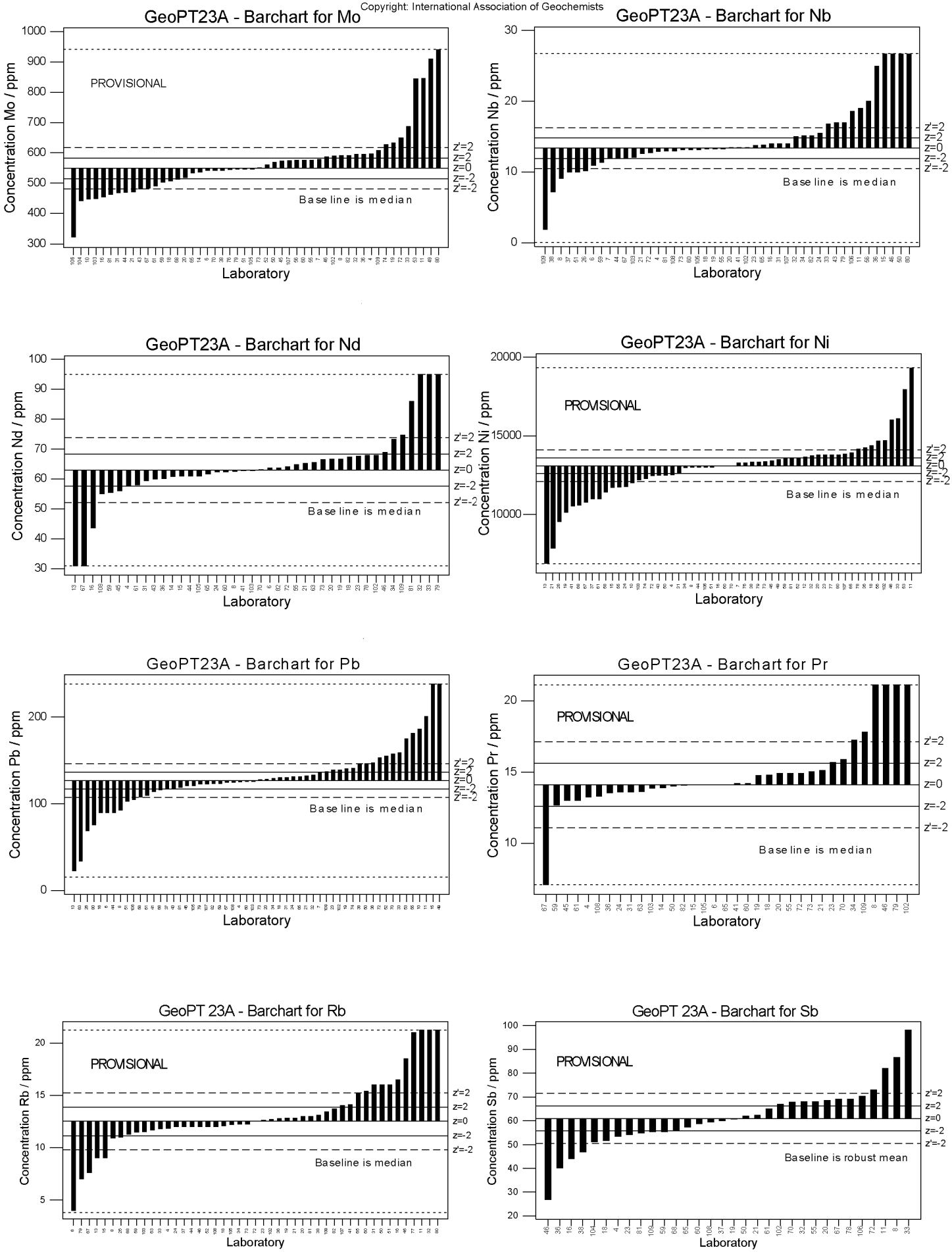
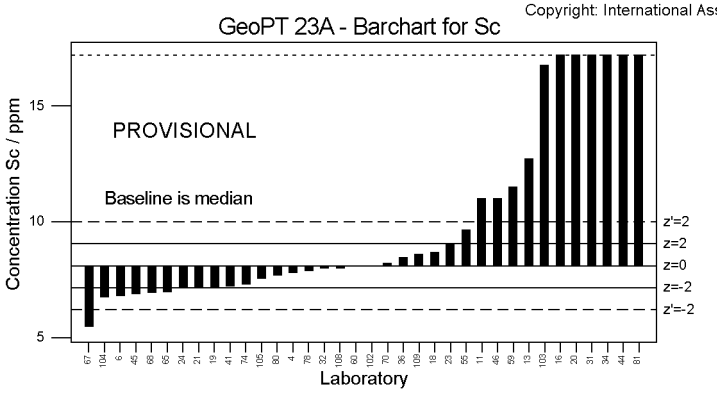
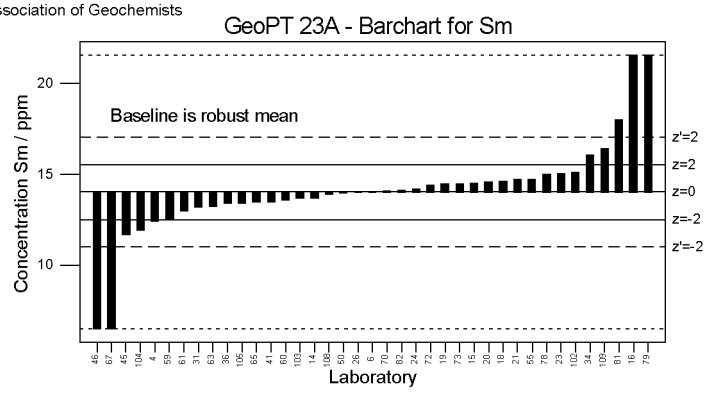
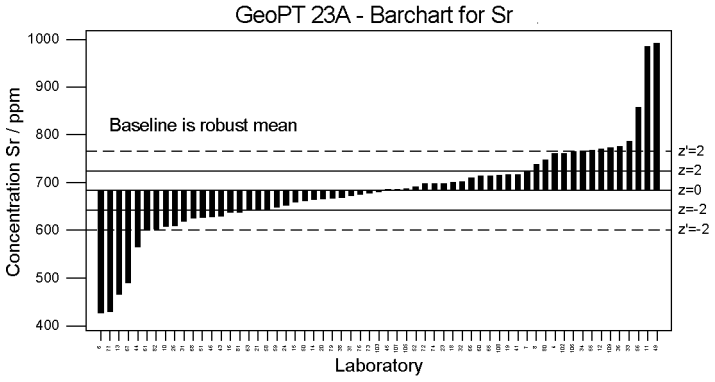
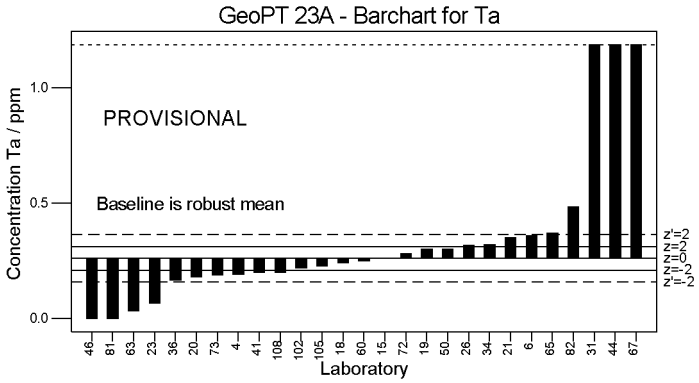


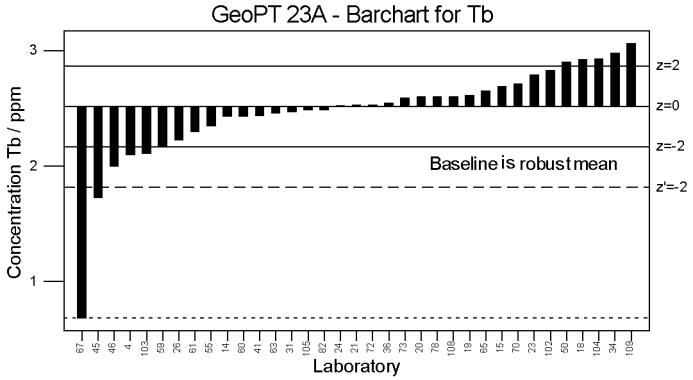
Figure 4b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

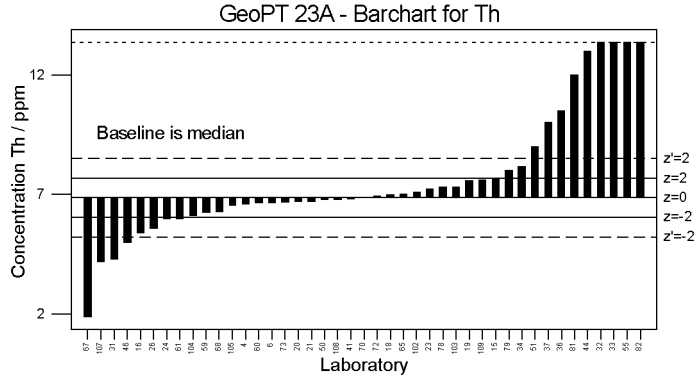


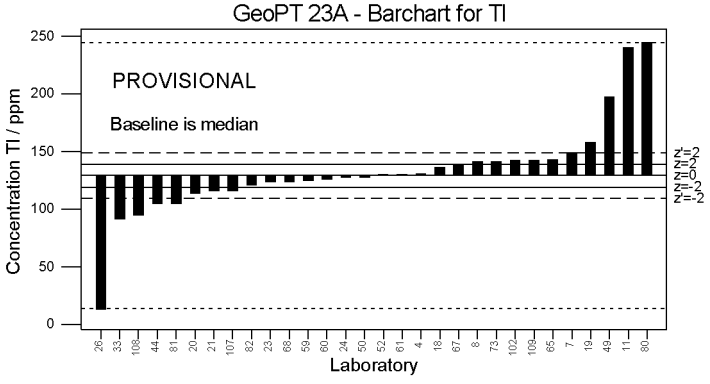












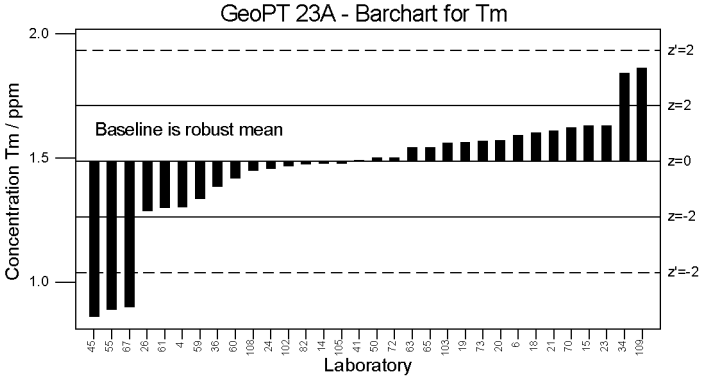
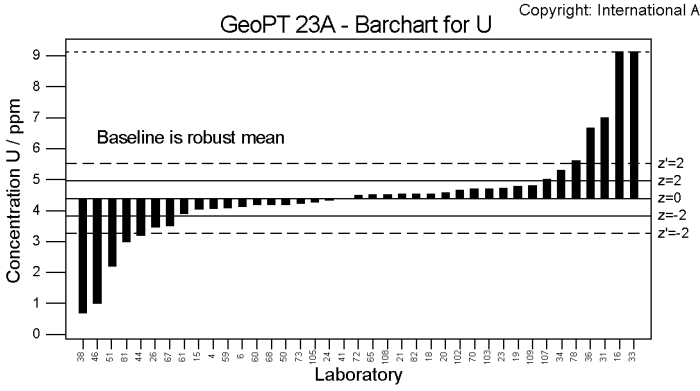
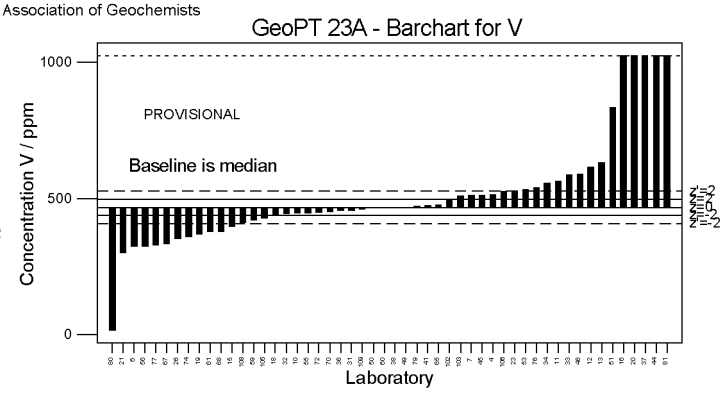
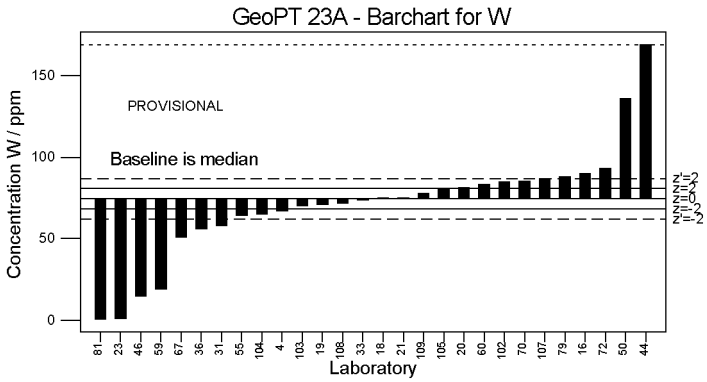
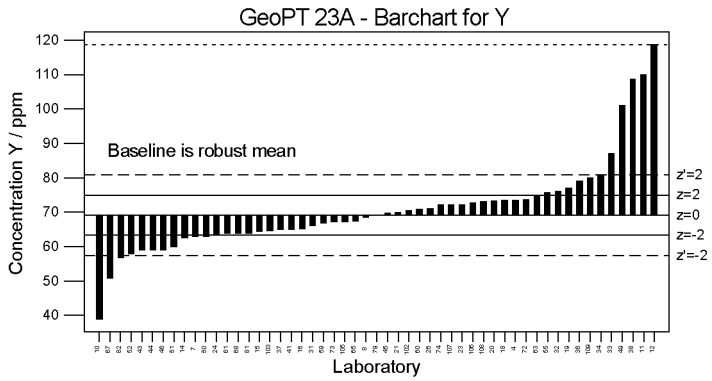


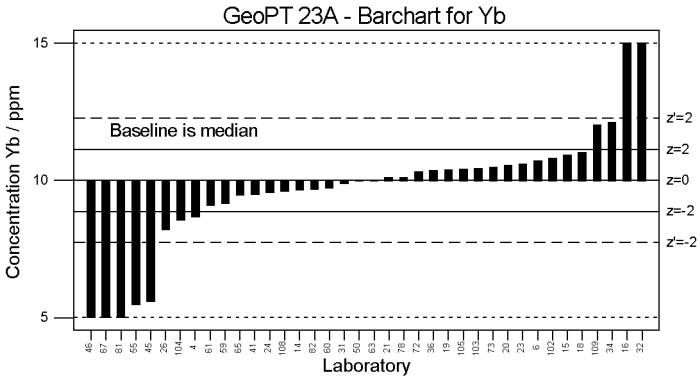
Figure 4b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

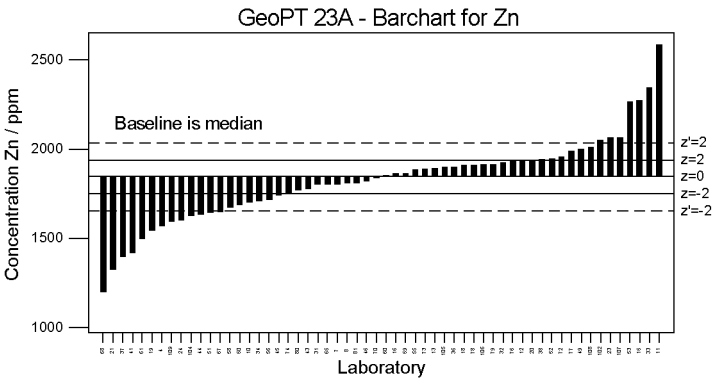












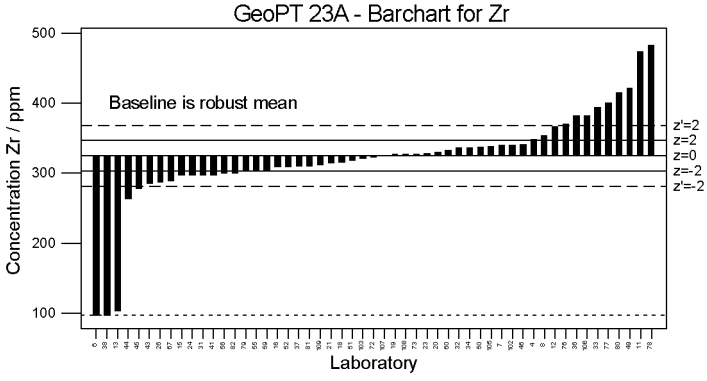


Figure 4b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

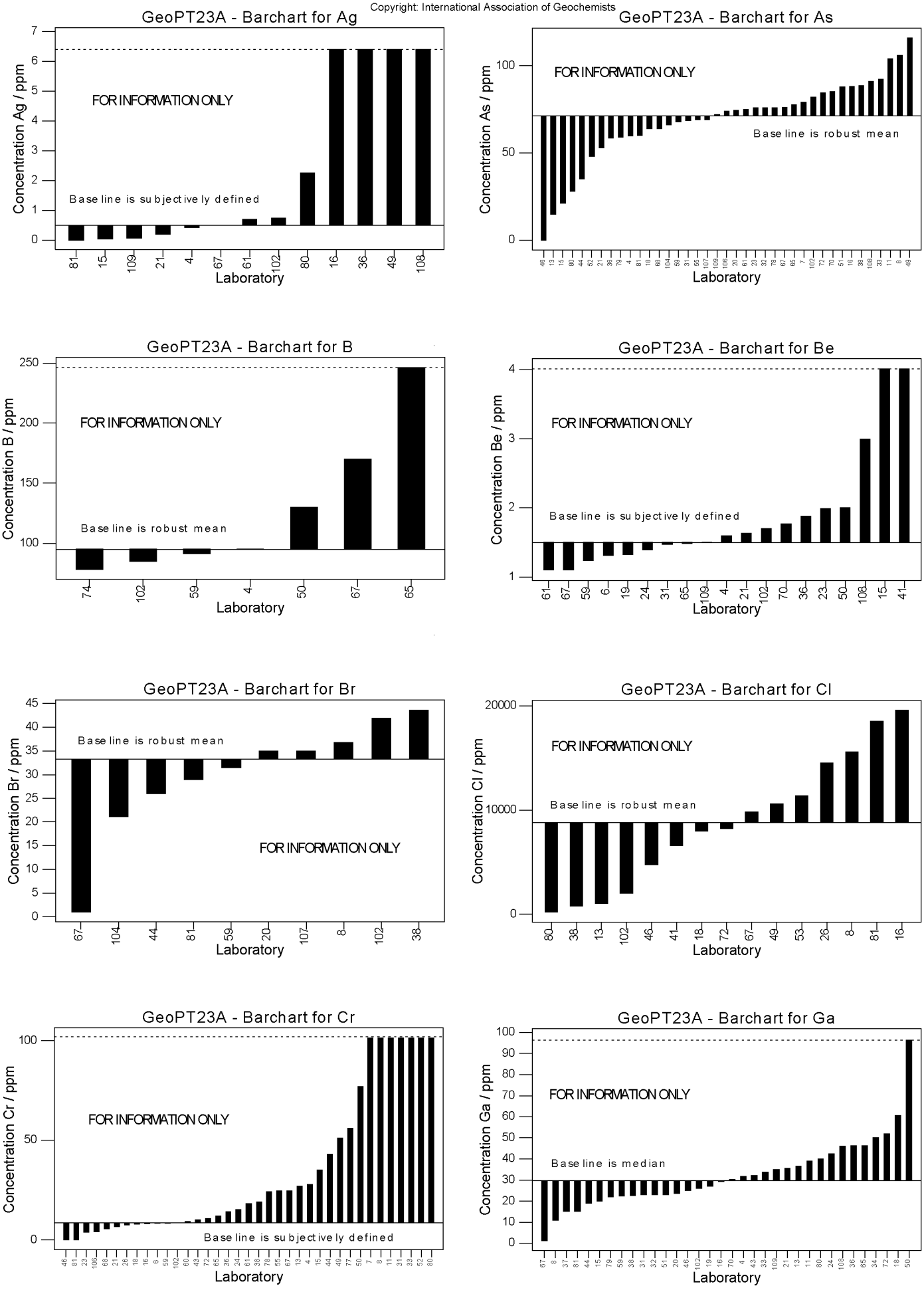


Figure 5b: GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for information only for elements for which values could not be assigned.

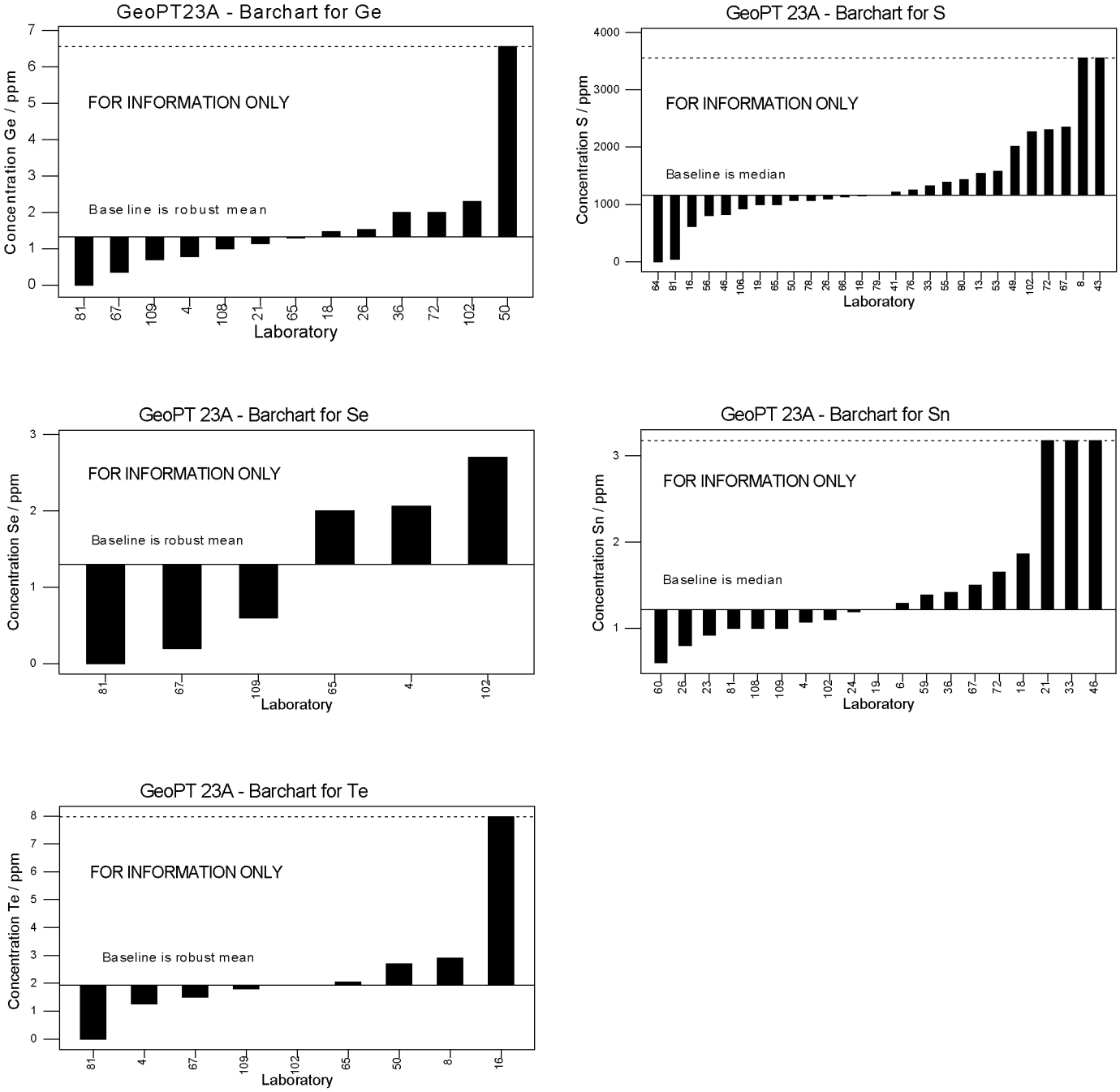


Figure 5b (cont'd): GeoPT23A – Manganese nodule, FeMn-1. Data distribution charts for information only for elements for which values could not be assigned.

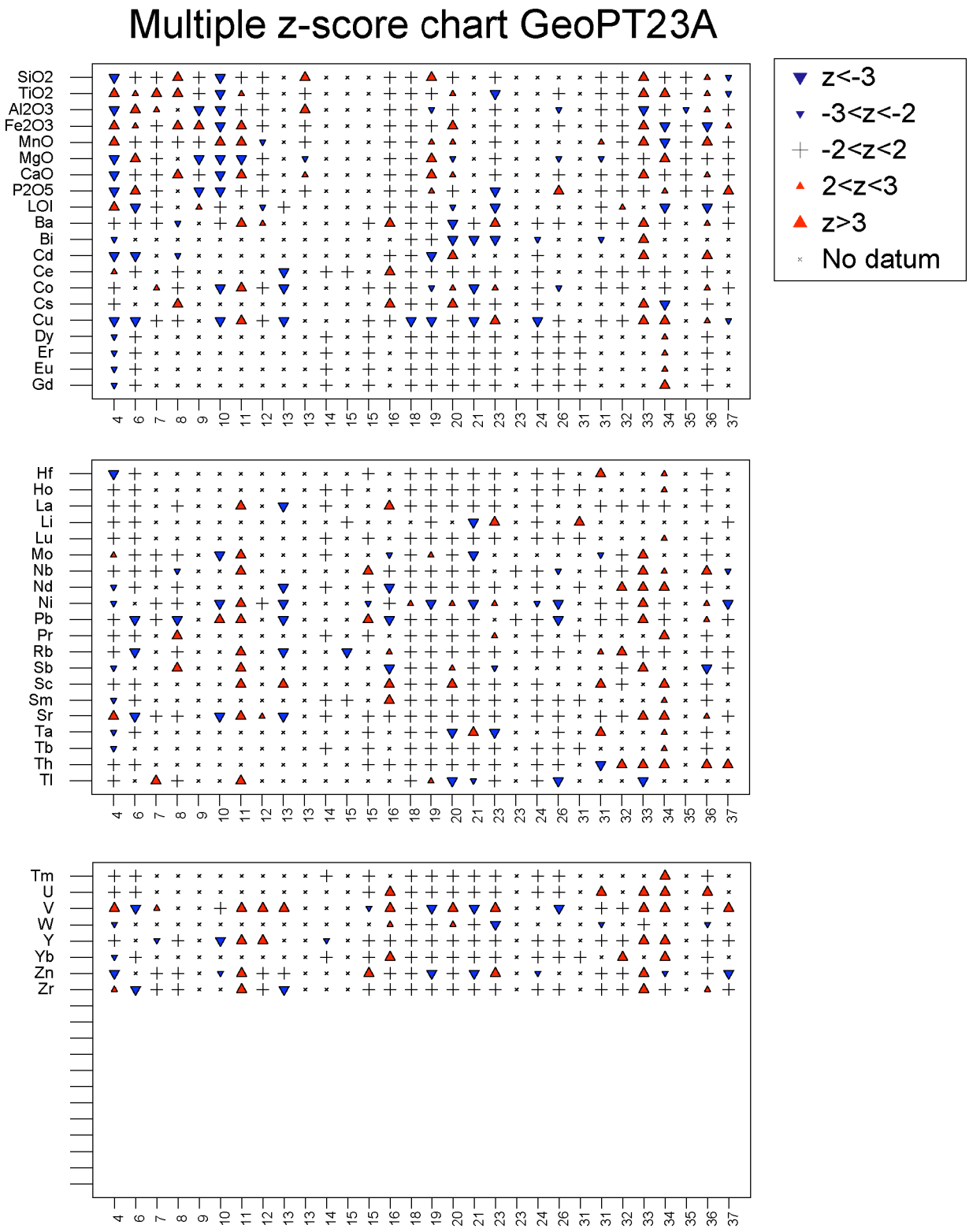


Figure 6a: GeoPT23A – Manganese nodule FeMn-1. Multiple z-score charts for laboratories participating in the GeoPT23 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▲), Z>+3 (▲).

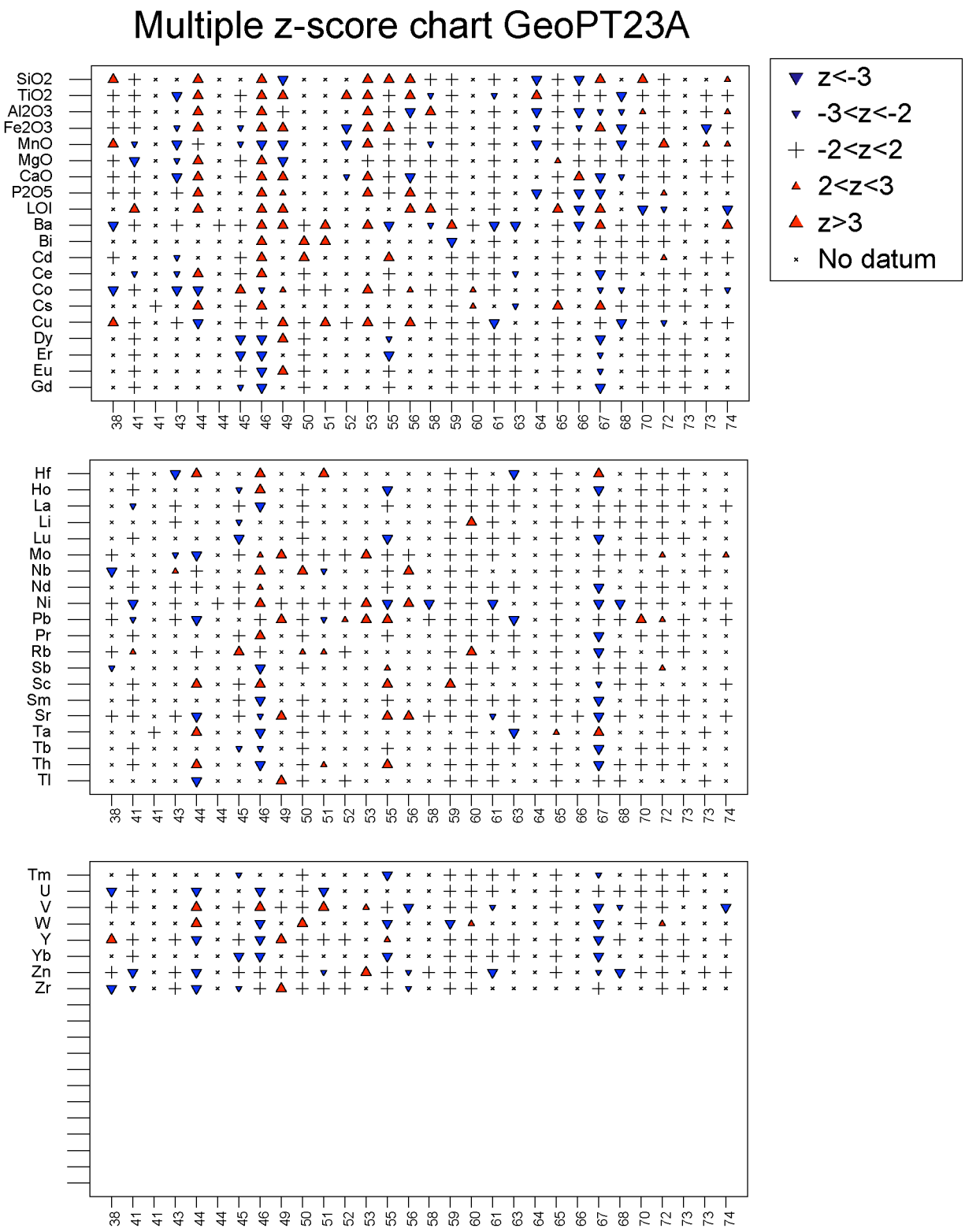


Figure 6b: GeoPT23A – Manganese nodule FeMn-1. Multiple z-score charts for laboratories participating in the GeoPT23 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▲), Z>+3 (▲).

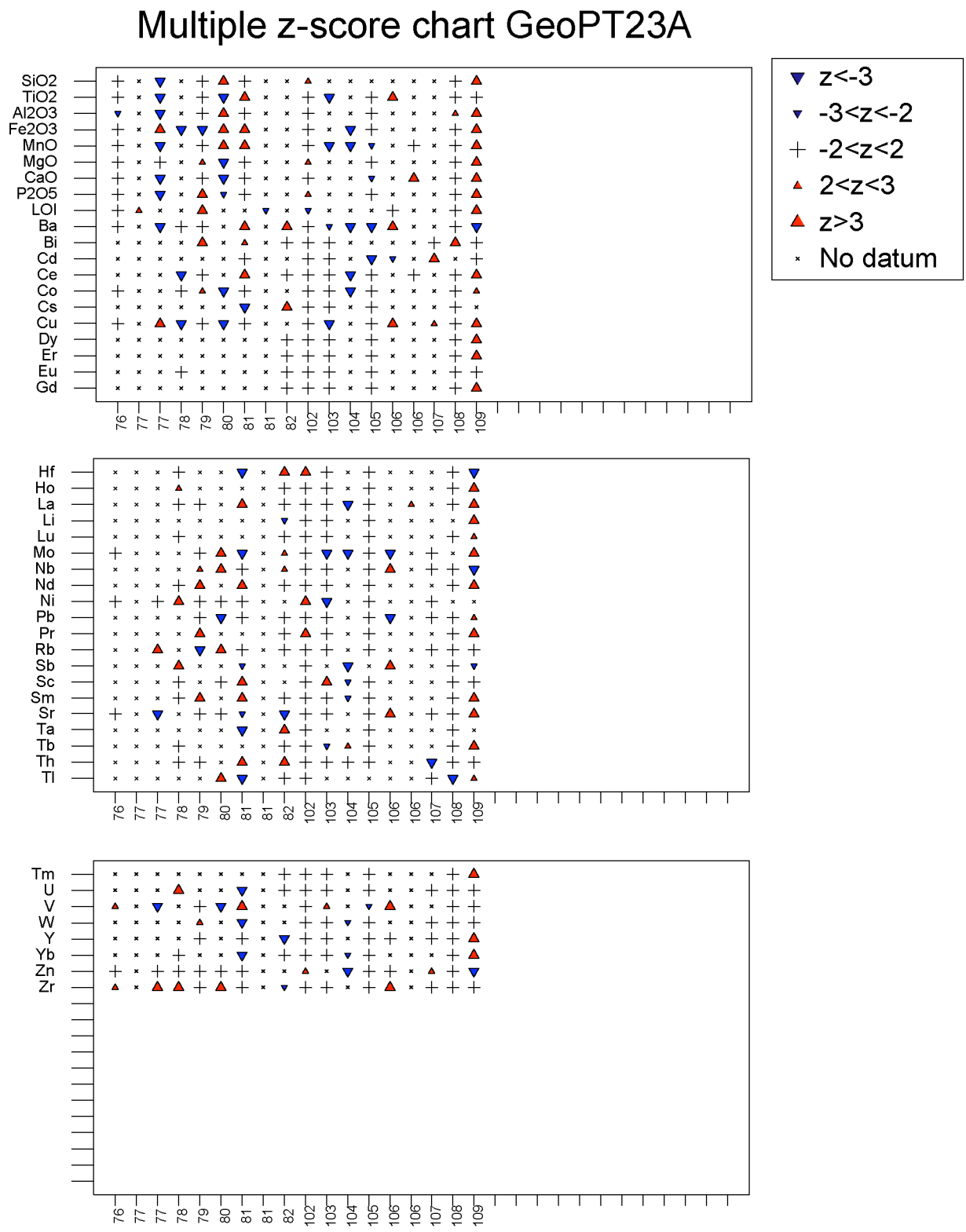


Figure 6c: GeoPT23A – Manganese nodule FeMn-1. Multiple z-score charts for laboratories participating in the GeoPT23 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▴), Z>+3 (▲).