Geo*PT*53 — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 53 (Tonalite, TLB-1) / July 2023

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Abstract

Results are presented for Round 53 of the Geo*PT* Proficiency Testing programme for analytical geochemistry laboratories organised by the International Association of Geoanalysts (IAG). The test material distributed in this round was the Tonalite, TLB-1, offered by Dr Wiedenbeck of Deutsches GeoForschungsZentrum, GFZ, Potsdam. In this report, the data contributed by 100 laboratories are listed, together with an assessment of consensus values, consequent *z*-scores and a series of charts to show for each analyte the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This fifty-third round of Geo*PT*, the international proficiency testing programme for geoanalytical laboratories, was conducted in a similar manner to earlier rounds (reports listed in the Appendix). The programme is designed to be a key part of the routine quality assurance procedures employed by an analytical geochemistry laboratory. It is organised by the International Association of Geoanalysts and is conducted in accordance with a published protocol (IAG, 2020). The overall aim of the programme is to provide participating laboratories with information on their performance in the form of *z*-scores for each reported measurement result so that individual laboratories can decide whether the quality of their data is satisfactory in relation both to their chosen fitness-for-purpose criteria and to the performance of other laboratories participating in this round. In circumstances where a *z*-score from a reported result is unsatisfactory, a participating laboratory is encouraged to investigate for unsuspected analytical bias and to take corrective action when it appears justified.

Steering Committee for Round 53:

P.C. Webb (administrator and results assessor), P.J. Potts (results reviewer), C.J.B. Gowing (distribution manager), M. Thompson (statistical advisor), M. Wiedenbeck (supplier of TLB-1 material).

Timetable for Round 53:

Distribution of sample: April 2023
Results accepted from: 15th May 2023
Results submission deadline: 5th July 2023
Release of report: July-August 2023

GeoPT53 Test Material Details

The Tonalite test material, TLB-1, was collected by Dr Sarah Glynn of Witwatersrand University from an abandoned quarry just outside of Barberton Town, Mpumalanga Province, South Africa and processed both at the Deutsches GeoForschungsZentrum GFZ, Potsdam by Dr Glodny, and at the British Geological Survey (BGS), Keyworth, where it was divided and packeted under the direction of Dr Charles Gowing.

The test material was evaluated for homogeneity by ICP-MS at the BGS and an assessment of the results showed that this material was sufficiently homogeneous to be suitable for use in this proficiency test.

Submission of Results

For Geo*PT*53 (TLB-1), a total of 3483 measurement results, submitted by 100 laboratories are listed in Table 1. We are pleased that the number of laboratories reporting is significantly higher than the disappointing level of participation in Round 52 of Geo*PT*. Of the measurements submitted, 1643 results were designated by their originators as data quality 1 (see the ***z*-score analysis section** below for explanation of data quality) and are shown in **bold**, whereas 1840 results were specified as data quality 2 and are shown underlined. Results from all laboratories submitting data were used to assess consensus values for each measurand.

Laboratories coded S45 and S81 reported all of their trace element **results in g/100g instead of mg/kg**, which is **counter to instructions** and will result in their z-scores being hugely inflated. Thankfully, no laboratories reported values of '0' (i.e. zero) in this round. However, it is apparent that a few laboratories reported **results for Cl in units of g/100g instead of mg/kg**. As a result of inappropriate reporting **we must firmly remind participants** that **measurement results** of **all constituents listed as elements should be reported in mg/kg**. Please be aware that **erroneous results cannot be altered or removed once they have been submitted** and that corresponding ***z*-scores will be adversely affected**.

Assigned values and results summary

Following procedures described in earlier rounds, and detailed fully in the Geo*PT* protocol (IAG, 2020), robust statistical procedures were used to derive consensus values for measurands in this test material: these consensus values being judged to be the best available estimates of its true composition. Values were credited with assigned status on the basis that: i) sufficient laboratories (15 or more) had contributed data for effective estimation of the consensus, ii) visual assessment gave confidence that a substantial proportion of the results distribution was symmetrically disposed about the consensus value, iii) the ratio of the uncertainty in the location estimate to the target precision was an acceptably small value, and iv) an evaluation of measurement results by analytical procedure – including both the method of analysis and the form of sample preparation – indicated either that no significant procedural bias was discernible amongst measurement results from which the consensus was derived or that sufficient data judged to be unbiased was available from which the consensus value was determined. Where these criteria were largely, but not fully met, or where obvious anomalies in the dataset could be accommodated by judicious selection of the consensus, values were credited with 'provisional' rather than 'assigned' status.

Data assessments involved an examination of barcharts showing the distribution of results contributed for each measurand (as presented in Figures 1 and 2). In addition, a variety of plots, permitting discrimination of data by method of measurement and by sample preparation procedure, as developed by Thomas Meisel using the statistical package 'R' and made available using the Shiny App (*https://www.shinyapps.io*), were also examined. This approach enabled us, when necessary, to refine the selection of consensus values by taking account of data distributions according to measurement procedure. As notified to participants in 2022, the facility now exists for participants to inspect for themselves Geo*PT* data distributions in a similar way using Shiny App graphics through the link: *https://geoanalyst.shinyapps.io/GeoPTcommon2/*. This enables you to view all data submitted according to: the principle of measurement, the method of sample preparation, and the chosen fitness-for-purpose criterion, using several forms of graphic.

Consensus values derived from the contributed data are listed in Table 2. They were provided in 19 instances by the Huber robust mean, a procedure that accommodates outliers, but is unreliable when a dataset is skewed. In such circumstances, the median is often a more robust estimator of the consensus and was employed in 19 cases. For more severely skewed and strongly tailed datasets, the median may not be a suitable estimator and a mode can often provide a more effective means of estimating the location of the consensus. In this round the use of a mode as a consensus estimator was preferred in 19 cases, and in 9 of those, the distribution of data was sufficiently compatible with the conditions outlined above to justify the designation as an assigned value. Although the choice of a mode may sometimes be used to 'fine tune' the location of the consensus, the use of modes in this round was most often necessary because datasets were skewed. Sometimes the source of the skew can be attributed to a known analytical problem. The procedure used to determine modes was mostly as described by Thompson (2017) involving the estimation of the mass fraction corresponding to the maximum value of the kernel density distribution for the dataset. Such modes can provide a robust estimate of the consensus location that represents

the most coherent part of the data distribution where the data are often symmetrically disposed, although the dataset as a whole may be asymmetric.

Table 2 lists consensus values distinguished as assigned or provisional for 11 major components and 46 trace elements in Geo*PT*53 (TLB-1). Barcharts for datasets from which these consensus values were derived are shown in Figure 1. Statistical data, consensus values and status designations are listed in full in Table 2 for the 57 analytes: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, LOI*, Ag*, Ba, Be, Bi*, Cd*, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge*, Hf, Ho, In*, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb*, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W*, Y, Yb, Zn and Zr*. Of these, the measurands of the 9 analytes marked '*' were credited only with provisional status. Provisional status was conferred because either: i) a relatively small number of results (less than 15, but at least 8) contributed to the consensus, or ii) the results were unduly dispersed in relation to the target value, or iii) the distribution of results was significantly skewed, or iv) the dataset was affected by bias in one or more methods employed but the remaining data defined a viable consensus.

Bar charts for the 8 analytes: Fe(II)O, H_2O^+, CO_2, As, C(tot), Cl, F and S are plotted in Figure 2 for information only, as the data were either insufficient in number, or the distribution was too highly skewed or too highly dispersed for a sufficiently reliable determination of a consensus for the estimation of *z*-scores.

Many data distributions were remarkably regular in this round, especially those of the major elements and rare earth elements. Several of the distributions recognised as provisional were only just acceptable, however. This applies especially to LOI, Ag, Cd, and Zr. The LOI data distribution is significantly dispersed but fairly symmetrical about the chosen consensus, justifying the provisional status. Indeed for LOI, the Horwitz criterion may be too stringent given the nature of the LOI measurement — for example, at a mass fraction of ca. 1 g/100g a relative precision of less than 2% relative would seem quite optimistic. For both Ag and Cd, a significant proportion of the data had variable values well in excess of the consensus, thus forming strikingly high tails. It was considered that on balance, however, that sufficient values were in close agreement to regard the mode-defined consensus, based on 8 or more coherent results, as a provisional value. The Zr provisional value is a somewhat tentative value for other reasons. Inspecting the measurement procedures used, the majority of XRF powder pellet data and much of the ICP-MS acid digestion data appear to be biased to low values compared to XRF fusion disc and ICP-MS fusion data as shown in Figure 0.1. We do not fully understand why the XRF powder pellet data should give low Zr mass fractions, but have greater confidence in the data by XRF and ICP-MS involving fusion methods. The consensus value for Zr provided by the mode of the whole distribution is close to the consensus of XRF and ICP-MS fusion results, but

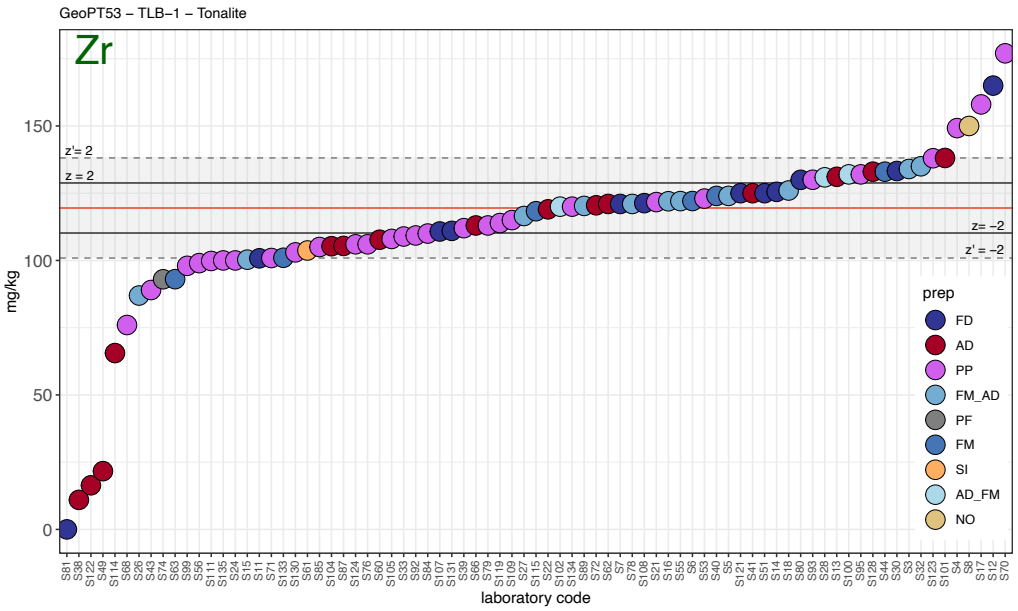


Figure 0.1 A sequential data distribution plot for TLB-1 of sorted Zr results distinguished according to method of sample preparation where there is obvious bias between populations of powder pellet (XRF – *labelled PP*) and fusion (ICP-MS and XRF – *labelled FD, FM, FM_AD and AD_FM*) results. Key to sample preparation: FD – Fusion disc, AD – Acid digestion, PP – Powder pellet, FM_AD – Fusion and acid digestion, PF – Powder on film, FM – Fusion melt, Si – Sintering, AD_FM – Acid digestion and fusion of the residue, NO – No preparation.

may, nevertheless, be a slight underestimate, and therefore can have only provisional status.

Similar, but less marked, differences in the distribution of XRF powder pellet results in comparison to fusion values is noted for Ba, Cr, Ni and V. Where this occurs the suspicion is that the powder pellet results are biased and the choice of consensus value was chosen to reflect more closely the results produced by other methods.

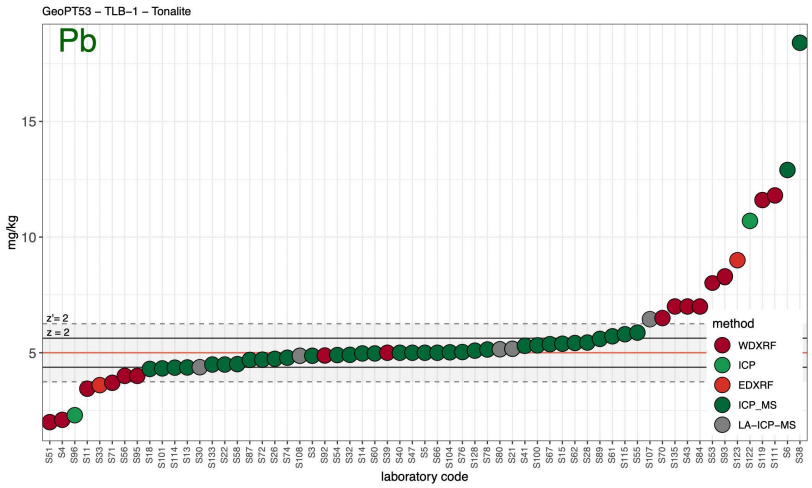


Figure 0.2 A sequential data distribution plot for TLB-1 of sorted Pb results distinguished according to method of measurement where dispersion of XRF data is markedly greater than that of ICP-MS and the XRF data contribute most to the high tail. Key to methods: WDXRF – Wavelength dispersive XRF; ICP – Inductively coupled plasma - atomic/optical emission spectrometry; EDXRF – Energy dispersive XRF; ICP-MS – Inductively coupled plasma - mass spectrometry; LA-ICP-MS – Laser ablation - inductively coupled plasma - mass spectrometry.

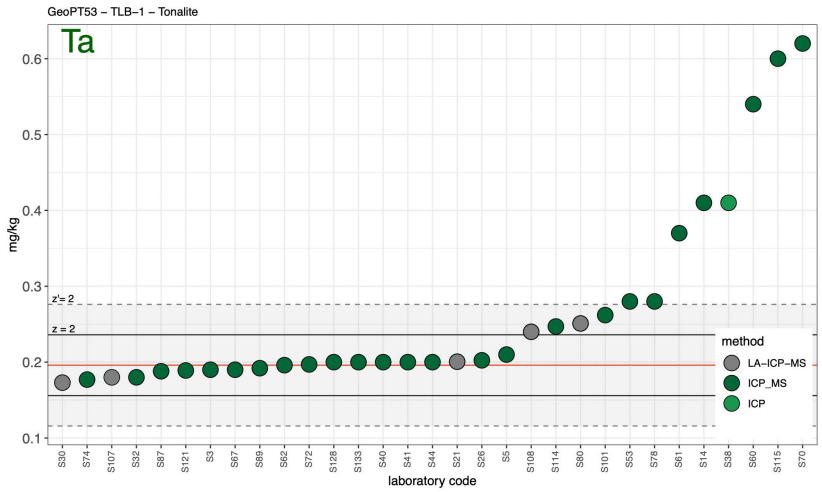


Figure 0.3 A sequential plot for TLB-1 of sorted Ta results distinguished according to method of sample preparation typifies several data distributions. There is a striking high tail that involves no XRF results, demonstrating that some ICP-MS systems do not perform to the same standard as many others. Key to methods as for Figure 0.2.

For several elements there are significant high tails resulting in skewed datasets necessitating the use of modes as consensus values. This applies especially to Ge, Pb, Sb, Sn, Ta, Th, U and W. In some cases, such as for As, Pb, Th, U and W, and shown for Pb in Figure 0.2, a significant proportion of the anomalous results are XRF measurements that are too close to the detection limit of the method and are susceptible to poor precision, in contrast to the ICP-MS results with detection limits that are at least an order of magnitude smaller. In other cases, however, such as for Ge, Sb, and Ta, as shown for Ta in Figure 0.3, both the coherent data and the data responsible for the high tails are dominantly by ICP-MS, indicating that some laboratories using this method perform poorly in relation to many others.

For several elements, such as Co and Cu, it is apparent that the distributions of ICP-MS results are more tightly constrained than for XRF results as is to be expected owing to the poorer precision of the XRF method when approaching its detection limit. However, there is little evidence of a comparable differential between the respective data for Y for which the XRF detection limit is expected to be lower than it is for Co and Cu.

As is often the case, some sets of results, including those of TiO_2, MnO, MgO, P_2O_5, Co, Cu, Lu, Pb, Rb and Sc feature notably stepped distributions caused by over-rounding of much of the contributed data. We continue to recommend that for proficiency testing purposes all measurements should be quoted to **at least one decimal place more than would be routinely presented** to a client. This recommendation would enable our statistical procedures to define the consensus more effectively. It is especially relevant to distributions of major element components and trace elements when reported at low mass fractions.

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.

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.

The **standard deviation for proficiency** (σ_{pt}) – also referred to as the target precision – for each measurand assessed was calculated from a modified form of the Horwitz function as follows:

$$\sigma_{pt} = k.x_{pt}^{0.8495}$$

Where x_{pt} is the mass fraction of the element; the factor k = 0.01 for pure geochemistry laboratories (quality 1) and k = 0.02 for applied geochemistry laboratories (quality 2).

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

$$z_i = [x_i - x_{pt}] / \sigma_{pt}$$

Where x_i is the contributed measurement result, x_{pt} is the assigned (or provisional) value and σ_{pt} is the target standard deviation (all as mass fractions). *Z*-scores for results contributed to Geo*PT*53 are listed in Table 3. Those of results designated as data **quality 1** are shown in **bold**: those of data quality 2 are shown underlined. *Z*-scores derived from *provisional value*s of measurands are shown in *italics*.

Participating laboratories are invited to assess their performance using the following criteria:–

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 participating laboratory). If the *z*-score for an element falls outside this range, more especially if it is outside the range $-3<z<3$, laboratories are advised to examine their procedures, and if necessary, take appropriate action to ensure that their determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories for this round is plotted in multiple *z*-score charts in Figure 3. In these charts, the *z*-score performance for each element is distinguished by symbols that make it easy to identify whether the results from your laboratory were satisfactory or gave *z*-scores that exceeded the action limits. This chart is designed to help individual laboratories judge their overall performance in this proficiency testing round. Participants should always review their *z*-scores in accordance 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 Round 54, the test materials for which will be distributed during September 2023.

Acknowledgements

The authors once again thank Andrea Mills (BGS) for much-valued assistance in distributing these samples and Thomas Meisel (Montanuniversität Leoben, Austria) for both maintaining the system and developing procedures involving the package 'R' and the Shiny App which has greatly assisted in the investigation of data according to analytical procedure, provided the graphics featured in Figures 0.1, 0.2 and 0.3, as well as facilitating the analysis of datasets involving modes derived according to Thompson (2017).

References

IAG (2020) Protocol for the operation of the Geo*PT* Proficiency testing scheme. International Association of Geoanalysts (Keyworth, UK), 18pp. *http://www.geoanalyst.org/wp-content/uploads/2020/07/GeoPT-revised-protocol-2020.pdf*.

Meisel, T. C., Webb, P. C., and Rachetti, A. (2022). Highlights from 25 Years of the Geo*PT* Programme: What Can be Learnt for the Advancement of Geoanalysis. *Geostandards and Geoanalytical Research*. *https://onlinelibrary.wiley.com/doi/10.1111/ggr.12424*

Potts P.J., Webb P.C. and Thompson M. (2014) Bias in the determination of Zr, Y and rare earth element concentrations in selected silicate rocks by ICP-MS when using some routine acid dissolution procedures: Evidence from the Geo*PT* proficiency testing programme. *Geostandards and Geoanalytical Research*, 39, 403–416.

Thompson, M. (2017) On the role of the mode as a location parameter for the results of proficiency tests in chemical measurement. *Anal. Methods*, **9**, p.5534-5540.

References of more general relevance

Potts P.J., Webb, P.C. and Thompson M. (2013) An assessment of performance in the routine analysis of silicate rocks based on an analysis of data submitted to the Geo*PT* proficiency testing programme for geochemical laboratories (2001–2011) *Geostandards and Geoanalytical Research*, **37**, 403–416.

Potts P.J., Thompson M., and Webb, P.C. (2015) The reliability of assigned values from the Geo*PT* proficiency testing programme from an evaluation of data for six test materials that have been characterised as certified reference materials. *Geostandards and Geoanalytical Research*, **39**, 407–417.

Potts P.J., Webb, P.C. and Thompson M. (2019) The Geo*PT* proficiency testing programme as a scheme for the certification of geological reference materials. *Geostandards and Geoanalytical Research*, **43**, 409–418.

Potts P.J. and Webb, P.C (2019) An evaluation of methods for assessing the competence of laboratories based on performance in the Geo*PT* proficiency testing scheme. *Geostandards and Geoanalytical Research*, **43**, 217–22.

Webb, P.C., Potts P.J., Thompson M., Wilson, S.A. and Gowing, C.J.B. (2019) The long-term robustness and stability of consensus values as composition location estimators for a typical geochemical test material in the Geo*PT* proficiency testing programme. *Geostandards and Geoanalytical Research*, **43**, 397–408.

ADDENDUM
— IMPORTANT NOTICES TO ANALYSTS

New procedural coding for Round 53

The facility to use the new **analytical technique and sample preparation codes** available for this round has had poor take-up. For the future, where relevant, please revise your procedure definition to specify the codes **LA-ICP-MS for laser ablation-ICP-MS measurement and either NP for nano-particulate pellets or FD for glass discs** to provide more accurate definitions of procedures in subsequent rounds. **Note** that in Figures 0.2 and 0.3 LA-ICP-MS designations have been shown according to descriptions of the technique used in 4 cases, and not by the technique coding provided.

Change in uncertainty estimation, 2020

Note that a change was made to the algorithm for the estimation of the uncertainty of median values and implemented for the first time in Round 47/47A. As described in the revised Geo*PT* protocol (IAG, 2020), median uncertainties are increased by a factor of 1.2533 compared to those reported prior to that date. Therefore, uncertainty values reported for median estimates in previous rounds should be increased by this factor.

Explicit advice to analysts for reporting of procedures involving ignition and fusion

Note that some laboratories are still listing their procedure for determining LOI as the same as that employed for major elements, rather than providing separate, specific details. We must remind analysts that it is important to provide information that is appropriate for every analyte. Indeed, analysts reporting measurement results for procedures involving fusion, sintering or ignition, and in particular, LOI determinations, should specify the correct method used and give details both of the temperature used and where appropriate, the end-point criterion, e.g., the duration of ignition. This information should be supplied in the description of the relevant **Procedure,** as **Additional Details**.

We recommend that details of gravimetric procedures are included under **Analytical Technique details** rather than under **Sample Preparation details**. For gravimetric analysis, other than drying, which should in any case be carried out according to our instructions, there is no other sample preparation involved.

Participant access to graphical displays of Geo*PT* data distributions

As previously reported, participants can now view their data according to analytical procedure online, using the Shiny App implementation produced and arranged by Thomas Meisel:
https://www.geoanalyst.shinyapps.io/GeoPTcommon2

Appendix 1

Publication status of proficiency testing reports.

Previous reports are available for download from the IAG website (*http://www.geoanalyst.org/*).

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

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

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

Geo*PT*4
Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
Geo*PT*4. 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).

Geo*PT*5
Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
Geo*PT*5. 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).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix 1 (Cont'd)

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

Geo*PT*23
Webb, P.C., Thompson, M., Potts, P.J., Watson, J.S. and Kriete, C. (2008)
Geo*PT*23 - 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, Keyworth. Unpublished report.

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

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

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

Geo*PT*27
Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2010)
Geo*PT*27 - an international proficiency test for analytical geochemistry laboratories - report on round 27 / July 2010 (Andesite, MGL-AND). International Association of Geoanalysts, Keyworth. Unpublished report.

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

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

Geo*PT*30
Webb, P.C., Thompson, M., Potts, P.J., Long, D. and Batjargal, B. (2012)
Geo*PT*30 - 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, Keyworth. Unpublished report.

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

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

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

Geo*PT*34
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*34 - an international proficiency test for analytical geochemistry laboratories - report on round 34 (Granite, GRI-1) / January 2014. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*35
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*35 - an international proficiency test for analytical geochemistry laboratories - report on round 35 (Tonalite, TLM-1) / August 2014. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*35A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*35A - an international proficiency test for analytical geochemistry laboratories - report on round 35A (Metalliferous sediment, SdAR-H1) / August 2014. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*36
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36 - an international proficiency test for analytical geochemistry laboratories - report on round 36 (Gabbro, GSM-1) / January 2015. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*36A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36A - an international proficiency test for analytical geochemistry laboratories - report on round 36A (Metal-rich sediment, SdAR-M2) / January 2015. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*37
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Burnham, M. (2015)
Geo*PT*37 - an international proficiency test for analytical geochemistry laboratories - report on round 37 (Rhyolite, ORPT-1) / July 2015. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*37A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S. (2015)
Geo*PT*37A - an international proficiency test for analytical geochemistry laboratories - report on round 37A (Blended sediment, SdAR-L2) / July 2015. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*38
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2016)
Geo*PT*38 - an international proficiency test for analytical geochemistry laboratories - report on round 38 (Gabbro, OU-7) / January 2016. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*38A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Meisel, T. (2016)
Geo*PT*38A - an international proficiency test for analytical geochemistry laboratories – special report on round 38A (Modified harzburgite, HARZ01) / June 2016. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*39
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2016)
Geo*PT*39 - an international proficiency test for analytical geochemistry laboratories - report on round 39 (Syenite, SyMP-1) / July 2016. International Association of Geoanalysts: Unpublished report.

Appendix 1 (Cont'd)

Geo*PT*39A
Webb, P.C., Thompson, M., Potts, P.J, and Gowing, C.J.B. (2016) Geo*PT*39A - an international proficiency test for analytical geochemistry laboratories - report on round 39A (Nepheline syenite, MNS-1) / July 2016. International Association of Geoanalysts: Unpublished report.

Geo*PT*40
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2017)
Geo*PT*40 - an international proficiency test for analytical geochemistry laboratories - report on round 40 (Silty marine shale, ShWYO-1) / January 2017. International Association of Geoanalysts: Unpublished report.

Geo*PT*40A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2017)
Geo*PT*40A - an international proficiency test for analytical geochemistry laboratories - report on round 40A (Calcareous organic-rich shale, ShTX-1) / January 2017. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*41
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2017)
Geo*PT*41 - an international proficiency test for analytical geochemistry laboratories - report on round 41 (Andesite, ORA-1) / July 2017. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*41A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2017)
Geo*PT*41A - an international proficiency test for analytical geochemistry laboratories - report on round 41A (Mineralized stream sediment, SSCO-1) / July 2017. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*42
Webb, P.C., Thompson, M., Potts, P.J., Gowing, C.J.B. and Burnham, M. (2018)
Geo*PT*42 – an international proficiency test for analytical geochemistry laboratories – report on round 42 (Queenston shale, QS-1) / January 2018. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*43
Webb, P.C., Potts, P.J., Thompson, M. and Gowing, C.J.B. (2018)
Geo*PT*43 – an international proficiency test for analytical geochemistry laboratories – report on round 43 (Dolerite, ADS-1) / July 2018. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*44
Webb, P.C., Potts, P.J., Thompson, M., Gowing, C.J.B. (2019)
Geo*PT*44 – an international proficiency test for analytical geochemistry laboratories – report on round 44 (Calcareous shale, ShCX-1) / January 2019. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*44A
Webb, P.C., Potts, P.J., Thompson, M. Gowing, C.J.B. and Wilson, S.A. (2019)
Geo*PT*44A – an international proficiency test for analytical geochemistry laboratories – report on round 44A (Calcareous mudrock, CM-1) / January 2019. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*45
Webb, P.C., Potts, P.J., Thompson, M. Gowing, C.J.B. and Wilson, S.A. (2019)
Geo*PT*45 – an international proficiency test for analytical geochemistry laboratories – report on round 45 (Silicified siltstone, GONV-1) / July 2019. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*46
Webb, P.C., Potts, P.J., Thompson, M. and Gowing, C.J.B. (2020)
Geo*PT*46 – an international proficiency test for analytical geochemistry laboratories – report on round 46 (Granodiorite, HG-1) / January 2020. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*46A
Webb, P.C., Potts, P.J., Thompson, M. Gowing, C.J.B. and Wilson, S.A. (2020)
Geo*PT*46A – an international proficiency test for analytical geochemistry laboratories – report on round 46A (Phosphate rock, POLC-1) / January 2020. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*47
Webb, P.C., Potts, P.J., Thompson, M. and Gowing, C.J.B. (2020)
Geo*PT*47 – an international proficiency test for analytical geochemistry laboratories – report on round 47 (Silty Soil BIM-1) / December 2020. International Association of Geoanalysts, Keyworth, Keyworth. Unpublished report.

Geo*PT*47A
Webb, P.C., Potts, P.J., Thompson, M. and Gowing, C.J.B. (2020)
Geo*PT*47A – an international proficiency test for analytical geochemistry laboratories – report on round 47A (Silty Soil, NES-1) / December 2020. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*48
Webb, P.C., Potts, P.J., Thompson, M., Gowing, C.J.B., Glodny, J., Wiedenbeck, M. (2021)
Geo*PT*48 – an international proficiency test for analytical geochemistry laboratories – report on round 48 (Monzonite, MzBP-1) / April 2021. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*49
Webb, P.C., Potts, P.J., Thompson, M., Gowing, C.J.B., and Wilson, S.A. (2021)
Geo*PT*49 – an international proficiency test for analytical geochemistry laboratories – report on round 49 (Basalt, BVA-1) / July 2021. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*50
Webb, P.C., Potts, P.J., Thompson, M., and Gowing, C.J.B. (2022)
Geo*PT*50 – an international proficiency test for analytical geochemistry laboratories – report on round 50 (Calcified sediment, CSd-1) / January 2022. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*51
Webb, P.C., Potts, P.J., Thompson, M., Gowing, C.J.B. and Renno, A.D. (2022)
Geo*PT*51 – an international proficiency test for analytical geochemistry laboratories – report on round 51 (Leucomonzogranite, GMN-1) / July 2022. International Association of Geoanalysts, Keyworth, Keyworth. Unpublished report.

Geo*PT*51A
Webb, P.C., Potts, P.J., Thompson, M. and Gowing, C.J.B. (2022)
Geo*PT*51A – an international proficiency test for analytical geochemistry laboratories – report on round 51A (Granite, MEG-1) / July 2022. International Association of Geoanalysts, Keyworth. Unpublished report.

Geo*PT*52
Webb, P.C., Potts, P.J., Gowing, C.J.B., Thompson, M., Wind, J., (2021)
Geo*PT*52 – an international proficiency test for analytical geochemistry laboratories – report on round 52 (Metalliferous Shale, EMS-1) / January 2023. International Association of Geoanalysts, Keyworth. Unpublished report.

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S2	S3	S4	S5	S6	S7	S8	S11	S12	S13	S14	S15	S16
SiO2	g 100g^{-1}	65.17	65.14	65.254	65.12	65.04	65.84	**77.01**	63.092	65.196	**65.29**	**65.1**	65.169	66.5
TiO2	g 100g^{-1}	0.47	0.47	0.462	0.47	0.458	0.471	**0.517**	0.464	0.455	**0.47**	**0.48**	0.474	0.468
Al2O3	g 100g^{-1}	15.66	15.8	15.645	15.58	15.83	15.9	**16.4**	15.908	15.811	**15.84**	**15.65**	15.87	15.7
Fe2O3T	g 100g^{-1}	4.22	4.22	4.244	4.23	4.194	4.24	**4.17**	4.3	4.065	**4.29**	**4.2**	4.191	4.19
Fe(II)O	g 100g^{-1}		2.95			3					**2.44**			
MnO	g 100g^{-1}	0.06		0.058	0.06	0.061	0.063	**0.062**	0.059	0.054	**0.057**	**0.061**	0.059	0.06
MgO	g 100g^{-1}	2.38	2.43	2.449	2.36	2.377	2.3	**2.62**	2.661	2.499	**2.39**	**2.38**	2.552	2.427
CaO	g 100g^{-1}	4.27	4.23	4.384	4.26	4.224	4.22	**4.04**	4.233	4.362	**4.07**	**4.24**	4.333	4.228
Na2O	g 100g^{-1}	5	5.06	4.962	4.89	4.898		**5.07**	5.302	5.725	**4.9**	**4.86**	4.739	4.921
K2O	g 100g^{-1}	1.34	1.32	1.31	1.34	1.305	1.29	**1.45**	1.389	1.305	**1.31**	**1.28**	1.264	1.292
P2O5	g 100g^{-1}	0.16	0.16	0.163	0.15	0.153	0.159		0.144	0.166	**0.153**	**0.158**	0.122	0.154
H2O+	g 100g^{-1}		1			1.7								
CO2	g 100g^{-1}					0.34								
LOI	g 100g^{-1}	1.01	0.95	1.07	0.999	0.941	1.12			**1.24**	**1.027**	**0.85**	1.07	
Ag	mg kg^{-1}		0.037		0.9						**0.653**			
As	mg kg^{-1}		0.48						6.146		**17.19**	0.75		
Au	mg kg^{-1}													
B	mg kg^{-1}										**2.896**	**2.85**		
Ba	mg kg^{-1}	266	294	299.3	309	286.9	323	**290**	322.902		**163.2**	**314**	297.310	300
Be	mg kg^{-1}		0.84			0.808					**1.339**	**1.03**	0.95	
Bi	mg kg^{-1}		0.024			0.29					**0.145**	0.03		
Br	mg kg^{-1}								7.329					
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}				1200	867				**983**				
Cd	mg kg^{-1}		0.032			0.2			3.308		**0.5**			
Ce	mg kg^{-1}	35	34.1	35	33.6	34.6	34.48	**34.3**	19.166		**25.89**	**32.39**	32.38	
Cl	mg kg^{-1}							**300**						
Co	mg kg^{-1}	13	13.75	14	15	16.8		**14.6**	13.885		**13.24**	**14.42**	13.52	
Cr	mg kg^{-1}	282	376	308.3		307.4	303	**340**	289.351	357	**297**	**311**	323.7	313
Cs	mg kg^{-1}		1.43		1.3	1.51		**1.45**			**0.666**	**1.38**	1.33	
Cu	mg kg^{-1}	12	14.45	18.3	16	12.9	11.18		12.621		**15.01**	**14.21**	12	
Dy	mg kg^{-1}		1.93		2.07	1.67	1.16	**2**			**1.603**	**1.82**	1.88	
Er	mg kg^{-1}		0.99		0.97	0.95	0.86				**0.778**	**0.91**	0.91	
Eu	mg kg^{-1}		0.91		0.97	1.51	0.66	**0.95**			**0.814**	**0.91**	0.95	
F	mg kg^{-1}		390											
Ga	mg kg^{-1}		18.4		20.5	19.4	17.94		16.404		**17.77**	**18.95**	16.16	
Gd	mg kg^{-1}	2.3	2.58		2.9	2.58	2.54				**2.595**	**2.55**	2.47	
Ge	mg kg^{-1}				1						**1.89**	**0.71**		
Hf	mg kg^{-1}		3.31		3	3		**3.08**					2.68	
Hg	mg kg^{-1}													
Ho	mg kg^{-1}		0.35		0.38	0.41	0.33				**0.116**	**0.33**	0.33	
In	mg kg^{-1}				0.02									
La	mg kg^{-1}	15	15.7	8	16	16.1	18.01	**15.8**	9.982		**10.47**	**13.06**	15.12	15
Li	mg kg^{-1}		19.1		22	18.7	18.56				**15.48**	**18.66**		
Lu	mg kg^{-1}		0.14		12	0.166	0.13	**0.109**				**0.12**		
Mo	mg kg^{-1}		0.88		2						**1.284**	0.9		
Nb	mg kg^{-1}		4.18	7.2	3.7	3.9			3.155		**8.063**	**3.82**	3.18	
Nd	mg kg^{-1}	14	16.9		16.9	17.6	17.81	**13.7**	10.802		**13.96**	**14.11**	15.45	
Ni	mg kg^{-1}	40	45.9	49.2	53	46.4	51.77		51.878		**49.08**	**48.5**	43.7	
Pb	mg kg^{-1}		4.87	2.1	5	12.9			3.446		**4.364**	**4.97**	5.39	
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	3.7	4.23		3.9	3.8	3.12				**3.215**	**3.51**	4.01	
Pt	mg kg^{-1}													
Rb	mg kg^{-1}		33	35.3	31	34.03	31.09	**34**	30.86		**5.655**	**35**	29.43	
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
S	mg kg^{-1}					60				**135**				
Sb	mg kg^{-1}											0.04		
Sc	mg kg^{-1}		7.51		9.2		7.77	**7.49**			**3.371**	**7.14**	7.1	
Se	mg kg^{-1}													
Sm	mg kg^{-1}	2.8	3.16		3.4	3.72	2.95	**3.2**			**3.236**	**2.93**	3.14	
Sn	mg kg^{-1}		0.76		0.2	5.6						0.82		
Sr	mg kg^{-1}	542	556	605.6	538	506.3	523	**540**	515.013	611	**473.5**	**517**	513.860	
Ta	mg kg^{-1}		0.19		0.21							**0.41**		
Tb	mg kg^{-1}		0.33		0.3	0.366	0.36	**0.26**			**0.123**	**0.3**	0.33	
Te	mg kg^{-1}													
Th	mg kg^{-1}		1.33	3.5	1.29	1.24		**1.47**			**0.518**	**1.23**	1.27	
Tl	mg kg^{-1}		0.218									**0.22**		
Tm	mg kg^{-1}		0.13		0.13	0.15	0.14					**0.13**		
U	mg kg^{-1}		0.29		0.35	0.361			4.56			**0.33**	0.35	
V	mg kg^{-1}	63	78	70.9	79		66.66	**79**	63.905		**72.39**	**74**	68.1	69
W	mg kg^{-1}		1.49		1.9	1.9		**4.2**	5.445			1.66		
Y	mg kg^{-1}		9.8	15.9	9.4	10.19	11.67		8.831		**8.603**	**8.43**	9.8	10
Yb	mg kg^{-1}		0.86		0.92	0.74	0.77	**0.84**			**0.594**	**0.8**	0.82	
Zn	mg kg^{-1}	49	55.1	57.2	49	58.8	57.85	**69**	52.057		**41.03**	**51**	59.8	54
Zr	mg kg^{-1}		134	149.2	124	122.080	121	**150**	100.792	165	**131.1**	**125.5**	100.290	122

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S17	S18	S20	S21	S22	S24	S25	S26	S27	S28	S29	S30	S32
SiO2	g 100g-1	65.42	65.27				43	65	59.55	**64.8**	**65.56**	65.12	64.877	65.33
TiO2	g 100g-1	0.49	0.482		**0.472**	**0.48**	0.39	0.47	0.492	**0.45**	**0.485**	0.474	0.531	0.48
Al2O3	g 100g-1	15.76	15.94			**15.9**	5.9	15.8	15.6	**16.1**	**15.368**	15.67	15.848	15.89
Fe2O3T	g 100g-1	4.21	4.198			**4.26**	3.4	4.21	4.259	**4.13**	**4.329**	4.22	4.212	4.28
Fe(II)O	g 100g-1										**2.795**			
MnO	g 100g-1	0.06	0.06		**0.058**	**0.06**	0.031	0.06	0.057	**0.059**	**0.066**	0.063	0.066	0.06
MgO	g 100g-1	2.34	2.388			**2.41**	1	2.38	2.407	**2.44**	**2.4**	2.34	2.401	2.44
CaO	g 100g-1	4.12	4.249			**4.24**	3.2	4.29	4.421	**4.29**	**4.625**	4.253	4.291	4.26
Na2O	g 100g-1	4.95	5.014			**5.05**		5.03	4.651	**5.37**	**4.905**	4.903	4.95	5.04
K2O	g 100g-1	1.32	1.318			**1.37**	1.2	1.33	1.322	**1.51**	**1.299**	1.313	1.322	1.32
P2O5	g 100g-1	0.14	0.155			**0.16**	0.29	0.15	0.18	**0.16**	**0.159**	0.157	0.149	0.16
H2O+	g 100g-1						0.5				**1.181**			
CO2	g 100g-1										**0.149**			
LOI	g 100g-1		0.94					1.09		**1.01**	**1.099**		0.92	0.93
Ag	mg kg-1								0.038					0.035
As	mg kg-1								0.493					0.6
Au	mg kg-1													
B	mg kg-1													
Ba	mg kg-1	315	311		**288.9**	**308**	180		303	**294.3**	385.1		312.890	300
Be	mg kg-1					**1.01**			1.065					0.86
Bi	mg kg-1								0.027				0.02	0.022
Br	mg kg-1													
C(org)	mg kg-1										545			200
C(tot)	mg kg-1										**950.3**			500
Cd	mg kg-1						6.2		0.045					0.029
Ce	mg kg-1	28	34	**32.3**	**31.94**	**33.4**			32.98		**35.87**		33.195	31.1
Cl	mg kg-1						140							
Co	mg kg-1	13	14		**14.87**	**14.8**	75		13.67				14.897	14
Cr	mg kg-1	321	270		**285.2**	**302**	160	315	274.5	**326.2**	340.6		333.3	336
Cs	mg kg-1		1.5		**1.624**	**1.5**			1.417				1.491	1.42
Cu	mg kg-1	13	14		**14.02**	**14.1**	13		13.53				11.346	13.8
Dy	mg kg-1		1.9	**1.85**	**1.724**	**1.76**			1.839		**2.09**		1.859	1.9
Er	mg kg-1		1.1	**0.81**	**0.873**	**0.91**			0.916		**1.004**		0.944	1.03
Eu	mg kg-1		1	**0.75**	**0.907**	**0.9**			0.965		**1.046**		0.961	0.86
F	mg kg-1							442			**965**			
Ga	mg kg-1	20	18		**18.79**	**18.2**			16.65		18.525		18.44	18.3
Gd	mg kg-1		2.7	**2.57**	**2.386**	**2.48**			2.509		**2.776**		2.492	2.54
Ge	mg kg-1					**0.72**								0.09
Hf	mg kg-1		3.1		**3.041**	**2.87**			2.136		3.268		3.113	3.61
Hg	mg kg-1													
Ho	mg kg-1		0.4	**0.18**	**0.325**	**0.33**			0.345		**0.335**		0.347	0.33
In	mg kg-1													0.022
La	mg kg-1		16	**16.6**	**14.37**	**15.4**			15.73		**17.304**		15.731	15.6
Li	mg kg-1		22		**19.67**	**20.3**		18.1	19.18		**20.903**			19.4
Lu	mg kg-1		0.14	**0.09**	**0.118**				0.125		**0.128**		0.122	0.14
Mo	mg kg-1		0.9			**0.9**			0.884					0.91
Nb	mg kg-1		4.6		**4.128**				3.753		4.54		4.11	3.78
Nd	mg kg-1		16	**17.2**	**15.28**	**15.7**			16.37		**17.644**		15.587	16.1
Ni	mg kg-1	51	45		**51.32**	**45.7**			48.23	**46.9**	43.04		62	45.9
Pb	mg kg-1		4.3		**5.172**	**4.49**			4.736		5.441		4.375	4.91
Pd	mg kg-1													
Pr	mg kg-1		4.1	**3.77**	**3.764**	**4.01**			4.022		**4.551**		4.022	4.19
Pt	mg kg-1													
Rb	mg kg-1	37	33		**36.61**	**35.2**	25		29.98		35.56		32.352	32.5
Re	mg kg-1													0.000
Rh	mg kg-1													
S	mg kg-1													100
Sb	mg kg-1								0.058					0.04
Sc	mg kg-1		7.1		**8.74**		92				8.523		7.807	6.94
Se	mg kg-1													0.006
Sm	mg kg-1		3.2	**3.08**	**2.943**	**2.96**			3.249		**3.44**		3.105	3.51
Sn	mg kg-1					**0.75**			0.752				1.397	0.86
Sr	mg kg-1	520	523		**496.4**	**525**	410		497.1	**524.9**	**486.2**		544.890	531
Ta	mg kg-1				**0.201**				0.202				0.173	0.18
Tb	mg kg-1		0.4	**0.26**	**0.325**	**0.36**			0.360		**0.337**		0.354	0.31
Te	mg kg-1													0.005
Th	mg kg-1		1.5		**1.276**	**1.41**	2.94		1.301		1.165		1.294	1.31
Tl	mg kg-1								0.216					0.2
Tm	mg kg-1		0.13	**0.05**	**0.124**				0.130		**0.140**		0.135	0.16
U	mg kg-1				**0.319**	**0.34**			0.347		0.35		0.329	0.31
V	mg kg-1	61	70		**67.05**	**75**	69		69.12	66.8	75.07		82.096	79
W	mg kg-1					**1.43**			1.497				1.974	1.57
Y	mg kg-1		9.7	**8.67**	**9.083**	**9.25**			9.19		**10.35**		10.295	9.7
Yb	mg kg-1		0.9	**0.7**	**0.798**	**0.81**			0.811		**0.919**		0.851	0.91
Zn	mg kg-1	52	56			**53.2**	37		59.02				51.447	56.8
Zr	mg kg-1	158	126		**121.7**	**119**	100		86.96	**116.520**	130.9		133.250	135

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S33	S36	S38	S39	S40	S41	S43	S44	S45	S47	S49	S50	S51
SiO2	g 100g-1	65.456	64.45	64.669	65.47	64.89		64.55	66.5	57.23	63.4	64.82	65.37	65.2
TiO2	g 100g-1	0.465		0.486	0.46	0.47	0.48	0.46	0.469	0.35	0.448	0.464	0.53	0.44
Al2O3	g 100g-1	15.774	14.27	15.734	15.85	15.8	15.8	15.34	15.67	12.79	15.4	15.72	16.09	15.57
Fe2O3T	g 100g-1	4.282	4.17	4.425	4.14	4.13	4.2	4.28	4.21	3.31	4.056	4.227	4.31	4.25
Fe(II)O	g 100g-1			3.982										
MnO	g 100g-1	0.061	0.056	0.06	0.059	0.06	0.06	0.07	0.058	0.05	0.062	0.06	0.07	0.058
MgO	g 100g-1	2.419	2.44	2.469	2.39	2.4	2.44	2.56	2.36	1.85	2.35	2.299	2.47	2.43
CaO	g 100g-1	4.148	4.2	4.545	4.21	4.23	4.4	4.37	4.28	3.78	4.209	4.217	4.36	4.22
Na2O	g 100g-1	5.404	5.13	5.056	4.91	4.9	4.96	4.92	4.6	6.23	4.843	5.014		4.76
K2O	g 100g-1	1.314	1.28	1.36	1.32	1.3	1.35	1.33	1.28	1.12	1.273	1.289	1.34	1.31
P2O5	g 100g-1	0.159		0.137	0.15	0.154	0.16	0.16	0.15	0.22	0.173	0.15	0.161	0.15
H2O+	g 100g-1			0.261	0.09									
CO2	g 100g-1			0.024										
LOI	g 100g-1	1.36	1.05	1.051	1.23	1.37		1.008	0.9	12.61	1	1.11	0.98	0.95
Ag	mg kg-1													
As	mg kg-1			1.473										
Au	mg kg-1			0.002										
B	mg kg-1													
Ba	mg kg-1	282.5	2900	272.683	296	300	290	319	311	0.04	346.9	312.6		327
Be	mg kg-1			0.687		0.95	0.96		1					
Bi	mg kg-1			0.022		0.03								
Br	mg kg-1							3						
C(org)	mg kg-1			434										
C(tot)	mg kg-1			754		600					700			
Cd	mg kg-1		20	0.44		0.04								
Ce	mg kg-1			27.53	21	32.3	32.3	28	34.3		32	32.41		34
Cl	mg kg-1			1.419				474		0.03	265			225
Co	mg kg-1	13.2	290	12.299	14	13.6	14.4	2		0.01	14	17.39		60
Cr	mg kg-1	334.3	97	269.098	285	319	311	202		0.03	351	319.9		302
Cs	mg kg-1			1.287	5	1.4	1.36							
Cu	mg kg-1	18.6	58	2.882	12	13.4	15.1	10		0.01	16			9
Dy	mg kg-1			1.799		1.8	1.86		1.8		2	1.94		
Er	mg kg-1			1.78		1	0.93		0.9			1.17		
Eu	mg kg-1			0.909		0.9	0.92		0.94			0.86		
F	mg kg-1			475				510			439			247
Ga	mg kg-1	18.5		16.908	18	17.6	18.3	19						14
Gd	mg kg-1			2.53		2.5	2.51		2.6		2.5	2.85		3
Ge	mg kg-1			0.195		0.8								
Hf	mg kg-1			0.129	4	3.1	3.02	6	3.1					4
Hg	mg kg-1			0.008										
Ho	mg kg-1			0.331		0.3	0.34		0.4					
In	mg kg-1			0.024		0.02								
La	mg kg-1			14.839	13	15.3	15.3		16.7		15	15.75		20
Li	mg kg-1		290	21.785		19.4	17.3				21			
Lu	mg kg-1					0.1	0.12		0.14					
Mo	mg kg-1			0.599	1	0.9	0.82				1.4			
Nb	mg kg-1			5.778	6	3.8	3.97	7	4			4.54		5
Nd	mg kg-1			15.118	20	15.1	15.6		15.9		16	16.1		23
Ni	mg kg-1	43		37.772	42	45.7	48.9	18		0.01	55.6	49.35		45
Pb	mg kg-1	3.6	193	18.399	5	5	5.3	7			5			2
Pd	mg kg-1			0.002										
Pr	mg kg-1			3.799		3.9	3.91		4.09		3.9			
Pt	mg kg-1			0.003										
Rb	mg kg-1	28.9		5.502	32	31.7	31.9	35	33			32.3		36
Re	mg kg-1													
Rh	mg kg-1													
S	mg kg-1			33.292				64		0.1				
Sb	mg kg-1			1.05		0.06								
Sc	mg kg-1			7.075	8	6.9	7.54		7		9.2	7.17		9
Se	mg kg-1			0.022										
Sm	mg kg-1			3.97		2.9	3.06		3.2		2.9	3.25		
Sn	mg kg-1			0.725		2	0.81		1	0.01				
Sr	mg kg-1	496.5		554.003	505	525.6	531	522	531	0.04	499	520		501
Ta	mg kg-1			0.41		0.2	0.2		0.2					
Tb	mg kg-1					0.3	0.35		0.3					
Te	mg kg-1			0.821										
Th	mg kg-1			1.73	2	1.3	1.31		1.3		1.4			
Tl	mg kg-1			0.199		0.22	0.22							
Tm	mg kg-1			0.121		0.1	0.13		0.13					
U	mg kg-1			0.33	1	0.33	0.34		0.3					
V	mg kg-1	60.9	967	60.513	65	70	69.5	83	71	0.01	70	70.92		84
W	mg kg-1			2.048	2	2	1.48	11						
Y	mg kg-1	7.5		8.27	9	8.6	10.1	1	9		9.4	7.96		11
Yb	mg kg-1			0.758	1	0.8	0.85		0.8			0.86		
Zn	mg kg-1	55.2	59.9	49.608	53	57	58.2	60		0.01				59
Zr	mg kg-1	108.9		10.983	112	124	125	89	133			21.67		125

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S53	S54	S55	S56	S58	S60	S61	S62	S63	S64	S65	S66	S67
SiO2	g 100g-1	64.88		65.267	65.48	65.23	65.455		65.04	60.100	64.77	65.43	65.15	
TiO2	g 100g-1	0.46	0.46	0.469	0.48	0.465	0.475		0.51	0.564	0.47	0.492	0.486	0.457
Al2O3	g 100g-1	15.33	15.8	15.696	15.49	17.21	15.9		15.69	15.989	15.69	15.89	15.69	16.76
Fe2O3T	g 100g-1	4.24	4.1	4.264	4.23	4.029	4.19		4.32	5.519	4.13	4.33	4.22	4.41
Fe(II)O	g 100g-1				2.9									
MnO	g 100g-1	0.067	0.06	0.059	0.059	0.060	0.056		0.06	0.087	0.05	0.070	0.058	0.06
MgO	g 100g-1	2.43	2.43	2.442	2.25	2.375	2.39		2.45	2.691	2.27	2.35	2.36	2.55
CaO	g 100g-1	4.31	4.1	4.259	4.23	4.316	4.24		4.15	5.681	4.18	4.73	4.21	3.9
Na2O	g 100g-1	4.85	4.81	4.878	5.38		5.12		4.91	5.783	4.7	4.31	4.78	5.21
K2O	g 100g-1	1.31	1.3	1.302	1.3	1.331	1.31		1.36	1.785	1.31	1.32	1.31	1.37
P2O5	g 100g-1	0.16	0.162	0.155	0.16	0.160	0.16		0.16	0.162	0.16	0.14	0.156	0.16
H2O+	g 100g-1				1.24									
CO2	g 100g-1				0.28									
LOI	g 100g-1	1.14		1.039			1.073		1.09	1.1	1.02	0.91	1.08	
Ag	mg kg-1					0.039	0.611							
As	mg kg-1	0.35				0.455	0.748	1.98						0.58
Au	mg kg-1													
B	mg kg-1													
Ba	mg kg-1	290	296	332.060	289	297	316	328	301	288.767			311	368.1
Be	mg kg-1	1.05		1.02		1.043	1.1	1.15	0.97					1.13
Bi	mg kg-1					0.025	0.025	0.05						
Br	mg kg-1													
C(org)	mg kg-1													
C(tot)	mg kg-1													
Cd	mg kg-1					0.037	0.04	0.12		4.004				0.049
Ce	mg kg-1	32.8	32	37.34	35	31.84	32.2	27.4	31.59	5.610			34.5	44.99
Cl	mg kg-1				85								219	
Co	mg kg-1	16	14	14.996	15	14.42	14	16.1	14.54				13	14.56
Cr	mg kg-1	290		344.279	181	314.8	321	387	306.8	188.689			297	332.020
Cs	mg kg-1			1.406	1	1.468	1.43	1.63	1.43				1.4	1.38
Cu	mg kg-1	24		16.178	14	14.03	15.5	15.1	15.49	6.305			11	14.51
Dy	mg kg-1	1.87	1.8	1.91		2.068	1.92	1.93	1.84				1.64	2.08
Er	mg kg-1	1	0.93	0.897		0.989	0.94	0.99	0.93				0.88	1.02
Eu	mg kg-1	0.92		1.007		0.991	0.98	1	0.94				0.98	0.99
F	mg kg-1				466								183	
Ga	mg kg-1	18	17.7	18.65	10	20.12	18.14	20.2	18.11				17	18.78
Gd	mg kg-1	2.8		2.708		2.7	2.49	2.76	2.68				2.32	2.94
Ge	mg kg-1	0.62						3.16	0.65					
Hf	mg kg-1	3.05			5		2.6	2.5	2.9	3.232			2.8	
Hg	mg kg-1													
Ho	mg kg-1	0.35		0.445		0.365	0.36	0.36	0.34				0.33	0.38
In	mg kg-1					0.023								
La	mg kg-1	18.4	15	17.52	16	14.7	14.25	20.3	14.76				16.6	17.78
Li	mg kg-1		18.6	19.91		21.95	19.22	25.6	19.91					21.52
Lu	mg kg-1	0.14					0.12	0.13	0.12				0.12	0.12
Mo	mg kg-1	0.55			1	0.782	0.97	1.38						0.97
Nb	mg kg-1	5.4			4		4.45	3.84	4.21				4.9	3.78
Nd	mg kg-1	16.65	15	17.37	14	16.7	15.62	16.4	16.27				15.9	18.59
Ni	mg kg-1	42	44.5	51.108	39	47.37	45.23	83.1	48.25	10.416			37	51.56
Pb	mg kg-1	8	4.9	5.87	4	4.508	4.97	5.71	5.42				5	5.37
Pd	mg kg-1													
Pr	mg kg-1	3.99	3.9	4.456		4.025	3.96	4.1	3.82				4.06	4.82
Pt	mg kg-1													
Rb	mg kg-1	31.5	30.4		32	33.87	30.85	36.1	31.76	80.003			32.4	34.08
Re	mg kg-1													
Rh	mg kg-1													0.001
S	mg kg-1						76							
Sb	mg kg-1						0.046	1.45						0.038
Sc	mg kg-1	8		7.885	8	8.213	7.44	11.4	7.73				8	7.23
Se	mg kg-1							1.49						0.002
Sm	mg kg-1	2.95	3.2	3.204		3.298	3.14	3.21	3.01				3.03	3.49
Sn	mg kg-1				2	0.818	0.789	1.51						0.79
Sr	mg kg-1	500	527	524.640	504	551.6	540	603	524	484.258			537	559.2
Ta	mg kg-1	0.28			5		0.54	0.37	0.196					0.19
Tb	mg kg-1	0.36		0.344		0.361	0.36	0.39	0.35				0.33	0.37
Te	mg kg-1						0.001	0.08						0.02
Th	mg kg-1	1.55			1	1.325	1.32	0.81	1.33	12.280			1.46	1.49
Tl	mg kg-1			0.215		0.226	0.21	0.13						
Tm	mg kg-1	0.14				0.132	0.14	0.14	0.13				0.12	0.14
U	mg kg-1	0.58		0.29		0.288	0.36	0.34	0.32				0.37	0.35
V	mg kg-1	73	71.4		63	71.67	64	88.4	68.3	43.404			63	67.9
W	mg kg-1	1.48			3		2.7	5.86						1.23
Y	mg kg-1	10	8.8	9.33	13	9.697	9.07	10.4	10.07	17.008			9.17	
Yb	mg kg-1	0.88					0.81	0.87	0.82				0.79	0.79
Zn	mg kg-1	53	61.8	55.96	53	59.26	53	100.9	52.31	28.057			53	52.71
Zr	mg kg-1	123		122.060	99		107.7	103.7	121	93.032			113	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S68	S70	S71	S72	S74	S75	S76	S77	S78	S79	S80	S81	S84
SiO2	g 100g-1	65.66	65.73	65.3	65.3	62.9	71.8	66.2	64.74	65.5	59.3	65.191	65.1	64.31
TiO2	g 100g-1	0.47	0.38	0.45	0.462	0.442	0.46	0.477	0.47	0.472	0.411	0.484	0.46	0.48
Al2O3	g 100g-1	15.8	16.02	15.57	15.9	15.48	15.8	16	15.66	15.84	15.3	15.808	15.73	15.13
Fe2O3T	g 100g-1	4.2	4.21	4.27	4.41	4.204	4.09	4.28	4.29	4.34	3.9	3.87	4.18	4.37
Fe(II)O	g 100g-1													
MnO	g 100g-1	0.06	0.06	0.055	0.061	0.074	0.06	0.064	0.06	0.059	0.051	0.060	0.06	0.06
MgO	g 100g-1	2.34	2.56	2.52	2.52	2.43	3.88	2.39	2.38	2.4		2.339	2.52	2.76
CaO	g 100g-1	4.28	4.26	4.34	4.13	4.124	4.13	4.18	4.19	4.27	3.85	4.246	4.13	4.11
Na2O	g 100g-1	4.95	3.69	5.14	5.07	4.899	4.77	4.45	5.01	4.89		4.849	5.04	4.7
K2O	g 100g-1	1.33	1.2	1.29	1.24	1.277	1.46	1.31	1.34	1.31	1.32	1.317	1.31	1.32
P2O5	g 100g-1	0.16	0.17	0.159	0.16	0.139	0.17	0.153	0.16	0.15		0.158	0.12	0.16
H2O+	g 100g-1						0.08							
CO2	g 100g-1													
LOI	g 100g-1	1.02	0.96	0.96	1.07	0.99	0.35	1.01	0.98	0.96		0.95	0.89	
Ag	mg kg-1					0.042						0.036		
As	mg kg-1		2.1	2		0.498		0.7				0.78		
Au	mg kg-1													
B	mg kg-1													
Ba	mg kg-1	302	301	277	303	322.6	302	292		300	288	298.8	0.036	316
Be	mg kg-1				0.921	0.83		0.97						
Bi	mg kg-1					0.026						0.035		
Br	mg kg-1													
C(org)	mg kg-1						700							
C(tot)	mg kg-1			748		807.5	600							
Cd	mg kg-1				0.07	0.034						0.05		
Ce	mg kg-1	33	30.3	25.9	31.9	32.59		33.3		33.12	31.2	33.194		
Cl	mg kg-1											0.017	0.04	
Co	mg kg-1		13.5	13.6	14.35	13.93		16.7						14
Cr	mg kg-1	323	312	255.7	330	323.7	317	387		312		314.7	0.034	324
Cs	mg kg-1		1.53		1.42	1.385				1.38		1.4		
Cu	mg kg-1		16.1	11.9	13.3	13.97		15.5		15		15.5		12
Dy	mg kg-1		1.72		1.823	1.762		1.84		1.79		1.885		
Er	mg kg-1		0.9		0.917	0.909		0.99		0.94		0.921		
Eu	mg kg-1		0.86		0.921	0.933		0.96		0.94		0.956		
F	mg kg-1													
Ga	mg kg-1		21.4	17.4	17.53	19.05		17.2		18	16.9	17.353		17
Gd	mg kg-1		2.5		2.5	2.559		2.7		2.5		2.574		
Ge	mg kg-1		1.53									0.82		
Hf	mg kg-1		1.73	6.1	2.96	1.282		4.48		3.06		3.1		
Hg	mg kg-1													
Ho	mg kg-1		0.33		0.352	0.342		0.34		0.35		0.351		
In	mg kg-1													
La	mg kg-1		14.1	15.3	14.76	14.75		16.5		15.8	13.8	15.85		
Li	mg kg-1				19.36	18.21								
Lu	mg kg-1		0.11		0.123	0.119		0.12		0.13		0.121		
Mo	mg kg-1		2.5		0.855			0.96				0.932		
Nb	mg kg-1	4	4	3.3	3.92	3.783		3.43		3.91		3.847		3
Nd	mg kg-1		14.5	12.2	15.44	15.32		16		15.76	14.9	16.029		
Ni	mg kg-1	51	44	40.3	46.5	45.66	29	53.4		49		45.8	0.008	39
Pb	mg kg-1		6.5	3.7	4.7	4.784		5.03		5.14		5.15		7
Pd	mg kg-1													
Pr	mg kg-1		3.59		3.93	3.892		3.87		4.06		4.009		
Pt	mg kg-1													
Rb	mg kg-1	32	29	32	32.13	32.06		30.7		32.1	31.7	32.07		30
Re	mg kg-1													
Rh	mg kg-1													
S	mg kg-1					78.02								
Sb	mg kg-1				0.043	0.06						4.99		
Sc	mg kg-1	8	7.1	14.5	7.509	7.347				7.6		7.762		10
Se	mg kg-1							1.84						
Sm	mg kg-1		2.83	5.8	3.05	3.052		3.25		3.07		3.043		
Sn	mg kg-1			4.5	1.496	0.779		2.46				1.03		
Sr	mg kg-1	525	478	490.9	518	533.2	539	583		521	524	522.5	0.051	490
Ta	mg kg-1		0.62		0.197	0.177				0.28		0.251		
Tb	mg kg-1		0.33		0.34	0.344		0.35		0.35		0.351		
Te	mg kg-1													
Th	mg kg-1		1.08	3.2	1.241	1.354		1.37		1.43		1.42		1
Tl	mg kg-1		0.28		0.218	0.217		0.23				0.207		
Tm	mg kg-1		0.12		0.131	0.128		0.13		0.14		0.131		
U	mg kg-1		0.31	2.7	0.341	0.338		0.32		0.34		0.333		
V	mg kg-1		59	59.7	68.99	74.84		86.7		71		68.67		72
W	mg kg-1				1.551	1.753								
Y	mg kg-1	9	8.5	9.7	9.14	8.972		9.32		10.01		9.908		12
Yb	mg kg-1		0.73		0.827	0.765		0.87		0.83		0.848		
Zn	mg kg-1	53	59	52.5	55.6	53.3		68.5		56	54.8	56.3	0.024	53
Zr	mg kg-1	76	177	100.9	120.5	93		106		121	113	129.970	0.015	110

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S85	S87	S88	S89	S92	S93	S95	S96	S99	S100	S101	S102	S103
SiO2	g 100g^{-1}	64.04	64.929	64.703	65.45		65.34	64.26	64.88	65.7			65.66	65.6
TiO2	g 100g^{-1}	0.46	0.473	0.472	0.512	0.453	0.45	0.476	0.47	0.461			0.48	
Al2O3	g 100g^{-1}	16.52	15.739	15.723	16.05		15.64	15.96	15.6	15.8			15.72	
Fe2O3T	g 100g^{-1}	4.4	4.202	4.202	4.14		4.11	4.21	4.35	4.28			4.08	
Fe(II)O	g 100g^{-1}		2.67										2.82	
MnO	g 100g^{-1}	0.063	0.056	0.062	0.055	0.058	0.067	0.059	0.063	0.064			0.06	
MgO	g 100g^{-1}	2.62	2.417	2.357	2.41		2.22	2.34	2.42	2.39			2.43	
CaO	g 100g^{-1}	4.52	4.225	4.251	4.26		4.39	4.19	4.13	4.25			4.36	
Na2O	g 100g^{-1}	4.77	5.062	4.863	4.52		4.72	4.71	5.21	4.84			4.7	
K2O	g 100g^{-1}	1.33	1.277	1.317	1.33		1.22	1.31	1.3	1.34			1.38	
P2O5	g 100g^{-1}	0.205	0.152	0.159	0.17		0.15	0.158	0.16	0.16			0.16	
H2O+	g 100g^{-1}		1.334											
CO2	g 100g^{-1}													
LOI	g 100g^{-1}		0.951	1.03	1.07		1.14	1	0.95	0.84				1.1
Ag	mg kg^{-1}											0.363		
As	mg kg^{-1}								0.81	6.1	0.37			
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}	171	307.190		303.470	288.6	284	315.160		305	320.5	278.9	325	
Be	mg kg^{-1}							0.89	0.07		0.95	0.954		
Bi	mg kg^{-1}										0.01	0.019		
Br	mg kg^{-1}													
C(org)	mg kg^{-1}								5350					
C(tot)	mg kg^{-1}		762						5500					
Cd	mg kg^{-1}		0.038						0.47		0.03	0.15		
Ce	mg kg^{-1}		32.829		33.34	26.7		31.8		33	27.4	21.96	33	
Cl	mg kg^{-1}								134					
Co	mg kg^{-1}	15	14.353		14	13.17	16	14	9.3	15	15.7	14.06	13	
Cr	mg kg^{-1}	304	315.150			308.5	295	310	289	308	347.2	319	306	
Cs	mg kg^{-1}		1.349		1.238			1.48			1.28	1.205		
Cu	mg kg^{-1}	10.5	14.39			13.8	25	15	16.6	14	18.9	14.03	15	
Dy	mg kg^{-1}		1.835		1.828			1.88			1.67	1.58	1.8	
Er	mg kg^{-1}		0.912		0.915			0.94			0.84	0.832	0.7	
Eu	mg kg^{-1}		0.949		0.981			0.96			0.93	0.821	0.8	
F	mg kg^{-1}		487				385							
Ga	mg kg^{-1}	19	15.111			17.86	17.3			18	18.1	18.97		
Gd	mg kg^{-1}		2.486		2.512			2.46			2.13	2.312	2.4	
Ge	mg kg^{-1}										0.85	2.528		
Hf	mg kg^{-1}		2.542		2.92						2.92	3.095		
Hg	mg kg^{-1}								0.000					
Ho	mg kg^{-1}		0.339		0.336			0.35			0.29	0.295	0.3	
In	mg kg^{-1}		0.025			0.009						0.023		
La	mg kg^{-1}		15.103		16.02	13.9		16		13	13.07	10.48	15	
Li	mg kg^{-1}		16.98					19.3			21.5	19.46	20	
Lu	mg kg^{-1}		0.122		0.125			0.1			0.13	0.108	0.09	
Mo	mg kg^{-1}		1.007			0.658		1.03						
Nb	mg kg^{-1}	3	3.484		3.25	3.58	5.3				4	4.127		
Nd	mg kg^{-1}		15.52		16.021		20.28	15.2		11	13.6	11.91	16	
Ni	mg kg^{-1}	29	47.41			46.05	43.3	42	33	44	56.3	48.5	48	
Pb	mg kg^{-1}		4.69		5.6	4.88	8.3	4	2.3		5.32	4.323		
Pd	mg kg^{-1}											0.551		
Pr	mg kg^{-1}		4.077		4.012			3.9			3.62	2.973	4	
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	33	35.896		32.4	32.87	30	33		30	32.6	14.9	33	
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
S	mg kg^{-1}	251							66					
Sb	mg kg^{-1}		0.041					0.16	2.4		0.03	0.038		
Sc	mg kg^{-1}		7.575			8.4	7	7.4		8.3	6.96	7.77	7	
Se	mg kg^{-1}													
Sm	mg kg^{-1}		3.032		3.114			3.02			2.59	2.464	3	
Sn	mg kg^{-1}		0.7					1			0.92	0.837		
Sr	mg kg^{-1}	574	539.190		502.7	505.950	497	470	524	496	561	434.3	516	
Ta	mg kg^{-1}		0.188		0.192							0.262		
Tb	mg kg^{-1}		0.342		0.353			0.33			0.35	0.305	0.3	
Te	mg kg^{-1}								2.8					
Th	mg kg^{-1}		1.314		1.536		0.9	1.15			0.98			
Tl	mg kg^{-1}		0.217			0.108		0.22	2.1			0.205		
Tm	mg kg^{-1}		0.126		0.126			0.12			0.11	0.112	0.1	
U	mg kg^{-1}		0.306		0.324			0.31			0.36			
V	mg kg^{-1}	89.5	71.51		66.4	67.47	73	73	55	64	85	71.9	63	
W	mg kg^{-1}		1.5								1.2			
Y	mg kg^{-1}	9	9.15		9.67	7.97	10	9		9.9	10.2	7.91	9	
Yb	mg kg^{-1}		0.795		0.805			0.71			0.78	0.726	0.6	
Zn	mg kg^{-1}	58.5	55.6		56.1	56.04	55	55	35	51	53	57.6	57	
Zr	mg kg^{-1}	105	105.4		120.270	109.280	130	132		98	132	138.1	120	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S104	S105	S107	S108	S109	S111	S113	S114	S115	S119	S121	S122	S123
SiO2	g 100g-1	66.02	65.04	65.57	64.4	64.93	65.29	65.82		65.82	64.79	65.16	61.07	64.729
TiO2	g 100g-1	0.462	0.48	0.46	0.47	0.48	0.47	0.45		0.48	0.47	0.473	0.503	0.467
Al2O3	g 100g-1	15.61	15.79	15.61	15.62	15.57	15.98	15.83		15.76	15.85	15.82	16.6	15.546
Fe2O3T	g 100g-1	4.137	4.22	4.11	3.96	4.31	4.24	4.23		4.29	4.19	4.27	4.17	4.159
Fe(II)O	g 100g-1					2.62								
MnO	g 100g-1	0.060	0.06	0.06	0.06	0.063	0.06	0.056		0.06	0.06	0.062	0.058	0.075
MgO	g 100g-1	2.367	2.38	2.36	2.36	2.36	2.39	2.46		2.46	2.42	2.44	3.25	2.487
CaO	g 100g-1	4.314	4.11	4.26	4.22	4.41	4.2	4.25		4.3	4.07	4.257	4.17	4.123
Na2O	g 100g-1	4.738	2.38	4.82	4.78	4.96	4.99	4.74		4.94	5.07	4.73	4.82	5.003
K2O	g 100g-1	1.24	5.22	1.32	1.28	1.34	1.34	1.32		1.33	1.29	1.307	1.39	1.339
P2O5	g 100g-1	0.155	0.15	0.14	0.155	0.158	0.14	0.15		0.16	0.14	0.157	0.134	0.142
H2O+	g 100g-1	1.434						0.11						
CO2	g 100g-1			0.25										
LOI	g 100g-1		1.01	1.16	2.29	1.03	0.96	1.02		1.23	1.04	1.01	1.4	1.181
Ag	mg kg-1	0.111		0.05										
As	mg kg-1	0.882		0.99							2.6			
Au	mg kg-1													
B	mg kg-1													
Ba	mg kg-1	294.8	298	303.380	296	303	297.2		324.6	306.1	287.1	304.5	299.6	278
Be	mg kg-1	0.935				0.9			0.976	1				
Bi	mg kg-1													
Br	mg kg-1													
C(org)	mg kg-1													
C(tot)	mg kg-1	974.2		684.840										
Cd	mg kg-1	0.206							0.058					
Ce	mg kg-1	32.14		33.36	34.47	35.2	32.2		33.53	33.9	34.2	32.8		34
Cl	mg kg-1				322									
Co	mg kg-1	13.49	15	14.08		14.08			15.172	14	14.5	13.5	13.8	25
Cr	mg kg-1	325.4	289	310.3	319.3	323	329.4		324.8	328.3	274.8	323	243.4	283
Cs	mg kg-1	1.398		1.45	1.38				1.354	1.4				
Cu	mg kg-1	13.75		20.02	10.7		13.4		2.71	14.9	10.9	15.3	12.9	60
Dy	mg kg-1	1.768		1.76	2.17				2.101	1.8		1.76		
Er	mg kg-1	0.945		0.94	1.09	1			0.972	1		0.895		
Eu	mg kg-1	0.949		0.92	1	1			1.011	1		0.935		
F	mg kg-1				162									
Ga	mg kg-1			17.19	17.46	17.6	16.7		18.781	18.4	16.8	18		19
Gd	mg kg-1	2.745		2.46	2.89	2.9			2.71	2.7		2.42		
Ge	mg kg-1											0.873		2
Hf	mg kg-1	2.763		3.04	3.48	3.7			0.861	3	1.5	2.95		7
Hg	mg kg-1													
Ho	mg kg-1	0.335		0.34	0.4				0.374	0.4		0.322		
In	mg kg-1													
La	mg kg-1	15.73		15.8	16.9	16.7	11.5		15.638	16.5	22.8	15	15.7	13
Li	mg kg-1					18.7			20.41				19.5	
Lu	mg kg-1	0.129		0.12	0.15				0.117	0.1		0.117		
Mo	mg kg-1	0.914		1.47	0.87				0.877	1				
Nb	mg kg-1	3.591		3.79	4.09		4.5		4.262	3.9	3.2	2.7		6
Nd	mg kg-1	15.64		15.52	16.9	16.8			16.208	16.4	14.3	14.9		33
Ni	mg kg-1	43.26	43	46.94	44.7	44	42.7		50.86	48.2	40.1	51.8	46.3	52
Pb	mg kg-1	5.018		6.45	4.87		11.8		4.356	5.8	11.6		10.7	9
Pd	mg kg-1													
Pr	mg kg-1	3.803		3.95	4.19	4.18			4.118	4.2		3.88		
Pt	mg kg-1													
Rb	mg kg-1	31.05	31	31.82	27.3	33	33.4		34.036	33	33.4	31.5		23
Re	mg kg-1													
Rh	mg kg-1													
S	mg kg-1	311.8		70.84									990	
Sb	mg kg-1			0.05					0.037					
Sc	mg kg-1		10	9.09	8.7	7.5	4.4		11.49		9.3	8.61	7.4	
Se	mg kg-1													
Sm	mg kg-1	3.055		2.95	3.28	3.25			3.147	3.1	2	2.91		
Sn	mg kg-1								0.817	1		0.9		
Sr	mg kg-1	489.7	498	494.950	525.7	516	520.2	600	532.4	514.2	508.5	511	504.5	468
Ta	mg kg-1			0.18	0.24				0.247	0.6		0.189		
Tb	mg kg-1			0.32	0.41				0.376	0.4		0.354		
Te	mg kg-1													
Th	mg kg-1	1.481		1.41	1.51		1.4		1.243	1.5		1.31		2
Tl	mg kg-1								0.247	0.2				
Tm	mg kg-1	0.130		0.12	0.15	0.127			0.128	0.2		0.121		
U	mg kg-1	0.369		0.33	0.34		3.1		0.34	0.4	1.6	0.34		
V	mg kg-1	64.7	65	71	70.05	64	71.4		73.04	72.7	66.7	67.8	69.7	64
W	mg kg-1								1.53	2.3	11.7			
Y	mg kg-1		10	9.14	10.93		8.9		9.435	10.4	9.6	8.78	8.6	16
Yb	mg kg-1	0.823		0.79	0.88				0.862	0.8		0.815		
Zn	mg kg-1	55.04	46	51.44	49.7	60	56.3		48.54	65.7	54.7	59.8	58.7	64
Zr	mg kg-1	105.3	108	110.760	121.3	115	99.8		65.563	118.3	113.9	125	16.4	138

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT53 Contributed data for Tonalite, TLB-1. 05/07/2023

Lab Code		S124	S126	S128	S130	S131	S132	S133	S134	S135	-	-	-	-
SiO2	g 100g-1	65.52	65	65.260	64.102	65.41	63.01	64.82	65.31	66.69				
TiO2	g 100g-1	0.465	0.48	0.473	0.474	0.463	0.46	0.46	0.48	0.49				
Al2O3	g 100g-1	15.91	15.75	15.691	15.429	15.79	15.62	15.61	15.71	16.01				
Fe2O3T	g 100g-1	4.183	4.28	4.224	4.310	4.222	4.01	4.3	4.24	4.3				
Fe(II)O	g 100g-1			2.662				2.653						
MnO	g 100g-1	0.06		0.059	0.055	0.058	0.05	0.057	0.058	0.06				
MgO	g 100g-1	2.414	2.43	2.429	2.247	2.448	2.28	2.39	2.39	2.39				
CaO	g 100g-1	4.263	4.28	4.185	4.180	4.237	4.01	4.31	4.23	4.4				
Na2O	g 100g-1	4.995	4.95	4.894	4.691	4.89	4.63	4.96	4.89	5.03				
K2O	g 100g-1	1.31	1.29	1.305	1.294	1.341	1.23	1.31	1.31	1.36				
P2O5	g 100g-1	0.165	0.16	0.157	0.154	0.164	0.15	0.16	0.154	0.16				
H2O+	g 100g-1							1.153						
CO2	g 100g-1							0.261	0.14					
LOI	g 100g-1	1.07		1.077	1.240	1.2	5.2	1.15	1.09	1.08				
Ag	mg kg-1							0.05						
As	mg kg-1	5							8					
Au	mg kg-1													
B	mg kg-1			13.8				3.182						
Ba	mg kg-1	298		300	382		290	265	309	293				
Be	mg kg-1			0.96				0.86						
Bi	mg kg-1													
Br	mg kg-1													
C(org)	mg kg-1								334					
C(tot)	mg kg-1					523			716					
Cd	mg kg-1							0.04						
Ce	mg kg-1	26		32.9				30		35				
Cl	mg kg-1	311						246.215						
Co	mg kg-1	16		14				13.7	22					
Cr	mg kg-1	369		308	324	322	300	333	332	293				
Cs	mg kg-1			1.4				1.28						
Cu	mg kg-1			14.1	77			16	16	18				
Dy	mg kg-1			1.88				1.73						
Er	mg kg-1			0.94				0.854						
Eu	mg kg-1			0.93				0.868						
F	mg kg-1	341						426						
Ga	mg kg-1	18		18.1	20			18	18	19				
Gd	mg kg-1			2.54				2.25						
Ge	mg kg-1							0.77						
Hf	mg kg-1			3.32				2.54	3					
Hg	mg kg-1							0.001						
Ho	mg kg-1			0.35				0.333						
In	mg kg-1													
La	mg kg-1			15.2				14.5		13				
Li	mg kg-1			18.1				18.5						
Lu	mg kg-1			0.13				0.113						
Mo	mg kg-1			0.82				0.92						
Nb	mg kg-1			3.82				3.04		5				
Nd	mg kg-1	17		15.4				14.2						
Ni	mg kg-1	47		45.1				47.4	49	34				
Pb	mg kg-1			5.09				4.49		7				
Pd	mg kg-1													
Pr	mg kg-1			4				3.62						
Pt	mg kg-1													
Rb	mg kg-1	34		33.1	30	38		30	32	32				
Re	mg kg-1													
Rh	mg kg-1													
S	mg kg-1													
Sb	mg kg-1							0.08						
Sc	mg kg-1	8		7.57				7.72						
Se	mg kg-1													
Sm	mg kg-1			3.12				2.85						
Sn	mg kg-1			0.87				0.71						
Sr	mg kg-1	497		519	524	499	480	498	527	506				
Ta	mg kg-1			0.2				0.2						
Tb	mg kg-1			0.36				0.314						
Te	mg kg-1													
Th	mg kg-1	6		1.29				1.29						
Tl	mg kg-1			0.24										
Tm	mg kg-1			0.13				0.123						
U	mg kg-1			0.35				0.3		7				
V	mg kg-1	73		69.1				65.2	67	64				
W	mg kg-1			1.54				1.58						
Y	mg kg-1	10		9.8				8.86	12	10				
Yb	mg kg-1			0.85				0.756						
Zn	mg kg-1	58		53.1	25	59		60	56	55				
Zr	mg kg-1	106		133	103	111		101	120	100				

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 2 - GeoPT53 Consensus values and statistical summary for Tonalite, TLB-1.

	Consensus Value	Uncertainty of consensus value	Horwitz Target Precision	Uncertainty/ Target Precision	Number of reported results	Robust Mean of results	Robust SD of results	Median of results	Status of consensus value	Type of consensus value
	X_{pt}	$u(x_{pt})$	σ_{pt}	$u(x_{pt}) / \sigma_{pt}$	n					
	g 100g $^{-1}$	g 100g $^{-1}$	g 100g $^{-1}$			g 100g $^{-1}$	g 100g $^{-1}$	g 100g $^{-1}$		
SiO2	65.17	0.06519	0.6951	0.09379	89	65.1	0.5951	65.17	Assigned	Median
TiO2	0.4701	0.001459	0.01053	0.1385	93	0.4701	0.01407	0.47	Assigned	Robust Mean
Al2O3	15.76	0.02518	0.2081	0.121	92	15.75	0.1973	15.76	Assigned	Median
Fe2O3T	4.219	0.009269	0.06794	0.1364	92	4.219	0.0889	4.22	Assigned	Robust Mean
MnO	0.05981	0.0003002	0.001828	0.1642	92	0.05981	0.002879	0.06	Assigned	Robust Mean
MgO	2.412	0.007704	0.04225	0.1824	91	2.412	0.07349	2.407	Assigned	Robust Mean
CaO	4.239	0.01078	0.06821	0.158	92	4.239	0.1034	4.24	Assigned	Robust Mean
Na2O	4.905	0.0249	0.07722	0.3225	87	4.912	0.1816	4.905	Assigned	Median
K2O	1.315	0.003274	0.02525	0.1297	92	1.315	0.03141	1.312	Assigned	Robust Mean
P2O5	0.1565	0.0007748	0.004138	0.1873	89	0.1565	0.00731	0.1585	Assigned	Robust Mean
LOI	1.02	0.0232	0.02034	1.141	74	1.048	0.1095	1.034	Provisional	Mode
	mg kg $^{-1}$	mg kg $^{-1}$	mg kg $^{-1}$			mg kg $^{-1}$	mg kg $^{-1}$	mg kg $^{-1}$		
Ag	0.0377	0.00439	0.004939	0.889	13	0.1992	0.2648	0.05	Provisional	Mode
Ba	300	2.204	10.17	0.2167	86	301.2	17.46	300	Assigned	Median
Be	0.96	0.02135	0.07726	0.2764	32	0.9614	0.1035	0.96	Assigned	Median
Bi	0.025	0.0015	0.003484	0.4306	16	0.02774	0.00928	0.02565	Provisional	Mode
Cd	0.039	0.00439	0.005083	0.8637	25	0.1937	0.2319	0.058	Provisional	Mode
Ce	32.8	0.2646	1.551	0.1706	71	32.44	2.271	32.8	Assigned	Median
Co	14.03	0.1233	0.7541	0.1635	70	14.35	1.145	14.03	Assigned	Median
Cr	317	3.46	10.66	0.3247	85	310.1	26.69	312	Assigned	Mode
Cs	1.401	0.0141	0.1065	0.1324	42	1.401	0.09141	1.4	Assigned	Robust Mean
Cu	14.03	0.3242	0.7541	0.4299	71	14.18	2.679	14.03	Assigned	Median
Dy	1.841	0.01678	0.1343	0.1249	51	1.841	0.1198	1.839	Assigned	Robust Mean
Er	0.935	0.01025	0.07554	0.1357	50	0.9382	0.06586	0.935	Assigned	Median
Eu	0.94	0.009618	0.07589	0.1267	50	0.9388	0.05684	0.94	Assigned	Median
Ga	18.04	0.126	0.9337	0.135	64	18.04	1.008	18	Assigned	Robust Mean
Gd	2.54	0.02061	0.1766	0.1168	52	2.575	0.1728	2.54	Assigned	Median
Ge	0.77	0.0749	0.06406	1.169	17	1.042	0.7015	0.82	Provisional	Mode
Hf	3.04	0.06371	0.2057	0.3097	49	3.044	0.5384	3.04	Assigned	Median
Ho	0.34	0.00271	0.03199	0.08473	47	0.3438	0.02755	0.34	Assigned	Median
In	0.023	0.0015	0.003246	0.4622	8	0.02195	0.002445	0.0225	Provisional	Mode
La	15.3	0.1894	0.8118	0.2333	68	15.3	1.562	15.35	Assigned	Robust Mean
Li	19.22	0.27	0.9853	0.274	37	19.7	1.625	19.4	Assigned	Mode
Lu	0.1205	0.002609	0.01325	0.1969	42	0.1228	0.01346	0.1205	Assigned	Median
Mo	0.9	0.0208	0.07314	0.2844	33	0.9441	0.1461	0.9139	Assigned	Mode
Nb	3.9	0.0943	0.2542	0.371	57	4.057	0.7228	3.97	Assigned	Mode
Nd	15.78	0.1742	0.8332	0.209	64	15.78	1.393	15.83	Assigned	Robust Mean
Ni	46.23	0.568	2.077	0.2735	78	45.74	5.38	45.9	Assigned	Mode
Pb	5	0.131	0.3139	0.4173	62	5.266	1.254	5	Assigned	Median
Pr	3.96	0.03382	0.2575	0.1314	51	3.946	0.2062	3.96	Assigned	Median
Rb	32.24	0.2567	1.529	0.1679	76	32.24	2.238	32.09	Assigned	Robust Mean
Sb	0.04	0.0025	0.005193	0.4814	19	0.08059	0.0647	0.05	Provisional	Mode
Sc	7.5	0.15	0.443	0.3386	58	7.894	0.9044	7.746	Assigned	Mode
Sm	3.103	0.0265	0.2093	0.1266	55	3.103	0.1965	3.1	Assigned	Robust Mean
Sn	0.79	0.03	0.06547	0.4582	32	0.9837	0.3893	0.8485	Assigned	Mode
Sr	519.5	3.664	16.21	0.226	88	516.5	26	519.5	Assigned	Median
Ta	0.196	0.00599	0.02003	0.299	32	0.2388	0.07089	0.2003	Assigned	Mode
Tb	0.35	0.00449	0.03279	0.137	46	0.3403	0.03071	0.347	Assigned	Mode
Th	1.31	0.0188	0.1006	0.1869	55	1.361	0.2062	1.325	Assigned	Mode
Tl	0.2177	0.003603	0.0219	0.1645	24	0.217	0.01649	0.2177	Assigned	Median
Tm	0.1294	0.001532	0.01408	0.1088	44	0.1294	0.01016	0.13	Assigned	Robust Mean
U	0.34	0.005421	0.03199	0.1695	47	0.3425	0.03409	0.34	Assigned	Median
V	69.53	0.7136	2.937	0.243	79	69.53	6.343	69.5	Assigned	Robust Mean
W	1.54	0.06	0.1154	0.5198	29	1.979	0.6919	1.753	Provisional	Mode
Y	9.508	0.1042	0.5419	0.1922	72	9.508	0.8839	9.418	Assigned	Robust Mean
Yb	0.8145	0.008734	0.06719	0.13	48	0.8145	0.06051	0.8104	Assigned	Robust Mean
Zn	54.95	0.5092	2.405	0.2117	80	54.95	4.554	55.07	Assigned	Robust Mean
Zr	119.5	4.73	4.653	1.017	79	115.3	17.24	118.3	Provisional	Mode

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S2	S3	S4	S5	S6	S7	S8	S11	S12	S13	S14	S15	S16
SiO2	0.00	-0.02	0.06	-0.04	-0.09	0.48	**17.03**	-1.49	0.02	**0.17**	**-0.10**	0.00	0.96
TiO2	-0.01	-0.01	-0.39	-0.01	-0.58	0.04	**4.45**	-0.29	-0.72	**-0.01**	**0.94**	0.18	-0.10
Al2O3	-0.24	0.10	-0.28	-0.43	0.17	0.34	**3.07**	0.36	0.12	**0.38**	**-0.53**	0.26	-0.14
Fe2O3T	0.01	0.01	0.19	0.08	-0.18	0.16	**-0.72**	0.60	-1.14	**1.05**	**-0.28**	-0.20	-0.21
MnO	0.05	*	-0.50	0.05	0.33	0.87	**1.14**	-0.22	-1.62	**-1.81**	**0.65**	-0.33	0.05
MgO	-0.38	0.22	0.44	-0.61	-0.41	-1.32	**4.93**	2.95	1.03	**-0.51**	**-0.75**	1.66	0.18
CaO	0.23	-0.06	1.06	0.16	-0.11	-0.14	**-2.91**	-0.04	0.90	**-2.47**	**0.02**	0.69	-0.08
Na2O	0.62	1.00	0.37	-0.10	-0.05	*	**2.14**	2.57	5.31	**-0.06**	**-0.58**	-1.07	0.10
K2O	0.49	0.09	-0.11	0.49	-0.21	-0.50	**5.33**	1.46	-0.21	**-0.22**	**-1.40**	-1.02	-0.46
P2O5	0.42	0.42	0.79	-0.79	-0.42	0.30	*	-1.51	1.09	**-0.85**	**0.36**	-4.17	-0.30
LOI	*-0.25*	*-1.72*	*1.23*	*-0.52*	*-1.94*	*2.46*	*	*	***10.82***	***0.33***	***-8.36***	*1.23*	*
Ag	*	*-0.07*	*	*87.30*	*	*	*	*	*	***124.53***	*	*	*
Ba	-1.67	-0.29	-0.03	0.44	-0.64	1.13	**-0.98**	1.13	*	**-13.45**	**1.38**	-0.13	0.00
Be	*	-0.78	*	*	-0.98	*	*	*	*	**4.91**	**0.91**	-0.06	*
Bi	*	*-0.14*	*	*	*38.03*	*	*	*	*	***34.30***	*0.72*	*	*
Cd	*	*-0.69*	*	*	*15.84*	*	*	*321.57*	*	***90.70***	*	*	*
Ce	0.71	0.42	0.71	0.26	0.58	0.54	**0.97**	-4.39	*	**-4.45**	**-0.26**	-0.14	*
Co	-0.68	-0.19	-0.02	0.64	1.84	*	**0.76**	-0.10	*	**-1.05**	**0.52**	-0.34	*
Cr	-1.64	2.77	-0.41	*	-0.45	-0.66	**2.16**	-1.30	1.88	**-1.88**	**-0.56**	0.31	-0.19
Cs	*	0.14	*	-0.47	0.51	*	**0.46**	*	*	**-6.90**	**-0.20**	-0.33	*
Cu	-1.35	0.28	2.83	1.31	-0.75	-1.89	*	-0.93	*	**1.30**	**0.24**	-1.35	*
Dy	*	0.33	*	0.85	-0.64	-2.54	**1.18**	*	*	**-1.77**	**-0.16**	0.14	*
Er	*	0.36	*	0.23	0.10	-0.50	*	*	*	**-2.08**	**-0.33**	-0.17	*
Eu	*	-0.20	*	0.20	3.76	-1.84	**0.13**	*	*	**-1.66**	**-0.40**	0.07	*
Ga	*	0.19	*	1.32	0.73	-0.05	*	-0.88	*	**-0.29**	**0.97**	-1.01	*
Gd	-0.68	0.11	*	1.02	0.11	0.00	*	*	*	**0.31**	**0.06**	-0.20	*
Ge	*	*	*	*1.80*	*	*	*	*	*	***17.48***	***-0.94***	*	*
Hf	*	0.66	*	-0.10	-0.10	*	**0.19**	*	*	*	*	-0.88	*
Ho	*	0.16	*	0.63	1.09	-0.16	*	*	*	**-6.99**	**-0.31**	-0.16	*
In	*	*	*	*-0.46*	*	*	*	*	*	*	*	*	*
La	-0.19	0.25	-4.50	0.43	0.49	1.67	**0.61**	-3.28	*	**-5.95**	**-2.76**	-0.11	-0.19
Li	*	-0.06	*	1.41	-0.26	-0.33	*	*	*	**-3.80**	**-0.57**	*	*
Lu	*	0.74	*	448.20	1.72	0.36	**-0.87**	*	*	*	**-0.04**	*	*
Mo	*	-0.14	*	7.52	*	*	*	*	*	**5.25**	-0.00	*	*
Nb	*	0.55	6.49	-0.39	0.00	*	*	-1.47	*	**16.38**	**-0.31**	-1.42	*
Nd	-1.07	0.67	*	0.67	1.09	1.22	**-2.49**	-2.99	*	**-2.18**	**-2.00**	-0.20	*
Ni	-1.50	-0.08	0.72	1.63	0.04	1.33	*	1.36	*	**1.37**	**1.09**	-0.61	*
Pb	*	-0.21	-4.62	0.00	12.58	*	*	-2.48	*	**-2.03**	**-0.10**	0.62	*
Pr	-0.50	0.52	*	-0.12	-0.31	-1.63	*	*	*	**-2.89**	**-1.75**	0.10	*
Rb	*	0.25	1.00	-0.41	0.58	-0.38	**1.15**	-0.45	*	**-17.39**	**1.80**	-0.92	*
Sb	*	*	*	*	*	*	*	*	*	*	*0.00*	*	*
Sc	*	0.01	*	1.92	*	0.30	**-0.02**	*	*	**-9.32**	**-0.81**	-0.45	*
Sm	-0.72	0.14	*	0.71	1.48	-0.36	**0.47**	*	*	**0.64**	**-0.82**	0.09	*
Sn	*	-0.23	*	-4.51	36.74	*	*	*	*	*	0.23	*	*
Sr	0.69	1.13	2.66	0.57	-0.41	0.11	**1.26**	-0.14	2.82	**-2.84**	**-0.15**	-0.17	*
Ta	*	-0.15	*	0.35	*	*	*	*	*	*	**10.68**	*	*
Tb	*	-0.31	*	-0.76	0.24	0.15	**-2.75**	*	*	**-6.94**	**-1.53**	-0.31	*
Th	*	0.10	10.89	-0.10	-0.35	*	**1.59**	*	*	**-7.87**	**-0.79**	-0.20	*
Tl	*	0.01	*	*	*	*	*	*	*	*	**0.11**	*	*
Tm	*	0.02	*	0.02	0.73	0.38	*	*	*	*	**0.05**	*	*
U	*	-0.78	*	0.16	0.33	*	*	65.96	*	*	**-0.31**	0.16	*
V	-1.11	1.44	0.23	1.61	*	-0.49	**3.23**	-0.96	*	**0.97**	**1.52**	-0.24	-0.09
W	*	*-0.22*	*	*1.56*	*1.56*	*	***23.05***	*16.92*	*	*	*0.52*	*	*
Y	*	0.27	5.90	-0.10	0.63	1.99	*	-0.63	*	**-1.67**	**-1.99**	0.27	0.45
Yb	*	0.34	*	0.79	-0.55	-0.33	**0.38**	*	*	**-3.28**	**-0.22**	0.04	*
Zn	-1.24	0.03	0.47	-1.24	0.80	0.60	**5.84**	-0.60	*	**-5.79**	**-1.64**	1.01	-0.20
Zr	*	*1.56*	*3.19*	*0.48*	*0.28*	*0.16*	***6.56***	*-2.01*	*4.89*	***2.49***	***1.29***	*-2.06*	*0.27*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S17	S18	S20	S21	S22	S24	S25	S26	S27	S28	S29	S30	S32
SiO2	0.18	0.07	*	*	*	-15.95	-0.12	-4.04	**-0.53**	**0.56**	-0.04	-0.21	0.12
TiO2	0.94	0.56	*	**0.17**	**0.94**	-3.80	-0.01	1.04	**-1.91**	**1.41**	0.18	2.89	0.47
Al2O3	0.00	0.43	*	*	**0.67**	-23.69	0.10	-0.38	**1.63**	**-1.88**	-0.22	0.21	0.31
Fe2O3T	-0.06	-0.15	*	*	**0.61**	-6.03	-0.06	0.30	**-1.31**	**1.62**	0.01	-0.05	0.45
MnO	0.05	0.05	*	**-0.99**	**0.10**	-7.88	0.05	-0.77	**-0.44**	**3.11**	0.87	1.69	0.05
MgO	-0.85	-0.28	*	*	**-0.04**	-16.71	-0.38	-0.06	**0.67**	**-0.28**	-0.85	-0.13	0.33
CaO	-0.87	0.08	*	*	**0.02**	-7.61	0.38	1.34	**0.75**	**5.66**	0.10	0.38	0.16
Na2O	0.29	0.71	*	*	**1.88**	*	0.81	-1.64	**6.02**	**0.00**	-0.01	0.29	0.87
K2O	0.09	0.05	*	*	**2.16**	-2.29	0.29	0.13	**7.71**	**-0.65**	-0.05	0.13	0.09
P2O5	-1.99	-0.18	*	*	**0.85**	16.13	-0.79	2.84	**0.85**	**0.48**	0.06	-0.91	0.42
LOI	*	*-1.97*	*	*	*	*	*1.72*	*	***-0.49***	***3.88***	*	*-2.46*	*-2.21*
Ag	*	*	*	*	*	*	*	*0.00*	*	*	*	*	*-0.27*
Ba	0.74	0.54	*	**-1.09**	**0.79**	-5.90	*	0.15	**-0.56**	4.18	*	0.63	0.00
Be	*	*	*	*	**0.65**	*	*	0.68	*	*	*	*	-0.65
Bi	*	*	*	*	*	*	*	*0.24*	*	*	*	*-0.72*	*-0.43*
Cd	*	*	*	*	*	*606.05*	*	*0.54*	*	*	*	*	*-0.98*
Ce	-1.55	0.39	**-0.32**	**-0.55**	**0.39**	*	*	0.06	*	**1.98**	*	0.13	-0.55
Co	-0.68	-0.02	*	**1.11**	**1.02**	40.43	*	-0.24	*	*	*	0.57	-0.02
Cr	0.19	-2.21	*	**-2.98**	**-1.41**	-7.37	-0.09	-1.99	**0.86**	1.11	*	0.76	0.89
Cs	*	0.46	*	**2.09**	**0.93**	*	*	0.07	*	*	*	0.42	0.09
Cu	-0.68	-0.02	*	**-0.01**	**0.09**	-0.68	*	-0.33	*	*	*	-1.78	-0.15
Dy	*	0.22	**0.07**	**-0.87**	**-0.60**	*	*	-0.01	*	**1.85**	*	0.07	0.22
Er	*	1.09	**-1.65**	**-0.82**	**-0.33**	*	*	-0.12	*	**0.91**	*	0.06	0.63
Eu	*	0.40	**-2.50**	**-0.44**	**-0.53**	*	*	0.16	*	**1.40**	*	0.14	-0.53
Ga	1.05	-0.02	*	**0.80**	**0.17**	*	*	-0.75	*	0.26	*	0.21	0.14
Gd	*	0.45	**0.17**	**-0.87**	**-0.34**	*	*	-0.09	*	**1.34**	*	-0.14	0.00
Ge	*	*	*	*	***-0.78***	*	*	*	*	*	*	*	*-5.31*
Hf	*	0.15	*	**0.00**	**-0.83**	*	*	-2.20	*	0.55	*	0.18	1.39
Ho	*	0.94	**-5.00**	**-0.47**	**-0.31**	*	*	0.07	*	**-0.16**	*	0.11	-0.16
In	*	*	*	*	*	*	*	*	*	*	*	*	*-0.15*
La	*	0.43	**1.60**	**-1.15**	**0.12**	*	*	0.26	*	**2.47**	*	0.26	0.18
Li	*	1.41	*	**0.46**	**1.10**	*	-0.57	-0.02	*	**1.71**	*	*	0.09
Lu	*	0.74	**-2.30**	**-0.20**	*	*	*	0.18	*	**0.53**	*	0.06	0.74
Mo	*	-0.00	*	*	**-0.00**	*	*	-0.11	*	*	*	*	0.07
Nb	*	1.38	*	**0.90**	*	*	*	-0.29	*	1.26	*	0.41	-0.24
Nd	*	0.13	**1.71**	**-0.60**	**-0.09**	*	*	0.36	*	**2.24**	*	-0.11	0.19
Ni	1.15	-0.30	*	**2.45**	**-0.26**	*	*	0.48	**0.32**	-0.77	*	3.80	-0.08
Pb	*	-1.12	*	**0.55**	**-1.62**	*	*	-0.42	*	0.70	*	-1.00	-0.14
Pr	*	0.27	**-0.74**	**-0.76**	**0.19**	*	*	0.12	*	**2.30**	*	0.12	0.45
Rb	1.56	0.25	*	**2.86**	**1.93**	-2.37	*	-0.74	*	1.08	*	0.04	0.08
Sb	*	*	*	*	*	*	*	*1.69*	*	*	*	*	*0.00*
Sc	*	-0.45	*	**2.80**	*	95.38	*	*	*	1.15	*	0.35	-0.63
Sm	*	0.23	**-0.11**	**-0.76**	**-0.68**	*	*	0.35	*	**1.61**	*	0.01	0.97
Sn	*	*	*	*	**-0.61**	*	*	-0.29	*	*	*	4.64	0.53
Sr	0.02	0.11	*	**-1.42**	**0.34**	-3.38	*	-0.69	**0.33**	**-2.05**	*	0.78	0.35
Ta	*	*	*	**0.23**	*	*	*	0.16	*	*	*	-0.57	-0.40
Tb	*	0.76	**-2.75**	**-0.77**	**0.31**	*	*	0.15	*	**-0.40**	*	0.06	-0.61
Th	*	0.94	*	**-0.34**	**1.00**	8.10	*	-0.04	*	-0.72	*	-0.08	0.00
Tl	*	*	*	*	*	*	*	-0.05	*	*	*	*	-0.40
Tm	*	0.02	**-5.64**	**-0.37**	*	*	*	0.01	*	**0.78**	*	0.20	1.09
U	*	*	*	**-0.67**	**0.00**	*	*	0.10	*	0.16	*	-0.17	-0.47
V	-1.45	0.08	*	**-0.84**	**1.86**	-0.09	*	-0.07	-0.46	0.94	*	2.14	1.61
W	*	*	*	*	***-0.95***	*	*	*-0.19*	*	*	*	*1.88*	*0.13*
Y	*	0.18	**-1.55**	**-0.79**	**-0.48**	*	*	-0.29	*	**1.55**	*	0.73	0.18
Yb	*	0.64	**-1.70**	**-0.25**	**-0.07**	*	*	-0.03	*	**1.55**	*	0.27	0.71
Zn	-0.61	0.22	*	*	**-0.73**	-3.73	*	0.85	*	*	*	-0.73	0.39
Zr	*4.14*	*0.70*	*	***0.47***	***-0.11***	*-2.10*	*	*-3.50*	***-0.64***	*1.23*	*	*1.48*	*1.67*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S33	S36	S38	S39	S40	S41	S43	S44	S45	S47	S49	S50	S51
SiO2	0.21	-0.52	-0.72	0.43	-0.20	*	-0.45	0.96	-11.42	-1.27	-0.50	0.29	0.04
TiO2	-0.24	*	1.51	-0.96	-0.01	0.94	-0.48	-0.05	-11.41	-1.07	-0.58	5.68	-2.86
Al2O3	0.03	-3.58	-0.12	0.43	0.10	0.19	-1.01	-0.22	-14.27	-0.86	-0.19	1.59	-0.91
Fe2O3T	0.47	-0.36	3.04	-1.16	-0.65	-0.28	0.45	-0.06	-13.38	-1.20	0.12	1.34	0.46
MnO	0.33	-1.04	0.10	-0.44	0.05	0.10	2.79	-0.50	-5.37	0.71	0.10	5.58	-0.99
MgO	0.09	0.33	1.36	-0.51	-0.14	0.67	1.76	-0.61	-13.30	-0.73	-2.67	1.38	0.43
CaO	-0.67	-0.28	4.49	-0.42	-0.06	2.36	0.96	0.30	-6.73	-0.22	-0.32	1.78	-0.27
Na2O	3.23	1.46	1.96	0.06	-0.03	0.71	0.10	-1.97	17.16	-0.40	1.41	*	-1.88
K2O	-0.03	-0.70	1.77	0.18	-0.31	1.37	0.29	-0.70	-7.74	-0.84	-1.05	0.97	-0.22
P2O5	0.30	*	-4.71	-1.57	-0.30	0.85	0.42	-0.79	15.35	2.01	-1.57	1.09	-1.57
LOI	*8.36*	*0.74*	*1.54*	*10.32*	*8.60*	*	*-0.29*	*-2.95*	*569.83*	*-0.49*	*4.42*	*-1.97*	*-3.44*
Ag	*	*	*	*	*	*	*	*	*	*	*	*	*
Ba	-0.86	127.83	-2.69	-0.39	0.00	-0.98	0.93	0.54	-29.50	2.31	1.24	*	2.65
Be	*	*	-3.53	*	-0.06	0.00	*	0.26	*	*	*	*	*
Bi	*	*	*-0.86*	*	*0.72*	*	*	*	*	*	*	*	*
Cd	*	*1963.55*	*78.89*	*	*0.10*	*	*	*	*	*	*	*	*
Ce	*	*	-3.40	-7.61	-0.16	-0.32	-1.55	0.48	*	-0.26	-0.13	*	0.77
Co	-0.55	182.98	-2.30	-0.04	-0.29	0.49	-7.98	*	-18.59	-0.02	4.46	*	60.96
Cr	0.81	-10.32	-4.49	-3.00	0.09	-0.56	-5.40	*	-29.74	1.60	0.27	*	-1.41
Cs	*	*	-1.07	33.79	-0.01	-0.39	*	*	*	*	*	*	*
Cu	3.03	29.15	-14.78	-2.69	-0.42	1.42	-2.67	*	-18.59	1.31	*	*	-6.67
Dy	*	*	-0.31	*	-0.15	0.14	*	-0.15	*	0.59	0.37	*	*
Er	*	*	11.19	*	0.43	-0.07	*	-0.23	*	*	1.56	*	*
Eu	*	*	-0.41	*	-0.26	-0.26	*	0.00	*	*	-0.53	*	*
Ga	0.24	*	-1.22	-0.05	-0.24	0.28	0.51	*	*	*	*	*	-4.33
Gd	*	*	-0.06	*	-0.11	-0.17	*	0.17	*	-0.11	0.88	*	2.61
Ge	*	*	*-8.98*	*	*0.23*	*	*	*	*	*	*	*	*
Hf	*	*	-14.15	4.67	0.15	-0.10	7.20	0.15	*	*	*	*	4.67
Ho	*	*	-0.28	*	-0.63	0.00	*	0.94	*	*	*	*	*
In	*	*	*0.31*	*	*-0.46*	*	*	*	*	*	*	*	*
La	*	*	-0.57	-2.84	-0.00	-0.00	*	0.86	*	-0.19	0.28	*	5.79
Li	*	137.42	2.60	*	0.09	-1.95	*	*	*	0.90	*	*	*
Lu	*	*	*	*	-0.77	-0.04	*	0.74	*	*	*	*	*
Mo	*	*	-4.12	1.37	-0.00	-1.09	*	*	*	3.42	*	*	*
Nb	*	*	7.39	8.26	-0.20	0.28	6.10	0.20	*	*	2.52	*	4.33
Nd	*	*	-0.79	5.07	-0.41	-0.21	*	0.07	*	0.13	0.19	*	8.67
Ni	-0.78	*	-4.07	-2.04	-0.13	1.29	-6.80	*	-22.26	2.26	1.50	*	-0.59
Pb	-2.23	299.47	42.69	0.00	0.00	0.96	3.19	*	*	0.00	*	*	-9.56
Pr	*	*	-0.63	*	-0.12	-0.19	*	0.25	*	-0.12	*	*	*
Rb	-1.09	*	-17.49	-0.16	-0.18	-0.22	0.90	0.25	*	*	0.04	*	2.46
Sb	*	*	*194.48*	*	*1.93*	*	*	*	*	*	*	*	*
Sc	*	*	-0.96	1.13	-0.68	0.09	*	-0.56	*	1.92	-0.74	*	3.39
Sm	*	*	4.15	*	-0.48	-0.20	*	0.23	*	-0.48	0.70	*	*
Sn	*	*	-0.99	*	9.24	0.31	*	1.60	-11.91	*	*	*	*
Sr	-0.71	*	2.13	-0.89	0.19	0.71	0.08	0.35	-32.04	-0.63	0.03	*	-1.14
Ta	*	*	10.68	*	0.10	0.20	*	0.10	*	*	*	*	*
Tb	*	*	*	*	-0.76	0.00	*	-0.76	*	*	*	*	*
Th	*	*	4.18	6.86	-0.05	0.00	*	-0.05	*	0.45	*	*	*
Tl	*	*	-0.85	*	0.05	0.11	*	*	*	*	*	*	*
Tm	*	*	-0.59	*	-1.04	0.05	*	0.02	*	*	*	*	*
U	*	*	-0.31	20.63	-0.16	0.00	*	-0.63	*	*	*	*	*
V	-1.47	152.78	-3.07	-1.54	0.08	-0.01	2.29	0.25	-23.67	0.08	0.47	*	4.93
W	*	*	*4.40*	*3.99*	*1.99*	*-0.52*	*40.98*	*	*	*	*	*	*
Y	-1.85	*	-2.29	-0.94	-0.84	1.09	-7.85	-0.47	*	-0.10	-2.86	*	2.75
Yb	*	*	-0.84	2.76	-0.11	0.53	*	-0.11	*	*	0.34	*	*
Zn	0.05	1.03	-2.22	-0.81	0.43	1.35	1.05	*	-22.84	*	*	*	1.69
Zr	*-1.14*	*	*-23.32*	*-1.61*	*0.48*	*1.18*	*-3.28*	*1.45*	*	*	*-21.03*	*	*1.18*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S53	S54	S55	S56	S58	S60	S61	S62	S63	S64	S65	S66	S67
SiO2	-0.21	*	0.14	0.45	0.04	0.41	*	-0.09	-3.65	-0.29	0.19	-0.03	*
TiO2	-0.48	-0.48	-0.13	0.94	-0.24	0.46	*	1.89	4.44	-0.01	1.04	1.51	-1.25
Al2O3	-1.03	0.10	-0.31	-1.30	3.48	0.67	*	-0.17	0.55	-0.17	0.31	-0.34	4.80
Fe2O3T	0.16	-0.87	0.66	0.16	-1.40	-0.42	*	0.74	9.57	-0.65	0.82	0.02	2.81
MnO	1.97	0.05	-0.27	-0.44	0.13	-2.08	*	0.05	7.44	-2.68	2.84	-0.99	0.10
MgO	0.22	0.22	0.73	-3.83	-0.43	-0.51	*	0.45	3.30	-1.68	-0.73	-1.22	3.27
CaO	0.52	-1.02	0.29	-0.13	0.57	0.02	*	-0.65	10.57	-0.43	3.60	-0.42	-4.97
Na2O	-0.36	-0.62	-0.35	6.15	*	2.78	*	0.03	5.68	-1.33	-3.85	-1.62	3.95
K2O	-0.11	-0.31	-0.53	-0.61	0.31	-0.22	*	0.88	9.30	-0.11	0.09	-0.22	2.16
P2O5	0.42	0.67	-0.41	0.85	0.39	0.85	*	0.42	0.71	0.42	-1.99	-0.12	0.85
LOI	*2.95*	*	***0.91***	*	*	***2.61***	*	*1.72*	*1.97*	*0.00*	*-2.70*	***2.95***	*
Ag	*	*	*	*	*0.13*	***116.09***	*	*	*	*	*	*	*
Ba	-0.49	-0.20	3.15	-1.08	-0.15	1.57	2.75	0.05	-0.55	*	*	1.08	6.70
Be	0.58	*	0.78	*	0.54	1.81	2.46	0.06	*	*	*	*	2.20
Bi	*	*	*	*	*0.04*	***0.00***	***7.18***	*	*	*	*	*	*
Cd	*	*	*	*	*-0.24*	***0.20***	***15.94***	*	*390.05*	*	*	*	***1.97***
Ce	0.00	-0.26	2.93	1.42	-0.31	-0.39	-3.48	-0.39	-8.76	*	*	1.10	7.86
Co	1.31	-0.02	1.28	1.29	0.26	-0.04	2.75	0.34	*	*	*	-1.37	0.70
Cr	-1.27	*	2.56	-12.76	-0.10	0.38	6.57	-0.48	-6.02	*	*	-1.88	1.41
Cs	*	*	0.05	-3.77	0.31	0.27	2.15	0.14	*	*	*	-0.01	-0.20
Cu	6.61	*	2.85	-0.04	0.00	1.95	1.42	0.97	-5.12	*	*	-4.02	0.64
Dy	0.11	-0.15	0.51	*	0.84	0.59	0.66	-0.00	*	*	*	-1.50	1.78
Er	0.43	-0.03	-0.50	*	0.36	0.07	0.73	-0.03	*	*	*	-0.73	1.13
Eu	-0.13	*	0.88	*	0.34	0.53	0.79	0.00	*	*	*	0.53	0.66
Ga	-0.02	-0.18	0.65	-8.61	1.11	0.10	2.31	0.04	*	*	*	-1.12	0.79
Gd	0.74	*	0.95	*	0.45	-0.28	1.25	0.40	*	*	*	-1.25	2.27
Ge	*-1.17*	*	*	*	*	*	***37.31***	*-0.94*	*	*	*	*	*
Hf	0.02	*	*	9.53	*	-2.14	-2.63	-0.34	0.47	*	*	-1.17	*
Ho	0.16	*	3.28	*	0.39	0.63	0.63	0.00	*	*	*	-0.31	1.25
In	*	*	*	*	*0.06*	*	*	*	*	*	*	*	*
La	1.91	-0.19	2.73	0.86	-0.37	-1.30	6.16	-0.33	*	*	*	1.60	3.05
Li	*	-0.31	0.70	*	1.39	0.00	6.48	0.35	*	*	*	*	2.33
Lu	0.74	*	*	*	*	-0.04	0.72	-0.02	*	*	*	-0.04	-0.04
Mo	-2.39	*	*	1.37	-0.81	0.96	6.56	*	*	*	*	*	0.96
Nb	2.95	*	*	0.39	*	2.16	-0.24	0.61	*	*	*	1.97	-0.47
Nd	0.52	-0.47	1.91	-2.13	0.55	-0.19	0.75	0.30	*	*	*	0.15	3.38
Ni	-1.02	-0.42	2.35	-3.48	0.27	-0.48	17.75	0.49	-8.62	*	*	-4.44	2.57
Pb	4.78	-0.16	2.77	-3.19	-0.78	-0.10	2.26	0.67	*	*	*	0.00	1.18
Pr	0.06	-0.12	1.93	*	0.13	0.00	0.54	-0.27	*	*	*	0.39	3.34
Rb	-0.24	-0.60	*	-0.16	0.53	-0.91	2.52	-0.16	15.62	*	*	0.10	1.20
Sb	*	*	*	*	*	***1.16***	***271.50***	*	*	*	*	*	***-0.39***
Sc	0.56	*	0.87	1.13	0.80	-0.14	8.80	0.26	*	*	*	0.56	-0.61
Sm	-0.36	0.23	0.48	*	0.47	0.18	0.51	-0.22	*	*	*	-0.35	1.85
Sn	*	*	*	18.48	0.21	-0.02	11.00	*	*	*	*	*	0.00
Sr	-0.60	0.23	0.32	-0.96	0.99	1.26	5.15	0.14	-1.09	*	*	1.08	2.45
Ta	2.10	*	*	239.79	*	17.17	8.69	0.00	*	*	*	*	-0.30
Tb	0.15	*	-0.19	*	0.17	0.31	1.22	0.00	*	*	*	-0.61	0.61
Th	1.19	*	*	-3.08	0.08	0.10	-4.97	0.10	54.52	*	*	1.49	1.79
Tl	*	*	-0.11	*	0.19	-0.35	-4.00	*	*	*	*	*	*
Tm	0.38	*	*	*	0.09	0.76	0.76	0.02	*	*	*	-0.67	0.76
U	3.75	*	-1.56	*	-0.81	0.63	0.00	-0.31	*	*	*	0.94	0.31
V	0.59	0.32	*	-2.22	0.36	-1.88	6.43	-0.21	-4.45	*	*	-2.22	-0.55
W	*-0.26*	*	*	***12.65***	*	***10.05***	***37.43***	*	*	*	*	*	***-2.69***
Y	0.45	-0.65	-0.33	6.44	0.17	-0.81	1.65	0.52	6.92	*	*	-0.62	*
Yb	0.49	*	*	*	*	-0.07	0.83	0.04	*	*	*	-0.36	-0.36
Zn	-0.40	1.43	0.42	-0.81	0.90	-0.81	19.11	-0.55	-5.59	*	*	-0.81	-0.93
Zr	*0.38*	*	***0.55***	***-4.41***	*	***-2.54***	***-3.40***	*0.16*	*-2.84*	*	*	***-1.40***	*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S68	S70	S71	S72	S74	S75	S76	S77	S78	S79	S80	S81	S84
SiO2	0.71	0.81	0.09	0.19	-3.26	4.77	1.48	-0.31	0.48	-4.22	0.03	-0.10	-0.62
TiO2	-0.01	-8.56	-0.96	-0.77	-2.67	-0.48	0.65	-0.01	0.18	-2.81	1.32	-0.96	0.47
Al2O3	0.19	1.25	-0.46	0.67	-1.35	0.10	1.15	-0.24	0.38	-1.11	0.23	-0.14	-1.51
Fe2O3T	-0.28	-0.13	0.38	2.81	-0.22	-0.95	0.90	0.52	1.78	-2.35	-5.13	-0.57	1.11
MnO	0.10	0.10	-1.32	0.65	7.76	0.05	2.29	0.05	-0.44	-2.41	0.32	0.05	0.05
MgO	-1.70	3.51	1.28	2.56	0.43	17.38	-0.51	-0.38	-0.28	*	-1.72	2.56	4.12
CaO	0.60	0.31	0.74	-1.59	-1.68	-0.80	-0.86	-0.36	0.46	-2.85	0.11	-1.59	-0.94
Na2O	0.58	-15.73	1.52	2.14	-0.08	-0.87	-5.89	0.68	-0.19	*	-0.73	1.75	-1.33
K2O	0.58	-4.57	-0.50	-2.99	-1.52	2.86	-0.22	0.49	-0.22	0.09	0.06	-0.22	0.09
P2O5	0.85	3.26	0.30	0.85	-4.23	1.63	-0.85	0.42	-1.57	*	0.46	-8.82	0.42
LOI	*0.00*	*-2.95*	*-1.47*	*2.46*	*-1.47*	*-16.47*	*-0.49*	*-0.98*	*-2.95*	*	*-3.44*	*-6.39*	*
Ag	*	*	*	*	*0.87*	*	*	*	*	*	*-0.34*	*	*
Ba	0.10	0.10	-1.13	0.29	2.22	0.10	-0.79	*	0.00	-0.59	-0.12	-14.75	0.79
Be	*	*	*	-0.50	-1.68	*	0.13	*	*	*	*	*	*
Bi	*	*	*	*	*0.29*	*	*	*	*	*	*2.87*	*	*
Cd	*	*	*	*6.10*	*-0.98*	*	*	*	*	*	*2.16*	*	*
Ce	0.06	-1.61	-2.22	-0.58	-0.14	*	0.32	*	0.21	-0.52	0.25	*	*
Co	*	-0.70	-0.29	0.42	-0.13	*	3.54	*	*	*	*	*	-0.02
Cr	0.56	-0.47	-2.88	1.22	0.63	0.00	6.57	*	-0.47	*	-0.22	-14.87	0.33
Cs	*	1.21	*	0.18	-0.15	*	*	*	-0.20	*	-0.01	*	*
Cu	*	2.75	-1.41	-0.97	-0.08	*	1.95	*	1.29	*	1.95	*	-1.35
Dy	*	-0.90	*	-0.14	-0.59	*	-0.01	*	-0.38	*	0.33	*	*
Er	*	-0.46	*	-0.24	-0.34	*	0.73	*	0.07	*	-0.19	*	*
Eu	*	-1.05	*	-0.25	-0.09	*	0.26	*	0.00	*	0.21	*	*
Ga	*	3.60	-0.34	-0.55	1.08	*	-0.45	*	-0.05	-0.61	-0.74	*	-0.56
Gd	*	-0.23	*	-0.23	0.11	*	0.91	*	-0.23	*	0.19	*	*
Ge	*	*11.86*	*	*	*	*	*	*	*	*	*0.78*	*	*
Hf	*	-6.37	7.44	-0.39	-8.55	*	3.50	*	0.10	*	0.29	*	*
Ho	*	-0.31	*	0.38	0.06	*	0.00	*	0.31	*	0.34	*	*
In	*	*	*	*	*	*	*	*	*	*	*	*	*
La	*	-1.48	-0.00	-0.67	-0.68	*	1.48	*	0.61	-0.92	0.68	*	*
Li	*	*	*	0.14	-1.03	*	*	*	*	*	*	*	*
Lu	*	-0.79	*	0.19	-0.11	*	-0.04	*	0.72	*	0.04	*	*
Mo	*	21.88	*	-0.62	*	*	0.82	*	*	*	0.44	*	*
Nb	0.39	0.39	-1.18	0.08	-0.46	*	-0.92	*	0.04	*	-0.21	*	-1.77
Nd	*	-1.53	-2.15	-0.41	-0.55	*	0.27	*	-0.02	-0.53	0.30	*	*
Ni	2.30	-1.07	-1.43	0.13	-0.27	-4.15	3.45	*	1.33	*	-0.21	-11.13	-1.74
Pb	*	4.78	-2.07	-0.96	-0.69	*	0.10	*	0.45	*	0.48	*	3.19
Pr	*	-1.44	*	-0.12	-0.26	*	-0.35	*	0.39	*	0.19	*	*
Rb	-0.16	-2.12	-0.08	-0.07	-0.12	*	-0.50	*	-0.09	-0.18	-0.11	*	-0.73
Sb	*	*	*	*0.58*	*3.85*	*	*	*	*	*	*953.14*	*	*
Sc	0.56	-0.90	7.90	0.02	-0.35	*	*	*	0.23	*	0.59	*	2.82
Sm	*	-1.30	6.44	-0.25	-0.24	*	0.70	*	-0.16	*	-0.28	*	*
Sn	*	*	28.33	10.78	-0.17	*	12.75	*	*	*	3.67	*	*
Sr	0.34	-2.56	-0.88	-0.09	0.84	0.60	3.92	*	0.09	0.14	0.19	-16.02	-0.91
Ta	*	21.16	*	0.05	-0.95	*	*	*	4.19	*	2.75	*	*
Tb	*	-0.61	*	-0.31	-0.18	*	0.00	*	0.00	*	0.03	*	*
Th	*	-2.29	9.39	-0.68	0.44	*	0.60	*	1.19	*	1.09	*	-1.54
Tl	*	2.84	*	0.01	-0.03	*	0.56	*	*	*	-0.49	*	*
Tm	*	-0.67	*	0.12	-0.10	*	0.05	*	0.76	*	0.12	*	*
U	*	-0.94	36.89	0.03	-0.06	*	-0.63	*	0.00	*	-0.22	*	*
V	*	-3.58	-1.67	-0.18	1.81	*	5.85	*	0.50	*	-0.29	*	0.42
W	*	*	*	*0.10*	*1.85*	*	*	*	*	*	*	*	*
Y	-0.94	-1.86	0.18	-0.68	-0.99	*	-0.35	*	0.93	*	0.74	*	2.30
Yb	*	-1.26	*	0.19	-0.74	*	0.83	*	0.23	*	0.50	*	*
Zn	-0.40	1.69	-0.51	0.27	-0.68	*	5.64	*	0.44	-0.03	0.56	-11.42	-0.40
Zr	*-9.35*	*12.36*	*-2.00*	*0.21*	*-5.70*	*	*-1.45*	*	*0.32*	*-0.70*	*2.25*	*-12.84*	*-1.02*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S85	S87	S88	S89	S92	S93	S95	S96	S99	S100	S101	S102	S103
SiO2	-1.62	-0.17	-0.67	0.40	*	0.12	-0.65	-0.21	0.76	*	*	0.35	0.31
TiO2	-0.96	0.15	0.18	3.97	-0.80	-0.96	0.28	-0.01	-0.87	*	*	0.47	*
Al2O3	3.65	-0.05	-0.18	1.39	*	-0.29	0.48	-0.38	0.19	*	*	-0.10	*
Fe2O3T	2.67	-0.12	-0.25	-1.16	*	-0.80	-0.06	0.97	0.90	*	*	-1.02	*
MnO	1.75	-1.08	1.14	-2.52	-0.61	1.97	-0.22	0.87	2.29	*	*	0.05	*
MgO	4.93	0.06	-1.29	-0.04	*	-2.27	-0.85	0.10	-0.51	*	*	0.22	*
CaO	4.12	-0.10	0.18	0.31	*	1.11	-0.36	-0.80	0.17	*	*	0.89	*
Na2O	-1.75	1.02	-0.54	-4.99	*	-1.20	-1.26	1.97	-0.84	*	*	-1.33	*
K2O	0.58	-0.77	0.06	0.58	*	-1.89	-0.11	-0.31	0.97	*	*	1.28	*
P2O5	11.72	-0.57	0.56	3.26	*	-0.79	0.18	0.42	0.85	*	*	0.42	*
LOI	*	*-1.70*	***0.49***	***2.46***	*	*2.95*	*-0.49*	*-1.72*	***-8.85***	*	*	*	*1.97*
Ag	*	*	*	*	*	*	*	*	*	*	***65.87***	*	*
Ba	-12.68	0.35	*	0.34	-0.56	-0.79	0.75	*	0.49	2.02	-2.07	1.23	*
Be	*	*	*	*	*	*	-0.45	-5.76	*	-0.13	-0.08	*	*
Bi	*	*	*	*	*	*	*	*	*	***-4.31***	***-1.72***	*	*
Cd	*	*-0.10*	*	*	*	*	*	*42.40*	*	***-1.77***	***21.84***	*	*
Ce	*	0.01	*	0.35	-1.97	*	-0.32	*	0.13	-3.48	-6.99	0.06	*
Co	1.29	0.21	*	-0.04	-0.57	1.31	-0.02	-3.14	1.29	2.21	0.04	-0.68	*
Cr	-1.22	-0.09	*	*	-0.40	-1.03	-0.33	-1.31	-0.84	2.83	0.19	-0.52	*
Cs	*	-0.24	*	-1.53	*	*	0.37	*	*	-1.14	-1.84	*	*
Cu	-4.68	0.24	*	*	-0.15	7.27	0.64	1.70	-0.04	6.46	0.00	0.64	*
Dy	*	-0.02	*	-0.10	*	*	0.14	*	*	-1.27	-1.94	-0.15	*
Er	*	-0.15	*	-0.26	*	*	0.03	*	*	-1.26	-1.36	-1.56	*
Eu	*	0.06	*	0.54	*	*	0.13	*	*	-0.13	-1.57	-0.92	*
Ga	1.03	-1.57	*	*	-0.10	-0.40	*	*	-0.05	0.06	0.99	*	*
Gd	*	-0.15	*	-0.16	*	*	-0.23	*	*	-2.32	-1.29	-0.40	*
Ge	*	*	*	*	*	*	*	*	*	***1.25***	***27.44***	*	*
Hf	*	-1.21	*	-0.58	*	*	*	*	*	-0.58	0.27	*	*
Ho	*	-0.02	*	-0.13	*	*	0.16	*	*	-1.56	-1.41	-0.63	*
In	*	*0.29*	*	*	*-2.16*	*	*	*	*	*	***0.00***	*	*
La	*	-0.12	*	0.88	-0.86	*	0.43	*	-2.84	-2.75	-5.94	-0.19	*
Li	*	-1.14	*	*	*	*	0.04	*	*	2.31	0.24	0.40	*
Lu	*	0.04	*	0.34	*	*	-0.77	*	*	0.72	-0.94	-1.15	*
Mo	*	0.73	*	*	-1.65	*	0.89	*	*	*	*	*	*
Nb	-3.54	-0.82	*	-2.56	-0.63	2.75	*	*	*	0.39	0.89	*	*
Nd	*	-0.15	*	0.29	*	2.70	-0.35	*	-5.73	-2.61	-4.64	0.13	*
Ni	-8.30	0.28	*	*	-0.04	-0.71	-1.02	-3.19	-1.07	4.85	1.09	0.43	*
Pb	*	-0.49	*	1.91	-0.19	5.26	-1.59	-4.30	*	1.02	-2.16	*	*
Pr	*	0.23	*	0.20	*	*	-0.12	*	*	-1.32	-3.83	0.08	*
Rb	0.50	1.19	*	0.10	0.21	-0.73	0.25	*	-1.47	0.23	-11.34	0.25	*
Sb	*	*0.10*	*	*	*	*	*11.55*	*227.21*	*	***-1.93***	***-0.39***	*	*
Sc	*	0.08	*	*	1.02	-0.56	-0.11	*	0.90	-1.22	0.61	-0.56	*
Sm	*	-0.17	*	0.05	*	*	-0.20	*	*	-2.45	-3.05	-0.25	*
Sn	*	-0.69	*	*	*	*	1.60	*	*	1.99	0.72	*	*
Sr	3.36	0.61	*	-1.04	-0.42	-0.69	-1.53	0.14	-1.45	2.56	-5.25	-0.11	*
Ta	*	-0.20	*	-0.20	*	*	*	*	*	*	3.29	*	*
Tb	*	-0.12	*	0.09	*	*	-0.31	*	*	0.00	-1.37	-0.76	*
Th	*	0.02	*	2.25	*	-2.04	-0.79	*	*	-3.28	*	*	*
Tl	*	-0.01	*	*	-2.50	*	0.05	42.97	*	*	-0.58	*	*
Tm	*	-0.12	*	-0.24	*	*	-0.33	*	*	-1.38	-1.23	-1.04	*
U	*	-0.53	*	-0.50	*	*	-0.47	*	*	0.63	*	*	*
V	6.80	0.34	*	-1.06	-0.35	0.59	0.59	-2.47	-1.88	5.27	0.81	-1.11	*
W	*	*-0.17*	*	*	*	*	*	*	*	***-2.95***	*	*	*
Y	-0.94	-0.33	*	0.30	-1.42	0.45	-0.47	*	0.36	1.28	-2.95	-0.47	*
Yb	*	-0.14	*	-0.14	*	*	-0.78	*	*	-0.51	-1.32	-1.60	*
Zn	1.48	0.14	*	0.48	0.23	0.01	0.01	-4.15	-1.64	-0.81	1.10	0.43	*
Zr	***-3.12***	*-1.52*	*	***0.17***	*-1.10*	*1.13*	*1.34*	*	***-4.62***	***2.69***	***4.00***	*0.05*	*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

Lab Code	S104	S105	S107	S108	S109	S111	S113	S114	S115	S119	S121	S122	S123
SiO2	**1.22**	-0.09	0.29	**-1.11**	-0.17	0.09	**0.94**	*	0.47	**-0.55**	-0.01	-2.95	-0.32
TiO2	**-0.73**	0.47	-0.48	**-0.01**	0.47	-0.01	**-1.91**	*	0.47	**-0.01**	0.14	1.56	-0.15
Al2O3	**-0.72**	0.07	-0.36	**-0.67**	-0.46	0.53	**0.34**	*	0.00	**0.43**	0.14	2.02	-0.51
Fe2O3T	**-1.20**	0.01	-0.80	**-3.81**	0.67	0.16	**0.16**	*	0.52	**-0.42**	0.38	-0.36	-0.44
MnO	**-0.03**	0.05	0.05	**0.10**	0.87	0.05	**-2.08**	*	0.05	**0.10**	0.60	-0.50	4.16
MgO	**-1.06**	-0.38	-0.61	**-1.22**	-0.61	-0.26	**1.14**	*	0.57	**0.20**	0.33	9.92	0.89
CaO	**1.10**	-0.94	0.16	**-0.27**	1.26	-0.28	**0.17**	*	0.45	**-2.47**	0.13	-0.50	-0.85
Na2O	**-2.16**	-16.35	-0.55	**-1.62**	0.36	0.55	**-2.14**	*	0.23	**2.14**	-1.13	-0.55	0.63
K2O	**-2.99**	77.33	0.09	**-1.40**	0.49	0.49	**0.18**	*	0.29	**-1.01**	-0.17	1.48	0.47
P2O5	**-0.46**	-0.79	-1.99	**-0.36**	0.18	-1.99	**-1.57**	*	0.42	**-3.99**	0.06	-2.72	-1.75
LOI	*	*-0.25*	*3.44*	***62.44***	*0.25*	*-1.47*	***0.00***	*	*5.16*	***0.98***	*-0.25*	*9.34*	*3.96*
Ag	***14.78***	*	*1.25*	*	*	*	*	*	*	*	*	*	*
Ba	**-0.51**	-0.10	0.17	**-0.39**	0.15	-0.14	*	**2.42**	0.30	**-1.27**	0.22	-0.02	-1.08
Be	**-0.32**	*	*	*	-0.39	*	*	**0.21**	0.26	*	*	*	*
Bi	*	*	*	*	*	*	*	*	*	*	*	*	*
Cd	***32.82***	*	*	*	*	*	*	***3.74***	*	*	*	*	*
Ce	**-0.43**	*	0.18	**1.08**	0.77	-0.19	*	**0.47**	0.35	**0.90**	0.00	*	0.39
Co	**-0.72**	0.64	0.03	*	0.03	*	*	**1.51**	-0.02	**0.62**	-0.35	-0.15	7.27
Cr	**0.79**	-1.31	-0.31	**0.22**	0.28	0.58	*	**0.73**	0.53	**-3.96**	0.28	-3.45	-1.60
Cs	**-0.03**	*	0.23	**-0.20**	*	*	*	**-0.44**	-0.01	*	*	*	*
Cu	**-0.37**	*	3.97	**-4.42**	*	-0.42	*	**-15.01**	0.58	**-4.15**	0.84	-0.75	30.48
Dy	**-0.55**	*	-0.30	**2.45**	*	*	*	**1.93**	-0.15	*	-0.30	*	*
Er	**0.14**	*	0.03	**2.05**	0.43	*	*	**0.49**	0.43	*	-0.26	*	*
Eu	**0.12**	*	-0.13	**0.79**	0.40	*	*	**0.94**	0.40	*	-0.03	*	*
Ga	*	*	-0.46	**-0.62**	-0.24	-0.72	*	**0.79**	0.19	**-1.33**	-0.02	*	0.51
Gd	**1.16**	*	-0.23	**1.98**	1.02	*	*	**0.96**	0.45	*	-0.34	*	*
Ge	*	*	*	*	*	*	*	*	*	*	*0.80*	*	*9.60*
Hf	**-1.35**	*	0.00	**2.14**	1.60	*	*	**-10.59**	-0.10	**-7.49**	-0.22	*	9.63
Ho	**-0.17**	*	0.00	**1.88**	*	*	*	**1.06**	0.94	*	-0.28	*	*
In	*	*	*	*	*	*	*	*	*	*	*	*	*
La	**0.53**	*	0.31	**1.97**	0.86	-2.34	*	**0.41**	0.74	**9.24**	-0.19	0.25	-1.42
Li	*	*	*	*	-0.26	*	*	**1.21**	*	*	*	0.14	*
Lu	**0.66**	*	-0.02	**2.23**	*	*	*	**-0.26**	-0.77	*	-0.13	*	*
Mo	**0.19**	*	3.90	**-0.41**	*	*	*	**-0.31**	0.68	*	*	*	*
Nb	**-1.22**	*	-0.22	**0.75**	*	1.18	*	**1.42**	0.00	**-2.75**	-2.36	*	4.13
Nd	**-0.17**	*	-0.15	**1.35**	0.61	*	*	**0.52**	0.37	**-1.77**	-0.53	*	10.34
Ni	**-1.43**	-0.78	0.17	**-0.74**	-0.54	-0.85	*	**2.23**	0.47	**-2.95**	1.34	0.02	1.39
Pb	**0.06**	*	2.31	**-0.41**	*	10.83	*	**-2.05**	1.27	**21.03**	*	9.08	6.37
Pr	**-0.61**	*	-0.02	**0.89**	0.43	*	*	**0.61**	0.47	*	-0.16	*	*
Rb	**-0.78**	-0.41	-0.14	**-3.23**	0.25	0.38	*	**1.17**	0.25	**0.76**	-0.24	*	-3.02
Sb	*	*	*0.96*	*	*	*	*	***-0.58***	*	*	*	*	*
Sc	*	2.82	1.79	**2.71**	0.00	-3.50	*	**9.01**	*	**4.06**	1.25	-0.11	*
Sm	**-0.23**	*	-0.36	**0.85**	0.35	*	*	**0.21**	-0.01	**-5.27**	-0.46	*	*
Sn	*	*	*	*	*	*	*	**0.41**	1.60	*	0.84	*	*
Sr	**-1.84**	-0.66	-0.76	**0.38**	-0.11	0.02	**4.96**	**0.80**	-0.16	**-0.68**	-0.26	-0.46	-1.59
Ta	*	*	-0.40	**2.20**	*	*	*	**2.55**	10.08	*	-0.17	*	*
Tb	*	*	-0.46	**1.83**	*	*	*	**0.79**	0.76	*	0.06	*	*
Th	**1.70**	*	0.50	**1.99**	*	0.45	*	**-0.67**	0.94	*	0.00	*	3.43
Tl	*	*	*	*	*	*	*	**1.34**	-0.40	*	*	*	*
Tm	**0.03**	*	-0.33	**1.47**	-0.08	*	*	**-0.10**	2.51	*	-0.30	*	*
U	**0.90**	*	-0.16	**0.00**	*	43.14	*	**0.00**	0.94	**39.39**	0.00	*	*
V	**-1.64**	-0.77	0.25	**0.18**	-0.94	0.32	*	**1.20**	0.54	**-0.96**	-0.29	0.03	-0.94
W	*	*	*	*	*	*	*	***-0.09***	*3.29*	***88.02***	*	*	*
Y	*	0.45	-0.34	**2.62**	*	-0.56	*	**-0.14**	0.82	**0.17**	-0.67	-0.84	5.99
Yb	**0.12**	*	-0.18	**0.97**	*	*	*	**0.71**	-0.11	*	0.00	*	*
Zn	**0.04**	-1.86	-0.73	**-2.18**	1.05	0.28	*	**-2.66**	2.24	**-0.10**	1.01	0.78	1.88
Zr	***-3.05***	*-1.24*	*-0.94*	***0.39***	*-0.48*	*-2.12*	*	***-11.59***	*-0.13*	***-1.20***	*0.59*	*-11.08*	*1.99*

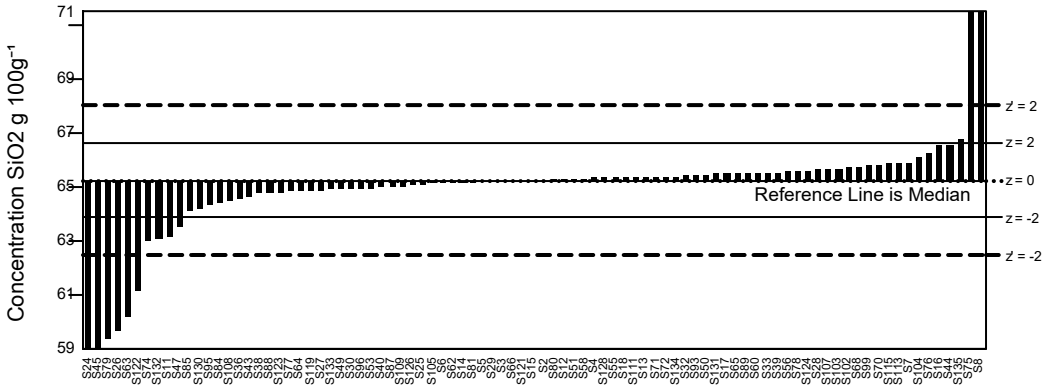
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT53 Z-scores for Tonalite, TLB-1. 05/07/2023

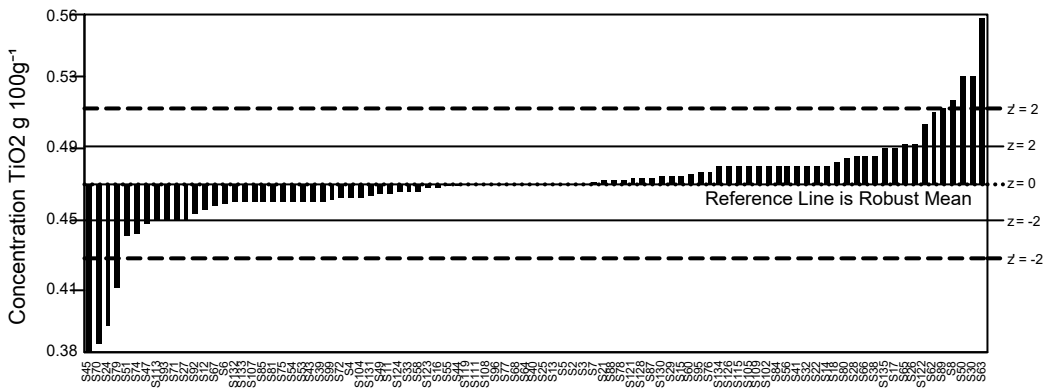
Lab Code	S124	S126	S128	S130	S131	S132	S133	S134	S135
SiO2	**0.50**	-0.12	**0.13**	-0.77	0.17	**-3.11**	**-0.50**	0.10	1.09
TiO2	**-0.49**	0.47	**0.28**	0.18	-0.34	**-0.96**	**-0.96**	0.47	0.94
Al2O3	**0.72**	-0.02	**-0.33**	-0.79	0.07	**-0.67**	**-0.72**	-0.12	0.60
Fe2O3T	**-0.53**	0.45	**0.07**	0.67	0.02	**-3.07**	**1.20**	0.16	0.60
MnO	**0.10**	*	**-0.61**	-1.23	-0.60	**-5.37**	**-1.54**	-0.50	0.05
MgO	**0.05**	0.22	**0.40**	-1.95	0.43	**-3.12**	**-0.51**	-0.26	-0.26
CaO	**0.36**	0.30	**-0.78**	-0.43	-0.01	**-3.35**	**1.04**	-0.06	1.18
Na2O	**1.17**	0.29	**-0.15**	-1.39	-0.10	**-3.56**	**0.71**	-0.10	0.81
K2O	**-0.22**	-0.50	**-0.43**	-0.43	0.51	**-3.38**	**-0.22**	-0.11	0.88
P2O5	**2.06**	0.42	**0.17**	-0.25	0.91	**-1.57**	**0.85**	-0.30	0.42
LOI	***2.46***	*	***2.78***	*5.41*	*4.42*	***205.51***	***6.39***	*1.72*	*1.47*
Ag	*	*	*	*	*	*	***2.49***	*	*
Ba	**-0.20**	*	**0.00**	4.03	*	-0.49	**-3.44**	0.44	-0.34
Be	*	*	**0.00**	*	*	*	**-1.29**	*	*
Bi	*	*	*	*	*	*	*	*	*
Cd	*	*	*	*	*	*	***0.20***	*	*
Ce	**-4.38**	*	**0.06**	*	*	*	**-1.80**	*	0.71
Co	**2.61**	*	**-0.04**	*	*	*	**-0.44**	5.28	*
Cr	**4.88**	*	**-0.84**	0.33	0.23	-0.80	**1.50**	0.70	-1.13
Cs	*	*	**-0.01**	*	*	*	**-1.14**	*	*
Cu	*	*	**0.09**	41.75	*	*	**2.61**	1.31	2.63
Dy	*	*	**0.29**	*	*	*	**-0.83**	*	*
Er	*	*	**0.07**	*	*	*	**-1.07**	*	*
Eu	*	*	**-0.13**	*	*	*	**-0.95**	*	*
Ga	**-0.05**	*	**0.06**	1.05	*	*	**-0.05**	-0.02	0.51
Gd	*	*	**0.00**	*	*	*	**-1.64**	*	*
Ge	*	*	*	*	*	*	***-0.00***	*	*
Hf	*	*	**1.36**	*	*	*	**-2.43**	-0.10	*
Ho	*	*	**0.31**	*	*	*	**-0.22**	*	*
In	*	*	*	*	*	*	*	*	*
La	*	*	**-0.13**	*	*	*	**-0.99**	*	-1.42
Li	*	*	**-1.14**	*	*	*	**-0.73**	*	*
Lu	*	*	**0.72**	*	*	*	**-0.57**	*	*
Mo	*	*	**-1.09**	*	*	*	**0.27**	*	*
Nb	*	*	**-0.31**	*	*	*	**-3.38**	*	2.16
Nd	**1.47**	*	**-0.45**	*	*	*	**-1.89**	*	*
Ni	**0.37**	*	**-0.54**	*	*	*	**0.56**	0.67	-2.94
Pb	*	*	**0.29**	*	*	*	**-1.62**	*	3.19
Pr	*	*	**0.16**	*	*	*	**-1.32**	*	*
Rb	**1.15**	*	**0.56**	-0.73	1.88	*	**-1.47**	-0.08	-0.08
Sb	*	*	*	*	*	*	***7.70***	*	*
Sc	**1.13**	*	**0.16**	*	*	*	**0.50**	*	*
Sm	*	*	**0.08**	*	*	*	**-1.21**	*	*
Sn	*	*	**1.22**	*	*	*	**-1.22**	*	*
Sr	**-1.39**	*	**-0.03**	0.14	-0.63	-1.22	**-1.33**	0.23	-0.42
Ta	*	*	**0.20**	*	*	*	**0.20**	*	*
Tb	*	*	**0.31**	*	*	*	**-1.10**	*	*
Th	**46.62**	*	**-0.20**	*	*	*	**-0.20**	*	*
Tl	*	*	**1.02**	*	*	*	*	*	*
Tm	*	*	**0.05**	*	*	*	**-0.45**	*	*
U	*	*	**0.31**	*	*	*	**-1.25**	*	104.10
V	**1.18**	*	**-0.15**	*	*	*	**-1.47**	-0.43	-0.94
W	*	*	***0.00***	*	*	*	***0.35***	*	*
Y	**0.91**	*	**0.54**	*	*	*	**-1.20**	2.30	0.45
Yb	*	*	**0.53**	*	*	*	**-0.87**	*	*
Zn	**1.27**	*	**-0.77**	-6.23	0.84	*	**2.10**	0.22	0.01
Zr	***-2.90***	*	***2.90***	*-1.77*	*-0.91*	*	***-3.98***	*0.05*	*-2.10*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

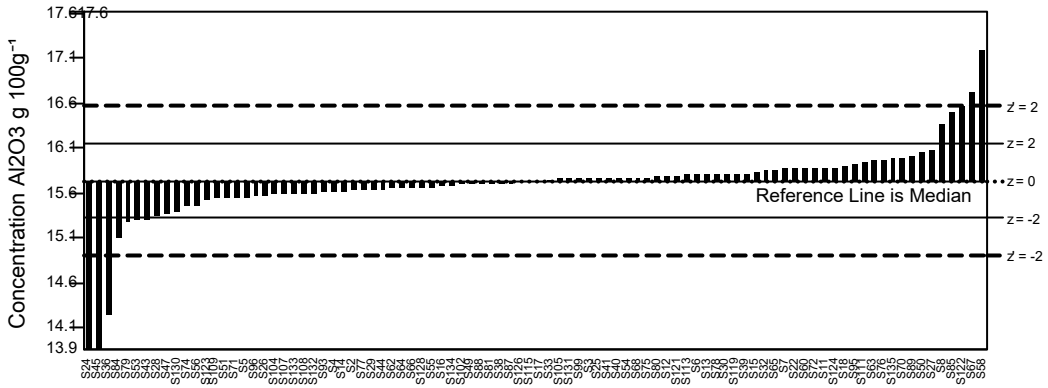
GeoPT53 - Barchart for SiO2



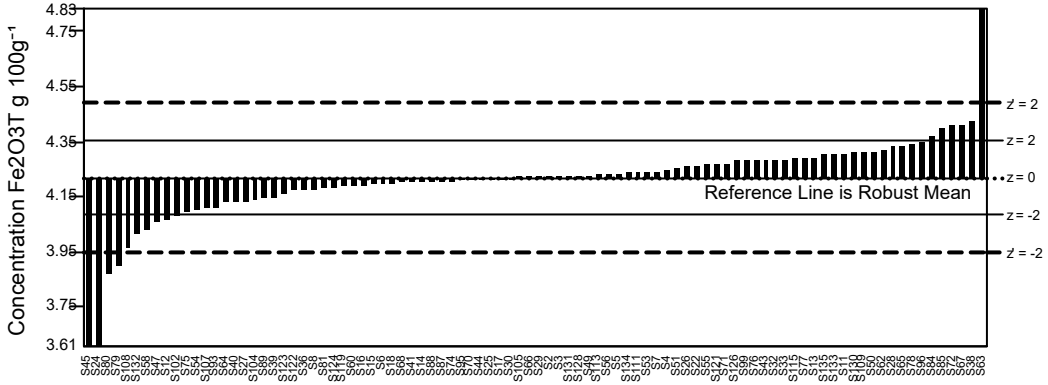
GeoPT53 - Barchart for TiO2



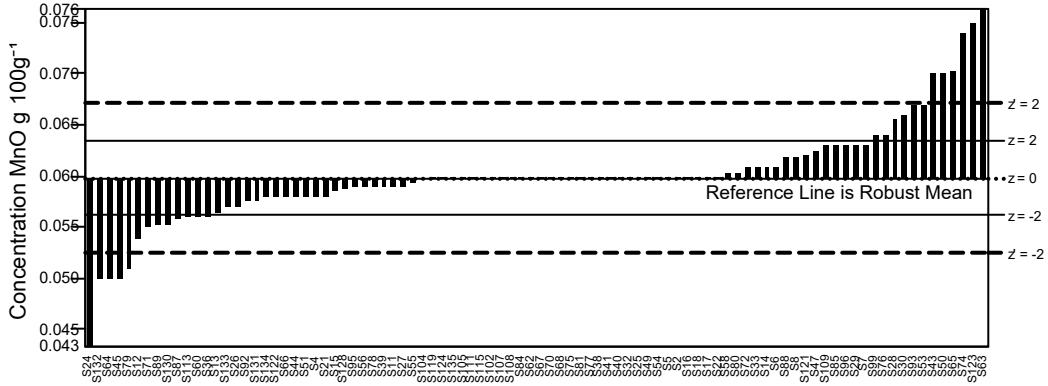
GeoPT53 - Barchart for Al2O3



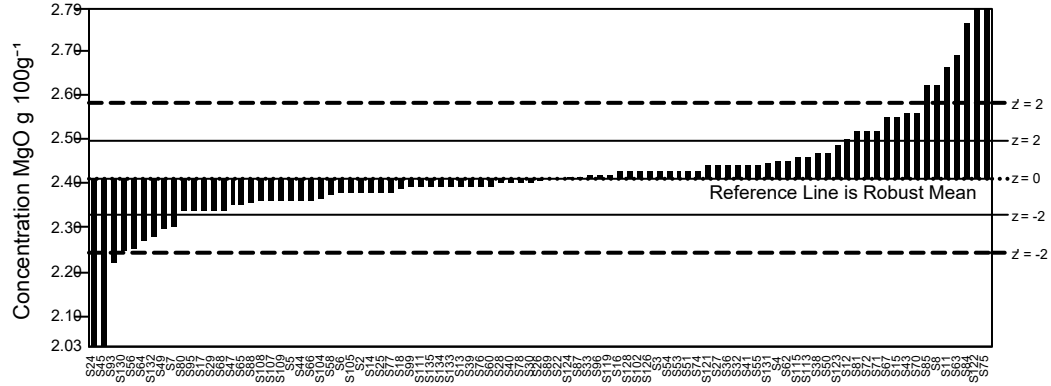
GeoPT53 - Barchart for Fe2O3T



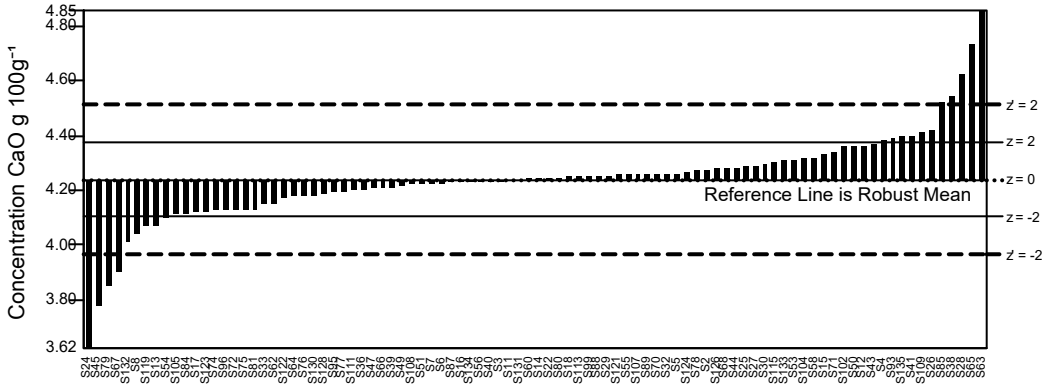
GeoPT53 - Barchart for MnO



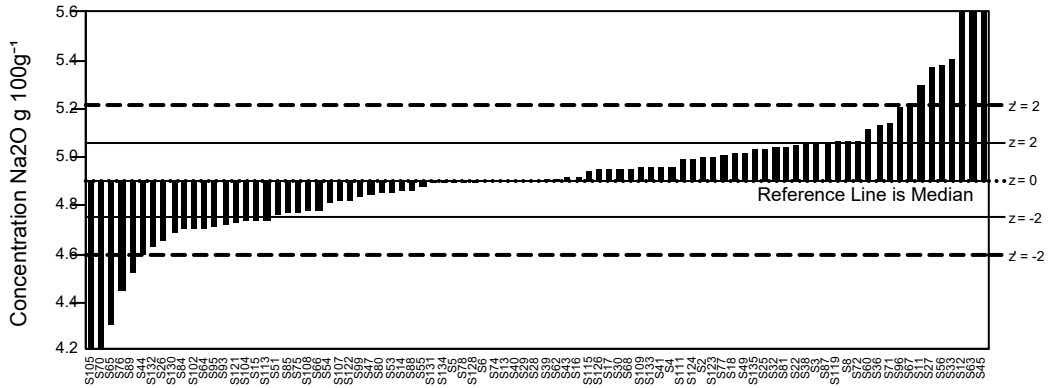
GeoPT53 - Barchart for MgO



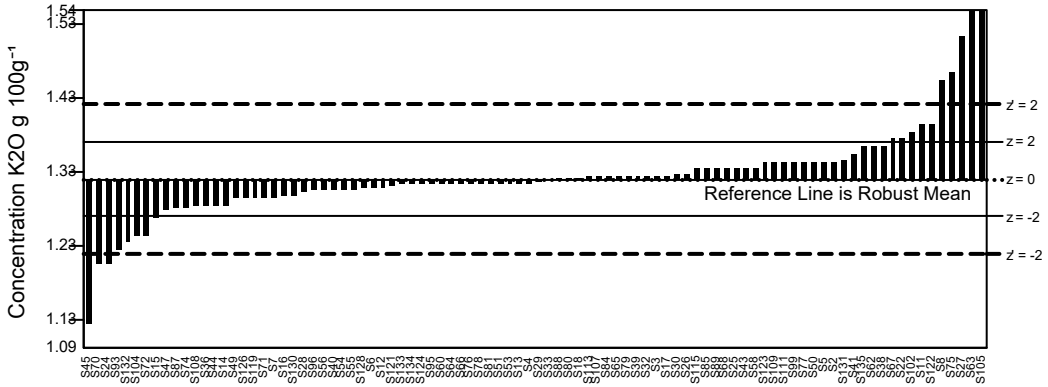
GeoPT53 - Barchart for CaO



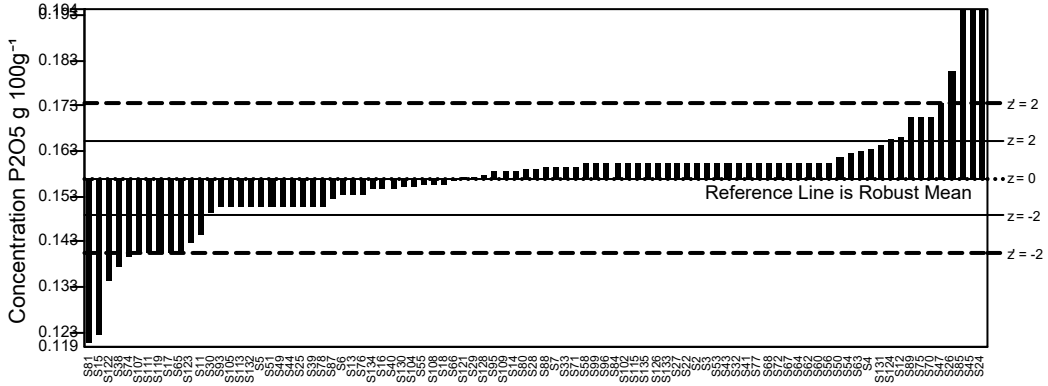
GeoPT53 - Barchart for Na2O



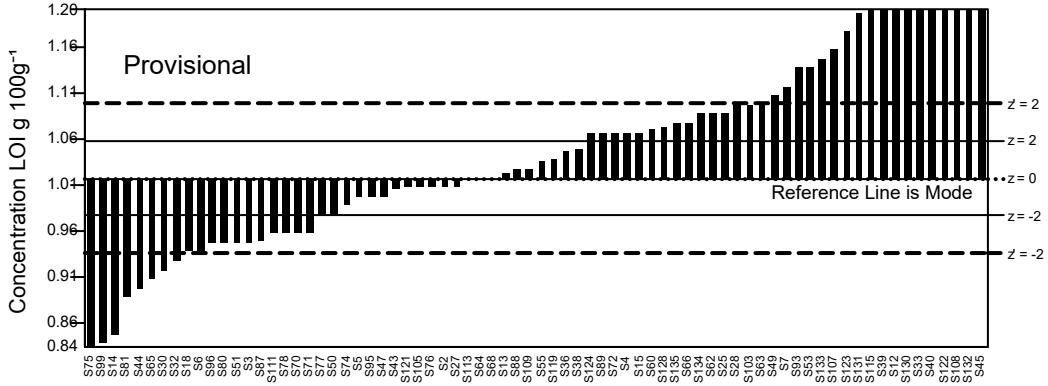
GeoPT53 - Barchart for K2O



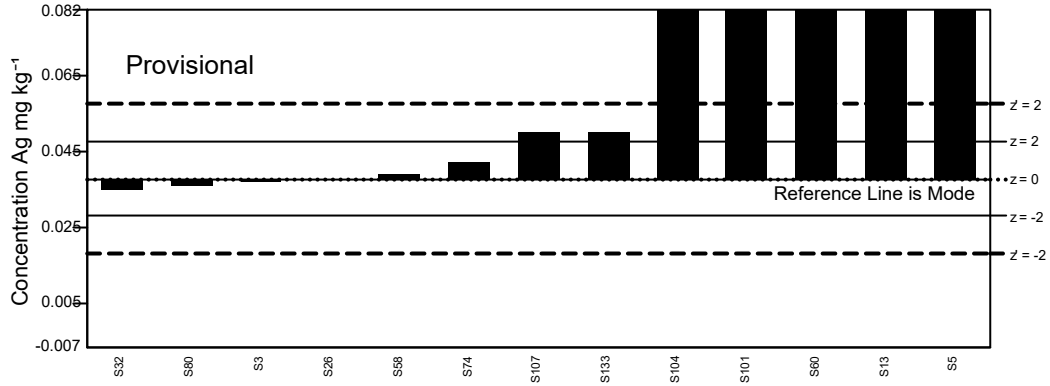
GeoPT53 - Barchart for P2O5



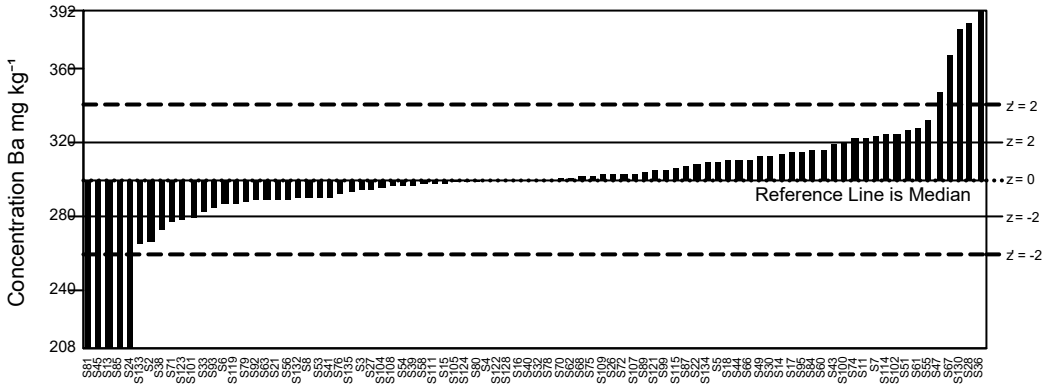
GeoPT53 - Barchart for LOI



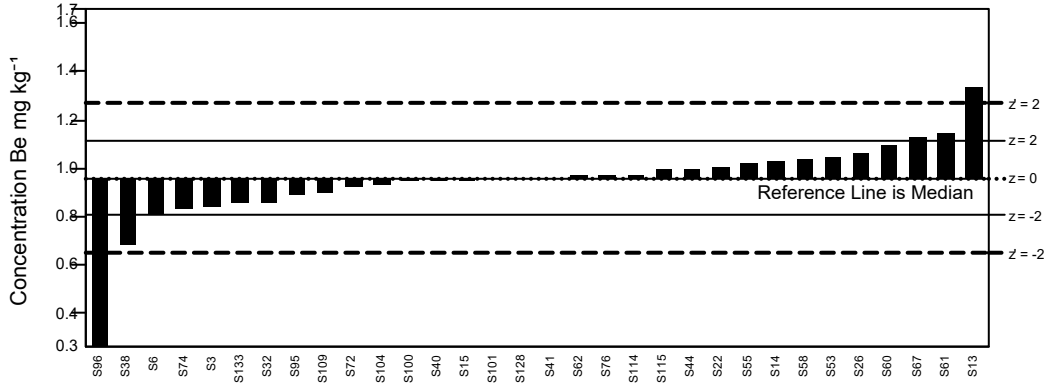
GeoPT53 - Barchart for Ag



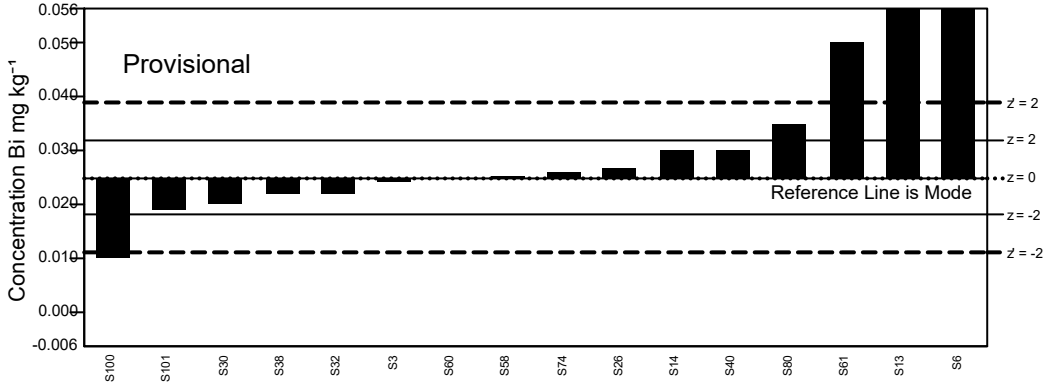
GeoPT53 - Barchart for Ba



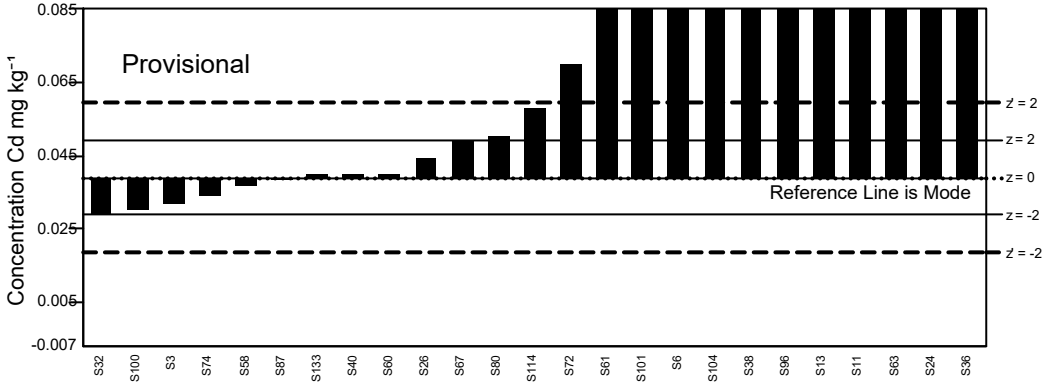
GeoPT53 - Barchart for Be



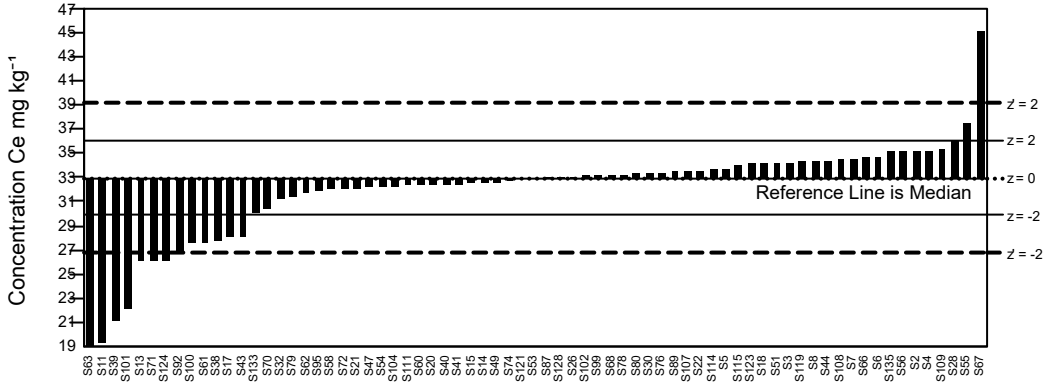
GeoPT53 - Barchart for Bi



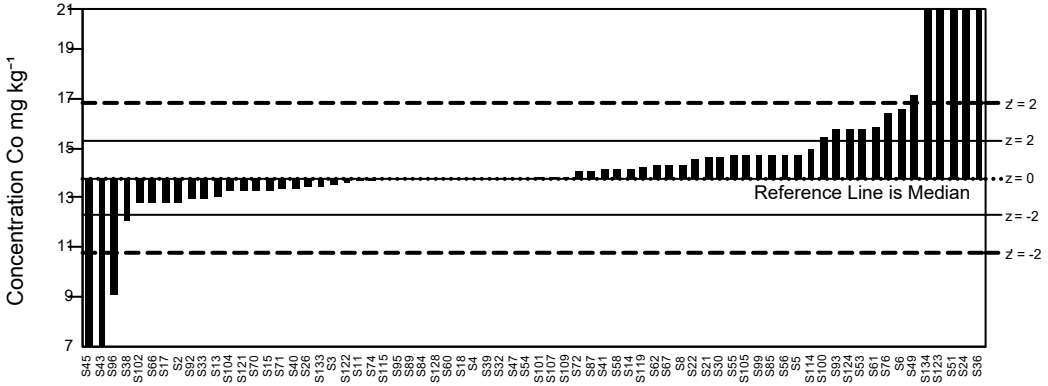
GeoPT53 - Barchart for Cd



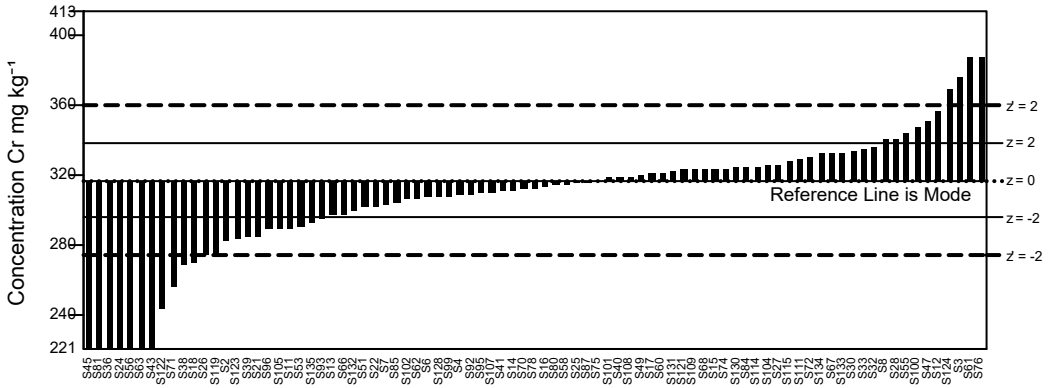
GeoPT53 - Barchart for Ce



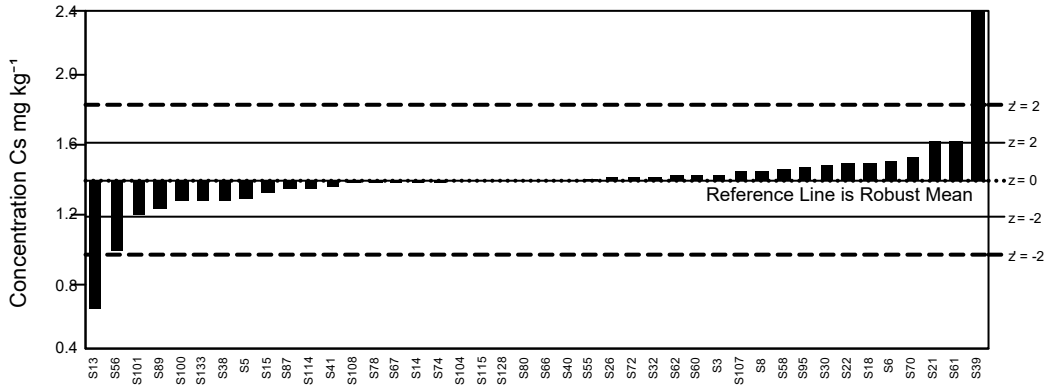
GeoPT53 - Barchart for Co



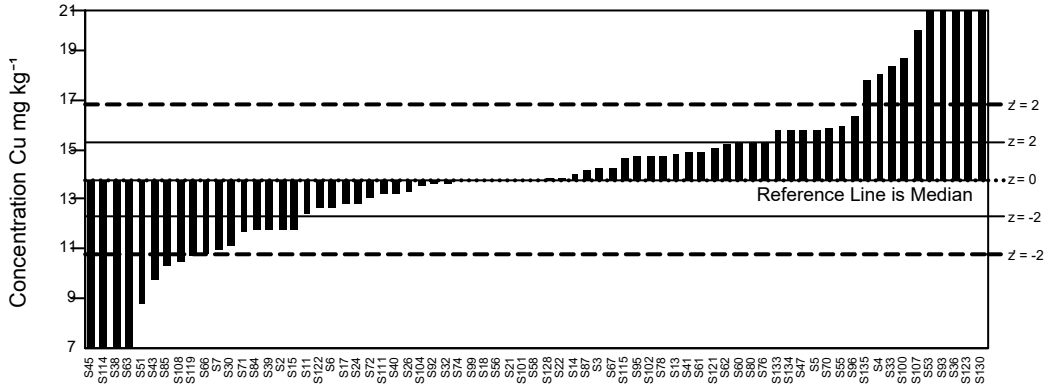
GeoPT53 - Barchart for Cr



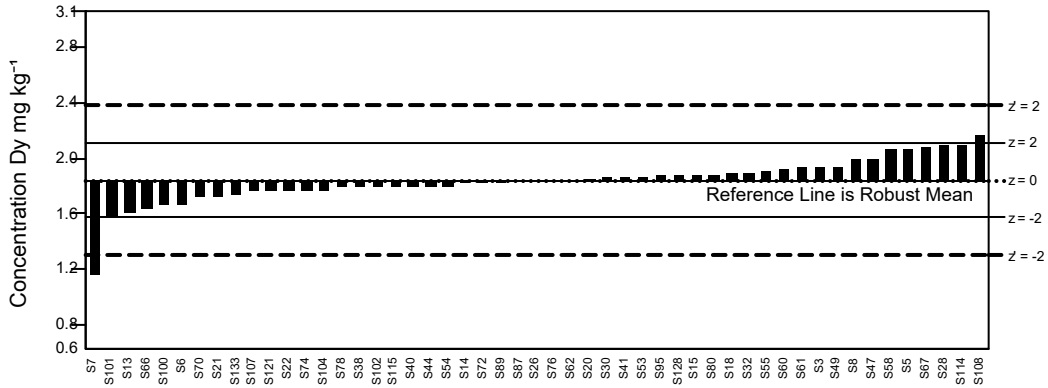
GeoPT53 - Barchart for Cs



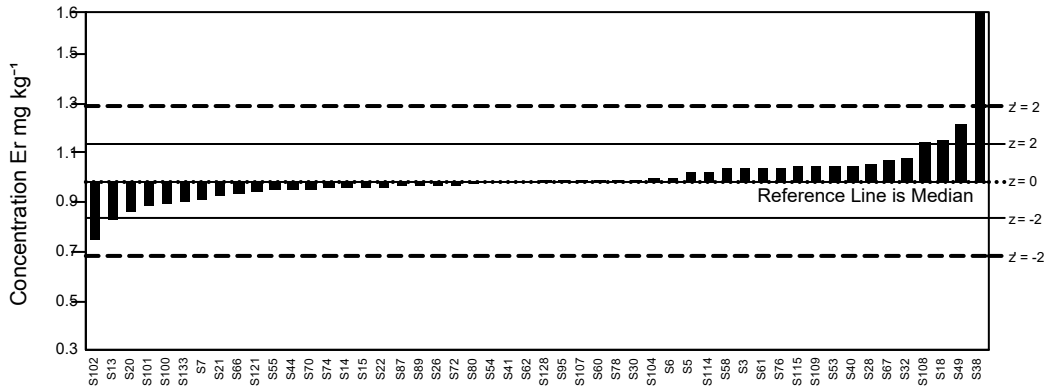
GeoPT53 - Barchart for Cu



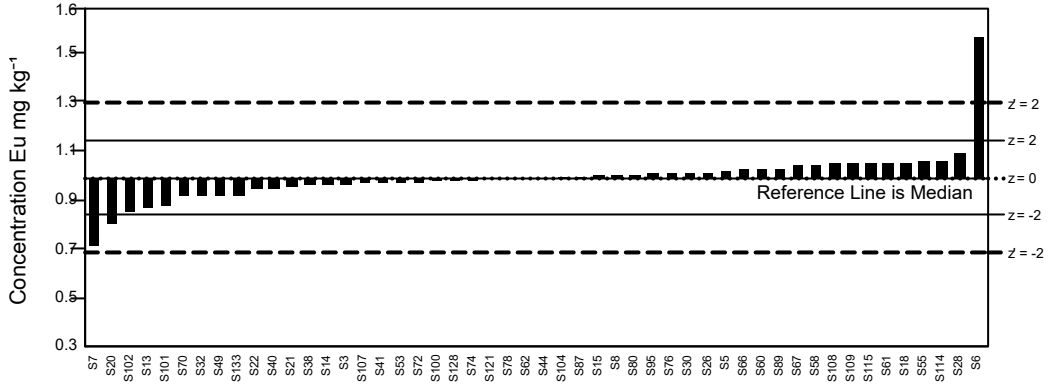
GeoPT53 - Barchart for Dy



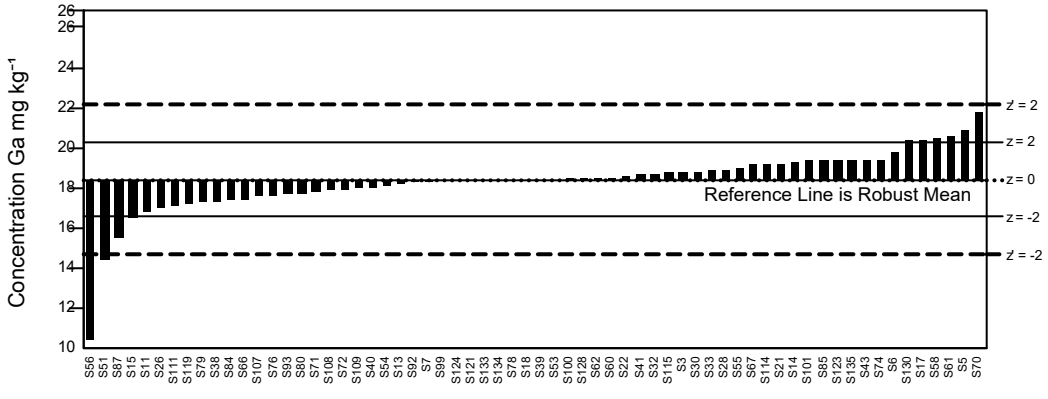
GeoPT53 - Barchart for Er



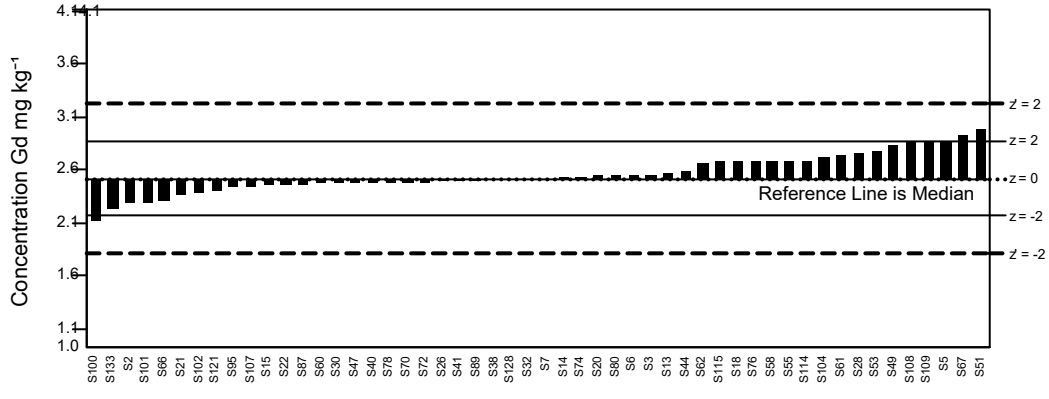
GeoPT53 - Barchart for Eu



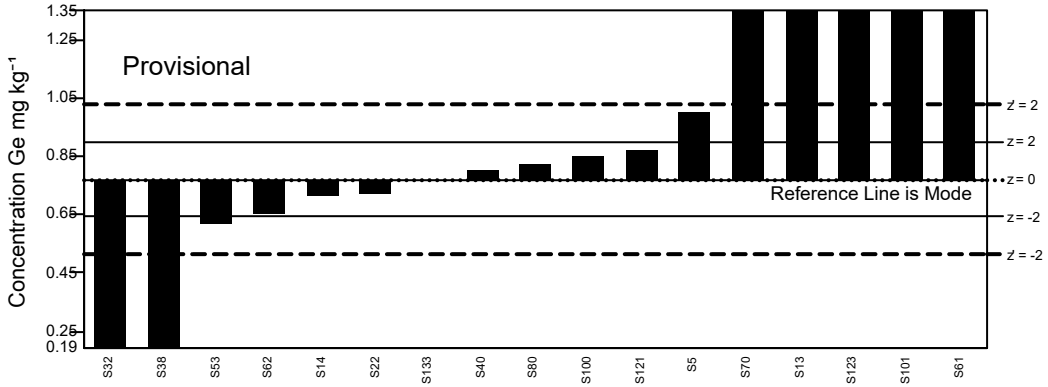
GeoPT53 - Barchart for Ga



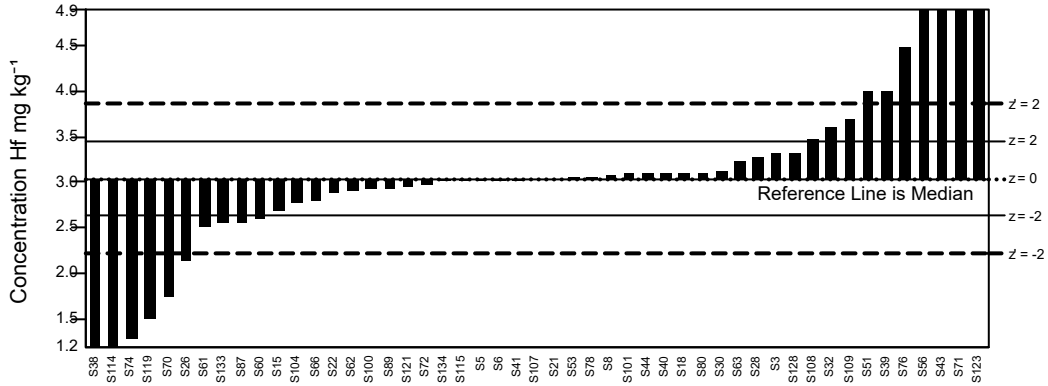
GeoPT53 - Barchart for Gd



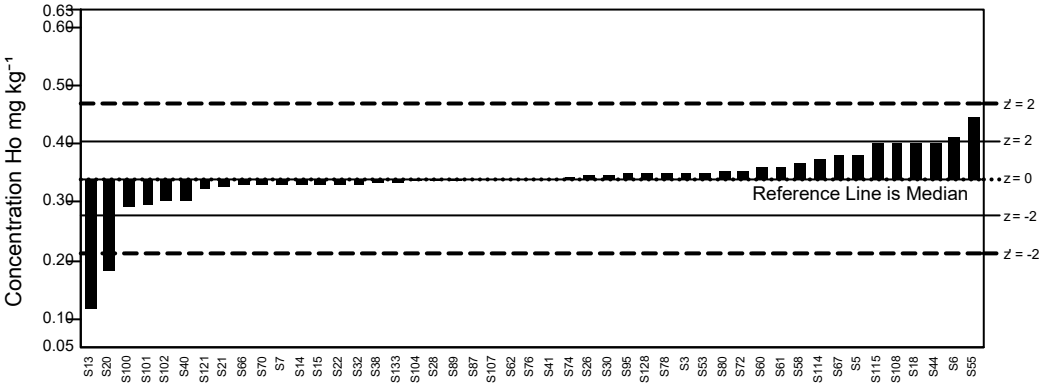
GeoPT53 - Barchart for Ge



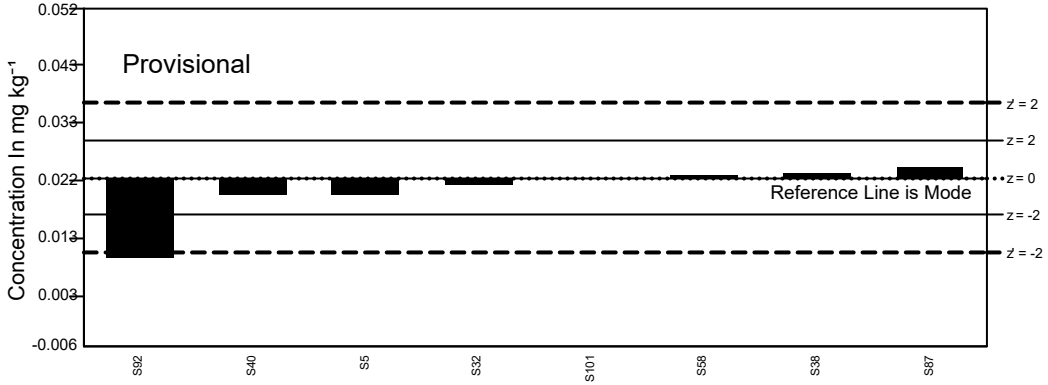
GeoPT53 - Barchart for Hf

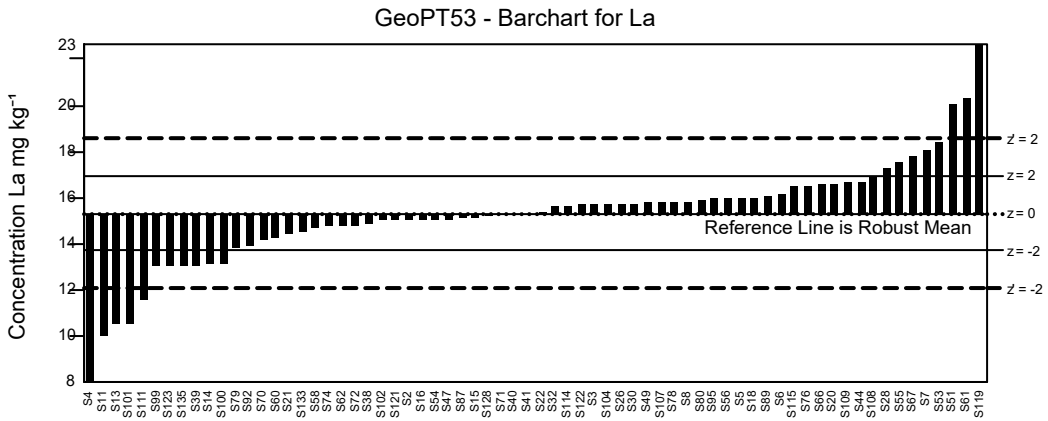


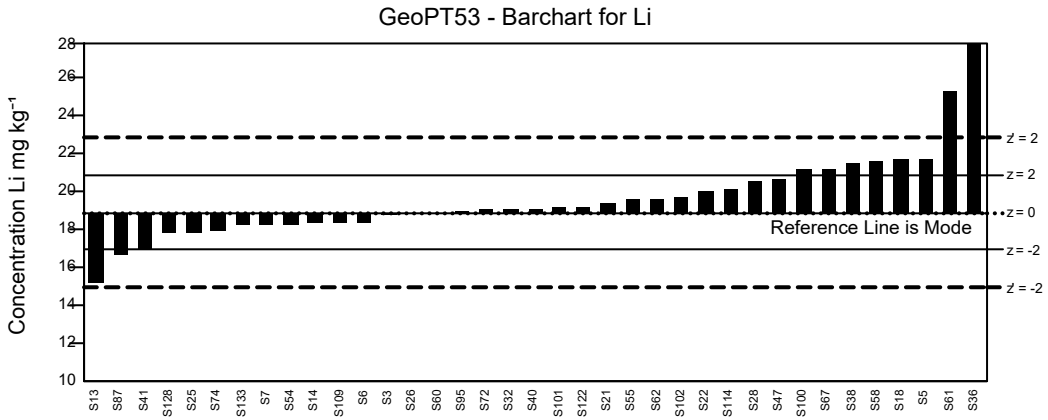
GeoPT53 - Barchart for Ho



GeoPT53 - Barchart for In




GeoPT53 - Barchart for La
Concentration La mg kg⁻¹
Reference Line is Robust Mean
z' = 2
z = 2
z = 0
z = -2
z' = -2


GeoPT53 - Barchart for Li
Concentration Li mg kg⁻¹
Reference Line is Mode
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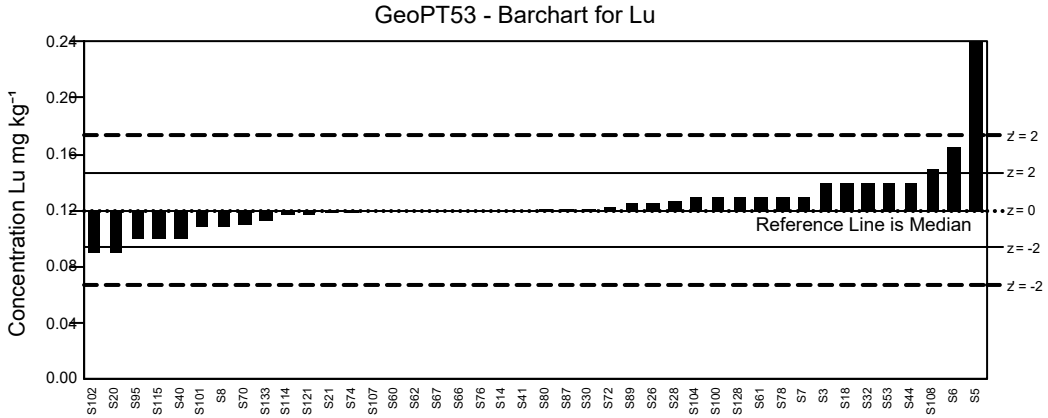
z = 2
z = 0
z = -2
z' = -2


GeoPT53 - Barchart for Lu
Concentration Lu mg kg⁻¹
Reference Line is Median
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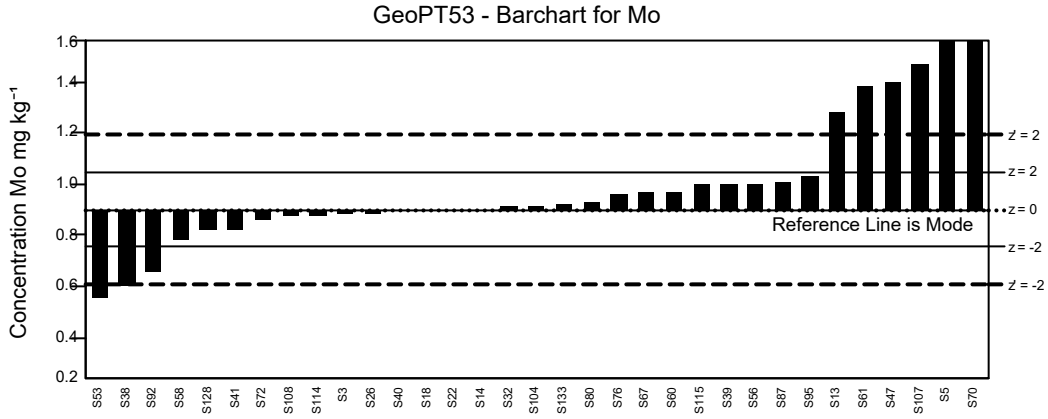
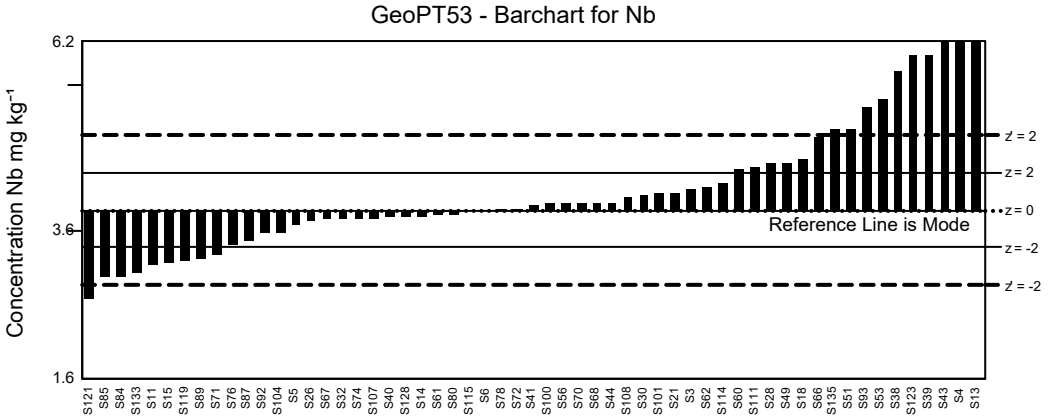
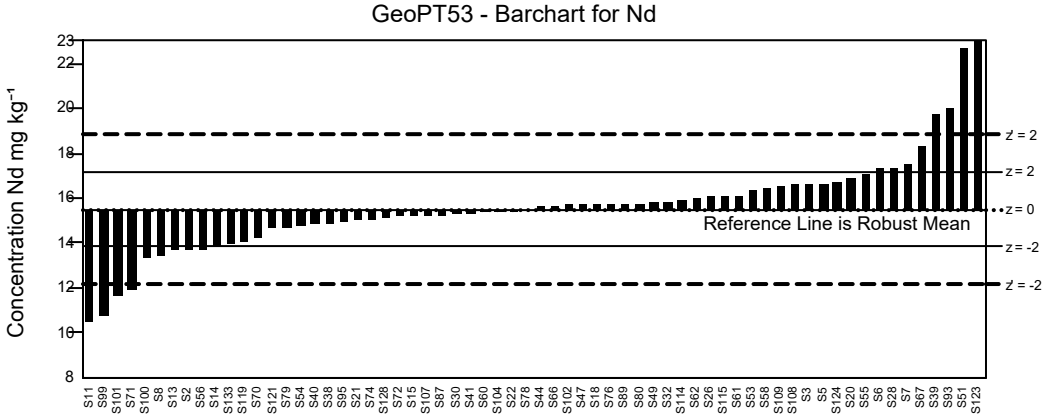
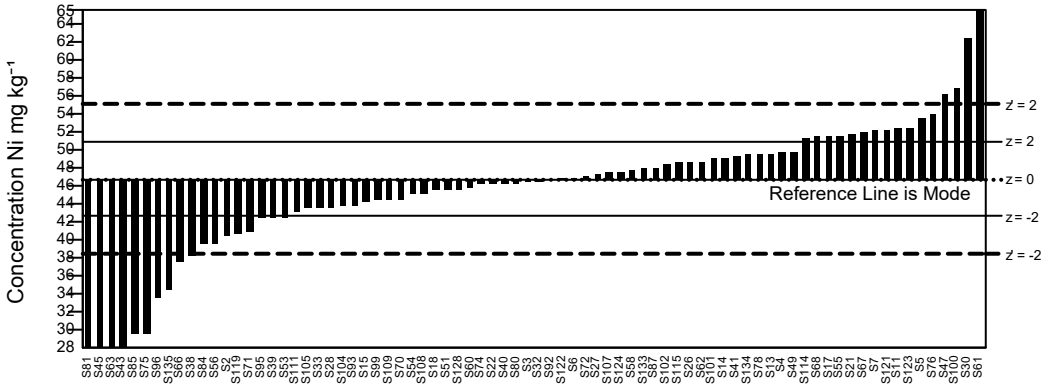
z = 2
z = 0
z = -2
z' = -2


GeoPT53 - Barchart for Mo
Concentration Mo mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2

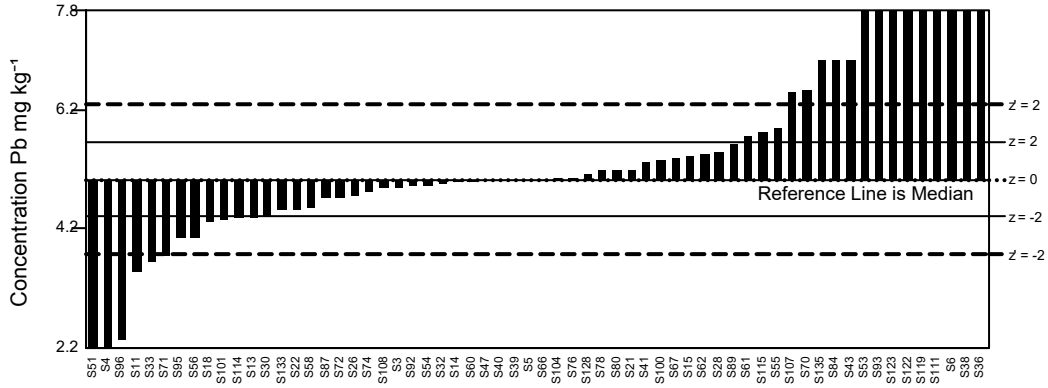

GeoPT53 - Barchart for Nb
Concentration Nb mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2


GeoPT53 - Barchart for Nd
Concentration Nd mg kg⁻¹
Reference Line is Robust Mean
z' = 2
z = 2
z = 0
z = -2
z' = -2

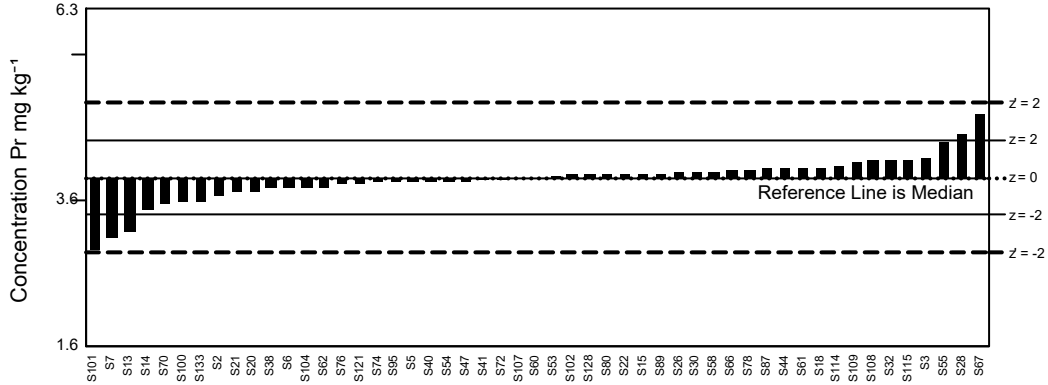
GeoPT53 - Barchart for Ni



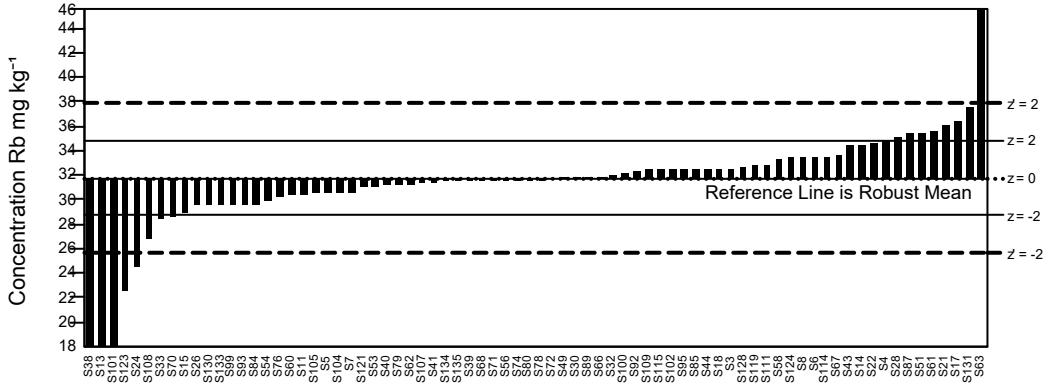
GeoPT53 - Barchart for Pb



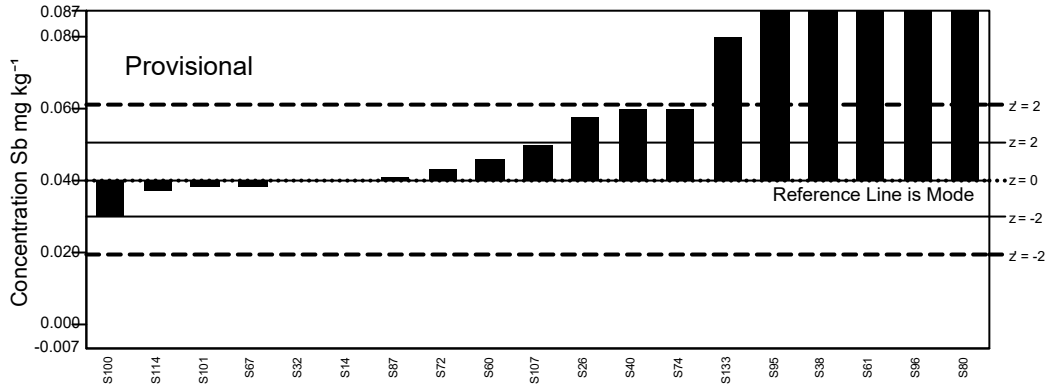
GeoPT53 - Barchart for Pr



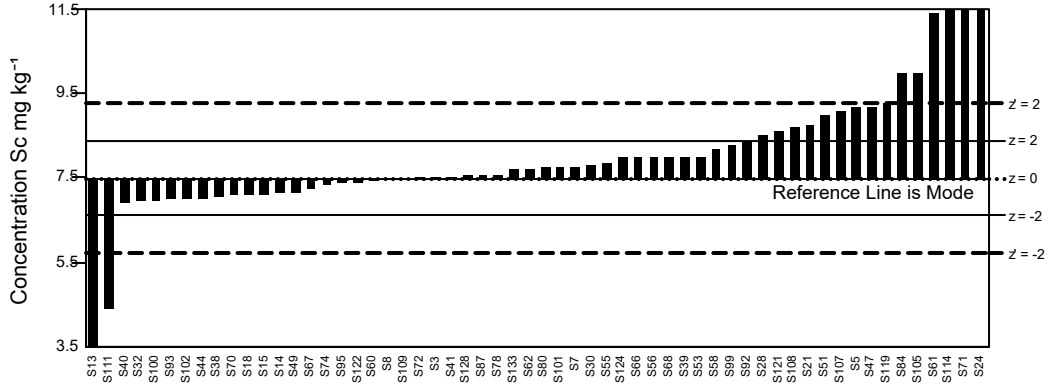
GeoPT53 - Barchart for Rb



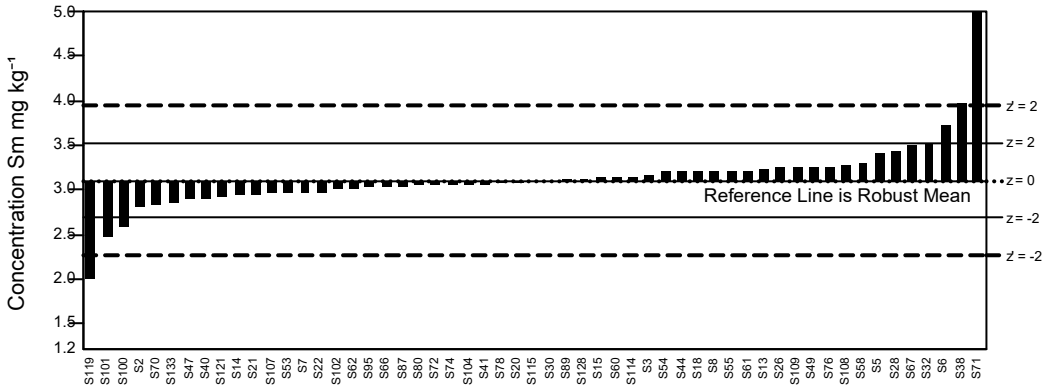
GeoPT53 - Barchart for Sb



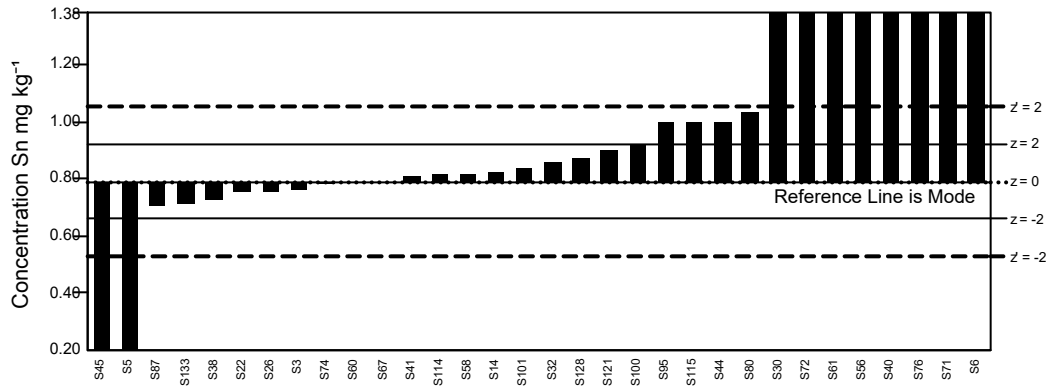
GeoPT53 - Barchart for Sc



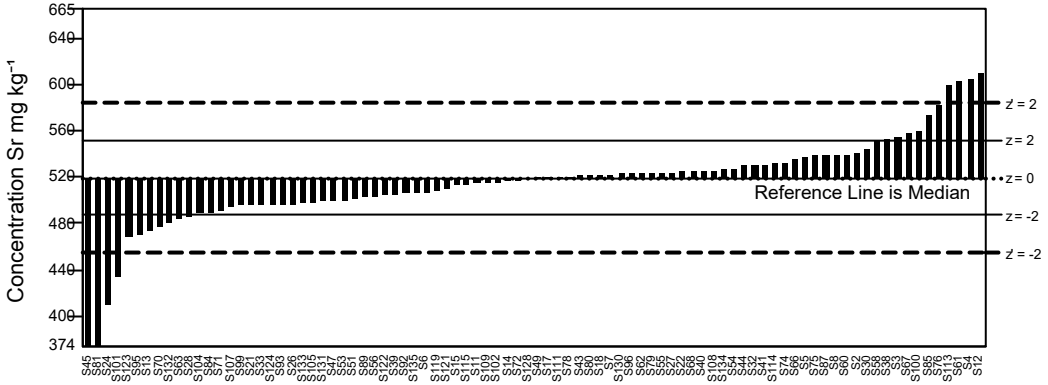
GeoPT53 - Barchart for Sm



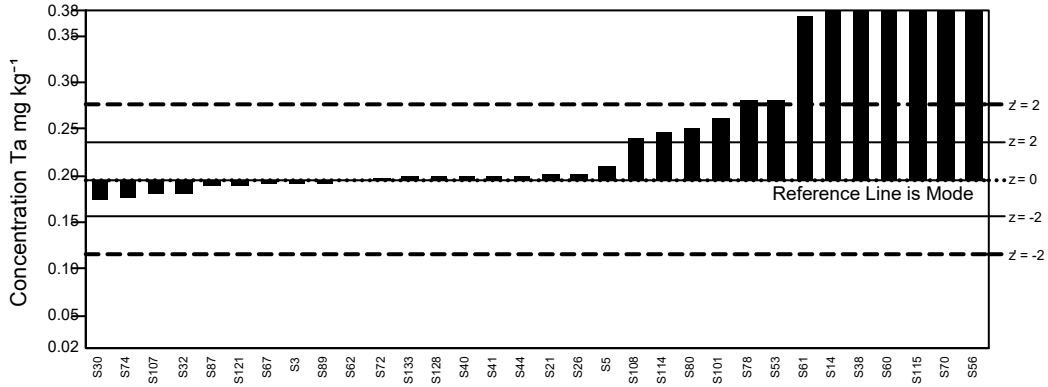
GeoPT53 - Barchart for Sn



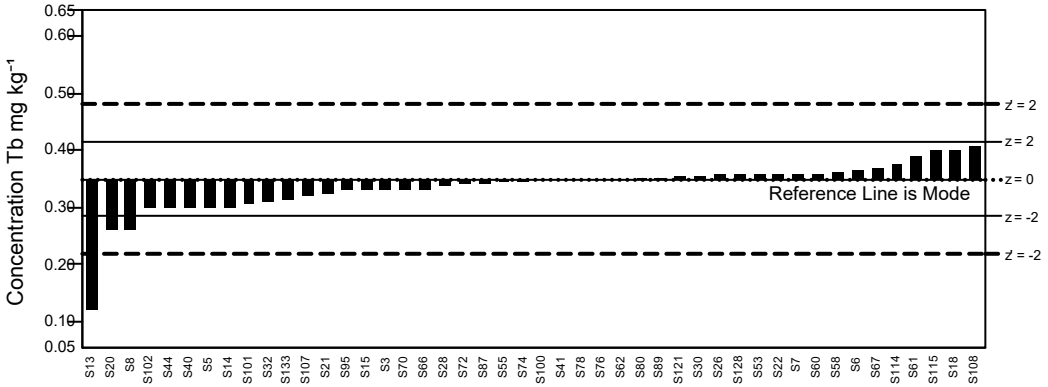
GeoPT53 - Barchart for Sr



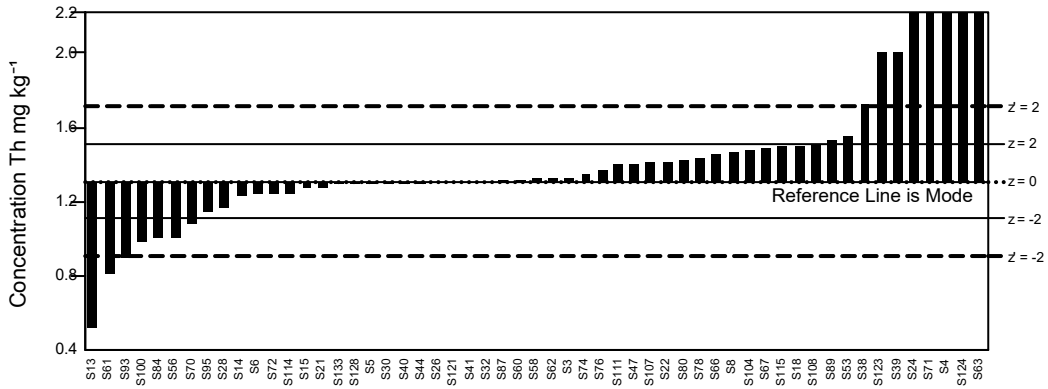
GeoPT53 - Barchart for Ta



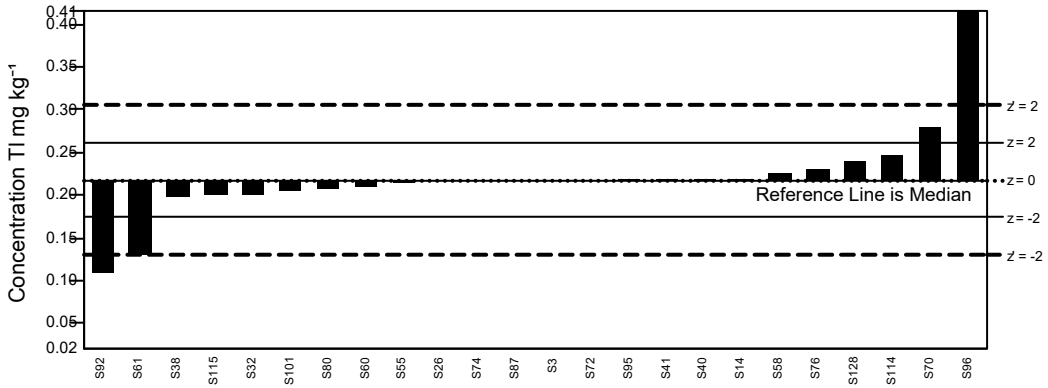
GeoPT53 - Barchart for Tb



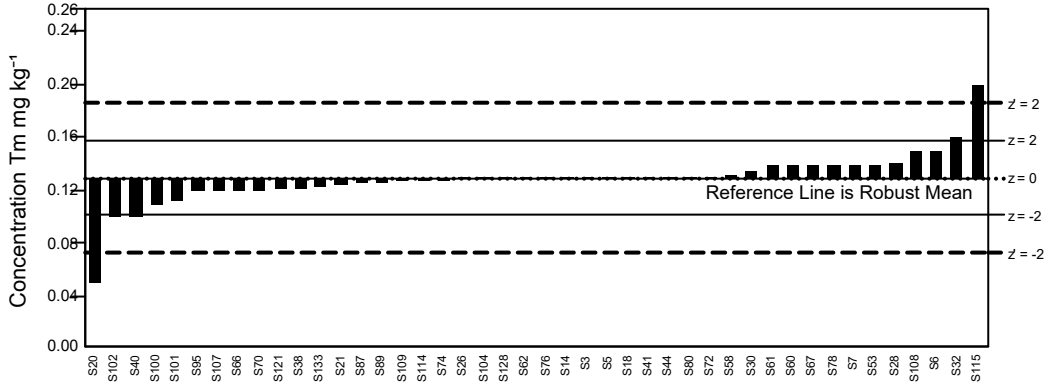
GeoPT53 - Barchart for Th



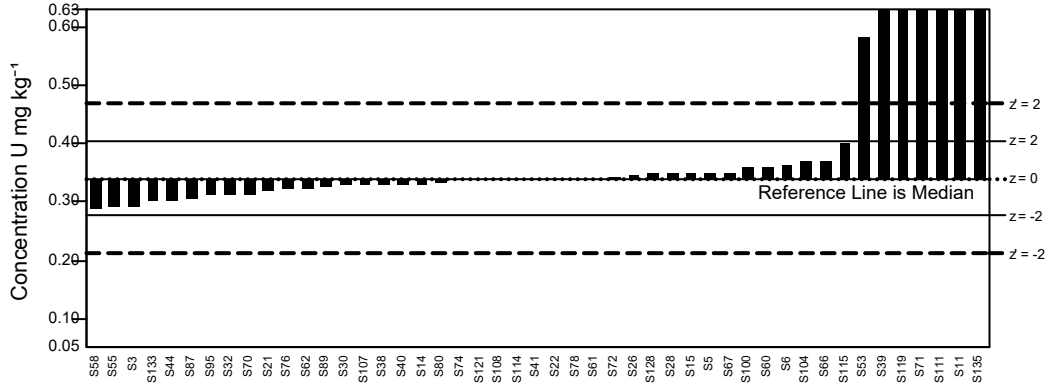
GeoPT53 - Barchart for Tl



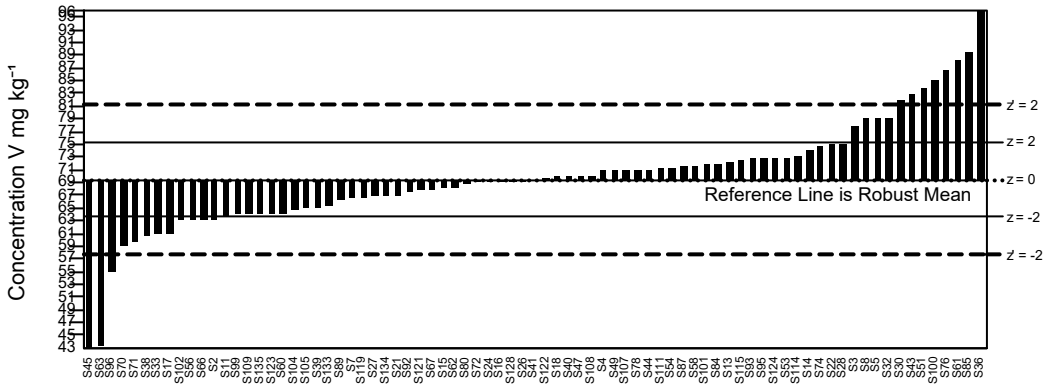
GeoPT53 - Barchart for Tm



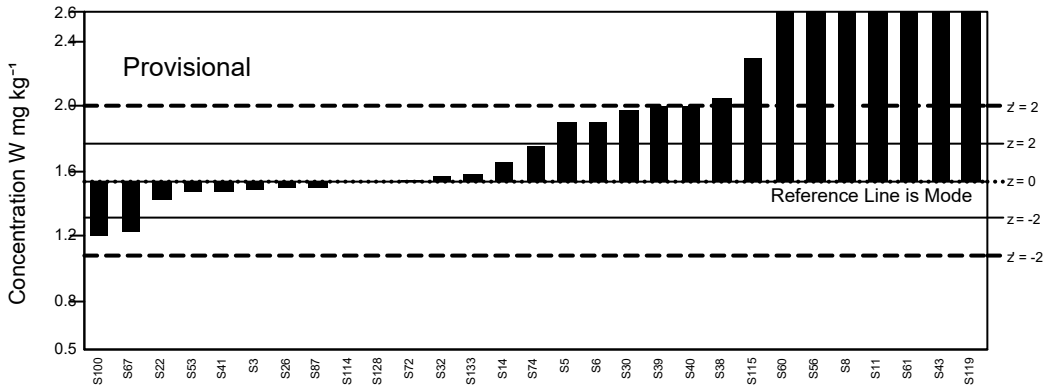
GeoPT53 - Barchart for U



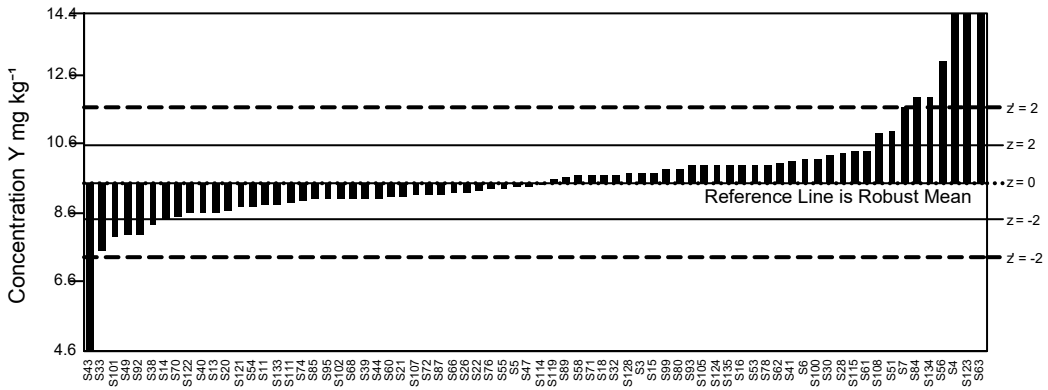
GeoPT53 - Barchart for V

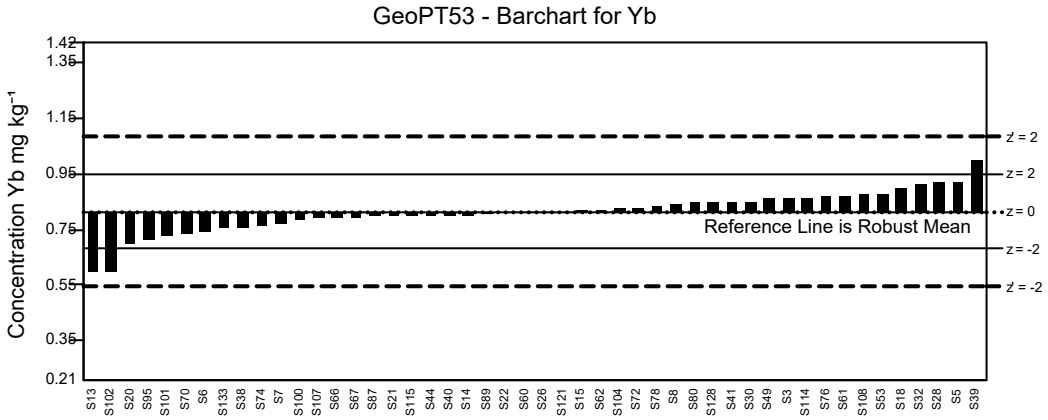


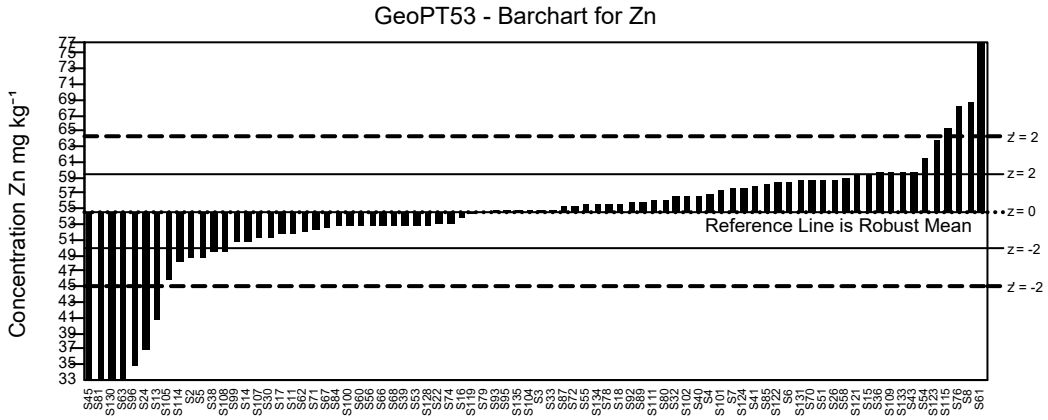
GeoPT53 - Barchart for W



GeoPT53 - Barchart for Y







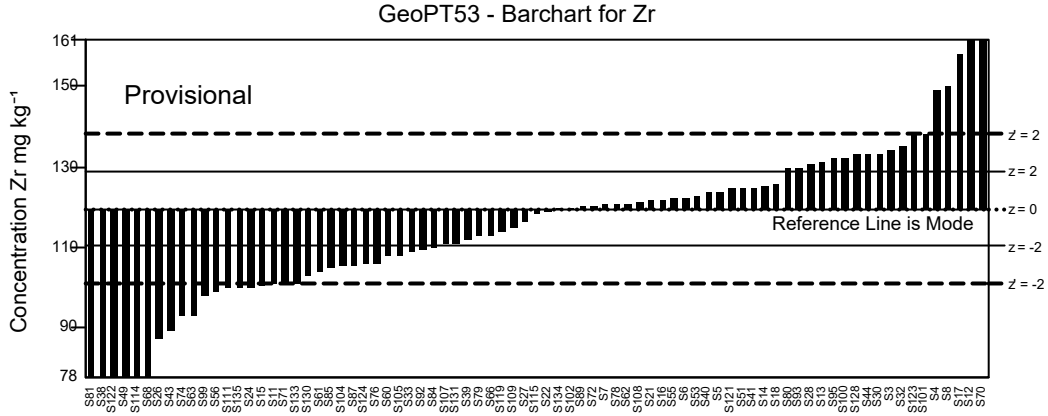
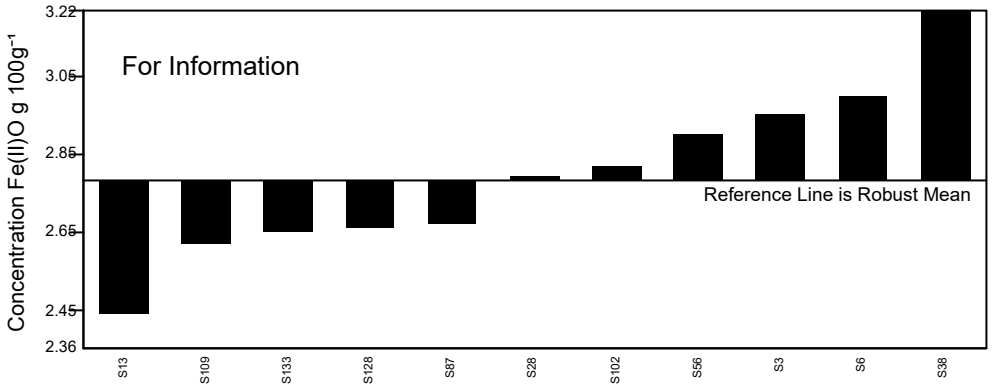
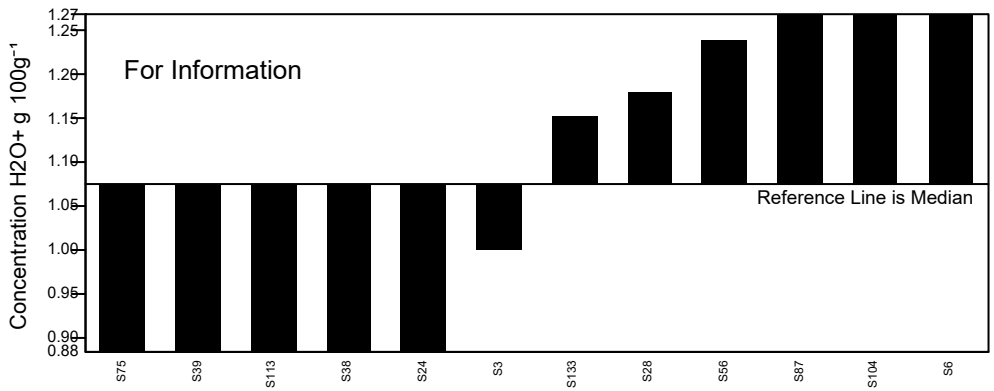


Figure 1: GeoPT53 - Tonalite, TLB-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

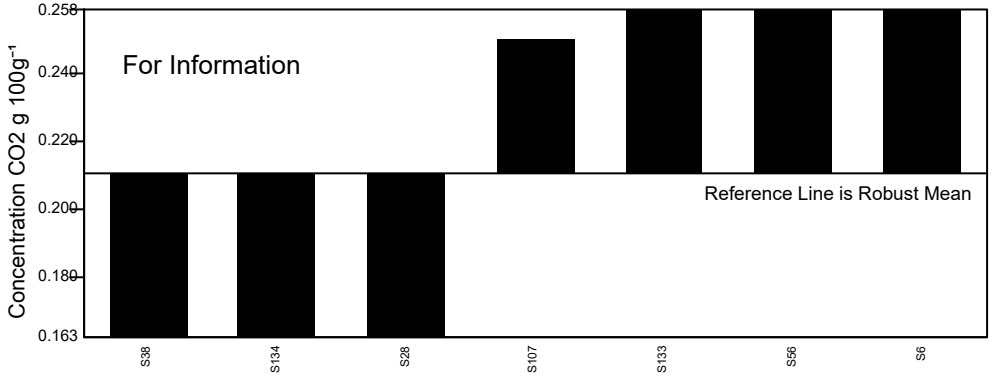
GeoPT53 - Barchart for Fe(II)O



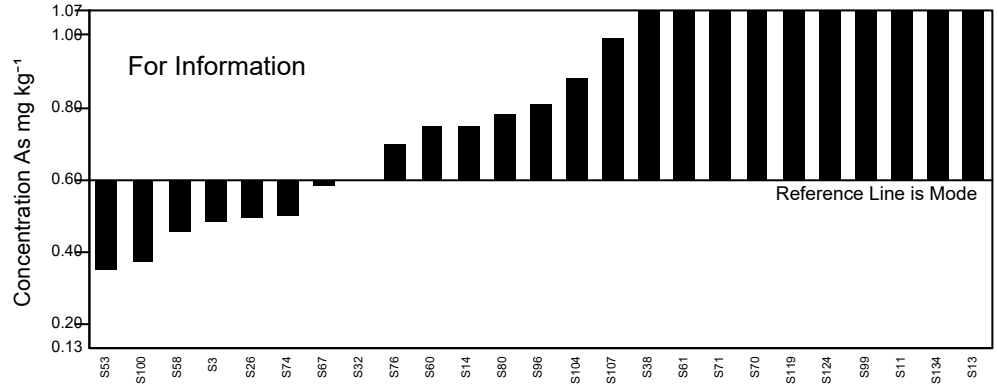
GeoPT53 - Barchart for H2O+



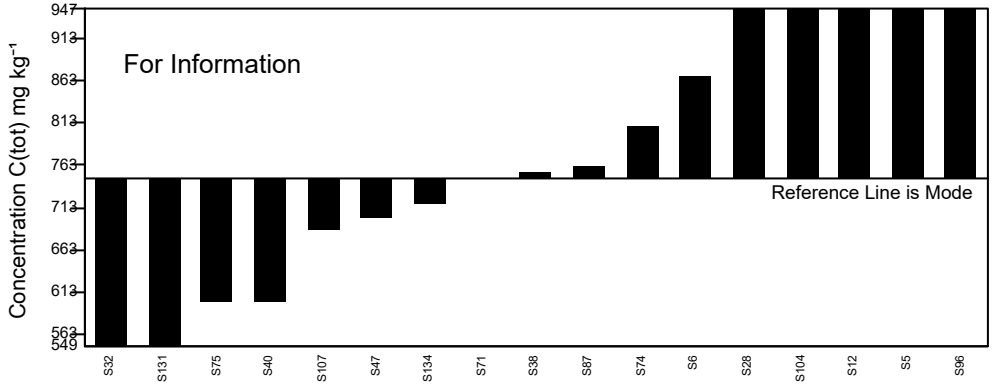
GeoPT53 - Barchart for CO2



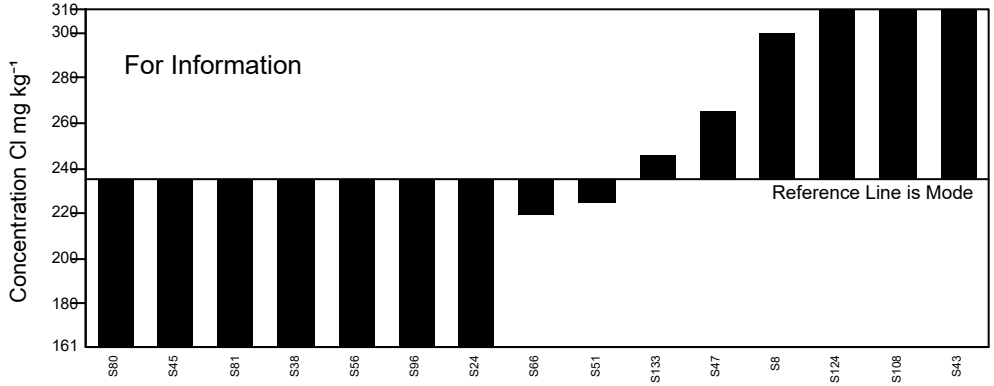
GeoPT53 - Barchart for As

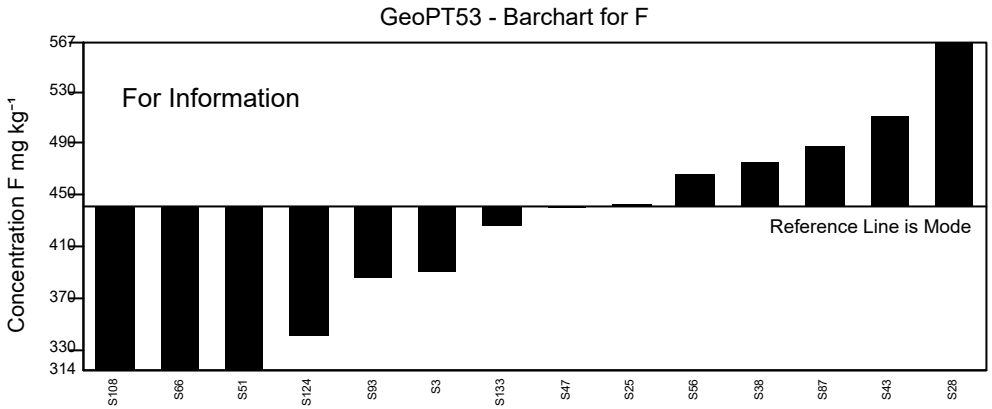


GeoPT53 - Barchart for C(tot)



GeoPT53 - Barchart for Cl





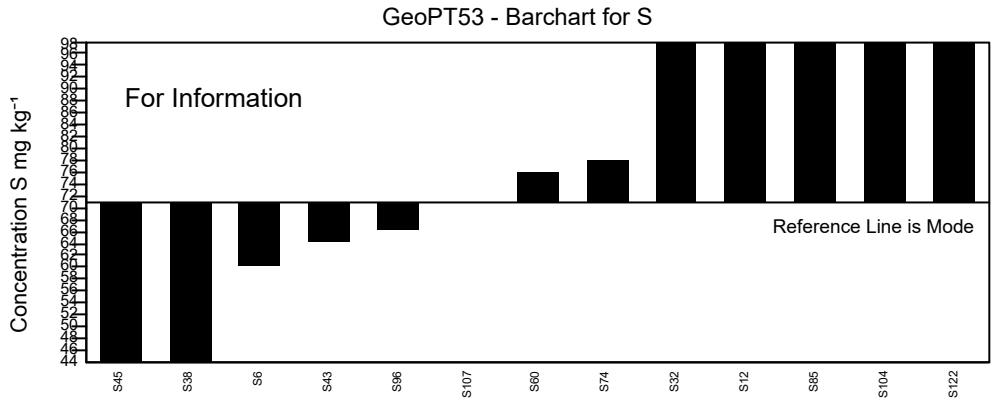
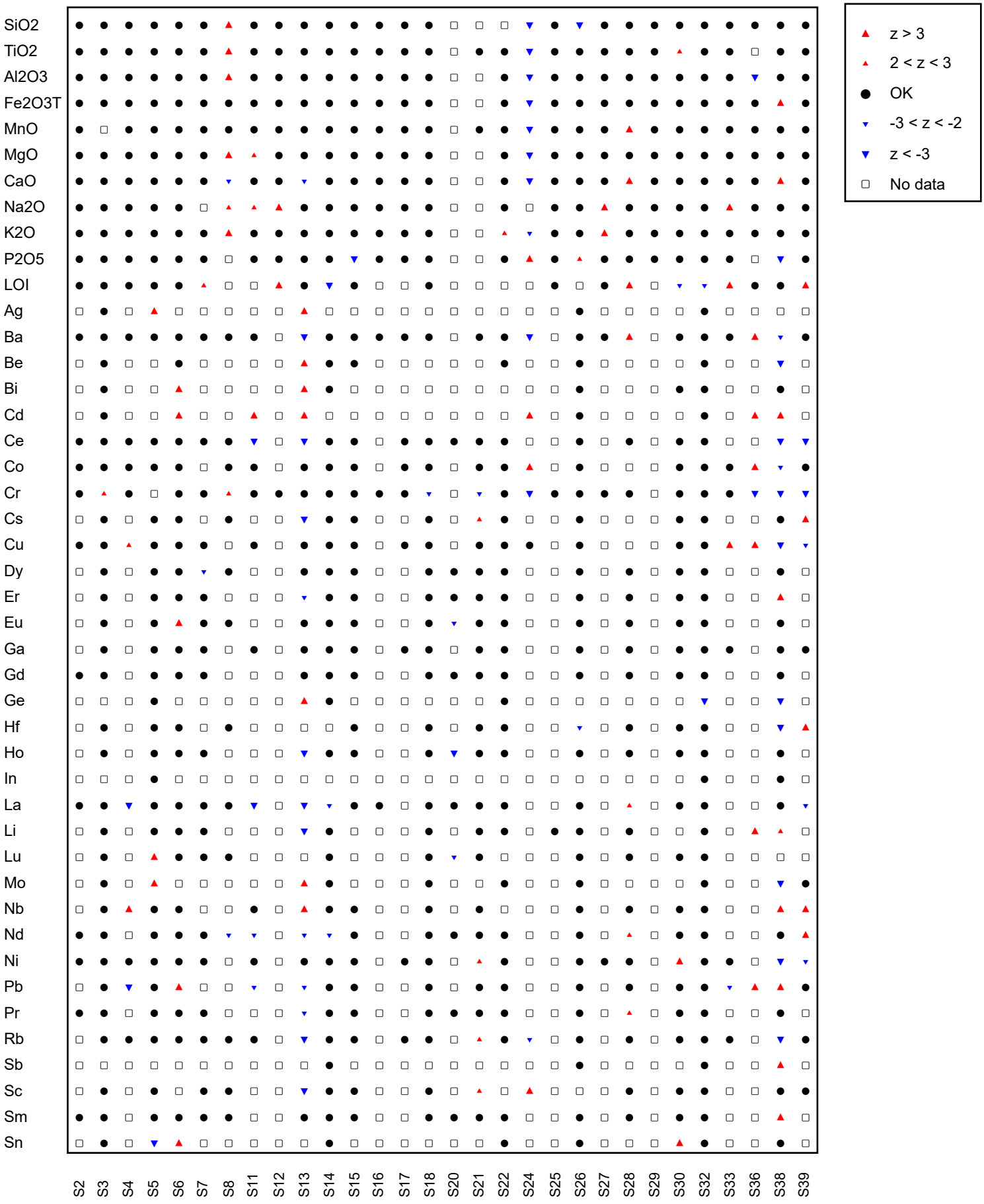


Figure 2: GeoPT53 - Tonalite, TLB-1. Data distribution charts provided for information only for elements for which values could not be assigned.

Multiple Z-Score Chart for GeoPT53



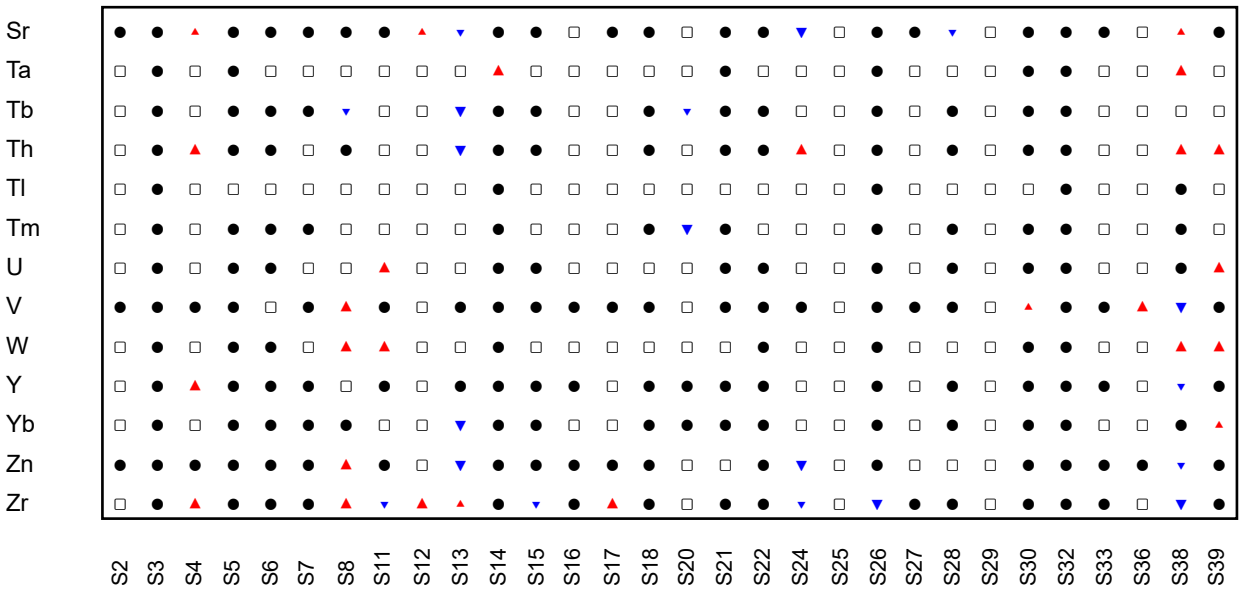
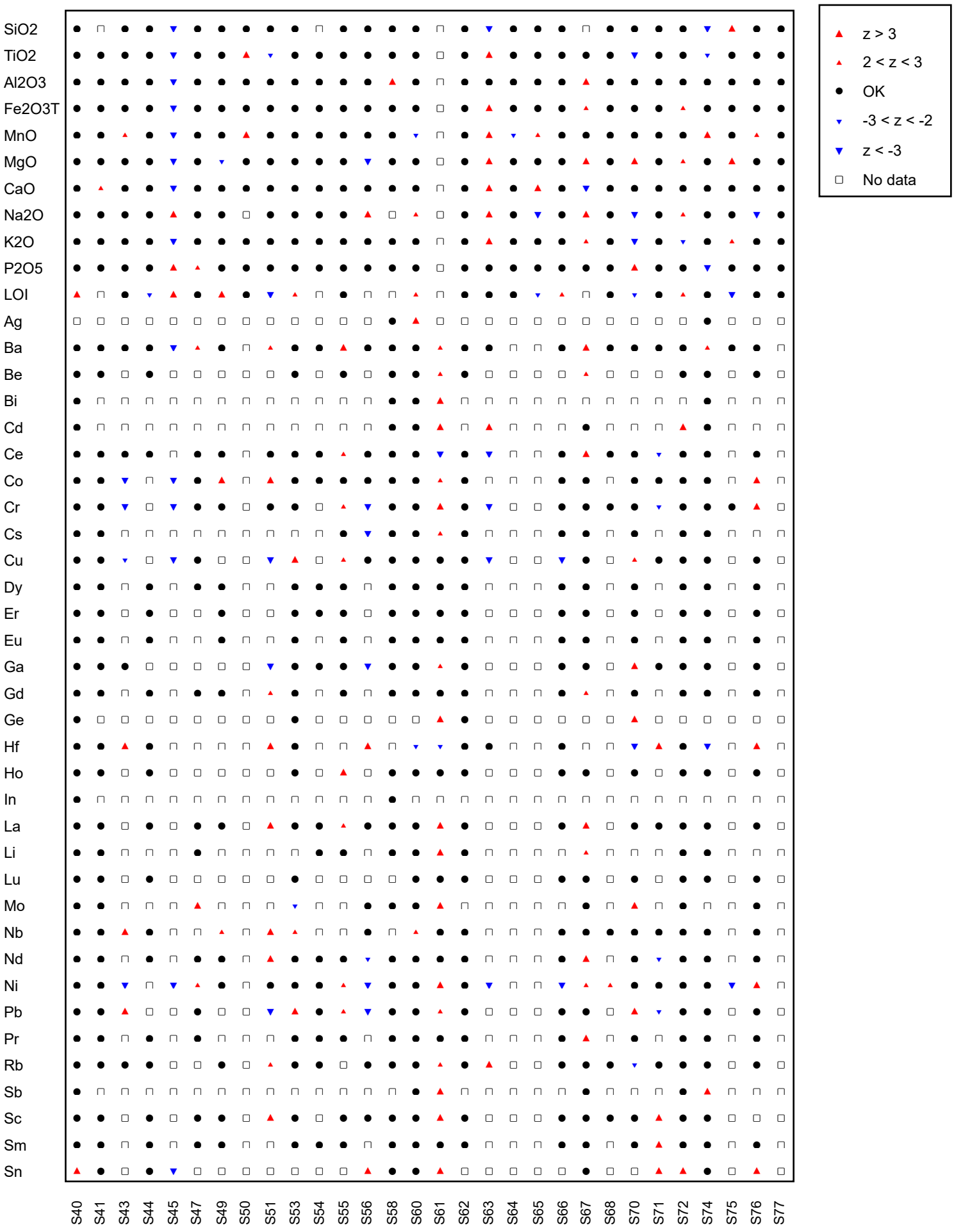


Figure 3: GeoPT53 - Tonalite, TLB-1. Multiple z-score charts for laboratories participating in the GeoPT53 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT53



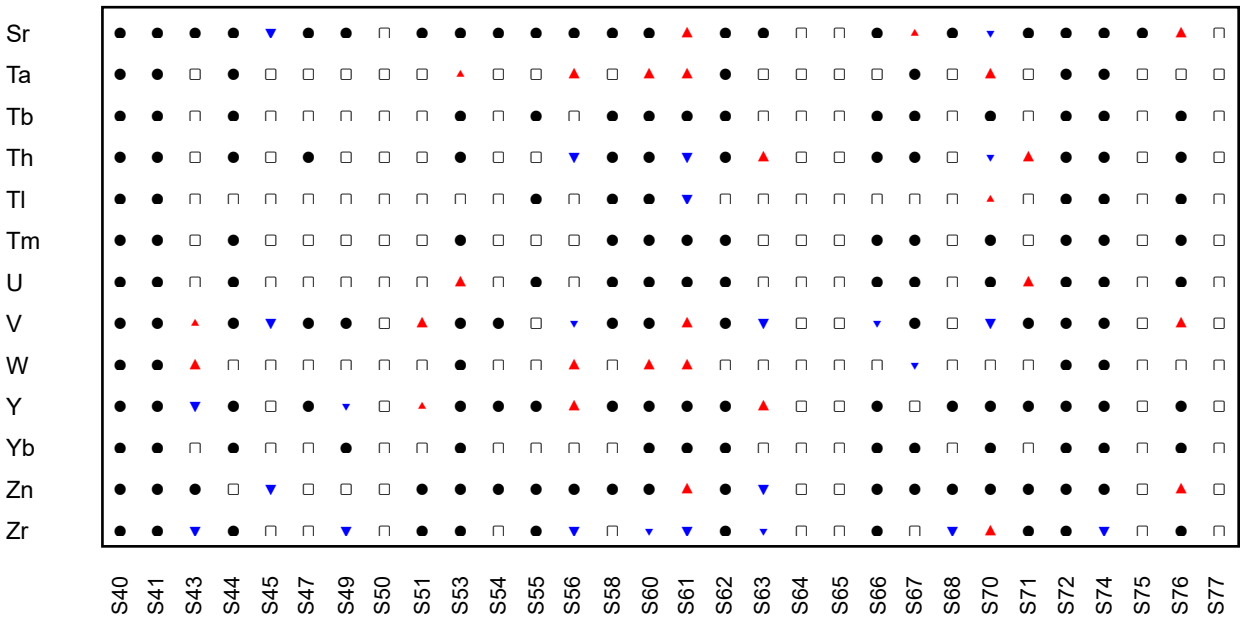
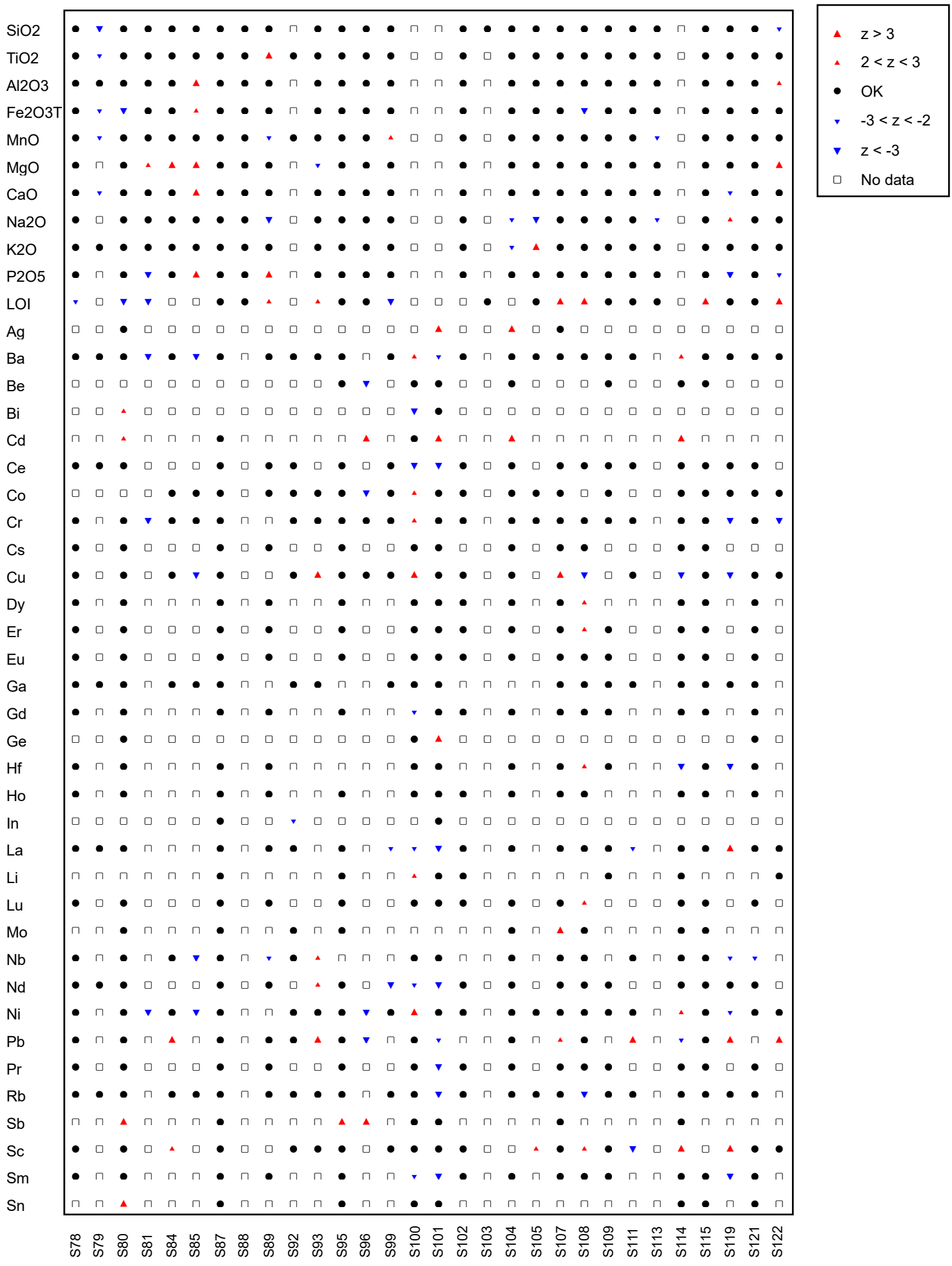


Figure 3: GeoPT53 - Tonalite, TLB-1. Multiple z-score charts for laboratories participating in the GeoPT53 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT53



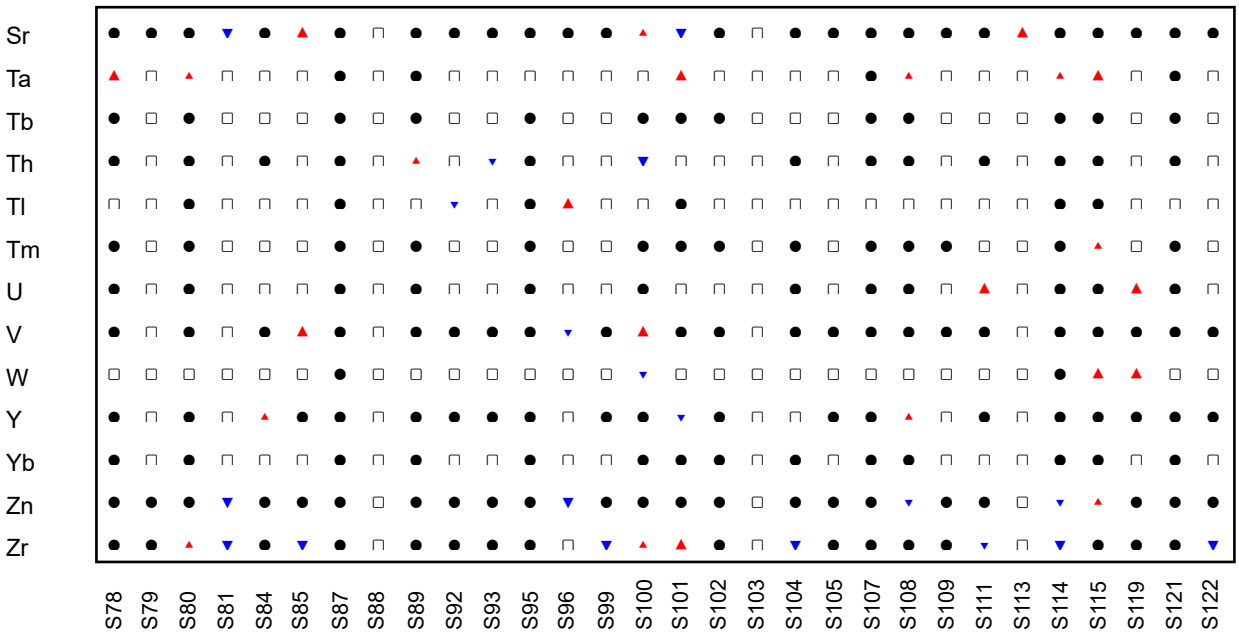
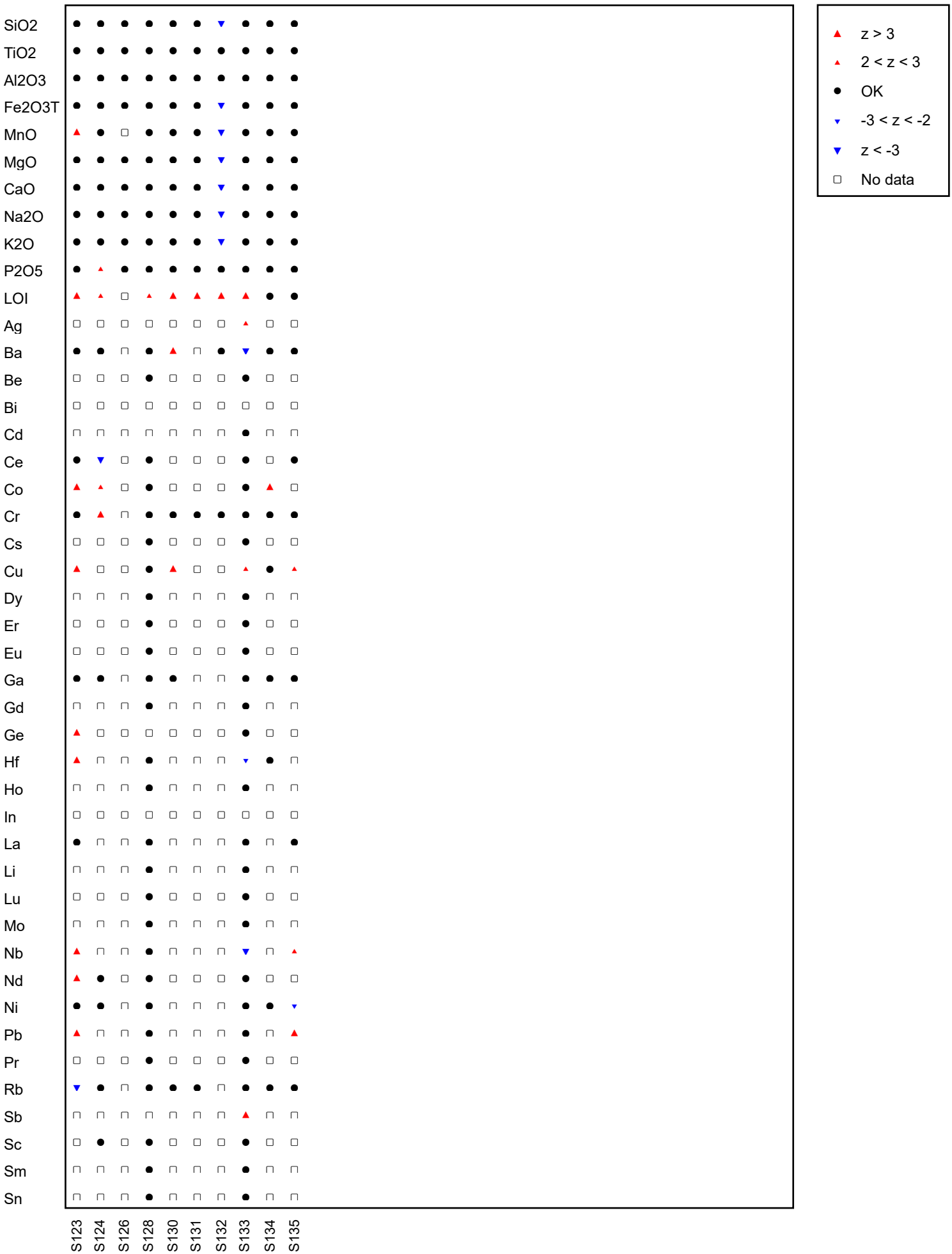


Figure 3: GeoPT53 - Tonalite, TLB-1. Multiple z-score charts for laboratories participating in the GeoPT53 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT53



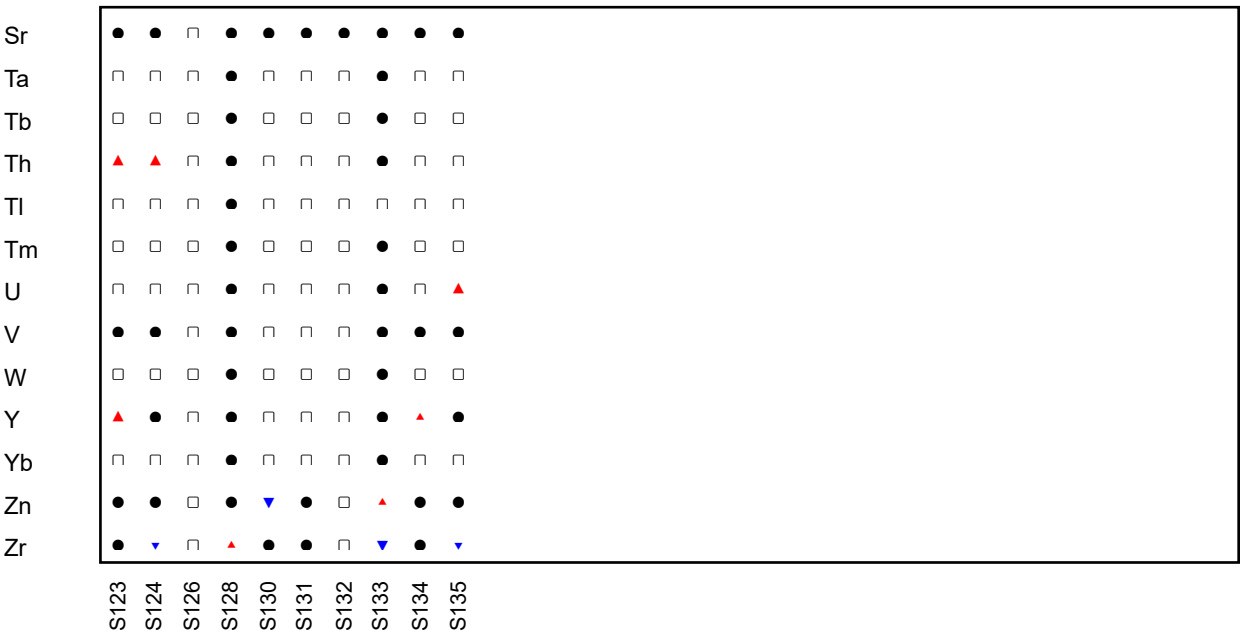


Figure 3: GeoPT53 - Tonalite, TLB-1. Multiple z-score charts for laboratories participating in the GeoPT53 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).