

GeoPT 34, England - GRI-1, Granite

Veranstalter: International Association of Geoanalysts and Geostandards Newsletter - GeoPT34

Ringversuchsmaterial: GRI-1, (Granite)

RV geschlossen: 2014 – 2

Literatur: Report - GeoPT34 Proficiency Testing Round (CRB Laborcode = J1)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
Na ₂ O	3,99	3,97	0,065	0,17
MgO	0,75	0,75	0,016	0,00
Al ₂ O ₃	15,97	15,92	0,21	0,12
SiO ₂	68,71	68,66	0,72	0,03
P ₂ O ₅	0,132	0,136	0,002	-0,48
K ₂ O	4,57	4,57	0,073	0,00
CaO	1,85	1,83	0,033	0,29
TiO ₂	0,48	0,476	0,011	0,20
Fe ₂ O ₃ tot	2,87	2,866	0,049	0,04
MnO	0,041	0,036	0,001	1,94
L.O.I.*	0,35	0,36	0,11	---

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
Ba	1953	1942	49,7	0,11
C-tot. *	1060	618	214	---
Ce	155	167	6,2	-0,97
Co	3	4,6	0,3	-2,72
Cl *	83	157	47	---
Cr	16	19	1	-1,55
Cu	14	15,4	0,8	-0,83
F *	1187	1242	335	---
Ga	23	23,6	1,2	-0,23
Hf	7,7	8,4	0,5	-0,72
La	89	92,9	3,8	-0,52
Mo	4	2,2	0,2	5,74
Nb	10	12,7	2,4	-1,92
Nd	50	54,7	2,4	-0,97
Ni	6	7,1	0,4	-1,27
Pb	27	31	1,5	-1,34
Pr	14	17	0,9	-1,70
Rb	166	167,6	6,2	-0,13
S *	60	89	38	---
Sm	7	7,4	0,4	-0,46
Sn	7	2,5	0,2	12,79
Sr	456	466	14,8	-0,33
Th	20	24,4	1,2	-1,84

Tl	0,6	0,8	0,1	-1,58
U	1,6	2,1	0,2	-1,78
V	44	35	1,7	2,47
Zn	88	87	3,6	0,14
Zr	330	330,5	11	-0,02

Legende

CRB: Ergebnisse CRB – **RV:** Ergebnisse Ringversuch -- **1s-RV:** Standardabweichung Ringversuch

Z-Score: Differenz des Messwertes vom Mittelwert des Ringversuchs -- * Wert nicht zertifiziert

GeoPT34 — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 34 (Granite, GRI-1) / Jan. 2014

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*Keywords: proficiency testing, quality assurance, GeoPT, GeoPT34, round 34,
GRI-1, granite*

Abstract

Results are presented for GeoPT34, the subject of round thirty-four of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The test sample distributed in this round was a granite, GRI-1, supplied by Dr Stephen Wilson of the U.S. Geological Survey. In this report, the data contributed from 92 laboratories are listed, together with an assessment of consensus values, consequent *z*-scores and charts to show the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This thirty-fourth 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 procedures employed by analytical geochemistry laboratories. The programme is organised by the International Association of Geoanalysts and is conducted in accordance with a published protocol available at (<http://www.geoanalyst.org/documents/GeoPT-protocol.pdf>). The overall aim of the programme is to provide participating laboratories with *z*-score information for reported elemental determinations from

which the laboratory can decide whether the quality of their data is satisfactory in relation both to their chosen fitness-for-purpose criteria and to the results submitted by other laboratories contributing to the round and can choose to take corrective action if this appears justified.

Steering Committee for Round 34: P.C. Webb (results coordinator), M. Thompson (statistical advisor), P.J. Potts (analytical advisor), S. Wilson (provision of GRI-1).

Timetable for Round 34:

Distribution of sample: September 2013.

Deadline for submission of analytical results:
13th December 2013.

Distribution of report: February 2014

Sample details

GeoPT34: The granite test material, GRI-1, was produced at the U.S. Geological Survey under the direction of Stephen Wilson. The test material was evaluated for homogeneity by the originator and as a result, the sample was considered suitable for use in this proficiency test.

Submission of results

The results submitted for GeoPT34 (GRI-1) by 92 laboratories are listed in Table 1. All of these data were used to assess respective assigned values.

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 available estimates of the true composition of this sample. Values were assigned on the basis that: (i) sufficient laboratories had contributed data for an element, and (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.

Table 2 lists assigned and provisional values for 10 major components and 41 trace elements in GeoPT34 (GRI-1). Bar charts for the 51 elements/components of GeoPT34 that were judged to have satisfactory distributions for consensus values to be assigned or given provisional values are shown in Figure 1. These are: SiO₂, TiO₂, Al₂O₃, Fe₂O₃T, MnO, MgO, CaO, Na₂O, K₂O, P₂O₅, Ba, Be, Bi*, Ce, Co, Cr, Cs, Cu*, Dy, Er, Eu, Ga, Gd*, Ge*, Hf*, Ho, La, Li, Lu, Mo, Nb, Nd, Ni*, Pb, Pr, Rb, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, Y, Yb, Zn and Zr. Of these, only provisional values were given to the 6 marked '*'. Instances of provisional status were recorded because either i) a relatively small number of measurements contributed to the consensus, or ii) the degree of consensus was less than ideal because results were significantly dispersed in relation to the target value or the distribution was in part non symmetrical. In 28 cases the robust mean was used to define the consensus value, but in 23 cases the median value was preferred.

Most of the results distributions for which values were assigned and provisional values given were largely symmetrical. However, notable low tails were a feature

of the Zr and Hf distributions. In view of the problems noted in Round 31, an examination of the Zr results according to analytical procedure was undertaken. The results are shown in Figure 0 and a summary of the data given in Table 0. There are strong indications, as for GeoPT31 (Webb et al. 2012), that many of the ICP-MS (and ICP-OES/AES) data suffer from incomplete digestion of a Zr-bearing phase, most probably zircon. From Figure 0 the use of fusion (and sintering) to prepare a solution for ICP-MS (and ICP-OES/AES) appears to be much more successful, as the results are much more tightly clustered. There remain some discrepancies between the procedures used, but the assigned value more closely matches the robust mean value for XRF than for other techniques, however this may not be surprising as XRF accounted for 40 of the 74 results. In Round 31 the problems of sample preparation that affect Zr also affected HREEs. In this round, however the distribution of results for HREEs do not show the marked tailing exhibited by Zr and Hf.

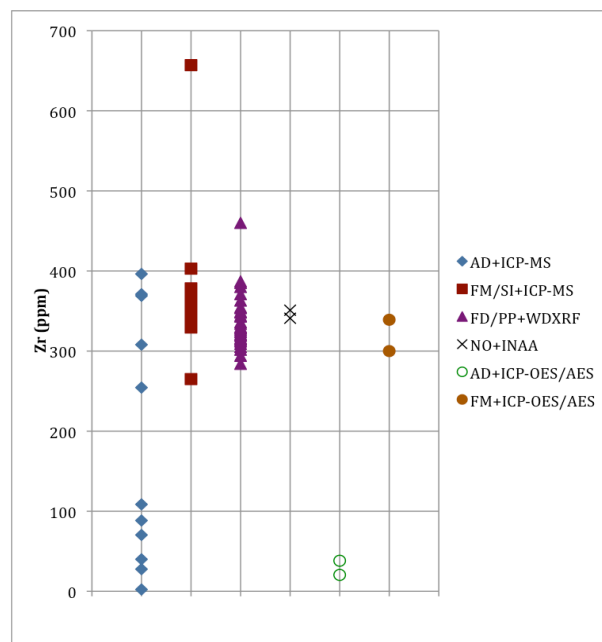


Figure 0. Zirconium determinations according to analytical procedure. Diamonds: ICP-MS using acid digestion; squares: ICP-MS using fusion (+sintering); triangles: XRF using fusion discs and powder pellets; crosses: INAA; open circles ICP-OES/AES using acid digestion; filled circles: ICP-OES/AES using fusions. See Table 0 for summary data.

Bar charts for the 16 elements/components: Fe(II)O, H₂O⁺, CO₂, LOI, Ag, As, C(tot), Cd, Cl, F, Hg, In, S,

Sb, Se and W are plotted in Figure 2 for information only, as the data were insufficient or too variable for the reliable determination of a consensus.

Some results distributions, especially at low concentrations, exhibited familiar stepped patterns as a result of over-rounding of submitted results. This applied particularly to TiO₂, MnO, Ho, Lu, Ta and Tm. Provision of additional decimal places when reporting for GeoPT, even though they may not be regarded as 'significant' is recommended to avoid the impression that there is a multimodal distribution of results.

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 GeoPT34, 1700 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 GeoPT34, 1579 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:

$$H_a = k \cdot X_a^{0.8495}$$

Where X_a is the concentration of the element expressed as a *fraction*; 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 GeoPT34 are listed in Table 3. 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, especially if it is outside the range $-3 < z < 3$, it would be advisable for the contributing laboratory to examine its 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 GeoPT34 in Figure 3. 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. 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 GeoPT35 round, the sample for which will be distributed during March 2014.

Acknowledgements

The authors thank Liz Lomas for valued assistance in distributing both the sample and the report and to John Watson for various forms of assistance.

Appendix 1

Publication status of proficiency testing reports. Previous reports are available for download from the IAG website (<http://www.geoanalyst.org/>). Pdf files for recent rounds are available on request from geopt@open.ac.uk.

GeoPT1

Thompson M., Potts P.J., Kane J.S. and Webb P.C. (1996)
GeoPT1. International proficiency test for analytical geochemistry laboratories - Report on round 1. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 20, 295-325.

GeoPT2

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson, J.S. (1998)
GeoPT2. International proficiency test for analytical geochemistry laboratories - Report on round 2. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 22 127-156.

GeoPT3

Thompson M., Potts P.J., Kane J.S. and Chappell B.W. (1999a)
GeoPT3. International proficiency test for analytical geochemistry laboratories - Report on round 3. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 23, 87-121.

GeoPT4

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
GeoPT4. International proficiency test for analytical geochemistry laboratories - Report on round 4. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT5

Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
GeoPT5. International proficiency test for analytical geochemistry laboratories - Report on round 5. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT6

Potts P.J., Thompson M., Kane J.S., Webb P.C. and Carignan J. (2000)
GEOPT6 - an international proficiency test for analytical geochemistry laboratories - report on round 6 (OU-3: Nanhon microgranite) and 6A (CAL-S: CRPG limestone). International Association of Geoanalysts: Unpublished report.

GeoPT7

Potts P.J., Thompson M., Kane J.S., and Petrov L.L. (2000)
GEOPT7 - an international proficiency test for analytical geochemistry laboratories - report on round 7 (GBPG-1 Garnet-biotite plagiogness). International Association of Geoanalysts: Unpublished report.

GeoPT8

Potts P.J., Thompson M., Kane J.S., Webb, P.C. and Watson J.S. (2000)
GEOPT8 - an international proficiency test for analytical geochemistry laboratories - report on round 8 / February 2001 (OU-4 Penmaenmawr microdiorite). International Association of Geoanalysts: Unpublished report.

GeoPT9

Potts P.J., Thompson M., Webb, P.C. and Watson J.S. (2001)
GEOPT9 - an international proficiency test for analytical geochemistry laboratories - report on round 9 / July 2001 (OU-6 Penrhyn slate). International Association of Geoanalysts: Unpublished report.

GeoPT10

Potts P.J., Thompson M., Webb, P.C., Watson J.S. and Wang Yimin (2001)
GEOPT10 - an international proficiency test for analytical geochemistry laboratories - report on round 10 / December 2001 (CH-1 Marine sediment). International Association of Geoanalysts: Unpublished report.

GeoPT11

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Watson J.S. (2002)
GEOPT11 - an international proficiency test for analytical geochemistry laboratories - report on round 11 / July 2002 (OU-5 Leaton dolerite). International Association of Geoanalysts: Unpublished report.

GeoPT12

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Batjargal B. (2003)
GEOPT12 - an international proficiency test for analytical geochemistry laboratories - report on round 12 / January 2003 (GAS Serpentine). International Association of Geoanalysts: Unpublished report.

GeoPT13

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Kaspar H.U. (2003)
GEOPT13 - an international proficiency test for analytical geochemistry laboratories - report on round 13 / July 2003 (Köln Loess). International Association of Geoanalysts: Unpublished report.

GeoPT14

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and B. Batjargal (2004)
GeoPT14 - an international proficiency test for analytical geochemistry laboratories - report on round 14 / January 2004 (OShBO - alkaline granite). International Association of Geoanalysts: Unpublished report.

GeoPT15

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and WANG Yimin (2004)
GeoPT15 - an international proficiency test for analytical geochemistry laboratories - report on round 15 / June 2004 (Ocean floor sediment MSAN). International Association of Geoanalysts: Unpublished report.

GeoPT16

Potts P.J., Thompson M., Webb, P.C. and S. Wilson (2005)
GeoPT16 - an international proficiency test for analytical geochemistry laboratories - report on round 16 / February 2005 (Nevada basalt, BNV-1). International Association of Geoanalysts: Unpublished report.

GeoPT17

Potts P.J., Thompson M., Webb, P.C. and J. Nicholas Walsh (2005)
GeoPT17 - an international proficiency test for analytical geochemistry laboratories - report on round 17 / July 2005 (Calcareous sandstone, OU-8). International Association of Geoanalysts: Unpublished report.

GeoPT18

Webb, P.C., Thompson M., Potts P.J. and L. Paul Bedard (2006)
GeoPT18 - an international proficiency test for analytical geochemistry laboratories - report on round 18 / Jan 2006 (Quartz Diorite, KPT-1). International Association of Geoanalysts: Unpublished report.

GeoPT19

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2006)
GeoPT19 - an international proficiency test for analytical geochemistry laboratories - report on round 19 / July 2006 (Gabbro, MGR-N). International Association of Geoanalysts: Unpublished report.

GeoPT20

Webb, P.C., Thompson M., Potts P.J. and M. Burnham (2007)
GeoPT20 - an international proficiency test for analytical geochemistry laboratories - report on round 20 / Jan 2007 (Ultramafic rock, OPY-1). International Association of Geoanalysts: Unpublished report.

GeoPT21

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2007)
 GeoPT21 - an international proficiency test for analytical
 geochemistry laboratories - report on round 21 / July 2007 (Granite,
 MGT-1). International Association of Geoanalysts: Unpublished
 report.

GeoPT22

Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2008)
 GeoPT22 - an international proficiency test for analytical
 geochemistry laboratories - report on round 22 / January 2008
 (Basalt, MBL-1). International Association of Geoanalysts:
 Unpublished report.

GeoPT23

Webb, P.C., Thompson, M., Potts, P.J., Watson, J.S. and Kriete, C.
 (2008)
 GeoPT23 - an international proficiency test for analytical
 geochemistry laboratories - report on round 23 / September 2008
 (Separation Lake pegmatite, OU-9) and 23A (Manganese nodule,
 FeMn-1). International Association of Geoanalysts: Unpublished
 report.

GeoPT24

Webb, P.C., Thompson, M., Potts, P.J. and Watson, J.S. (2009)
 GeoPT24 - an international proficiency test for analytical
 geochemistry laboratories - report on round 24 / January 2009
 (Longmyndian greywacke, OU-10). International Association of
 Geoanalysts: Unpublished report.

GeoPT25

Webb, P.C., Thompson, M., Potts, P.J. and Enzweiler, J. (2009)
 GeoPT25 - an international proficiency test for analytical
 geochemistry laboratories - report on round 25 / July 2009 (Basalt,
 HTP-1). International Association of Geoanalysts: Unpublished
 report.

GeoPT26

Webb, P.C., Thompson, M., Potts, P.J. and Loubser, M. (2010)
 GeoPT26 - an international proficiency test for analytical
 geochemistry laboratories - report on round 26 / January 2010
 (Ordinary Portland cement, OPC-1). International Association of
 Geoanalysts: Unpublished report.

GeoPT27

Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2010)
 GeoPT27 - an international proficiency test for analytical

geochemistry laboratories - report on round 27 / July 2010 (Andesite,
 MGL-AND). International Association of Geoanalysts: Unpublished
 report.

GeoPT28

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011)
 GeoPT28 - an international proficiency test for analytical
 geochemistry laboratories - report on round 28 / January 2011
 (Shale, SBC-1). International Association of Geoanalysts:
 Unpublished report.

GeoPT29

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011)
 GeoPT29 - an international proficiency test for analytical
 geochemistry laboratories - report on round 29 / July 2011
 (Nephelinite, NKT-1). International Association of Geoanalysts:
 Unpublished report.

GeoPT30

Webb, P.C., Thompson, M., Potts, P.J., Long, D. and Batjargal, B.
 (2012)
 GeoPT30 - an international proficiency test for analytical
 geochemistry laboratories - report on round 30 / January 2012
 (Syenite, CG-2) and 30A (Limestone, ML-2). International
 Association of Geoanalysts: Unpublished report.

GeoPT31

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2012)
 GeoPT31 - an international proficiency test for analytical
 geochemistry laboratories - report on round 31 / July 2012 (Modified
 river sediment, SdAR-1). International Association of Geoanalysts:
 Unpublished report.

GeoPT32

Webb, P.C., Thompson, M., Potts, P.J. and Webber, E. (2013)
 GeoPT32 - an international proficiency test for analytical
 geochemistry laboratories - report on round 32 / January 2013
 (Woodstock Basalt, WG-1). International Association of
 Geoanalysts: Unpublished report.

GeoPT33

Webb, P.C., Thompson, M., Potts, P.J., Prusisz, B., and Young, K.
 (2013)
 GeoPT33 - an international proficiency test for analytical
 geochemistry laboratories - report on round 33 / July-August 2013
 (Ball Clay, DBC-1). International Association of Geoanalysts:
 Unpublished report.

Table 0. Summary of GeoPT34 zirconium determinations according to analytical procedure.

Sample preparation + Technique	No.	Median	Mean	St Dev	Robust mean	Robust SD
Acid digestion + ICP-MS	11	219.7	226.7	132.7	185.1	175.8
Fusion /sintering + ICP-MS	17	358.0	337.4	120.2	355.4	26.6
Fusion disc /powder pellet + WD/ED XRF	40	326.5	320.5	69.6	330.8	24.2
INAA	2	343.5	232.2			
Acid digestion + ICP-OES/AES	2	24.9	22.0			
Fusion disc /powder pellet + ICP-OES/AES	2	309.8	218.0			
Overall	74	329.9	311.6	104.4	330.5*	37.2

* Assigned value for Zr

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J01	J02	J03	J04	J05	J06	J06	J07	J08	J09	J10
Data Quality		2	2	2	2	2	1	2	1	2	1	1
SiO2	g 100g ⁻¹	68.71	68.72	68.184	68.9	68.85	68.11		68.27	68.82		69.81
TiO2	g 100g ⁻¹	0.48	0.45	0.465	0.47	0.49	0.48		0.49	0.48		0.5
Al2O3	g 100g ⁻¹	15.97	16.2	16.064	16.05	15.96	15.92		15.93	15.93		16.23
Fe2O3T	g 100g ⁻¹	2.87	2.85	2.837	2.86	2.91	2.89		2.85	2.88		3.13
Fe(II)O	g 100g ⁻¹											
MnO	g 100g ⁻¹	0.041	0.0335	0.035	0.04	0.037	0.04		0.03	0.04		0.046
MgO	g 100g ⁻¹	0.75	0.74	0.697	0.76	0.77	0.75		0.85	0.75		0.8
CaO	g 100g ⁻¹	1.85	1.83	1.816	1.8	1.85	1.75		1.92	1.83		1.88
Na2O	g 100g ⁻¹	3.99	4.01	4.114	4.02	4.02	3.98		3.91	4.05		4.2
K2O	g 100g ⁻¹	4.57	4.6	4.65	4.57	4.61	4.58		4.58	4.59		4.44
P2O5	g 100g ⁻¹	0.132	0.14	0.127	0.13	0.137	0.13		0.14	0.134		0.17
H2O+	g 100g ⁻¹			0.09851								
CO2	g 100g ⁻¹											0.179
LOI	g 100g ⁻¹	0.35	0.4	0.651	0.5	0.39	0.33		0.35	0.27		
Ag	mg kg ⁻¹									0.3		0.5
As	mg kg ⁻¹	0.2					1.15					
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	1953	1961	1888.2			2076		1972	1878	2104.1	2221
Be	mg kg ⁻¹						2.58			3.5		
Bi	mg kg ⁻¹											0.07
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹	1040								500		
C(org)	mg kg ⁻¹				190							
Cd	mg kg ⁻¹									0.05		0.3
Ce	mg kg ⁻¹	155		155.6				164		172.1	174.64	179.21
Cl	mg kg ⁻¹	157										
Co	mg kg ⁻¹	3		3.7			3.59			4.6	4.33	8.62
Cr	mg kg ⁻¹	16	9	24.2				12.1		17	18.87	22
Cs	mg kg ⁻¹			3.6						1.63	1.579	1.77
Cu	mg kg ⁻¹	14	3	13.8						15	16.14	
Dy	mg kg ⁻¹						10.6			2.1	2.101	2.15
Er	mg kg ⁻¹						2.25			1	0.804	0.9
Eu	mg kg ⁻¹						1.02			1.42	1.4	1.223
F	mg kg ⁻¹	1187										
Ga	mg kg ⁻¹	23	27	21.5				24.7		24.8	25.52	
Gd	mg kg ⁻¹						4.69			4.2	5.05	5.24
Ge	mg kg ⁻¹	3.5								0.7		
Hf	mg kg ⁻¹	7.7		7.3				10.2		8.7	8.4	8.05
Hg	mg kg ⁻¹									0.02		
Ho	mg kg ⁻¹						0.36			0.3	0.345	0.39
I	mg kg ⁻¹			2								
In	mg kg ⁻¹											0.08
Ir	mg kg ⁻¹											0.27
La	mg kg ⁻¹	89	78	89.7			89.1			94	89.45	101.5
Li	mg kg ⁻¹						26			30		
Lu	mg kg ⁻¹						0.11			0.13	0.092	0.11
Mo	mg kg ⁻¹	4		1.8				1.7		2		2.69
Nb	mg kg ⁻¹	10	80	11.8				12.1	12	12	13.77	12
Nd	mg kg ⁻¹	50		52.3			53.8			57.7	53.64	58.87
Ni	mg kg ⁻¹	6	3	6			5.76			3	8.24	
Pb	mg kg ⁻¹	27	45	31.4				30.6	28	34	32.09	31.03
Pr	mg kg ⁻¹	14					16.7			17.18	16.68	18
Rb	mg kg ⁻¹	166	169	163.5				161	173	176.1	174.74	167.5
Re	mg kg ⁻¹											0.0095
S	mg kg ⁻¹	60								76		119.3
Sb	mg kg ⁻¹			0.5			0.12			0.2		
Sc	mg kg ⁻¹			5.1				3		3	6.74	
Se	mg kg ⁻¹						3.04					0.11
Sm	mg kg ⁻¹	7		6.3			7.59			7.7	7.23	8
Sn	mg kg ⁻¹	7		1.7						2.3		6
Sr	mg kg ⁻¹	456	654	458.8				444	465	474.9	479.66	491
Ta	mg kg ⁻¹									1.03	0.898	0.97
Tb	mg kg ⁻¹						0.47			0.55	0.596	0.5
Te	mg kg ⁻¹											
Th	mg kg ⁻¹	20		23.9				26.6		23.4	24.58	26.6
Tl	mg kg ⁻¹	0.6		1.6				0.77		0.91		
Tm	mg kg ⁻¹							0.12		0.16	0.1085	0.14
U	mg kg ⁻¹	1.6		2.2			2.29			2.5	1.947	2.45
V	mg kg ⁻¹	44	41	30.2				34.8	36	32	65.15	37
W	mg kg ⁻¹									0.3		0.8
Y	mg kg ⁻¹	2	39	8.3			9.56		9	9.8	10.47	10.45
Yb	mg kg ⁻¹						0.76			0.7	0.754	0.78
Zn	mg kg ⁻¹	88	110	84.7				87	85	83	72.22	99
Zr	mg kg ⁻¹	330	387	319.7				305	316	358	369.52	329.4

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	J21
Data Quality		1	1	2	1	2	2	2	1	1	2	2
SiO2	g 100g ⁻¹		68.8	68.56	68.01		69.11	67.02	68.65	68.4	68.66	64.3
TiO2	g 100g ⁻¹	0.53	0.49	0.48	0.48	0.139	0.49	0.47	0.477	0.4651	0.476	0.415
Al2O3	g 100g ⁻¹		16.2	15.94	15.74	1.161	15.61	15.71	16.06	16.9	15.92	18.3
Fe2O3T	g 100g ⁻¹		2.86	2.85	2.96	2.106	2.95	2.82	2.865	2.6	2.9	2.9
Fe(II)O	g 100g ⁻¹				1.79							
MnO	g 100g ⁻¹		0.04	0.04	0.037	0.026	0.028	0.034	0.033	0.027	0.049	0.0349
MgO	g 100g ⁻¹		0.75	0.73	0.77	0.727	0.8	0.72	0.75	0.73	0.74	
CaO	g 100g ⁻¹		1.83	1.85	1.89	0.437	1.9	1.81	1.816	1.84	1.78	1.75
Na2O	g 100g ⁻¹		4.25	4.08	4.05	0.060	4.11	3.94	3.86	4.1	3.88	
K2O	g 100g ⁻¹		4.57	4.66	4.53	0.676	4.62	4.53	4.56	4.4	4.53	5.37
P2O5	g 100g ⁻¹	0.141	0.13	0.13	0.15	0.157	0.122	0.13	0.135	0.145	0.129	
H2O+	g 100g ⁻¹		0.53		0.42							
CO2	g 100g ⁻¹											1.88
LOI	g 100g ⁻¹		0.31	0.27	0.35		0.28	0.39	0.42			
Ag	mg kg ⁻¹		0.4			0.30						
As	mg kg ⁻¹		24			0.98			1.39			
B	mg kg ⁻¹				4	0.93						
Ba	mg kg ⁻¹	1852.3	1981	1980	1925	260.27	1825.1	1810	1986	1831	1925	2170
Be	mg kg ⁻¹		2.6		4.73	0.27					3.65	
Bi	mg kg ⁻¹	0.0311	0.13			0.06	0.3					
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹		500		349					600		
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹		0.06		0.32	0.1			0.24			2.4
Ce	mg kg ⁻¹	169.3	163		163	14.7	125.5	111.9	171.3	156	168	170
Cl	mg kg ⁻¹				75					120		
Co	mg kg ⁻¹	4.278	4.3		4.56	4.32	8.6		3.8		4.27	
Cr	mg kg ⁻¹	15.68	12	17	20.8	28.2	75.9	15.8	15.9			
Cs	mg kg ⁻¹	1.678	1.43		1.62		6.1		1.67			
Cu	mg kg ⁻¹	13.214	17.7	16	16.7	19.33	13.6	12	13.1			22
Dy	mg kg ⁻¹	1.979	4.67		2.14	0.94			2.23		2.05	
Er	mg kg ⁻¹	0.979	2.49		0.82	0.45			0.895		1.04	
Eu	mg kg ⁻¹	1.379	2.64		1.32	0.76			1.318			
F	mg kg ⁻¹		0.21		1300							
Ga	mg kg ⁻¹		20.5	23	24.4		22.6	19.1	24.9	22		27
Gd	mg kg ⁻¹	5.292	7.45		4.02	5.37			4.04			
Ge	mg kg ⁻¹		0.2		1.1	0.15						
Hf	mg kg ⁻¹	1.125	0.58		8.17		7.9		8.88			
Hg	mg kg ⁻¹				0.0095		0.0157					
Ho	mg kg ⁻¹	0.31	0.83		0.323	0.12			0.369			
I	mg kg ⁻¹						2.2					
In	mg kg ⁻¹		0.03									
Ir	mg kg ⁻¹											
La	mg kg ⁻¹	96.45	99.3		88.2	7.1	93.9	106.4	93.19	79		89.2
Li	mg kg ⁻¹		36		31	27.7			37.5		31.56	
Lu	mg kg ⁻¹	0.103	0.35		0.1	0.03			0.112			
Mo	mg kg ⁻¹	6.996	2.46		3.01	2.8	1.5		0.78			
Nb	mg kg ⁻¹	12.17	16.8		11.3	0.59	11.6	15.9	11.6			10.7
Nd	mg kg ⁻¹	55.81	56.4		52.5	58.46	30.4	32.8	57.21		55.32	66.5
Ni	mg kg ⁻¹	6.398	10	9	8	6.89	4.4		6			
Pb	mg kg ⁻¹	31.85	25.4		32.9	10.21	27	29.7	35		29.47	37
Pr	mg kg ⁻¹	17.43	19		16.3	19.92			16.86			20
Rb	mg kg ⁻¹	171.8	145		163	25.2	159.6	160.1	161.9	154	164.8	182
Re	mg kg ⁻¹											
S	mg kg ⁻¹				114		410			159		
Sb	mg kg ⁻¹		0.77				4.7					
Sc	mg kg ⁻¹	2.731	2.5		3.33	2.37	2.7				3.27	
Se	mg kg ⁻¹				0.05	0.11	0.2					
Sm	mg kg ⁻¹	7.207	9.4		7.03	5.47	7.4		7.382		7.45	
Sn	mg kg ⁻¹	2.561	2.4		2.34	0.28	7		3.38			
Sr	mg kg ⁻¹	468.4	478	415	470	21.4	448	446.8	474	430		505
Ta	mg kg ⁻¹	0.832	3.15		0.94		1.4					
Tb	mg kg ⁻¹	0.567	1.02		0.47	0.32			0.47			
Te	mg kg ⁻¹						1.2					
Th	mg kg ⁻¹	23.53	18		24.9	31.31	23.2	24	27.57	39	23	22
Tl	mg kg ⁻¹		0.72			0.35			0.65			
Tm	mg kg ⁻¹	0.079	0.35		0.11	0.03			0.126			
U	mg kg ⁻¹	1.667	1.64		2.04	2.17	4		2.24			
V	mg kg ⁻¹	34.71	37	33	32.8	11.1	28.9	32.1	32.5	42	41	295
W	mg kg ⁻¹	0.478	0.8		0.31		2.9		0.24			
Y	mg kg ⁻¹	7.594	12.8		9.08	2.6	8.5	9.3	9.14	19	11	11.1
Yb	mg kg ⁻¹	0.672	2.3		0.696	0.19			0.751			
Zn	mg kg ⁻¹	88.24	86	94	92.7	86.33	80.1	85	104	93	87	96
Zr	mg kg ⁻¹	40.02	20.5		343	2.31	323.9	348.1	329	344	330	354

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J22	J23	J24	J25	J26	J27	J28	J29	J30	J31	J32
Data Quality		1	2	1	1	2	1	1	1	2	1	2
SiO2	g 100g ⁻¹	68.69		68.8141	68.1928	67.6	64.3	68.711	68.6	69.09	68.77	68.7
TiO2	g 100g ⁻¹	0.47		0.4853	0.4415	0.63	0.41	0.473	0.43	0.479	0.48	0.476
Al2O3	g 100g ⁻¹	15.99		16.1344	15.5299	14.6	13.4	16.11	15.5	15.89	15.84	15.96
Fe2O3T	g 100g ⁻¹	2.88		2.9235	2.8402	4.79	2.618	2.872	3.15	2.84	2.91	2.851
Fe(II)O	g 100g ⁻¹	1.77							1.89			
MnO	g 100g ⁻¹	0.04		0.0513	0.0342	0.02	0.0317	0.039	0.038	0.032	0.051	0.037
MgO	g 100g ⁻¹	0.75			0.7371	2.02	0.83	0.753	0.7	0.736	0.69	0.752
CaO	g 100g ⁻¹	1.86		1.8672	1.7407	5.57	1.84	1.834	1.76	1.82	1.9	1.823
Na2O	g 100g ⁻¹	3.93			3.7759	2.78	2.3	4.084	3.91	3.91	4.16	0.752
K2O	g 100g ⁻¹	4.53		4.8247	4.5338	0.92	4.43	4.584	4.33	4.59	4.59	4.582
P2O5	g 100g ⁻¹	0.14		0.1323	0.1306	0.27	0.122	0.146	0.14	0.129	0.14	0.13
H2O+	g 100g ⁻¹											
CO2	g 100g ⁻¹											0.125
LOI	g 100g ⁻¹	0.4		0.29	0.3471	0.8		0.34	0.17	0.4	0.28	0.365
Ag	mg kg ⁻¹											
As	mg kg ⁻¹			0.921								
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	1885		2030.81	1921		2286	1869.9	1500		1887	
Be	mg kg ⁻¹			2.154					3.69			
Bi	mg kg ⁻¹											
Br	mg kg ⁻¹				5.2							
C(tot)	mg kg ⁻¹											638
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹		0.28	1.106			2		0.18			
Ce	mg kg ⁻¹		170	178.783	131		173.5		164		174	
Cl	mg kg ⁻¹				20							
Co	mg kg ⁻¹	5		3.383	10			3.4	3.38		6	6.8
Cr	mg kg ⁻¹	55		25.858	21		22.5	16.6	461		26	32.8
Cs	mg kg ⁻¹		1.55				30.1					
Cu	mg kg ⁻¹	9		12.49	12		12.1	13.6	17		14	16.5
Dy	mg kg ⁻¹		2.3						3.77			
Er	mg kg ⁻¹		0.96						1.08			
Eu	mg kg ⁻¹		1.45						1.22			
F	mg kg ⁻¹				1023							1799
Ga	mg kg ⁻¹	24	24.1		21		22	22.6			25	
Gd	mg kg ⁻¹		5.46		8				4.09			
Ge	mg kg ⁻¹		1.26		2							
Hf	mg kg ⁻¹	8			10		4.7				10	
Hg	mg kg ⁻¹			0.04699								
Ho	mg kg ⁻¹		0.38						0.56			
I	mg kg ⁻¹											
In	mg kg ⁻¹											
Ir	mg kg ⁻¹											
La	mg kg ⁻¹		97.1	105.932	92		99.4		89.3		101	
Li	mg kg ⁻¹											
Lu	mg kg ⁻¹		0.12									
Mo	mg kg ⁻¹								3.69			
Nb	mg kg ⁻¹	13	12.2		13		10.5	12.6	14.07		12	
Nd	mg kg ⁻¹		57.6		58				52.4		61	
Ni	mg kg ⁻¹	9		6.418	10		5.1	7.9	13.7		5	11.5
Pb	mg kg ⁻¹	33		30.859	37		29.9	30.7			30	56.1
Pr	mg kg ⁻¹		17.8						15.4			
Rb	mg kg ⁻¹	164	170	167.893	166		153.7	171.6			166	
Re	mg kg ⁻¹											
S	mg kg ⁻¹			363.2	15.2305		97.5		867			
Sb	mg kg ⁻¹		0.17									
Sc	mg kg ⁻¹		2.66		4			3.5	3.38		3.4	
Se	mg kg ⁻¹			0.115					2.45			
Sm	mg kg ⁻¹		7.62						6.98			
Sn	mg kg ⁻¹		2.58				5					
Sr	mg kg ⁻¹	480		471.103	417		413.3	463.8	450		447	
Ta	mg kg ⁻¹											
Tb	mg kg ⁻¹		0.61									
Te	mg kg ⁻¹											
Th	mg kg ⁻¹	24	21.9		24		25.2	25.2			23	
Tl	mg kg ⁻¹		0.78	0.948								
Tm	mg kg ⁻¹		0.13									
U	mg kg ⁻¹		2.18				3.1	3.6			5.1	
V	mg kg ⁻¹	47		35.969	42		30.3	32.2	33.3		38	43.6
W	mg kg ⁻¹											
Y	mg kg ⁻¹	8	9.97		12		8.3	10	13.4		9.2	
Yb	mg kg ⁻¹		0.82						0.759			
Zn	mg kg ⁻¹	86		87.996	93		86	80.3	96.7		86	65.5
Zr	mg kg ⁻¹	349			336		301.6	323.7	38.2		309	385

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J33	J34	J35	J36	J37	J38	J39	J40	J41	J42	J43
Data Quality		2	2	2	1	2	1	1	2	2	2	1
SiO2	g 100g ⁻¹	69.764	68.55	68.61	68.572	66.27	68.73	69.1	72.337		68.46	68.83
TiO2	g 100g ⁻¹	0.511	0.486	0.4974	0.479	0.48	0.485	0.47	0.033	0.45	0.48	0.47
Al2O3	g 100g ⁻¹	16.67	16.386	16.21	15.957	15.28	15.96	16.16	14	15.87	15.98	15.56
Fe2O3T	g 100g ⁻¹	3.011	3.052	2.83	2.895	2.85	2.845	2.89	2.719	2.979	2.87	2.63
Fe(II)O	g 100g ⁻¹			2.06			1.845					
MnO	g 100g ⁻¹	0.039	0.041	0.038	0.0374	0.039	0.037	0.03	0.039	0.039	0.04	0.03
MgO	g 100g ⁻¹	0.774	0.623	0.8014	0.748	0.75	0.83	0.75	0.696	0.791	0.75	0.95
CaO	g 100g ⁻¹	1.95	1.886	1.778	1.837	1.83	1.795	1.78	1.853	2.126	1.82	1.72
Na2O	g 100g ⁻¹	4.192	4.137	4.048	3.914	3.65	3.905	4.08	3.615	4.296	3.96	3.85
K2O	g 100g ⁻¹	4.756	4.831	4.633	4.614	4.49	4.426	4.49	4.576	5.574	4.62	4.44
P2O5	g 100g ⁻¹	0.135	0.138	0.1295	0.1327	0.14	0.123	0.13	0.137	0.151	0.13	0.15
H2O+	g 100g ⁻¹						0.415					
CO2	g 100g ⁻¹					0.21	0.05					
LOI	g 100g ⁻¹	0.39	0.27	0.173	0.2		0.31	0.4	0.249		0.48	0.53
Ag	mg kg ⁻¹			0.191						0.245		
As	mg kg ⁻¹			2.837					1.376	0.646	0.7	
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	2073.9	1966		1922.2	2040			1776.25	2065	2200	1912
Be	mg kg ⁻¹	4.4		3.757					3.493	4.194		
Bi	mg kg ⁻¹			0.066					0.0053	0.049		
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹			1062		580	598				500	
C(org)	mg kg ⁻¹						461				500	
Cd	mg kg ⁻¹			0.056					0.056	0.078		
Ce	mg kg ⁻¹	172.88		177.3	170.754	170				182.9	192	
Cl	mg kg ⁻¹											
Co	mg kg ⁻¹	5.07	5.5	4.904					4.795	4.92	4.4	6
Cr	mg kg ⁻¹	19	23.2	21.34	19	20			19.29	20.09	28	
Cs	mg kg ⁻¹	1.67		1.562	1				1.395	1.673	1.54	
Cu	mg kg ⁻¹	15.3	18.8	14.22	14.7	10			18.02	16.66	17	21
Dy	mg kg ⁻¹	2.31		2.244	2.378					2.232	2.11	
Er	mg kg ⁻¹	1.01		0.922	0.91					0.818	0.9	
Eu	mg kg ⁻¹	1.48		1.647	1.454					1.443	1.39	
F	mg kg ⁻¹						1290					
Ga	mg kg ⁻¹	27.28		27.83	22.9				20.64	22.97	24.5	25
Gd	mg kg ⁻¹	4.87		7.395	4.122					4.135	4.66	
Ge	mg kg ⁻¹			1.119					1.499			
Hf	mg kg ⁻¹	8.76		8.984	8.727					0.843	9.2	
Hg	mg kg ⁻¹						0.0145					
Ho	mg kg ⁻¹	0.38		0.378	0.397					0.36	0.33	
I	mg kg ⁻¹											
In	mg kg ⁻¹											
Ir	mg kg ⁻¹											
La	mg kg ⁻¹	95.2		98.22	92.35	90				94.12	91.7	
Li	mg kg ⁻¹			29.3			32.5		33.69	38.64		
Lu	mg kg ⁻¹			0.109	0.106					0.08	0.1	
Mo	mg kg ⁻¹	2.18	3.8	2.219					1.729	2.317	3	
Nb	mg kg ⁻¹	11.26	15.3	14.4	12.416				18.05	12.83	13.8	11
Nd	mg kg ⁻¹	58.59		58.22	54.919					58.4	53	
Ni	mg kg ⁻¹	9	6.6	6.35	9.6				8.579	7.303	15	2
Pb	mg kg ⁻¹	33.7	38.5	29.64	31.215				30.06	32.71	31	31
Pr	mg kg ⁻¹	17.9		17.75	17.168					18.07	14.6	
Rb	mg kg ⁻¹	178.92	187.4	176.2	171.4				169.23	176.4	163	181
Re	mg kg ⁻¹			0.0032								
S	mg kg ⁻¹			44.8		110				1158	100	
Sb	mg kg ⁻¹			0.167					0.0158	0.135		
Sc	mg kg ⁻¹	3.2		2.909	3.3				5.373			2
Se	mg kg ⁻¹			1.842						0.411		
Sm	mg kg ⁻¹	7.83		8.598	7.73					8.306	7.06	
Sn	mg kg ⁻¹	2.42		2.653						2.517	3	
Sr	mg kg ⁻¹	480.09	529.2	515.5	471.7		516		422.82	465.8	538	565
Ta	mg kg ⁻¹	0.88		0.984	0.934					1.032	1	
Tb	mg kg ⁻¹	0.5		0.592	0.509					0.483	0.5	
Te	mg kg ⁻¹											
Th	mg kg ⁻¹	24.69	31.3	25.88	25.22				27.49	26.85	25	29
Tl	mg kg ⁻¹			0.858					0.134	0.929	0.7	
Tm	mg kg ⁻¹			0.12	0.12					0.108	0.11	
U	mg kg ⁻¹	2.12		2.197	2.274				2.516	2.073	2.2	4
V	mg kg ⁻¹	34.9	41.4	38.61	36.7	40			34.8	39.36	32	34
W	mg kg ⁻¹			0.435						0.271		
Y	mg kg ⁻¹	8.81	12.6	10.13	10.153	10			10.11	9.036	9.1	15
Yb	mg kg ⁻¹	0.8		0.741	0.769					0.59	0.77	
Zn	mg kg ⁻¹	92.4	95.5	79.46	92.9	100			92.03	94.19	82	87
Zr	mg kg ⁻¹	348.41	353.6	378.3	354.7	300				27.68	372	371

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J44	J45	J46	J47	J48	J48	J49	J50	J51	J52	J52
Data Quality		1	1	2	1	1	2	2	1	2	1	2
SiO2	g 100g ⁻¹	68.91	68.12	68.595	68.85		60.24	69.29		68.51	65.99	
TiO2	g 100g ⁻¹	0.47	0.48	0.48125	0.47	0.4602		0.49		0.52	0.5	
Al2O3	g 100g ⁻¹	14.99	15.91	15.9775	15.94	15.209		15.7		15.8	15.74	
Fe2O3T	g 100g ⁻¹	2.72	2.87	2.89	2.87	2.834		2.9		2.79	2.84	
Fe(II)O	g 100g ⁻¹										1.92	
MnO	g 100g ⁻¹	0.03	0.04	0.03875	0.036	0.0348		0.03	0.0366		0.04	
MgO	g 100g ⁻¹	0.8	0.74	0.735	0.73	0.826		0.78		0.72	0.92	
CaO	g 100g ⁻¹	1.82	1.76	1.83675	1.79	1.805		1.73		1.9	1.82	
Na2O	g 100g ⁻¹	4.27	4.03	3.895	3.99	3.908		4.18		4.42	3.78	
K2O	g 100g ⁻¹	4.48	4.53	4.42075	4.52	4.581		4.79		4.56	4.54	
P2O5	g 100g ⁻¹	0.15	0.12	0.1385	0.128			0.13		0.13	0.16	
H2O+	g 100g ⁻¹											
CO2	g 100g ⁻¹											
LOI	g 100g ⁻¹		0.35	0.4675	0.36			0.41			9.53	
Ag	mg kg ⁻¹			0.29								
As	mg kg ⁻¹			7.8			0.84	1.28				9
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	1913	1796	1984		1851		1847.5	1940	2027	1887	
Be	mg kg ⁻¹			2.44					4.54	3.85		
Bi	mg kg ⁻¹			0.05					0.056			
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹				430							
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹			0.1								6
Ce	mg kg ⁻¹	164	161	167		169			168	169	174.5	
Cl	mg kg ⁻¹						104					36
Co	mg kg ⁻¹		4	5.7		4.538		9.4	4.48		7	
Cr	mg kg ⁻¹	28	20	17.9		17.39		26.47	17.5	19	2	
Cs	mg kg ⁻¹		2	1.12		1.688			1.48		4	
Cu	mg kg ⁻¹	21	7	17.3			64	16.2	16.3	14	14	
Dy	mg kg ⁻¹	1.9		2.29		2.21			2.21		2.028	
Er	mg kg ⁻¹	0.9		0.84					0.88		0.958	
Eu	mg kg ⁻¹	1.4		2.27		1.422			1.38		1.7	
F	mg kg ⁻¹											932
Ga	mg kg ⁻¹		22	28		18.7		22.1	24.5	22	24	
Gd	mg kg ⁻¹	4.1		4.55					4.32		6.346	
Ge	mg kg ⁻¹			2.6					1.14			
Hf	mg kg ⁻¹		9			8.71			8.89		9	
Hg	mg kg ⁻¹			0.009								
Ho	mg kg ⁻¹	0.3		0.41					0.36		0.33	
I	mg kg ⁻¹											
In	mg kg ⁻¹			0.022			0.081					
Ir	mg kg ⁻¹											
La	mg kg ⁻¹	93	102	96		91.25			91.8	92	94.5	
Li	mg kg ⁻¹	31		37					30.7	30		
Lu	mg kg ⁻¹			0.12		0.1193			0.11		0.086	
Mo	mg kg ⁻¹		2	2.5				1.29	2.15		5	
Nb	mg kg ⁻¹	13	11	15				10.09	13.3	13	15	
Nd	mg kg ⁻¹	56	43	60		49.99			54.1		57	
Ni	mg kg ⁻¹	11	5	6.9				5.8	7.11		8	
Pb	mg kg ⁻¹	29	35	30					31.7	31	31	
Pr	mg kg ⁻¹	15.5		18.2					16.7		16.369	
Rb	mg kg ⁻¹	159	167	161		172.3		223	167	164	164	
Re	mg kg ⁻¹											
S	mg kg ⁻¹				73							
Sb	mg kg ⁻¹			0.22			0.17					7
Sc	mg kg ⁻¹	2.8	8	3		3.285			3.57	3.5	4	
Se	mg kg ⁻¹											
Sm	mg kg ⁻¹	9.2	9	9.3		7.379			7.43		7.61	
Sn	mg kg ⁻¹			2.7					2.31		3	
Sr	mg kg ⁻¹	448	460	450		503		440.3	463	457	460	
Ta	mg kg ⁻¹					0.831			0.91			
Tb	mg kg ⁻¹	0.5		0.62		0.453			0.47		0.584	
Te	mg kg ⁻¹											
Th	mg kg ⁻¹	23	23	26.4		25.56		22.1	24.7		22	
Tl	mg kg ⁻¹			0.48					0.95			
Tm	mg kg ⁻¹	0.1		0.15					0.12		0.078	
U	mg kg ⁻¹	2	2.6	2.28		1.63		7.31	2.28		2	
V	mg kg ⁻¹	31	35	30.5		34.73		36.6	34.2		29	
W	mg kg ⁻¹		7	0.37								
Y	mg kg ⁻¹	9	10	13.3				37.49	10.2	10	13	
Yb	mg kg ⁻¹	0.6		0.823		0.733			0.74		0.64	
Zn	mg kg ⁻¹	86	82	93.8		89.7		85.4	87.6	86	87	
Zr	mg kg ⁻¹	315	312	343		341		312.2	371	316	294	

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J53	J54	J55	J55	J56	J57	J58	J59	J60	J61	J62
Data Quality		1	1	1	2	1	1	1	2	2	2	1
SiO2	g 100g ⁻¹			69.65		69.11	68.76	68.32	71.5528	69.39	68.47	68.79
TiO2	g 100g ⁻¹			0.49		0.467	0.48	0.48	0.47388	0.456	0.49	0.47
Al2O3	g 100g ⁻¹			15.92		16.09	15.9	15.79	16.7823	15.34	15.68	15.25
Fe2O3T	g 100g ⁻¹			3.08		2.74	2.86	2.88	2.93702	2.72	3.1	2.89
Fe(II)O	g 100g ⁻¹							2.06				
MnO	g 100g ⁻¹			0.04		0.03	0.03	0.04	0.04098	0.0367	0.05	0.035
MgO	g 100g ⁻¹			0.75		0.682	0.75	0.8	0.61143	0.658	0.73	0.75
CaO	g 100g ⁻¹			1.82		1.77	1.85	1.84	2.06377	1.91	1.88	1.801
Na2O	g 100g ⁻¹			4.01		3.91	3.95	3.96	4.26403	3.89	3.4	3.89
K2O	g 100g ⁻¹			4.53		4.56	4.56	4.53	4.55092	4.56	4.8	4.481
P2O5	g 100g ⁻¹			0.11		0.132	0.14	0.13	0.14344	0.136	0.13	0.124
H2O+	g 100g ⁻¹							0.39			0.26	
CO2	g 100g ⁻¹							0.17			0.2	
LOI	g 100g ⁻¹				0.27	0.4	0.4	0.42	0.32		0.42	0.31
Ag	mg kg ⁻¹	1.321						0.25				
As	mg kg ⁻¹	1.714						0.58				
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	2346	1993	1926.7			1840	1780	1890.25	2039	1970	2160
Be	mg kg ⁻¹	5.265	4.46				4.61	4.26	3.73981	3.5	4	4.75
Bi	mg kg ⁻¹	0.305	0.058				0.035	0.048	0.0382			
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹								600			
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹	0.204					0.041	0.086	0.0658	0.057		
Ce	mg kg ⁻¹	199.7	172	156.2			161	138.8	172.242	155.3	160	191.2
Cl	mg kg ⁻¹			24.8						57		
Co	mg kg ⁻¹	4.12	4.54	3.3			18.8	5.52	5.90497	4.75	4.2	4.22
Cr	mg kg ⁻¹	25.41	17.6	21.4			21.4	18.5	19.2932	16	17	19.2
Cs	mg kg ⁻¹	1.566	1.5	1.6			1.38	1.71	1.25345	1.38	1.5	1.8
Cu	mg kg ⁻¹	19.36	16	13.8			13.9	20.3	18.9299	16.1	19	15.13
Dy	mg kg ⁻¹	2.897	2.18				2.3	2.18	2.18645	1.95	2.1	2.1
Er	mg kg ⁻¹	1.322	0.88				0.9	1.03	0.88476	0.757	0.82	0.83
Eu	mg kg ⁻¹	2.025	1.35				1.4	2.45	1.59349	1.24	1.38	1.32
F	mg kg ⁻¹							1200		1254		
Ga	mg kg ⁻¹	43.48	24.2	21			33	22.7	26.9165	23.4	23	23.26
Gd	mg kg ⁻¹	6.615	4.11				4.39	7.56	5.92867	4.39	4.8	3.78
Ge	mg kg ⁻¹		1.16					1.73				
Hf	mg kg ⁻¹	12.73	8.86	7			1.81	10.6			8.2	2.06
Hg	mg kg ⁻¹							0.01	0.01047			
Ho	mg kg ⁻¹	0.466	0.37				0.38	0.38	0.35011	0.313	0.36	0.35
I	mg kg ⁻¹											
In	mg kg ⁻¹	0.109						0.029				
Ir	mg kg ⁻¹											
La	mg kg ⁻¹	103.9	93	95.8			89.6	83.4	94.3964	82.8	85	100
Li	mg kg ⁻¹		31.2				31.7	30.6	33.6566	30.9	32	34.8
Lu	mg kg ⁻¹	0.127	0.11				0.11	0.12	0.11765	0.078	0.12	0.08
Mo	mg kg ⁻¹	3.489	2.23	2			1.64	1.81	2.18666	2.15		
Nb	mg kg ⁻¹	11.44	13.2	11.3			12.3	12.5	11.9511	12.7	14.2	14.3
Nd	mg kg ⁻¹	69.96	54.2	49.3			55.1	51.8	57.7374	50.9	55	55.9
Ni	mg kg ⁻¹	27.47	7.29	5.6			4.22	8.65	8.96758	6.96		8.2
Pb	mg kg ⁻¹	18.39	31.9	30.4			28.3	29.3	29.028	30.87	30	28.9
Pr	mg kg ⁻¹	20.78	16.6				18.1	15.3	18.3097	15.67	16.5	17.45
Rb	mg kg ⁻¹	161.5	169	162.5			166	136.2	172.939	174.3	160	167
Re	mg kg ⁻¹											
S	mg kg ⁻¹							85	100	176		
Sb	mg kg ⁻¹	4.268		2.8				0.16	0.21919	0.183		
Sc	mg kg ⁻¹	55.9	3.5	3.9			3.11	3.67	3.22475	3.18		3.06
Se	mg kg ⁻¹	43.44		0.1				0.076				
Sm	mg kg ⁻¹	9.417	7.34	4.7			7.2	6.99	7.65984	6.84	7.5	7.5
Sn	mg kg ⁻¹	6.517	2.44	5.8				2.25		2.28	2.9	
Sr	mg kg ⁻¹	480.7	468	446.6			443	349.3	527.294	467	440	552
Ta	mg kg ⁻¹	0.028	0.92	1.1			1.31	1	3.37981			0.98
Tb	mg kg ⁻¹	0.653	0.47				0.47	0.64	0.60635	0.419	0.48	0.44
Te	mg kg ⁻¹	0.07						0.015	24.255			
Th	mg kg ⁻¹	40.45	24.9	23.7			25.6	23.4	20.4393	24.3	25	23.8
Tl	mg kg ⁻¹	0.215	0.92				0.89	0.88	0.69947	0.874	0.85	
Tm	mg kg ⁻¹	0.15	0.13				0.12	0.12	0.12804	0.094	0.12	
U	mg kg ⁻¹	3.305	2.36	1.7			1.5	1.7	1.61521		2.3	1.84
V	mg kg ⁻¹	34.78	34.9	37.5			36.6	32.8	44.4287	35.6	34	37.5
W	mg kg ⁻¹	1.07		1.2			0.27	0.26	0.63095		0.45	
Y	mg kg ⁻¹	9.404	10.1	7.6			10.6	8.93	8.96229	9.4	8.6	10.4
Yb	mg kg ⁻¹	0.989	0.76				0.8	0.76	0.78738	0.584	0.77	0.63
Zn	mg kg ⁻¹	90.78	88.5	78			88.1	96	146.469	90.3	85	
Zr	mg kg ⁻¹	373.2	369	314			265	396.3	330.595	330	320	88.4

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J62	J63	J64	J65	J66	J67	J68	J69	J70	J71	J72
Data Quality		2	1	1	2	1	1	2	1	1	2	2
SiO2	g 100g ⁻¹			68.67	68.19	68.79	67.972	68.598		69.6183	69.1	67.58
TiO2	g 100g ⁻¹			0.51	0.48	0.4	0.482	0.462	0.48	0.48255	0.48	0.472
Al2O3	g 100g ⁻¹			15.91	15.88	16.39	15.875	15.69	14.26	15.4839	16.12	15.73
Fe2O3T	g 100g ⁻¹			2.84	2.85	2.56	2.835	2.909	2.59	2.5435	2.98	2.883
Fe(II)O	g 100g ⁻¹						1.84			0.5		
MnO	g 100g ⁻¹			0.032	0.04	0.03	0.041	0.04	0.03	0.03055	0.04	0.045
MgO	g 100g ⁻¹			0.77	0.74	0.81	0.787	0.734	0.54	1.01	0.79	0.761
CaO	g 100g ⁻¹			1.81	1.79	1.91	1.819	1.83	1.72	1.8284	1.92	1.788
Na2O	g 100g ⁻¹			4.01	4.03	3.77	3.985	4.005	4.46	3.745	4.03	3.827
K2O	g 100g ⁻¹			4.69	4.54	4.59	4.573	4.569	4.99	4.3296	4.51	4.549
P2O5	g 100g ⁻¹			0.13	0.136	0.15	0.133	0.133	0.12	0.17	0.14	0.132
H2O+	g 100g ⁻¹											
CO2	g 100g ⁻¹											
LOI	g 100g ⁻¹			0.35	0.41	0.3		0.38	0.41	0.37	0.36	0.34
Ag	mg kg ⁻¹				0.35		0.09			0.47998		
As	mg kg ⁻¹						0.85	1	0.57	0.78404		
B	mg kg ⁻¹											
Ba	mg kg ⁻¹		2199.71		2040	2027	2002.29	1745	2161.75	2061.79	1956	
Be	mg kg ⁻¹				3.86		4.06		4.19	3.31185	4.23	
Bi	mg kg ⁻¹				0.06		0.07			0.04341		
Br	mg kg ⁻¹											
C(tot)	mg kg ⁻¹			542								820
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹						0.037			0.05135		
Ce	mg kg ⁻¹	164.314			170.5	199	171.28	183	164.98	113.117	172.8	
Cl	mg kg ⁻¹						45					
Co	mg kg ⁻¹				4.5	6	4.48		4.59	4.71359	5.1	
Cr	mg kg ⁻¹				15	20	21	15	18.57	18.6835	18.3	
Cs	mg kg ⁻¹	1.512		1.49			1.56		1.21	1.30007	1.75	
Cu	mg kg ⁻¹					23	21.48	8	16.54	19.2118	14.9	
Dy	mg kg ⁻¹	1.946		2.2	2.3	2.3	1.71		3.42	1.40829	2.17	
Er	mg kg ⁻¹	0.727		0.89	0.99	0.99	0.79		1.12	0.57472	1.02	
Eu	mg kg ⁻¹	1.313		1.34	1.87	1.87	1.18		1.92	0.84853	1.53	
F	mg kg ⁻¹						895					
Ga	mg kg ⁻¹				25		23.95	24	20.93	25.2356	23.1	
Gd	mg kg ⁻¹	3.675		3.85	5.13	5.13	3.44		7.19	2.10307	6.1	
Ge	mg kg ⁻¹			0.21			1.12		0.8	1.14105		
Hf	mg kg ⁻¹	8.701		8.4			8.7		1.58	2.85366	9.1	
Hg	mg kg ⁻¹											
Ho	mg kg ⁻¹	0.315		0.35	0.91	0.91	0.28		0.31	0.21859	0.4	
I	mg kg ⁻¹											
In	mg kg ⁻¹											
Ir	mg kg ⁻¹											
La	mg kg ⁻¹	89.572		85.8	110	110	85.76	117	89.07	50.4481	95.1	
Li	mg kg ⁻¹	30.734							25.99	30.2177		
Lu	mg kg ⁻¹	0.069		0.11	0.1	0.1	0.07		0.08	0.05534	0.11	
Mo	mg kg ⁻¹	2.372		2.03			2.122			2.33106	2.5	
Nb	mg kg ⁻¹	18.471		13.7			13.36	11	15.73	12.1032	13.9	
Nd	mg kg ⁻¹	53.604		52.5	62.07	62.07	51.79		52.8	28.7269	56.7	
Ni	mg kg ⁻¹			7.4	8	8	5	4	7.14	6.55672	6.3	
Pb	mg kg ⁻¹	31.97		32.8	34.8	34.8	30.23	34	31.57	32.0122	34.5	
Pr	mg kg ⁻¹	16.803		16.55	19.49	19.49	15.41		16.55	8.84137	17.8	
Rb	mg kg ⁻¹			175	158	158	174.2	176	180.76	165.044	171.8	
Re	mg kg ⁻¹											
S	mg kg ⁻¹						774					
Sb	mg kg ⁻¹			0.21			1.29		0.13	0.14595		
Sc	mg kg ⁻¹			3			5	4	3.15	2.1805	3.3	
Se	mg kg ⁻¹									0.20303		
Sm	mg kg ⁻¹	6.975		7.49	8.46	8.46	6.41		6.71	4.14748	7.7	
Sn	mg kg ⁻¹						3.06		1.91	2.1811		
Sr	mg kg ⁻¹	447.31		486	544	544	491.34	484	470.64	356.874	465.2	
Ta	mg kg ⁻¹	0.974		0.9			0.84		1	0.9923	0.98	
Tb	mg kg ⁻¹	0.423		0.46	0.51	0.51	0.38		0.73	0.26125		
Te	mg kg ⁻¹									0.01165		
Th	mg kg ⁻¹	26.244		23			15.15	25	24.39	14.0984	25.7	
Tl	mg kg ⁻¹	0.913		0.7						0.87329	0.8	
Tm	mg kg ⁻¹	0.086		0.11	0.12	0.12			0.09	0.07625	0.13	
U	mg kg ⁻¹	2.125		2			2.09	2	1.94	1.92188	2.3	
V	mg kg ⁻¹				43	43	32.56	34	33.24	36.5906	35.9	
W	mg kg ⁻¹						0.47			0.28266	0.49	
Y	mg kg ⁻¹		7.951	9.4	10.97	10.97	11	9	7.52	5.97619	10.5	
Yb	mg kg ⁻¹		0.679	0.72	0.8	0.8	0.6		0.55	0.44798	0.78	
Zn	mg kg ⁻¹	91		96	84	84	86	86	76.85	145.276	106.9	
Zr	mg kg ⁻¹	402.926		338	327	327	358.74	284	70.39	108.577	364.5	460

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)										
Lab. Code		J73	J74	J75	J76	J77	J77	J78	J79	J80	J81	J82
Data Quality		2	1	1	2	1	2	2	2	2	2	2
SiO2	g 100g ⁻¹	68.53	68.492	68.381	68.66			65.01	67.96	66.19	68.4	68.73
TiO2	g 100g ⁻¹	0.477	0.4774	0.46	0.47				0.479	0.44	0.472	0.49
Al2O3	g 100g ⁻¹	15.84	16.112	16.153	15.89			5.28	16.17	16.7	15.69	16.14
Fe2O3T	g 100g ⁻¹	2.896	2.821	2.915	2.86			3.5	2.85	2.71	2.85	2.82
Fe(II)O	g 100g ⁻¹					2.21						1.66
MnO	g 100g ⁻¹	0.037	0.0349	0.038	0.035					0.03		0.0417
MgO	g 100g ⁻¹	0.724	0.782	0.75	0.73			0.69	0.738	0.83	0.719	0.688
CaO	g 100g ⁻¹	1.802	1.849	1.889	1.8			8.01	1.79	2.06	1.77	1.8
Na2O	g 100g ⁻¹	4.013	4.077	3.895	4.05			1.71	3.87	4.08	3.81	3.83
K2O	g 100g ⁻¹	4.664	4.585	4.664	4.63			4.1	4.59	5.28	4.37	4.54
P2O5	g 100g ⁻¹	0.134	0.1425	0.138	0.13			0.09	0.14	0.23		0.13
H2O+	g 100g ⁻¹							0.1				0.14
CO2	g 100g ⁻¹											
LOI	g 100g ⁻¹	0.32	0.325		0.3	0.39		0.32	0.29	0.97	0.36	0.31
Ag	mg kg ⁻¹											
As	mg kg ⁻¹			0.577								
B	mg kg ⁻¹											
Ba	mg kg ⁻¹	1821	1869	1966.67	1970	1824			2050			1804
Be	mg kg ⁻¹		4.76	3.597								
Bi	mg kg ⁻¹		0.101									
Br	mg kg ⁻¹			0.327								
C(tot)	mg kg ⁻¹					407						
C(org)	mg kg ⁻¹											
Cd	mg kg ⁻¹											
Ce	mg kg ⁻¹		166	164.667		170						159
Cl	mg kg ⁻¹											
Co	mg kg ⁻¹	5	4.42	4.467								
Cr	mg kg ⁻¹	28	19.33	18.267			13					18
Cs	mg kg ⁻¹		1.52	1.437		1.54						
Cu	mg kg ⁻¹	11	17.02	18.5			11					13
Dy	mg kg ⁻¹		1.999	1.963		2.13						2.16
Er	mg kg ⁻¹		0.884	0.95		0.81						0.88
Eu	mg kg ⁻¹		1.501	1.38		1.35						1.59
F	mg kg ⁻¹	1234					1109					
Ga	mg kg ⁻¹	23	22.44	24.1		21						22
Gd	mg kg ⁻¹		5.291	4.88		4.4						3.9
Ge	mg kg ⁻¹											
Hf	mg kg ⁻¹		7.722	8.687		7.47						5
Hg	mg kg ⁻¹			0.01								
Ho	mg kg ⁻¹		0.336	0.46		0.33						0.35
I	mg kg ⁻¹											
In	mg kg ⁻¹											
Ir	mg kg ⁻¹											
La	mg kg ⁻¹		92.112	90.8		75.3						94
Li	mg kg ⁻¹	28	32.283	33.567								29.9
Lu	mg kg ⁻¹		0.083	0.108		0.09						0.1
Mo	mg kg ⁻¹		1.819									
Nb	mg kg ⁻¹		11.965	12.867		14.5						11
Nd	mg kg ⁻¹		53.966	55.3		52.2						52
Ni	mg kg ⁻¹	7	7.33	6.333			6					
Pb	mg kg ⁻¹	42	32.14	30.7		29.5				25.79		28
Pr	mg kg ⁻¹		16.256	15.933		16.7						16.3
Rb	mg kg ⁻¹		167	165		154						160
Re	mg kg ⁻¹											
S	mg kg ⁻¹											
Sb	mg kg ⁻¹		0.163	0.209								
Sc	mg kg ⁻¹		4.47	3.233		3.07						
Se	mg kg ⁻¹			0.087								
Sm	mg kg ⁻¹		7.061	7.933		6.96						7.1
Sn	mg kg ⁻¹		2.17									
Sr	mg kg ⁻¹	434	463.1	463.333	410	473						456
Ta	mg kg ⁻¹		0.861	0.973								0.8
Tb	mg kg ⁻¹		0.518	0.451		0.44						0.46
Te	mg kg ⁻¹											
Th	mg kg ⁻¹		24.16	25.033		23.4						23
Tl	mg kg ⁻¹			0.81								
Tm	mg kg ⁻¹		0.109	0.11		0.11						0.13
U	mg kg ⁻¹		1.436	2.147		1.59						2.3
V	mg kg ⁻¹		33.49	36.6		33						31
W	mg kg ⁻¹		0.1	0.577								
Y	mg kg ⁻¹	8	11.803	9.51		8.93						10
Yb	mg kg ⁻¹		0.573	0.794		0.65						0.77
Zn	mg kg ⁻¹	84	91.06	103.967		87						83
Zr	mg kg ⁻¹	343	312.1	351		315						326

Table 1		GeoPT34 Contributed data for granite, GRI-1 (December 2013)									
Lab. Code		J83	J84	J85	J86	J87	J88	J89	J90	J91	J92
Data Quality		1	1	2	2	2	1	2	2	2	1
SiO2	g 100g ⁻¹	68.889	71.79	68.29	69	69.0488	68.08	68.66	67.8	68.242	68.8971
TiO2	g 100g ⁻¹	0.4573	0.452	0.481	0.52	0.46073	0.477	0.49	0.47	0.477	0.46572
Al2O3	g 100g ⁻¹	15.752	13.7	16.02	15.87	16.1855	15.97	16.09	15.9	15.971	16.1061
Fe2O3T	g 100g ⁻¹	2.86	2.814	2.908	2.81	2.8545	2.89	2.92	2.82	2.933	2.85084
Fe(II)O	g 100g ⁻¹			2.15				2.08			
MnO	g 100g ⁻¹	0.037	0.033	0.025	0.033	0.03606	0.034	0.04	0.034	0.04	0.03388
MgO	g 100g ⁻¹	0.6916	0.775	0.783	0.71	0.75118	0.75	0.76	0.73	0.763	0.78694
CaO	g 100g ⁻¹	1.772	1.96	1.836	1.83	1.82187	1.83	1.84	1.79	1.81	1.82056
Na2O	g 100g ⁻¹	3.918	3.49	3.993	3.89	4.02634	4.03	4.16	3.97	4.067	3.93187
K2O	g 100g ⁻¹	4.225	4.42	4.627	4.52	4.64732	4.64	4.58	4.47	4.592	4.5805
P2O5	g 100g ⁻¹	0.1373	0.195	0.135	0.14	0.13621	0.135	0.14	0.129	0.134	0.13147
H2O+	g 100g ⁻¹			0.23		0.188		0.15			
CO2	g 100g ⁻¹			0.075							
LOI	g 100g ⁻¹			0.462	0.36	0.30047	0.26	0.32	0.295	0.35	0.39
Ag	mg kg ⁻¹			0.32				177			
As	mg kg ⁻¹			1.17				0.99			
B	mg kg ⁻¹										
Ba	mg kg ⁻¹	1817	1850	2024	1843	1959.09	1868	2010	1842	1871	1851
Be	mg kg ⁻¹			2.92		3.84606		4.7			
Bi	mg kg ⁻¹				0.04						
Br	mg kg ⁻¹										
C(tot)	mg kg ⁻¹	927.3		470		7263.38					
C(org)	mg kg ⁻¹										
Cd	mg kg ⁻¹					0.11418		0.091			
Ce	mg kg ⁻¹		270	164.7	159.4	165.23	162	165	132		166
Cl	mg kg ⁻¹		160			119.988					
Co	mg kg ⁻¹			4.89	5	4.51712	4.1	4.75			6.2
Cr	mg kg ⁻¹		40		18	19.03	16.5	16		21	20.2
Cs	mg kg ⁻¹			1.72	1.6	1.54043		1.66			
Cu	mg kg ⁻¹		50	14.7	13	14.623	1.8	19.7	9.57		12
Dy	mg kg ⁻¹			2.08	2.4	2.19245		2.24			
Er	mg kg ⁻¹			0.891	1.4	0.90242		0.94			
Eu	mg kg ⁻¹			1.33		1.398		1.52			
F	mg kg ⁻¹					926.759					
Ga	mg kg ⁻¹		15	25.4	23.6	23.8075	21	26.1	22.2		23.9
Gd	mg kg ⁻¹			3.87		3.81601		4.73			
Ge	mg kg ⁻¹			1.04		1.02337					
Hf	mg kg ⁻¹			8.61	5.8	5.91933	6.6	7.54	9.1		
Hg	mg kg ⁻¹			0.0097				0.023			
Ho	mg kg ⁻¹			0.35	0.4	0.35286		0.36			
I	mg kg ⁻¹										
In	mg kg ⁻¹				0.033	0.03035					
Ir	mg kg ⁻¹										
La	mg kg ⁻¹			92.9	95	90.2622	106	92.51	101		88.2
Li	mg kg ⁻¹			31.5		30.5481		34.6			
Lu	mg kg ⁻¹			0.1	0.12	0.09805		0.12			
Mo	mg kg ⁻¹			2.1	2.4	2.96467	2.3	1.83			1.9
Nb	mg kg ⁻¹		15	12.9	11.9	12.7	12.6	13.4	13.9		12.6
Nd	mg kg ⁻¹			53.4	54.9	55.7679	46.6	54.8	49.7		59.4
Ni	mg kg ⁻¹			8	5.1	7.21136	5.6	8.66			5.8
Pb	mg kg ⁻¹		20	28.2	30.4	30.2477	31.5	26.4	29		32.2
Pr	mg kg ⁻¹			16.9	18	17.1831		17.5			
Rb	mg kg ⁻¹		160	176.5	163.4	170.529	172	199	169		168
Re	mg kg ⁻¹										
S	mg kg ⁻¹		10	165		39.2619				80	
Sb	mg kg ⁻¹			0.3		0.17027		0.26			
Sc	mg kg ⁻¹					3.40537	3.2	4.42			3.3
Se	mg kg ⁻¹										
Sm	mg kg ⁻¹			7.12	7	7.40967		8.59			
Sn	mg kg ⁻¹			2.3		2.70426		1.95			1.6
Sr	mg kg ⁻¹	462.1	490	464.4	487	461.627	469	473	449	464	472
Ta	mg kg ⁻¹			0.83		0.90643		1.1			
Tb	mg kg ⁻¹			0.47		0.43899		0.56			
Te	mg kg ⁻¹										
Th	mg kg ⁻¹			24.4	23	24.6148	28.3	23	24.7		23.7
Tl	mg kg ⁻¹			0.8	0.91	0.81228		0.87			
Tm	mg kg ⁻¹			0.13	0.11	0.11598		0.18			
U	mg kg ⁻¹			2.28	1.5	2.0332	3.6	2.04			0.7
V	mg kg ⁻¹			36.4	35.3	33.9535	33	39	30.4	81	36.2
W	mg kg ⁻¹				7.6	0.26041		0.25			
Y	mg kg ⁻¹		10	9.89	10.2	9.79543	9.5	9.4	9.29		10.2
Yb	mg kg ⁻¹			0.77	0.78	0.70411	1.2	0.74			
Zn	mg kg ⁻¹		105	85.9	84	82.1294	84.7	85.3	80.9	94	86.5
Zr	mg kg ⁻¹	339.1	380	329.7	363	254.401	328	308	321	334	319

Table 2 GeoPT34 Assigned values and statistical summary of contributed data for the granite, GRI-1.

	Uncertainty		Horwitz Target value	Uncertainty /Target	Number of reported results	Median of results	Robust mean of results	Status of consensus value	Type of consensus value
	Assigned value	of assigned value							
	X_a g 100g ⁻¹	s_{dm} g 100g ⁻¹	H_a g 100g ⁻¹	s_{dm}/H_a	n	g 100g ⁻¹	g 100g ⁻¹		
SiO2	68.66	0.046	0.7266	0.0633	81	68.66	68.581	Assigned	Median
TiO2	0.476	0.0017	0.0106	0.1617	84	0.4782	0.476	Assigned	Robust Mean
Al2O3	15.92	0.0307	0.2099	0.1464	84	15.92	15.887	Assigned	Median
Fe2O3T	2.866	0.008	0.0489	0.163	84	2.86	2.866	Assigned	Robust Mean
MnO	0.0363	0.0006	0.0012	0.4694	81	0.037	0.036	Assigned	Robust Mean
MgO	0.75	0.0038	0.0157	0.2456	82	0.75	0.753	Assigned	Median
CaO	1.830	0.0062	0.0334	0.1847	84	1.8292	1.830	Assigned	Robust Mean
Na2O	3.968	0.0179	0.0645	0.2781	82	3.9825	3.968	Assigned	Robust Mean
K2O	4.57	0.0081	0.0727	0.1112	84	4.57	4.562	Assigned	Median
P2O5	0.136	0.001	0.0037	0.2653	82	0.1345	0.136	Assigned	Robust Mean
	mg kg⁻¹	mg kg⁻¹	mg kg⁻¹			mg kg⁻¹	mg kg⁻¹		
Ba	1942	13.7	49.69	0.28	76	1933.35	1941.6	Assigned	Robust Mean
Be	3.846	0.1383	0.2511	0.5508	33	3.85	3.846	Assigned	Robust Mean
Bi	0.057	0.0044	0.007	0.6281	20	0.057	0.0602	Provisional	Median
Ce	167.0	1.291	6.181	0.209	64	167.5	166.95	Assigned	Robust Mean
Co	4.59	0.0805	0.2919	0.2758	57	4.59	4.809	Assigned	Median
Cr	19.03	0.429	0.977	0.439	67	19.03	19.851	Assigned	Median
Cs	1.58	0.029	0.118	0.246	44	1.564	1.58	Assigned	Robust Mean
Cu	15.36	0.4755	0.8142	0.584	68	15.065	15.356	Provisional	Robust Mean
Dy	2.165	0.0258	0.1541	0.1672	45	2.18	2.165	Assigned	Robust Mean
Er	0.9	0.0178	0.0731	0.243	44	0.9	0.915	Assigned	Median
Eu	1.4	0.0185	0.1064	0.1742	43	1.4	1.448	Assigned	Median
Ga	23.55	0.2782	1.1708	0.2376	62	23.5	23.549	Assigned	Robust Mean
Gd	4.66	0.1427	0.2957	0.4825	43	4.66	4.808	Provisional	Median
Ge	1.12	0.1088	0.0881	1.2359	19	1.12	1.142	Provisional	Median
Hf	8.4	0.1514	0.4877	0.3104	47	8.4	7.775	Provisional	Median
Ho	0.358	0.007	0.0334	0.2101	43	0.36	0.3576	Assigned	Robust Mean
La	92.89	0.8486	3.7564	0.2259	63	92.51	92.887	Assigned	Robust Mean
Li	31.1	0.3123	1.4829	0.2106	32	31.1	31.615	Assigned	Median
Lu	0.108	0.0028	0.0121	0.2301	41	0.108	0.1029	Assigned	Median
Mo	2.203	0.0773	0.1564	0.494	42	2.2028	2.308	Assigned	Median
Nb	12.65	0.1916	0.6906	0.2775	66	12.65	12.813	Assigned	Median
Nd	54.65	0.5223	2.3937	0.2182	57	54.9	54.648	Assigned	Robust Mean
Ni	7.073	0.2619	0.4214	0.6215	60	6.98	7.073	Provisional	Robust Mean
Pb	30.95	0.3396	1.4767	0.23	69	30.87	30.947	Assigned	Robust Mean
Pr	17.02	0.1936	0.8886	0.2178	45	16.86	17.019	Assigned	Robust Mean
Rb	167.6	0.968	6.201	0.156	69	167	167.57	Assigned	Robust Mean
Sc	3.293	0.063	0.22	0.284	48	3.293	3.391	Assigned	Median
Sm	7.405	0.0817	0.4382	0.1865	50	7.4048	7.450	Assigned	Median
Sn	2.517	0.0896	0.1752	0.5111	33	2.517	2.675	Assigned	Median
Sr	465.8	3.245	14.777	0.22	75	465	465.76	Assigned	Robust Mean
Ta	0.961	0.02	0.0773	0.2584	33	0.973	0.9612	Assigned	Robust Mean
Tb	0.483	0.01	0.0431	0.231	41	0.483	0.5056	Assigned	Median
Th	24.44	0.2527	1.2084	0.2091	64	24.395	24.442	Assigned	Robust Mean
Tl	0.812	0.026	0.067	0.3882	31	0.8123	0.7988	Assigned	Median
Tm	0.117	0.0036	0.0129	0.276	39	0.12	0.1169	Assigned	Robust Mean
U	2.143	0.061	0.1528	0.3991	55	2.147	2.143	Assigned	Robust Mean
V	35.74	0.5208	1.6688	0.3121	70	34.95	35.740	Assigned	Robust Mean
Y	9.786	0.1738	0.5553	0.313	71	9.8	9.786	Assigned	Robust Mean
Yb	0.754	0.0102	0.0629	0.1616	45	0.754	0.7272	Assigned	Median
Zn	87	0.6894	3.5532	0.194	74	87	88.613	Assigned	Median
Zr	330.5	4.322	11.041	0.391	74	329.85	330.49	Assigned	Robust Mean

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J01	J02	J03	J04	J05	J06	J06	J07	J08	J09	J10	J11	J12	J13	J14	J15	J16	J17
Quality	2	2	2	2	2	1	2	1	2	1	1	1	1	2	1	2	2	2
SiO2	0.03	0.04	-0.33	0.17	0.13	-0.76	*	-0.54	0.11	*	1.58	*	0.19	-0.07	-0.89	*	0.31	-1.13
TiO2	0.20	-1.21	-0.51	-0.27	0.67	0.40	*	1.34	0.20	*	2.28	5.10	1.34	0.20	0.40	-15.83	0.67	-0.27
Al2O3	0.12	0.67	0.34	0.31	0.10	0.00	*	0.05	0.02	*	1.48	*	1.33	0.05	-0.86	-35.15	-0.74	-0.50
Fe2O3T	0.04	-0.16	-0.29	-0.06	0.45	0.49	*	-0.32	0.15	*	5.40	*	-0.12	-0.16	1.93	-7.77	0.86	-0.47
MnO	1.94	-1.19	-0.56	1.53	0.27	3.05	*	-5.30	1.53	*	8.07	*	3.05	1.53	0.55	-4.32	-3.49	-0.98
MgO	0.00	-0.32	-1.69	0.32	0.64	0.00	*	6.38	0.00	*	3.19	*	0.00	-0.64	1.28	-0.73	1.60	-0.96
CaO	0.29	-0.01	-0.21	-0.45	0.29	-2.40	*	2.68	-0.01	*	1.49	*	-0.01	0.29	1.79	-20.85	1.04	-0.30
Na2O	0.17	0.33	1.13	0.40	0.40	0.19	*	-0.90	0.64	*	3.60	*	4.38	0.87	1.27	-30.30	1.10	-0.22
K2O	0.00	0.21	0.55	0.00	0.28	0.14	*	0.14	0.14	*	-1.79	*	0.00	0.62	-0.55	-26.78	0.34	-0.28
P2O5	-0.48	0.62	-1.16	-0.75	0.21	-1.50	*	1.24	-0.20	*	9.43	1.51	-1.50	-0.75	3.97	2.94	-1.84	-0.75
Ba	0.11	0.20	-0.54	*	*	2.70	*	0.61	-0.64	3.27	5.62	-1.80	0.79	0.39	-0.33	-16.92	-1.17	-1.32
Be	*	*	*	*	*	-5.04	*	*	-0.69	*	*	*	-4.96	*	3.52	-7.12	*	*
Bi	*	*	*	*	*	*	*	*	*	*	1.85	-3.69	10.40	*	*	0.21	17.32	*
Ce	-0.97	*	-0.92	*	*	*	-0.24	*	0.42	1.24	1.98	0.38	-0.64	*	-0.64	-12.32	-3.35	-4.45
Co	-2.72	*	-1.52	*	*	-3.43	*	*	0.02	-0.89	13.81	-1.07	-0.99	*	-0.10	-0.46	6.87	*
Cr	-1.55	-5.13	2.65	*	*	*	-3.55	*	-1.04	-0.16	3.04	-3.43	-7.20	-1.04	1.81	4.69	29.11	-1.65
Cs	*	*	8.57	*	*	*	*	*	0.21	-0.01	1.61	0.83	-1.27	*	0.34	*	19.16	*
Cu	-0.83	-7.59	-0.96	*	*	-5.84	*	*	-0.22	0.96	*	-2.63	2.88	0.40	1.65	2.44	-1.08	-2.06
Dy	*	*	*	*	*	0.55	*	*	-0.21	-0.41	-0.09	-1.20	16.26	*	-0.16	-3.97	*	*
Er	*	*	*	*	*	1.64	*	*	0.68	-1.31	0.00	1.08	21.74	*	-1.09	-3.08	*	*
Eu	*	*	*	*	*	0.19	*	*	0.00	-1.66	3.01	-0.20	11.65	*	-0.75	-3.01	*	*
Ga	-0.23	1.47	-0.87	*	*	*	0.49	*	0.53	1.68	*	*	-2.60	-0.23	0.73	*	-0.41	-1.90
Gd	*	*	*	*	*	0.10	*	*	-0.78	1.32	1.96	2.14	9.44	*	-2.16	1.20	*	*
Ge	13.51	*	*	*	*	*	*	*	-2.38	*	*	*	-10.45	*	-0.23	-5.51	*	*
Hf	-0.72	*	-1.13	*	*	*	1.85	*	0.31	0.00	-0.72	-14.92	-16.03	*	-0.47	*	-0.51	*
Ho	*	*	*	*	*	0.07	*	*	-0.86	-0.38	0.97	-1.43	14.15	*	-1.04	-3.56	*	*
La	-0.52	-1.98	-0.42	*	*	-1.01	*	*	0.15	-0.91	2.29	0.95	1.71	*	-1.25	-11.42	0.13	1.80
Li	*	*	*	*	*	-3.44	*	*	-0.37	*	*	*	3.30	*	-0.07	-1.15	*	*
Lu	*	*	*	*	*	0.17	*	*	0.91	-1.33	0.17	-0.41	20.04	*	-0.66	-3.23	*	*
Mo	5.74	*	-1.29	*	*	*	-1.61	*	-0.65	*	3.11	30.64	1.64	*	5.16	1.91	-2.25	*
Nb	-1.92	48.76	-0.62	*	*	*	-0.40	-0.94	-0.47	1.62	-0.94	-0.70	6.01	*	-1.95	-8.73	-0.76	2.35
Nd	-0.97	*	-0.49	*	*	-0.35	*	*	0.64	-0.42	1.76	0.49	0.73	*	-0.90	0.80	-5.06	-4.56
Ni	-1.27	-4.83	-1.27	*	*	-3.12	*	*	-4.83	2.77	*	-1.60	6.95	2.29	2.20	-0.22	-3.17	*
Pb	-1.34	4.76	0.15	*	*	*	-0.12	-2.00	1.03	0.77	0.06	0.61	-3.76	*	1.32	-7.02	-1.34	-0.42
Pr	-1.70	*	*	*	*	-0.36	*	*	0.09	-0.38	1.10	0.46	2.23	*	-0.81	1.63	*	*
Rb	-0.13	0.12	-0.33	*	*	*	-0.53	0.88	0.69	1.16	-0.01	0.68	-3.64	*	-0.74	-11.48	-0.64	-0.60
Sc	*	*	4.11	*	*	*	-0.66	*	-0.66	15.66	*	-2.55	-3.60	*	0.17	-2.10	-1.35	*
Sm	-0.46	*	-1.26	*	*	0.42	*	*	0.34	-0.40	1.36	-0.45	4.55	*	-0.86	-2.21	-0.01	*
Sn	12.79	*	-2.33	*	*	*	*	*	-0.62	*	19.88	0.25	-0.67	*	-1.01	-6.38	12.79	*
Sr	-0.33	6.37	-0.24	*	*	*	-0.74	-0.05	0.31	0.94	1.71	0.18	0.83	-1.72	0.29	-15.04	-0.60	-0.64
Ta	*	*	*	*	*	*	*	*	0.44	-0.82	0.11	-1.67	28.30	*	-0.27	*	2.84	*
Tb	*	*	*	*	*	-0.30	*	*	0.78	2.62	0.39	1.95	12.46	*	-0.30	-1.89	*	*
Th	-1.84	*	-0.22	*	*	*	0.89	*	-0.43	0.11	1.79	-0.75	-5.33	*	0.38	2.84	-0.51	-0.18
Tl	-1.58	*	5.88	*	*	-0.63	*	*	0.73	*	*	*	-1.38	*	*	-3.45	*	*
Tm	*	*	*	*	*	0.24	*	*	1.67	-0.65	1.78	-2.94	18.04	*	-0.54	-3.36	*	*
U	-1.78	*	0.19	*	*	0.96	*	*	1.17	-1.28	2.01	-3.12	-3.29	*	-0.68	0.09	6.07	*
V	2.47	1.58	-1.66	*	*	*	-0.28	0.16	-1.12	17.62	0.75	-0.62	0.75	-0.82	-1.76	-7.38	-2.05	-1.09
Y	-7.01	26.30	-1.34	*	*	-0.41	*	-1.42	0.01	1.23	1.20	-3.95	5.43	*	-1.27	-6.47	-1.16	-0.44
Yb	*	*	*	*	*	0.10	*	*	-0.43	0.00	0.41	-1.30	24.57	*	-0.92	-4.48	*	*
Zn	0.14	3.24	-0.32	*	*	*	0.00	-0.56	-0.56	-4.16	3.38	0.35	-0.28	0.99	1.60	-0.09	-0.97	-0.28
Zr	-0.02	2.56	-0.49	*	*	*	-1.15	-1.31	1.25	3.54	-0.10	-26.31	-28.08	*	1.13	-14.86	-0.30	0.80

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J18	J19	J20	J21	J22	J23	J24	J25	J26	J27	J28	J29	J30	J31	J32	J33	J34	J35
Quality	1	1	2	2	1	2	1	1	2	1	1	1	2	1	2	2	2	2
SiO2	-0.01	-0.36	0.00	-3.00	0.04	*	0.21	-0.64	-0.73	-6.00	0.07	-0.08	0.30	0.15	0.03	0.76	-0.08	-0.03
TiO2	0.12	-1.00	0.01	-2.85	-0.54	*	0.90	-3.22	7.25	-6.18	-0.26	-4.30	0.15	0.40	0.01	1.66	0.48	1.02
Al2O3	0.67	4.67	0.00	5.67	0.33	*	1.02	-1.86	-3.14	-12.00	0.91	-2.00	-0.07	-0.38	0.10	1.79	1.11	0.69
Fe2O3T	-0.02	-5.43	0.35	0.35	0.29	*	1.18	-0.52	19.67	-5.07	0.13	5.81	-0.26	0.90	-0.15	1.48	1.90	-0.37
MnO	-2.79	-7.81	5.29	-0.60	3.05	*	12.49	-1.79	-6.83	-3.88	2.22	1.38	-1.82	12.24	0.27	1.11	1.94	0.69
MgO	0.00	-1.28	-0.32	*	0.00	*	*	-0.82	40.54	5.11	0.19	-3.19	-0.45	-3.83	0.06	0.77	-4.05	1.64
CaO	-0.43	0.29	-0.75	-1.20	0.89	*	1.10	-2.68	55.95	0.29	0.11	-2.10	-0.15	2.08	-0.11	1.79	0.83	-0.78
Na2O	-1.67	2.05	-0.68	*	-0.59	*	*	-2.98	-9.21	-25.86	1.80	-0.90	-0.45	2.98	-24.93	1.74	1.31	0.62
K2O	-0.14	-2.34	-0.28	5.50	-0.55	*	3.50	-0.50	-25.10	-1.93	0.19	-3.30	0.14	0.28	0.08	1.28	1.79	0.43
P2O5	-0.13	2.60	-0.89	*	1.24	*	-0.87	-1.33	18.38	-3.68	2.87	1.24	-0.89	1.24	-0.75	-0.07	0.34	-0.82
Ba	0.89	-2.23	-0.17	2.30	-1.14	*	1.80	-0.41	*	6.93	-1.44	-8.89	*	-1.10	*	1.33	0.25	*
Be	*	*	-0.39	*	*	*	-6.74	*	*	*	*	-0.62	*	*	*	1.10	*	-0.18
Bi	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.64
Ce	0.70	-1.77	0.09	0.25	*	0.25	1.91	-5.82	*	1.06	*	-0.48	*	1.14	*	0.48	*	0.84
Co	-2.71	*	-0.55	*	1.40	*	-4.14	18.53	*	*	-4.08	-4.15	*	4.83	3.79	0.82	1.56	0.54
Cr	-3.20	*	*	*	36.82	*	6.99	2.02	*	3.55	-2.49	452.39	*	7.13	7.05	-0.02	2.13	1.18
Cs	0.77	*	*	*	*	-0.13	*	*	*	241.81	*	*	*	*	*	0.38	*	-0.08
Cu	-2.77	*	*	4.08	-7.81	*	-3.52	-4.12	*	-4.00	-2.16	2.02	*	-1.67	0.70	-0.03	2.11	-0.70
Dy	0.42	*	-0.37	*	*	0.44	*	*	*	*	*	10.42	*	*	*	0.47	*	0.26
Er	-0.07	*	0.96	*	*	0.41	*	*	*	*	*	2.46	*	*	*	0.75	*	0.15
Eu	-0.77	*	*	*	*	0.23	*	*	*	*	*	-1.69	*	*	*	0.38	*	1.16
Ga	1.15	-1.32	*	1.47	0.39	0.24	*	-2.18	*	-1.32	-0.81	*	*	1.24	*	1.59	*	1.83
Gd	-2.10	*	*	*	*	1.35	*	11.30	*	*	*	-1.93	*	*	*	0.36	*	4.63
Ge	*	*	*	*	*	0.79	*	9.99	*	*	*	*	*	*	*	*	*	-0.01
Hf	0.98	*	*	*	-0.82	*	*	3.28	*	-7.59	*	*	*	3.28	*	0.37	*	0.60
Ho	0.34	*	*	*	*	0.34	*	*	*	*	*	6.06	*	*	*	0.34	*	0.31
La	0.08	-3.70	*	-0.49	*	0.56	3.47	-0.24	*	1.73	*	-0.95	*	2.16	*	0.31	*	0.71
Li	4.32	*	0.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-0.61
Lu	0.33	*	*	*	*	0.50	*	*	*	*	*	*	*	*	*	*	*	0.04
Mo	-9.09	*	*	*	*	*	*	*	*	*	*	9.51	*	*	*	-0.07	5.10	0.05
Nb	-1.52	*	*	-1.41	0.51	-0.33	*	0.51	*	-3.11	-0.07	2.06	*	-0.94	*	-1.01	1.92	1.27
Nd	1.07	*	0.14	2.48	*	0.62	*	1.40	*	*	*	-0.94	*	2.65	*	0.82	*	0.75
Ni	-2.55	*	*	*	4.57	*	-1.55	6.95	*	-4.68	1.96	15.73	*	-4.92	5.25	2.29	-0.56	-0.86
Pb	2.74	*	-0.50	2.05	1.39	*	-0.06	4.10	*	-0.71	-0.17	*	*	-0.64	8.52	0.93	2.56	-0.44
Pr	-0.18	*	*	1.68	*	0.44	*	*	*	*	*	-1.82	*	*	*	0.50	*	0.41
Rb	-0.92	-2.19	-0.22	1.16	-0.58	0.20	0.05	-0.25	*	-2.24	0.65	*	*	-0.25	*	0.92	1.60	0.70
Sc	*	*	-0.05	*	*	-1.44	*	3.21	*	*	0.94	0.40	*	0.49	*	-0.21	*	-0.87
Sm	-0.05	*	0.05	*	*	0.25	*	*	*	*	*	-0.97	*	*	*	0.49	*	1.36
Sn	4.93	*	*	*	*	0.18	*	*	*	14.17	*	*	*	*	*	-0.28	*	0.39
Sr	0.56	-2.42	*	1.33	0.96	*	0.36	-3.30	*	-3.55	-0.13	-1.07	*	-1.27	*	0.49	2.15	1.68
Ta	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-0.53	*	0.15
Tb	-0.30	*	*	*	*	1.47	*	*	*	*	*	*	*	*	*	0.20	*	1.26
Th	2.59	12.05	-0.60	-1.01	-0.37	-1.05	*	-0.37	*	0.63	0.63	*	*	-1.19	*	0.10	2.84	0.59
Tl	-2.42	*	*	*	*	-0.24	2.02	*	*	*	*	*	*	*	*	*	*	0.34
Tm	0.70	*	*	*	*	0.51	*	*	*	*	*	*	*	*	*	*	*	0.12
U	0.63	*	*	*	*	0.12	*	*	*	6.26	9.53	*	*	19.34	*	-0.08	*	0.18
V	-1.94	3.75	1.58	77.68	6.75	*	0.14	3.75	*	-3.26	-2.12	-1.46	*	1.35	2.35	-0.25	1.70	0.86
Y	-1.16	16.59	1.09	1.18	-3.22	0.17	*	3.99	*	-2.68	0.38	6.51	*	-1.06	*	-0.88	2.53	0.31
Yb	-0.05	*	*	*	*	0.52	*	*	*	*	*	0.08	*	*	*	0.37	*	-0.10
Zn	4.78	1.69	0.00	1.27	-0.28	*	0.28	1.69	*	-0.28	-1.89	2.73	*	-0.28	-3.03	0.76	1.20	-1.06
Zr	-0.14	1.22	-0.02	1.07	1.68	*	*	0.50	*	-2.62	-0.62	-26.47	*	-1.95	2.47	0.81	1.05	2.17

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J36	J37	J38	J39	J40	J41	J42	J43	J44	J45	J46	J47	J48	J48	J49	J50	J51	J52
Quality	1	2	1	1	2	2	2	1	1	1	2	1	1	2	2	1	2	1
SiO2	-0.12	-1.64	0.10	0.61	2.53	*	-0.14	0.23	0.34	-0.74	-0.04	0.26	*	-5.79	0.43	*	-0.10	-3.67
TiO2	0.31	0.20	0.87	-0.54	-20.81	-1.21	0.20	-0.54	-0.54	0.40	0.26	-0.54	-1.46	*	0.67	*	2.08	2.28
Al2O3	0.18	-1.52	0.19	1.14	-4.57	-0.12	0.14	-1.72	-4.43	-0.05	0.14	0.10	-3.39	*	-0.52	*	-0.29	-0.86
Fe2O3T	0.60	-0.16	-0.43	0.49	-1.50	1.16	0.04	-4.82	-2.98	0.09	0.25	0.09	-0.65	*	0.35	*	-0.77	-0.53
MnO	0.88	1.11	0.55	-5.30	1.11	1.11	1.53	-5.30	-5.30	3.05	1.00	-0.29	-1.29	*	-2.65	0.21	*	3.05
MgO	-0.13	0.00	5.11	0.00	-1.72	1.31	0.00	12.77	3.19	-0.64	-0.48	-1.28	4.85	*	0.96	*	-0.96	10.85
CaO	0.20	-0.01	-1.06	-1.51	0.34	4.42	-0.15	-3.30	-0.31	-2.10	0.10	-1.21	-0.76	*	-1.50	*	1.04	-0.31
Na2O	-0.83	-2.46	-0.97	1.74	-2.74	2.54	-0.06	-1.83	4.69	0.96	-0.56	0.34	-0.93	*	1.65	*	3.51	-2.91
K2O	0.61	-0.55	-1.98	-1.10	0.04	6.90	0.34	-1.79	-1.24	-0.55	-1.03	-0.69	0.15	*	1.51	*	-0.07	-0.41
P2O5	-0.76	0.62	-3.41	-1.50	0.21	2.12	-0.75	3.97	3.97	-4.23	0.41	-2.04	*	*	-0.75	*	-0.75	6.70
Ba	-0.39	0.99	*	*	-1.66	1.24	2.60	-0.60	-0.58	-2.93	0.43	*	-1.82	*	-0.95	-0.03	0.86	-1.10
Be	*	*	*	*	-0.70	0.69	*	*	*	*	-2.80	*	*	*	*	2.76	0.01	*
Bi	*	*	*	*	-3.68	-0.57	*	*	*	*	-0.50	*	*	*	*	-0.14	*	*
Ce	0.62	0.25	*	*	*	1.29	2.03	*	-0.48	-0.96	0.00	*	0.33	*	*	0.17	0.17	1.22
Co	*	*	*	*	0.35	0.57	-0.33	4.83	*	-2.02	1.90	*	-0.18	*	8.24	-0.38	*	8.26
Cr	-0.03	0.50	*	*	0.13	0.54	4.59	*	9.18	0.99	-0.58	*	-1.68	*	3.81	-1.57	-0.02	-17.43
Cs	-4.92	*	*	*	-0.78	0.40	-0.17	*	*	3.56	-1.95	*	0.92	*	*	-0.85	*	20.52
Cu	-0.81	-3.29	*	*	1.64	0.80	1.01	6.93	6.93	-10.26	1.19	*	*	29.87	0.52	1.16	-0.83	-1.67
Dy	1.38	*	*	*	*	0.22	-0.18	*	-1.72	*	0.41	*	0.29	*	*	0.29	*	-0.89
Er	0.14	*	*	*	*	-0.56	0.00	*	0.00	*	-0.41	*	*	*	*	-0.27	*	0.79
Eu	0.51	*	*	*	*	0.20	-0.05	*	0.00	*	4.09	*	0.21	*	*	-0.19	*	2.82
Ga	-0.55	*	*	*	-1.24	-0.25	0.41	1.24	*	-1.32	1.90	*	-4.14	*	-0.62	0.81	-0.66	0.39
Gd	-1.82	*	*	*	*	-0.89	0.00	*	-1.89	*	-0.19	*	*	*	*	-1.15	*	5.70
Ge	*	*	*	*	2.15	*	*	*	*	*	8.40	*	*	*	*	0.23	*	*
Hf	0.67	*	*	*	*	-7.75	0.82	*	*	1.23	*	*	0.64	*	*	1.00	*	1.23
Ho	1.18	*	*	*	*	0.04	-0.41	*	-1.73	*	0.78	*	*	*	*	0.07	*	-0.83
La	-0.14	-0.38	*	*	*	0.16	-0.16	*	0.03	2.43	0.41	*	-0.44	*	*	-0.29	-0.12	0.43
Li	*	*	0.94	*	0.87	2.54	*	*	-0.07	*	1.99	*	*	*	*	-0.27	-0.37	*
Lu	-0.17	*	*	*	*	-1.16	-0.33	*	*	*	0.50	*	0.94	*	*	0.17	*	-1.82
Mo	*	*	*	*	-1.51	0.36	2.55	*	*	-1.30	0.95	*	*	*	-2.92	-0.34	*	17.88
Nb	-0.34	*	*	*	3.91	0.13	0.83	-2.39	0.51	-2.39	1.70	*	*	*	-1.85	0.94	0.25	3.40
Nd	0.11	*	*	*	*	0.78	-0.34	*	0.57	-4.87	1.12	*	-1.95	*	*	-0.23	*	0.98
Ni	6.00	*	*	*	1.79	0.27	9.41	-12.04	9.32	-4.92	-0.20	*	*	*	-1.51	0.09	*	2.20
Pb	0.18	*	*	*	-0.30	0.60	0.02	0.04	-1.32	2.74	-0.32	*	*	*	*	0.51	0.02	0.04
Pr	0.17	*	*	*	*	0.59	-1.36	*	-1.71	*	0.66	*	*	*	*	-0.36	*	-0.73
Rb	0.62	*	*	*	0.13	0.71	-0.37	2.17	-1.38	-0.09	-0.53	*	0.76	*	4.47	-0.09	-0.29	-0.58
Sc	0.03	*	*	*	4.73	*	*	-5.87	-2.24	21.39	-0.66	*	-0.03	*	*	1.26	0.47	3.21
Sm	0.74	*	*	*	*	1.03	-0.39	*	4.10	3.64	2.16	*	-0.06	*	*	0.06	*	0.47
Sn	*	*	*	*	*	0.00	1.38	*	*	*	0.52	*	*	*	*	-1.18	*	2.76
Sr	0.40	*	3.40	*	-1.45	0.00	2.44	6.72	-1.20	-0.39	-0.53	*	2.52	*	-0.86	-0.19	-0.30	-0.39
Ta	-0.35	*	*	*	*	0.46	0.25	*	*	*	*	*	-1.68	*	*	-0.66	*	*
Tb	0.60	*	*	*	*	0.00	0.20	*	0.39	*	1.59	*	-0.70	*	*	-0.30	*	2.34
Th	0.64	*	*	*	1.26	1.00	0.23	3.77	-1.19	-1.19	0.81	*	0.93	*	-0.97	0.21	*	-2.02
Tl	*	*	*	*	-5.06	0.87	-0.84	*	*	*	-2.48	*	*	*	*	2.05	*	*
Tm	0.24	*	*	*	*	-0.35	-0.27	*	-1.31	*	1.28	*	*	*	*	0.24	*	-3.01
U	0.86	*	*	*	1.22	-0.23	0.19	12.15	-0.94	2.99	0.45	*	-3.36	*	16.90	0.89	*	-0.94
V	0.58	1.28	*	*	-0.28	1.08	-1.12	-1.04	-2.84	-0.44	-1.57	*	-0.61	*	0.26	-0.92	*	-4.04
Y	0.66	0.19	*	*	0.29	-0.68	-0.62	9.39	-1.42	0.38	3.16	*	*	*	24.94	0.75	0.19	5.79
Yb	0.24	*	*	*	*	-1.30	0.13	*	-2.45	*	0.55	*	-0.33	*	*	-0.22	*	-1.81
Zn	1.66	1.83	*	*	0.71	1.01	-0.70	0.00	-0.28	-1.41	0.96	*	0.76	*	-0.23	0.17	-0.14	0.00
Zr	2.19	-1.38	*	*	*	-13.71	1.88	3.67	-1.40	-1.68	0.57	*	0.95	*	-0.83	3.67	-0.66	-3.31

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J52	J53	J54	J55	J55	J56	J57	J58	J59	J60	J61	J62	J62	J63	J64	J65	J66	J67
Quality	2	1	1	1	2	1	1	1	2	2	2	1	2	1	1	2	1	1
SiO2	*	*	*	1.36	*	0.62	0.14	-0.47	1.99	0.50	-0.13	0.18	*	*	0.01	-0.32	0.18	-0.95
TiO2	*	*	*	1.34	*	-0.82	0.40	0.40	-0.09	-0.93	0.67	-0.54	*	*	3.22	0.20	-7.12	0.59
Al2O3	*	*	*	0.00	*	0.81	-0.10	-0.62	2.05	-1.38	-0.57	-3.19	*	*	-0.05	-0.10	2.24	-0.21
Fe2O3T	*	*	*	4.38	*	-2.57	-0.12	0.29	0.73	-1.49	2.39	0.49	*	*	-0.53	-0.16	-6.25	-0.63
MnO	*	*	*	3.05	*	-5.30	-5.30	3.05	1.93	0.15	5.70	-1.12	*	*	-3.63	1.53	-5.30	3.89
MgO	*	*	*	0.00	*	-4.34	0.00	3.19	-4.42	-2.94	-0.64	0.00	*	*	1.28	-0.32	3.83	2.36
CaO	*	*	*	-0.31	*	-1.81	0.59	0.29	3.49	1.19	0.74	-0.88	*	*	-0.61	-0.60	2.38	-0.34
Na2O	*	*	*	0.65	*	-0.90	-0.28	-0.12	2.30	-0.60	-4.40	-1.21	*	*	0.65	0.48	-3.07	0.27
K2O	*	*	*	-0.55	*	-0.14	-0.14	-0.55	-0.13	-0.07	1.58	-1.22	*	*	1.65	-0.21	0.28	0.04
P2O5	*	*	*	-6.96	*	-0.95	1.24	-1.50	1.09	0.07	-0.75	-3.14	*	*	-1.50	0.07	3.97	-0.68
Ba	*	8.14	1.03	-0.30	*	*	-2.04	-3.25	-0.52	0.98	0.29	4.40	*	5.19	*	0.99	1.72	1.22
Be	*	5.65	2.45	*	*	*	3.04	1.65	-0.21	-0.69	0.31	3.60	*	*	*	0.03	*	0.85
Bi	*	35.35	0.14	*	*	*	-3.14	-1.28	-1.34	*	*	*	*	*	*	0.21	*	1.85
Ce	*	5.30	0.82	-1.74	*	*	-0.96	-4.55	0.43	-0.94	-0.56	3.92	*	-0.43	*	0.29	5.19	0.70
Co	*	-1.61	-0.17	-4.42	*	*	48.68	3.19	2.25	0.27	-0.67	-1.27	*	*	*	-0.15	4.83	-0.38
Cr	*	6.53	-1.46	2.43	*	*	2.43	-0.54	0.14	-1.55	-1.04	0.17	*	*	*	-2.06	0.99	2.02
Cs	*	-0.12	-0.68	0.17	*	*	-1.69	1.11	-1.38	-0.85	-0.34	1.87	*	-0.57	*	-0.38	*	-0.17
Cu	*	4.92	0.79	-1.91	*	*	-1.79	6.07	2.19	0.46	2.24	-0.28	*	*	*	*	9.39	7.52
Dy	*	4.75	0.10	*	*	*	0.88	0.10	0.07	-0.70	-0.21	-0.42	*	-1.42	*	0.11	0.88	-2.95
Er	*	5.77	-0.27	*	*	*	0.00	1.78	-0.10	-0.98	-0.55	-0.96	*	-2.37	*	-0.07	1.23	-1.50
Eu	*	5.87	-0.47	*	*	*	0.00	9.86	0.91	-0.75	-0.09	-0.75	*	-0.82	*	-0.28	4.42	-2.07
Ga	*	17.02	0.56	-2.18	*	*	8.07	-0.72	1.44	-0.06	-0.23	-0.25	*	*	*	0.62	*	0.34
Gd	*	6.61	-1.86	*	*	*	-0.91	9.81	2.15	-0.46	0.24	-2.98	*	-3.33	*	-1.37	1.59	-4.13
Ge	*	*	0.45	*	*	*	*	6.93	*	*	*	*	*	*	*	-5.17	*	0.00
Hf	*	8.88	0.94	-2.87	*	*	-13.51	4.51	*	*	-0.21	-13.00	*	0.62	*	0.00	*	0.62
Ho	*	3.25	0.37	*	*	*	0.67	0.67	-0.11	-0.67	0.04	-0.23	*	-1.28	*	-0.11	16.54	-2.32
La	*	2.93	0.03	0.78	*	*	-0.88	-2.53	0.20	-1.34	-1.05	1.89	*	-0.88	*	-0.94	4.56	-1.90
Li	*	*	0.07	*	*	*	0.40	-0.34	0.86	-0.07	0.30	2.50	*	-0.25	*	*	*	*
Lu	*	1.57	0.17	*	*	*	0.17	0.99	0.40	-1.24	0.50	-2.32	*	-3.23	*	0.08	-0.66	-3.15
Mo	*	8.22	0.17	-1.30	*	*	-3.60	-2.51	-0.05	-0.17	*	*	*	1.08	*	-0.55	*	-0.52
Nb	*	-1.75	0.80	-1.95	*	*	-0.51	-0.22	-0.51	0.04	1.12	2.39	*	8.43	*	0.76	*	1.03
Nd	*	6.40	-0.19	-2.23	*	*	0.19	-1.19	0.65	-0.78	0.07	0.52	*	-0.44	*	-0.45	3.10	-1.19
Ni	*	48.40	0.52	-3.49	*	*	-6.77	3.74	2.25	-0.13	*	2.67	*	*	*	0.39	2.20	-4.92
Pb	*	-8.50	0.65	-0.37	*	*	-1.79	-1.12	-0.65	-0.03	-0.32	-1.39	*	0.69	*	0.63	2.61	-0.49
Pr	*	4.23	-0.47	*	*	*	1.22	-1.94	0.73	-0.76	-0.29	0.48	*	-0.24	*	-0.26	2.78	-1.81
Rb	*	-0.98	0.23	-0.82	*	*	-0.25	-5.06	0.43	0.54	-0.61	-0.09	*	*	*	0.60	-1.54	1.07
Sc	*	239.01	0.94	2.76	*	*	-0.83	1.72	-0.15	-0.26	*	-1.06	*	*	*	-0.66	*	7.76
Sm	*	4.59	-0.15	-6.17	*	*	-0.47	-0.95	0.29	-0.64	0.11	0.22	*	-0.98	*	0.10	2.41	-2.27
Sn	*	22.83	-0.44	18.74	*	*	*	-1.52	*	-0.68	1.09	*	*	*	*	*	*	3.10
Sr	*	1.01	0.15	-1.30	*	*	-1.54	-7.88	2.08	0.04	-0.87	5.84	*	-1.25	*	0.69	5.30	1.73
Ta	*	-12.07	-0.53	1.79	*	*	4.51	0.50	15.64	*	*	0.24	*	0.17	*	-0.40	*	-1.57
Tb	*	3.94	-0.30	*	*	*	-0.30	3.64	1.43	-0.74	-0.03	-1.00	*	-1.39	*	-0.27	0.63	-2.39
Th	*	13.25	0.38	-0.61	*	*	0.96	-0.86	-1.66	-0.06	0.23	-0.53	*	1.49	*	-0.60	*	-7.69
Tl	*	-8.91	1.61	*	*	*	1.16	1.01	-0.84	0.46	0.28	*	*	1.50	*	-0.84	*	*
Tm	*	2.56	1.01	*	*	*	0.24	0.24	0.43	-0.89	0.12	*	*	-2.40	*	-0.27	0.24	*
U	*	7.60	1.42	-2.90	*	*	-4.21	-2.90	-1.73	*	0.51	-1.98	*	-0.12	*	-0.47	*	-0.35
V	*	-0.58	-0.50	1.05	*	*	0.52	-1.76	2.60	-0.04	-0.52	1.05	*	*	*	*	4.35	-1.91
Y	*	-0.69	0.57	-3.94	*	*	1.47	-1.54	-0.74	-0.35	-1.07	1.11	*	-3.31	*	-0.35	2.13	2.19
Yb	*	3.73	0.10	*	*	*	0.73	0.10	0.27	-1.35	0.13	-1.97	*	-1.19	*	-0.27	0.73	-2.45
Zn	*	1.06	0.42	-2.53	*	*	0.31	2.53	8.37	0.46	-0.28	*	0.56	*	*	1.27	-0.84	-0.28
Zr	*	3.87	3.49	-1.49	*	*	-5.93	5.96	0.01	-0.02	-0.48	-21.93	*	6.56	*	0.34	-0.32	2.56

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J68	J69	J70	J71	J72	J73	J74	J75	J76	J77	J77	J78	J79	J80	J81	J82	J83	J84
Quality	2	1	1	2	2	2	1	1	2	1	2	2	2	2	2	2	1	1
SiO2	-0.04	*	1.32	0.30	-0.74	-0.09	-0.23	-0.38	0.00	*	*	-2.51	-0.48	-1.70	-0.18	0.05	0.32	4.31
TiO2	-0.65	0.40	0.64	0.20	-0.18	0.06	0.15	-1.48	-0.27	*	*	*	0.15	-1.68	-0.18	0.67	-1.73	-2.23
Al2O3	-0.55	-7.91	-2.08	0.48	-0.45	-0.19	0.91	1.11	-0.07	*	*	-25.34	0.60	1.86	-0.55	0.52	-0.80	-10.58
Fe2O3T	0.44	-5.64	-6.59	1.17	0.18	0.31	-0.92	1.01	-0.06	*	*	6.48	-0.16	-1.59	-0.16	-0.47	-0.12	-1.06
MnO	1.53	-5.30	-4.84	1.53	3.62	0.27	-1.21	1.38	-0.56	*	*	*	*	-2.65	*	2.24	0.55	-2.79
MgO	-0.51	-13.41	16.60	1.28	0.35	-0.83	2.04	0.00	-0.64	*	*	-1.92	-0.38	2.55	-0.99	-1.98	-3.73	1.60
CaO	-0.01	-3.30	-0.06	1.34	-0.63	-0.42	0.56	1.76	-0.45	*	*	92.45	-0.60	3.44	-0.90	-0.45	-1.75	3.88
Na2O	0.29	7.63	-3.46	0.48	-1.09	0.35	1.69	-1.13	0.64	*	*	-17.51	-0.76	0.87	-1.22	-1.07	-0.77	-7.41
K2O	-0.01	5.78	-3.31	-0.41	-0.14	0.65	0.21	1.29	0.41	*	*	-3.23	0.14	4.88	-1.38	-0.21	-4.74	-2.06
P2O5	-0.34	-4.23	9.43	0.62	-0.48	-0.20	1.92	0.69	-0.75	*	*	-6.21	0.62	12.91	*	-0.75	0.50	16.26
Ba	-1.98	4.43	2.42	0.14	*	-1.21	-1.46	0.50	0.29	-2.37	*	*	1.09	*	*	-1.38	-2.51	-1.84
Be	*	1.37	-2.13	0.77	*	*	3.64	-0.99	*	*	*	*	*	*	*	*	*	*
Bi	*	*	-1.94	*	*	*	6.27	*	*	*	*	*	*	*	*	*	*	*
Ce	1.30	-0.32	-8.71	0.47	*	*	-0.15	-0.37	*	0.49	*	*	*	*	*	-0.64	*	16.67
Co	*	0.00	0.42	0.87	*	0.70	-0.58	-0.42	*	*	*	*	*	*	*	*	*	*
Cr	-2.06	-0.47	-0.36	-0.37	*	4.59	0.31	-0.78	*	*	-3.09	*	*	*	*	-0.53	*	21.46
Cs	*	-3.13	-2.37	0.72	*	*	-0.51	-1.21	*	-0.34	*	*	*	*	*	*	*	*
Cu	-4.52	1.45	4.74	-0.28	*	-2.68	2.04	3.86	*	*	-2.68	*	*	*	*	-1.45	*	42.55
Dy	*	8.15	-4.91	0.02	*	*	-1.07	-1.31	*	-0.22	*	*	*	*	*	-0.01	*	*
Er	*	3.01	-4.45	0.82	*	*	-0.22	0.68	*	-1.23	*	*	*	*	*	-0.14	*	*
Eu	*	4.89	-5.18	0.61	*	*	0.95	-0.19	*	-0.47	*	*	*	*	*	0.89	*	*
Ga	0.19	-2.24	1.44	-0.19	*	-0.23	-0.95	0.47	*	-2.18	*	*	*	*	*	-0.66	*	-7.30
Gd	*	8.56	-8.65	2.44	*	*	2.13	0.74	*	-0.88	*	*	*	*	*	-1.29	*	*
Ge	*	-3.63	0.24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hf	*	-13.98	-11.37	0.72	*	*	-1.39	0.59	*	-1.91	*	*	*	*	*	-3.49	*	*
Ho	*	-1.43	-4.16	0.63	*	*	-0.65	3.07	*	-0.83	*	*	*	*	*	-0.11	*	*
La	3.21	-1.02	-11.30	0.29	*	*	-0.21	-0.56	*	-4.68	*	*	*	*	*	0.15	*	*
Li	*	-3.45	-0.60	*	*	-1.05	0.80	1.66	*	*	*	*	*	*	*	-0.40	*	*
Lu	*	-2.32	-4.36	0.08	*	*	-2.07	0.00	*	-1.49	*	*	*	*	*	-0.33	*	*
Mo	*	*	0.82	0.95	*	*	-2.45	*	*	*	*	*	*	*	*	*	*	*
Nb	-1.19	4.46	-0.79	0.91	*	*	-0.99	0.31	*	2.68	*	*	*	*	*	-1.19	*	3.40
Nd	*	-0.77	-10.83	0.43	*	*	-0.28	0.27	*	-1.02	*	*	*	*	*	-0.55	*	*
Ni	-3.65	0.16	-1.22	-0.92	*	-0.09	0.61	-1.76	*	*	-1.27	*	*	*	*	*	*	*
Pb	1.03	0.42	0.72	1.20	*	3.74	0.81	-0.17	*	-0.98	*	*	*	*	-1.75	-1.00	*	-7.41
Pr	*	-0.53	-9.20	0.44	*	*	-0.86	-1.22	*	-0.36	*	*	*	*	*	-0.40	*	*
Rb	0.68	2.13	-0.41	0.34	*	*	-0.09	-0.42	*	-2.19	*	*	*	*	*	-0.61	*	-1.22
Sc	1.61	-0.65	-5.05	0.02	*	*	5.35	-0.27	*	-1.01	*	*	*	*	*	*	*	*
Sm	*	-1.59	-7.43	0.34	*	*	-0.78	1.21	*	-1.02	*	*	*	*	*	-0.35	*	*
Sn	*	-3.46	-1.92	*	*	*	-1.98	*	*	*	*	*	*	*	*	*	*	*
Sr	0.62	0.33	-7.37	-0.02	*	-1.07	-0.18	-0.16	-1.89	0.49	*	*	*	*	*	-0.33	-0.25	1.64
Ta	*	0.50	0.40	0.12	*	*	-1.30	0.15	*	*	*	*	*	*	*	-1.04	*	*
Tb	*	5.73	-5.14	*	*	*	0.81	-0.74	*	-1.00	*	*	*	*	*	-0.27	*	*
Th	0.23	-0.04	-8.56	0.52	*	*	-0.23	0.49	*	-0.86	*	*	*	*	*	-0.60	*	*
Tl	*	*	0.91	-0.09	*	*	*	-0.03	*	*	*	*	*	*	*	*	*	*
Tm	*	-2.09	-3.15	0.51	*	*	-0.61	-0.54	*	-0.54	*	*	*	*	*	0.51	*	*
U	-0.47	-1.33	-1.45	0.51	*	*	-4.63	0.02	*	-3.62	*	*	*	*	*	0.51	*	*
V	-0.52	-1.50	0.51	0.05	*	*	-1.35	0.52	*	-1.64	*	*	*	*	*	-1.42	*	*
Y	-0.71	-4.08	-6.86	0.64	*	-1.61	3.63	-0.50	*	-1.54	*	*	*	*	*	0.19	*	0.38
Yb	*	-3.24	-4.86	0.21	*	*	-2.88	0.64	*	-1.65	*	*	*	*	*	0.13	*	*
Zn	-0.14	-2.86	16.40	2.80	*	-0.42	1.14	4.78	*	0.00	*	*	*	*	*	-0.56	*	5.07
Zr	-2.11	-23.56	-20.10	1.54	5.87	0.57	-1.67	1.86	*	-1.40	*	*	*	*	*	-0.20	0.78	4.48

Table 3 GeoPT34 Z-scores for contributed data for granite, GRI-1 December 2013)

Lab Code	J85	J86	J87	J88	J89	J90	J91	J92
Quality	2	2	2	1	2	2	2	1
SiO2	-0.25	0.23	0.27	-0.80	0.00	-0.59	-0.29	0.33
TiO2	0.25	2.08	-0.71	0.12	0.67	-0.27	0.06	-0.94
Al2O3	0.24	-0.12	0.63	0.24	0.40	-0.05	0.12	0.89
Fe2O3T	0.43	-0.57	-0.12	0.49	0.55	-0.47	0.69	-0.31
MnO	-4.74	-1.40	-0.12	-1.96	1.53	-0.98	1.53	-2.06
MgO	1.05	-1.28	0.04	0.00	0.32	-0.64	0.42	2.36
CaO	0.08	-0.01	-0.13	-0.01	0.14	-0.60	-0.30	-0.29
Na2O	0.20	-0.60	0.45	0.96	1.49	0.02	0.77	-0.56
K2O	0.39	-0.34	0.53	0.96	0.07	-0.69	0.15	0.14
P2O5	-0.07	0.62	0.10	-0.13	0.62	-0.89	-0.20	-1.09
Ba	0.83	-0.99	0.18	-1.48	0.69	-1.00	-0.71	-1.82
Be	-1.84	*	0.00	*	1.70	*	*	*
Bi	*	-1.21	*	*	*	*	*	*
Ce	-0.18	-0.61	-0.14	-0.80	-0.16	-2.83	*	-0.15
Co	0.51	0.70	-0.12	-1.68	0.27	*	*	5.52
Cr	*	-0.53	0.00	-2.59	-1.55	*	1.01	1.20
Cs	0.60	0.09	-0.17	*	0.34	*	*	*
Cu	-0.40	-1.45	-0.45	-16.65	2.67	-3.55	*	-4.12
Dy	-0.27	0.76	0.09	*	0.24	*	*	*
Er	-0.06	3.42	0.02	*	0.27	*	*	*
Eu	-0.33	*	-0.01	*	0.56	*	*	*
Ga	0.79	0.02	0.11	-2.18	1.09	-0.58	*	0.30
Gd	-1.34	*	-1.43	*	0.12	*	*	*
Ge	-0.45	*	-0.55	*	*	*	*	*
Hf	0.22	-2.67	-2.54	-3.69	-0.88	0.72	*	*
Ho	-0.11	0.63	-0.07	*	0.04	*	*	*
La	0.00	0.28	-0.35	3.49	-0.05	1.08	*	-1.25
Li	0.13	*	-0.19	*	1.18	*	*	*
Lu	-0.33	0.50	-0.41	*	0.50	*	*	*
Mo	-0.33	0.63	2.43	0.62	-1.19	*	*	-1.94
Nb	0.18	-0.54	0.04	-0.07	0.54	0.91	*	-0.07
Nd	-0.26	0.05	0.23	-3.36	0.03	-1.03	*	1.99
Ni	1.10	-2.34	0.16	-3.49	1.88	*	*	-3.02
Pb	-0.93	-0.19	-0.24	0.37	-1.54	-0.66	*	0.85
Pr	-0.07	0.55	0.09	*	0.27	*	*	*
Rb	0.72	-0.34	0.24	0.71	2.53	0.12	*	0.07
Sc	*	*	0.26	-0.42	2.56	*	*	0.03
Sm	-0.33	-0.46	0.01	*	1.35	*	*	*
Sn	-0.62	*	0.53	*	-1.62	*	*	-5.23
Sr	-0.05	0.72	-0.14	0.22	0.25	-0.57	-0.06	0.42
Ta	-0.85	*	-0.35	*	0.90	*	*	*
Tb	-0.15	*	-0.51	*	0.89	*	*	*
Th	-0.02	-0.60	0.07	3.19	-0.60	0.11	*	-0.61
Tl	-0.09	0.73	0.00	*	0.43	*	*	*
Tm	0.51	-0.27	-0.04	*	2.44	*	*	*
U	0.45	-2.10	-0.36	9.53	-0.34	*	*	-9.44
V	0.20	-0.13	-0.54	-1.64	0.98	-1.60	13.56	0.28
Y	0.09	0.37	0.01	-0.52	-0.35	-0.45	*	0.75
Yb	0.13	0.21	-0.40	7.09	-0.11	*	*	*
Zn	-0.15	-0.42	-0.69	-0.65	-0.24	-0.86	0.99	-0.14
Zr	-0.04	1.47	-3.45	-0.23	-1.02	-0.43	0.16	-1.04

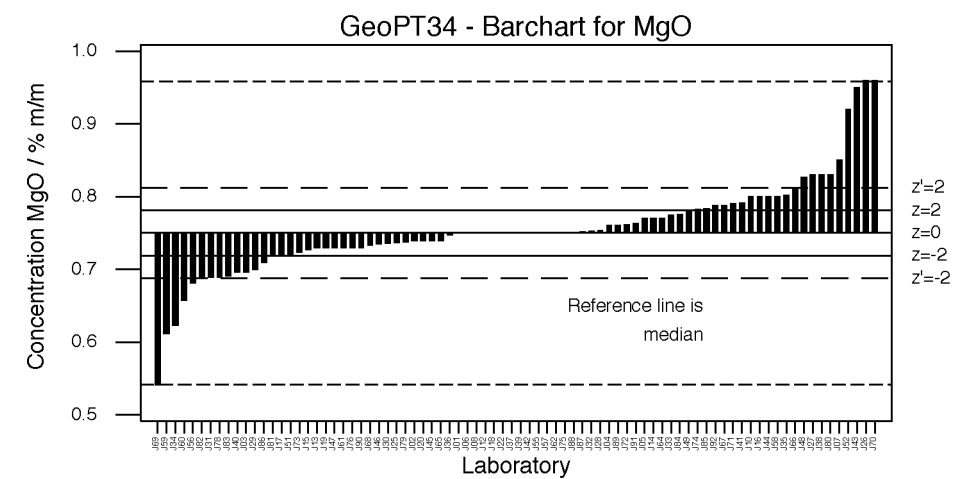
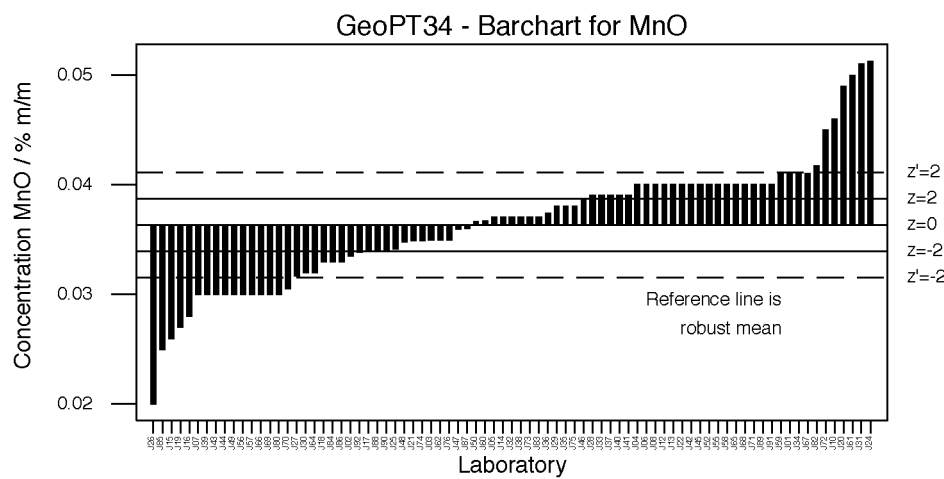
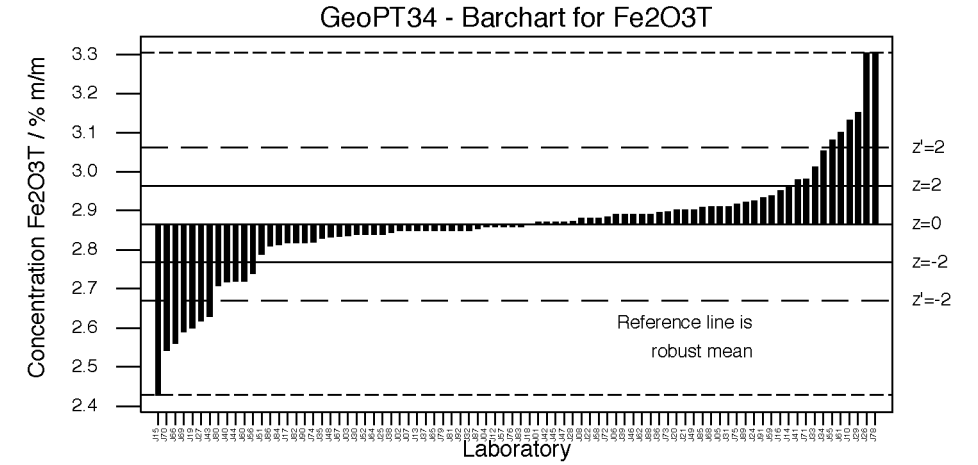
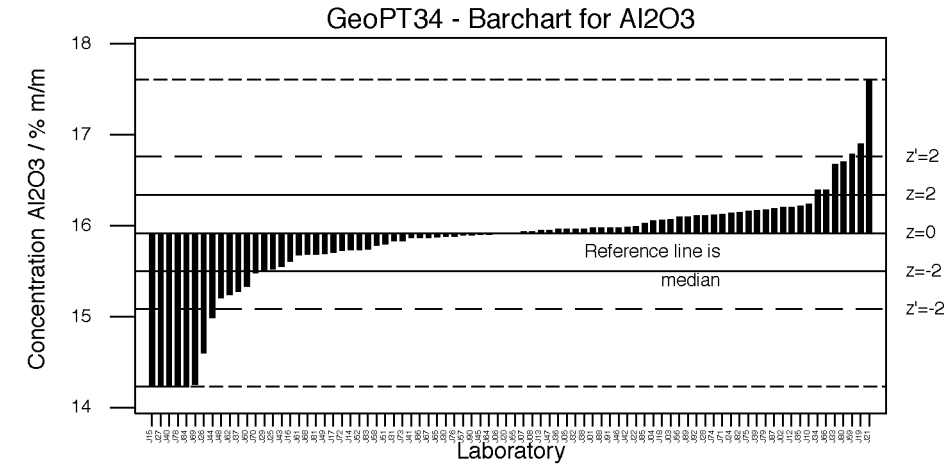
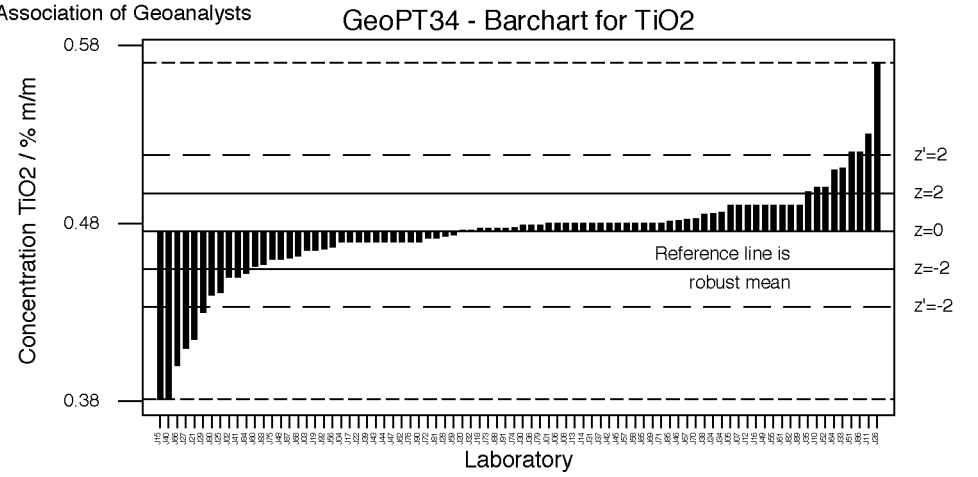
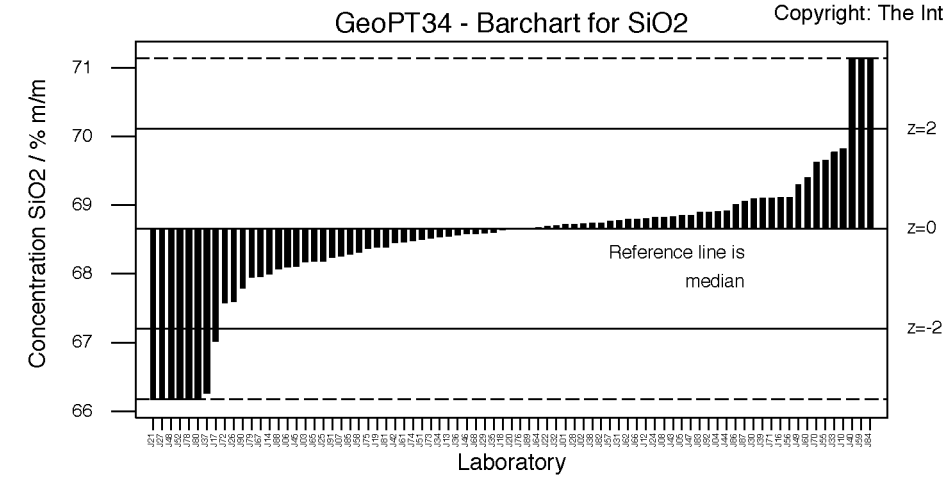


Figure 1: GeoPT34 – Granite, GRI-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

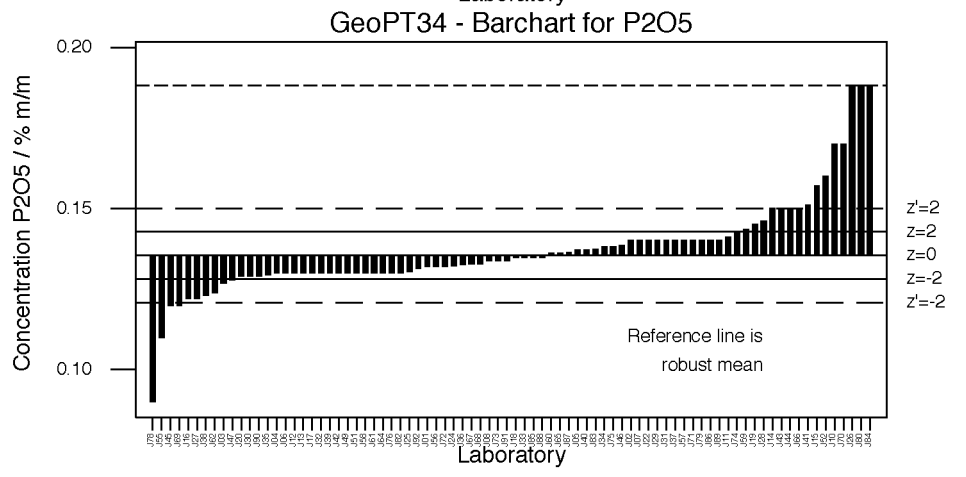
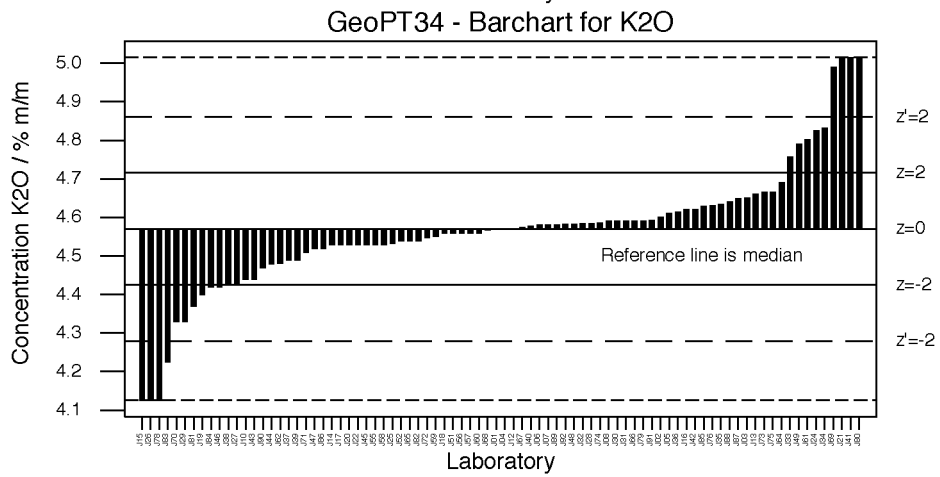
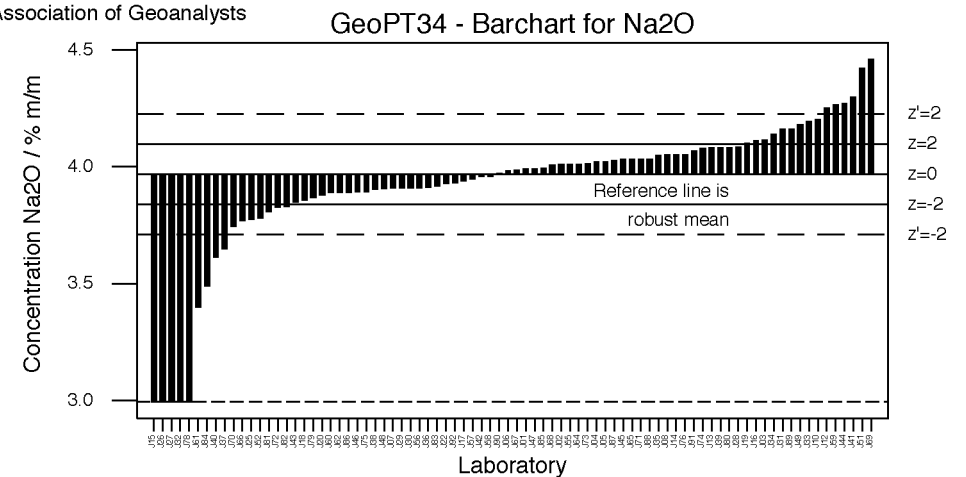
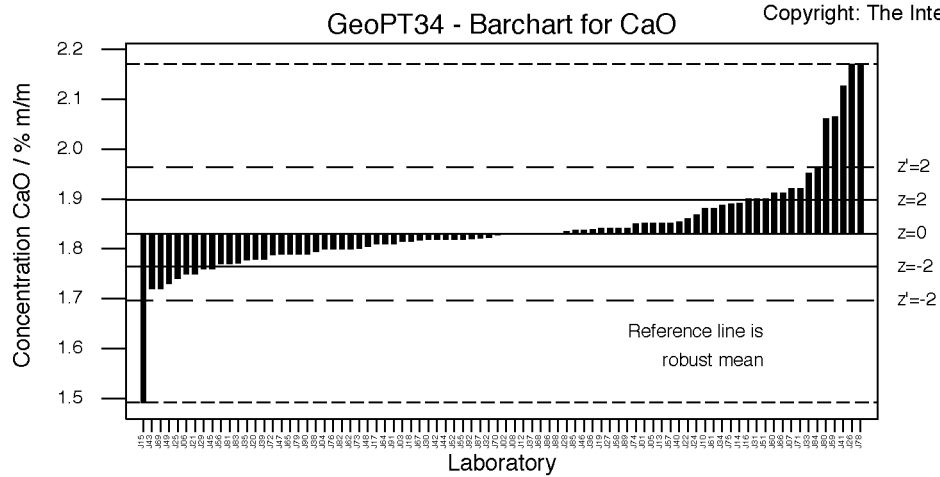


Figure 1 (Cont'd): GeoPT34 – Granite, GRI-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

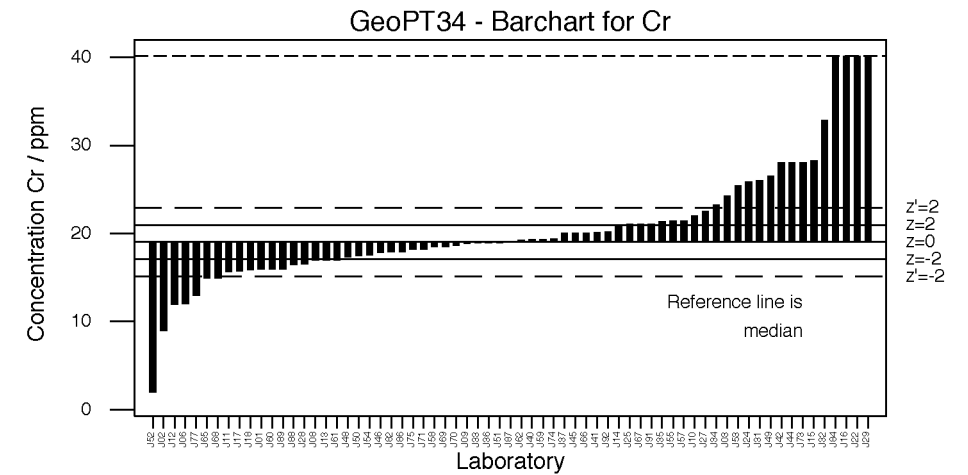
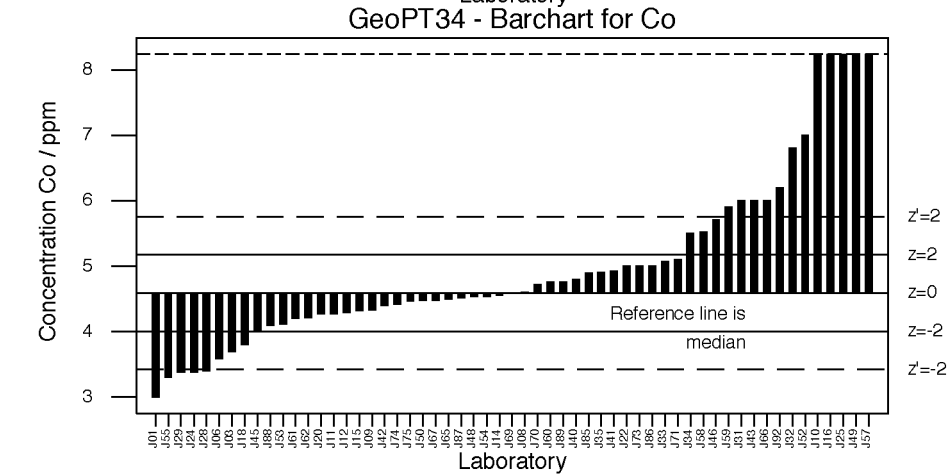
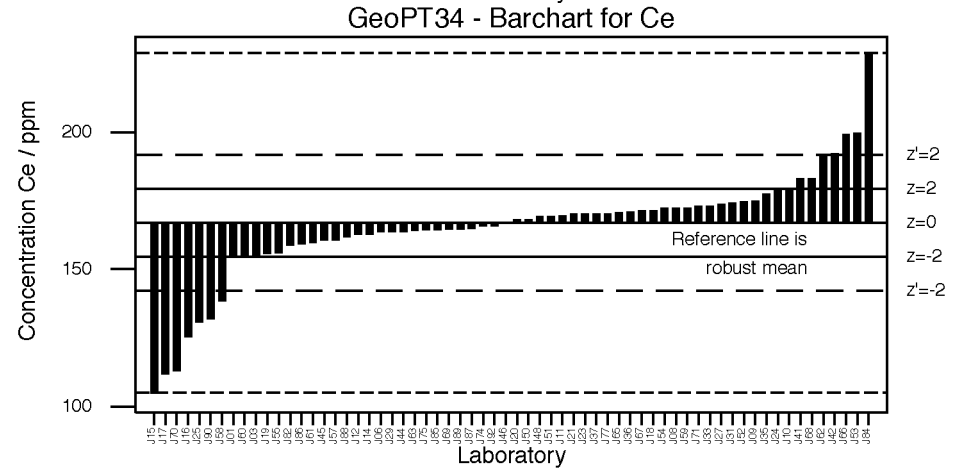
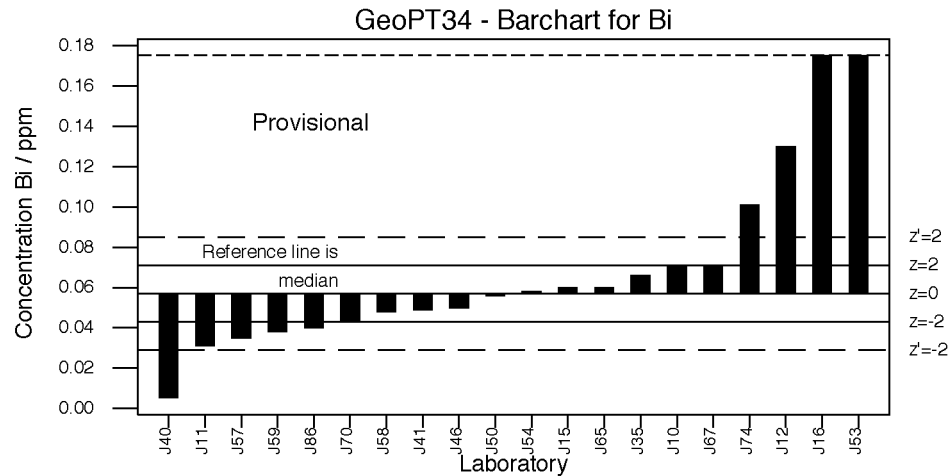
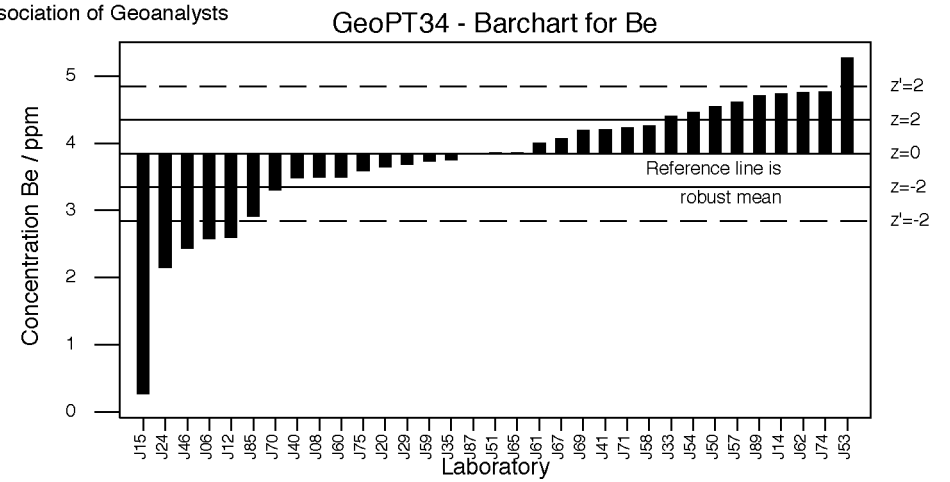
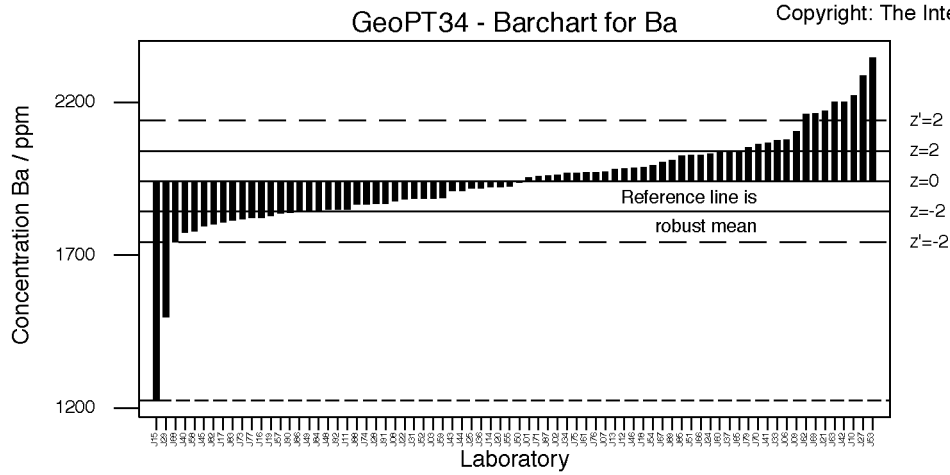


Figure 1 (Cont'd): GeoPT34 – Granite, GRI-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z < 2$ for applied geochemistry labs (pecked lines).

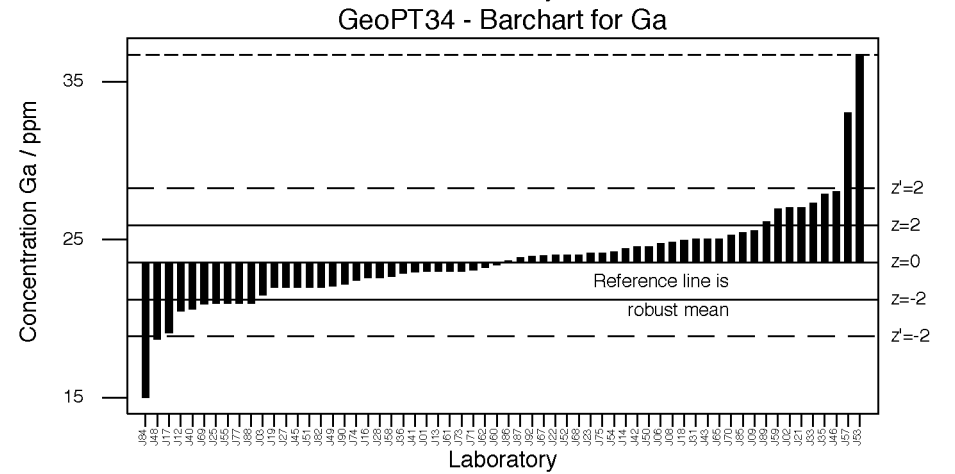
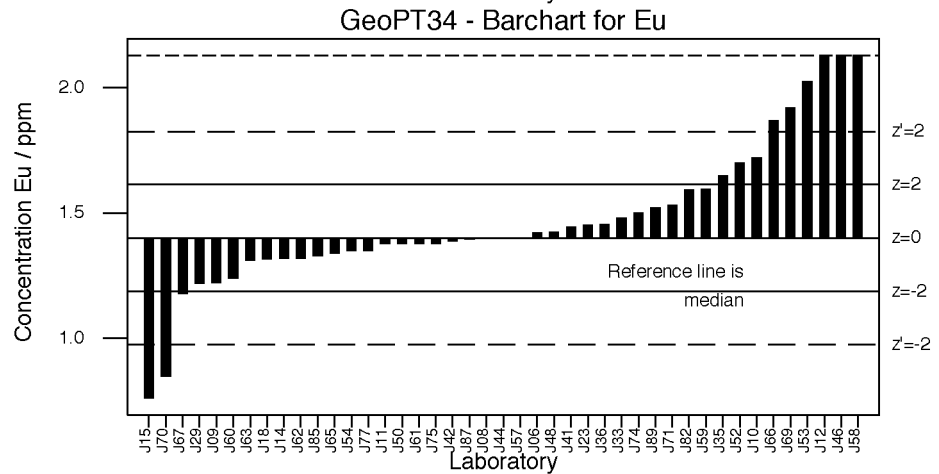
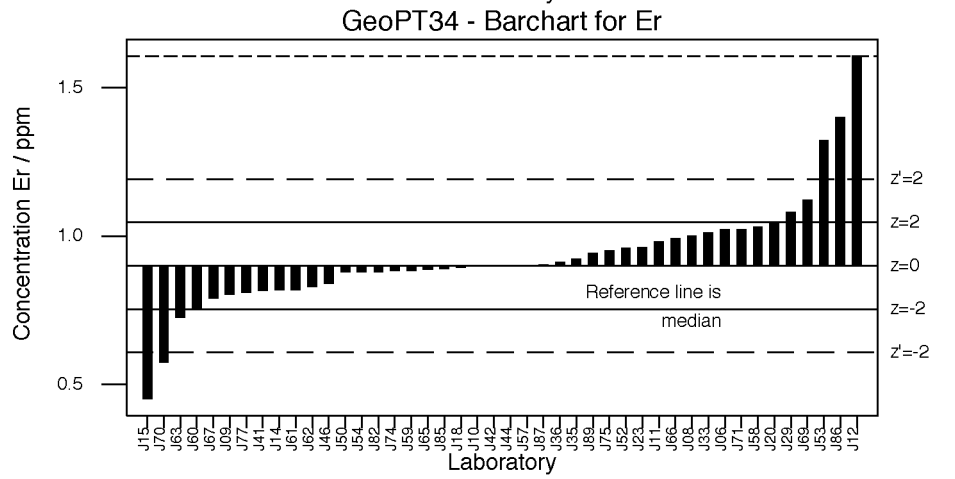
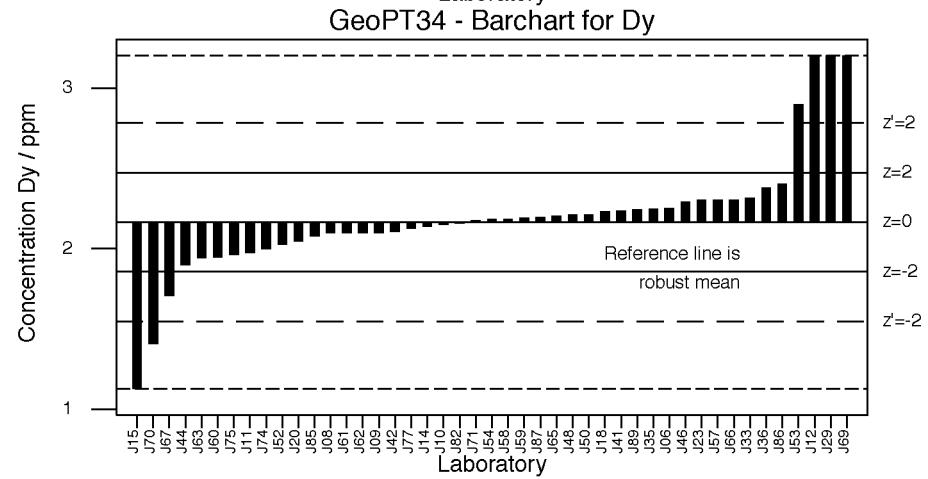
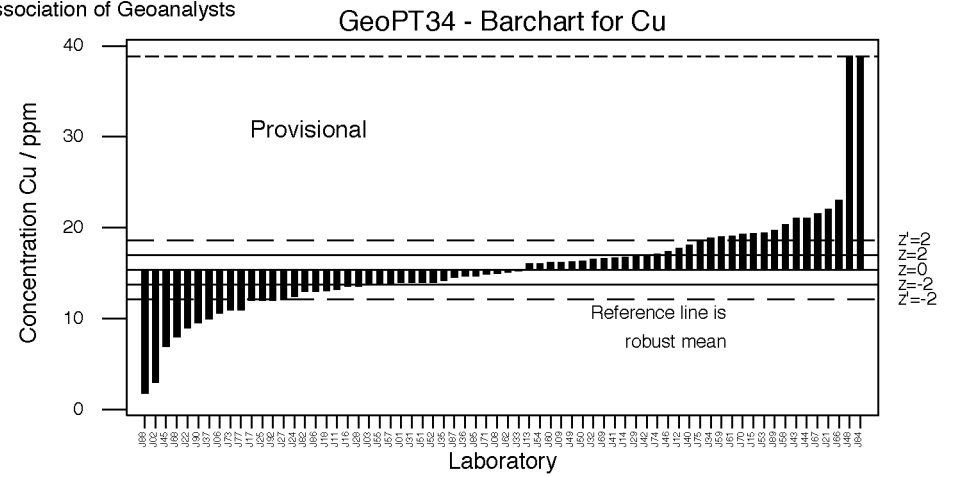
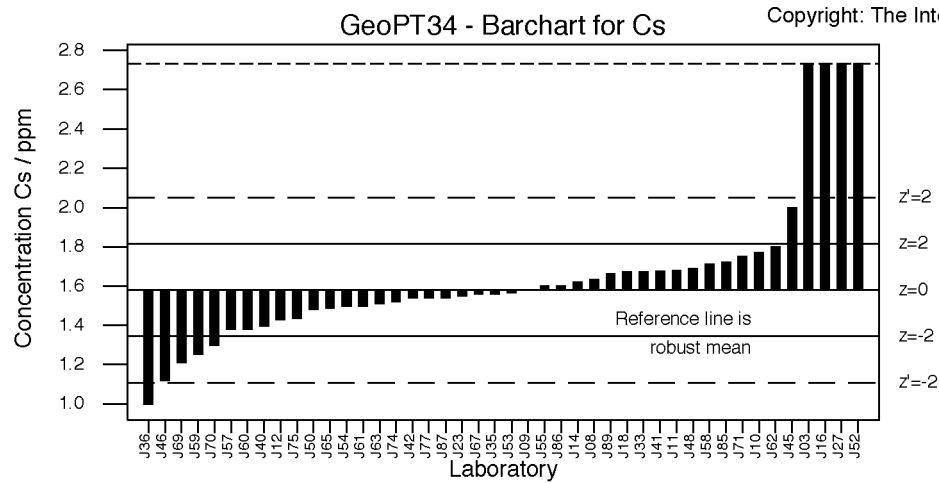


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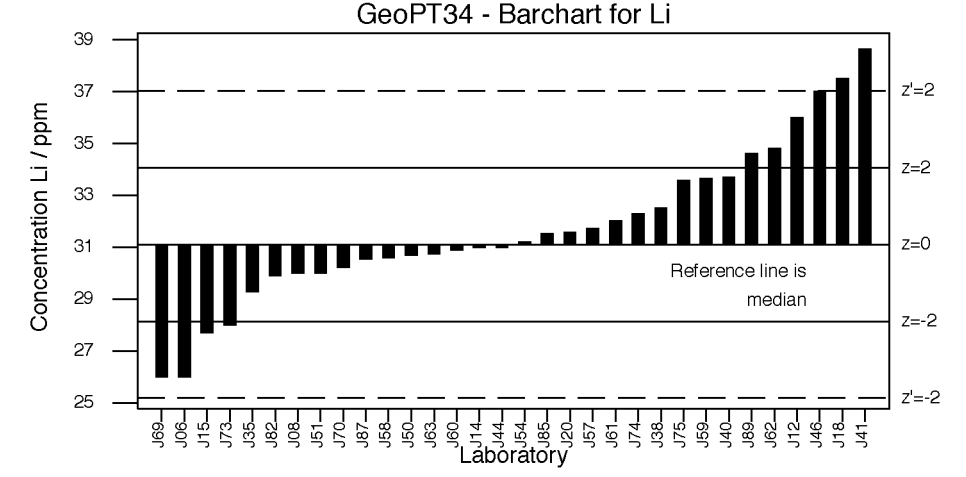
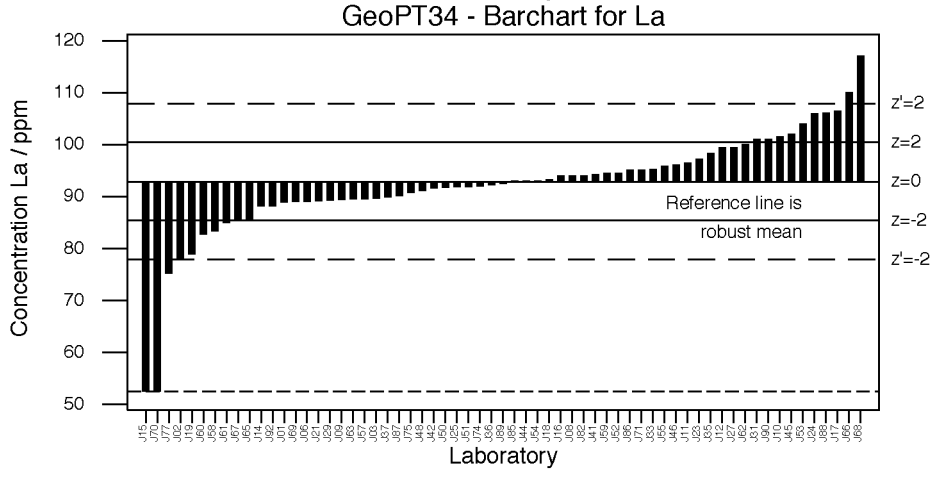
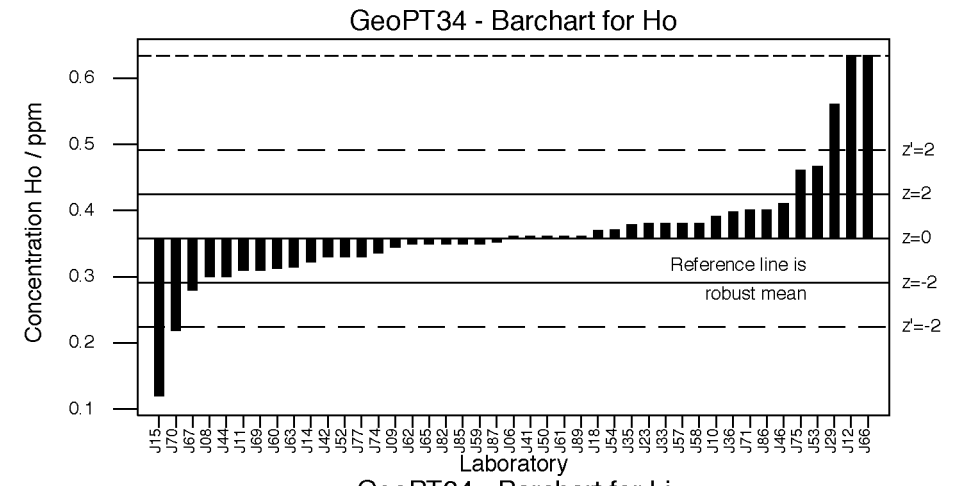
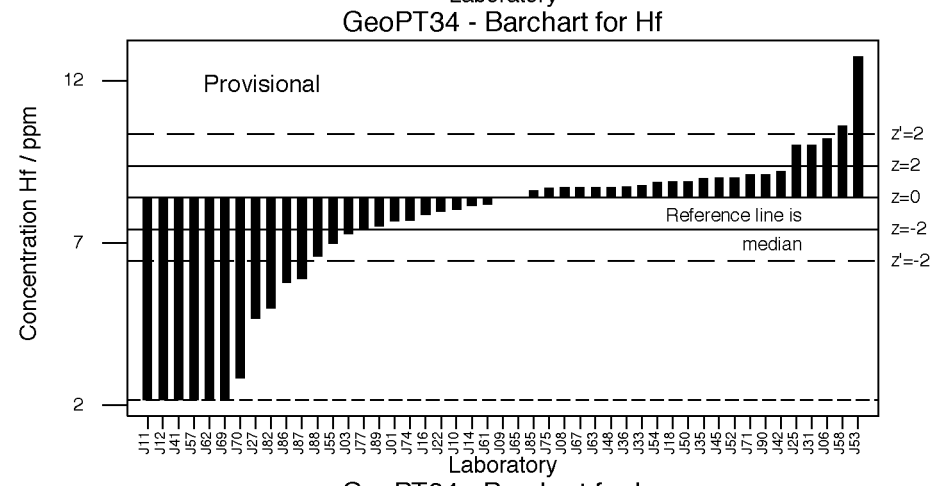
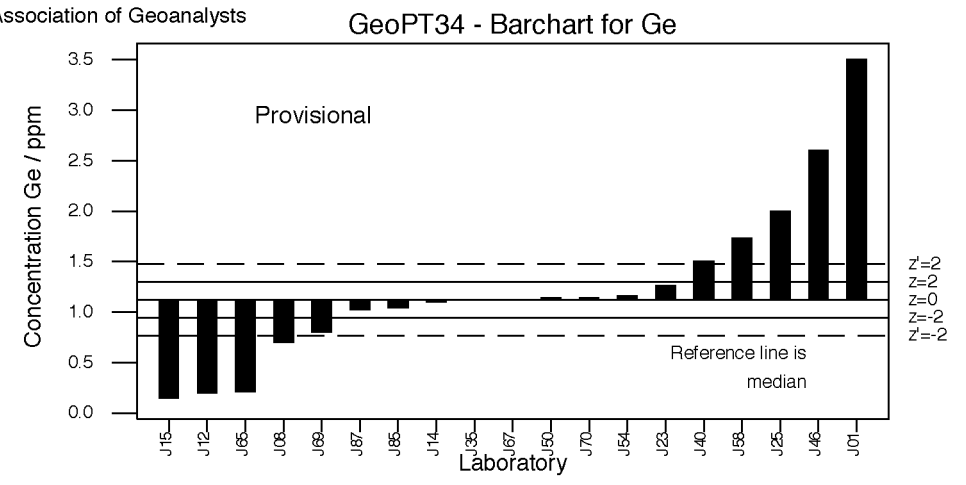
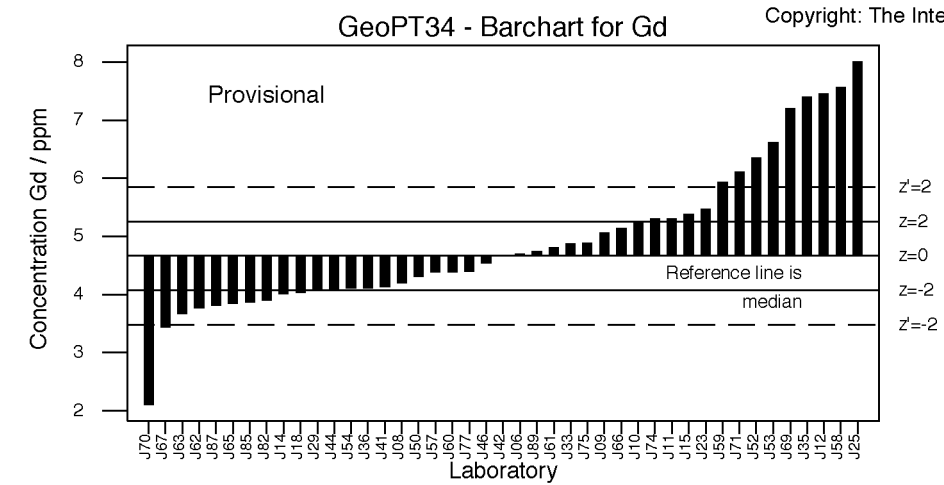


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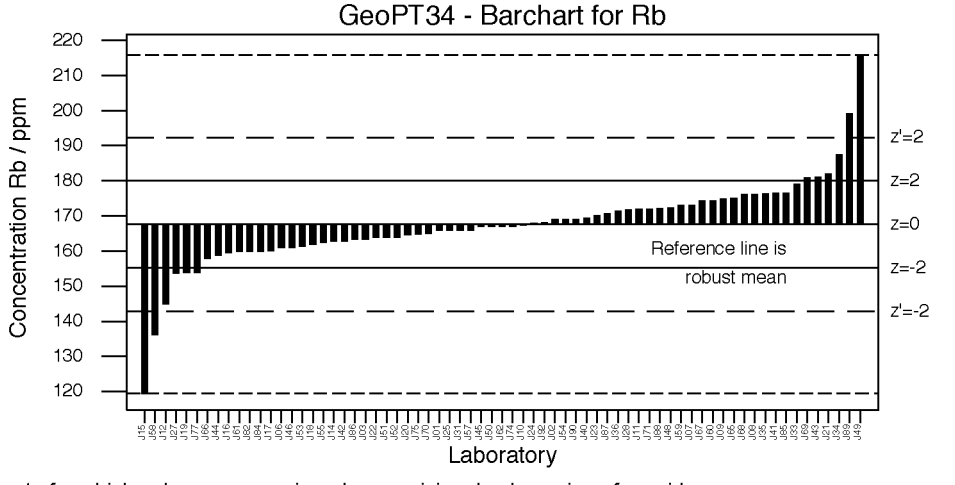
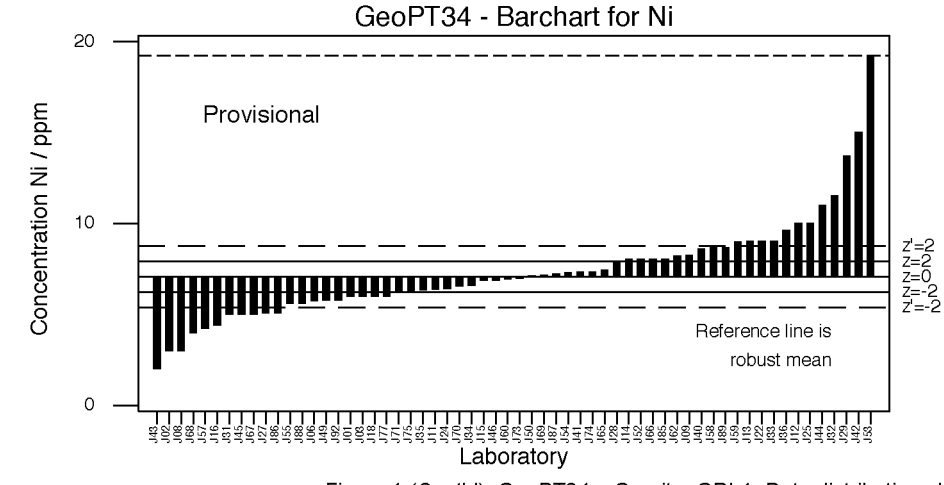
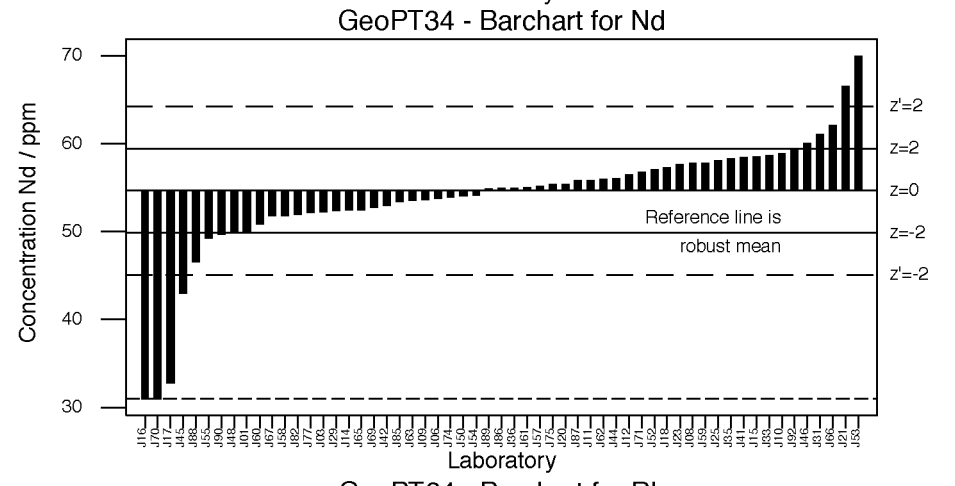
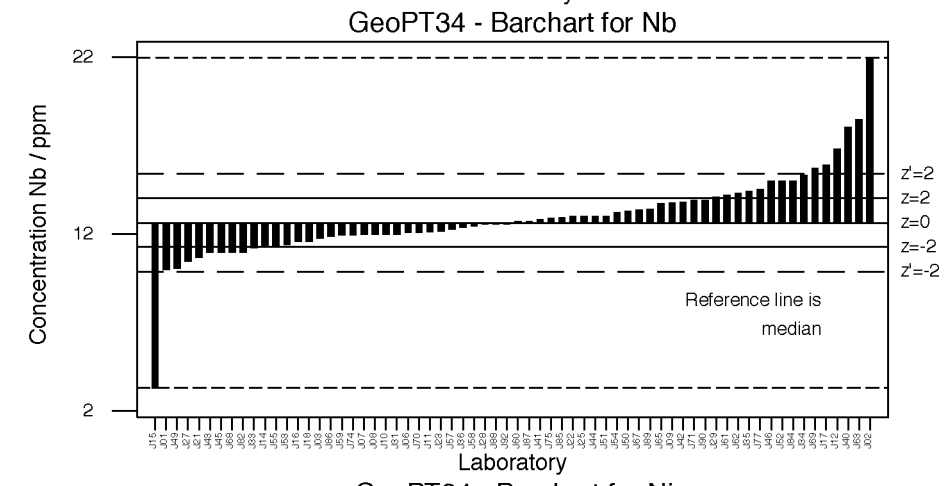
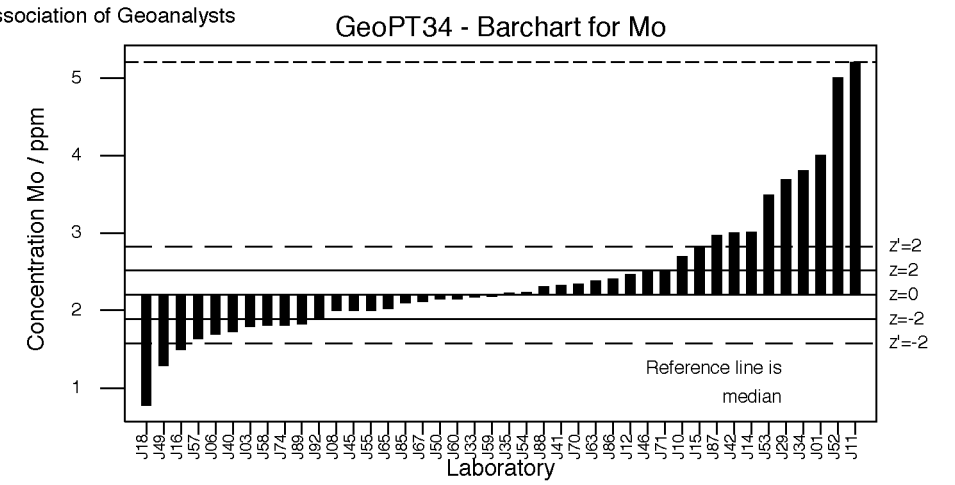
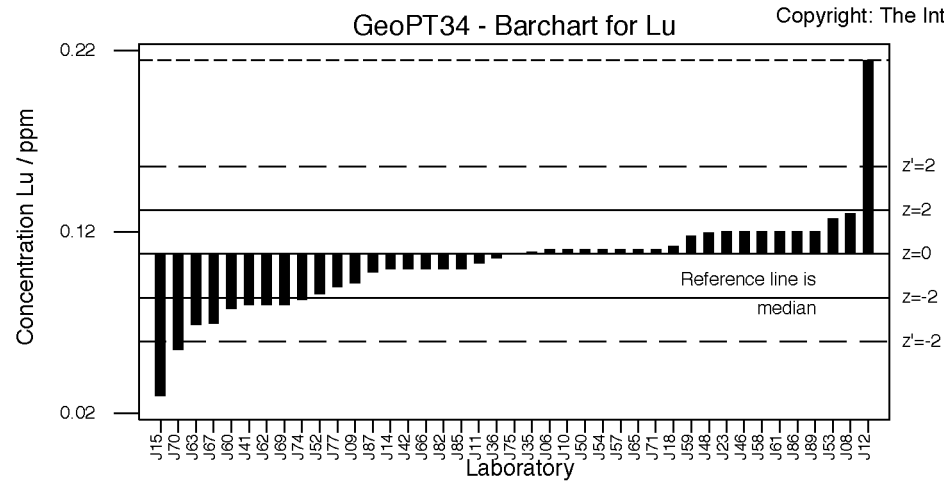


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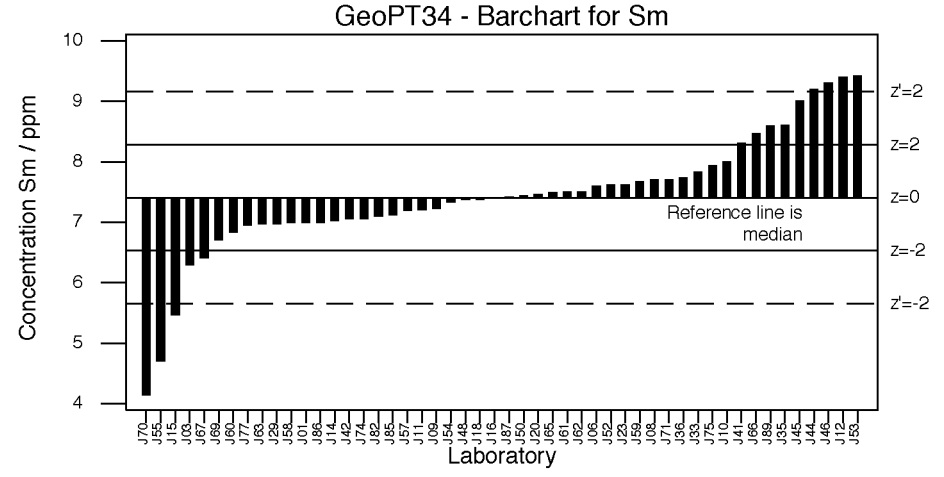
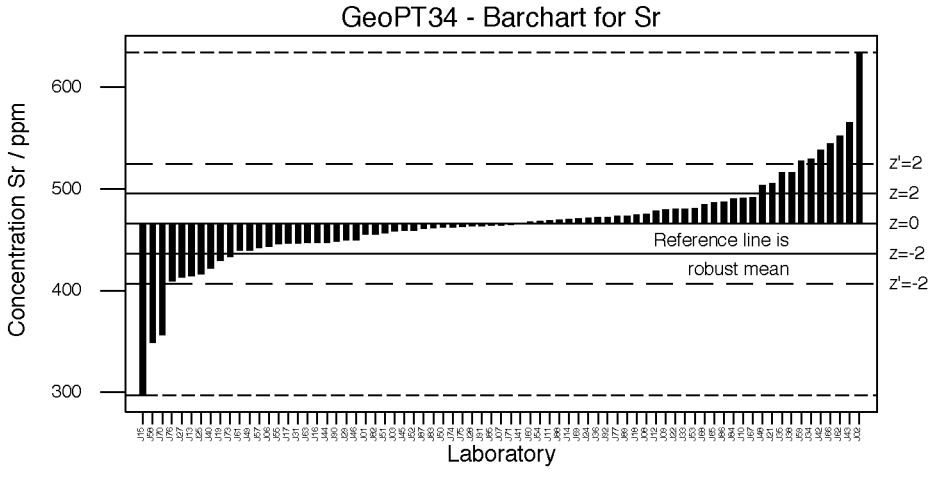
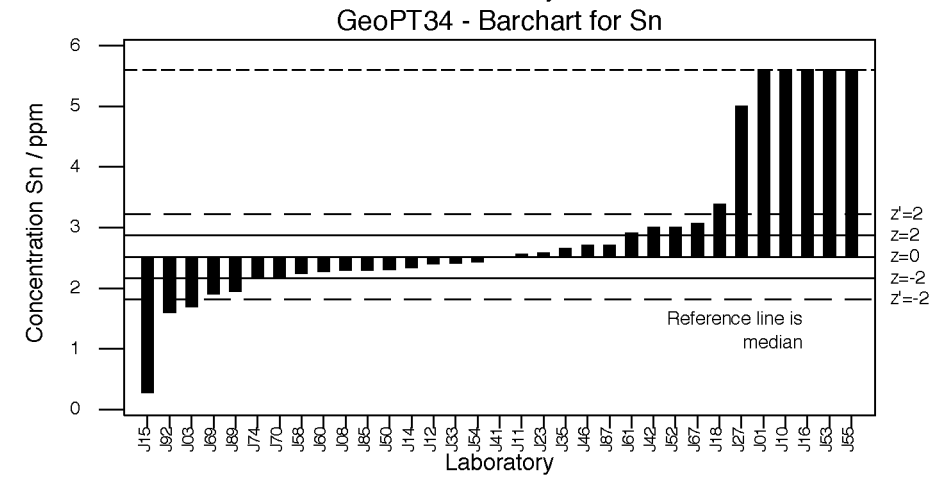
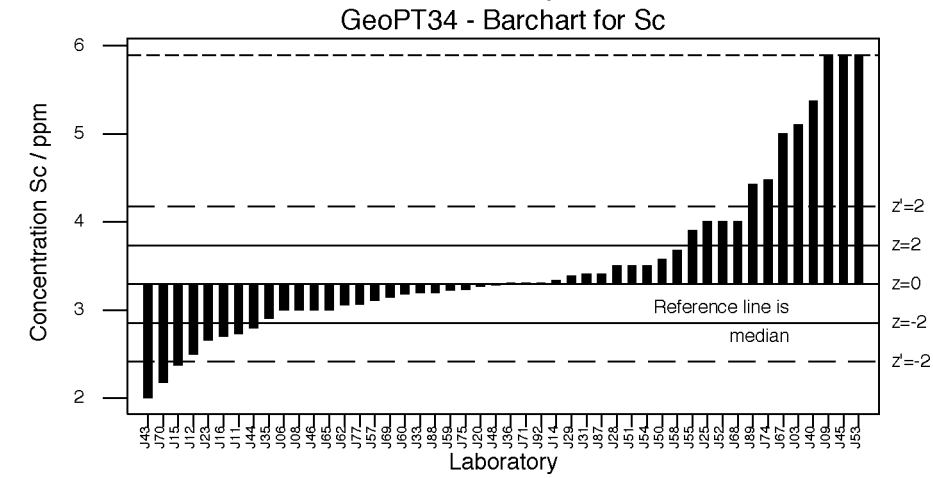
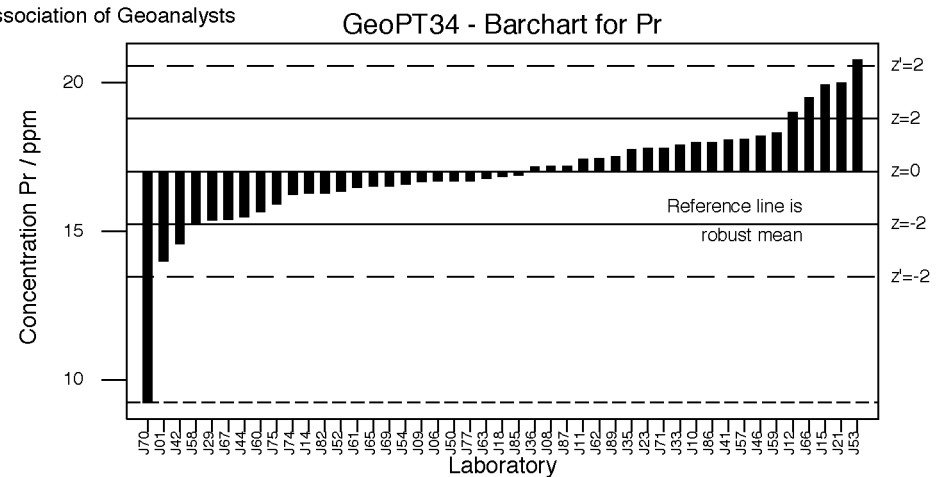
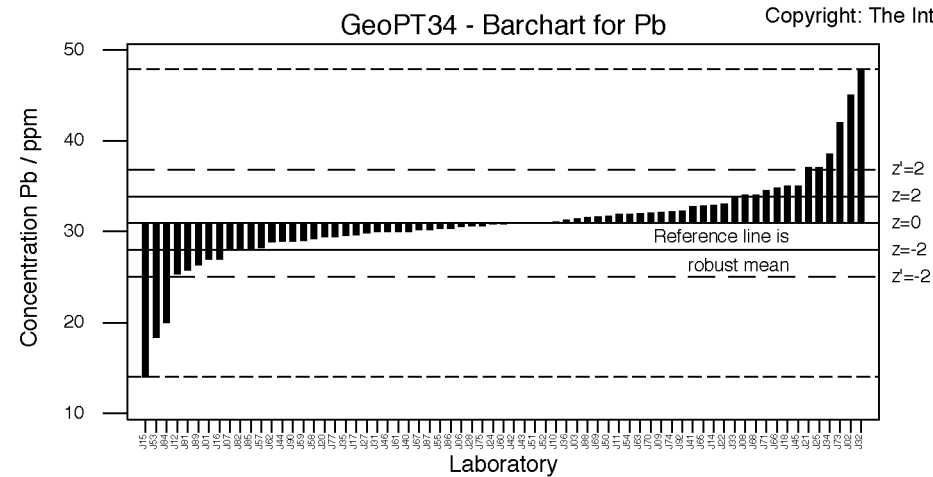


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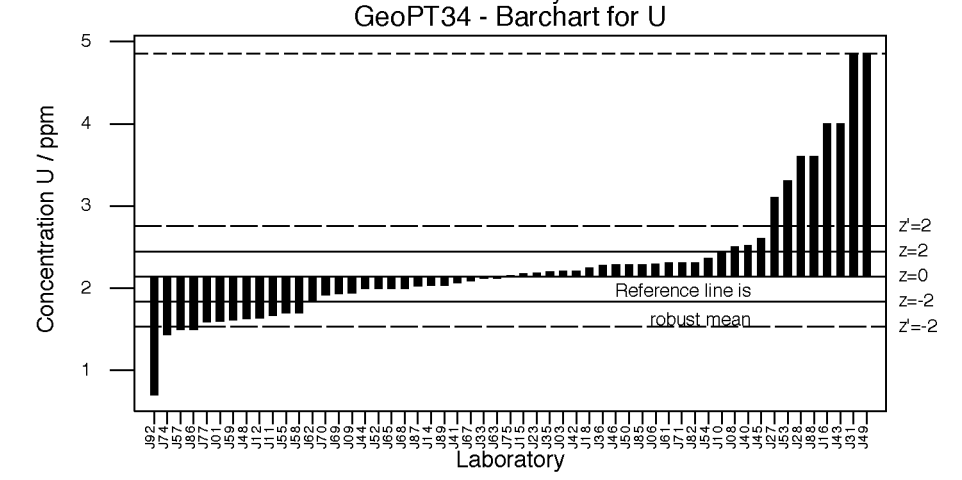
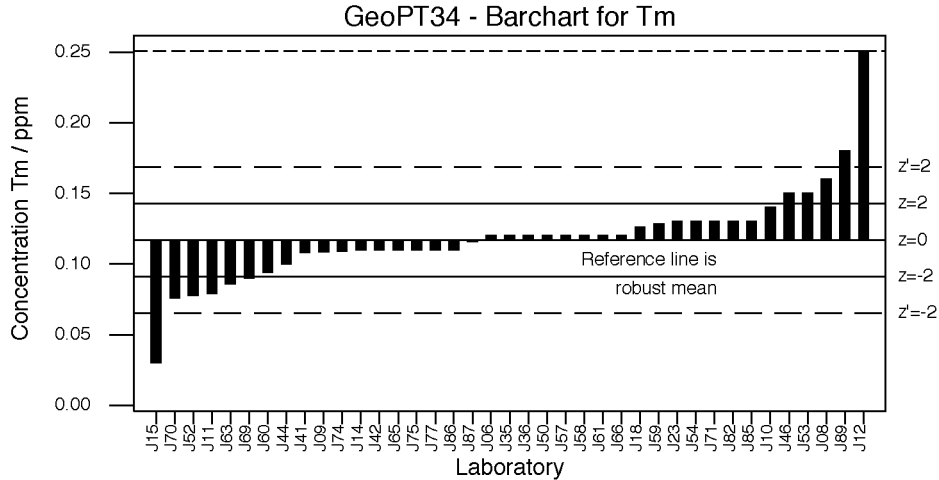
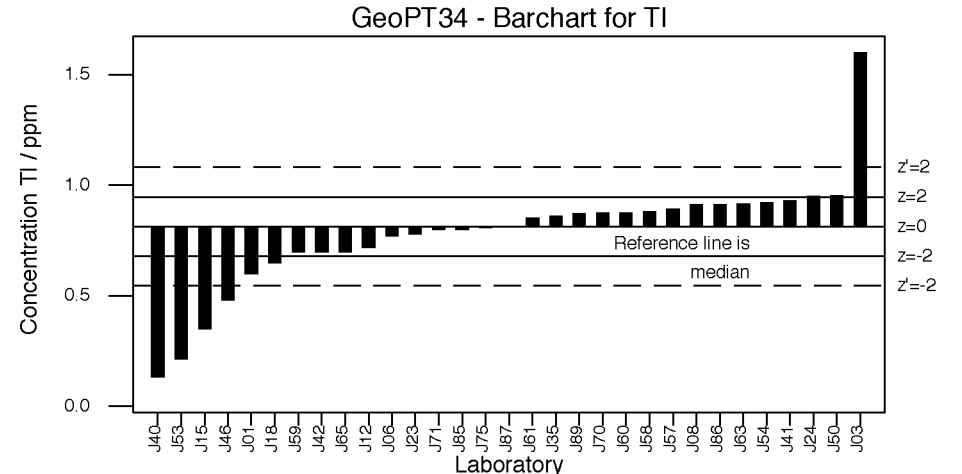
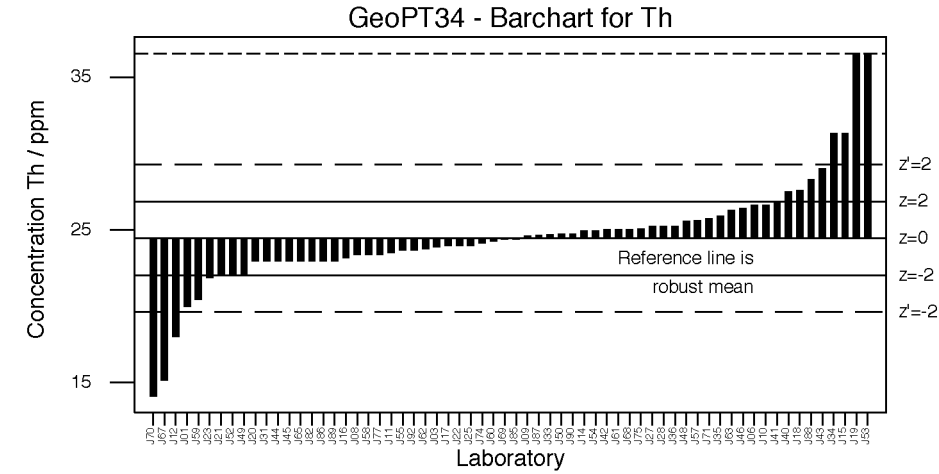
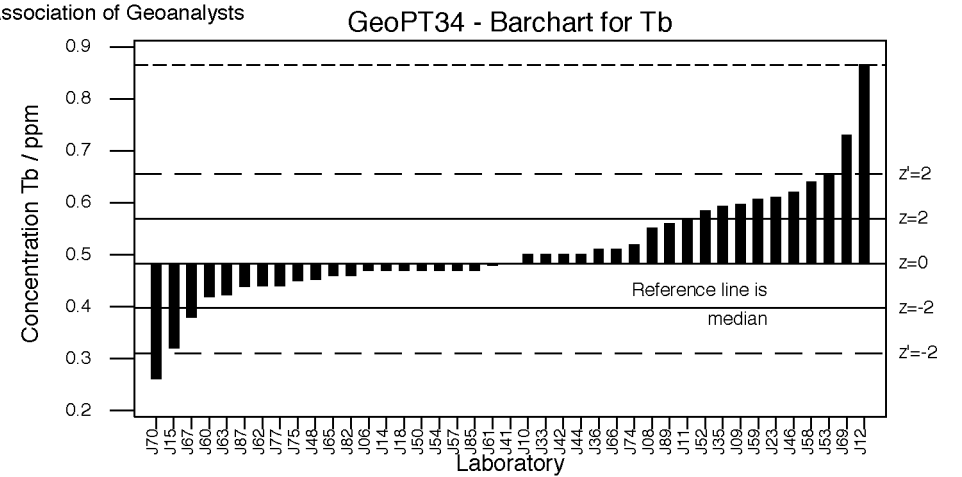
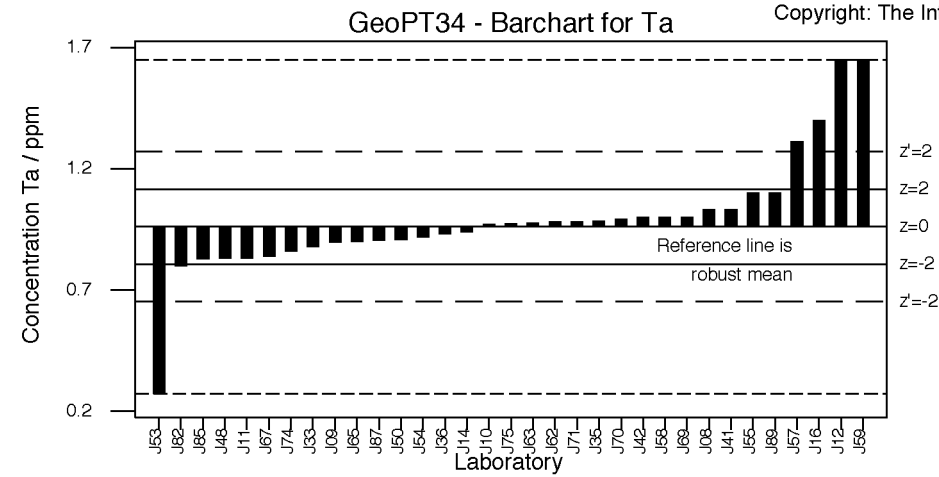


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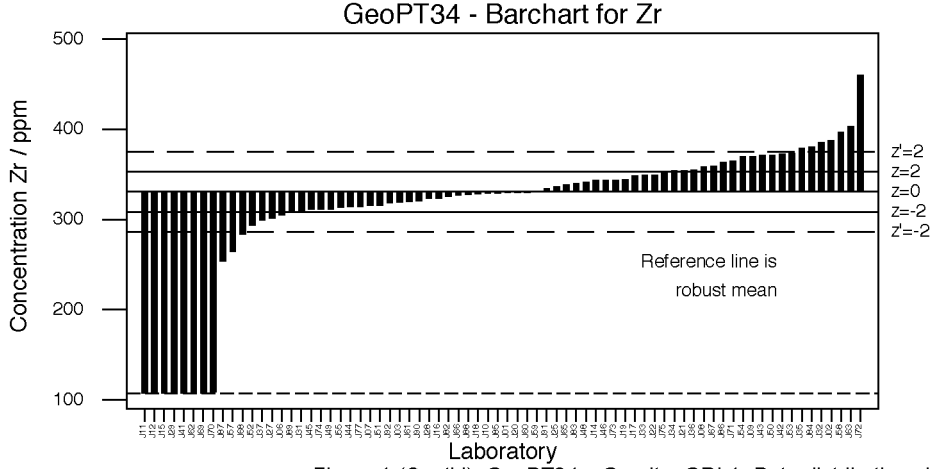
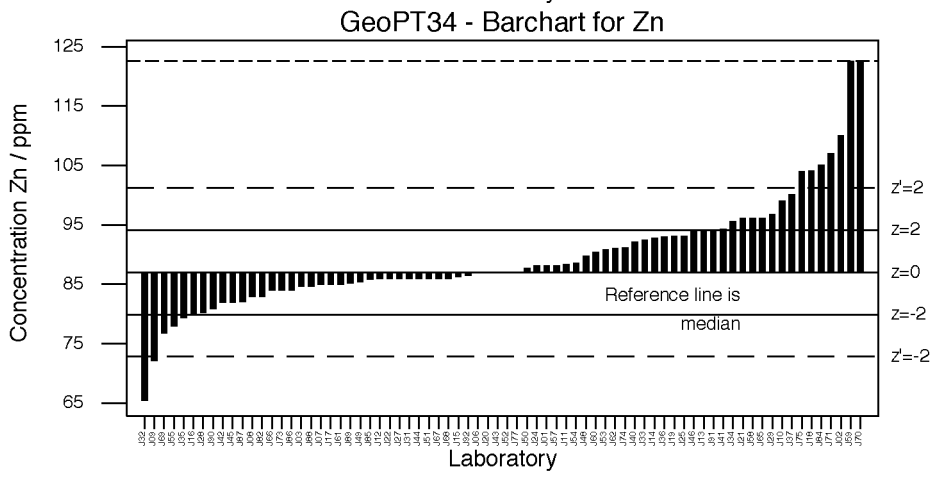
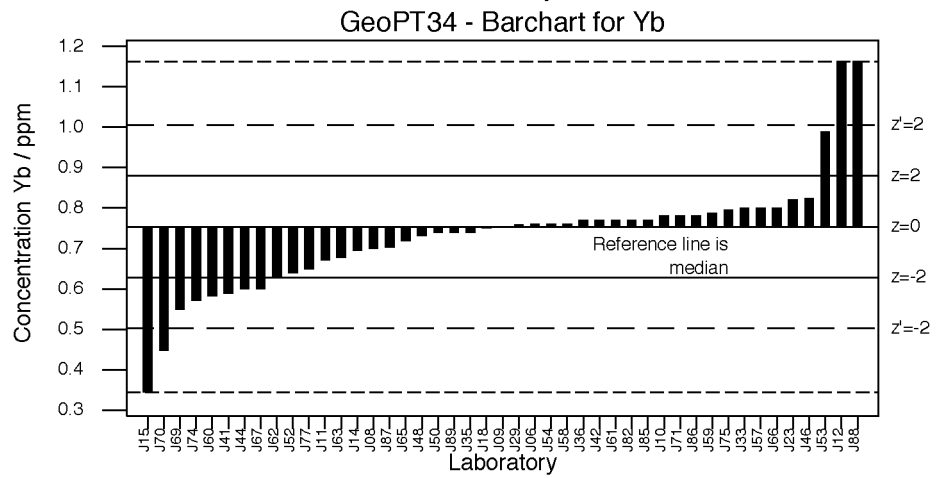
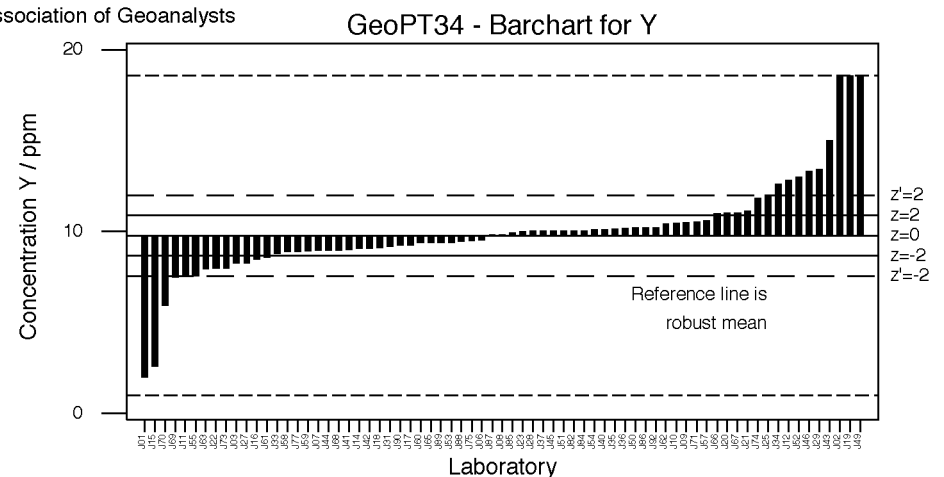
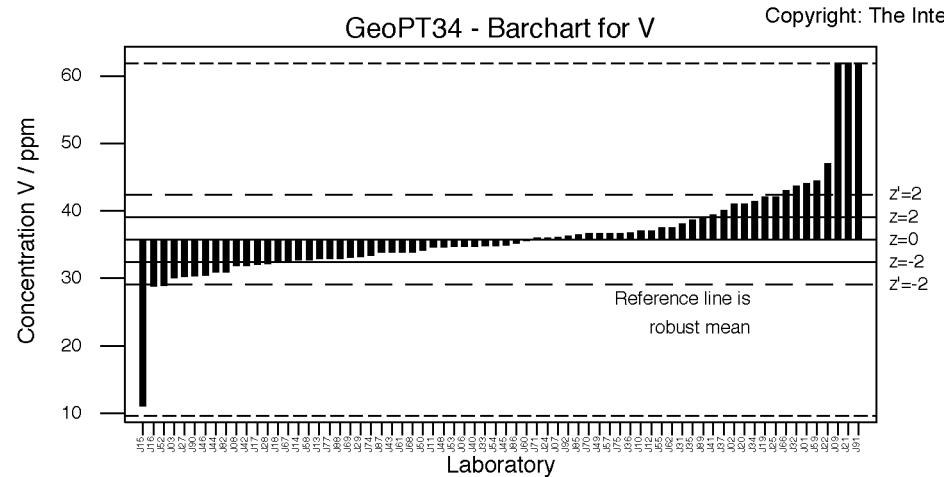


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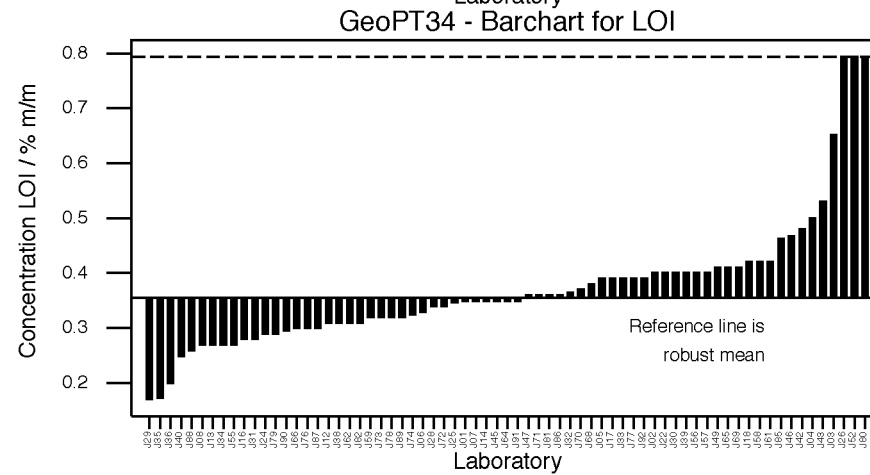
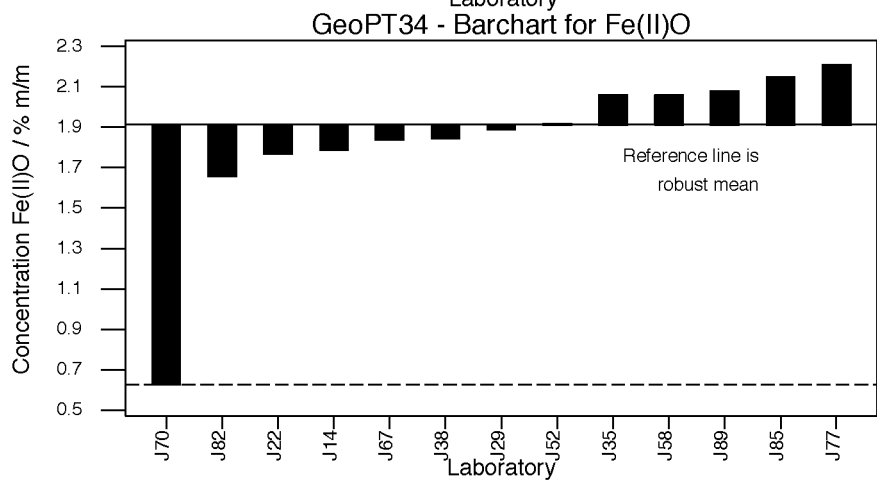
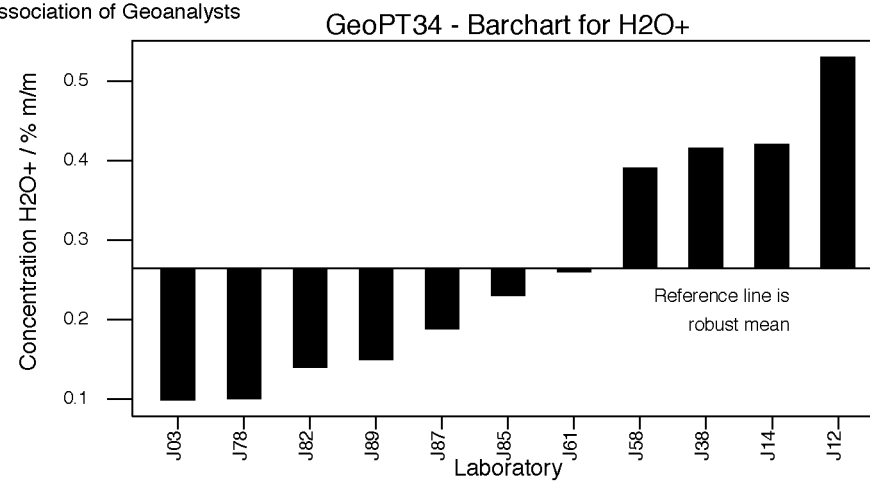
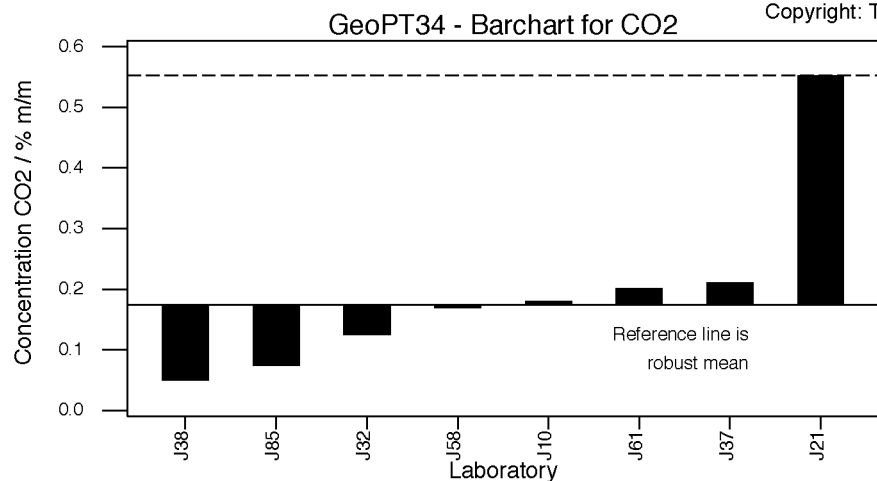


Figure 2 : GeoPT34 – Granite, GRI-1. Data distribution charts provided for information only for elements for which values could not be assigned.

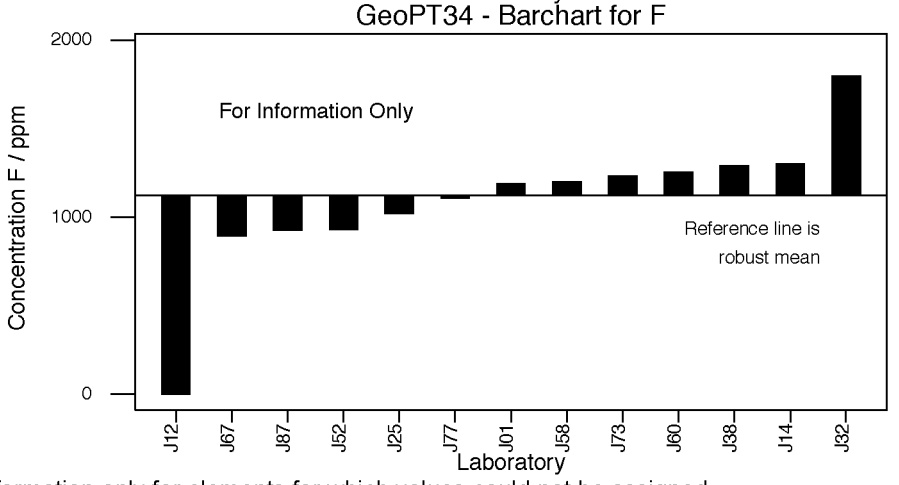
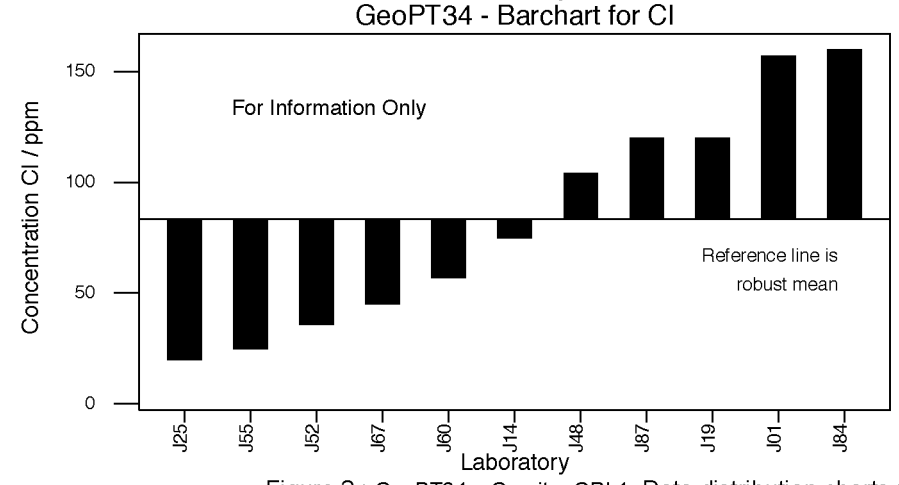
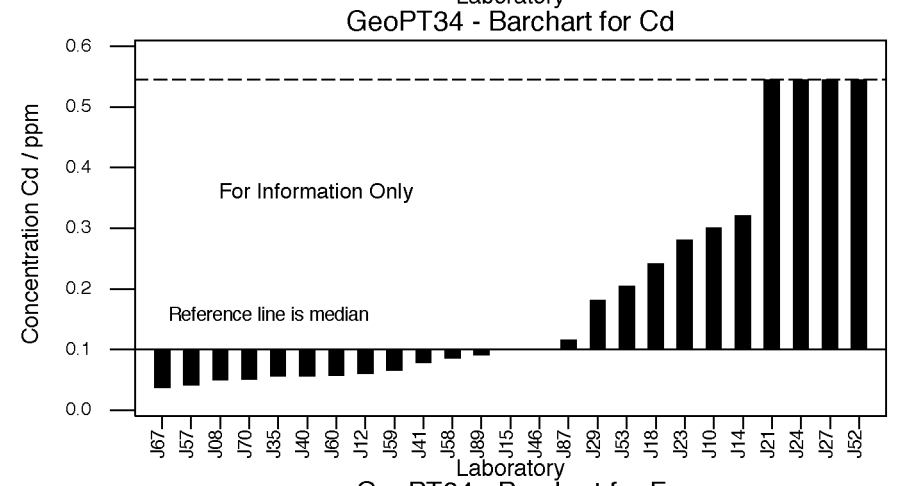
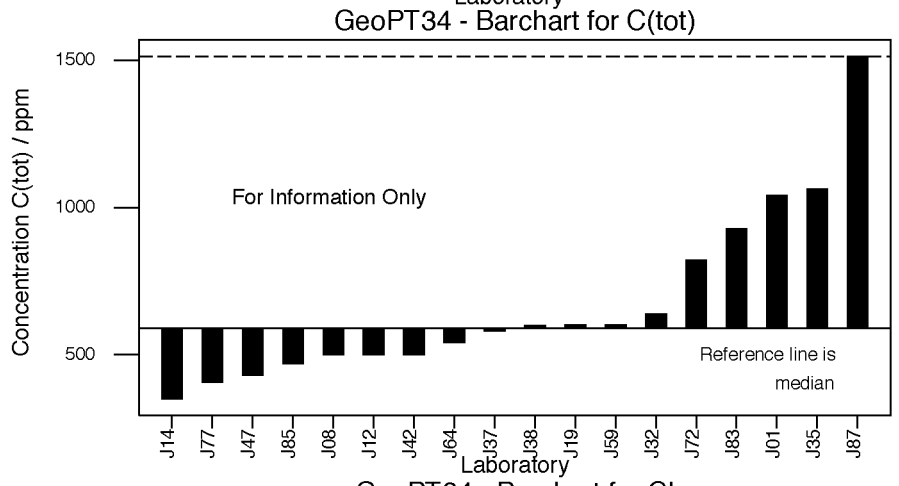
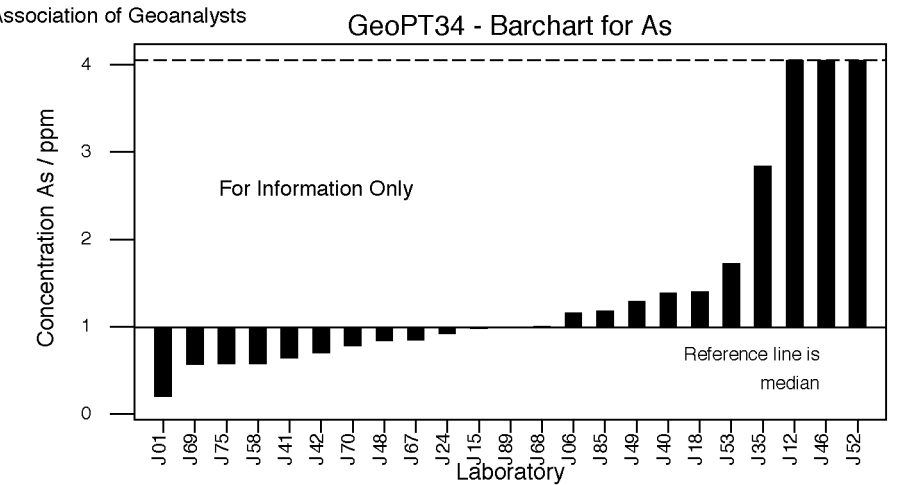
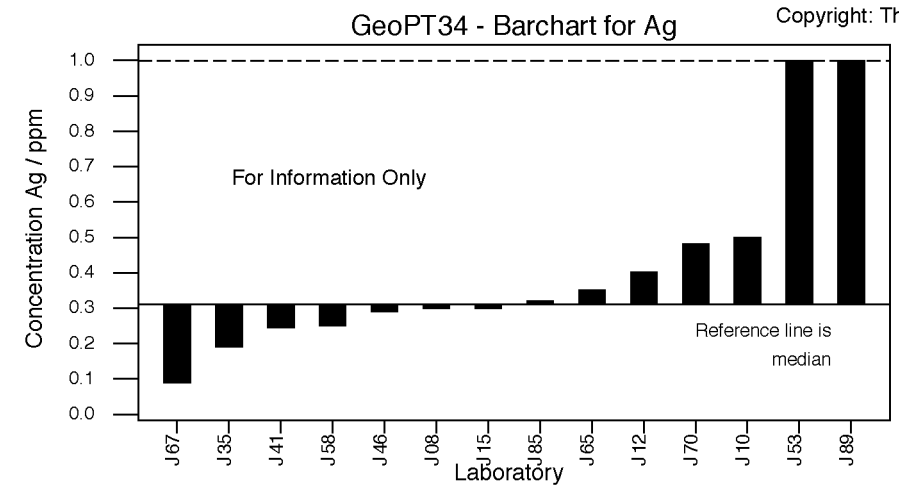


Figure 2 : GeoPT34 – Granite, GRI-1. Data distribution charts provided for information only for elements for which values could not be assigned.

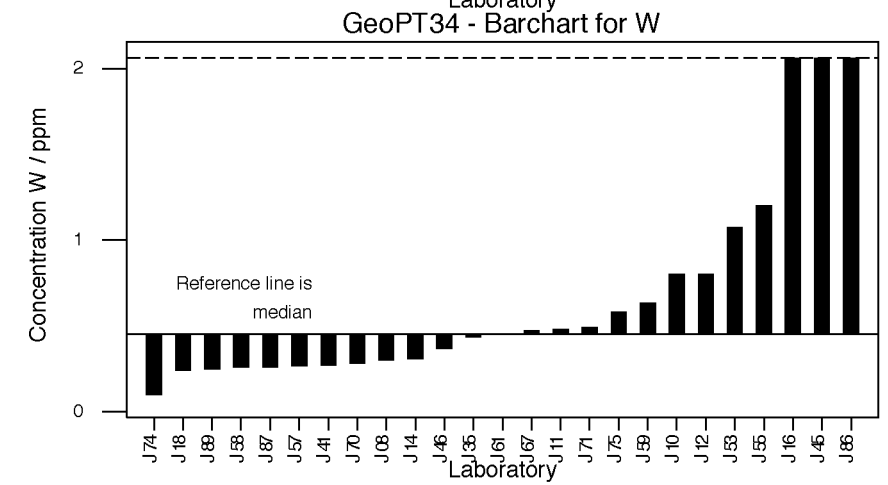
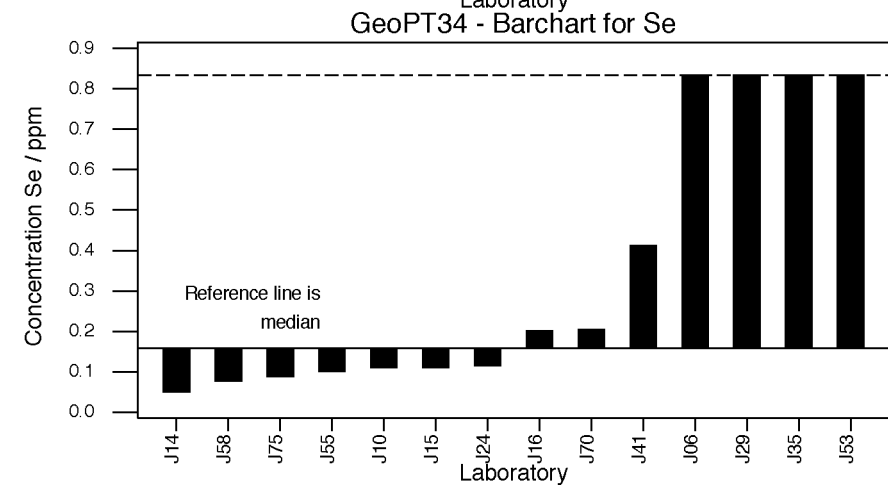
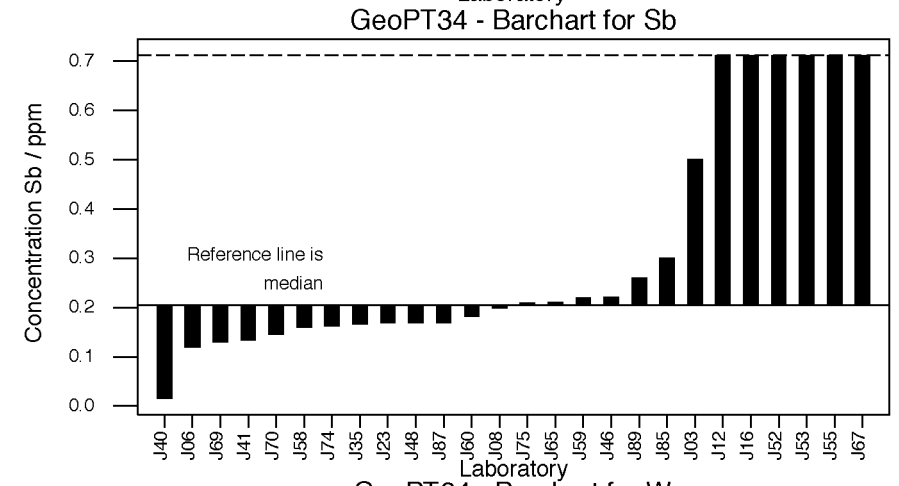
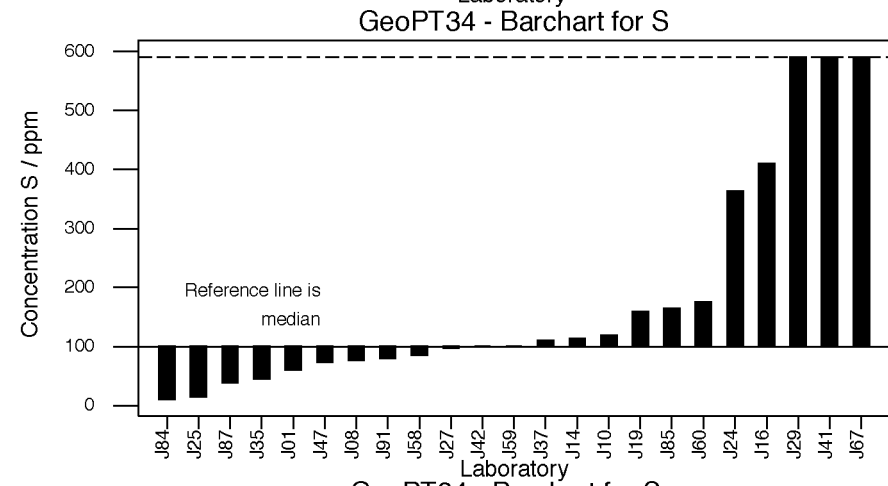
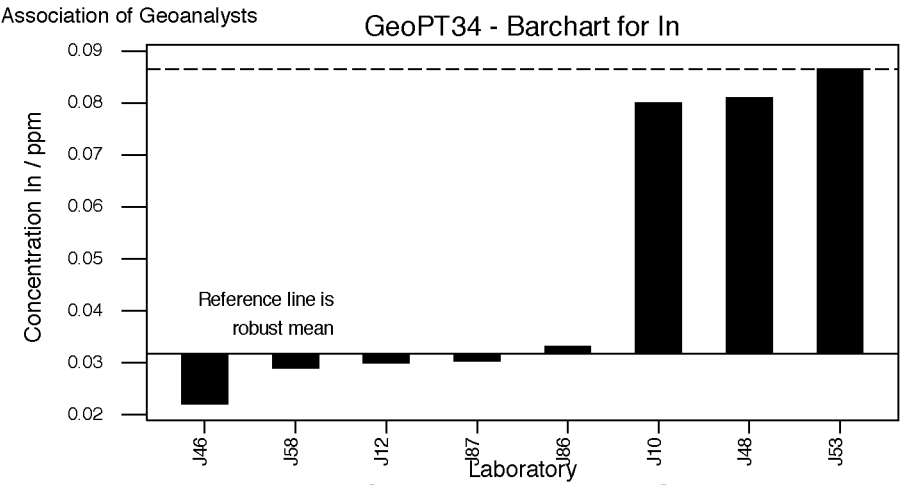
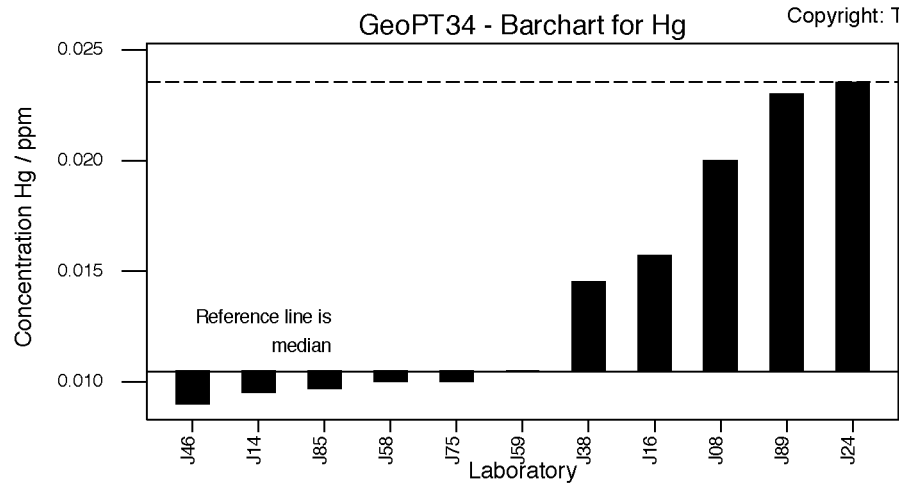


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Multiple z-score chart for GeoPT34

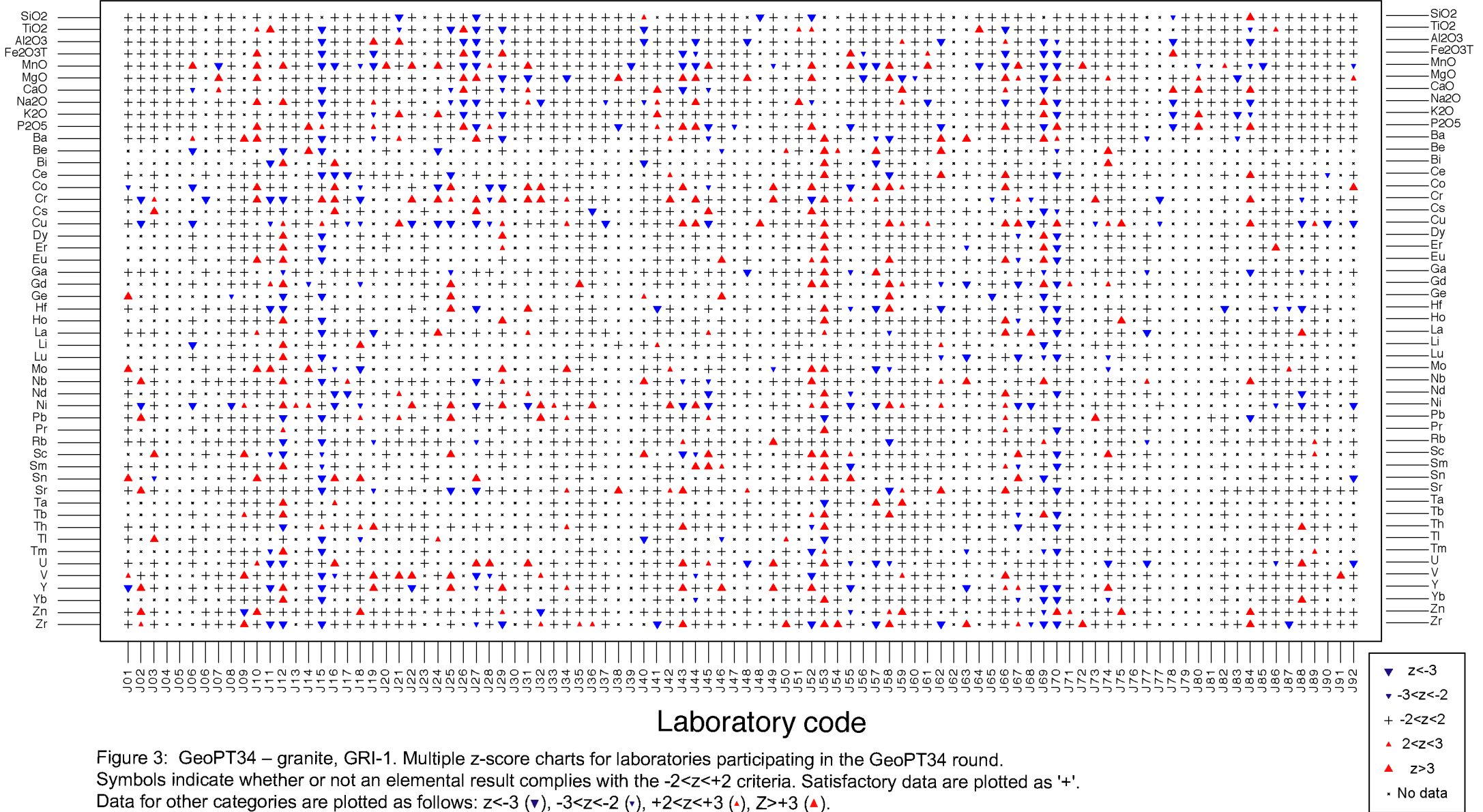


Figure 3: GeoPT34 – granite, GRI-1. Multiple z-score charts for laboratories participating in the GeoPT34 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < 2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ (∇), $-3 < z < -2$ (\triangledown), $+2 < z < 3$ (\blacktriangle), $Z > +3$ (\blacktriangle).