

## RFA Ringversuch AMIS, Südafrika - Dolomite AMIS0547

Veranstalter des Ringversuchs:	AMIS - African Mineral Standard - Südafrika
Ringversuchsmaterial:	Dolomite AMIS0547
RV geschlossen:	2018 - 5
Literatur:	Proficiency Testing Final Report (Laborcode CRB = I)

### Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
Na <sub>2</sub> O	0,030	0,030	0,011	-0,380
MgO	16,740	16,750	0,348	0,300
Al <sub>2</sub> O <sub>3</sub>	3,260	3,330	0,160	0,180
SiO <sub>2</sub>	11,410	11,470	0,224	0,240
P <sub>2</sub> O <sub>5</sub>	0,033	0,028	0,006	0,260
S	0,270	0,243	0,023	0,900
K <sub>2</sub> O	0,443	0,437	0,017	0,470
CaO	25,070	25,196	0,313	0,420
TiO <sub>2</sub>	0,765	0,758	0,023	0,210
Fe <sub>2</sub> O <sub>3</sub> tot	2,720	2,676	0,051	0,790
Cr <sub>2</sub> O <sub>3</sub>	0,084	0,082	0,006	0,390
MnO	1,128	1,134	0,015	0,220
SrO	0,005	0,007	0,003	0,750
L.O.I.	38,130	38,150	0,870	-0,280
TC	10,160	10,170	0,105	-0,410

### Legende

**CRB:** Ergebnisse CRB – **RV:** Ergebnisse Ringversuch -- **1s-RV:** Standardabweichung Ringversuch  
**Z-Score:** Differenz des Messwertes vom Mittelwert des Ringversuchs -- \* Wert nicht zertifiziert



AMIS\_Documents

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Originator: Quality  
Specialist

Approver:  
Managing Director

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Issued By: Quality Specialist

Proficiency Testing Report

# Proficiency Testing Final Report

Report to participating laboratories on the results from

## AMIS0547 Proficiency Testing Dolomite, Olifantsfontein South Africa

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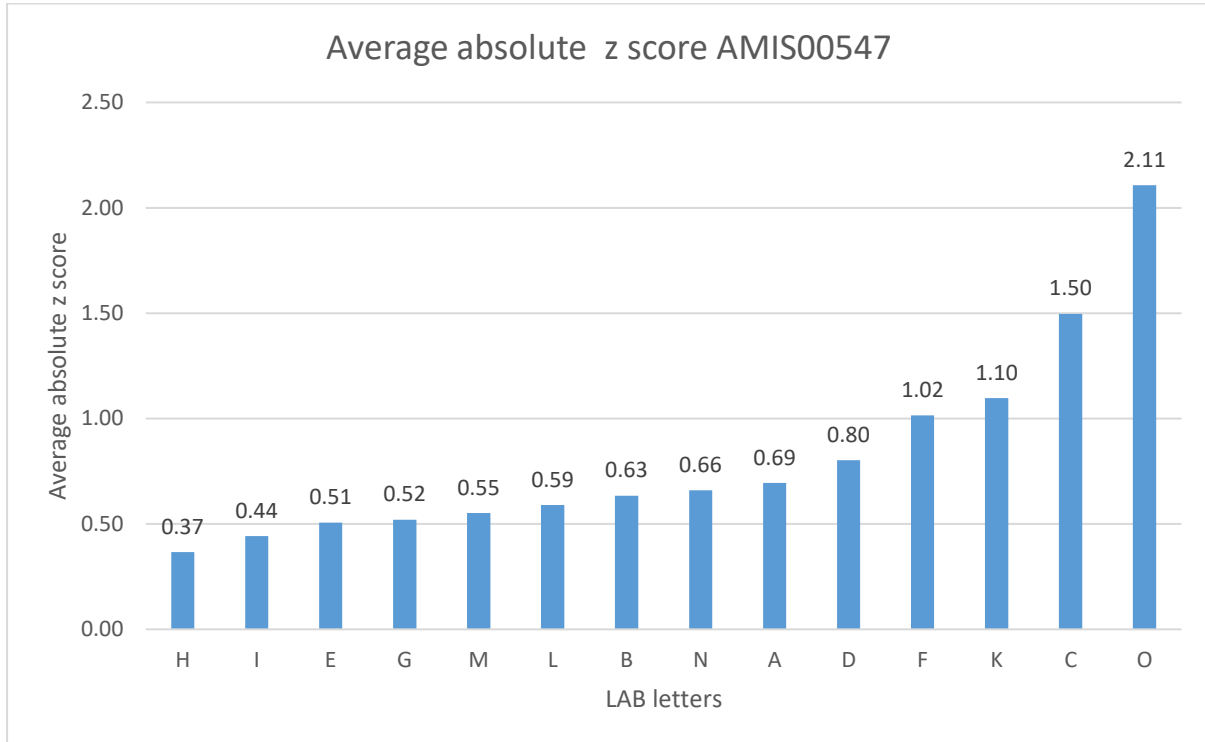
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**Version 0.00**

## 1. Confidentiality

This report is strictly confidential. Individual laboratories are not identified in this report. Individual laboratories will be given their own identifying codes for the different tables and graphs, but not the codes for other laboratories.

## 2. Absolute average z scores



Based on the average of the absolute value of the z-scores

It is recommended by AMIS that should a laboratory's absolute average z-score be greater than 2, an internal investigation of possible root causes should be carried out by the laboratory. The values highlighted in red on the data are considered outliers.

<b>Labs that participated-NOT the same order as Lab Letter</b>
Analytical Laboratory Services - Vancouver, Canada
Bureau Veritas Minerals Ultra Trace Pty Ltd
Centre for Minerals Research and Development
Dorfner Anzaplan Analysenzentrum und Anlagenplanungsgesellschaft mbH
Intertek Perth
Modderfontein Laboratory Services (PTY) LTD
Sci Ba
Set Point Laboratories (Isando) SA
SGS Geosol Laboratories Ltda (Brazil)
SGS Mineral Services Lakefield (Canada)
SGS Taiwan
SGS Vancouver (Canada)
Shiva Analyticals India
CRB Analyse Service GmbH

### 3. Explanation of statistical analysis

Fifteen laboratories were each sent 8 samples of material taken scientifically from throughout the batch. Results from Fourteen of the laboratories were received in time for the Certification.

Laboratories are indicated by letters A through to O and are not listed in alphabetical order.

1.1 The data tables contain raw assay data from those labs plus:

- the lab mean,
- the lab standard deviation,
- the lab RSD (the laboratory standard deviation divided by the lab mean, expressed as a percentage),
- the z-scores of the individual analyses (the individual value minus the mean of the whole data divided by the standard deviation of the whole data),
- a laboratory ranking based on the average of the absolute values for the z-score of the AMIS0547 data,
- statistics for the un-iterated data set (mean, standard deviation and RSD),
- Statistics for the iterated data (mean, RSD percent, number of results, SD, 2SD, 3SD, Std mean $\pm$ 2SD and Std mean $\pm$ 3SD). This data can be used in conjunction with the graph
- simple statistics of the lab statistics (mean, standard deviation and RSD),
- Measurement of uncertainty

1.2 Some results were removed for the calculation of the mean and standard deviation presented on the graph. The general rules for exclusion were:

- If the z score  $>\pm 2$ , the result is an outlier and it is removed.
- If 50% or less of the results from one laboratory have z scores  $>\pm 2$ , those results are removed
- If 50% or more of the results from one laboratory have z scores  $>\pm 2$ , the entire laboratory's results are removed.

1.3 Statistics on these tables are those for the whole data set. They differ from the "recommended concentrations" and two "between laboratory standard deviations" on the certificate independently calculated by the certifying geochemist. Some outlying results were excluded for the calculation of those values.

1.4 An independent geochemist Allan Fraser, was retained to provide recommended concentrations and limits at two standard deviations. These represent the values that a "good lab" should report, within acceptable limits of analytical accuracy. Allan Fraser was provided with the electronic versions of all assay reports and a spreadsheet containing the compiled data prepared by Mrs Melesha Gopi Mungaroo (PT Scheme Coordinator).

Disclaimer: While every precaution has been taken to ensure the accuracy of this data AMIS, a division of Torre Analytical Services (Pty) Ltd will not be held responsible for any errors. Laboratory managers are requested to carefully vet this report and to draw the author's attention to any mistakes or omissions that may be present.

### 4. Subcontracted activities

The following activities were subcontracted:

- 4.1 Preparation of Certified Reference Material
- 4.2 QC analysis to determine ranges for individual elements
- 4.3 Proficiency testing analysis performed by participating laboratories

## 5. Method of preparation, Homogeneity and Stability assessment

The particle size distribution for this material was shown to have a nominal top size of 54µm (95% passing 54µm). The procedure of preparation in brief is as follows: the material was crushed, dry-milled and air-classified to <54µm. It was then blended in a bi-conical mixer, systematically divided and sealed into 1kg Laboratory Packs. Explorer Packs are then subdivided from the Laboratory Packs as required. Final packaged units were then selected on a random basis and submitted for analysis to an independent laboratory accredited with the ISO17025:2005 standard of general requirements for the competence of testing and calibration laboratories. The results obtained from this laboratory are then evaluated statistically by AMIS for homogeneity. The stability of the material will be subject to continuous testing for the duration of the inventory. Should product stability become an issue, all customers will be notified and notification to that effect will be placed on the [www.amis.co.za](http://www.amis.co.za) website.

## 6. Assigned value

The assigned values for the PT report are expressed as the mean calculated from the software as follows:

- 6.1 Calculated from all the raw data including outliers
- 6.2 Calculated after removal of outliers using z-scores (Refer to 1.4)

## 7. Metrological traceability and measurement of uncertainty

The values quoted herein are based on the consensus values derived from statistical analysis of the data from an inter-laboratory measurement program. Traceability to SI units is via the standards used by the individual laboratories the majority of which are accredited to the ISO17025:2005 general requirements for the competence of testing and calibration laboratories and who have maintained measurement traceability during the analytical process.

The samples used in this PT process have been selected in such a way as to represent the entire batch of material and were taken from the final packaged units; therefore all possible sources of uncertainty (sample uncertainty and measurement uncertainty) are included in the final combined standard uncertainty determination. The uncertainty measurement takes into consideration the between lab and the within lab variances.

## 8. Design and implementation of the PT Scheme

At the beginning of each year, the Technical Personnel and Managing Director plan what possible Proficiency Testing Schemes will be sent to laboratories.

The samples are sent to an external laboratory to determine the range of the elements of interest and homogeneity.

An analysis request letter is compiled and sent to participating laboratories.

Samples are dispatched and results are returned within the given time frame by participating laboratories electronically.

Results are loaded onto the software.

A PT report is compiled and sent to participating laboratories.

## 9. Concentration ranges

Hg	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	S	Cu	Co	Ni	As	Cr
ppb	%	%	%	%	ppm	ppm	ppm	ppm	ppm
35-70	3.0-3.5	11-12	2.3-2.7	0.25-0.29	120-140	10-20	185-215	5-15	250-310

Cl	F	Sr	Pb	LOI 1000°C	Mg	Ti	MnO
%	%	ppm	ppm	%	%	%	%
0.02-0.04	0.04-0.06	30-40	8-16	37-41	9.5-10.5	0.1-0.2	1.0-1.3

## 10. Element statistics

### 10.1 Loss on Ignition-LOI

Lab_ID	Z_Score	Data
A	-0.15	39.20
A	-0.15	39.21
A	-0.15	39.19
A	-0.15	39.19
A	-0.13	39.33
A	-0.13	39.35
A	-0.15	39.20
A	-0.15	39.19
B	-0.50	36.28
B	-0.50	36.29
B	-0.51	36.23
B	-0.51	36.22
B	-0.50	36.28
B	-0.50	36.27
B	-0.50	36.31
B	-0.51	36.24
C	-0.11	39.48
C	-0.12	39.41
C	-0.11	39.51
C	-0.12	39.45
C	-0.12	39.41
C	-0.13	39.37
C	-0.12	39.41
C	-0.12	39.46
D	-0.26	38.24
D	-0.27	38.20
D	-0.25	38.38

Lab_ID	Z_Score	Data
D	-0.25	38.36
D	-0.26	38.31
D	-0.25	38.37
D	-0.24	38.43
D	-0.24	38.46
E	-0.27	38.21
E	-0.27	38.21
E	-0.26	38.23
E	-0.27	38.20
E	-0.27	38.20
E	-0.26	38.23
E	-0.27	38.21
E	-0.27	38.22
G	-0.28	38.10
G	-0.27	38.20
G	-0.28	38.10
G	-0.28	38.10
G	-0.27	38.20
G	-0.28	38.10
H	-0.19	38.89
H	-0.19	38.86
H	-0.19	38.84
H	-0.22	38.63
H	-0.23	38.53
H	-0.20	38.80

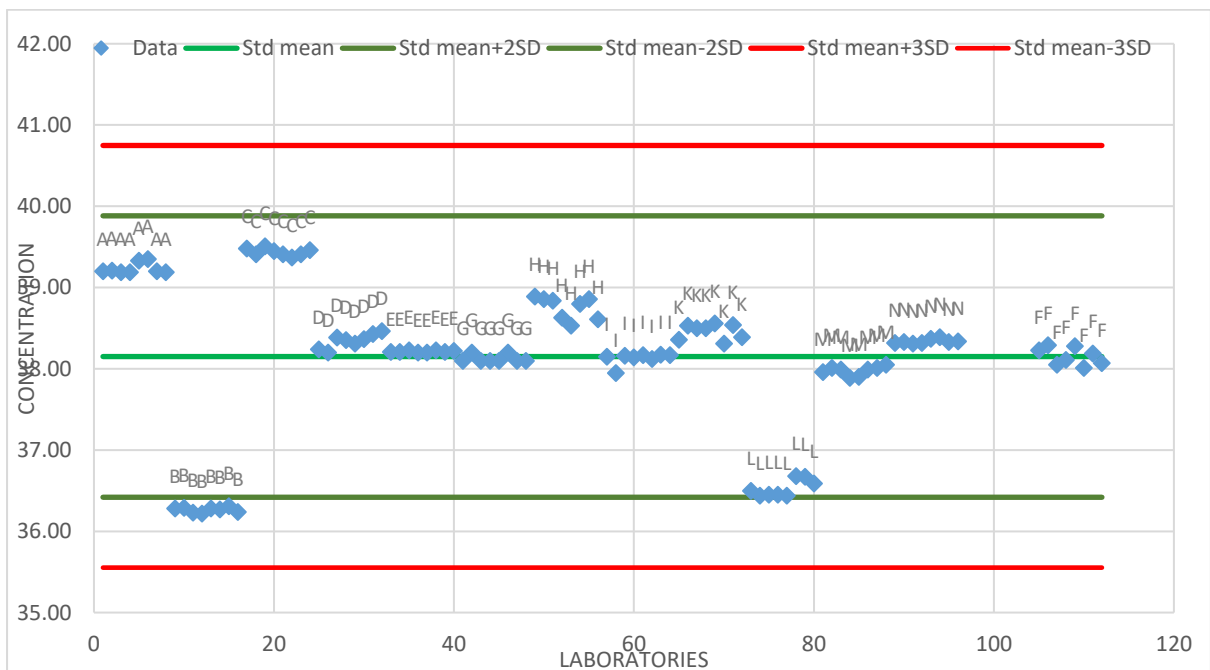
Lab_ID	Z_Score	Data
H	-0.19	38.86
H	-0.22	38.61
I	-0.27	38.15
I	-0.30	37.95
I	-0.27	38.16
I	-0.28	38.14
I	-0.27	38.17
I	-0.28	38.12
I	-0.27	38.17
I	-0.27	38.17
K	-0.25	38.36
K	-0.23	38.53
K	-0.23	38.50
K	-0.23	38.50
K	-0.23	38.56
K	-0.26	38.31
K	-0.23	38.54
K	-0.25	38.39
L	-0.47	36.50
L	-0.48	36.44
L	-0.48	36.45
L	-0.48	36.45
L	-0.48	36.44
L	-0.45	36.68
L	-0.45	36.67
L	-0.46	36.59
M	-0.30	37.96

Lab_ID	Z_Score	Data
M	-0.29	38.01
M	-0.29	37.99
M	-0.31	37.89
M	-0.30	37.90
M	-0.29	37.99
M	-0.29	38.01
M	-0.29	38.05
N	-0.25	38.32
N	-0.25	38.33
N	-0.26	38.31
N	-0.25	38.32
N	-0.25	38.37
N	-0.25	38.39
N	-0.25	38.33
N	-0.25	38.34
O	3.70	71.01
O	3.56	69.80
O	3.59	70.05
O	3.68	70.83
O	3.58	70.03
O	3.53	69.59
O	3.47	69.05
O	3.45	68.89
F	-0.26	38.23
F	-0.26	38.29
F	-0.29	38.05
F	-0.28	38.11
F	-0.26	38.28
F	-0.29	38.01
F	-0.27	38.19
F	-0.28	38.07



Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI	112	40.419	8.259	20.434	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
LOI	LOI	A	8	39.233	0.067	0.002	0.171
LOI	LOI	B	8	36.265	0.032	0.001	0.087
LOI	LOI	C	8	39.438	0.046	0.001	0.116
LOI	LOI	D	8	38.343	0.089	0.002	0.233
LOI	LOI	E	8	38.214	0.012	0.000	0.031
LOI	LOI	G	8	38.125	0.046	0.001	0.121
LOI	LOI	H	8	38.753	0.140	0.004	0.361
LOI	LOI	I	8	38.129	0.074	0.002	0.195
LOI	LOI	K	8	38.461	0.094	0.002	0.244
LOI	LOI	L	8	36.528	0.104	0.003	0.284
LOI	LOI	M	8	37.975	0.056	0.001	0.146
LOI	LOI	N	8	38.339	0.027	0.001	0.072
LOI	LOI	O	8	69.905	0.755	0.011	1.080
LOI	LOI	F	8	38.154	0.108	0.003	0.284
<b>Average</b>				<b>40.419</b>	<b>0.215</b>	<b>0.002</b>	<b>0.245</b>



<b>Results without outliers</b>						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI	104	38.150	0.866	2.270	%

Std mean	38.150
SD	0.866
2SD	1.732
3SD	2.598
Std mean+2SD	39.882
Std mean-2SD	36.419
Std mean+3SD	40.748
Std mean-3SD	35.553

<b>Measurement of uncertainty</b>						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
LOI	LOI	0.194	0.491	0.701	0.077	%

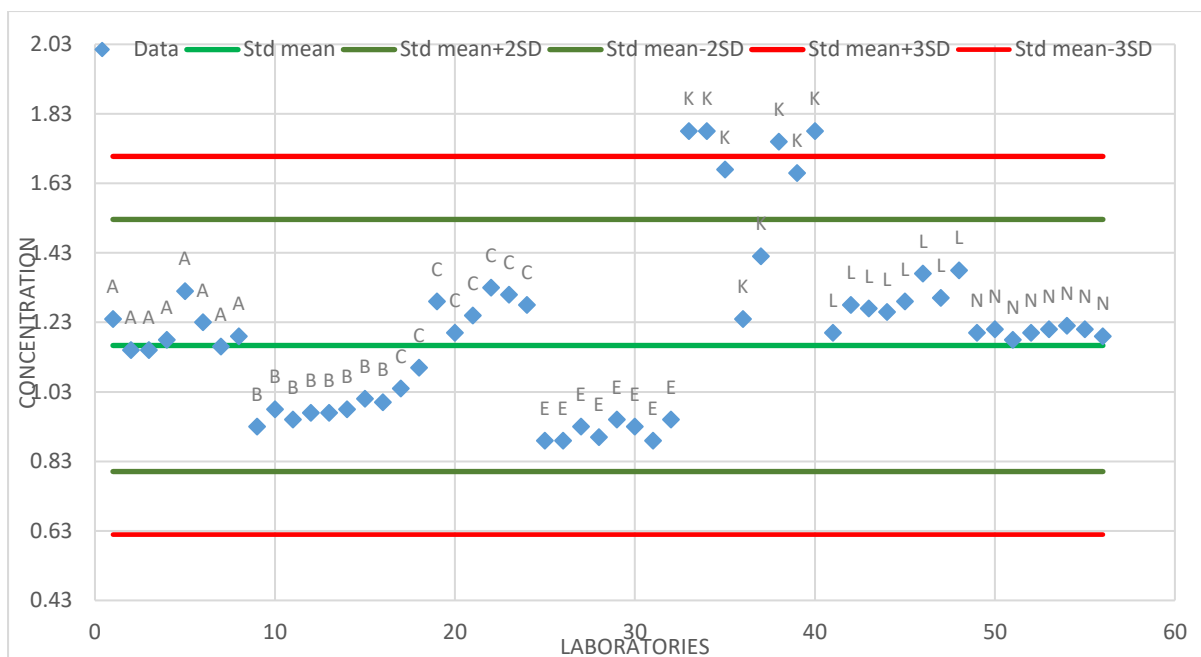
Note; 8 out of 112 results rejected as outliers using z score, Lab O not included on graph as it is an obvious outlier

## 10.2 Loss at 400°C on Ignition-LOI 400

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.14	1.24	C	0.35	1.29	K	0.90	1.42
A	-0.24	1.15	C	-0.03	1.20	K	2.30	1.75
A	-0.24	1.15	C	0.18	1.25	K	1.92	1.66
A	-0.11	1.18	C	0.52	1.33	K	2.43	1.78
A	0.48	1.32	C	0.44	1.31	L	-0.03	1.20
A	0.10	1.23	C	0.31	1.28	L	0.31	1.28
A	-0.20	1.16	E	-1.34	0.89	L	0.27	1.27
A	-0.07	1.19	E	-1.34	0.89	L	0.23	1.26
B	-1.18	0.93	E	-1.18	0.93	L	0.35	1.29
B	-0.96	0.98	E	-1.30	0.90	L	0.69	1.37
B	-1.09	0.95	E	-1.09	0.95	L	0.39	1.30
B	-1.01	0.97	E	-1.18	0.93	L	0.73	1.38
B	-1.01	0.97	E	-1.34	0.89	N	-0.03	1.20
B	-0.96	0.98	E	-1.09	0.95	N	0.01	1.21
B	-0.84	1.01	K	2.43	1.78	N	-0.11	1.18
B	-0.88	1.00	K	2.43	1.78	N	-0.03	1.20
C	-0.71	1.04	K	1.96	1.67	N	0.01	1.21
C	-0.45	1.10	K	0.14	1.24	N	0.06	1.22
						N	0.01	1.21
						N	-0.07	1.19

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI400	56	1.207	0.236	19.529	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
LOI	LOI400	A	8	1.203	0.058	0.049	4.864
LOI	LOI400	B	8	0.974	0.026	0.026	2.629
LOI	LOI400	C	8	1.225	0.105	0.085	8.539
LOI	LOI400	E	8	0.916	0.027	0.029	2.913
LOI	LOI400	K	8	1.635	0.200	0.122	12.241
LOI	LOI400	L	8	1.294	0.059	0.045	4.525
LOI	LOI400	N	8	1.203	0.013	0.011	1.066
			<b>Average</b>	<b>1.207</b>	<b>0.092</b>	<b>0.053</b>	<b>5.254</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI400	52	1.163	0.181	15.588	%

Std mean	1.163
SD	0.181
2SD	0.363
3SD	0.544
Std mean+2SD	1.526
Std mean-2SD	0.801
Std mean+3SD	1.708
Std mean-3SD	0.619

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
LOI	LOI400	0.069	0.033	0.181	0.077	%

Note: 4 out of 56 results are rejected as outliers using z score

### 10.3 Loss at 500°C on Ignition-LOI 500

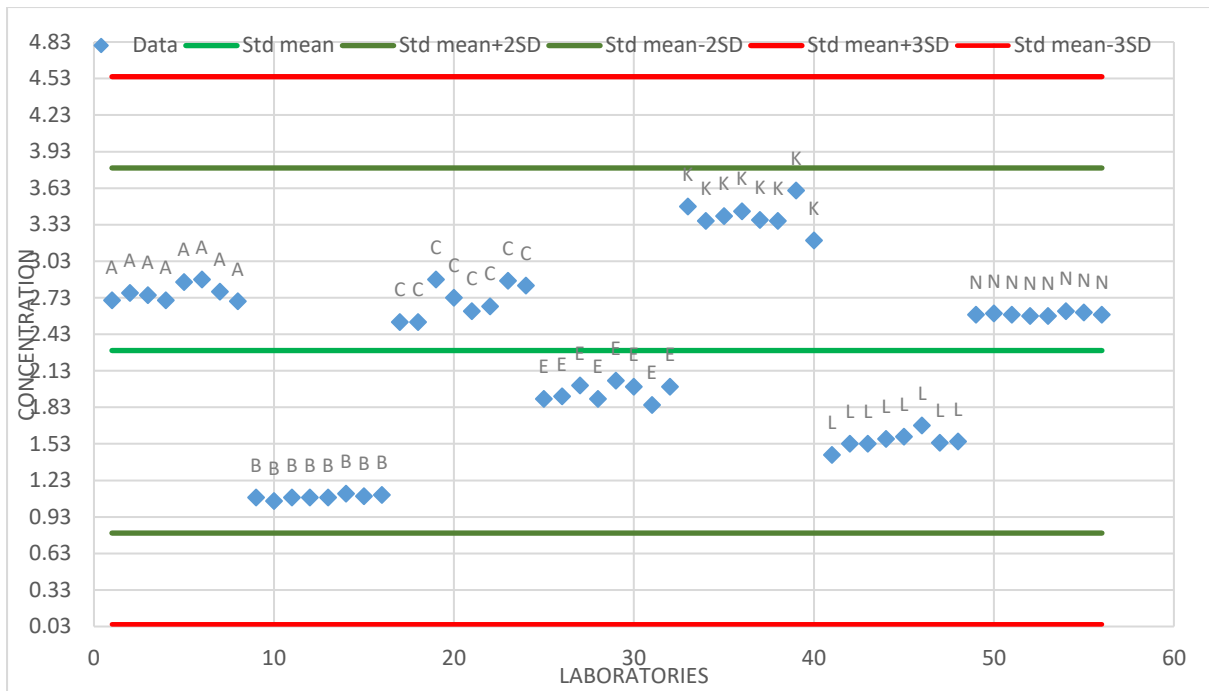
Lab_ID	Z_Score	Data
A	0.55	2.71
A	0.63	2.77
A	0.61	2.75
A	0.55	2.71
A	0.75	2.86
A	0.78	2.88
A	0.65	2.78
A	0.54	2.70
B	-1.61	1.09
B	-1.65	1.06
B	-1.61	1.09
B	-1.61	1.09
B	-1.61	1.09
B	-1.57	1.12
B	-1.60	1.10
B	-1.58	1.11
C	0.31	2.53
C	0.31	2.53

Lab_ID	Z_Score	Data
C	0.78	2.88
C	0.58	2.73
C	0.43	2.62
C	0.49	2.66
C	0.77	2.87
C	0.71	2.83
E	-0.53	1.90
E	-0.50	1.92
E	-0.38	2.01
E	-0.53	1.90
E	-0.33	2.05
E	-0.40	2.00
E	-0.60	1.85
E	-0.40	2.00
K	1.58	3.48
K	1.42	3.36
K	1.47	3.40
K	1.53	3.44

Lab_ID	Z_Score	Data
K	1.43	3.37
K	1.42	3.36
K	1.75	3.61
K	1.21	3.20
L	-1.14	1.44
L	-1.02	1.53
L	-1.02	1.53
L	-0.97	1.57
L	-0.94	1.59
L	-0.82	1.68
L	-1.01	1.54
L	-1.00	1.55
N	0.39	2.59
N	0.40	2.60
N	0.39	2.59
N	0.38	2.58
N	0.38	2.58
N	0.43	2.62
N	0.42	2.61
N	0.39	2.59

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI500	56	2.296	0.750	32.642	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
LOI	LOI500	A	8	2.770	0.068	0.025	2.471
LOI	LOI500	B	8	1.094	0.018	0.016	1.616
LOI	LOI500	C	8	2.706	0.144	0.053	5.311
LOI	LOI500	E	8	1.954	0.070	0.036	3.587
LOI	LOI500	K	8	3.403	0.117	0.034	3.445
LOI	LOI500	L	8	1.554	0.067	0.043	4.337
LOI	LOI500	N	8	2.595	0.014	0.005	0.545
<b>Average</b>				<b>2.296</b>	<b>0.084</b>	<b>0.030</b>	<b>3.045</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
LOI	LOI500	56	2.296	0.750	32.642	%

Std mean	2.296
SD	0.750
2SD	1.499
3SD	2.249
Std mean+2SD	3.796
Std mean-2SD	0.797
Std mean+3SD	4.545
Std mean-3SD	0.048

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
LOI	LOI500	0.32	0.727	0.852	0.084	%

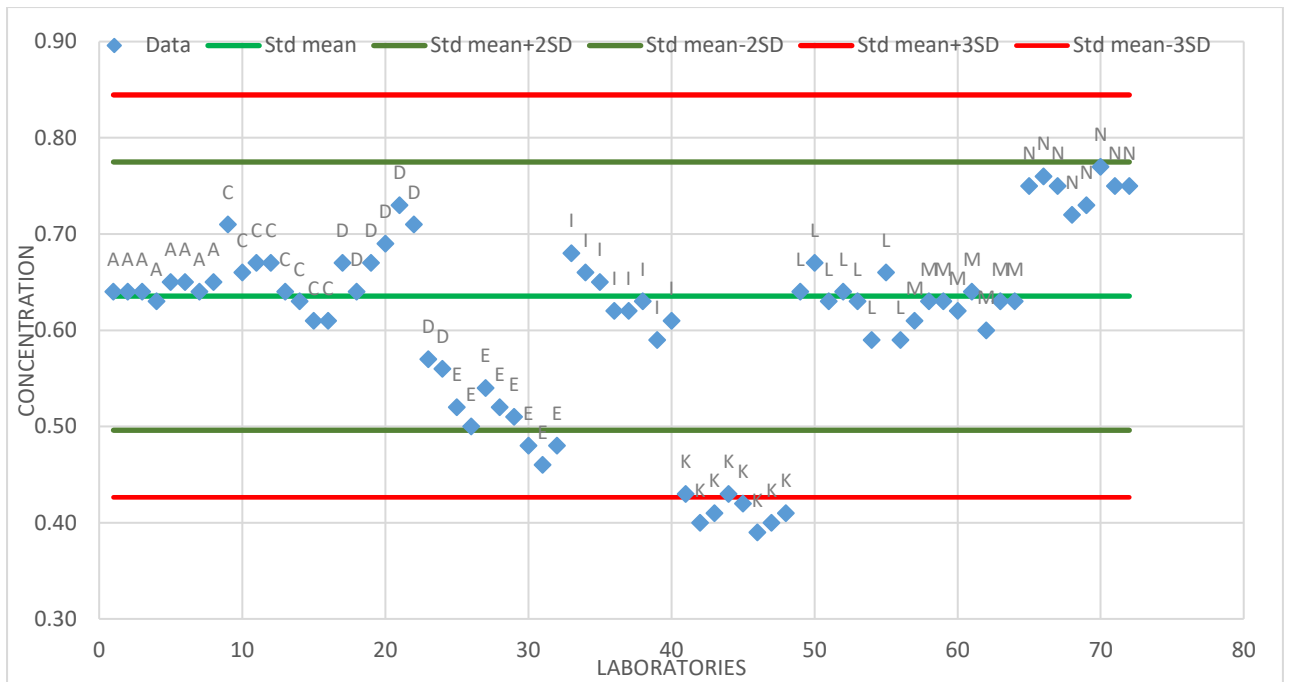
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

## 10.4 Moisture

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.30	0.64	D	0.61	0.67	I	0.10	0.62	L	0.51	0.66
A	0.30	0.64	D	0.82	0.69	I	0.20	0.63	L	-0.21	0.59
A	0.30	0.64	D	1.23	0.73	I	-0.21	0.59	M	-0.01	0.61
A	0.20	0.63	D	1.03	0.71	I	-0.01	0.61	M	0.20	0.63
A	0.41	0.65	D	-0.42	0.57	K	-1.87	0.43	M	0.20	0.63
A	0.41	0.65	D	-0.52	0.56	K	-2.18	0.40	M	0.10	0.62
A	0.30	0.64	E	-0.94	0.52	K	-2.07	0.41	M	0.30	0.64
A	0.41	0.65	E	-1.14	0.50	K	-1.87	0.43	M	-0.11	0.60
C	1.03	0.71	E	-0.73	0.54	K	-1.97	0.42	M	0.20	0.63
C	0.51	0.66	E	-0.94	0.52	K	-2.28	0.39	M	0.20	0.63
C	0.61	0.67	E	-1.04	0.51	K	-2.18	0.40	N	1.44	0.75
C	0.61	0.67	E	-1.35	0.48	K	-2.07	0.41	N	1.54	0.76
C	0.30	0.64	E	-1.56	0.46	L	0.30	0.64	N	1.44	0.75
C	0.20	0.63	E	-1.35	0.48	L	0.61	0.67	N	1.13	0.72
C	-0.01	0.61	I	0.72	0.68	L	0.20	0.63	N	1.23	0.73
C	-0.01	0.61	I	0.51	0.66	L	0.30	0.64	N	1.65	0.77
D	0.61	0.67	I	0.41	0.65	L	0.20	0.63	N	1.44	0.75
D	0.30	0.64	I	0.10	0.62	L	-0.21	0.59	N	1.44	0.75

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Moisture	Moisture	72	0.611	0.097	15.851	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_ %
Moisture	Moisture	A	8	0.643	0.007	0.011	1.101
Moisture	Moisture	C	8	0.650	0.034	0.053	5.266
Moisture	Moisture	D	8	0.655	0.062	0.094	9.447
Moisture	Moisture	E	8	0.501	0.026	0.053	5.272
Moisture	Moisture	I	8	0.633	0.029	0.046	4.609
Moisture	Moisture	K	8	0.411	0.015	0.035	3.545
Moisture	Moisture	L	8	0.631	0.029	0.046	4.594
Moisture	Moisture	M	8	0.624	0.013	0.021	2.088
Moisture	Moisture	N	8	0.748	0.016	0.021	2.115
<b>Average</b>				<b>0.611</b>	<b>0.030</b>	<b>0.042</b>	<b>4.226</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Moisture	Moisture	64	0.635	0.070	10.967	%

Std mean	0.635
SD	0.070
2SD	0.139
3SD	0.209
Std mean+2SD	0.775
Std mean-2SD	0.496
Std mean+3SD	0.845
Std mean-3SD	0.426

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Moisture	Moisture	0.024	0.004	0.066	0.031	%

Note: 8 out of 72 results are rejected as outliers using z score

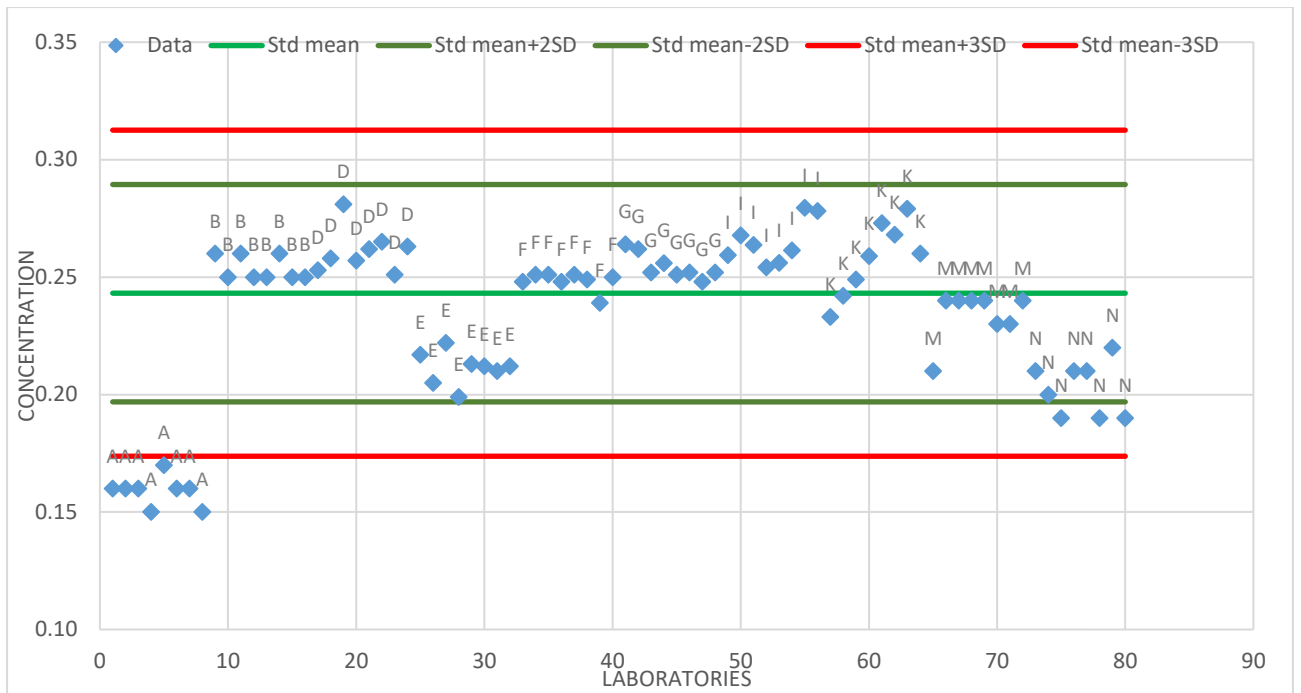


## 10.5 Sulphur by Combustion/LECO- S Combustion/LECO

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-2.22	0.16	D	0.81	0.26	G	0.87	0.26	K	1.14	0.27
A	-2.22	0.16	D	0.90	0.27	G	0.81	0.26	K	0.99	0.27
A	-2.22	0.16	D	0.48	0.25	G	0.51	0.25	K	1.32	0.28
A	-2.52	0.15	D	0.84	0.26	G	0.63	0.26	K	0.75	0.26
A	-1.92	0.17	E	-0.53	0.22	G	0.48	0.25	M	-0.73	0.21
A	-2.22	0.16	E	-0.88	0.21	G	0.51	0.25	M	0.16	0.24
A	-2.22	0.16	E	-0.38	0.22	G	0.39	0.25	M	0.16	0.24
A	-2.52	0.15	E	-1.06	0.20	G	0.51	0.25	M	0.16	0.24
B	0.75	0.26	E	-0.64	0.21	I	0.73	0.26	M	0.16	0.24
B	0.45	0.25	E	-0.67	0.21	I	0.98	0.27	M	-0.14	0.23
B	0.75	0.26	E	-0.73	0.21	I	0.86	0.26	M	-0.14	0.23
B	0.45	0.25	E	-0.67	0.21	I	0.58	0.25	M	0.16	0.24
B	0.45	0.25	F	0.39	0.25	I	0.64	0.26	N	-0.73	0.21
B	0.75	0.26	F	0.48	0.25	I	0.79	0.26	N	-1.03	0.20
B	0.45	0.25	F	0.48	0.25	I	1.33	0.28	N	-1.33	0.19
B	0.45	0.25	F	0.39	0.25	I	1.29	0.28	N	-0.73	0.21
D	0.54	0.25	F	0.48	0.25	K	-0.05	0.23	N	-0.73	0.21
D	0.69	0.26	F	0.42	0.25	K	0.22	0.24	N	-1.33	0.19
D	1.37	0.28	F	0.13	0.24	K	0.42	0.25	N	-0.44	0.22
D	0.66	0.26	F	0.45	0.25	K	0.72	0.26	N	-1.33	0.19

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
S	Combustion/LECO	80	0.235	0.034	14.346	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
S	Combustion/LECO	A	8	0.159	0.006	0.040	4.037
S	Combustion/LECO	B	8	0.254	0.005	0.020	2.040
S	Combustion/LECO	D	8	0.261	0.009	0.036	3.572
S	Combustion/LECO	E	8	0.211	0.007	0.033	3.316
S	Combustion/LECO	F	8	0.248	0.004	0.016	1.610
S	Combustion/LECO	G	8	0.255	0.006	0.022	2.211
S	Combustion/LECO	I	8	0.265	0.010	0.036	3.599
S	Combustion/LECO	K	8	0.258	0.016	0.061	6.101
S	Combustion/LECO	M	8	0.234	0.011	0.045	4.538
S	Combustion/LECO	N	8	0.203	0.012	0.058	5.753
<b>Average</b>				<b>0.235</b>	<b>0.009</b>	<b>0.037</b>	<b>3.678</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
S	Combustion/LECO	72	0.243	0.023	9.514	%

Std mean	0.243
SD	0.023
2SD	0.046
3SD	0.069
Std mean+2SD	0.289
Std mean-2SD	0.197
Std mean+3SD	0.313
Std mean-3SD	0.174

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
S	Combustion/LECO	0.007	0.000	0.021	0.009	%

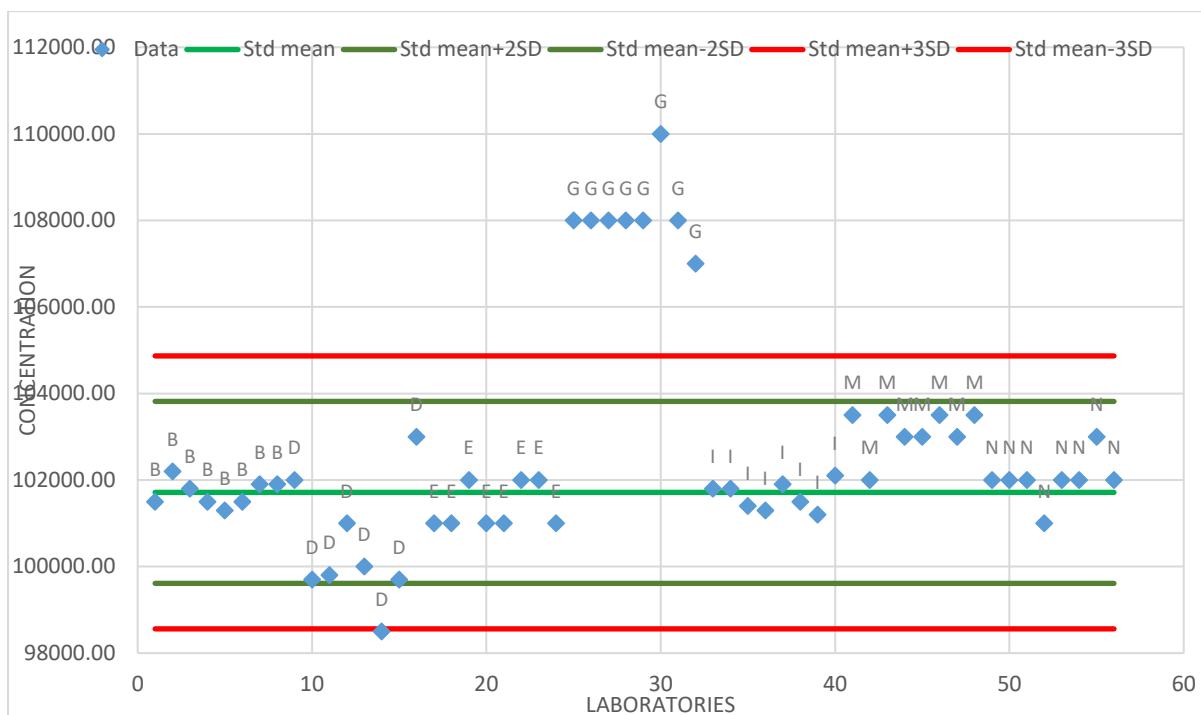
Note: 8 out of 80 results are rejected as outliers using z score

## 10.6 Carbon by Combustion/LECO- C Combustion/LECO

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.46	101500	E	-0.66	101000	I	-0.58	101200
B	-0.17	102200	E	-0.66	101000	I	-0.21	102100
B	-0.33	101800	E	-0.25	102000	M	0.35	103500
B	-0.46	101500	E	-0.25	102000	M	-0.25	102000
B	-0.54	101300	E	-0.66	101000	M	0.35	103500
B	-0.46	101500	G	2.16	108000	M	0.15	103000
B	-0.29	101900	G	2.16	108000	M	0.15	103000
B	-0.29	101900	G	2.16	108000	M	0.35	103500
D	-0.25	102000	G	2.16	108000	M	0.15	103000
D	-1.18	99700	G	2.16	108000	M	0.35	103500
D	-1.14	99800	G	2.97	110000	N	-0.25	102000
D	-0.66	101000	G	2.16	108000	N	-0.25	102000
D	-1.06	100000	G	1.76	107000	N	-0.25	102000
D	-1.66	98500	I	-0.33	101800	N	-0.66	101000
D	-1.18	99700	I	-0.33	101800	N	-0.25	102000
D	0.15	103000	I	-0.50	101400	N	-0.25	102000
E	-0.66	101000	I	-0.54	101300	N	0.15	103000
E	-0.66	101000	I	-0.29	101900	N	-0.25	102000
E	-0.25	102000	I	-0.46	101500			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
C	Combustion/LECO	56	102630.357	2481.196	2.418	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
C	Combustion/LECO	B	8	101700.000	297.610	0.003	0.293
C	Combustion/LECO	D	8	100462.500	#####	0.014	1.445
C	Combustion/LECO	E	8	101375.000	517.549	0.005	0.511
C	Combustion/LECO	G	8	108125.000	834.523	0.008	0.772
C	Combustion/LECO	I	8	101625.000	319.598	0.003	0.314
C	Combustion/LECO	M	8	103125.000	517.549	0.005	0.502
C	Combustion/LECO	N	8	102000.000	534.522	0.005	0.524
<b>Average</b>				<b>102630.357</b>	<b>738.431</b>	<b>0.006</b>	<b>0.623</b>



#### Results without outliers

Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
C	Combustion/LECO	48	101714.583	1051.238	1.034	ppm

Std mean	101714.583
SD	1051.238
2SD	2102.476
3SD	3153.714
Std mean+2SD	103817.059
Std mean-2SD	99612.107
Std mean+3SD	104868.297
Std mean-3SD	98560.869

#### Measurement of uncertainty

Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
C	Combustion/LECO	404.461	916519.841	957.350	721.172	ppm

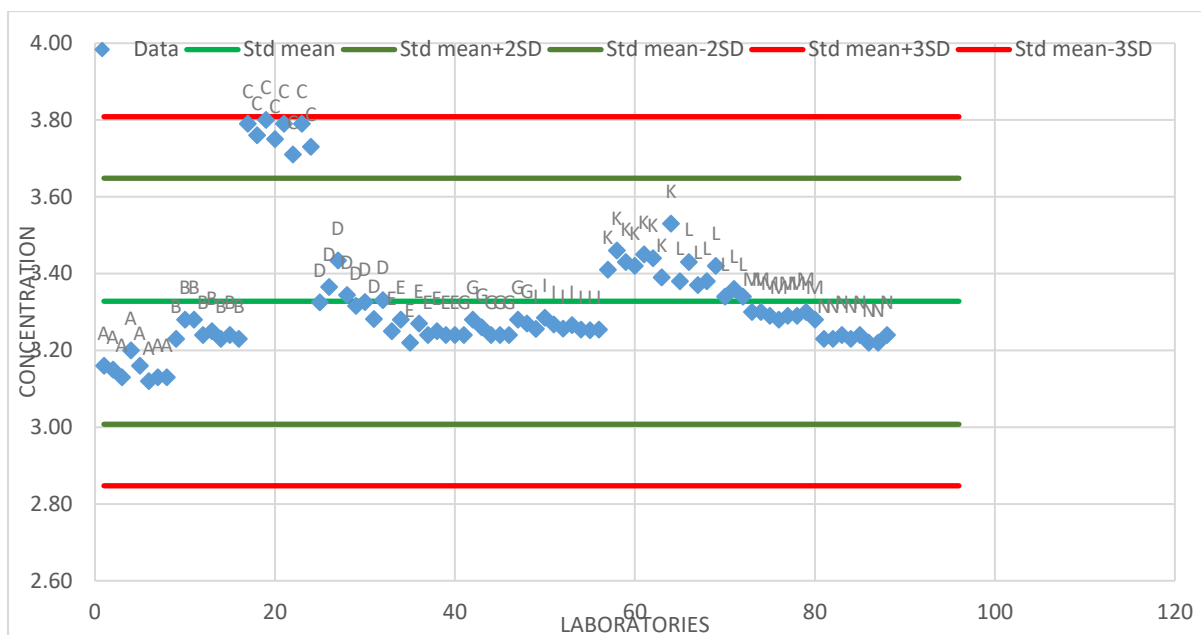
Note: 8 out of 56 results are rejected as outliers using z score

## 10.7 Aluminium Oxide with XRF finish-Al<sub>2</sub>O<sub>3</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.01	3.16	D	0.28	3.33	I	0.16	3.26	M	0.24	3.30
A	-0.03	3.15	D	0.35	3.37	I	0.21	3.29	M	0.24	3.30
A	-0.07	3.13	D	0.48	3.43	I	0.18	3.27	M	0.22	3.29
A	0.06	3.20	D	0.32	3.34	I	0.16	3.26	M	0.20	3.28
A	-0.01	3.16	D	0.27	3.32	I	0.18	3.27	M	0.22	3.29
A	-0.08	3.12	D	0.28	3.33	I	0.16	3.25	M	0.22	3.29
A	-0.07	3.13	D	0.21	3.28	I	0.15	3.25	M	0.24	3.30
A	-0.07	3.13	D	0.29	3.33	I	0.16	3.25	M	0.20	3.28
B	0.11	3.23	E	0.15	3.25	K	0.43	3.41	N	0.11	3.23
B	0.20	3.28	E	0.20	3.28	K	0.52	3.46	N	0.11	3.23
B	0.20	3.28	E	0.09	3.22	K	0.47	3.43	N	0.13	3.24
B	0.13	3.24	E	0.18	3.27	K	0.45	3.42	N	0.11	3.23
B	0.15	3.25	E	0.13	3.24	K	0.51	3.45	N	0.13	3.24
B	0.11	3.23	E	0.15	3.25	K	0.49	3.44	N	0.09	3.22
B	0.13	3.24	E	0.13	3.24	K	0.40	3.39	N	0.09	3.22
B	0.11	3.23	E	0.13	3.24	K	0.65	3.53	N	0.13	3.24
C	1.11	3.79	G	0.13	3.24	L	0.38	3.38	O	-3.38	1.27
C	1.06	3.76	G	0.20	3.28	L	0.47	3.43	O	-3.35	1.29
C	1.13	3.80	G	0.17	3.26	L	0.36	3.37	O	-3.21	1.37
C	1.04	3.75	G	0.13	3.24	L	0.38	3.38	O	-3.46	1.23
C	1.11	3.79	G	0.13	3.24	L	0.45	3.42	O	-2.78	1.61
C	0.97	3.71	G	0.13	3.24	L	0.31	3.34	O	-2.93	1.52
C	1.11	3.79	G	0.20	3.28	L	0.34	3.36	O	-3.22	1.36
C	1.01	3.73	G	0.18	3.27	L	0.31	3.34	O	-3.00	1.49

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Al <sub>2</sub> O <sub>3</sub>	XRF	96	3.167	0.560	17.684	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Al <sub>2</sub> O <sub>3</sub>	XRF	A	8	3.148	0.026	0.008	0.828
Al <sub>2</sub> O <sub>3</sub>	XRF	B	8	3.248	0.021	0.007	0.653
Al <sub>2</sub> O <sub>3</sub>	XRF	C	8	3.765	0.033	0.009	0.875
Al <sub>2</sub> O <sub>3</sub>	XRF	D	8	3.340	0.045	0.013	1.335
Al <sub>2</sub> O <sub>3</sub>	XRF	E	8	3.249	0.019	0.006	0.580
Al <sub>2</sub> O <sub>3</sub>	XRF	G	8	3.256	0.018	0.006	0.567
Al <sub>2</sub> O <sub>3</sub>	XRF	I	8	3.261	0.011	0.003	0.337
Al <sub>2</sub> O <sub>3</sub>	XRF	K	8	3.441	0.042	0.012	1.227
Al <sub>2</sub> O <sub>3</sub>	XRF	L	8	3.378	0.033	0.010	0.985
Al <sub>2</sub> O <sub>3</sub>	XRF	M	8	3.291	0.008	0.003	0.254
Al <sub>2</sub> O <sub>3</sub>	XRF	N	8	3.231	0.008	0.003	0.258
Al <sub>2</sub> O <sub>3</sub>	XRF	O	8	1.394	0.135	0.097	9.679
<b>Average</b>				<b>3.167</b>	<b>0.047</b>	<b>0.015</b>	<b>1.465</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Al <sub>2</sub> O <sub>3</sub>	XRF	88	3.328	0.160	4.813	%

Std mean	3.328
SD	0.160
2SD	0.320
3SD	0.481
Std mean+2SD	3.648
Std mean-2SD	3.008
Std mean+3SD	3.809
Std mean-3SD	2.847

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Al <sub>2</sub> O <sub>3</sub>	XRF	0.042	0.020	0.140	0.027	%

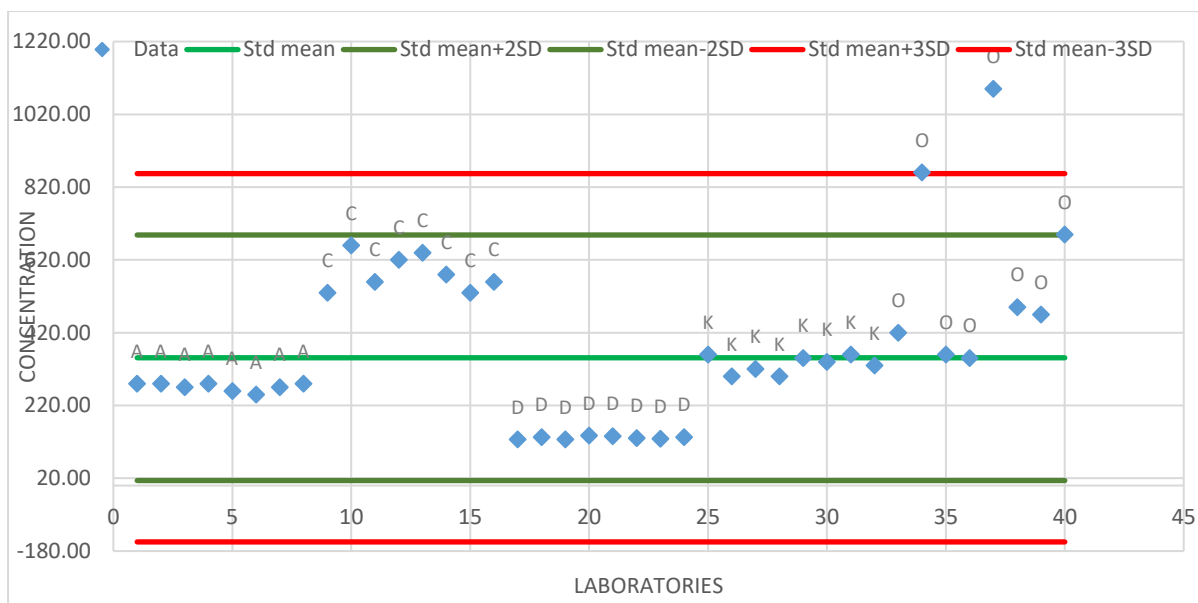
Note: 8 out of 96 results are rejected as outliers using z score, Lab O not included on the graph as it is an obvious outlier.

## 10.8 Chlorine with XRF finish-CI XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.47	280	D	-1.14	136
A	-0.47	280	D	-1.17	130
A	-0.52	270	D	-1.17	129
A	-0.47	280	D	-1.15	133
A	-0.57	260	K	-0.10	360
A	-0.61	250	K	-0.38	300
A	-0.52	270	K	-0.29	320
A	-0.47	280	K	-0.38	300
C	0.68	530	K	-0.15	350
C	1.29	660	K	-0.20	340
C	0.82	560	K	-0.10	360
C	1.10	620	K	-0.24	330
C	1.19	640	O	0.17	420
C	0.92	580	O	2.21	860
C	0.68	530	O	-0.10	360
C	0.82	560	O	-0.15	350
D	-1.18	127	O	3.28	1090
D	-1.15	133	O	0.50	490
D	-1.18	127	O	0.41	470
D	-1.14	137	O	1.42	690

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cl	XRF	40	382.300	215.948	56.487	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cl	XRF	A	8	271.250	11.260	0.042	4.151
Cl	XRF	C	8	585.000	49.570	0.085	8.473
Cl	XRF	D	8	131.500	3.854	0.029	2.931
Cl	XRF	K	8	332.500	24.349	0.073	7.323
Cl	XRF	O	8	591.250	266.374	0.451	45.053
<b>Average</b>				<b>382.300</b>	<b>121.776</b>	<b>0.136</b>	<b>13.586</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cl	XRF	38	351.105	168.675	48.041	ppm

Std mean	351.105
SD	168.675
2SD	337.350
3SD	506.025
Std mean+2SD	688.455
Std mean-2SD	13.755
Std mean+3SD	857.130
Std mean-3SD	-154.919

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cl	XRF	97.4	47035.735	216.877	55.014	ppm

Note: 2 out of 40 results are rejected as outliers using z score



## 10.9 Calcium Oxide with XRF finish-CaO XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.00	25.47	D	-0.53	24.95	I	-0.43	25.05	M	-0.48	25.00
A	-0.04	25.44	D	-0.56	24.92	I	-0.33	25.15	M	-0.38	25.10
A	0.01	25.48	D	-0.48	25.00	I	-0.46	25.02	M	-0.28	25.20
A	-0.15	25.33	D	-0.52	24.96	I	-0.40	25.08	M	-0.38	25.10
A	-0.28	25.20	D	-0.50	24.99	I	-0.42	25.06	M	-0.18	25.30
A	-0.20	25.28	D	-0.57	24.92	I	-0.40	25.08	M	-0.48	25.00
A	0.04	25.51	D	-0.60	24.88	I	-0.46	25.02	M	-0.28	25.20
A	0.05	25.52	D	-0.49	25.00	I	-0.42	25.07	M	-0.48	25.00
B	-0.48	25.00	E	-0.28	25.20	K	-0.38	25.10	N	-0.65	24.84
B	-0.48	25.00	E	-0.28	25.20	K	-0.18	25.30	N	-0.62	24.87
B	-0.55	24.93	E	-0.48	25.00	K	-0.48	25.00	N	-0.61	24.88
B	-0.52	24.96	E	-0.28	25.20	K	-0.58	24.90	N	-0.55	24.93
B	-0.63	24.86	E	-0.28	25.20	K	-0.48	25.00	N	-0.64	24.85
B	-0.56	24.92	E	-0.28	25.20	K	-0.48	25.00	N	-0.66	24.83
B	-0.56	24.92	E	-0.28	25.20	K	-0.48	25.00	N	-0.62	24.87
B	-0.52	24.96	E	-0.28	25.20	K	-0.48	25.00	N	-0.61	24.88
C	0.48	25.95	G	-0.28	25.20	L	0.03	25.50	O	2.70	28.12
C	0.38	25.85	G	-0.38	25.10	L	0.10	25.57	O	3.10	28.52
C	0.72	26.18	G	-0.28	25.20	L	0.00	25.47	O	3.02	28.44
C	0.53	26.00	G	-0.28	25.20	L	0.02	25.49	O	2.32	27.75
C	0.60	26.06	G	-0.38	25.10	L	0.08	25.55	O	3.53	28.95
C	0.31	25.78	G	-0.38	25.10	L	0.05	25.52	O	3.09	28.52
C	0.32	25.79	G	-0.38	25.10	L	0.05	25.52	O	3.49	28.90
C	0.55	26.02	G	-0.38	25.10	L	-0.03	25.45	O	3.68	29.09

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
CaO	XRF	96	25.475	0.983	3.858	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
CaO	XRF	A	8	25.404	0.119	0.005	0.467
CaO	XRF	B	8	24.944	0.047	0.002	0.187
CaO	XRF	C	8	25.954	0.140	0.005	0.539
CaO	XRF	D	8	24.952	0.043	0.002	0.172
CaO	XRF	E	8	25.175	0.071	0.003	0.281
CaO	XRF	G	8	25.138	0.052	0.002	0.206
CaO	XRF	I	8	25.066	0.040	0.002	0.161
CaO	XRF	K	8	25.038	0.119	0.005	0.474
CaO	XRF	L	8	25.509	0.040	0.002	0.156
CaO	XRF	M	8	25.113	0.113	0.004	0.448
CaO	XRF	N	8	24.869	0.031	0.001	0.124
CaO	XRF	O	8	28.537	0.448	0.016	1.571
<b>Average</b>				<b>25.475</b>	<b>0.152</b>	<b>0.004</b>	<b>0.399</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
CaO	XRF	88	25.196	0.313	1.242	%

Std mean	25.196
SD	0.313
2SD	0.626
3SD	0.939
Std mean+2SD	25.822
Std mean-2SD	24.570
Std mean+3SD	26.135
Std mean-3SD	24.257

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
CaO	XRF	0.081	0.072	0.268	0.083	%

Note: 8 out of 96 results are rejected as outliers using z score, Lab O not included on the graph as it is an obvious outlier

### 10.10 Chrome (III) Oxide with XRF finish-Cr<sub>2</sub>O<sub>3</sub> XRF

Lab_ID	Z_Score	Data
B	0.12	0.08
B	0.80	0.09
B	0.12	0.08
B	0.12	0.08
B	0.12	0.08
B	0.12	0.08
B	0.12	0.08
B	0.12	0.08
B	0.12	0.08
C	2.17	0.11
C	1.00	0.09
C	0.73	0.09
C	0.94	0.09
C	1.14	0.10
C	0.32	0.08
C	0.25	0.08
C	0.94	0.09
D	0.18	0.08
D	-0.16	0.08
D	0.59	0.09
D	0.59	0.09
D	-0.02	0.08
D	0.46	0.09
D	-0.02	0.08
D	-0.02	0.08

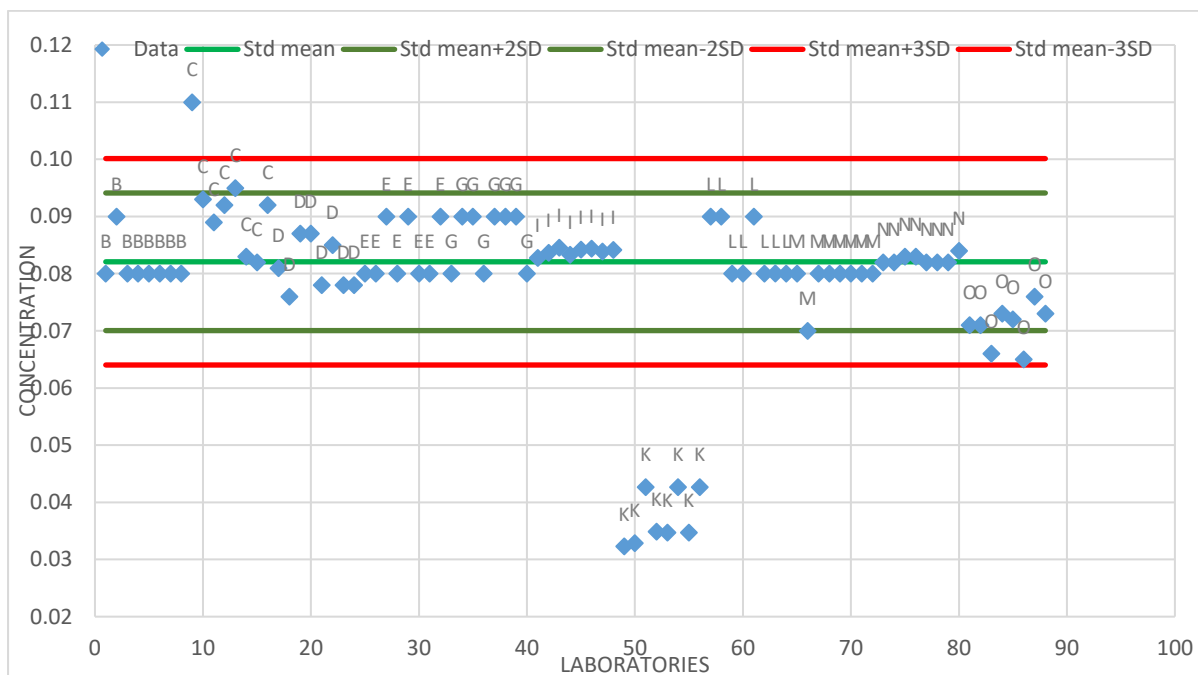
Lab_ID	Z_Score	Data
E	0.12	0.08
E	0.12	0.08
E	0.80	0.09
E	0.12	0.08
E	0.80	0.09
E	0.12	0.08
E	0.12	0.08
E	0.80	0.09
E	0.12	0.08
E	0.80	0.09
G	0.12	0.08
G	0.80	0.09
G	0.80	0.09
G	0.12	0.08
G	0.80	0.09
G	0.80	0.09
G	0.80	0.09
G	0.12	0.08
I	0.30	0.08
I	0.36	0.08
I	0.43	0.08
I	0.34	0.08
I	0.40	0.08
I	0.42	0.08
I	0.38	0.08
I	0.40	0.08

Lab_ID	Z_Score	Data
K	-3.15	0.03
K	-3.10	0.03
K	-2.43	0.04
K	-2.97	0.03
K	-2.98	0.03
K	-2.43	0.04
K	-2.98	0.03
K	-2.43	0.04
L	0.80	0.09
L	0.80	0.09
L	0.12	0.08
L	0.12	0.08
L	0.80	0.09
L	0.12	0.08
L	0.12	0.08
L	0.12	0.08
L	0.12	0.08
L	0.12	0.08
M	0.12	0.08
M	-0.57	0.07
M	0.12	0.08
M	0.12	0.08
M	0.12	0.08
M	0.12	0.08
M	0.12	0.08
M	0.12	0.08

Lab_ID	Z_Score	Data
N	0.25	0.08
N	0.25	0.08
N	0.32	0.08
N	0.32	0.08
N	0.25	0.08
N	0.25	0.08
N	0.25	0.08
N	0.39	0.08
O	-0.50	0.07
O	-0.50	0.07
O	-0.84	0.07
O	-0.36	0.07
O	-0.43	0.07
O	-0.91	0.07
O	-0.16	0.08
O	-0.36	0.07

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cr <sub>2</sub> O <sub>3</sub>	XRF	88	0.078	0.015	18.681	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cr <sub>2</sub> O <sub>3</sub>	XRF	B	8	0.081	0.004	0.044	4.351
Cr <sub>2</sub> O <sub>3</sub>	XRF	C	8	0.092	0.009	0.094	9.404
Cr <sub>2</sub> O <sub>3</sub>	XRF	D	8	0.081	0.004	0.055	5.494
Cr <sub>2</sub> O <sub>3</sub>	XRF	E	8	0.084	0.005	0.062	6.180
Cr <sub>2</sub> O <sub>3</sub>	XRF	G	8	0.086	0.005	0.060	6.001
Cr <sub>2</sub> O <sub>3</sub>	XRF	I	8	0.084	0.001	0.007	0.713
Cr <sub>2</sub> O <sub>3</sub>	XRF	K	8	0.037	0.005	0.125	12.487
Cr <sub>2</sub> O <sub>3</sub>	XRF	L	8	0.084	0.005	0.062	6.180
Cr <sub>2</sub> O <sub>3</sub>	XRF	M	8	0.079	0.004	0.045	4.490
Cr <sub>2</sub> O <sub>3</sub>	XRF	N	8	0.083	0.001	0.009	0.916
Cr <sub>2</sub> O <sub>3</sub>	XRF	O	8	0.071	0.004	0.052	5.194
<b>Average</b>				<b>0.078</b>	<b>0.005</b>	<b>0.056</b>	<b>5.583</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cr <sub>2</sub> O <sub>3</sub>	XRF	79	0.082	0.006	7.332	%

Std mean	0.082
SD	0.006
2SD	0.012
3SD	0.018
Std mean+2SD	0.094
Std mean-2SD	0.070
Std mean+3SD	0.100
Std mean-3SD	0.064

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cr <sub>2</sub> O <sub>3</sub>	XRF	0.001	0.000	0.004	0.004	%

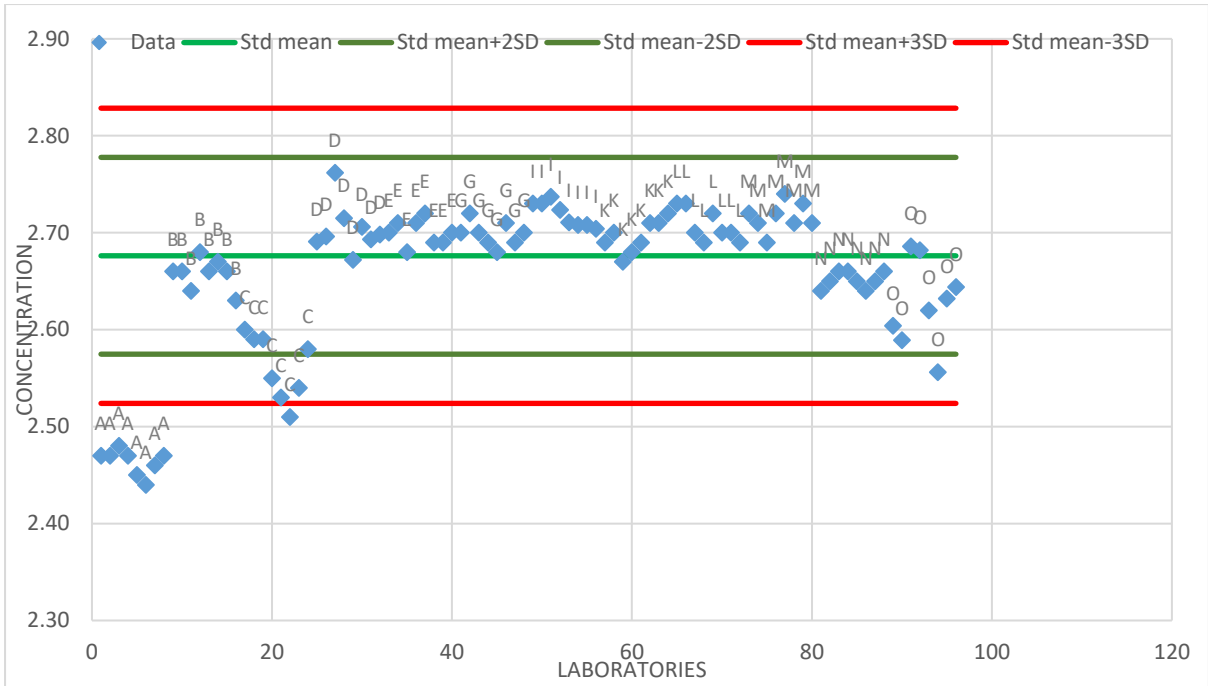
Note: 9 out of 88 results are rejected as outliers using z score, recommend outliers be investigated

### 10.11 Iron (III) Oxide with XRF finish-Fe<sub>2</sub>O<sub>3</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-2.46	2.47	D	0.42	2.69	I	0.93	2.73	M	0.80	2.72
A	-2.46	2.47	D	0.49	2.70	I	0.93	2.73	M	0.67	2.71
A	-2.33	2.48	D	1.35	2.76	I	1.03	2.74	M	0.41	2.69
A	-2.46	2.47	D	0.74	2.72	I	0.85	2.72	M	0.80	2.72
A	-2.72	2.45	D	0.18	2.67	I	0.68	2.71	M	1.06	2.74
A	-2.86	2.44	D	0.62	2.71	I	0.65	2.71	M	0.67	2.71
A	-2.59	2.46	D	0.45	2.69	I	0.65	2.71	M	0.93	2.73
A	-2.46	2.47	D	0.52	2.70	I	0.59	2.70	M	0.67	2.71
B	0.02	2.66	E	0.54	2.70	K	0.41	2.69	N	-0.24	2.64
B	0.02	2.66	E	0.67	2.71	K	0.54	2.70	N	-0.11	2.65
B	-0.24	2.64	E	0.28	2.68	K	0.15	2.67	N	0.02	2.66
B	0.28	2.68	E	0.67	2.71	K	0.28	2.68	N	0.02	2.66
B	0.02	2.66	E	0.80	2.72	K	0.41	2.69	N	-0.11	2.65
B	0.15	2.67	E	0.41	2.69	K	0.67	2.71	N	-0.24	2.64
B	0.02	2.66	E	0.41	2.69	K	0.67	2.71	N	-0.11	2.65
B	-0.37	2.63	E	0.54	2.70	K	0.80	2.72	N	0.02	2.66
C	-0.76	2.60	G	0.54	2.70	L	0.93	2.73	O	-0.71	2.60
C	-0.90	2.59	G	0.80	2.72	L	0.93	2.73	O	-0.91	2.59
C	-0.90	2.59	G	0.54	2.70	L	0.54	2.70	O	0.36	2.69
C	-1.42	2.55	G	0.41	2.69	L	0.41	2.69	O	0.31	2.68
C	-1.68	2.53	G	0.28	2.68	L	0.80	2.72	O	-0.50	2.62
C	-1.94	2.51	G	0.67	2.71	L	0.54	2.70	O	-1.34	2.56
C	-1.55	2.54	G	0.41	2.69	L	0.54	2.70	O	-0.35	2.63
C	-1.03	2.58	G	0.54	2.70	L	0.41	2.69	O	-0.19	2.64

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Fe <sub>2</sub> O <sub>3</sub>	XRF	96	2.659	0.077	2.878	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Fe <sub>2</sub> O <sub>3</sub>	XRF	A	8	2.464	0.013	0.005	0.529
Fe <sub>2</sub> O <sub>3</sub>	XRF	B	8	2.658	0.016	0.006	0.595
Fe <sub>2</sub> O <sub>3</sub>	XRF	C	8	2.561	0.033	0.013	1.294
Fe <sub>2</sub> O <sub>3</sub>	XRF	D	8	2.704	0.026	0.010	0.979
Fe <sub>2</sub> O <sub>3</sub>	XRF	E	8	2.700	0.013	0.005	0.485
Fe <sub>2</sub> O <sub>3</sub>	XRF	G	8	2.699	0.012	0.005	0.462
Fe <sub>2</sub> O <sub>3</sub>	XRF	I	8	2.719	0.013	0.005	0.466
Fe <sub>2</sub> O <sub>3</sub>	XRF	K	8	2.696	0.017	0.006	0.625
Fe <sub>2</sub> O <sub>3</sub>	XRF	L	8	2.708	0.017	0.006	0.616
Fe <sub>2</sub> O <sub>3</sub>	XRF	M	8	2.716	0.015	0.006	0.554
Fe <sub>2</sub> O <sub>3</sub>	XRF	N	8	2.651	0.008	0.003	0.315
Fe <sub>2</sub> O <sub>3</sub>	XRF	O	8	2.627	0.045	0.017	1.695
<b>Average</b>				<b>2.659</b>	<b>0.022</b>	<b>0.007</b>	<b>0.718</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Fe <sub>2</sub> O <sub>3</sub>	XRF	88	2.676	0.051	1.896	%

Std mean	2.676
SD	0.051
2SD	0.102
3SD	0.152
Std mean+2SD	2.778
Std mean-2SD	2.575
Std mean+3SD	2.828
Std mean-3SD	2.524

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Fe <sub>2</sub> O <sub>3</sub>	XRF	0.01	0.002	0.041	0.022	%

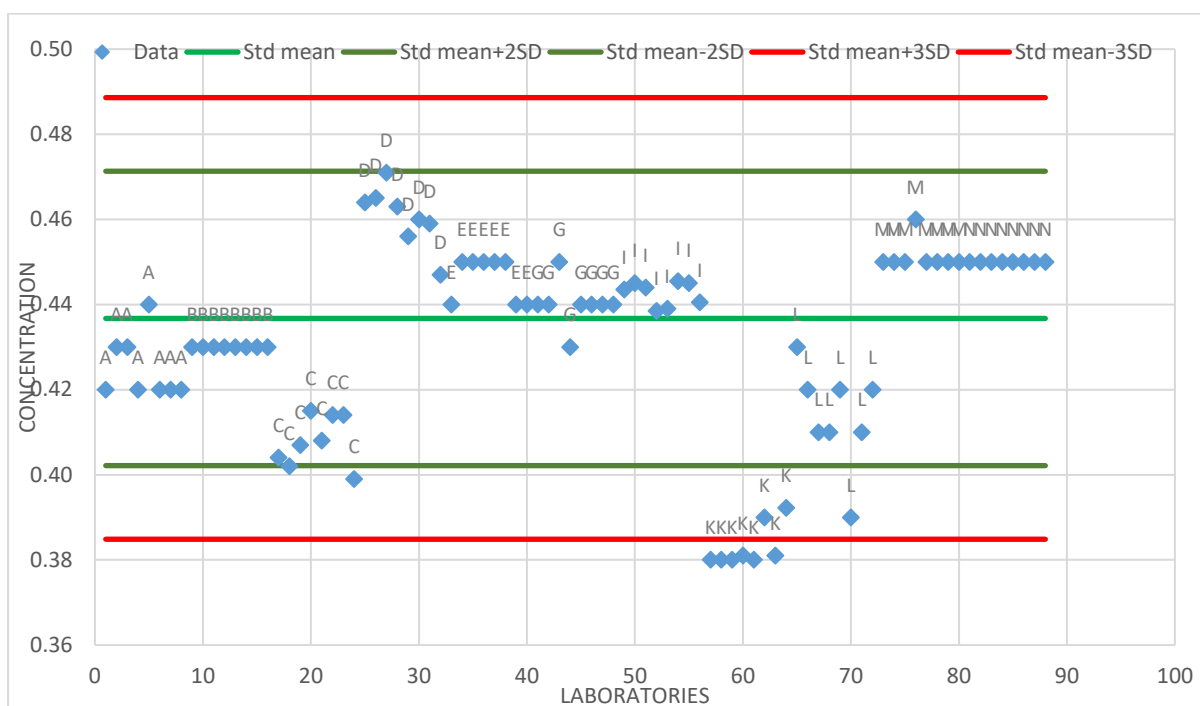
Note: 8 out of 96 results are rejected as outliers using z score, recommend outliers be investigated

## 10.12 Potassium Oxide with XRF finish –K<sub>2</sub>O XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.52	0.42	D	1.42	0.46	I	0.51	0.44	M	0.80	0.45
A	-0.08	0.43	D	1.46	0.47	I	0.58	0.45	M	0.80	0.45
A	-0.08	0.43	D	1.73	0.47	I	0.54	0.44	M	0.80	0.45
A	-0.52	0.42	D	1.37	0.46	I	0.29	0.44	M	1.24	0.46
A	0.36	0.44	D	1.06	0.46	I	0.31	0.44	M	0.80	0.45
A	-0.52	0.42	D	1.24	0.46	I	0.60	0.45	M	0.80	0.45
A	-0.52	0.42	D	1.20	0.46	I	0.58	0.45	M	0.80	0.45
A	-0.52	0.42	D	0.67	0.45	I	0.38	0.44	M	0.80	0.45
B	-0.08	0.43	E	0.36	0.44	K	-2.29	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.80	0.45	K	-2.29	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.80	0.45	K	-2.29	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.80	0.45	K	-2.24	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.80	0.45	K	-2.29	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.80	0.45	K	-1.84	0.39	N	0.80	0.45
B	-0.08	0.43	E	0.36	0.44	K	-2.24	0.38	N	0.80	0.45
B	-0.08	0.43	E	0.36	0.44	K	-1.75	0.39	N	0.80	0.45
B	-0.08	0.43	E	0.36	0.44	L	-0.08	0.43			
C	-1.23	0.40	G	0.36	0.44	L	-0.52	0.42			
C	-1.32	0.40	G	0.36	0.44	L	-0.96	0.41			
C	-1.10	0.41	G	0.80	0.45	L	-0.96	0.41			
C	-0.74	0.42	G	-0.08	0.43	L	-0.52	0.42			
C	-1.05	0.41	G	0.36	0.44	L	-1.84	0.39			
C	-0.79	0.41	G	0.36	0.44	L	-0.96	0.41			
C	-0.79	0.41	G	0.36	0.44	L	-0.96	0.41			
C	-1.45	0.40	G	0.36	0.44	L	-0.52	0.42			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
K <sub>2</sub> O	XRF	88	0.432	0.023	5.254	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
K <sub>2</sub> O	XRF	A	8	0.425	0.008	0.018	1.779
K <sub>2</sub> O	XRF	B	8	0.430	0.000	0.000	0.000
K <sub>2</sub> O	XRF	C	8	0.408	0.006	0.015	1.479
K <sub>2</sub> O	XRF	D	8	0.461	0.007	0.015	1.544
K <sub>2</sub> O	XRF	E	8	0.446	0.005	0.012	1.160
K <sub>2</sub> O	XRF	G	8	0.440	0.005	0.012	1.215
K <sub>2</sub> O	XRF	I	8	0.443	0.003	0.006	0.644
K <sub>2</sub> O	XRF	K	8	0.383	0.005	0.013	1.315
K <sub>2</sub> O	XRF	L	8	0.414	0.012	0.029	2.871
K <sub>2</sub> O	XRF	M	8	0.451	0.004	0.008	0.783
K <sub>2</sub> O	XRF	N	8	0.450	<0.001	<0.001	<0.001
			<b>Average</b>	<b>0.432</b>	<b>0.006</b>	<b>0.012</b>	<b>1.163</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
K <sub>2</sub> O	XRF	80	0.437	0.017	3.960	%

Std mean	0.437
SD	0.017
2SD	0.035
3SD	0.052
Std mean+2SD	0.471
Std mean-2SD	0.402
Std mean+3SD	0.489
Std mean-3SD	0.385

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
K <sub>2</sub> O	XRF	0.007	0.000	0.018	0.007	%

Note: 8 out of 88 results are rejected as outliers using z score

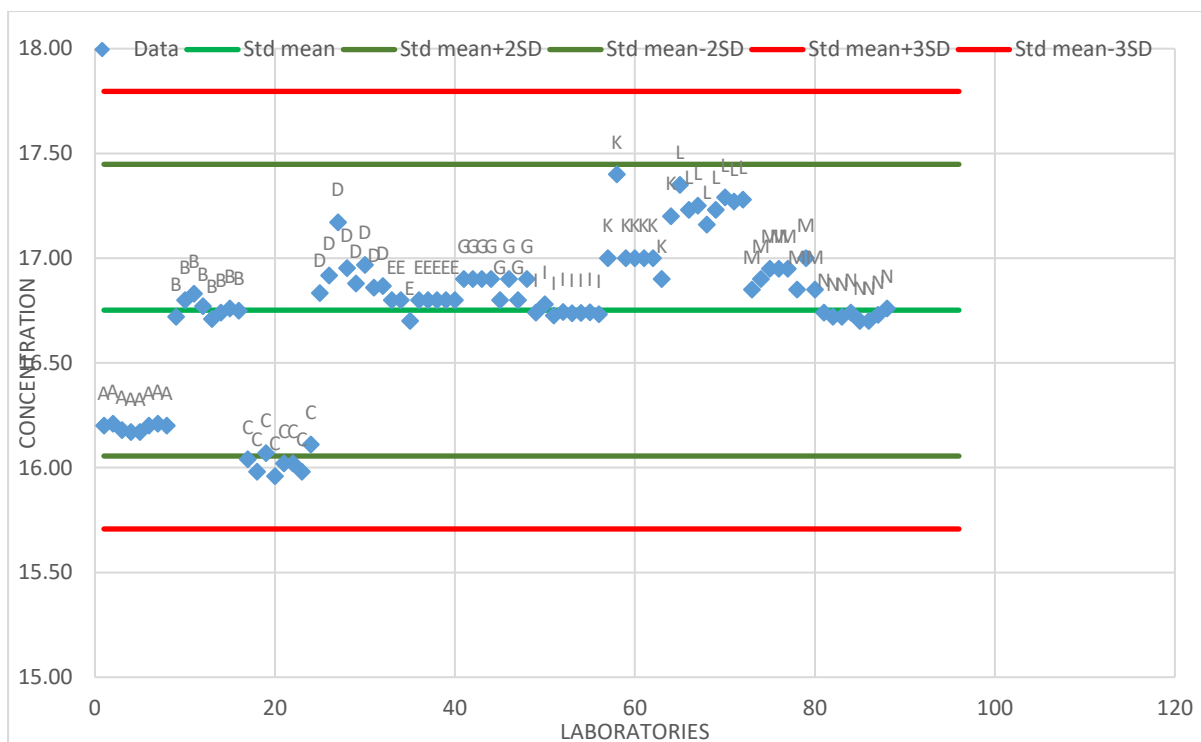


### 10.13 Magnesium Oxide with XRF finish- MgO XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.16	16.20	D	0.32	16.83	I	0.30	16.74	M	0.32	16.85
A	0.16	16.21	D	0.34	16.92	I	0.31	16.78	M	0.34	16.90
A	0.16	16.18	D	0.40	17.17	I	0.29	16.73	M	0.35	16.95
A	0.15	16.17	D	0.35	16.95	I	0.30	16.74	M	0.35	16.95
A	0.15	16.17	D	0.33	16.88	I	0.29	16.74	M	0.35	16.95
A	0.16	16.20	D	0.35	16.97	I	0.30	16.74	M	0.32	16.85
A	0.16	16.21	D	0.33	16.86	I	0.30	16.74	M	0.36	17.00
A	0.16	16.20	D	0.33	16.87	I	0.29	16.73	M	0.32	16.85
B	0.29	16.72	E	0.31	16.80	K	0.36	17.00	N	0.30	16.74
B	0.31	16.80	E	0.31	16.80	K	0.46	17.40	N	0.29	16.72
B	0.32	16.83	E	0.29	16.70	K	0.36	17.00	N	0.29	16.72
B	0.30	16.77	E	0.31	16.80	K	0.36	17.00	N	0.30	16.74
B	0.29	16.71	E	0.31	16.80	K	0.36	17.00	N	0.29	16.70
B	0.30	16.74	E	0.31	16.80	K	0.36	17.00	N	0.29	16.70
B	0.30	16.76	E	0.31	16.80	K	0.34	16.90	N	0.29	16.73
B	0.30	16.75	E	0.31	16.80	K	0.41	17.20	N	0.30	16.76
C	0.12	16.04	G	0.34	16.90	L	0.45	17.35	O	-3.57	1.21
C	0.11	15.98	G	0.34	16.90	L	0.42	17.23	O	-3.19	2.71
C	0.13	16.07	G	0.34	16.90	L	0.42	17.25	O	-3.28	2.39
C	0.10	15.96	G	0.34	16.90	L	0.40	17.16	O	-3.34	2.11
C	0.12	16.02	G	0.31	16.80	L	0.42	17.23	O	-3.55	1.30
C	0.12	16.02	G	0.34	16.90	L	0.43	17.29	O	-3.18	2.76
C	0.11	15.98	G	0.31	16.80	L	0.43	17.27	O	-3.06	3.27
C	0.14	16.11	G	0.34	16.90	L	0.43	17.28	O	-3.10	3.10

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
MgO	XRF	96	15.552	4.019	25.845	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
MgO	XRF	A	8	16.193	0.017	0.001	0.103
MgO	XRF	B	8	16.760	0.040	0.002	0.239
MgO	XRF	C	8	16.023	0.050	0.003	0.314
MgO	XRF	D	8	16.931	0.108	0.006	0.636
MgO	XRF	E	8	16.788	0.035	0.002	0.211
MgO	XRF	G	8	16.875	0.046	0.003	0.274
MgO	XRF	I	8	16.742	0.016	0.001	0.096
MgO	XRF	K	8	17.063	0.160	0.009	0.937
MgO	XRF	L	8	17.258	0.055	0.003	0.320
MgO	XRF	M	8	16.913	0.058	0.003	0.344
MgO	XRF	N	8	16.726	0.021	0.001	0.124
MgO	XRF	O	8	2.355	0.772	0.328	32.795
<b>Average</b>				<b>15.552</b>	<b>0.232</b>	<b>0.030</b>	<b>3.033</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
MgO	XRF	88	16.752	0.348	2.078	%

Std mean	16.752
SD	0.348
2SD	0.696
3SD	1.044
Std mean+2SD	17.448
Std mean-2SD	16.056
Std mean+3SD	17.796
Std mean-3SD	15.708

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
MgO	XRF	0.092	0.092	0.303	0.069	%

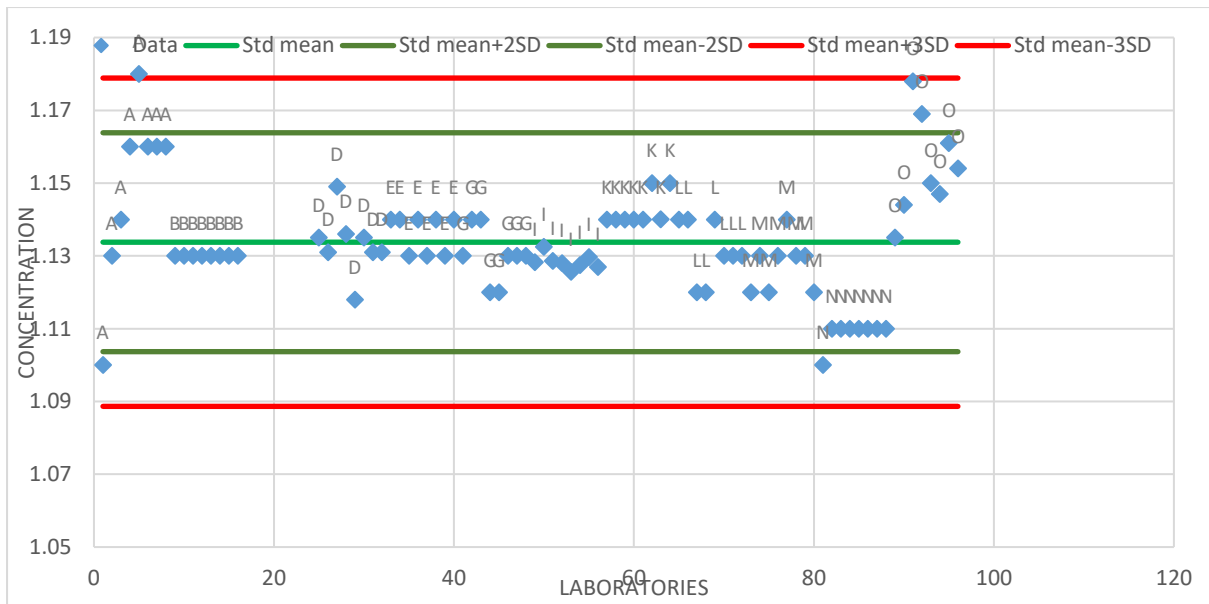
Note: 8 out of 96 results are rejected as outliers using z score, Lab O not included on the graph as it is an obvious outlier

### 10.14 Manganese Oxide with XRF finish-MnO XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.18	1.10	D	0.31	1.14	I	0.22	1.13	M	0.10	1.12
A	0.24	1.13	D	0.25	1.13	I	0.28	1.13	M	0.24	1.13
A	0.38	1.14	D	0.51	1.15	I	0.22	1.13	M	0.10	1.12
A	0.66	1.16	D	0.32	1.14	I	0.21	1.13	M	0.24	1.13
A	0.94	1.18	D	0.07	1.12	I	0.18	1.13	M	0.38	1.14
A	0.66	1.16	D	0.31	1.14	I	0.21	1.13	M	0.24	1.13
A	0.66	1.16	D	0.25	1.13	I	0.24	1.13	M	0.24	1.13
A	0.66	1.16	D	0.25	1.13	I	0.20	1.13	M	0.10	1.12
B	0.24	1.13	E	0.38	1.14	K	0.38	1.14	N	-0.18	1.10
B	0.24	1.13	E	0.38	1.14	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.24	1.13	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.38	1.14	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.24	1.13	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.38	1.14	K	0.52	1.15	N	-0.04	1.11
B	0.24	1.13	E	0.24	1.13	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.38	1.14	K	0.38	1.14	N	-0.04	1.11
B	0.24	1.13	E	0.24	1.13	K	0.52	1.15	N	-0.04	1.11
B	0.24	1.13	E	0.38	1.14	L	0.38	1.14	O	0.31	1.14
C	-3.39	0.87	G	0.24	1.13	L	0.38	1.14	O	0.44	1.14
C	-3.25	0.88	G	0.38	1.14	L	0.10	1.12	O	0.91	1.18
C	-2.97	0.90	G	0.38	1.14	L	0.10	1.12	O	0.78	1.17
C	-3.25	0.88	G	0.10	1.12	L	0.38	1.14	O	0.52	1.15
C	-3.11	0.89	G	0.10	1.12	L	0.24	1.13	O	0.48	1.15
C	-3.25	0.88	G	0.24	1.13	L	0.24	1.13	O	0.67	1.16
C	-3.52	0.86	G	0.24	1.13	L	0.24	1.13	O	0.58	1.15
C	-3.11	0.89	G	0.24	1.13	L	0.24	1.13			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
MnO	XRF	96	1.113	0.072	6.443	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
MnO	XRF	A	8	1.149	0.025	0.022	2.154
MnO	XRF	B	8	1.130	0.000	0.000	0.000
MnO	XRF	C	8	0.881	0.012	0.014	1.414
MnO	XRF	D	8	1.133	0.009	0.008	0.753
MnO	XRF	E	8	1.136	0.005	0.005	0.455
MnO	XRF	G	8	1.130	0.008	0.007	0.669
MnO	XRF	I	8	1.128	0.002	0.002	0.181
MnO	XRF	K	8	1.143	0.005	0.004	0.405
MnO	XRF	L	8	1.131	0.008	0.007	0.738
MnO	XRF	M	8	1.128	0.007	0.006	0.627
MnO	XRF	N	8	1.109	0.004	0.003	0.319
MnO	XRF	O	8	1.155	0.014	0.012	1.212
			<b>Average</b>	<b>1.113</b>	<b>0.010</b>	<b>0.007</b>	<b>0.744</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
MnO	XRF	88	1.134	0.015	1.326	%

Std mean	1.134
SD	0.015
2SD	0.030
3SD	0.045
Std mean+2SD	1.164
Std mean-2SD	1.104
Std mean+3SD	1.179
Std mean-3SD	1.089

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
MnO	XRF	0.004	0.000	0.011	0.011	%

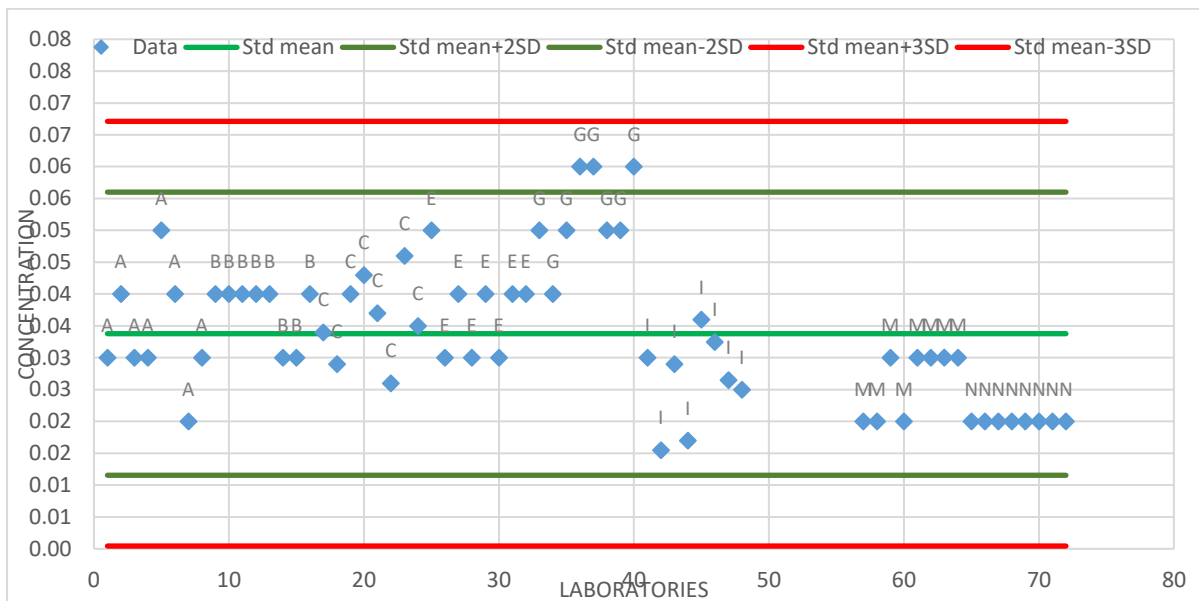
Note: 8 out of 96 results are rejected as outliers using z score, Lab C not included on the graph as it is an obvious outlier

### 10.15 Sodium Oxide with XRF finish-Na<sub>2</sub>O XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.37	0.03	C	-0.32	0.04	G	-0.21	0.06	K	2.82	0.64
A	-0.32	0.04	C	-0.30	0.04	G	-0.26	0.05	K	3.39	0.75
A	-0.37	0.03	C	-0.33	0.04	G	-0.26	0.05	M	-0.42	0.02
A	-0.37	0.03	C	-0.39	0.03	G	-0.21	0.06	M	-0.42	0.02
A	-0.26	0.05	C	-0.28	0.05	I	-0.37	0.03	M	-0.37	0.03
A	-0.32	0.04	C	-0.34	0.04	I	-0.44	0.02	M	-0.42	0.02
A	-0.42	0.02	E	-0.26	0.05	I	-0.37	0.03	M	-0.37	0.03
A	-0.37	0.03	E	-0.37	0.03	I	-0.44	0.02	M	-0.37	0.03
B	-0.32	0.04	E	-0.32	0.04	I	-0.34	0.04	M	-0.37	0.03
B	-0.32	0.04	E	-0.37	0.03	I	-0.36	0.03	M	-0.37	0.03
B	-0.32	0.04	E	-0.32	0.04	I	-0.39	0.03	N	-0.42	0.02
B	-0.32	0.04	E	-0.37	0.03	I	-0.39	0.03	N	-0.42	0.02
B	-0.32	0.04	E	-0.32	0.04	K	3.13	0.70	N	-0.42	0.02
B	-0.37	0.03	E	-0.32	0.04	K	2.61	0.60	N	-0.42	0.02
B	-0.37	0.03	G	-0.26	0.05	K	2.55	0.59	N	-0.42	0.02
B	-0.32	0.04	G	-0.32	0.04	K	2.45	0.57	N	-0.42	0.02
C	-0.35	0.03	G	-0.26	0.05	K	2.82	0.64	N	-0.42	0.02
C	-0.37	0.03	G	-0.21	0.06	K	2.55	0.59	N	-0.42	0.02

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Na <sub>2</sub> O	XRF	72	0.101	0.192	190.458	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Na <sub>2</sub> O	XRF	A	8	0.034	0.009	0.271	27.144
Na <sub>2</sub> O	XRF	B	8	0.038	0.005	0.123	12.344
Na <sub>2</sub> O	XRF	C	8	0.036	0.007	0.186	18.637
Na <sub>2</sub> O	XRF	E	8	0.038	0.007	0.189	18.856
Na <sub>2</sub> O	XRF	G	8	0.053	0.007	0.135	13.469
Na <sub>2</sub> O	XRF	I	8	0.026	0.007	0.271	27.059
Na <sub>2</sub> O	XRF	K	8	0.635	0.062	0.098	9.780
Na <sub>2</sub> O	XRF	M	8	0.026	0.005	0.197	19.716
Na <sub>2</sub> O	XRF	N	8	0.020	<0.001	<0.001	<0.001
			<b>Average</b>	<b>0.101</b>	<b>0.022</b>	<b>0.163</b>	<b>16.334</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Na <sub>2</sub> O	XRF	64	0.034	0.011	32.905	%

Std mean	0.034
SD	0.011
2SD	0.022
3SD	0.033
Std mean+2SD	0.056
Std mean-2SD	0.012
Std mean+3SD	0.067
Std mean-3SD	0.000

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Na <sub>2</sub> O	XRF	0.004	0.000	0.010	0.006	%

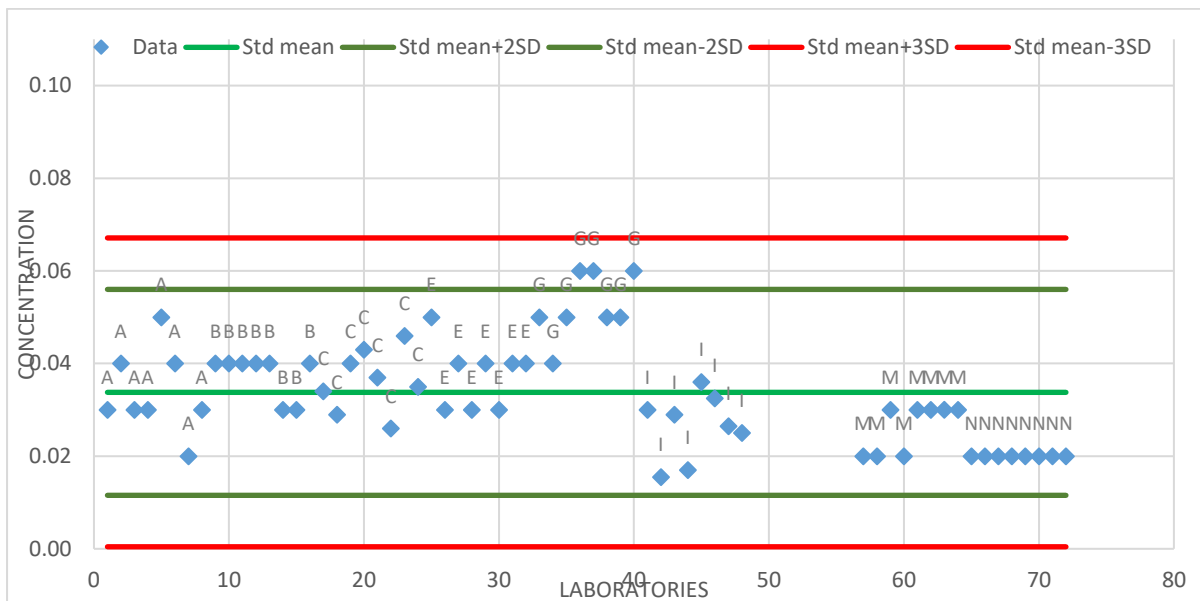
Note: 8 out of 72 results are rejected as outliers using z score, Lab K not included on the graph as it is an obvious outlier

### 10.16 Phosphorus (V) Oxide with XRF finish– P<sub>2</sub>O<sub>5</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-1.18	0.02	D	0.32	0.03	I	0.12	0.03	M	-0.03	0.03
A	-1.18	0.02	D	0.09	0.03	I	0.39	0.03	M	-0.03	0.03
A	-1.18	0.02	D	0.20	0.03	I	0.17	0.03	M	-0.03	0.03
A	-0.03	0.03	D	-0.03	0.03	I	0.23	0.03	M	-0.03	0.03
A	-0.03	0.03	D	0.20	0.03	I	0.48	0.03	M	-0.03	0.03
A	-1.18	0.02	D	0.43	0.03	I	0.45	0.03	M	-0.03	0.03
A	-1.18	0.02	D	0.20	0.03	I	0.15	0.03	M	-0.03	0.03
A	-1.18	0.02	D	0.20	0.03	I	0.42	0.03	M	-0.03	0.03
B	0.32	0.03	E	-0.03	0.03	K	-0.83	0.02	N	0.09	0.03
B	0.09	0.03	E	-0.03	0.03	K	-0.60	0.03	N	0.20	0.03
B	-0.03	0.03	E	1.13	0.04	K	-0.72	0.02	N	0.20	0.03
B	-0.14	0.03	E	-0.03	0.03	K	-0.72	0.02	N	0.09	0.03
B	0.09	0.03	E	-0.03	0.03	K	-0.37	0.03	N	0.20	0.03
B	0.09	0.03	E	-0.03	0.03	K	-0.72	0.02	N	0.20	0.03
B	0.09	0.03	E	-0.03	0.03	K	-0.72	0.02	N	0.20	0.03
B	0.32	0.03	E	-0.03	0.03	K	-0.49	0.03	N	0.20	0.03
B	0.09	0.03	E	-0.03	0.03	K	-0.37	0.03	N	0.20	0.03
C	-1.52	0.02	G	-0.03	0.03	L	2.51	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.51	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.39	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.39	0.05	N	0.20	0.03
C	-1.75	0.02	G	-0.03	0.03	L	2.51	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.39	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.39	0.05	N	0.20	0.03
C	-1.87	0.01	G	-0.03	0.03	L	2.39	0.05	N	0.20	0.03
C	-1.64	0.02	G	-0.03	0.03	L	2.28	0.05	N	0.20	0.03

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
P <sub>2</sub> O <sub>5</sub>	XRF	88	0.030	0.009	28.740	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
P <sub>2</sub> O <sub>5</sub>	XRF	A	8	0.023	0.005	0.206	20.574
P <sub>2</sub> O <sub>5</sub>	XRF	B	8	0.031	0.001	0.044	4.357
P <sub>2</sub> O <sub>5</sub>	XRF	C	8	0.015	0.001	0.079	7.898
P <sub>2</sub> O <sub>5</sub>	XRF	D	8	0.032	0.001	0.037	3.735
P <sub>2</sub> O <sub>5</sub>	XRF	E	8	0.031	0.004	0.113	11.314
P <sub>2</sub> O <sub>5</sub>	XRF	G	8	0.030	0.000	0.000	0.000
P <sub>2</sub> O <sub>5</sub>	XRF	I	8	0.033	0.001	0.039	3.878
P <sub>2</sub> O <sub>5</sub>	XRF	K	8	0.025	0.002	0.060	6.047
P <sub>2</sub> O <sub>5</sub>	XRF	L	8	0.051	0.001	0.014	1.380
P <sub>2</sub> O <sub>5</sub>	XRF	M	8	0.030	0.000	0.000	0.000
P <sub>2</sub> O <sub>5</sub>	XRF	N	8	0.032	0.000	0.015	1.458
<b>Average</b>				<b>0.101</b>	<b>0.022</b>	<b>0.163</b>	<b>16.334</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
P <sub>2</sub> O <sub>5</sub>	XRF	80	0.028	0.006	20.672	%

Std mean	0.028
SD	0.006
2SD	0.012
3SD	0.017
Std mean+2SD	0.040
Std mean-2SD	0.016
Std mean+3SD	0.046
Std mean-3SD	0.011

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
P <sub>2</sub> O <sub>5</sub>	XRF	0.002	0.000	0.006	0.002	%

Note: 8 out of 88 results are rejected as outliers using z score, Lab K not included on the graph as it is an obvious outlier

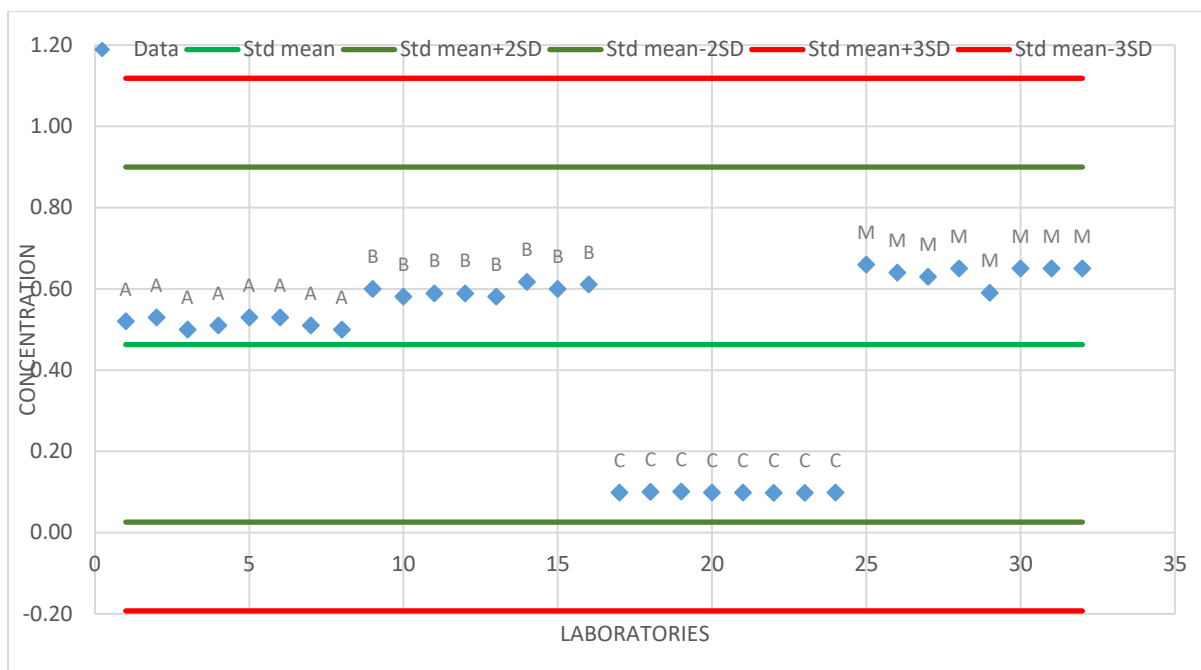


### 10.17 Sulphur Trioxide with XRF finish- SO<sub>3</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.26	0.52	C	-1.67	0.10
A	0.31	0.53	C	-1.66	0.10
A	0.17	0.50	C	-1.66	0.10
A	0.22	0.51	C	-1.67	0.10
A	0.31	0.53	C	-1.67	0.10
A	0.31	0.53	C	-1.67	0.10
A	0.22	0.51	C	-1.67	0.10
A	0.17	0.50	C	-1.67	0.10
B	0.63	0.60	M	0.90	0.66
B	0.54	0.58	M	0.81	0.64
B	0.58	0.59	M	0.77	0.63
B	0.58	0.59	M	0.86	0.65
B	0.54	0.58	M	0.58	0.59
B	0.71	0.62	M	0.86	0.65
B	0.63	0.60	M	0.86	0.65
B	0.68	0.61	M	0.86	0.65

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
SO <sub>3</sub>	XRF	32	0.463	0.218	47.207	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
SO <sub>3</sub>	XRF	A	8	0.516	0.013	0.025	2.523
SO <sub>3</sub>	XRF	B	8	0.596	0.013	0.022	2.239
SO <sub>3</sub>	XRF	C	8	0.099	0.001	0.010	1.000
SO <sub>3</sub>	XRF	M	8	0.640	0.022	0.034	3.444
<b>Average</b>				<b>0.463</b>	<b>0.014</b>	<b>0.023</b>	<b>2.301</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
SO <sub>3</sub>	XRF	32	0.463	0.218	47.207	%

Std mean	0.463
SD	0.218
2SD	0.437
3SD	0.655
Std mean+2SD	0.900
Std mean-2SD	0.026
Std mean+3SD	1.118
Std mean-3SD	-0.193

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
SO <sub>3</sub>	XRF	0.18	0.123	0.350	0.014	%

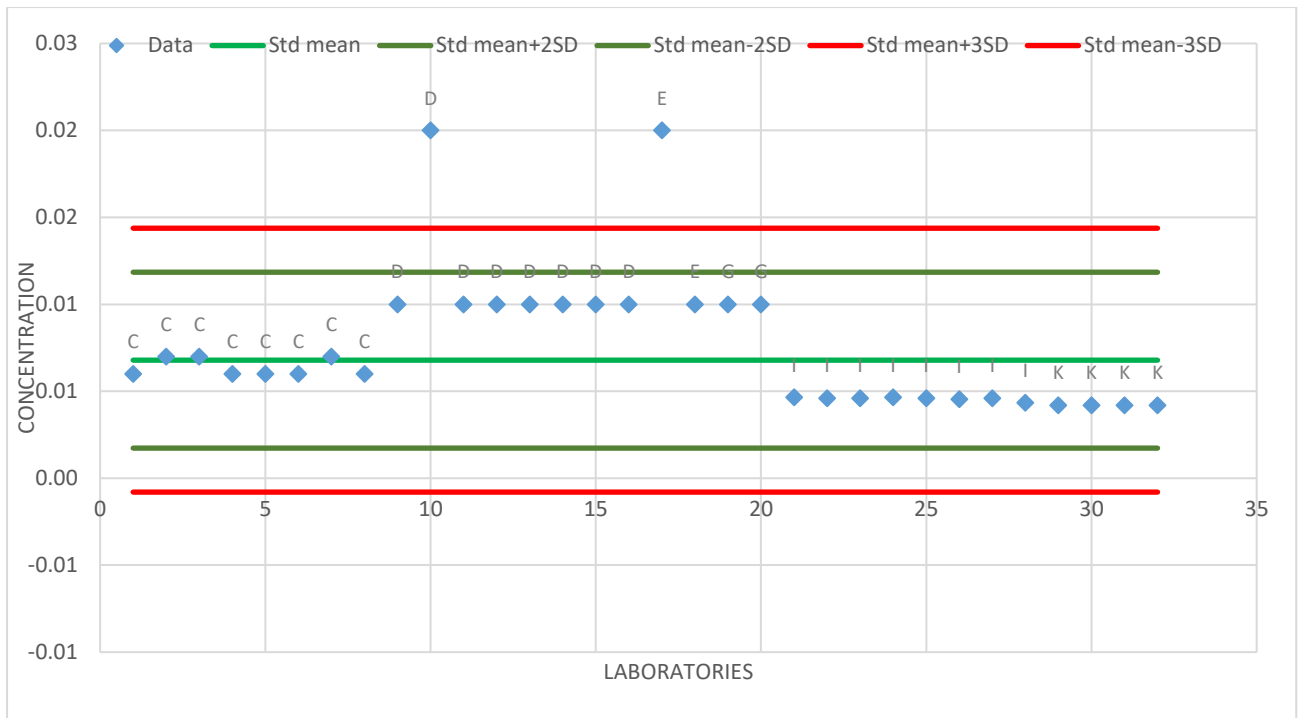
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

### 10.18 Strontium Oxide with XRF finish- SrO XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
C	-0.38	0.01	I	-0.73	0.00
C	-0.12	0.01	I	-0.75	0.00
C	-0.12	0.01	I	-0.75	0.00
C	-0.38	0.01	I	-0.73	0.00
C	-0.38	0.01	I	-0.75	0.00
C	-0.38	0.01	I	-0.76	0.00
C	-0.12	0.01	I	-0.75	0.00
C	-0.38	0.01	I	-0.81	0.00
D	0.66	0.01	K	-0.85	0.00
D	3.26	0.02	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
D	0.66	0.01	K	-0.85	0.00
E	3.26	0.02	M	0.66	0.01
E	0.66	0.01	M	0.66	0.01
G	0.66	0.01	M	0.66	0.01
G	0.66	0.01			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
SrO	XRF	39	0.007	0.004	51.475	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
SrO	XRF	C	8	0.006	0.001	0.081	8.118
SrO	XRF	D	8	0.011	0.004	0.314	31.427
SrO	XRF	E	2	0.015	0.007	0.471	47.140
SrO	XRF	G	2	0.010	<0.001	<0.001	<0.001
SrO	XRF	I	8	0.005	<0.001	0.021	2.106
SrO	XRF	K	8	0.004	<0.001	<0.001	<0.001
SrO	XRF	M	3	0.010	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.009</b>	<b>0.003</b>	<b>0.127</b>	<b>12.685</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
SrO	XRF	37	0.007	0.003	37.245	%

Std mean	0.007
SD	0.003
2SD	0.005
3SD	0.008
Std mean+2SD	0.012
Std mean-2SD	0.002
Std mean+3SD	0.014
Std mean-3SD	-0.001

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
SrO	XRF	0.002	0.002	0.003	0.000	%

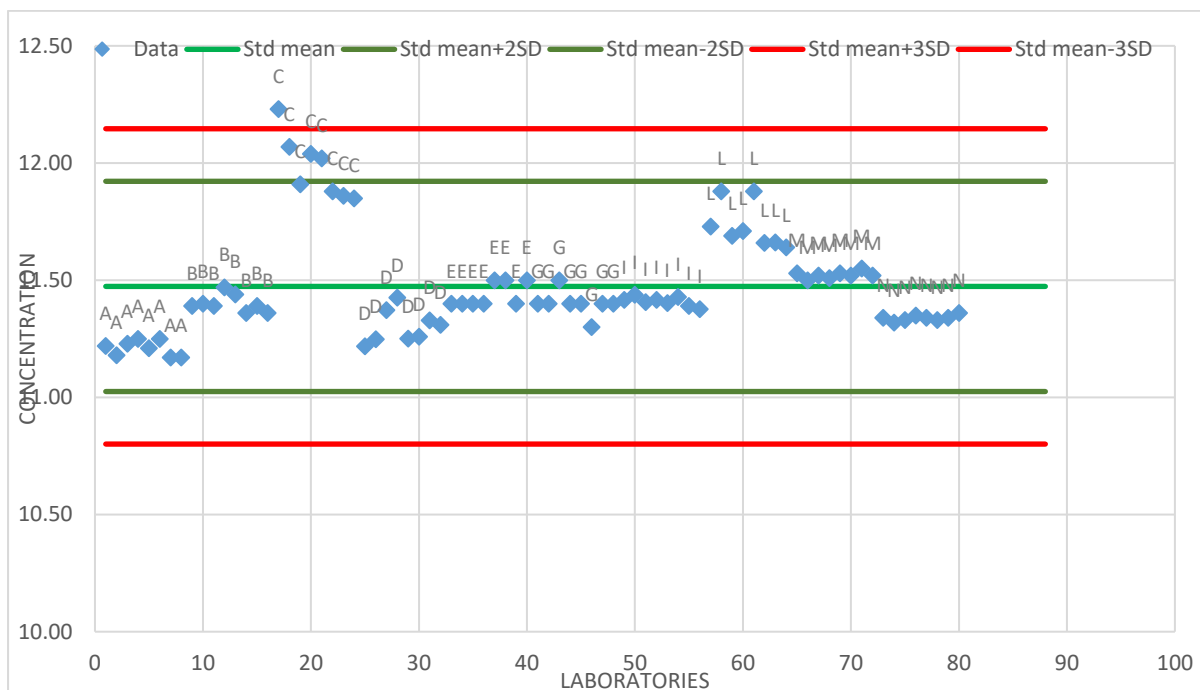
Note: 2 out of 39 results are rejected as outliers using z score

### 10.19 Silicon Dioxide with XRF finish- SiO<sub>2</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.05	11.22	D	0.05	11.22	I	0.25	11.42	N	0.17	11.34
A	0.01	11.18	D	0.08	11.25	I	0.27	11.44	N	0.15	11.32
A	0.06	11.23	D	0.20	11.37	I	0.24	11.41	N	0.16	11.33
A	0.08	11.25	D	0.26	11.43	I	0.25	11.42	N	0.18	11.35
A	0.04	11.21	D	0.08	11.25	I	0.23	11.40	N	0.17	11.34
A	0.08	11.25	D	0.09	11.26	I	0.26	11.43	N	0.16	11.33
A	0.00	11.17	D	0.16	11.33	I	0.22	11.39	N	0.17	11.34
A	0.00	11.17	D	0.14	11.31	I	0.21	11.38	N	0.19	11.36
B	0.22	11.39	E	0.23	11.40	L	0.57	11.73	O	-3.05	8.18
B	0.23	11.40	E	0.23	11.40	L	0.72	11.88	O	-3.17	8.07
B	0.22	11.39	E	0.23	11.40	L	0.53	11.69	O	-3.27	7.97
B	0.30	11.47	E	0.23	11.40	L	0.55	11.71	O	-3.33	7.91
B	0.27	11.44	E	0.33	11.50	L	0.72	11.88	O	-3.02	8.22
B	0.19	11.36	E	0.33	11.50	L	0.50	11.66	O	-2.82	8.41
B	0.22	11.39	E	0.23	11.40	L	0.50	11.66	O	-2.97	8.26
B	0.19	11.36	E	0.33	11.50	L	0.48	11.64	O	-2.89	8.34
C	1.08	12.23	G	0.23	11.40	M	0.36	11.53			
C	0.92	12.07	G	0.23	11.40	M	0.33	11.50			
C	0.75	11.91	G	0.33	11.50	M	0.35	11.52			
C	0.88	12.04	G	0.23	11.40	M	0.34	11.51			
C	0.86	12.02	G	0.23	11.40	M	0.36	11.53			
C	0.72	11.88	G	0.13	11.30	M	0.35	11.52			
C	0.70	11.86	G	0.23	11.40	M	0.38	11.55			
C	0.69	11.85	G	0.23	11.40	M	0.35	11.52			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
SiO <sub>2</sub>	XRF	88	11.173	0.980	8.773	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
SiO <sub>2</sub>	XRF	A	8	11.210	0.033	0.003	0.298
SiO <sub>2</sub>	XRF	B	8	11.400	0.038	0.003	0.332
SiO <sub>2</sub>	XRF	C	8	11.983	0.132	0.011	1.102
SiO <sub>2</sub>	XRF	D	8	11.302	0.071	0.006	0.630
SiO <sub>2</sub>	XRF	E	8	11.438	0.052	0.005	0.453
SiO <sub>2</sub>	XRF	G	8	11.400	0.053	0.005	0.469
SiO <sub>2</sub>	XRF	I	8	11.410	0.020	0.002	0.175
SiO <sub>2</sub>	XRF	L	8	11.731	0.096	0.008	0.821
SiO <sub>2</sub>	XRF	M	8	11.523	0.015	0.001	0.129
SiO <sub>2</sub>	XRF	N	8	11.339	0.012	0.001	0.110
SiO <sub>2</sub>	XRF	O	8	8.169	0.177	0.022	2.172
			<b>Average</b>	<b>11.173</b>	<b>0.081</b>	<b>0.006</b>	<b>0.608</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
SiO <sub>2</sub>	XRF	80	11.473	0.224	1.955	%

Std mean	11.473
SD	0.224
2SD	0.449
3SD	0.673
Std mean+2SD	11.922
Std mean-2SD	11.025
Std mean+3SD	12.146
Std mean-3SD	10.801

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
SiO <sub>2</sub>	XRF	0.064	0.041	0.201	0.064	%

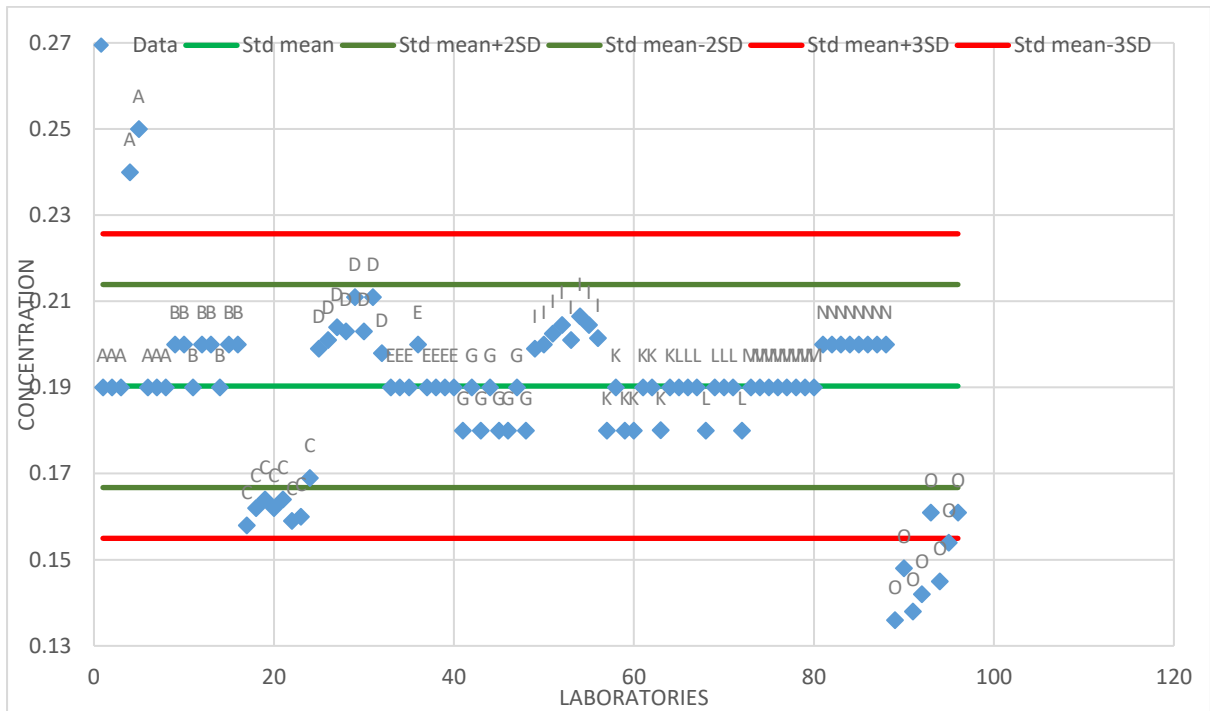
Note: 8 out of 88 results are rejected as outliers using z score, Lab o not included on the graph as it is an obvious outlier

## 10.20 Titanium Dioxide with XRF finish- TiO<sub>2</sub> XRF

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.11	0.19	D	0.60	0.20	I	0.60	0.20	M	0.11	0.19
A	0.11	0.19	D	0.71	0.20	I	0.65	0.20	M	0.11	0.19
A	0.11	0.19	D	0.87	0.20	I	0.79	0.20	M	0.11	0.19
A	2.83	0.24	D	0.82	0.20	I	0.90	0.20	M	0.11	0.19
A	3.37	0.25	D	1.25	0.21	I	0.71	0.20	M	0.11	0.19
A	0.11	0.19	D	0.82	0.20	I	1.01	0.21	M	0.11	0.19
A	0.11	0.19	D	1.25	0.21	I	0.90	0.20	M	0.11	0.19
A	0.11	0.19	D	0.55	0.20	I	0.74	0.20	M	0.11	0.19
B	0.65	0.20	E	0.11	0.19	K	-0.43	0.18	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	0.11	0.19	N	0.65	0.20
B	0.11	0.19	E	0.11	0.19	K	-0.43	0.18	N	0.65	0.20
B	0.65	0.20	E	0.65	0.20	K	-0.43	0.18	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	0.11	0.19	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	0.11	0.19	N	0.65	0.20
B	0.11	0.19	E	0.11	0.19	K	-0.43	0.18	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	0.11	0.19	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	-0.43	0.18	N	0.65	0.20
B	0.65	0.20	E	0.11	0.19	K	0.11	0.19	N	0.65	0.20
C	-1.63	0.16	G	-0.43	0.18	L	0.11	0.19	O	-2.82	0.14
C	-1.41	0.16	G	0.11	0.19	L	0.11	0.19	O	-2.17	0.15
C	-1.30	0.16	G	-0.43	0.18	L	0.11	0.19	O	-2.71	0.14
C	-1.41	0.16	G	0.11	0.19	L	-0.43	0.18	O	-2.50	0.14
C	-1.30	0.16	G	-0.43	0.18	L	0.11	0.19	O	-1.46	0.16
C	-1.57	0.16	G	-0.43	0.18	L	0.11	0.19	O	-2.33	0.15
C	-1.52	0.16	G	0.11	0.19	L	0.11	0.19	O	-1.84	0.15
C	-1.03	0.17	G	-0.43	0.18	L	-0.43	0.18	O	-1.46	0.16

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
TiO <sub>2</sub>	XRF	96	0.188	0.018	9.795	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
TiO <sub>2</sub>	XRF	A	8	0.204	0.026	0.126	12.564
TiO <sub>2</sub>	XRF	B	8	0.198	0.005	0.023	2.344
TiO <sub>2</sub>	XRF	C	8	0.162	0.003	0.022	2.154
TiO <sub>2</sub>	XRF	D	8	0.204	0.005	0.024	2.415
TiO <sub>2</sub>	XRF	E	8	0.191	0.004	0.018	1.849
TiO <sub>2</sub>	XRF	G	8	0.184	0.005	0.028	2.817
TiO <sub>2</sub>	XRF	I	8	0.202	0.003	0.013	1.262
TiO <sub>2</sub>	XRF	K	8	0.185	0.005	0.029	2.889
TiO <sub>2</sub>	XRF	L	8	0.188	0.005	0.025	2.469
TiO <sub>2</sub>	XRF	M	8	0.190	<0.001	<0.001	<0.001
TiO <sub>2</sub>	XRF	N	8	0.200	<0.001	<0.001	<0.001
TiO <sub>2</sub>	XRF	O	8	0.148	0.010	0.066	6.570
<b>Average</b>				<b>0.188</b>	<b>0.009</b>	<b>0.031</b>	<b>3.111</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
TiO <sub>2</sub>	XRF	86	0.190	0.012	6.191	%

Std mean	0.190
SD	0.012
2SD	0.024
3SD	0.035
Std mean+2SD	0.214
Std mean-2SD	0.167
Std mean+3SD	0.226
Std mean-3SD	0.155

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
TiO <sub>2</sub>	XRF	0.003	0.000	0.011	0.004	%

Note: 2 out of 96 results are rejected as outliers using z score

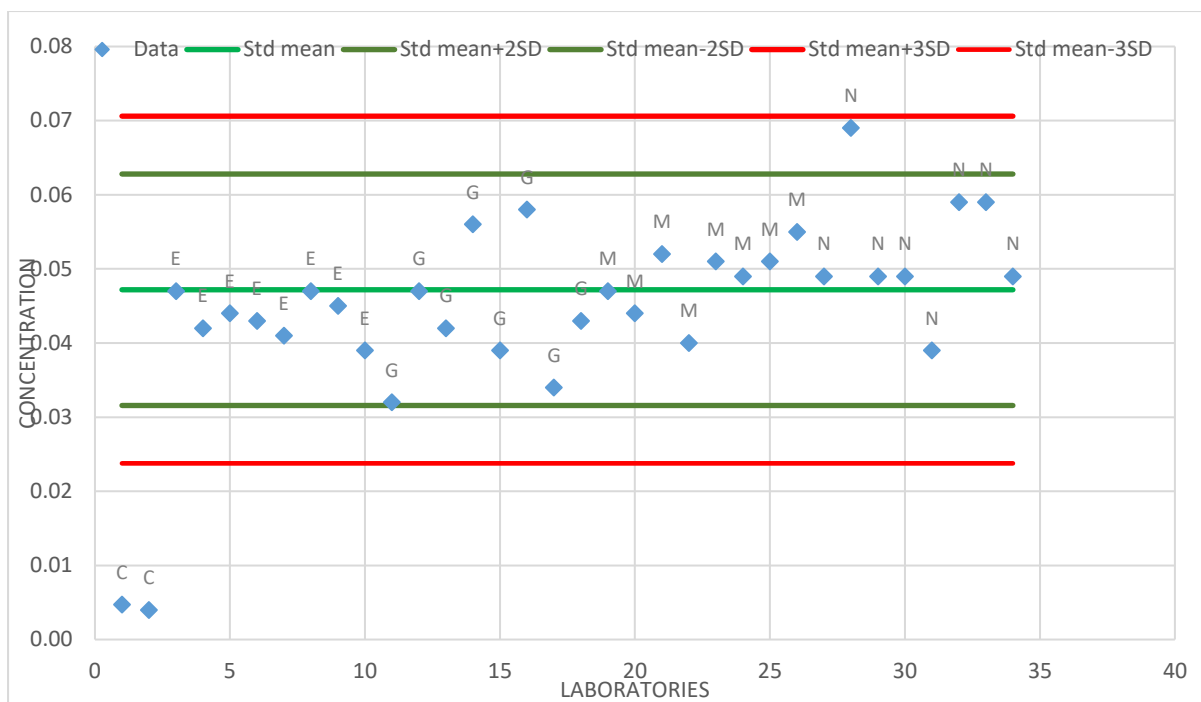


### 10.21 Mercury Combine by a combination of methods- Hg Combine

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
C	-3.14	0.01	M	0.18	0.05
C	-3.20	0.01	M	-0.05	0.05
E	0.18	0.05	M	0.58	0.05
E	-0.21	0.04	M	-0.37	0.04
E	-0.05	0.05	M	0.50	0.05
E	-0.13	0.04	M	0.34	0.05
E	-0.29	0.04	M	0.50	0.05
E	0.18	0.05	M	0.81	0.06
E	0.03	0.05	N	0.34	0.05
E	-0.45	0.04	N	1.91	0.07
G	-1.00	0.03	N	0.34	0.05
G	0.18	0.05	N	0.34	0.05
G	-0.21	0.04	N	-0.45	0.04
G	0.89	0.06	N	1.13	0.06
G	-0.45	0.04	N	1.13	0.06
G	1.05	0.06	N	0.34	0.05
G	-0.84	0.04			
G	-0.13	0.04			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Hg	Combine	34	0.046	0.013	27.864	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Hg	Combine	C	2	0.005	0.000	0.093	9.252
Hg	Combine	E	8	0.045	0.003	0.064	6.356
Hg	Combine	G	8	0.045	0.009	0.210	21.021
Hg	Combine	M	8	0.050	0.005	0.097	9.690
Hg	Combine	N	8	0.054	0.009	0.170	17.044
<b>Average</b>				<b>0.040</b>	<b>0.006</b>	<b>0.127</b>	<b>12.673</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Hg	Combine	32	0.048	0.008	16.199	ppm

Std mean	0.048
SD	0.008
2SD	0.016
3SD	0.023
Std mean+2SD	0.064
Std mean-2SD	0.033
Std mean+3SD	0.072
Std mean-3SD	0.025

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Hg	Combine	0.003	0.000	0.005	0.007	

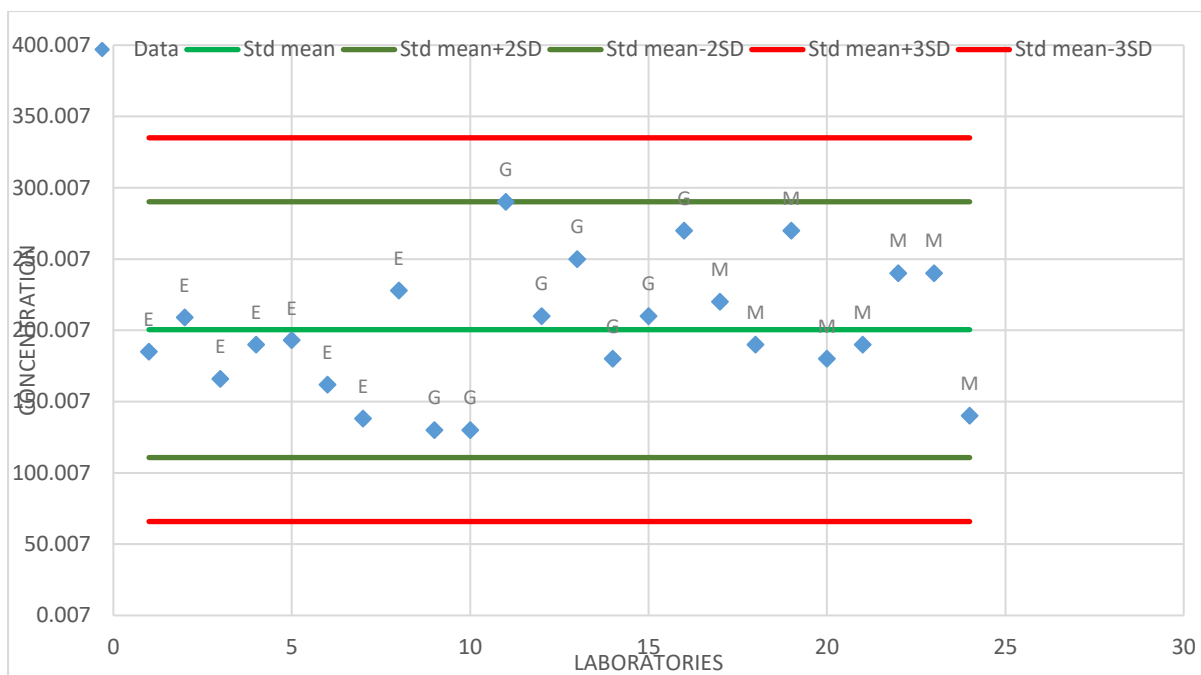
Note: 2 out of 34 results are rejected as outliers using z score

## 10.22 Chlorine Combine by a combination of methods- CI Combine

Lab_ID	Z_Score	Data
E	-0.34	185
E	0.19	209
E	-0.77	166
E	-0.23	190
E	-0.17	193
E	-0.86	162
E	-1.39	138
E	0.61	228
G	-1.57	130
G	-1.57	130
G	2.00	290
G	0.21	210
G	1.10	250
G	-0.46	180
G	0.21	210
G	1.55	270
M	0.44	220
M	-0.23	190
M	1.55	270
M	-0.46	180
M	-0.23	190
M	0.88	240
M	0.88	240
M	-1.35	140

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cl	Combine	24	200.458	44.856	22.377	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cl	Combine	E	8	183.875	28.292	0.154	15.386
Cl	Combine	G	8	208.750	60.104	0.288	28.792
Cl	Combine	M	8	208.750	41.555	0.199	19.906
<b>Average</b>				<b>200.458</b>	<b>45.239</b>	<b>0.214</b>	<b>21.362</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cl	Combine	24	200.458	44.856	22.377	ppm

Std mean	200.458
SD	44.856
2SD	89.713
3SD	134.569
Std mean+2SD	290.171
Std mean-2SD	110.746
Std mean+3SD	335.027
Std mean-3SD	65.890

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cl	Combine	11.372	132.175	11.497	45.239	ppm

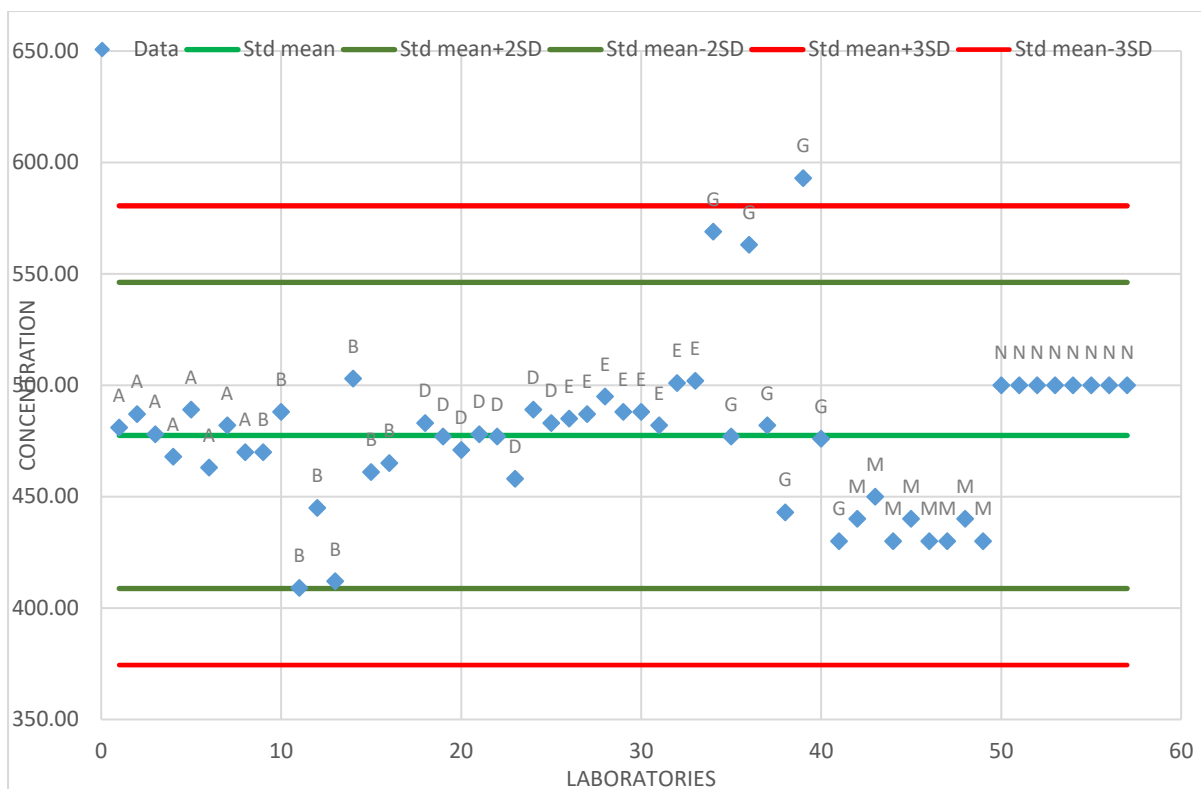
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

### 10.23 Fluorine Combine by a combination of methods- F Combine

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.10	481	D	-0.18	471	G	0.78	593
A	-0.05	487	D	-0.12	478	G	-0.14	476
A	-0.12	478	D	-0.13	477	G	-0.50	430
A	-0.20	468	D	-0.28	458	M	-0.42	440
A	-0.04	489	D	-0.04	489	M	-0.34	450
A	-0.24	463	D	-0.08	483	M	-0.50	430
A	-0.09	482	E	-0.07	485	M	-0.42	440
A	-0.19	470	E	-0.05	487	M	-0.50	430
B	-0.19	470	E	0.01	495	M	-0.50	430
B	-0.04	488	E	-0.04	488	M	-0.42	440
B	-0.67	409	E	-0.04	488	M	-0.50	430
B	-0.38	445	E	-0.09	482	N	0.05	500
B	-0.64	412	E	0.06	501	N	0.05	500
B	0.07	503	E	0.07	502	N	0.05	500
B	-0.26	461	G	0.59	569	N	0.05	500
B	-0.23	465	G	-0.13	477	N	0.05	500
C	7.15	1400	G	0.55	563	N	0.05	500
D	-0.08	483	G	-0.09	482	N	0.05	500
D	-0.13	477	G	-0.40	443	N	0.05	500

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
F	Combine	57	493.649	126.846	25.696	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
F	Combine	A	8	477.250	9.347	0.020	1.958
F	Combine	B	8	456.625	33.376	0.073	7.309
F	Combine	C	1	1400.000	<0.001	<0.001	<0.001
F	Combine	D	8	477.000	9.366	0.020	1.963
F	Combine	E	8	491.000	7.445	0.015	1.516
F	Combine	G	8	504.125	61.900	0.123	12.279
F	Combine	M	8	436.250	7.440	0.017	1.705
F	Combine	N	8	500.000	<0.001	<0.001	<0.001
<b>Average</b>				<b>592.781</b>	27.0967	<b>0.038</b>	<b>3.819</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
F	Combine	56	477.464	34.351	7.194	ppm

Std mean	477.464
SD	34.351
2SD	68.702
3SD	103.053
Std mean+2SD	546.167
Std mean-2SD	408.762
Std mean+3SD	580.518
Std mean-3SD	374.411

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
F	Combine	11.335	661.927	25.728	29.528	

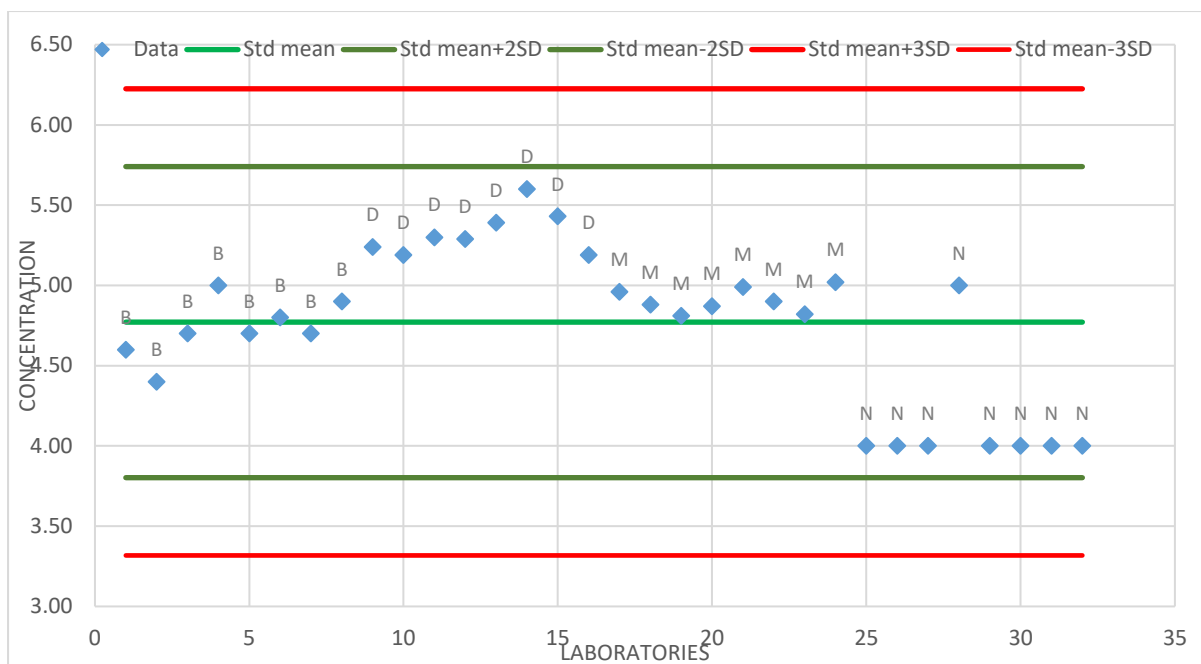
Note; 1 out of 57 results rejected as outlier using z score, the result is not included on the graph as it is an obvious outlier

10.24 Silver by 4 acid multi digest finished with ICP- Ag 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.35	4.60	M	0.39	4.96
B	-0.77	4.40	M	0.22	4.88
B	-0.15	4.70	M	0.08	4.81
B	0.47	5.00	M	0.20	4.87
B	-0.15	4.70	M	0.45	4.99
B	0.06	4.80	M	0.27	4.90
B	-0.15	4.70	M	0.10	4.82
B	0.27	4.90	M	0.51	5.02
D	0.97	5.24	N	-1.59	4.00
D	0.86	5.19	N	-1.59	4.00
D	1.09	5.30	N	-1.59	4.00
D	1.07	5.29	N	0.47	5.00
D	1.28	5.39	N	-1.59	4.00
D	1.71	5.60	N	-1.59	4.00
D	1.36	5.43	N	-1.59	4.00
D	0.86	5.19	N	-1.59	4.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ag	4A_MICP	32	4.771	0.485	10.156	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ag	4A_MICP	B	8	4.725	0.183	0.039	3.878
Ag	4A_MICP	D	8	5.329	0.140	0.026	2.619
Ag	4A_MICP	M	8	4.906	0.077	0.016	1.571
Ag	4A_MICP	N	8	4.125	0.354	0.086	8.571
<b>Average</b>				<b>4.771</b>	<b>0.214</b>	<b>0.042</b>	<b>4.160</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ag	4A_MICP	32	4.771	0.485	10.156	ppm

Std mean	4.771
SD	0.485
2SD	0.969
3SD	1.454
Std mean+2SD	5.740
Std mean-2SD	3.802
Std mean+3SD	6.225
Std mean-3SD	3.318

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ag	4A_MICP	0.351	0.488	0.698	0.214	ppm

Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

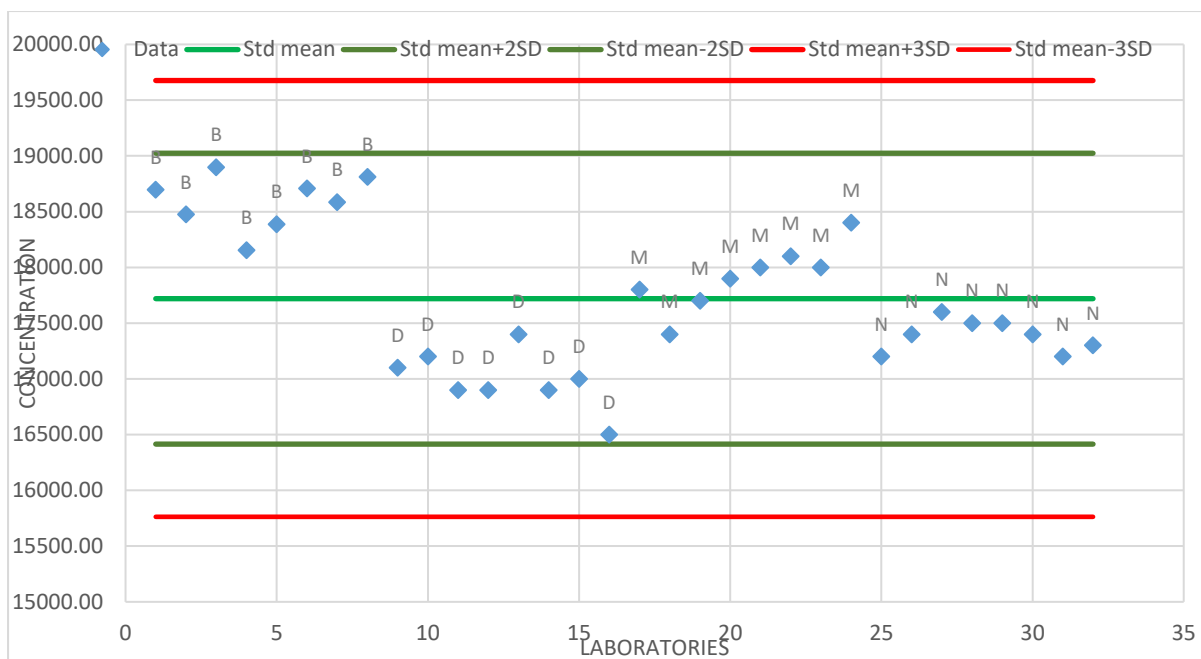


### 10.25 Aluminium by 4 acid multi digest finished with ICP- AI 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	1.50	18697	M	0.12	17800
B	1.16	18475	M	-0.49	17400
B	1.81	18899	M	-0.03	17700
B	0.67	18155	M	0.28	17900
B	1.03	18388	M	0.43	18000
B	1.52	18708	M	0.58	18100
B	1.33	18584	M	0.43	18000
B	1.68	18813	M	1.04	18400
D	-0.95	17100	N	-0.80	17200
D	-0.80	17200	N	-0.49	17400
D	-1.26	16900	N	-0.18	17600
D	-1.26	16900	N	-0.34	17500
D	-0.49	17400	N	-0.34	17500
D	-1.26	16900	N	-0.49	17400
D	-1.10	17000	N	-0.80	17200
D	-1.87	16500	N	-0.64	17300

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Al	4A_MICP	32	17719.344	652.215	3.681	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Al	4A_MICP	B	8	18589.875	243.156	0.013	1.308
Al	4A_MICP	D	8	16987.500	264.237	0.016	1.555
Al	4A_MICP	M	8	17912.500	294.897	0.016	1.646
Al	4A_MICP	N	8	17387.500	145.774	0.008	0.838
<b>Average</b>				<b>17719.344</b>	<b>243.496</b>	<b>0.013</b>	<b>1.337</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
AI	4A_MICP	32	17719.344	652.215	3.681	ppm

Std mean	17719.344
SD	652.215
2SD	1304.430
3SD	1956.645
Std mean+2SD	19023.774
Std mean-2SD	16414.914
Std mean+3SD	19675.989
Std mean-3SD	15762.698

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
AI	4A_MICP	488.148	945743.836	972.494	243.496	ppm

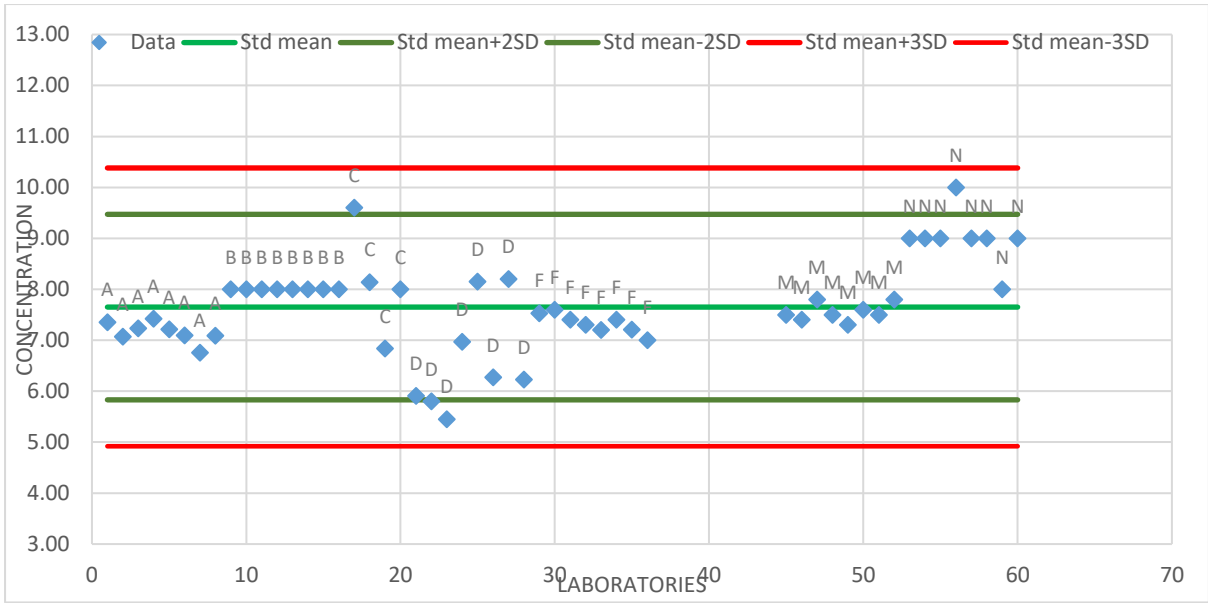
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

10.26 Arsenic by 4 acid multi digest finished with ICP- As 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.40	7.35	D	-0.48	5.91	K	3.28	75.20
A	-0.42	7.07	D	-0.48	5.80	K	2.63	63.20
A	-0.41	7.23	D	-0.50	5.45	K	2.49	60.70
A	-0.40	7.42	D	-0.42	6.97	K	2.66	63.80
A	-0.41	7.21	D	-0.36	8.15	M	-0.39	7.50
A	-0.41	7.10	D	-0.46	6.27	M	-0.40	7.40
A	-0.43	6.75	D	-0.35	8.20	M	-0.38	7.80
A	-0.41	7.09	D	-0.46	6.23	M	-0.39	7.50
B	-0.36	8.00	F	-0.39	7.53	M	-0.40	7.30
B	-0.36	8.00	F	-0.39	7.60	M	-0.39	7.60
B	-0.36	8.00	F	-0.40	7.40	M	-0.39	7.50
B	-0.36	8.00	F	-0.40	7.30	M	-0.38	7.80
B	-0.36	8.00	F	-0.41	7.20	N	-0.31	9.00
B	-0.36	8.00	F	-0.40	7.40	N	-0.31	9.00
B	-0.36	8.00	F	-0.41	7.21	N	-0.31	9.00
B	-0.36	8.00	F	-0.42	7.00	N	-0.26	10.00
C	-0.28	9.60	K	1.84	48.70	N	-0.31	9.00
C	-0.36	8.14	K	2.31	57.30	N	-0.31	9.00
C	-0.43	6.84	K	2.00	51.70	N	-0.36	8.00
C	-0.36	8.00	K	2.76	65.60	N	-0.31	9.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
As	4A_MICP	60	14.734	18.456	125.261	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
As	4A_MICP	A	8	7.154	0.205	0.029	2.865
As	4A_MICP	B	8	8.000	0.000	0.000	0.000
As	4A_MICP	C	4	8.145	1.132	0.139	13.892
As	4A_MICP	D	8	6.623	1.054	0.159	15.919
As	4A_MICP	F	8	7.330	0.194	0.026	2.648
As	4A_MICP	K	8	60.775	8.338	0.137	13.719
As	4A_MICP	M	8	7.550	0.177	0.023	2.348
As	4A_MICP	N	8	9.000	0.535	0.059	5.939
<b>Average</b>				<b>14.322</b>	<b>3.091</b>	<b>0.072</b>	<b>7.166</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
As	4A_MICP	52	7.651	0.910	11.898	ppm

Std mean	7.651
SD	0.910
2SD	1.820
3SD	2.731
Std mean+2SD	9.471
Std mean-2SD	5.830
Std mean+3SD	10.381
Std mean-3SD	4.920

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
As	4A_MICP	0.384	0.833	0.913	0.616	ppm

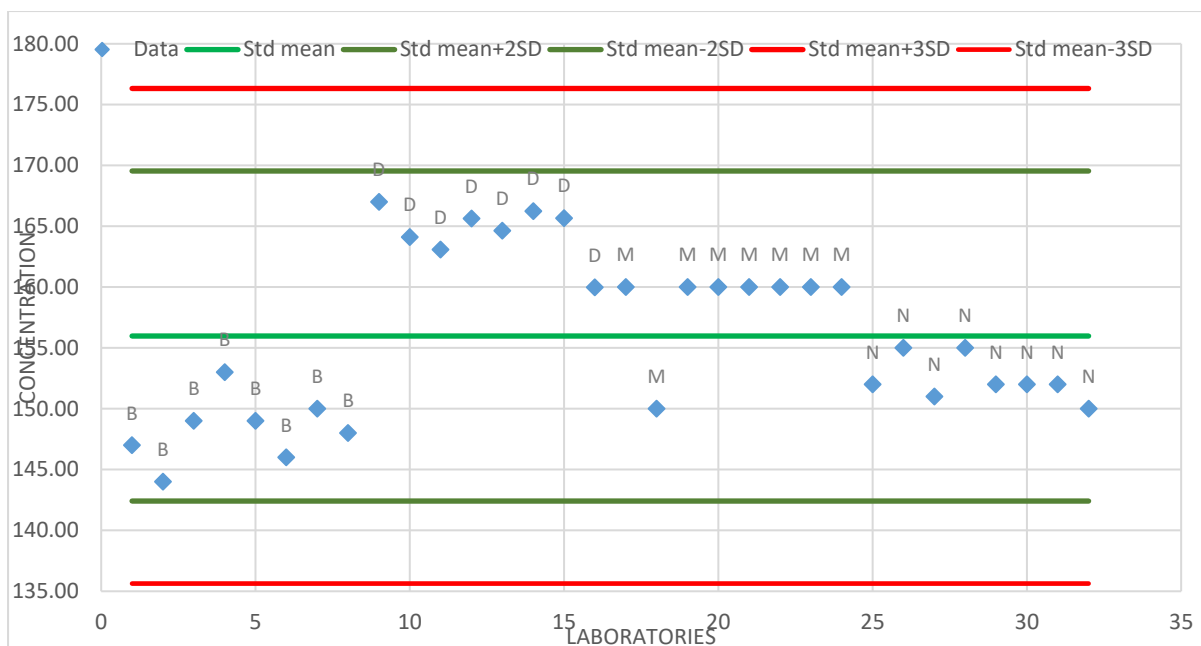
Note: 8 out of 60 results rejected as outliers using z score, results from LAB K not included on the graph as it is an obvious outlier

10.27 Barium by 4 acid multi digest finished with ICP- Ba 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-1.32	147	M	0.59	160
B	-1.77	144	M	-0.88	150
B	-1.03	149	M	0.59	160
B	-0.44	153	M	0.59	160
B	-1.03	149	M	0.59	160
B	-1.47	146	M	0.59	160
B	-0.88	150	M	0.59	160
B	-1.18	148	M	0.59	160
D	1.63	167	N	-0.59	152
D	1.20	164	N	-0.14	155
D	1.05	163	N	-0.73	151
D	1.42	166	N	-0.14	155
D	1.28	165	N	-0.59	152
D	1.51	166	N	-0.59	152
D	1.43	166	N	-0.59	152
D	0.59	160	N	-0.88	150

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ba	4A_MICP	32	155.980	6.782	4.348	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ba	4A_MICP	B	8	148.250	2.712	0.018	1.830
Ba	4A_MICP	D	8	164.546	2.224	0.014	1.351
Ba	4A_MICP	M	8	158.750	3.536	0.022	2.227
Ba	4A_MICP	N	8	152.375	1.768	0.012	1.160
<b>Average</b>				<b>155.980</b>	<b>2.642</b>	<b>0.016</b>	<b>1.642</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ba	4A_MICP	32	155.980	6.782	4.348	ppm

Std mean	155.980
SD	6.782
2SD	13.564
3SD	20.346
Std mean+2SD	169.545
Std mean-2SD	142.416
Std mean+3SD	176.327
Std mean-3SD	135.634

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ba	4A_MICP	5.041	100.790	10.039	2.642	ppm

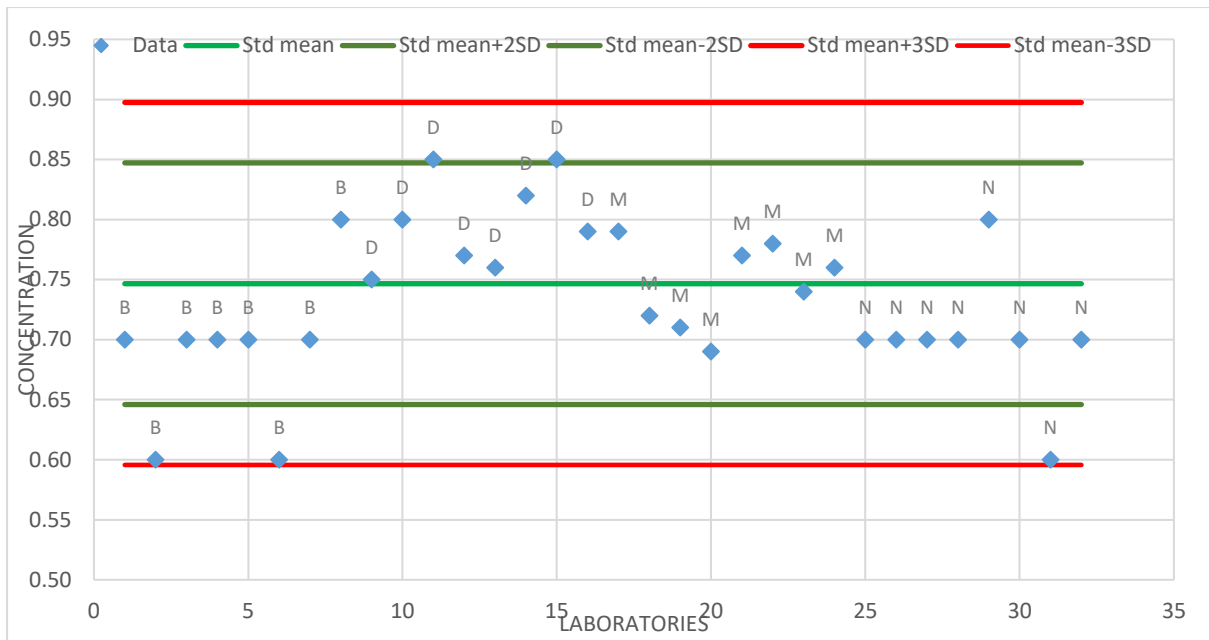
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.28 Beryllium by 4 acid multi digest finished with ICP- Be 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.51	0.70	M	0.89	0.79
<b>B</b>	<b>-2.06</b>	<b>0.60</b>	M	-0.20	0.72
B	-0.51	0.70	M	-0.35	0.71
B	-0.51	0.70	M	-0.66	0.69
B	-0.51	0.70	M	0.58	0.77
B	-2.06	0.60	M	0.73	0.78
B	-0.51	0.70	M	0.11	0.74
B	1.04	0.80	M	0.42	0.76
D	0.27	0.75	N	-0.51	0.70
D	1.04	0.80	N	-0.51	0.70
D	1.81	0.85	N	-0.51	0.70
D	0.58	0.77	N	-0.51	0.70
D	0.42	0.76	N	1.04	0.80
D	1.35	0.82	N	-0.51	0.70
D	1.81	0.85	<b>N</b>	<b>-2.06</b>	<b>0.60</b>
D	0.89	0.79	N	-0.51	0.70

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Be	4A_MICP	32	0.733	0.065	8.811	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Be	4A_MICP	B	8	0.688	0.064	0.093	9.322
Be	4A_MICP	D	8	0.799	0.039	0.048	4.846
Be	4A_MICP	M	8	0.745	0.036	0.048	4.813
Be	4A_MICP	N	8	0.700	0.053	0.076	7.636
<b>Average</b>				<b>0.733</b>	<b>0.049</b>	<b>0.067</b>	<b>6.654</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Be	4A_MICP	29	0.747	0.050	6.738	ppm

Std mean	0.747
SD	0.050
2SD	0.101
3SD	0.151
Std mean+2SD	0.847
Std mean-2SD	0.646
Std mean+3SD	0.897
Std mean-3SD	0.596

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Be	4A_MICP	0.026	0.003	0.050	0.038	ppm

Note: 2 out of 32 results are rejected as outliers using z score

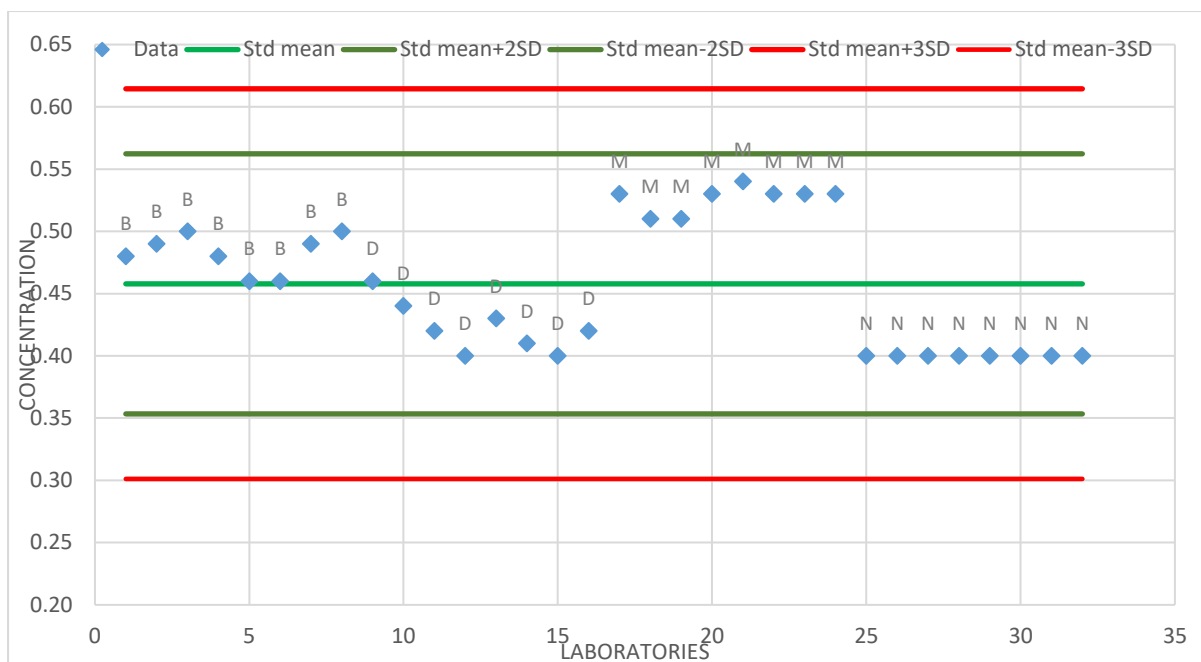


10.29 Bismuth by 4 acid multi digest finished with ICP- Bi 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.42	0.48	M	1.38	0.53
B	0.62	0.49	M	1.00	0.51
B	0.81	0.50	M	1.00	0.51
B	0.42	0.48	M	1.38	0.53
B	0.04	0.46	M	1.57	0.54
B	0.04	0.46	M	1.38	0.53
B	0.62	0.49	M	1.38	0.53
B	0.81	0.50	M	1.38	0.53
D	0.04	0.46	N	-1.11	0.40
D	-0.34	0.44	N	-1.11	0.40
D	-0.72	0.42	N	-1.11	0.40
D	-1.11	0.40	N	-1.11	0.40
D	-0.53	0.43	N	-1.11	0.40
D	-0.92	0.41	N	-1.11	0.40
D	-1.11	0.40	N	-1.11	0.40
D	-0.72	0.42	N	-1.11	0.40

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Bi	4A_MICP	32	0.458	0.052	11.407	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Bi	4A_MICP	B	8	0.483	0.016	0.033	3.277
Bi	4A_MICP	D	8	0.423	0.021	0.049	4.859
Bi	4A_MICP	M	8	0.526	0.011	0.020	2.016
Bi	4A_MICP	N	8	0.400	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.458</b>	<b>0.014</b>	<b>0.025</b>	<b>2.538</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Bi	4A_MICP	32	0.458	0.052	11.407	ppm

Std mean	0.458
SD	0.052
2SD	0.104
3SD	0.157
Std mean+2SD	0.562
Std mean-2SD	0.353
Std mean+3SD	0.614
Std mean-3SD	0.301

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Bi	4A_MICP	0.041	0.007	0.081	0.014	ppm

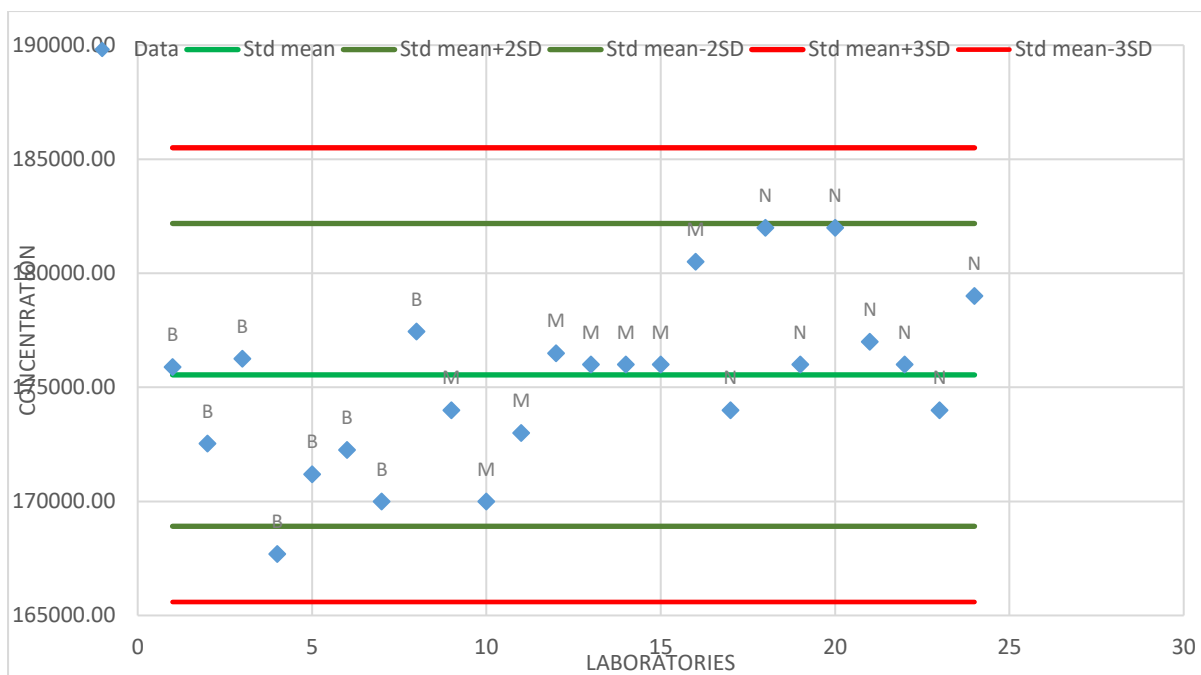
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

10.30 Calcium by 4 acid multi digest finished with ICP- Ca 4A\_MICP

Lab_ID	Z_Score	Data
B	0.18	175886
B	-0.74	172538
B	0.29	176252
<b>B</b>	<b>-2.08</b>	<b>167700</b>
B	-1.11	171189
B	-0.82	172248
B	-1.44	169990
B	0.62	177451
M	-0.34	174000
M	-1.44	170000
M	-0.61	173000
M	0.35	176500
M	0.22	176000
M	0.22	176000
M	0.22	176000
M	1.46	180500
N	-0.34	174000
N	1.87	182000
N	0.22	176000
N	1.87	182000
N	0.49	177000
N	0.22	176000
N	-0.34	174000
N	1.04	179000

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ca	4A_MICP	24	175218.917	3619.143	2.065	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ca	4A_MICP	B	8	172906.750	3377.554	0.020	1.953
Ca	4A_MICP	M	8	175250.000	3047.247	0.017	1.739
Ca	4A_MICP	N	8	177500.000	3207.135	0.018	1.807
<b>Average</b>				<b>175218.917</b>	<b>3213.477</b>	<b>0.018</b>	<b>1.833</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ca	4A_MICP	23	175545.826	3318.450	1.890	ppm

Std mean	175545.826
SD	3318.450
2SD	6636.900
3SD	9955.350
Std mean+2SD	182182.726
Std mean-2SD	168908.926
Std mean+3SD	185501.176
Std mean-3SD	165590.476

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ca	4A_MICP	1582.552	6301200.803	2510.219	3048.540	ppm

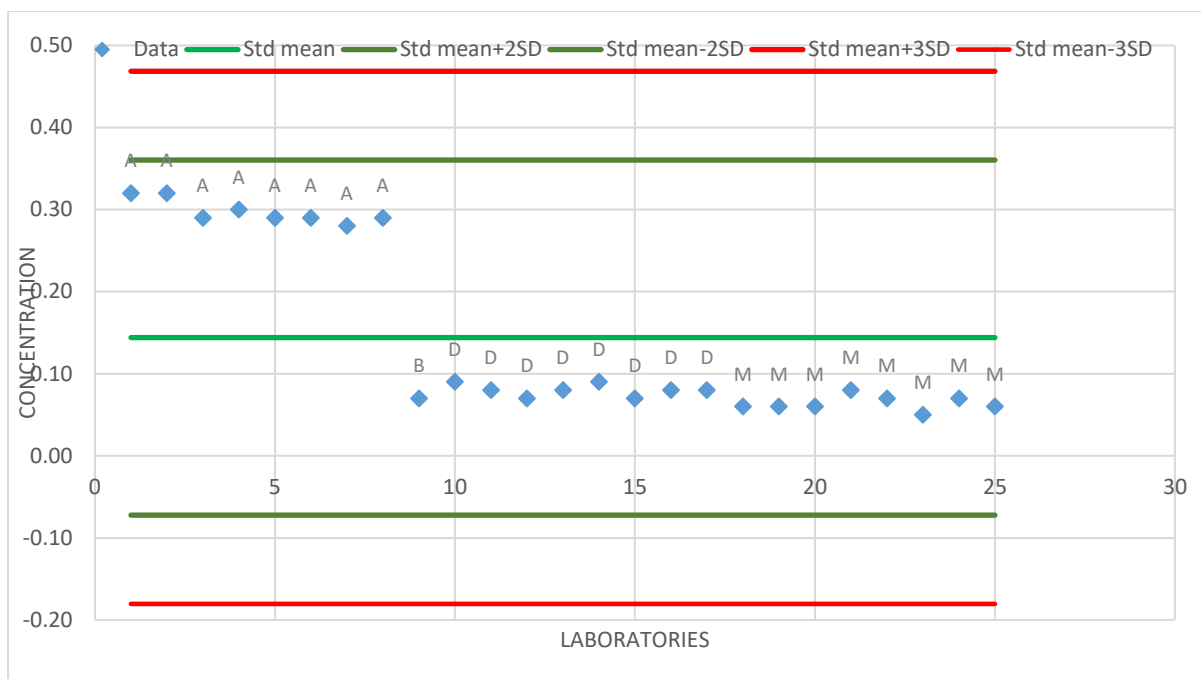
Note: 1 out of 24 results are rejected as outliers using z score, all results are within the mean +/- 3SD

10.31 Cadmium by 4 acid multi digest finished with ICP- Cd 4A\_MICP

Lab_ID	Z_Score	Data
A	1.63	0.32
A	1.63	0.32
A	1.35	0.29
A	1.44	0.30
A	1.35	0.29
A	1.35	0.29
A	1.26	0.28
A	1.35	0.29
B	-0.68	0.07
D	-0.50	0.09
D	-0.59	0.08
D	-0.68	0.07
D	-0.59	0.08
D	-0.50	0.09
D	-0.68	0.07
D	-0.59	0.08
D	-0.59	0.08
M	-0.78	0.06
M	-0.78	0.06
M	-0.78	0.06
M	-0.59	0.08
M	-0.68	0.07
M	-0.87	0.05
M	-0.68	0.07
M	-0.78	0.06

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cd	4A_MICP	25	0.144	0.108	75.116	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cd	4A_MICP	A	8	0.298	0.015	0.050	5.002
Cd	4A_MICP	B	1	0.070	<0.001	<0.001	<0.001
Cd	4A_MICP	D	8	0.080	0.008	0.094	9.449
Cd	4A_MICP	M	8	0.064	0.009	0.144	14.371
<b>Average</b>				<b>0.128</b>	<b>0.011</b>	<b>0.096</b>	<b>9.607</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cd	4A_MICP	25	0.144	0.108	75.116	ppm

Std mean	0.144
SD	0.108
2SD	0.216
3SD	0.325
Std mean+2SD	0.360
Std mean-2SD	-0.072
Std mean+3SD	0.469
Std mean-3SD	-0.181

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cd	4A_MICP	0.123	0.045	0.213	0.011	ppm

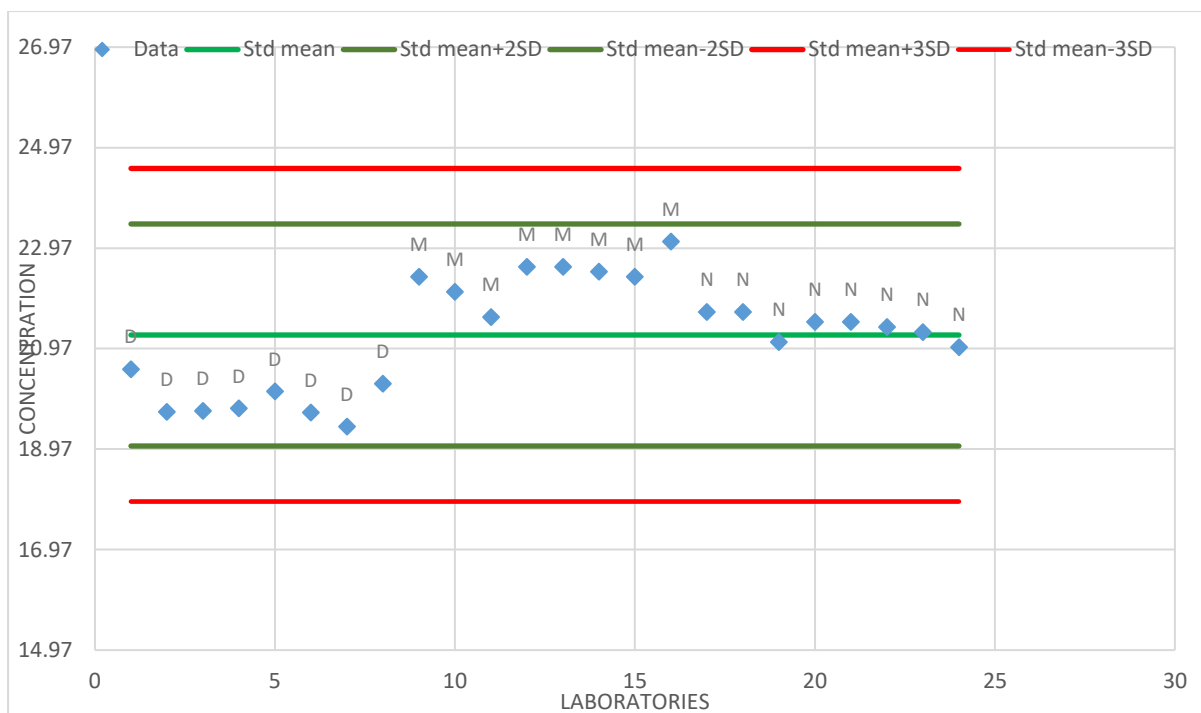
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.32 Cerium by 4 acid multi digest finished with ICP- Ce 4A\_MICP

Lab_ID	Z_Score	Data
D	-0.62	20.56
D	-1.39	19.71
D	-1.37	19.73
D	-1.32	19.78
D	-1.02	20.12
D	-1.40	19.70
D	-1.65	19.42
D	-0.88	20.27
M	1.05	22.40
M	0.78	22.10
M	0.32	21.60
M	1.23	22.60
M	1.23	22.60
M	1.14	22.50
M	1.05	22.40
M	1.68	23.10
N	0.42	21.70
N	0.42	21.70
N	-0.13	21.10
N	0.23	21.50
N	0.23	21.50
N	0.14	21.40
N	0.05	21.30
N	-0.22	21.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ce	4A_MICP	24	21.241	1.105	5.201	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ce	4A_MICP	D	8	19.911	0.372	0.019	1.869
Ce	4A_MICP	M	8	22.413	0.432	0.019	1.929
Ce	4A_MICP	N	8	21.400	0.256	0.012	1.198
<b>Average</b>				<b>21.241</b>	<b>0.361</b>	<b>0.017</b>	<b>1.665</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ce	4A_MICP	24	21.241	1.105	5.201	ppm

Std mean	21.241
SD	1.105
2SD	2.209
3SD	3.314
Std mean+2SD	23.451
Std mean-2SD	19.032
Std mean+3SD	24.555
Std mean-3SD	17.927

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ce	4A_MICP	1.182	4.178	2.044	0.361	ppm

Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

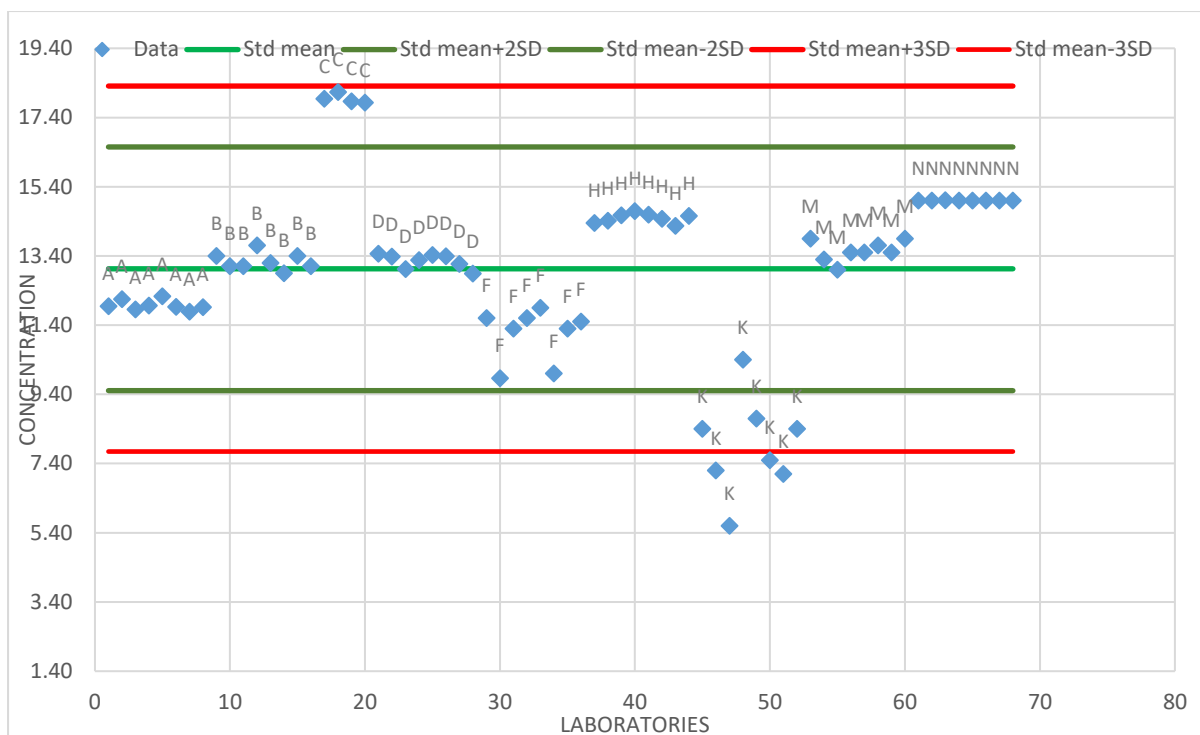


### 10.33 Cobalt by 4 acid multi digest finished with ICP- Co 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.38	11.95	C	2.12	18.14	F	-0.64	11.30	K	-1.81	8.40
A	-0.30	12.15	C	2.01	17.87	F	-0.56	11.50	M	0.41	13.90
A	-0.42	11.85	C	1.99	17.83	H	0.59	14.35	M	0.17	13.30
A	-0.37	11.97	D	0.23	13.46	H	0.62	14.42	M	0.05	13.00
A	-0.26	12.23	D	0.20	13.38	H	0.68	14.57	M	0.25	13.50
A	-0.38	11.93	D	0.05	13.02	H	0.73	14.69	M	0.25	13.50
A	-0.44	11.79	D	0.16	13.28	H	0.69	14.59	M	0.33	13.70
A	-0.39	11.92	D	0.22	13.43	H	0.64	14.47	M	0.25	13.50
B	0.21	13.40	D	0.20	13.39	H	0.56	14.27	M	0.41	13.90
B	0.09	13.10	D	0.12	13.17	H	0.68	14.56	N	0.85	15.00
B	0.09	13.10	D	0.00	12.89	K	-1.81	8.40	N	0.85	15.00
B	0.33	13.70	F	-0.52	11.60	K	-2.29	7.20	N	0.85	15.00
B	0.13	13.20	F	-1.21	9.87	K	-2.93	5.60	N	0.85	15.00
B	0.01	12.90	F	-0.64	11.30	K	-1.00	10.40	N	0.85	15.00
B	0.21	13.40	F	-0.52	11.60	K	-1.68	8.70	N	0.85	15.00
B	0.09	13.10	F	-0.40	11.90	K	-2.17	7.50	N	0.85	15.00
C	2.04	17.94	F	-1.16	10.00	K	-2.33	7.10	N	0.85	15.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Co	4A_MICP	68	12.884	2.483	19.272	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Co	4A_MICP	A	8	11.974	0.147	0.012	1.227
Co	4A_MICP	B	8	13.238	0.250	0.019	1.891
Co	4A_MICP	C	4	17.945	0.138	0.008	0.767
Co	4A_MICP	D	8	13.253	0.208	0.016	1.569
Co	4A_MICP	F	8	11.134	0.765	0.069	6.869
Co	4A_MICP	H	8	14.490	0.139	0.010	0.957
Co	4A_MICP	K	8	7.913	1.413	0.179	17.853
Co	4A_MICP	M	8	13.538	0.302	0.022	2.231
Co	4A_MICP	N	8	15.000	0.000	0.000	0.000
<b>Average</b>				<b>13.164722</b>	<b>0.57679</b>	<b>0.0371</b>	<b>3.707</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Co	4A_MICP	61	13.028	1.760	13.512	ppm

Std mean	13.028
SD	1.760
2SD	3.521
3SD	5.281
Std mean+2SD	16.549
Std mean-2SD	9.508
Std mean+3SD	18.309
Std mean-3SD	7.747

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Co	4A_MICP	0.647	2.907	1.705	0.435	ppm

Note: 7 out of 68 results are rejected as outliers using z score

10.34 Chrome by 4 acid multi digest finished with ICP- Cr 4A\_MICP

Lab_ID	Z_Score	Data
A	1.48	581
A	1.55	591
A	1.47	579
A	1.47	578
A	1.41	570
A	1.48	580
A	1.36	563
A	1.42	571
B	0.14	375
B	-0.03	350
B	0.03	359
B	0.06	363
B	0.00	354
B	0.07	365
B	-0.19	325
B	0.13	374
C	-1.93	59

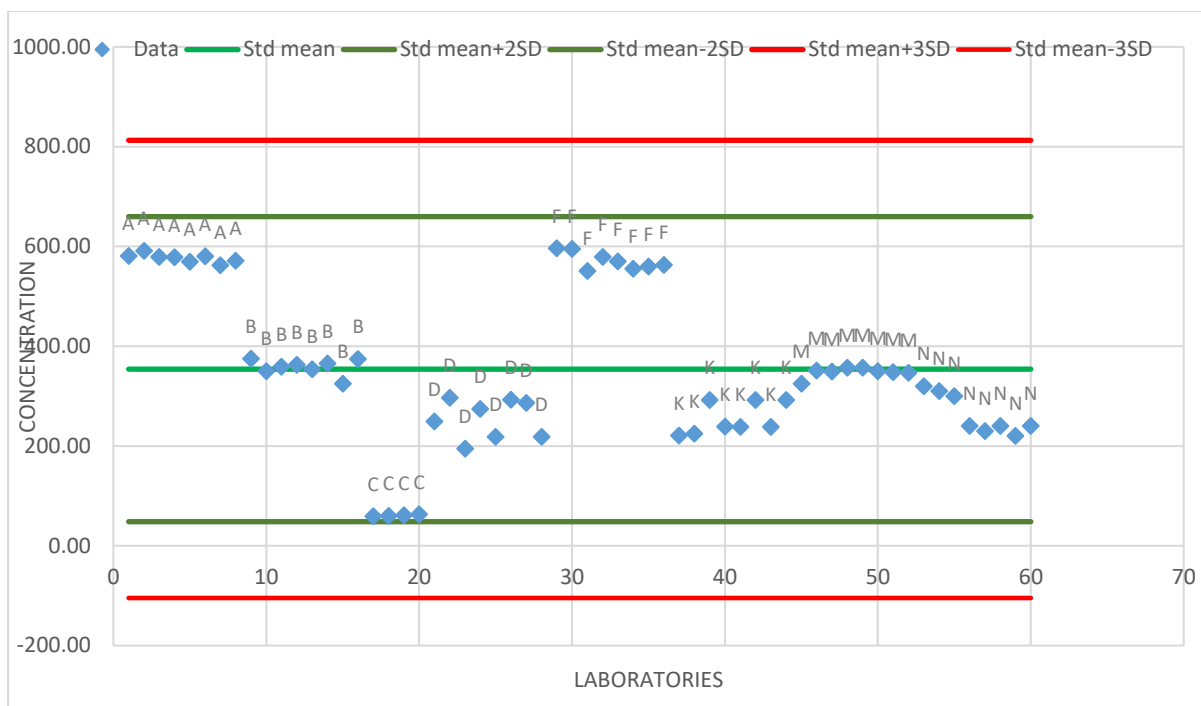
Lab_ID	Z_Score	Data
C	-1.93	60
C	-1.92	61
C	-1.90	63
D	-0.69	249
D	-0.37	297
D	-1.04	195
D	-0.52	274
D	-0.89	218
D	-0.40	293
D	-0.44	286
D	-0.89	218
F	1.58	596
F	1.58	595
F	1.29	551
F	1.47	579
F	1.41	570
F	1.31	555

Lab_ID	Z_Score	Data
F	1.35	560
F	1.37	563
K	-0.87	221
K	-0.84	225
K	-0.41	292
K	-0.75	239
K	-0.76	238
K	-0.41	292
K	-0.76	238
K	-0.41	292
K	-0.41	292
M	-0.19	325
M	-0.02	351
M	-0.03	349
M	0.02	357
M	0.02	357
M	-0.03	350
M	-0.04	348

Lab_ID	Z_Score	Data
M	-0.05	347
N	-0.22	320
N	-0.29	310
N	-0.35	300
N	-0.75	240
N	-0.81	230
N	-0.75	240
N	-0.88	220
N	-0.75	240

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cr	4A_MICP	60	354.008	152.886	43.187	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cr	4A_MICP	A	8	576.615	8.704	0.015	1.510
Cr	4A_MICP	B	8	358.125	15.986	0.045	4.464
Cr	4A_MICP	C	4	60.600	1.689	0.028	2.787
Cr	4A_MICP	D	8	253.774	39.437	0.155	15.540
Cr	4A_MICP	F	8	571.125	17.349	0.030	3.038
Cr	4A_MICP	K	8	254.625	31.613	0.124	12.416
Cr	4A_MICP	M	8	348.000	10.043	0.029	2.886
Cr	4A_MICP	N	8	262.500	40.267	0.153	15.340
<b>Average</b>				<b>335.670</b>	<b>25.5883</b>	<b>0.072</b>	<b>7.248</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cr	4A_MICP	60	354.008	152.886	43.187	ppm

Std mean	354.008
SD	152.886
2SD	305.773
3SD	458.659
Std mean+2SD	659.781
Std mean-2SD	48.236
Std mean+3SD	812.667
Std mean-3SD	-104.650

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cr	4A_MICP	54.793	23929.974	154.693	25.711	ppm

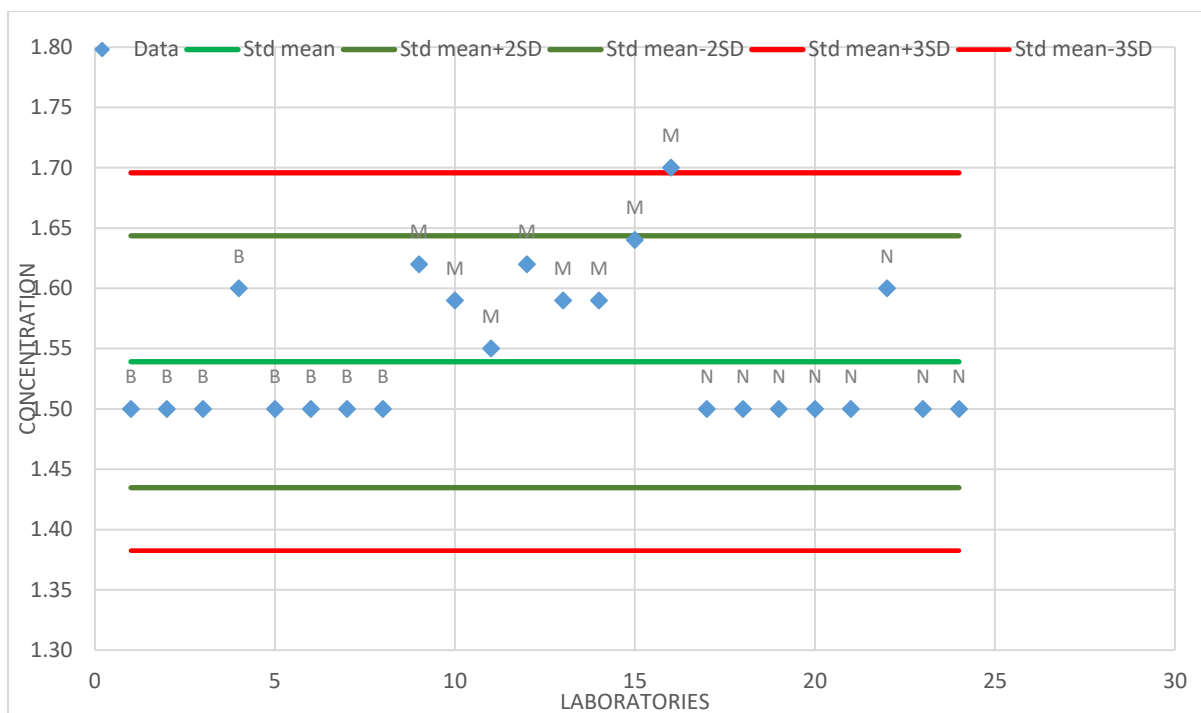
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.35 Caesium by 4 acid multi digest finished with ICP- Cs 4A\_MICP

Lab_ID	Z_Score	Data
B	-0.75	1.50
B	-0.75	1.50
B	-0.75	1.50
B	0.89	1.60
B	-0.75	1.50
B	-0.75	1.50
B	-0.75	1.50
B	-0.75	1.50
M	1.22	1.62
M	0.73	1.59
M	0.07	1.55
M	1.22	1.62
M	0.73	1.59
M	0.73	1.59
M	1.55	1.64
<b>M</b>	<b>2.54</b>	<b>1.70</b>
N	-0.75	1.50
N	-0.75	1.50
N	-0.75	1.50
N	-0.75	1.50
N	-0.75	1.50
N	0.89	1.60
N	-0.75	1.50
N	-0.75	1.50

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cs	4A_MICP	24	1.546	0.061	3.928	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cs	4A_MICP	B	8	1.513	0.035	0.023	2.338
Cs	4A_MICP	M	8	1.613	0.045	0.028	2.768
Cs	4A_MICP	N	8	1.513	0.035	0.023	2.338
<b>Average</b>				<b>1.546</b>	<b>0.039</b>	<b>0.025</b>	<b>2.481</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cs	4A_MICP	23	1.539	0.052	3.393	ppm

Std mean	1.539
SD	0.052
2SD	0.104
3SD	0.157
Std mean+2SD	1.644
Std mean-2SD	1.435
Std mean+3SD	1.696
Std mean-3SD	1.382

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cs	4A_MICP	0.045	0.006	0.076	0.034	ppm

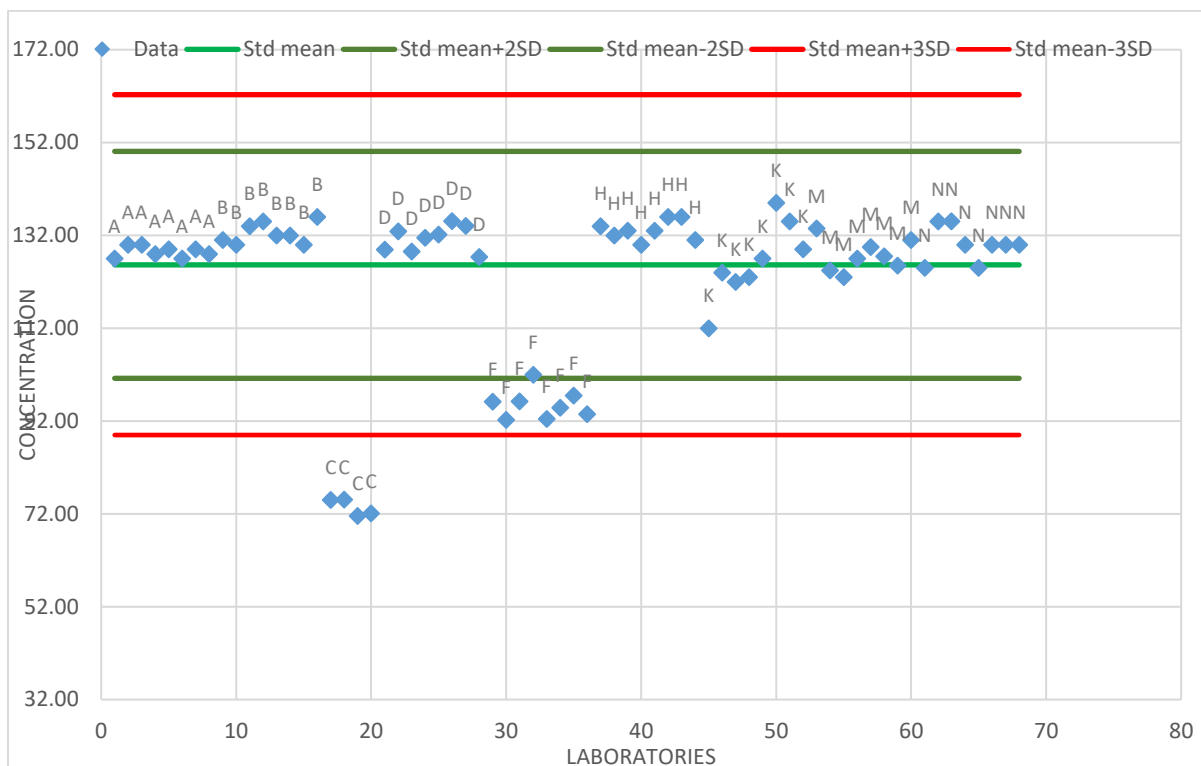
Note: 1 out of 24 results are rejected as outliers using z score

### 10.36 Copper by 4 acid multi digest finished with ICP- Cu 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.26	127	D	0.37	129	H	0.61	133	N	0.14	125
A	0.43	130	D	0.60	133	H	0.78	136	N	0.73	135
A	0.43	130	D	0.35	129	H	0.78	136	N	0.73	135
A	0.32	128	D	0.52	131	H	0.49	131	N	0.43	130
A	0.37	129	D	0.56	132	K	-0.62	112	N	0.14	125
A	0.26	127	D	0.73	135	K	0.08	124	N	0.43	130
A	0.37	129	D	0.67	134	K	-0.03	122	N	0.43	130
A	0.32	128	D	0.28	127	K	0.02	123	N	0.43	130
B	0.49	131	F	-1.54	96	K	0.26	127			
B	0.43	130	F	-1.77	92	K	0.96	139			
B	0.67	134	F	-1.53	96	K	0.73	135			
B	0.73	135	F	-1.20	102	K	0.37	129			
B	0.55	132	F	-1.76	93	M	0.64	134			
B	0.55	132	F	-1.62	95	M	0.11	125			
B	0.43	130	F	-1.46	98	M	0.02	123			
B	0.78	136	F	-1.70	94	M	0.26	127			
C	-2.78	75	H	0.67	134	M	0.40	130			
C	-2.77	75	H	0.55	132	M	0.29	128			
C	-2.97	72	H	0.61	133	M	0.17	126			
C	-2.95	72	H	0.43	130	M	0.49	131			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cu	4A_MICP	68	122.576	17.136	13.980	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Cu	4A_MICP	A	8	128.500	1.195	0.009	0.930
Cu	4A_MICP	B	8	132.500	2.268	0.017	1.712
Cu	4A_MICP	C	4	73.450	1.859	0.025	2.531
Cu	4A_MICP	D	8	131.333	2.774	0.021	2.112
Cu	4A_MICP	F	8	95.650	3.180	0.033	3.325
Cu	4A_MICP	H	8	133.125	2.167	0.016	1.628
Cu	4A_MICP	K	8	126.375	8.314	0.066	6.579
Cu	4A_MICP	M	8	127.688	3.494	0.027	2.737
Cu	4A_MICP	N	8	130.000	3.780	0.029	2.907
			<b>Average</b>	<b>119.847</b>	<b>3.857</b>	<b>0.027</b>	<b>2.718</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Cu	4A_MICP	64	125.646	12.220	9.726	ppm

Std mean	125.646
SD	12.220
2SD	24.440
3SD	36.659
Std mean+2SD	150.086
Std mean-2SD	101.207
Std mean+3SD	162.306
Std mean-3SD	88.987

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Cu	4A_MICP	4.365	150.453	12.266	3.948	ppm

Note: 4 out of 68 results are rejected as outliers using z score



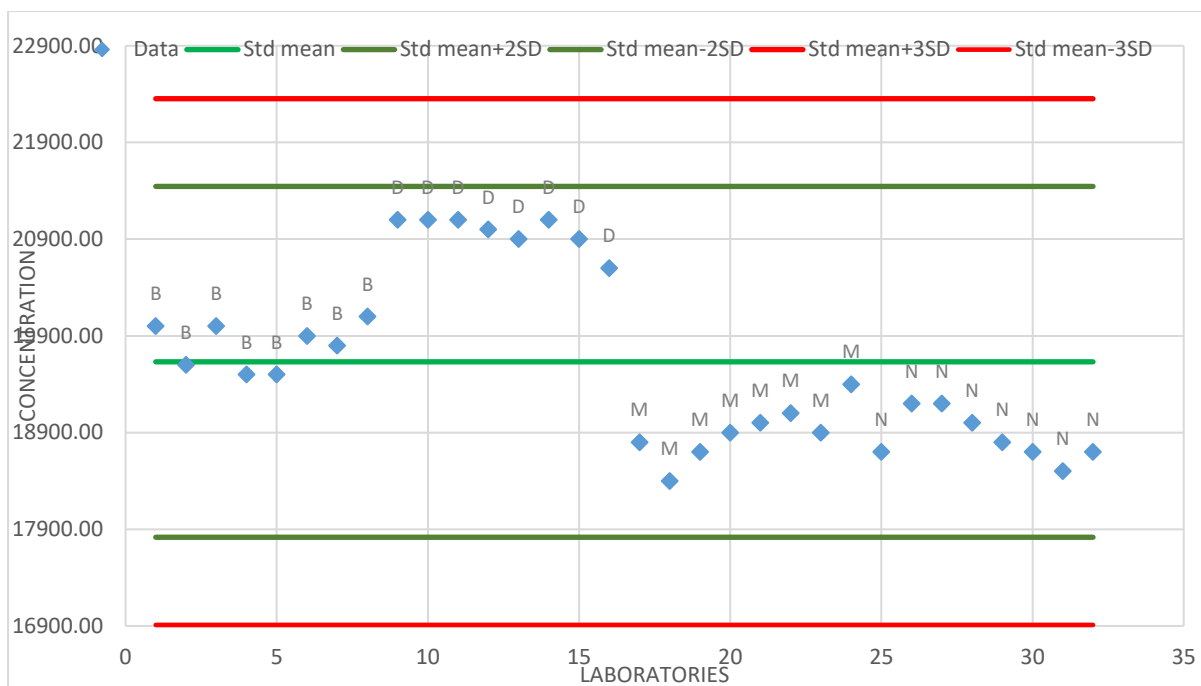
10.37 Iron by 4 acid multi digest finished with ICP- Fe 4A\_MICP

Lab_ID	Z_Score	Data
B	0.41	20000
B	-0.03	19600
B	0.41	20000
B	-0.14	19500
B	-0.14	19500
B	0.30	19900
B	0.19	19800
B	0.52	20100
D	1.62	21100
D	1.62	21100
D	1.62	21100
D	1.51	21000
D	1.40	20900
D	1.62	21100
D	1.40	20900
D	1.07	20600

Lab_ID	Z_Score	Data
M	-0.92	18800
M	-1.36	18400
M	-1.03	18700
M	-0.81	18900
M	-0.70	19000
M	-0.59	19100
M	-0.81	18900
M	-0.25	19400
N	-1.03	18700
N	-0.48	19200
N	-0.48	19200
N	-0.70	19000
N	-0.92	18800
N	-1.03	18700
N	-1.25	18500
N	-1.03	18700

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Fe	4A_MICP	32	19631.250	907.118	4.621	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Fe	4A_MICP	B	8	19800.000	239.046	0.012	1.207
Fe	4A_MICP	D	8	20975.000	175.255	0.008	0.836
Fe	4A_MICP	M	8	18900.000	292.770	0.015	1.549
Fe	4A_MICP	N	8	18850.000	256.348	0.014	1.360
<b>Average</b>				<b>19631.250</b>	<b>244.584</b>	<b>0.012</b>	<b>1.238</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Fe	4A_MICP	32	19631.250	907.118	4.621	ppm

Std mean	19631.250
SD	907.118
2SD	1814.236
3SD	2721.354
Std mean+2SD	21445.486
Std mean-2SD	17817.014
Std mean+3SD	22352.604
Std mean-3SD	16909.896

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Fe	4A_MICP	703.326	1971190.476	1403.991	244.584	ppm

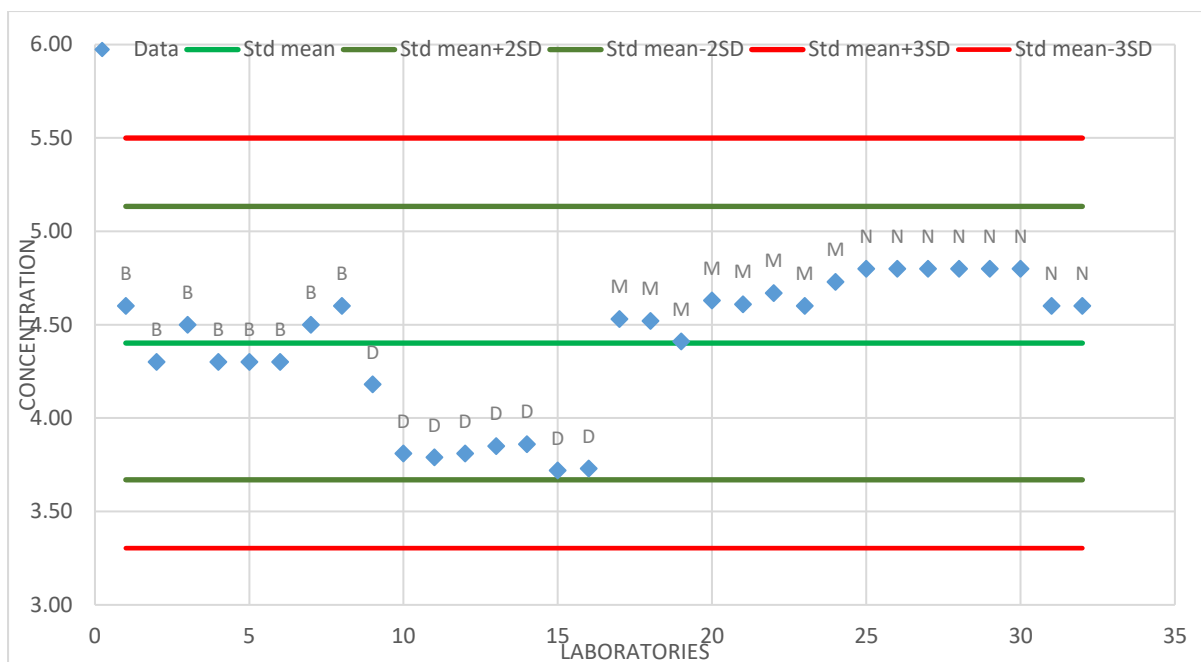
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.38 Gallium by 4 acid multi digest finished with ICP- Ga 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.54	4.60	M	0.35	4.53
B	-0.28	4.30	M	0.32	4.52
B	0.27	4.50	M	0.02	4.41
B	-0.28	4.30	M	0.62	4.63
B	-0.28	4.30	M	0.57	4.61
B	-0.28	4.30	M	0.73	4.67
B	0.27	4.50	M	0.54	4.60
B	0.54	4.60	M	0.90	4.73
D	-0.61	4.18	N	1.09	4.80
D	-1.62	3.81	N	1.09	4.80
D	-1.67	3.79	N	1.09	4.80
D	-1.62	3.81	N	1.09	4.80
D	-1.51	3.85	N	1.09	4.80
D	-1.48	3.86	N	1.09	4.80
D	-1.86	3.72	N	0.54	4.60
D	-1.83	3.73	N	0.54	4.60

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ga	4A_MICP	32	4.402	0.366	8.315	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ga	4A_MICP	B	8	4.425	0.139	0.031	3.138
Ga	4A_MICP	D	8	3.844	0.145	0.038	3.767
Ga	4A_MICP	M	8	4.588	0.099	0.022	2.163
Ga	4A_MICP	N	8	4.750	0.093	0.019	1.949
<b>Average</b>				<b>4.402</b>	<b>0.121</b>	<b>0.028</b>	<b>2.755</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ga	4A_MICP	32	4.402	0.366	8.315	ppm

Std mean	4.402
SD	0.366
2SD	0.732
3SD	1.098
Std mean+2SD	5.134
Std mean-2SD	3.670
Std mean+3SD	5.500
Std mean-3SD	3.304

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ga	4A_MICP	0.278	0.308	0.555	0.121	ppm

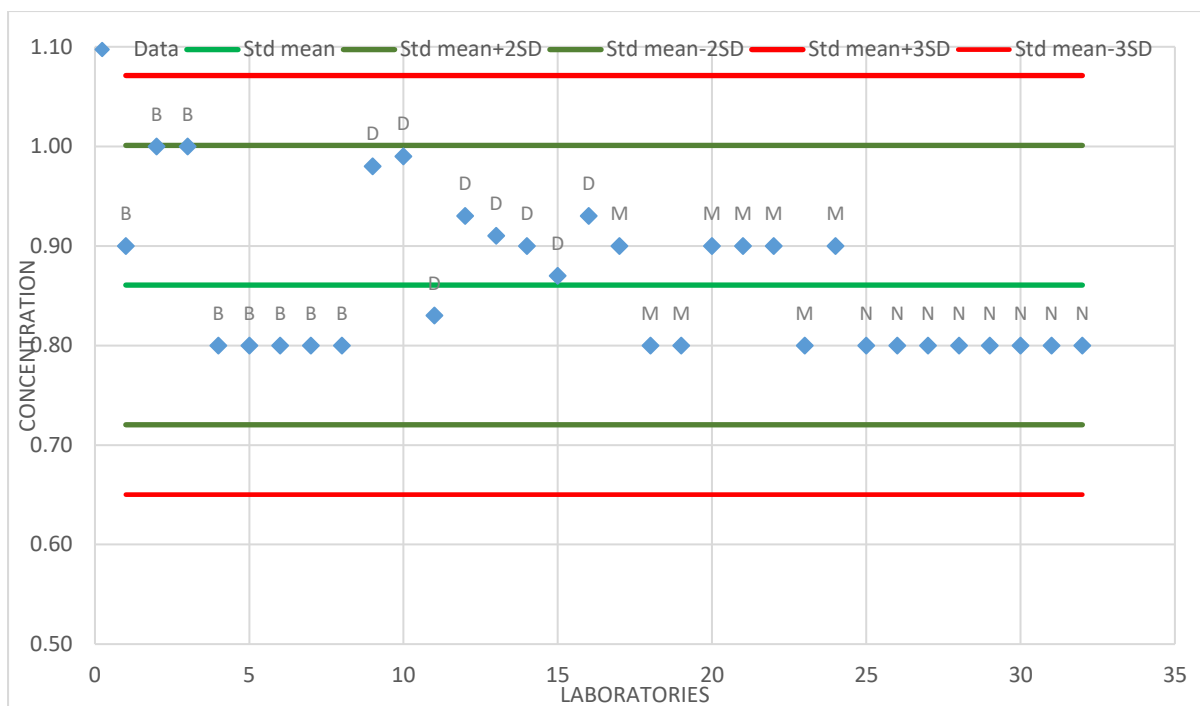
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

10.39 Hafnium by 4 acid multi digest finished with ICP- Hf 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.56	0.90	M	0.56	0.90
B	1.99	1.00	M	-0.86	0.80
B	1.99	1.00	M	-0.86	0.80
B	-0.86	0.80	M	0.56	0.90
B	-0.86	0.80	M	0.56	0.90
B	-0.86	0.80	M	0.56	0.90
B	-0.86	0.80	M	-0.86	0.80
B	-0.86	0.80	M	0.56	0.90
D	1.70	0.98	N	-0.86	0.80
D	1.84	0.99	N	-0.86	0.80
D	-0.44	0.83	N	-0.86	0.80
D	0.99	0.93	N	-0.86	0.80
D	0.70	0.91	N	-0.86	0.80
D	0.56	0.90	N	-0.86	0.80
D	0.13	0.87	N	-0.86	0.80
D	0.99	0.93	N	-0.86	0.80

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Hf	4A_MICP	32	0.861	0.070	8.152	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Hf	4A_MICP	B	8	0.863	0.092	0.106	10.622
Hf	4A_MICP	D	8	0.918	0.053	0.058	5.789
Hf	4A_MICP	M	8	0.863	0.052	0.060	6.001
Hf	4A_MICP	N	8	0.800	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.861</b>	<b>0.059</b>	<b>0.056</b>	<b>5.603</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Hf	4A_MICP	32	0.861	0.070	8.152	ppm

Std mean	0.861
SD	0.070
2SD	0.140
3SD	0.210
Std mean+2SD	1.001
Std mean-2SD	0.720
Std mean+3SD	1.071
Std mean-3SD	0.650

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Hf	4A_MICP	0.032	0.004	0.061	0.059	ppm

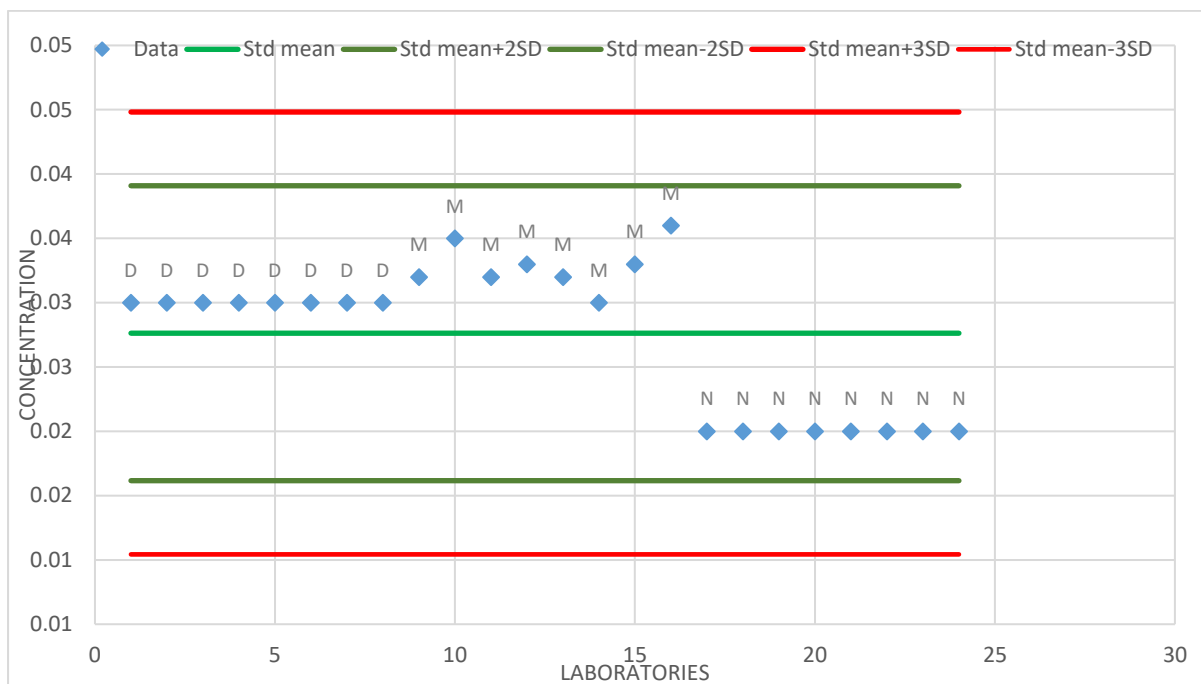
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

10.40 Indium by 4 acid multi digest finished with ICP- In 4A\_MICP

Lab_ID	Z_Score	Data
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
D	0.41	0.03
M	0.76	0.03
M	1.29	0.04
M	0.76	0.03
M	0.94	0.03
M	0.76	0.03
M	0.41	0.03
M	0.94	0.03
M	1.46	0.04
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02
N	-1.33	0.02

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ind	4A_MICP	24	0.028	0.006	20.749	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ind	4A_MICP	D	8	0.030	0.000	0.000	0.000
Ind	4A_MICP	M	8	0.033	0.002	0.057	5.734
Ind	4A_MICP	N	8	0.020	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.028</b>	<b>0.001</b>	<b>0.019</b>	<b>1.911</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Ind	4A_MICP	24	0.028	0.006	20.749	ppm

Std mean	0.028
SD	0.006
2SD	0.011
3SD	0.017
Std mean+2SD	0.039
Std mean-2SD	0.016
Std mean+3SD	0.045
Std mean-3SD	0.010

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ind	4A_MICP	0.013	<0.001	0.018	0.001	ppm

Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

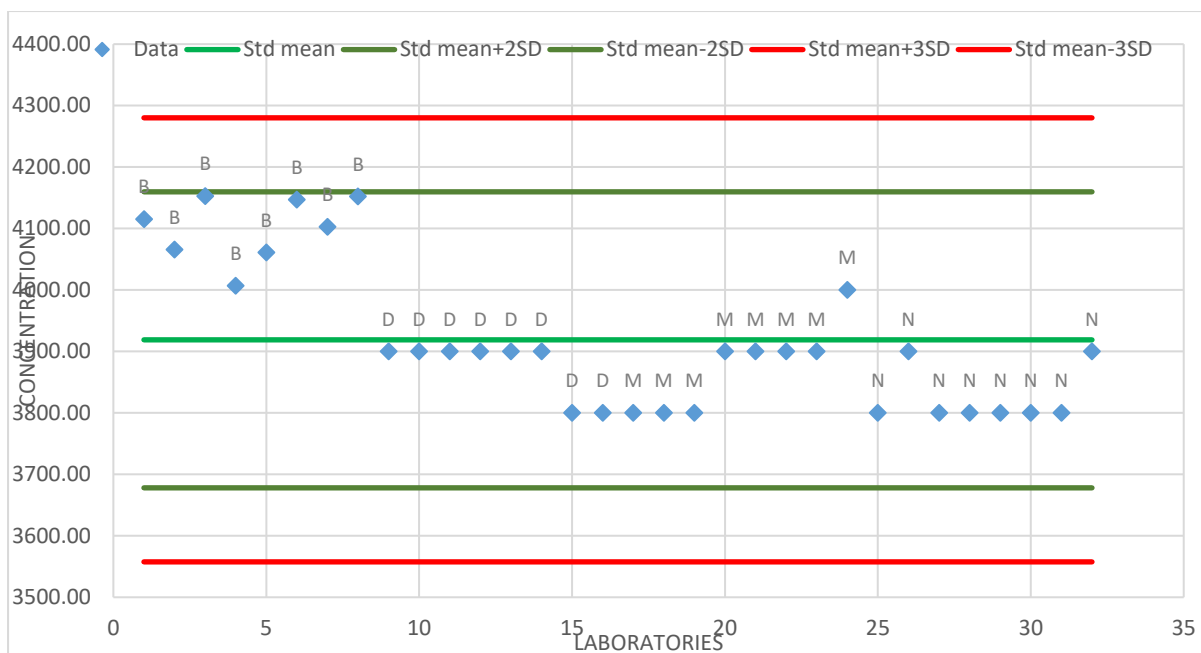


10.41 Potassium by 4 acid multi digest finished with ICP- K 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	1.63	4115	M	-0.99	3800
B	1.22	4066	M	-0.99	3800
B	1.94	4153	M	-0.99	3800
B	0.73	4007	M	-0.16	3900
B	1.18	4061	M	-0.16	3900
B	1.89	4147	M	-0.16	3900
B	1.53	4103	M	-0.16	3900
B	1.94	4152	M	0.67	4000
D	-0.16	3900	N	-0.99	3800
D	-0.16	3900	N	-0.16	3900
D	-0.16	3900	N	-0.99	3800
D	-0.16	3900	N	-0.99	3800
D	-0.16	3900	N	-0.99	3800
D	-0.16	3900	N	-0.99	3800
D	-0.16	3900	N	-0.99	3800
D	-0.99	3800	N	-0.99	3800
D	-0.99	3800	N	-0.16	3900

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
K	4A_MICP	32	3918.875	120.414	3.073	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
K	4A_MICP	B	8	4100.500	52.481	0.013	1.280
K	4A_MICP	D	8	3875.000	46.291	0.012	1.195
K	4A_MICP	M	8	3875.000	70.711	0.018	1.825
K	4A_MICP	N	8	3825.000	46.291	0.012	1.210
<b>Average</b>				<b>3918.875</b>	<b>54.863</b>	<b>0.014</b>	<b>1.377</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
K	4A_MICP	32	3918.875	120.414	3.073	ppm

Std mean	3918.875
SD	120.414
2SD	240.827
3SD	361.241
Std mean+2SD	4159.702
Std mean-2SD	3678.048
Std mean+3SD	4280.116
Std mean-3SD	3557.635

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
K	4A_MICP	86.685	29680.958	172.282	54.863	ppm

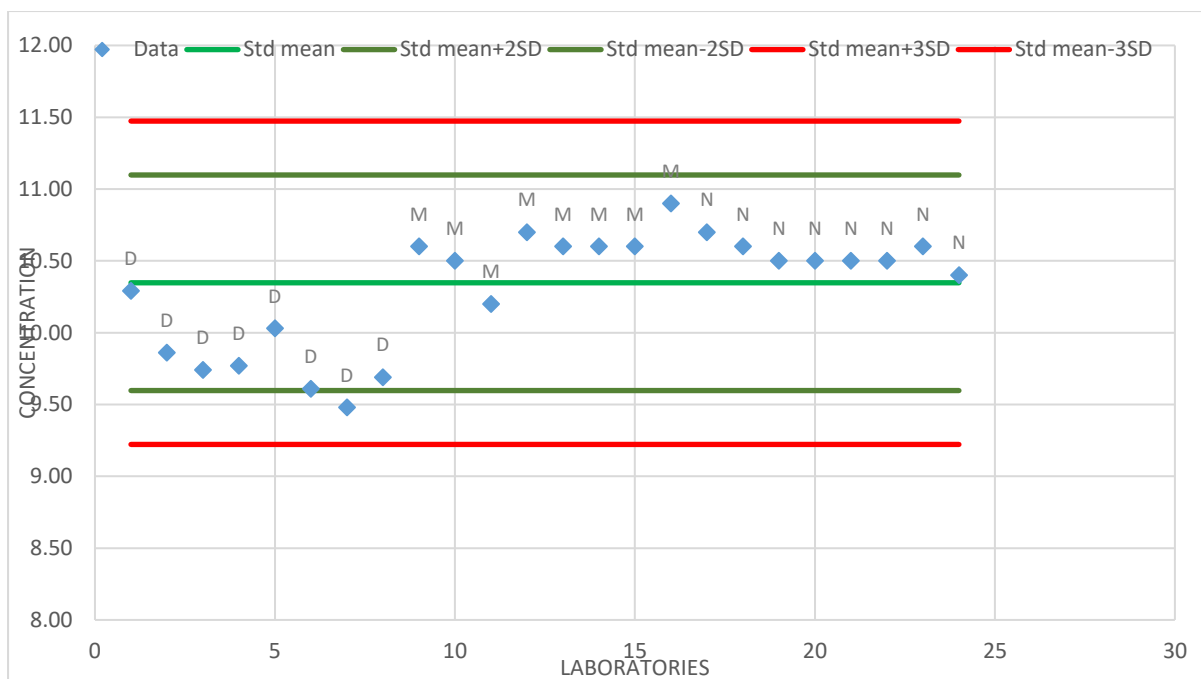
Note: All results are within the mean+- SD, no results are rejected as outliers using z score

10.42 Lanthanum by 4 acid multi digest finished with ICP- La 4A\_MICP

Lab_ID	Z_Score	Data
D	-0.05	10.29
D	-1.11	9.86
D	-1.40	9.74
D	-1.33	9.77
D	-0.69	10.03
D	-1.72	9.61
D	-2.04	9.48
D	-1.52	9.69
M	0.71	10.60
M	0.46	10.50
M	-0.27	10.20
M	0.95	10.70
M	0.71	10.60
M	0.71	10.60
M	0.71	10.60
M	1.44	10.90
N	0.95	10.70
N	0.71	10.60
N	0.46	10.50
N	0.46	10.50
N	0.46	10.50
N	0.46	10.50
N	0.71	10.60
N	0.22	10.40

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
La	4A_MICP	24	10.311	0.407	3.952	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
La	4A_MICP	D	8	9.809	0.254	0.026	2.588
La	4A_MICP	M	8	10.588	0.196	0.019	1.851
La	4A_MICP	N	8	10.538	0.092	0.009	0.869
<b>Average</b>				<b>10.311</b>	<b>0.193</b>	<b>0.018</b>	<b>1.769</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
La	4A_MICP	23	10.347	0.375	3.626	ppm

Std mean	10.347
SD	0.375
2SD	0.750
3SD	1.126
Std mean+2SD	11.098
Std mean-2SD	9.597
Std mean+3SD	11.473
Std mean-3SD	9.222

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
La	4A_MICP	0.365	0.396	0.629	0.181	ppm

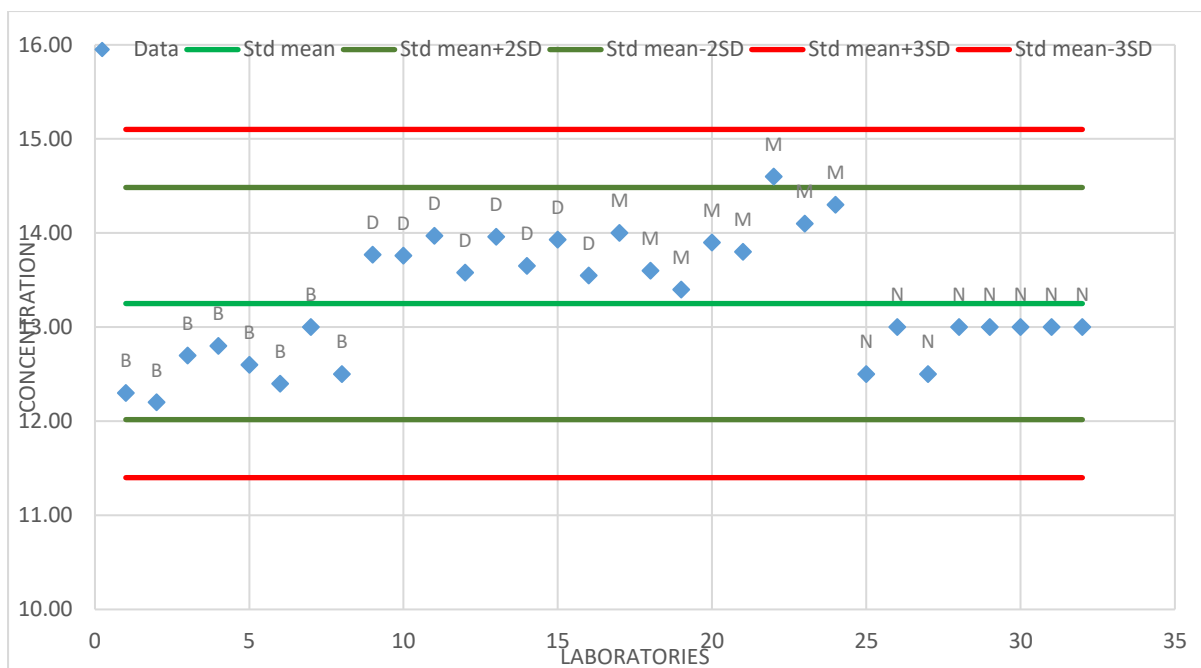
Note: 1 out of 24 results are rejected as outliers using z score, all results are within the mean +/- 3SD

10.43 Lithium by 4 acid multi digest finished with ICP- Li 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-1.52	12.30	M	1.08	14.00
B	-1.68	12.20	M	0.47	13.60
B	-0.91	12.70	M	0.16	13.40
B	-0.76	12.80	M	0.93	13.90
B	-1.06	12.60	M	0.78	13.80
B	-1.37	12.40	M	2.01	14.60
B	-0.45	13.00	M	1.24	14.10
B	-1.22	12.50	M	1.54	14.30
D	0.73	13.77	N	-1.22	12.50
D	0.72	13.76	N	-0.45	13.00
D	1.04	13.97	N	-1.22	12.50
D	0.44	13.58	N	-0.45	13.00
D	1.02	13.96	N	-0.45	13.00
D	0.55	13.65	N	-0.45	13.00
D	0.98	13.93	N	-0.45	13.00
D	0.39	13.55	N	-0.45	13.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Li	4A_MICP	32	13.293	0.652	4.904	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Li	4A_MICP	B	8	12.563	0.267	0.021	2.125
Li	4A_MICP	D	8	13.771	0.169	0.012	1.230
Li	4A_MICP	M	8	13.963	0.381	0.027	2.732
Li	4A_MICP	N	8	12.875	0.231	0.018	1.798
<b>Average</b>				<b>13.293</b>	<b>0.273</b>	<b>0.020</b>	<b>1.971</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Li	4A_MICP	31	13.251	0.617	4.655	ppm

Std mean	13.251
SD	0.617
2SD	1.234
3SD	1.850
Std mean+2SD	14.484
Std mean-2SD	12.017
Std mean+3SD	15.101
Std mean-3SD	11.400

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Li	4A_MICP	0.449	0.800	0.895	0.246	ppm

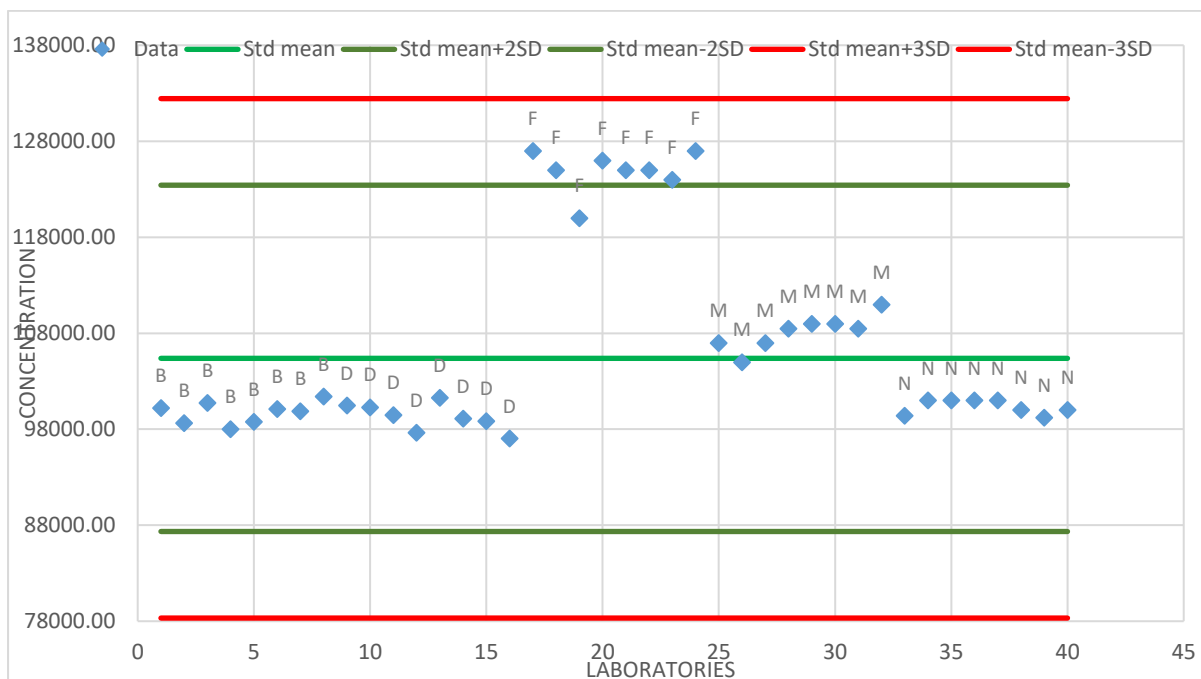
Note: 1 out of 32 results are rejected as outliers using z score, all results are within the mean +- 3SD

### 10.44 Magnesium by 4 acid multi digest finished with ICP- Mg 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.63	100209	F	1.85	125000
B	-0.78	98656	F	1.85	125000
B	-0.57	100744	F	1.75	124000
B	-0.85	98014	F	2.05	127000
B	-0.77	98773	M	0.05	107000
B	-0.63	100130	M	-0.15	105000
B	-0.66	99875	M	0.05	107000
B	-0.50	101425	M	0.20	108500
D	-0.60	100473	M	0.25	109000
D	-0.62	100291	M	0.25	109000
D	-0.70	99467	M	0.20	108500
D	-0.88	97664	M	0.45	111000
D	-0.52	101271	N	-0.71	99400
D	-0.73	99120	N	-0.55	101000
D	-0.76	98843	N	-0.55	101000
D	-0.94	97040	N	-0.55	101000
F	2.05	127000	N	-0.55	101000
F	1.85	125000	N	-0.65	100000
F	1.35	120000	N	-0.73	99200
F	1.95	126000	N	-0.65	100000

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mg	4A_MICP	40	106464.875	9996.373	9.389	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Mg	4A_MICP	B	8	99728.250	1154.225	0.012	1.157
Mg	4A_MICP	D	8	99271.125	1428.756	0.014	1.439
Mg	4A_MICP	F	8	124875.000	2232.071	0.018	1.787
Mg	4A_MICP	M	8	108125.000	1787.856	0.017	1.654
Mg	4A_MICP	N	8	100325.000	770.436	0.008	0.768
<b>Average</b>				<b>106464.875</b>	<b>1558.571</b>	<b>0.014</b>	<b>1.361</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mg	4A_MICP	38	105384.079	9018.600	8.558	ppm

Std mean	105384.079
SD	9018.600
2SD	18037.200
3SD	27055.800
Std mean+2SD	123421.279
Std mean-2SD	87346.879
Std mean+3SD	132439.879
Std mean-3SD	78328.279

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
MgO	XRF	0.092	0.092	0.303	0.069	%

Note: 2 out of 40 results are rejected as outliers using z score, all results are within the mean +- 3SD

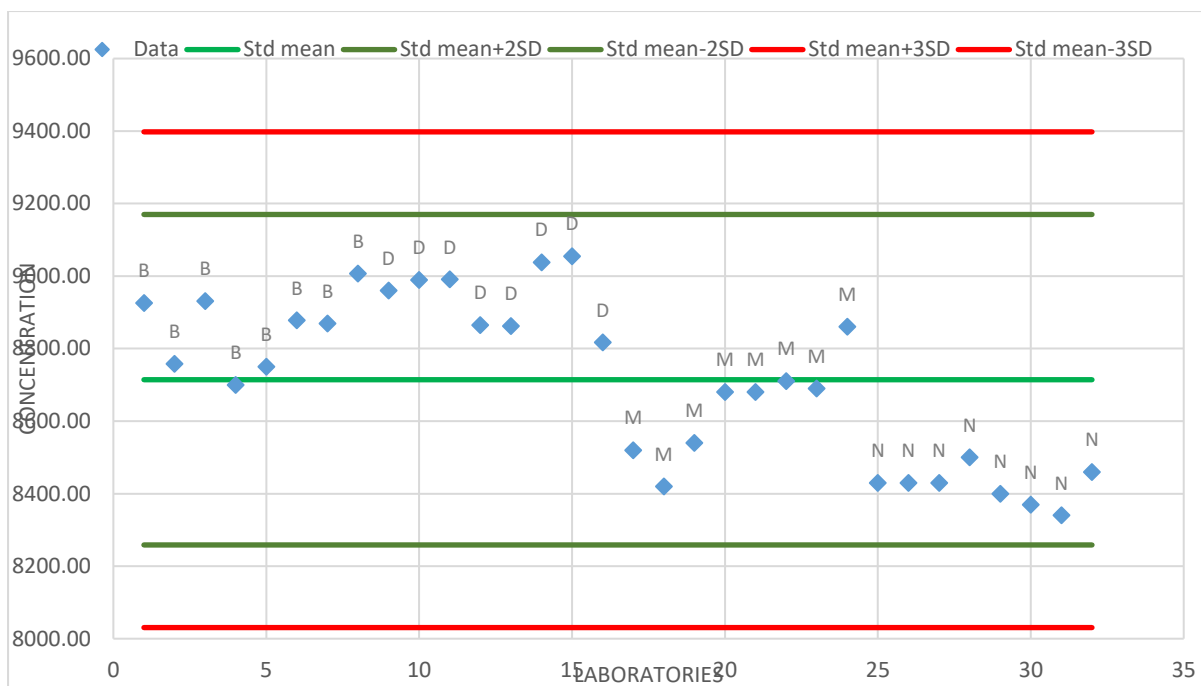


10.45 Manganese by 4 acid multi digest finished with ICP- Mn 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.93	8926	M	-0.85	8520
B	0.19	8758	M	-1.29	8420
B	0.95	8931	M	-0.76	8540
B	-0.06	8700	M	-0.15	8680
B	0.16	8750	M	-0.15	8680
B	0.72	8878	M	-0.02	8710
B	0.68	8869	M	-0.11	8690
B	1.28	9007	M	0.64	8860
D	1.08	8960	N	-1.25	8430
D	1.21	8989	N	-1.25	8430
D	1.21	8991	N	-1.25	8430
D	0.66	8865	N	-0.94	8500
D	0.65	8862	N	-1.38	8400
D	1.42	9038	N	-1.51	8370
D	1.50	9055	N	-1.64	8340
D	0.45	8817	N	-1.12	8460

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mn	4A_MICP	32	8714.250	227.846	2.615	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Mn	4A_MICP	B	8	8852.375	106.268	0.012	1.200
Mn	4A_MICP	D	8	8947.125	88.368	0.010	0.988
Mn	4A_MICP	M	8	8637.500	137.191	0.016	1.588
Mn	4A_MICP	N	8	8420.000	50.143	0.006	0.596
<b>Average</b>				<b>8714.250</b>	<b>100.545</b>	<b>0.011</b>	<b>1.093</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mn	4A_MICP	32	8714.250	227.846	2.615	ppm

Std mean	8714.250
SD	227.846
2SD	455.692
3SD	683.538
Std mean+2SD	9169.942
Std mean-2SD	8258.558
Std mean+3SD	9397.788
Std mean-3SD	8030.712

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Mn	4A_MICP	165.271	107994.592	328.625	100.545	ppm

Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

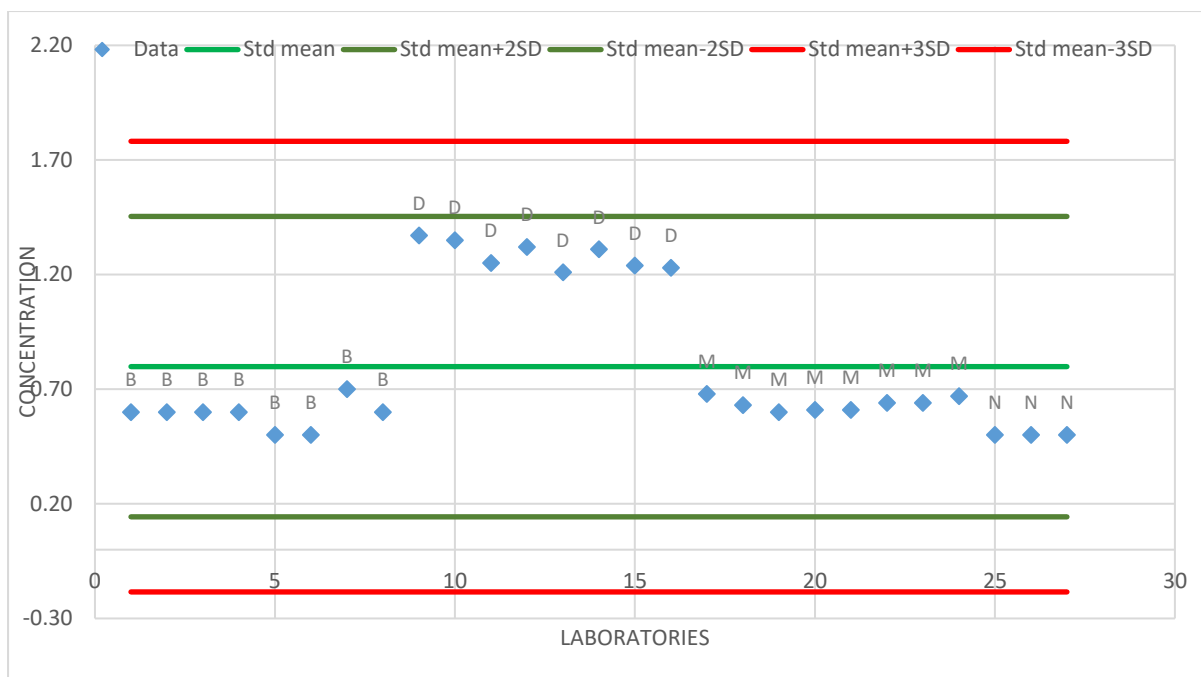
10.46 Molybdenum by 4 acid multi digest finished with ICP- Mo 4A\_MICP

Lab_ID	Z_Score	Data
B	-0.61	0.60
B	-0.61	0.60
B	-0.61	0.60
B	-0.61	0.60
B	-0.91	0.50
B	-0.91	0.50
B	-0.30	0.70
B	-0.61	0.60
D	1.74	1.37
D	1.68	1.35
D	1.38	1.25
D	1.59	1.32
D	1.26	1.21
D	1.56	1.31

Lab_ID	Z_Score	Data
D	1.35	1.24
D	1.32	1.23
M	-0.36	0.68
M	-0.51	0.63
M	-0.61	0.60
M	-0.58	0.61
M	-0.58	0.61
M	-0.48	0.64
M	-0.48	0.64
M	-0.39	0.67
N	-0.91	0.50
N	-0.91	0.50
N	-0.91	0.50

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mo	4A_MICP	27	0.799	0.328	41.027	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Mo	4A_MICP	B	8	0.588	0.064	0.109	10.908
Mo	4A_MICP	D	8	1.285	0.060	0.047	4.669
Mo	4A_MICP	M	8	0.635	0.029	0.045	4.533
Mo	4A_MICP	N	3	0.500	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.752</b>	<b>0.050</b>	<b>0.050</b>	<b>5.028</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Mo	4A_MICP	27	0.799	0.328	41.027	ppm

Std mean	0.799
SD	0.328
2SD	0.655
3SD	0.983
Std mean+2SD	1.454
Std mean-2SD	0.143
Std mean+3SD	1.781
Std mean-3SD	-0.184

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Mo	4A_MICP	0.370	0.410	0.640	0.053	ppm

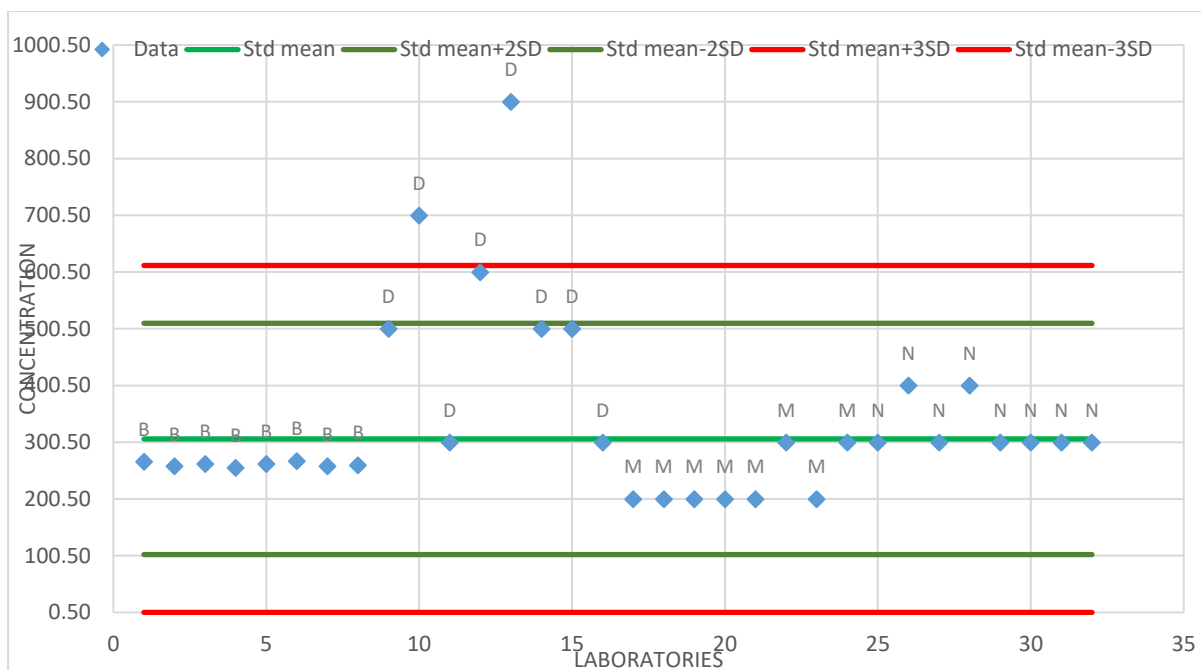
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.47 Sodium by 4 acid multi digest finished with ICP- Na 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.45	266	M	-0.87	200
B	-0.50	258	M	-0.87	200
B	-0.47	262	M	-0.87	200
B	-0.52	255	M	-0.87	200
B	-0.47	262	M	-0.87	200
B	-0.44	267	M	-0.23	300
B	-0.50	258	M	-0.87	200
B	-0.49	260	M	-0.23	300
D	1.03	500	N	-0.23	300
D	2.29	700	N	0.40	400
D	-0.23	300	N	-0.23	300
D	1.66	600	N	0.40	400
D	3.55	900	N	-0.23	300
D	1.03	500	N	-0.23	300
D	1.03	500	N	-0.23	300
D	-0.23	300	N	-0.23	300

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Na	4A_MICP	32	337.125	158.438	46.997	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Na	4A_MICP	B	8	261.000	4.106	0.016	1.573
Na	4A_MICP	D	8	537.500	199.553	0.371	37.126
Na	4A_MICP	M	8	225.000	46.291	0.206	20.574
Na	4A_MICP	N	8	325.000	46.291	0.142	14.243
<b>Average</b>				<b>337.125</b>	<b>105.029</b>	<b>0.184</b>	<b>18.379</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Na	4A_MICP	30	306.267	101.897	33.271	ppm

Std mean	306.267
SD	101.897
2SD	203.794
3SD	305.692
Std mean+2SD	510.061
Std mean-2SD	102.472
Std mean+3SD	611.958
Std mean-3SD	0.575

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Na	4A_MICP	62.970	15321.739	123.781	63.585	ppm

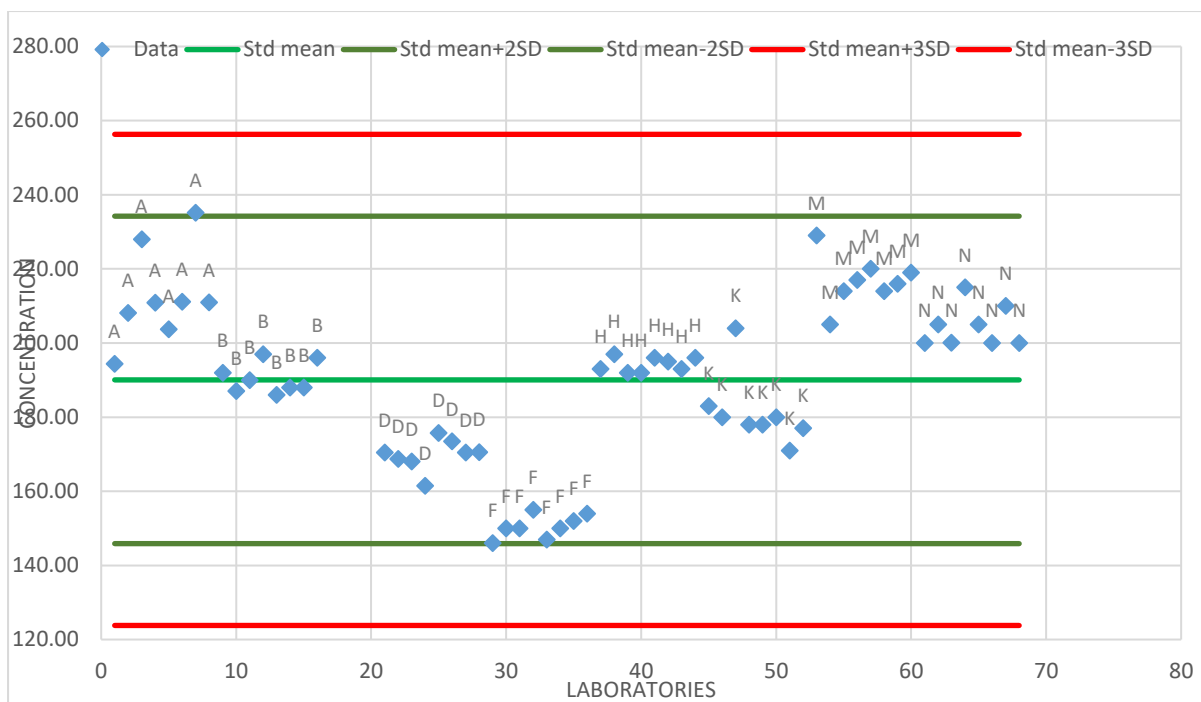
Note: 2 out of 32 results are rejected as outliers using z score

10.48 Nickel by 4 acid multi digest finished with ICP- Ni 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	0.32	194	D	-0.74	161	K	0.63	204
A	0.76	208	D	-0.28	176	K	-0.21	178
A	1.40	228	D	-0.35	173	K	-0.21	178
A	0.85	211	D	-0.45	170	K	-0.14	180
A	0.62	204	D	-0.44	171	K	-0.43	171
A	0.86	211	F	-1.23	146	K	-0.24	177
A	1.63	235	F	-1.10	150	M	1.43	229
A	0.85	211	F	-1.10	150	M	0.66	205
B	0.24	192	F	-0.94	155	M	0.95	214
B	0.08	187	F	-1.20	147	M	1.04	217
B	0.18	190	F	-1.10	150	M	1.14	220
B	0.40	197	F	-1.04	152	M	0.95	214
B	0.05	186	F	-0.98	154	M	1.01	216
B	0.11	188	H	0.27	193	M	1.11	219
B	0.11	188	H	0.40	197	N	0.50	200
B	0.37	196	H	0.24	192	N	0.66	205
C	-2.91	94	H	0.24	192	N	0.50	200
C	-2.83	96	H	0.37	196	N	0.98	215
C	-2.90	94	H	0.34	195	N	0.66	205
C	-2.91	94	H	0.27	193	N	0.50	200
D	-0.45	170	H	0.37	196	N	0.82	210
D	-0.50	169	K	-0.05	183	N	0.50	200
D	-0.53	168	K	-0.14	180			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ni	4A_MICP	68	184.421	31.199	16.917	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ni	4A_MICP	A	8	212.789	12.996	0.061	6.107
Ni	4A_MICP	B	8	190.500	4.140	0.022	2.173
Ni	4A_MICP	C	4	94.350	1.179	0.012	1.250
Ni	4A_MICP	D	8	169.863	4.211	0.025	2.479
Ni	4A_MICP	F	8	150.500	3.117	0.021	2.071
Ni	4A_MICP	H	8	194.250	1.982	0.010	1.020
Ni	4A_MICP	K	8	181.375	9.768	0.054	5.385
Ni	4A_MICP	M	8	216.750	6.756	0.031	3.117
Ni	4A_MICP	N	8	204.375	5.630	0.028	2.755
			<b>Average</b>	<b>179.417</b>	<b>6.781</b>	<b>0.029</b>	<b>2.929</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ni	4A_MICP	64	190.050	22.086	11.621	ppm

Std mean	190.050
SD	22.086
2SD	44.172
3SD	66.258
Std mean+2SD	234.222
Std mean-2SD	145.878
Std mean+3SD	256.309
Std mean-3SD	123.792

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ni	4A_MICP	7.906	493.904	22.224	6.984	ppm

Note: 4 out of 68 results are rejected as outliers using z score, all results are within the mean +/- 3SD

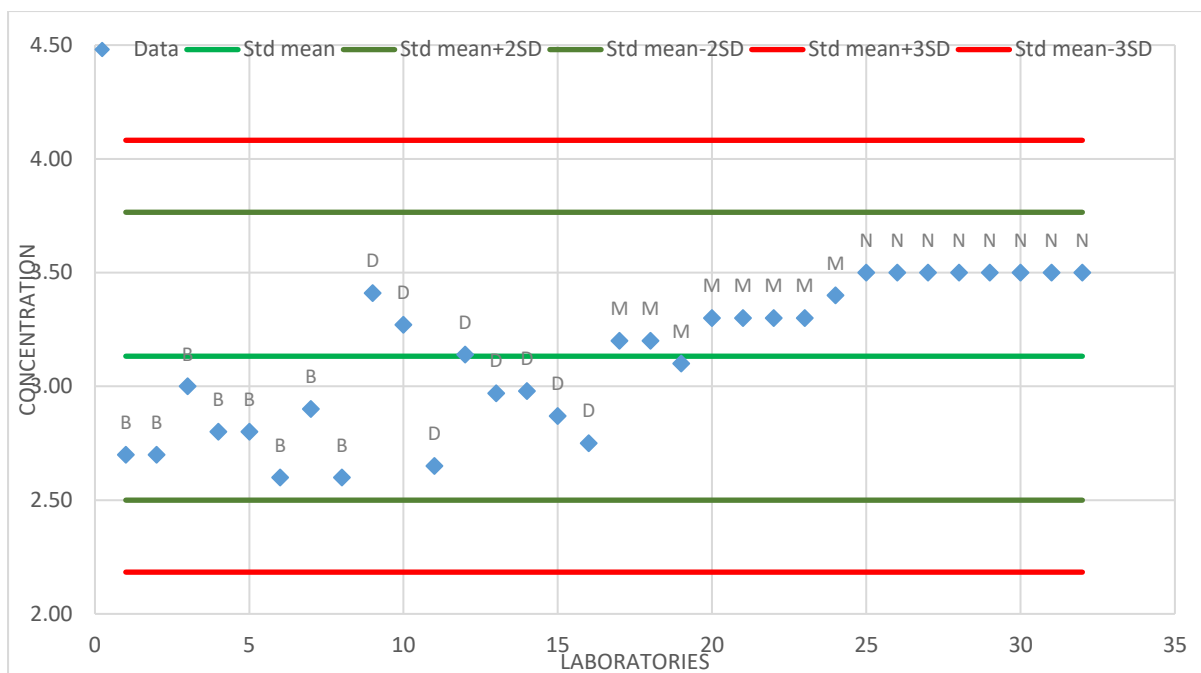


10.49 Niobium by 4 acid multi digest finished with ICP- Nb 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-1.37	2.70	M	0.21	3.20
B	-1.37	2.70	M	0.21	3.20
B	-0.42	3.00	M	-0.10	3.10
B	-1.05	2.80	M	0.53	3.30
B	-1.05	2.80	M	0.53	3.30
B	-1.68	2.60	M	0.53	3.30
B	-0.73	2.90	M	0.53	3.30
B	-1.68	2.60	M	0.85	3.40
D	0.88	3.41	N	1.16	3.50
D	0.43	3.27	N	1.16	3.50
D	-1.53	2.65	N	1.16	3.50
D	0.02	3.14	N	1.16	3.50
D	-0.51	2.97	N	1.16	3.50
D	-0.48	2.98	N	1.16	3.50
D	-0.83	2.87	N	1.16	3.50
D	-1.21	2.75	N	1.16	3.50

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Nb	4A_MICP	32	3.133	0.316	10.098	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Nb	4A_MICP	B	8	2.763	0.141	0.051	5.096
Nb	4A_MICP	D	8	3.005	0.257	0.086	8.564
Nb	4A_MICP	M	8	3.263	0.092	0.028	2.808
Nb	4A_MICP	N	8	3.500	<0.001	<0.001	<0.001
<b>Average</b>				<b>3.133</b>	<b>0.154</b>	<b>0.041</b>	<b>4.117</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Nb	4A_MICP	32	3.133	0.316	10.098	ppm

Std mean	3.133
SD	0.316
2SD	0.633
3SD	0.949
Std mean+2SD	3.765
Std mean-2SD	2.500
Std mean+3SD	4.081
Std mean-3SD	2.184

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Nb	4A_MICP	0.271	0.216	0.465	0.177	ppm

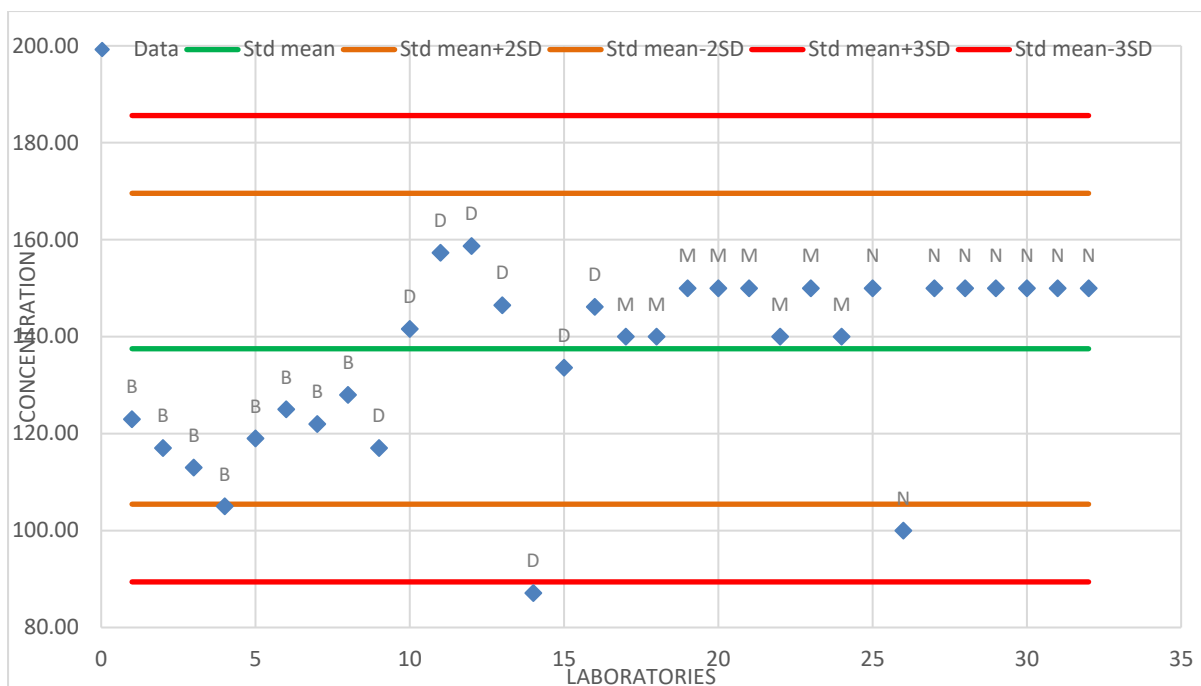
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.50 Phosphorous by 4 acid multi digest finished with ICP- P 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.71	123	M	0.22	140
B	-1.05	117	M	0.22	140
B	-1.27	113	M	0.78	150
B	-1.71	105	M	0.78	150
B	-0.93	119	M	0.78	150
B	-0.60	125	M	0.22	140
B	-0.77	122	M	0.78	150
B	-0.44	128	M	0.22	140
D	-1.05	117	N	0.78	150
D	0.31	142	N	-1.98	100
D	1.18	157	N	0.78	150
D	1.26	159	N	0.78	150
D	0.58	147	N	0.78	150
D	-2.70	87	N	0.78	150
D	-0.13	134	N	0.78	150
D	0.56	146	N	0.78	150

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
P	4A_MICP	32	135.934	18.119	13.329	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
P	4A_MICP	B	8	119.000	7.348	0.062	6.175
P	4A_MICP	D	8	135.986	23.818	0.175	17.515
P	4A_MICP	M	8	145.000	5.345	0.037	3.686
P	4A_MICP	N	8	143.750	17.678	0.123	12.298
<b>Average</b>				<b>135.934</b>	<b>15.511</b>	<b>0.099</b>	<b>9.918</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
P	4A_MICP	31	137.510	16.036	11.661	ppm

Std mean	137.510
SD	16.036
2SD	32.071
3SD	48.107
Std mean+2SD	169.581
Std mean-2SD	105.439
Std mean+3SD	185.616
Std mean-3SD	89.403

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
P	4A_MICP	8.533	272.096	16.495	12.178	ppm

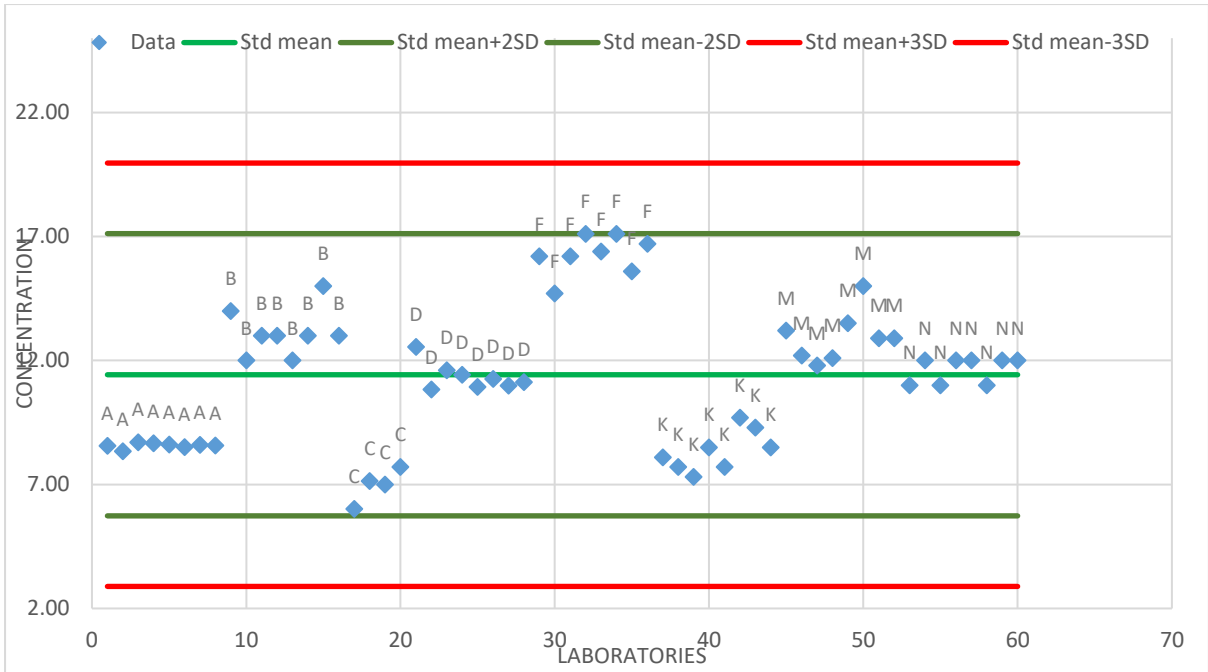
Note: 1 out of 32 results are rejected as outliers using z score

10.51 Lead by 4 acid multi digest finished with ICP- Pb 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-1.01	8.56	D	0.40	12.55	K	-1.31	7.70
A	-1.09	8.34	D	-0.21	10.83	K	-0.61	9.70
A	-0.96	8.71	D	0.06	11.61	K	-0.75	9.30
A	-0.97	8.66	D	0.00	11.42	K	-1.03	8.50
A	-0.99	8.61	D	-0.17	10.94	M	0.62	13.20
A	-1.03	8.50	D	-0.06	11.26	M	0.27	12.20
A	-0.99	8.60	D	-0.16	10.98	M	0.13	11.80
A	-1.00	8.58	D	-0.10	11.13	M	0.24	12.10
B	0.90	14.00	F	1.68	16.20	M	0.73	13.50
B	0.20	12.00	F	1.15	14.70	M	1.26	15.00
B	0.55	13.00	F	1.68	16.20	M	0.52	12.90
B	0.55	13.00	F	1.99	17.10	M	0.52	12.90
B	0.20	12.00	F	1.75	16.40	N	-0.15	11.00
B	0.55	13.00	F	1.99	17.10	N	0.20	12.00
B	1.26	15.00	F	1.47	15.60	N	-0.15	11.00
B	0.55	13.00	F	1.85	16.70	N	0.20	12.00
C	-1.90	6.02	K	-1.17	8.10	N	0.20	12.00
C	-1.51	7.14	K	-1.31	7.70	N	-0.15	11.00
C	-1.56	7.00	K	-1.45	7.30	N	0.20	12.00
C	-1.31	7.70	K	-1.03	8.50	N	0.20	12.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Pb	4A_MICP	60	11.425	2.846	24.907	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Pb	4A_MICP	A	8	8.567	0.112	0.013	1.308
Pb	4A_MICP	B	8	13.125	0.991	0.076	7.551
Pb	4A_MICP	C	4	6.965	0.699	0.100	10.033
Pb	4A_MICP	D	8	11.340	0.553	0.049	4.880
Pb	4A_MICP	F	8	16.250	0.802	0.049	4.934
Pb	4A_MICP	K	8	8.350	0.826	0.099	9.896
Pb	4A_MICP	M	8	12.950	1.013	0.078	7.821
Pb	4A_MICP	N	8	11.625	0.518	0.045	4.452
<b>Average</b>				<b>11.147</b>	<b>0.742</b>	<b>0.064</b>	<b>6.359</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Pb	4A_MICP	60	11.425	2.846	24.907	ppm

Std mean	11.425
SD	2.846
2SD	5.691
3SD	8.537
Std mean+2SD	17.117
Std mean-2SD	5.734
Std mean+3SD	19.963
Std mean-3SD	2.888

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Pb	4A_MICP	1.001	7.946	2.819	0.746	ppm

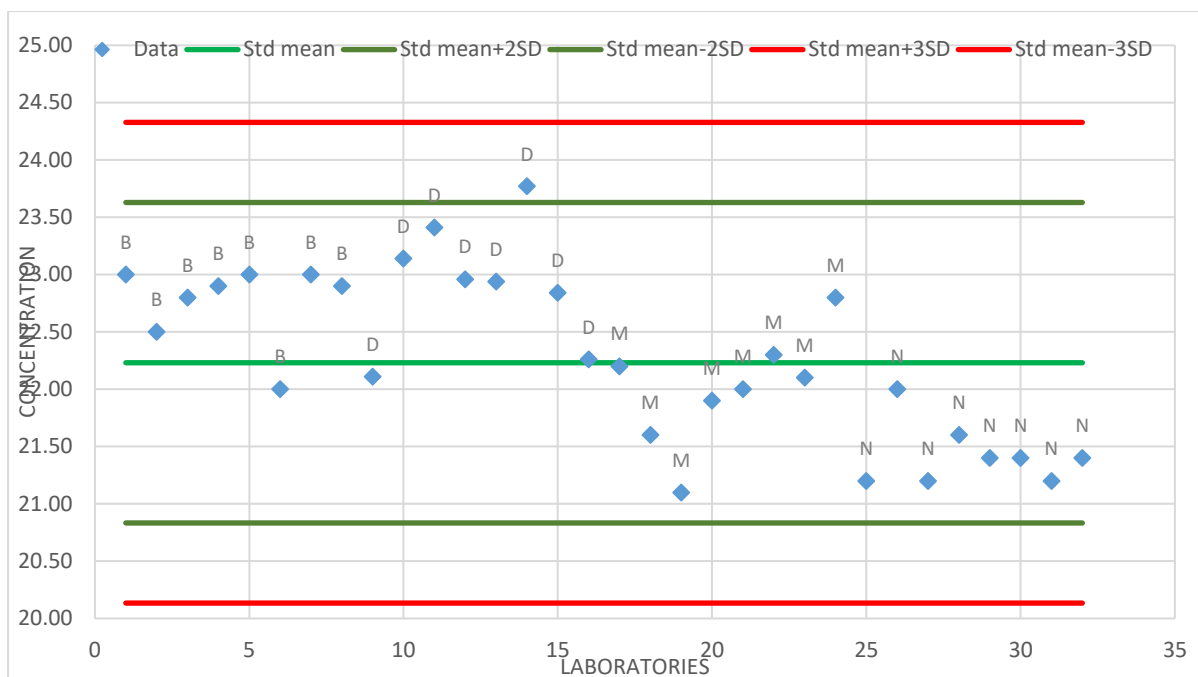
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.52 Rubidium by 4 acid multi digest finished with ICP- Rb 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.98	23.00	M	-0.11	22.20
B	0.30	22.50	M	-0.92	21.60
B	0.70	22.80	M	-1.59	21.10
B	0.84	22.90	M	-0.51	21.90
B	0.98	23.00	M	-0.38	22.00
B	-0.38	22.00	M	0.03	22.30
B	0.98	23.00	M	-0.24	22.10
B	0.84	22.90	M	0.70	22.80
D	-0.23	22.11	N	-1.46	21.20
D	1.16	23.14	N	-0.38	22.00
D	1.53	23.41	N	-1.46	21.20
D	0.92	22.96	N	-0.92	21.60
D	0.89	22.94	N	-1.19	21.40
D	2.02	23.77	N	-1.19	21.40
D	0.76	22.84	N	-1.46	21.20
D	-0.03	22.26	N	-1.19	21.40

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Rb	4A_MICP	32	22.279	0.739	3.319	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Rb	4A_MICP	B	8	22.763	0.350	0.015	1.539
Rb	4A_MICP	D	8	22.929	0.549	0.024	2.395
Rb	4A_MICP	M	8	22.000	0.501	0.023	2.279
Rb	4A_MICP	N	8	21.425	0.271	0.013	1.266
<b>Average</b>				<b>22.279</b>	<b>0.433</b>	<b>0.019</b>	<b>1.870</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Rb	4A_MICP	31	22.231	0.699	3.144	ppm

Std mean	22.231
SD	0.699
2SD	1.398
3SD	2.097
Std mean+2SD	23.629
Std mean-2SD	20.833
Std mean+3SD	24.328
Std mean-3SD	20.134

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Rb	4A_MICP	0.456	0.811	0.900	0.405	ppm

Note: 1 out of 32 results are rejected as outliers using z score, all results are within the mean +/- 3SD

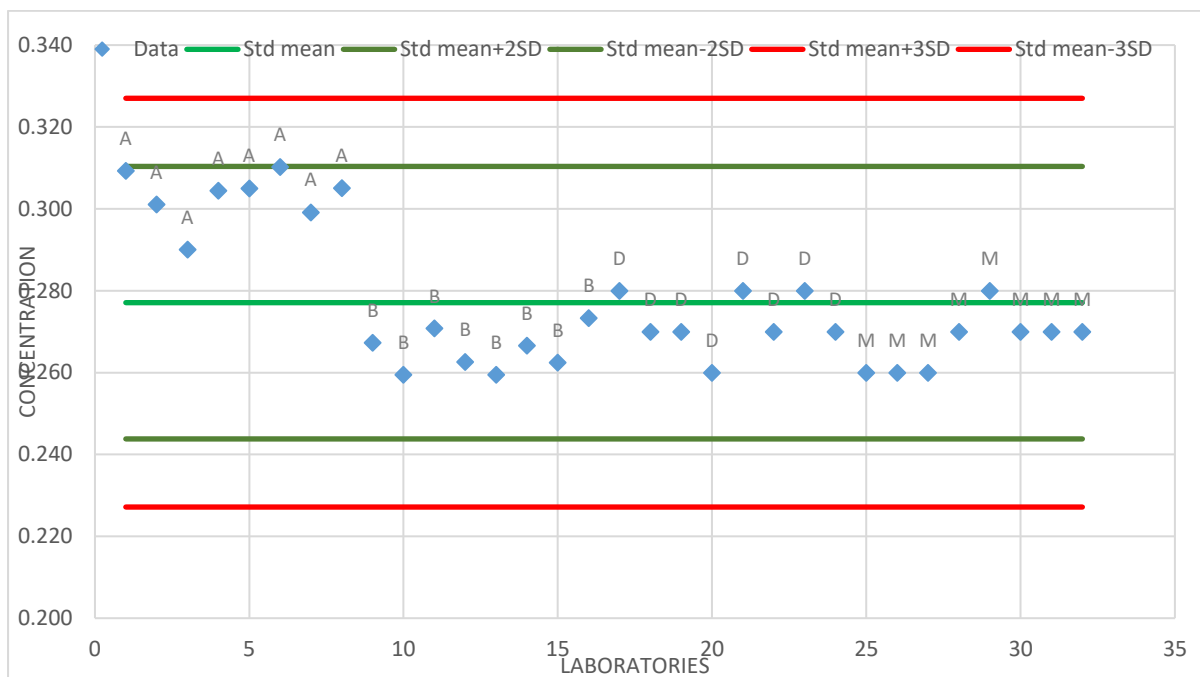


10.53 Sulphur by 4 acid multi digest finished with ICP- S 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	1.94	0.31	D	0.18	0.28
A	1.44	0.30	D	-0.43	0.27
A	0.78	0.29	D	-0.43	0.27
A	1.65	0.30	D	-1.03	0.26
A	1.68	0.31	D	0.18	0.28
A	1.99	0.31	D	-0.43	0.27
A	1.33	0.30	D	0.18	0.28
A	1.68	0.31	D	-0.43	0.27
B	-0.59	0.27	M	-1.03	0.26
B	-1.06	0.26	M	-1.03	0.26
B	-0.38	0.27	M	-1.03	0.26
B	-0.87	0.26	M	-0.43	0.27
B	-1.06	0.26	M	0.18	0.28
B	-0.63	0.27	M	-0.43	0.27
B	-0.88	0.26	M	-0.43	0.27
B	-0.23	0.27	M	-0.43	0.27

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
S	4A_MICP	32	0.277	0.017	6.006	%

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Rb	4A_MICP	B	8	22.763	0.350	0.015	1.539
Rb	4A_MICP	D	8	22.929	0.549	0.024	2.395
Rb	4A_MICP	M	8	22.000	0.501	0.023	2.279
Rb	4A_MICP	N	8	21.425	0.271	0.013	1.266
<b>Average</b>				<b>0.277</b>	<b>0.006</b>	<b>0.023</b>	<b>2.320</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
S	4A_MICP	32	0.277	0.017	6.006	%

Std mean	0.277
SD	0.017
2SD	0.033
3SD	0.050
Std mean+2SD	0.310
Std mean-2SD	0.244
Std mean+3SD	0.327
Std mean-3SD	0.227

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
S	4A_MICP	0.002	<0.001	0.005	0.004	%

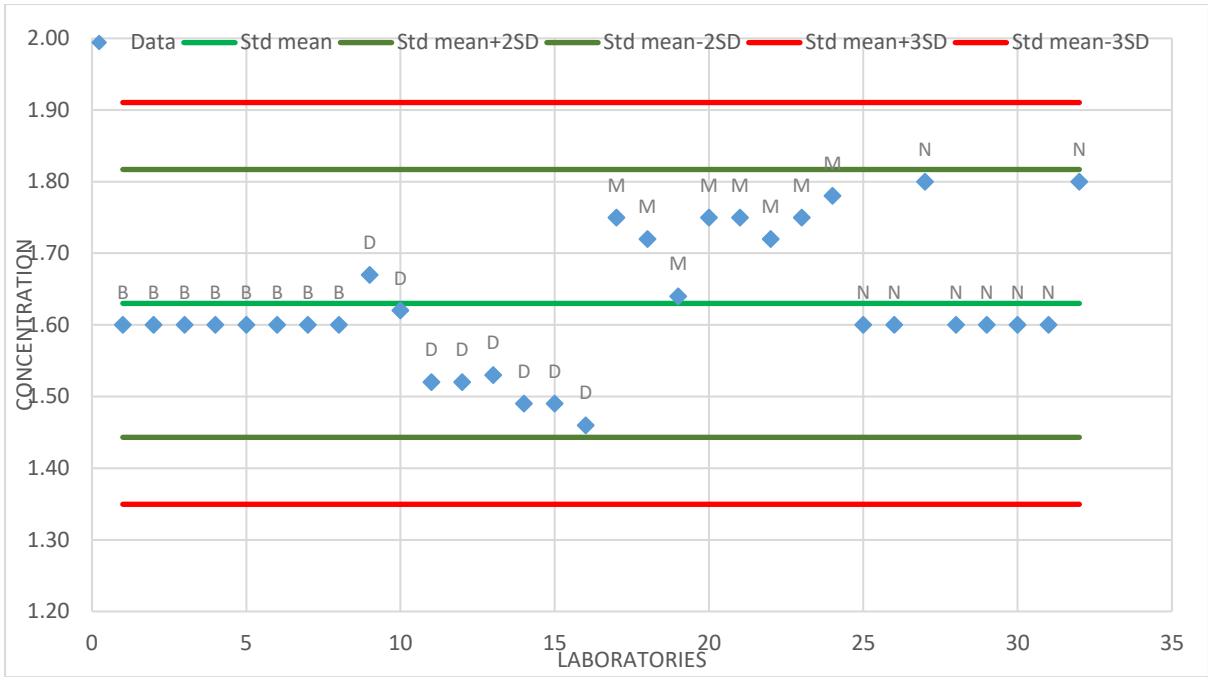
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.54 Antimony by 4 acid multi digest finished with ICP- Sb 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.32	1.60	M	1.28	1.75
B	-0.32	1.60	M	0.96	1.72
B	-0.32	1.60	M	0.11	1.64
B	-0.32	1.60	M	1.28	1.75
B	-0.32	1.60	M	1.28	1.75
B	-0.32	1.60	M	0.96	1.72
B	-0.32	1.60	M	1.28	1.75
B	-0.32	1.60	M	1.60	1.78
D	0.43	1.67	N	-0.32	1.60
D	-0.11	1.62	N	-0.32	1.60
D	-1.18	1.52	N	1.82	1.80
D	-1.18	1.52	N	-0.32	1.60
D	-1.07	1.53	N	-0.32	1.60
D	-1.50	1.49	N	-0.32	1.60
D	-1.50	1.49	N	-0.32	1.60
D	-1.82	1.46	N	1.82	1.80

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sb	4A_MICP	32	1.630	0.093	5.734	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Sb	4A_MICP	B	8	1.600	0.000	0.000	0.000
Sb	4A_MICP	D	8	1.538	0.071	0.046	4.635
Sb	4A_MICP	M	8	1.733	0.042	0.024	2.424
Sb	4A_MICP	N	8	1.650	0.093	0.056	5.611
<b>Average</b>				<b>1.630</b>	<b>0.062</b>	<b>0.032</b>	<b>3.168</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sb	4A_MICP	32	1.630	0.093	5.734	ppm

Std mean	1.630
SD	0.093
2SD	0.187
3SD	0.280
Std mean+2SD	1.817
Std mean-2SD	1.443
Std mean+3SD	1.910
Std mean-3SD	1.350

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Sb	4A_MICP	0.057	0.013	0.112	0.062	ppm

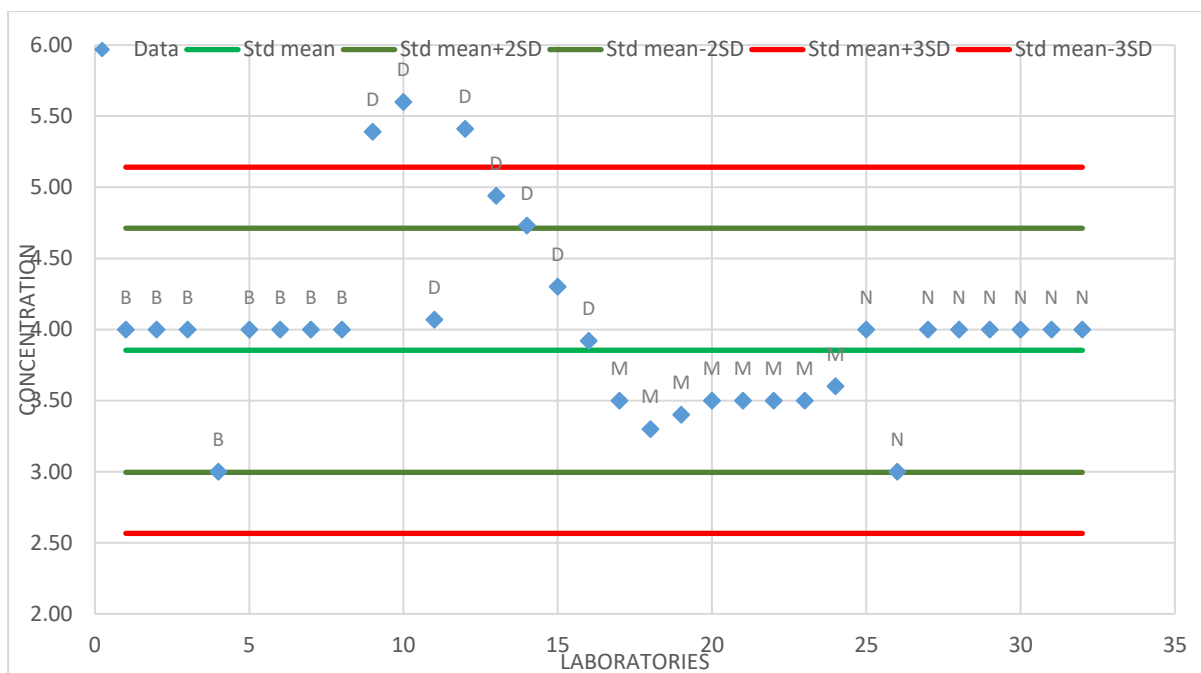
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.55 Scandium by 4 acid multi digest finished with ICP- Sc 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.01	4.00	M	-0.80	3.50
B	-0.01	4.00	M	-1.12	3.30
B	-0.01	4.00	M	-0.96	3.40
B	-1.60	3.00	M	-0.80	3.50
B	-0.01	4.00	M	-0.80	3.50
B	-0.01	4.00	M	-0.80	3.50
B	-0.01	4.00	M	-0.80	3.50
B	-0.01	4.00	M	-0.64	3.60
D	2.20	5.39	N	-0.01	4.00
D	2.54	5.60	N	-1.60	3.00
D	0.10	4.07	N	-0.01	4.00
D	2.23	5.41	N	-0.01	4.00
D	1.49	4.94	N	-0.01	4.00
D	1.15	4.73	N	-0.01	4.00
D	0.47	4.30	N	-0.01	4.00
D	-0.14	3.92	N	-0.01	4.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sc	4A_MICP	32	4.005	0.629	15.700	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Sc	4A_MICP	B	8	3.875	0.354	0.091	9.124
Sc	4A_MICP	D	8	4.795	0.648	0.135	13.520
Sc	4A_MICP	M	8	3.475	0.089	0.026	2.551
Sc	4A_MICP	N	8	3.875	0.354	0.091	9.124
<b>Average</b>				<b>4.005</b>	<b>0.412</b>	<b>0.086</b>	<b>8.580</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sc	4A_MICP	29	3.854	0.429	11.137	ppm

Std mean	3.854
SD	0.429
2SD	0.858
3SD	1.288
Std mean+2SD	4.712
Std mean-2SD	2.995
Std mean+3SD	5.141
Std mean-3SD	2.566

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Sc	4A_MICP	0.227	0.191	0.437	0.320	ppm

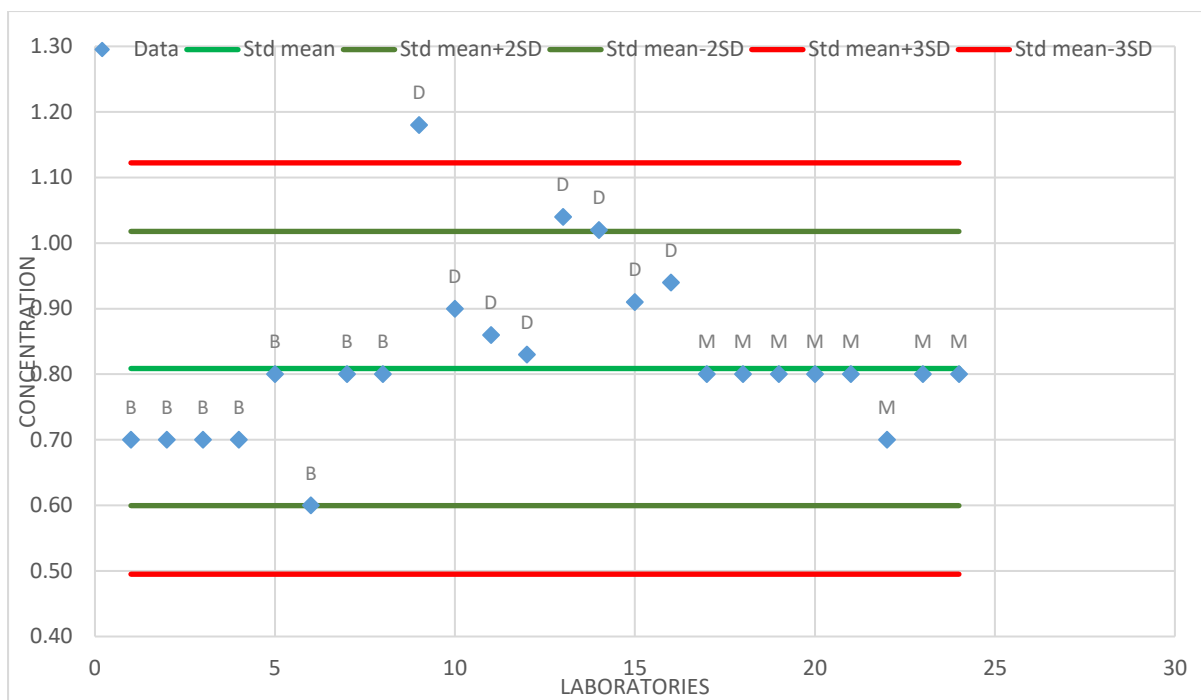
Note: 3 out of 32 results are rejected as outliers using z score

10.56 Tin by 4 acid multi digest finished with ICP- Sn 4A\_MICP

Lab_ID	Z_Score	Data
B	-0.98	0.70
B	-0.98	0.70
B	-0.98	0.70
B	-0.98	0.70
B	-0.19	0.80
B	-1.76	0.60
B	-0.19	0.80
B	-0.19	0.80
D	2.80	1.18
D	0.60	0.90
D	0.28	0.86
D	0.05	0.83
D	1.70	1.04
D	1.54	1.02
D	0.67	0.91
D	0.91	0.94
M	-0.19	0.80
M	-0.19	0.80
M	-0.19	0.80
M	-0.19	0.80
M	-0.19	0.80
M	-0.19	0.80
M	-0.98	0.70
M	-0.19	0.80
M	-0.19	0.80

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sn	4A_MICP	24	0.824	0.127	15.443	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Sn	4A_MICP	B	8	0.725	0.071	0.098	9.753
Sn	4A_MICP	D	8	0.960	0.115	0.119	11.929
Sn	4A_MICP	M	8	0.788	0.035	0.045	4.490
<b>Average</b>				<b>0.824</b>	<b>0.080</b>	<b>0.087</b>	<b>8.724</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sn	4A_MICP	23	0.809	0.105	12.928	ppm

Std mean	0.809
SD	0.105
2SD	0.209
3SD	0.314
Std mean+2SD	1.018
Std mean-2SD	0.600
Std mean+3SD	1.122
Std mean-3SD	0.495

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Sn	4A_MICP	0.093	0.025	0.159	0.063	ppm

Note: 1 out of 24 results are rejected as outliers using z score

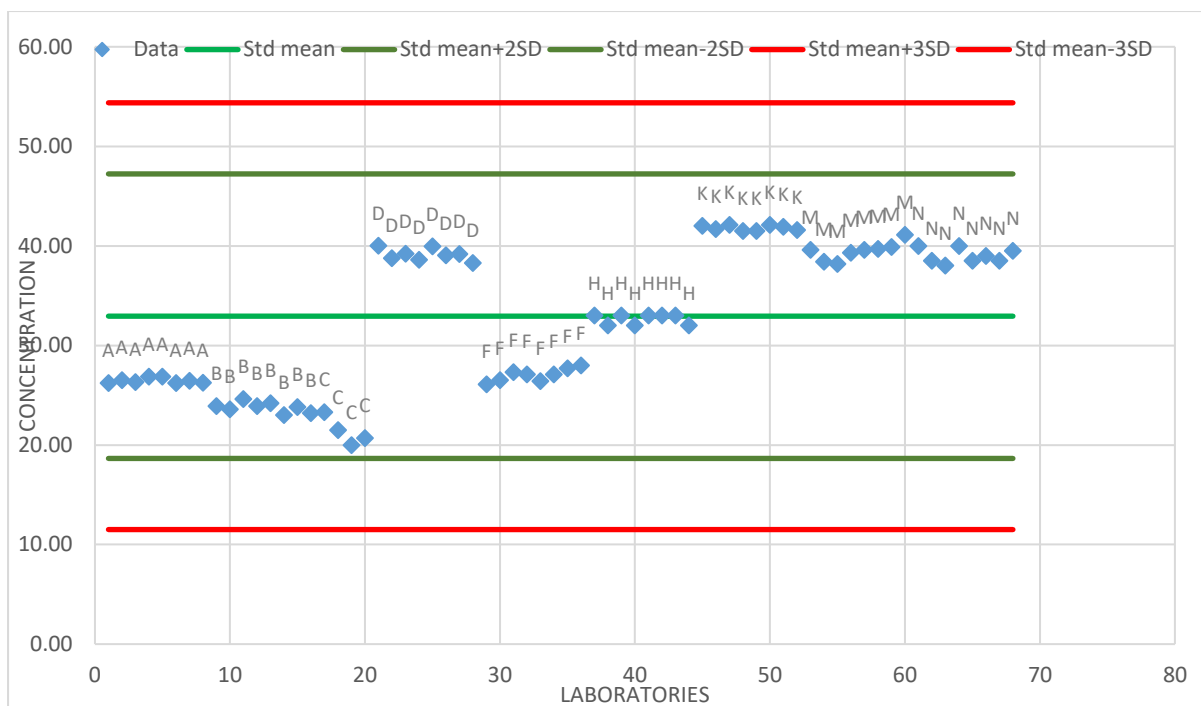


10.57 Strontium by 4 acid multi digest finished with ICP- Sr 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
A	-0.94	26.22	D	0.99	40.01	H	0.01	33.00	N	0.99	40.00
A	-0.90	26.51	D	0.82	38.77	H	0.01	33.00	N	0.78	38.50
A	-0.93	26.33	D	0.88	39.22	H	0.01	33.00	N	0.71	38.00
A	-0.85	26.87	D	0.79	38.61	H	-0.13	32.00	N	0.99	40.00
A	-0.85	26.86	D	0.98	39.95	K	1.27	42.00	N	0.78	38.50
A	-0.94	26.22	D	0.86	39.05	K	1.23	41.70	N	0.85	39.00
A	-0.91	26.43	D	0.87	39.19	K	1.28	42.10	N	0.78	38.50
A	-0.94	26.24	D	0.75	38.29	K	1.20	41.50	N	0.92	39.50
B	-1.27	23.90	F	-0.96	26.10	K	1.20	41.50			
B	-1.31	23.60	F	-0.90	26.50	K	1.28	42.10			
B	-1.17	24.60	F	-0.79	27.30	K	1.25	41.90			
B	-1.27	23.90	F	-0.82	27.10	K	1.21	41.60			
B	-1.22	24.20	F	-0.92	26.40	M	0.93	39.60			
B	-1.39	23.00	F	-0.82	27.10	M	0.76	38.40			
B	-1.28	23.80	F	-0.73	27.70	M	0.74	38.20			
B	-1.36	23.20	F	-0.69	28.00	M	0.89	39.30			
C	-1.35	23.30	H	0.01	33.00	M	0.93	39.60			
C	-1.60	21.50	H	-0.13	32.00	M	0.95	39.70			
C	-1.81	20.00	H	0.01	33.00	M	0.97	39.90			
C	-1.71	20.70	H	-0.13	32.00	M	1.14	41.10			

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sr	4A_MICP	68	32.939	7.145	21.691	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Sr	4A_MICP	A	8	26.460	0.270	0.010	1.021
Sr	4A_MICP	B	8	23.775	0.515	0.022	2.165
Sr	4A_MICP	C	4	21.375	1.422	0.067	6.653
Sr	4A_MICP	D	8	39.136	0.606	0.015	1.548
Sr	4A_MICP	F	8	27.025	0.656	0.024	2.428
Sr	4A_MICP	H	8	32.625	0.518	0.016	1.586
Sr	4A_MICP	K	8	41.800	0.256	0.006	0.613
Sr	4A_MICP	M	8	39.475	0.904	0.023	2.289
Sr	4A_MICP	N	8	39.000	0.756	0.019	1.938
		<b>Average</b>		<b>32.297</b>	<b>0.675</b>	<b>0.022</b>	<b>2.249</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Sr	4A_MICP	68	32.939	7.145	21.691	ppm

Std mean	32.939
SD	7.145
2SD	14.290
3SD	21.434
Std mean+2SD	47.229
Std mean-2SD	18.650
Std mean+3SD	54.374
Std mean-3SD	11.505

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Sr	4A_MICP	2.289	47.092	6.862	0.665	ppm

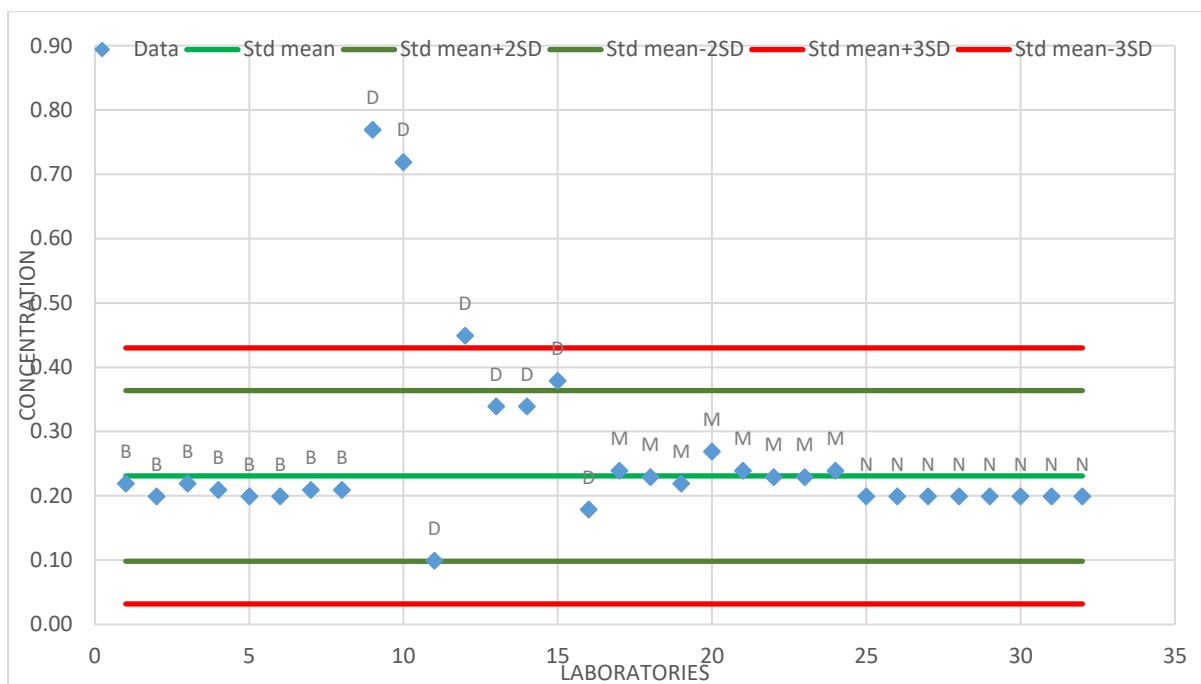
Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

10.58 Tantalum by 4 acid multi digest finished with ICP- Ta 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.31	0.22	M	-0.17	0.24
B	-0.45	0.20	M	-0.24	0.23
B	-0.31	0.22	M	-0.31	0.22
B	-0.38	0.21	M	0.04	0.27
B	-0.45	0.20	M	-0.17	0.24
B	-0.45	0.20	M	-0.24	0.23
B	-0.38	0.21	M	-0.24	0.23
B	-0.38	0.21	M	-0.17	0.24
D	3.57	0.77	N	-0.45	0.20
D	3.22	0.72	N	-0.45	0.20
D	-1.16	0.10	N	-0.45	0.20
D	1.31	0.45	N	-0.45	0.20
D	0.54	0.34	N	-0.45	0.20
D	0.54	0.34	N	-0.45	0.20
D	0.82	0.38	N	-0.45	0.20
D	-0.59	0.18	N	-0.45	0.20

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ta	4A_MICP	32	0.264	0.142	53.658	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Ta	4A_MICP	B	8	0.209	0.008	0.040	3.998
Ta	4A_MICP	D	8	0.410	0.235	0.573	57.349
Ta	4A_MICP	M	8	0.238	0.015	0.063	6.265
Ta	4A_MICP	N	8	0.200	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.264</b>	<b>0.118</b>	<b>0.169</b>	<b>16.903</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Ta	4A_MICP	30	0.232	0.066	28.601	ppm

Std mean	0.232
SD	0.066
2SD	0.133
3SD	0.199
Std mean+2SD	0.365
Std mean-2SD	0.099
Std mean+3SD	0.431
Std mean-3SD	0.033

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Ta	4A_MICP	0.027	0.002	0.049	0.058	ppm

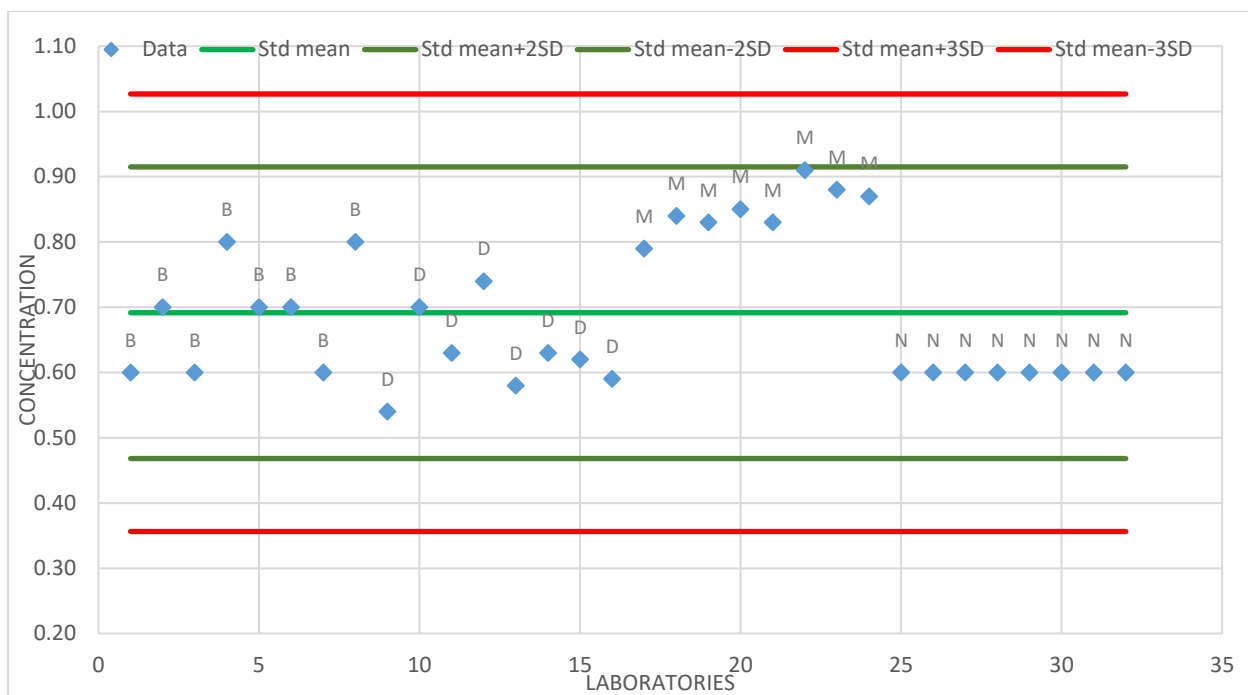
Note: 2 out of 32 results are rejected as outliers using z score

10.59 Tellurium by 4 acid multi digest finished with ICP- Te 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.82	0.60	M	0.88	0.79
B	0.08	0.70	M	1.33	0.84
B	-0.82	0.60	M	1.24	0.83
B	0.97	0.80	M	1.42	0.85
B	0.08	0.70	M	1.24	0.83
B	0.08	0.70	M	1.95	0.91
B	-0.82	0.60	M	1.69	0.88
B	0.97	0.80	M	1.60	0.87
D	-1.36	0.54	N	-0.82	0.60
D	0.08	0.70	N	-0.82	0.60
D	-0.55	0.63	N	-0.82	0.60
D	0.43	0.74	N	-0.82	0.60
D	-1.00	0.58	N	-0.82	0.60
D	-0.55	0.63	N	-0.82	0.60
D	-0.64	0.62	N	-0.82	0.60
D	-0.91	0.59	N	-0.82	0.60

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Te	4A_MICP	32	0.692	0.112	16.157	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Te	4A_MICP	B	8	0.688	0.083	0.121	12.139
Te	4A_MICP	D	8	0.629	0.065	0.103	10.288
Te	4A_MICP	M	8	0.850	0.037	0.043	4.311
Te	4A_MICP	N	8	0.600	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.692</b>	<b>0.056</b>	<b>0.067</b>	<b>6.684</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Te	4A_MICP	32	0.692	0.112	16.157	ppm

Std mean	0.692
SD	0.112
2SD	0.223
3SD	0.335
Std mean+2SD	0.915
Std mean-2SD	0.468
Std mean+3SD	1.027
Std mean-3SD	0.356

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Te	4A_MICP	0.112	0.037	0.193	0.065	ppm

Note: All results are within the mean+/- SD, no results are rejected as outliers using z score

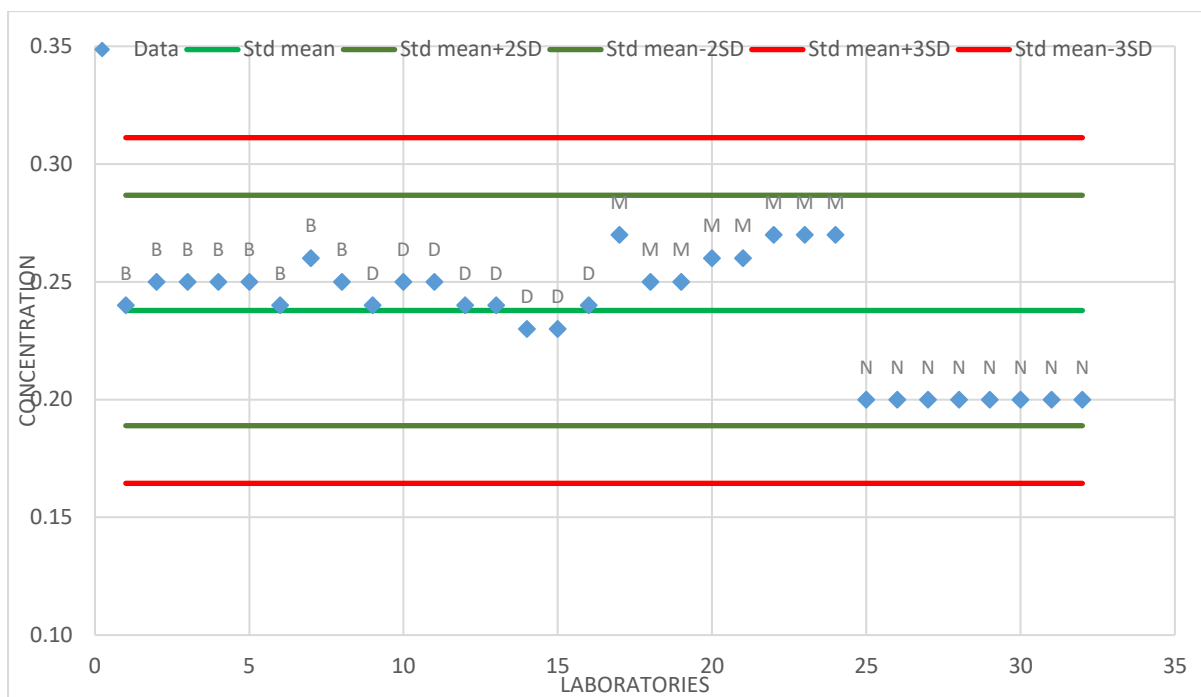
10.60 Thallium by 4 acid multi digest finished with ICP- TI 4A\_MICP

Lab_ID	Z_Score	Data
B	0.09	0.24
B	0.50	0.25
B	0.50	0.25
B	0.50	0.25
B	0.50	0.25
B	0.09	0.24
B	0.91	0.26
B	0.50	0.25
D	0.09	0.24
D	0.50	0.25
D	0.50	0.25
D	0.09	0.24
D	0.09	0.24
D	-0.32	0.23
D	-0.32	0.23
D	0.09	0.24

Lab_ID	Z_Score	Data
M	1.32	0.27
M	0.50	0.25
M	0.50	0.25
M	0.91	0.26
M	0.91	0.26
M	1.32	0.27
M	1.32	0.27
M	1.32	0.27
N	-1.55	0.20
N	-1.55	0.20
N	-1.55	0.20
N	-1.55	0.20
N	-1.55	0.20
N	-1.55	0.20
N	-1.55	0.20

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
TI	4A_MICP	32	0.238	0.024	10.285	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
TI	4A_MICP	B	8	0.249	0.006	0.026	2.576
TI	4A_MICP	D	8	0.240	0.008	0.031	3.150
TI	4A_MICP	M	8	0.263	0.009	0.034	3.377
TI	4A_MICP	N	8	0.200	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.238</b>	<b>0.007</b>	<b>0.023</b>	<b>2.276</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
TI	4A_MICP	32	0.238	0.024	10.285	ppm

Std mean	0.238
SD	0.024
2SD	0.049
3SD	0.073
Std mean+2SD	0.287
Std mean-2SD	0.189
Std mean+3SD	0.311
Std mean-3SD	0.164

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
TI	4A_MICP	0.019	0.001	0.038	0.007	ppm

Note: All results are within the mean+- SD, no results are rejected as outliers using z score

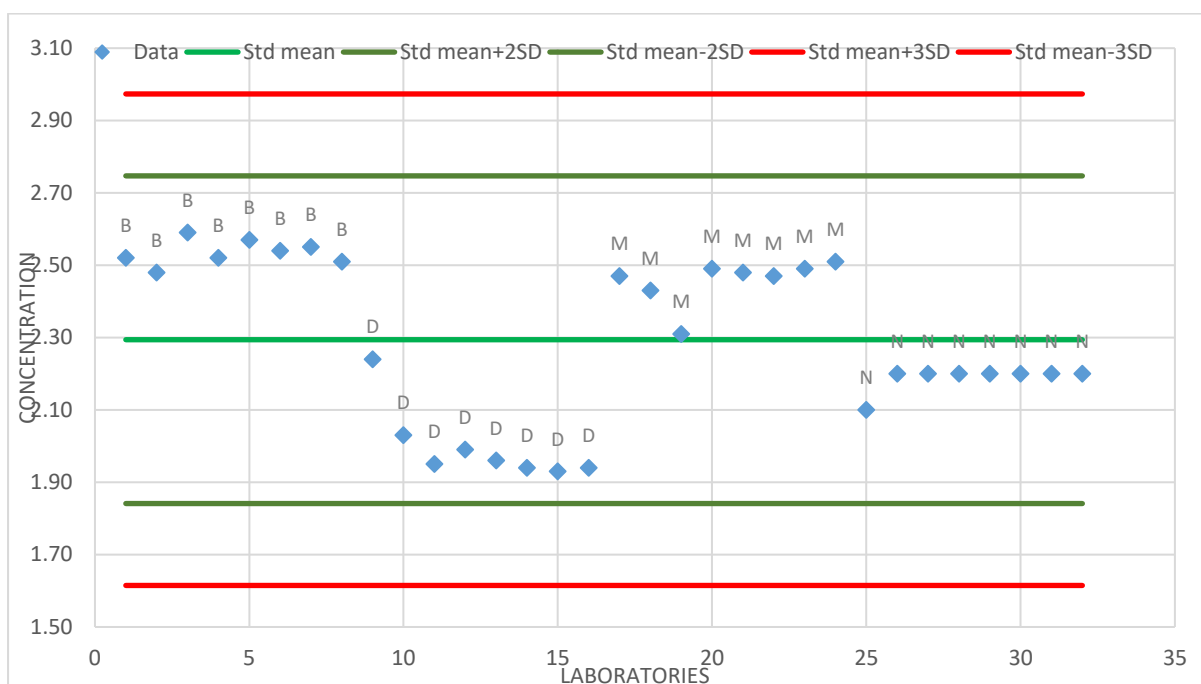


10.61 Thorium by 4 acid multi digest finished with ICP- Th 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	1.00	2.52	M	0.78	2.47
B	0.82	2.48	M	0.60	2.43
B	1.31	2.59	M	0.07	2.31
B	1.00	2.52	M	0.87	2.49
B	1.22	2.57	M	0.82	2.48
B	1.09	2.54	M	0.78	2.47
B	1.13	2.55	M	0.87	2.49
B	0.95	2.51	M	0.95	2.51
D	-0.24	2.24	N	-0.86	2.10
D	-1.17	2.03	N	-0.42	2.20
D	-1.52	1.95	N	-0.42	2.20
D	-1.34	1.99	N	-0.42	2.20
D	-1.48	1.96	N	-0.42	2.20
D	-1.56	1.94	N	-0.42	2.20
D	-1.61	1.93	N	-0.42	2.20
D	-1.56	1.94	N	-0.42	2.20

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Th	4A_MICP	32	2.294	0.226	9.871	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Th	4A_MICP	B	8	2.535	0.035	0.014	1.383
Th	4A_MICP	D	8	1.998	0.103	0.052	5.173
Th	4A_MICP	M	8	2.456	0.063	0.026	2.583
Th	4A_MICP	N	8	2.188	0.035	0.016	1.616
<b>Average</b>				<b>2.294</b>	<b>0.066</b>	<b>0.027</b>	<b>2.689</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Th	4A_MICP	32	2.294	0.226	9.871	ppm

Std mean	2.294
SD	0.226
2SD	0.453
3SD	0.679
Std mean+2SD	2.747
Std mean-2SD	1.841
Std mean+3SD	2.973
Std mean-3SD	1.615

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Th	4A_MICP	0.175	0.121	0.348	0.066	ppm

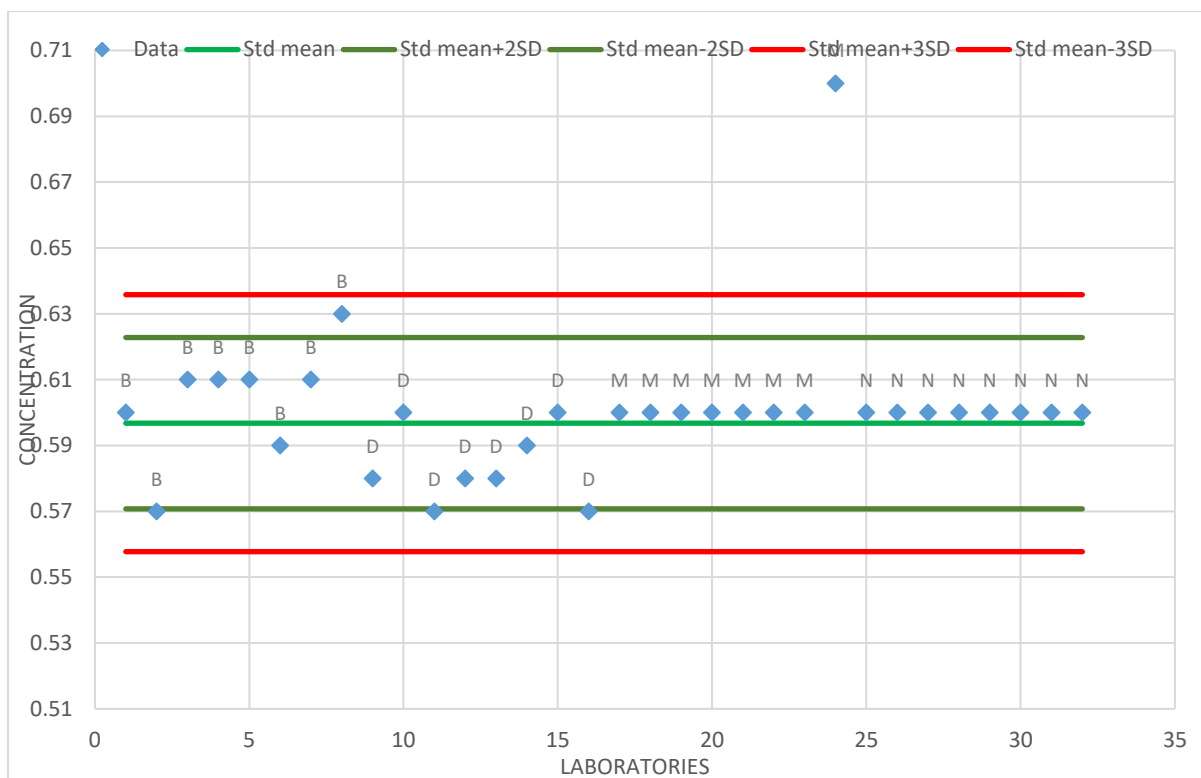
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.62 Uranium by 4 acid multi digest finished with ICP- U 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.00	0.60	M	0.00	0.60
B	-1.35	0.57	M	0.00	0.60
B	0.45	0.61	M	0.00	0.60
B	0.45	0.61	M	0.00	0.60
B	0.45	0.61	M	0.00	0.60
B	-0.45	0.59	M	0.00	0.60
B	0.45	0.61	M	0.00	0.60
B	1.35	0.63	M	0.00	0.60
D	-0.90	0.58	M	4.49	0.70
D	0.00	0.60	N	0.00	0.60
D	-1.35	0.57	N	0.00	0.60
D	-0.90	0.58	N	0.00	0.60
D	-0.90	0.58	N	0.00	0.60
D	-0.45	0.59	N	0.00	0.60
D	0.00	0.60	N	0.00	0.60
D	-1.35	0.57	N	0.00	0.60

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
U	4A_MICP	32	0.600	0.022	3.715	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
U	4A_MICP	B	8	0.604	0.018	0.029	2.928
U	4A_MICP	D	8	0.584	0.012	0.020	2.035
U	4A_MICP	M	8	0.613	0.035	0.058	5.772
U	4A_MICP	N	8	0.600	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.600</b>	<b>0.021</b>	<b>0.027</b>	<b>2.684</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
U	4A_MICP	31	0.597	0.013	2.180	ppm

Std mean	0.597
SD	0.013
2SD	0.026
3SD	0.039
Std mean+2SD	0.623
Std mean-2SD	0.571
Std mean+3SD	0.636
Std mean-3SD	0.558

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
U	4A_MICP	0.020	0.001	0.028	0.015	ppm

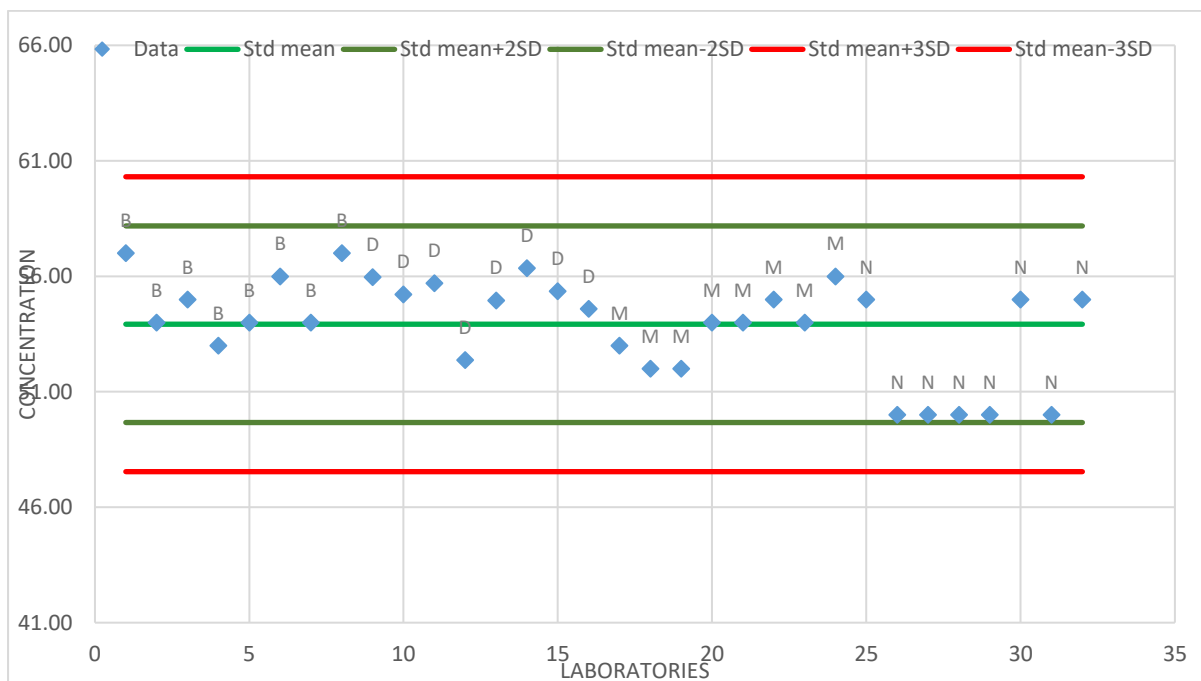
Note: 1 out of 32 results are rejected as outliers using z score

10.63 Vanadium by 4 acid multi digest finished with ICP- V 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	1.45	57.00	M	-0.43	53.00
B	0.04	54.00	M	-0.90	52.00
B	0.51	55.00	M	-0.90	52.00
B	-0.43	53.00	M	0.04	54.00
B	0.04	54.00	M	0.04	54.00
B	0.98	56.00	M	0.51	55.00
B	0.04	54.00	M	0.04	54.00
B	1.45	57.00	M	0.98	56.00
D	0.96	55.97	N	0.51	55.00
D	0.61	55.22	N	-1.84	50.00
D	0.83	55.70	N	-1.84	50.00
D	-0.73	52.38	N	-1.84	50.00
D	0.49	54.96	N	-1.84	50.00
D	1.14	56.36	N	0.51	55.00
D	0.68	55.36	N	-1.84	50.00
D	0.32	54.60	N	0.51	55.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
V	4A_MICP	32	53.923	2.128	3.947	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
V	4A_MICP	B	8	55.000	1.512	0.027	2.749
V	4A_MICP	D	8	55.069	1.222	0.022	2.218
V	4A_MICP	M	8	53.750	1.389	0.026	2.584
V	4A_MICP	N	8	51.875	2.588	0.050	4.988
<b>Average</b>				<b>53.923</b>	<b>1.761</b>	<b>0.031</b>	<b>3.135</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
V	4A_MICP	32	53.923	2.128	3.947	ppm

Std mean	53.923
SD	2.128
2SD	4.256
3SD	6.384
Std mean+2SD	58.180
Std mean-2SD	49.667
Std mean+3SD	60.308
Std mean-3SD	47.539

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
V	4A_MICP	1.010	3.689	1.921	1.761	ppm

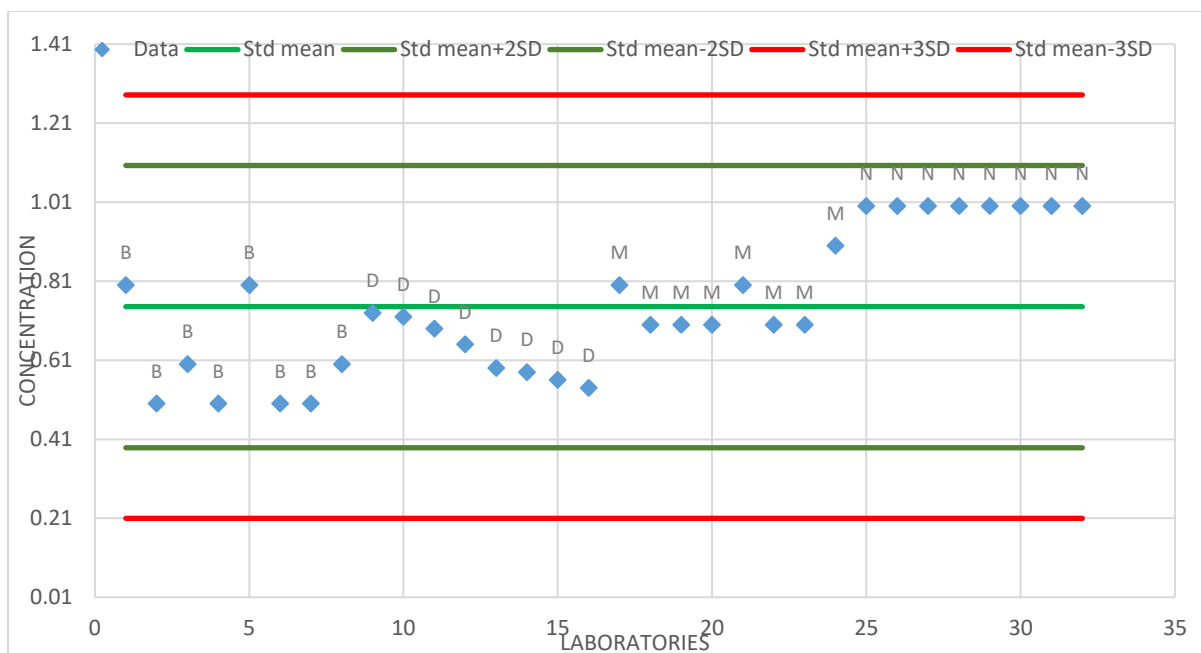
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.64 Tungsten by 4 acid multi digest finished with ICP- W 4A\_MICP

Standardid	Z_Score	Data	Lab_ID	Z_Score	Data
B	0.30	0.80	M	0.30	0.80
B	-1.38	0.50	M	-0.26	0.70
B	-0.82	0.60	M	-0.26	0.70
B	-1.38	0.50	M	-0.26	0.70
B	0.30	0.80	M	0.30	0.80
B	-1.38	0.50	M	-0.26	0.70
B	-1.38	0.50	M	-0.26	0.70
B	-0.82	0.60	M	0.86	0.90
D	-0.09	0.73	N	1.42	1.00
D	-0.14	0.72	N	1.42	1.00
D	-0.31	0.69	N	1.42	1.00
D	-0.54	0.65	N	1.42	1.00
D	-0.87	0.59	N	1.42	1.00
D	-0.93	0.58	N	1.42	1.00
D	-1.04	0.56	N	1.42	1.00
D	-1.15	0.54	N	1.42	1.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
W	4A_MICP	32	0.746	0.179	23.955	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
W	4A_MICP	B	8	0.600	0.131	0.218	21.822
W	4A_MICP	D	8	0.633	0.075	0.118	11.824
W	4A_MICP	M	8	0.750	0.076	0.101	10.079
W	4A_MICP	N	8	1.000	<0.001	<0.001	<0.001
<b>Average</b>				<b>0.746</b>	<b>0.084</b>	<b>0.109</b>	<b>10.931</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
W	4A_MICP	32	0.746	0.179	23.955	ppm

Std mean	0.746
SD	0.179
2SD	0.357
3SD	0.536
Std mean+2SD	1.103
Std mean-2SD	0.388
Std mean+3SD	1.281
Std mean-3SD	0.210

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
W	4A_MICP	0.120	0.042	0.205	0.097	ppm

Note: All results are within the mean+- SD, no results are rejected as outliers using z score

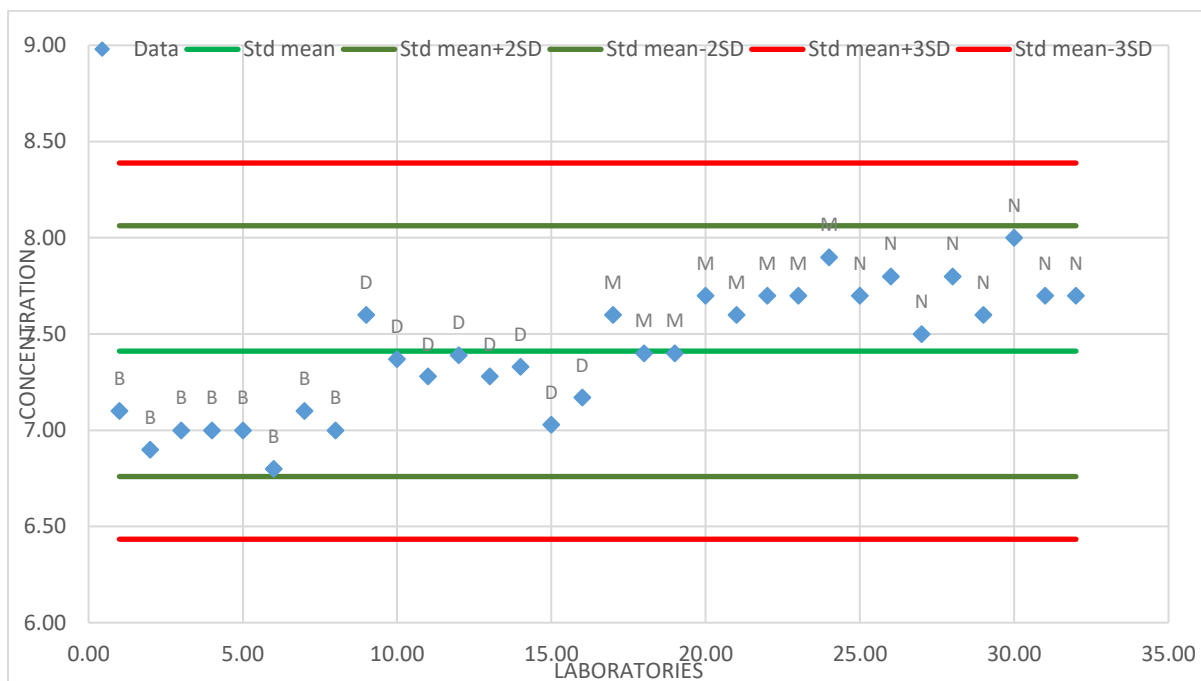


10.65 Yttrium by 4 acid multi digest finished with ICP- Y 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.95	7.10	M	0.58	7.60
B	-1.57	6.90	M	-0.03	7.40
B	-1.26	7.00	M	-0.03	7.40
B	-1.26	7.00	M	0.89	7.70
B	-1.26	7.00	M	0.58	7.60
B	-1.88	6.80	M	0.89	7.70
B	-0.95	7.10	M	0.89	7.70
B	-1.26	7.00	M	1.50	7.90
D	0.58	7.60	N	0.89	7.70
D	-0.13	7.37	N	1.19	7.80
D	-0.40	7.28	N	0.27	7.50
D	-0.06	7.39	N	1.19	7.80
D	-0.40	7.28	N	0.58	7.60
D	-0.25	7.33	N	1.81	8.00
D	-1.17	7.03	N	0.89	7.70
D	-0.74	7.17	N	0.89	7.70

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Y	4A_MICP	32	7.411	0.326	4.396	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Y	4A_MICP	B	8	6.988	0.099	0.014	1.418
Y	4A_MICP	D	8	7.306	0.167	0.023	2.280
Y	4A_MICP	M	8	7.625	0.167	0.022	2.189
Y	4A_MICP	N	8	7.725	0.149	0.019	1.926
<b>Average</b>				<b>7.411</b>	<b>0.148</b>	<b>0.020</b>	<b>1.953</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_ %	Unit
Y	4A_MICP	32	7.411	0.326	4.396	ppm

Std mean	7.411
SD	0.326
2SD	0.652
3SD	0.977
Std mean+2SD	8.063
Std mean-2SD	6.759
Std mean+3SD	8.388
Std mean-3SD	6.434

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Y	4A_MICP	0.235	0.218	0.467	0.148	ppm

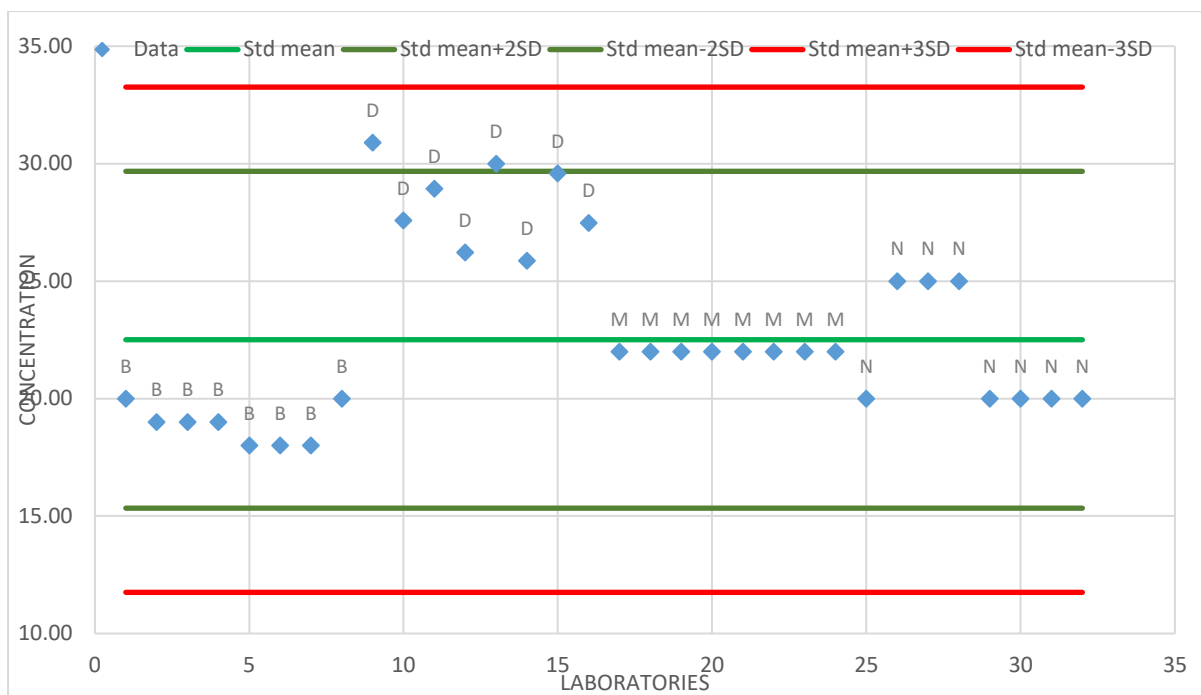
Note: All results are within the mean $\pm$  SD, no results are rejected as outliers using z score

10.66 Zinc by 4 acid multi digest finished with ICP- Zn 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.72	20.00	M	-0.20	22.00
B	-0.98	19.00	M	-0.20	22.00
B	-0.98	19.00	M	-0.20	22.00
B	-0.98	19.00	M	-0.20	22.00
B	-1.25	18.00	M	-0.20	22.00
B	-1.25	18.00	M	-0.20	22.00
B	-1.25	18.00	M	-0.20	22.00
B	-0.72	20.00	M	-0.20	22.00
D	2.13	30.90	N	-0.72	20.00
D	1.26	27.58	N	0.58	25.00
D	1.61	28.93	N	0.58	25.00
D	0.90	26.22	N	0.58	25.00
D	1.89	30.00	N	-0.72	20.00
D	0.81	25.86	N	-0.72	20.00
D	1.78	29.58	N	-0.72	20.00
D	1.23	27.48	N	-0.72	20.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Zn	4A_MICP	32	22.767	3.826	16.804	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Zn	4A_MICP	B	8	18.875	0.835	0.044	4.421
Zn	4A_MICP	D	8	28.319	1.819	0.064	6.422
Zn	4A_MICP	M	8	22.000	<0.001	<0.001	<0.001
Zn	4A_MICP	N	8	21.875	2.588	0.118	11.830
<b>Average</b>				<b>22.767</b>	<b>1.636</b>	<b>0.057</b>	<b>5.668</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Zn	4A_MICP	31	22.505	3.584	15.928	ppm

Std mean	22.505
SD	3.584
2SD	7.169
3SD	10.753
Std mean+2SD	29.674
Std mean-2SD	15.336
Std mean+3SD	33.258
Std mean-3SD	11.751

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Zn	4A_MICP	4.164	51.567	7.181	1.834	ppm

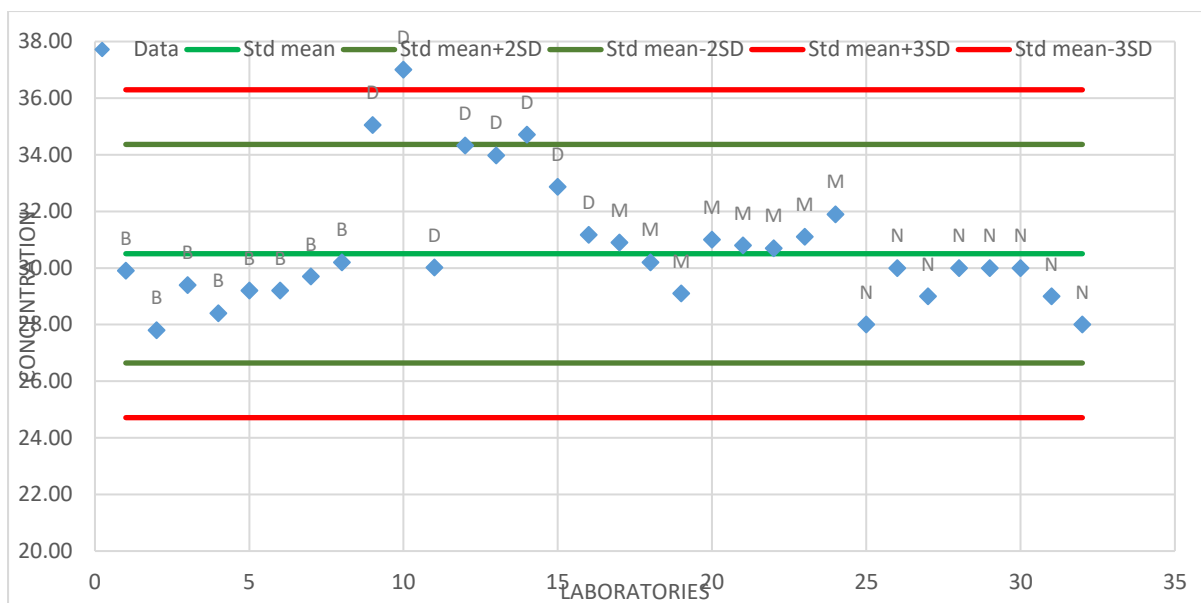
Note: 1 out of 32 results are rejected as outliers using z score, all results are within the mean +- 3SD

10.67 Zirconium by 4 acid multi digest finished with ICP- Zr 4A\_MICP

Lab_ID	Z_Score	Data	Lab_ID	Z_Score	Data
B	-0.36	29.90	M	0.09	30.90
B	-1.31	27.80	M	-0.23	30.20
B	-0.59	29.40	M	-0.72	29.10
B	-1.04	28.40	M	0.13	31.00
B	-0.68	29.20	M	0.04	30.80
B	-0.68	29.20	M	0.00	30.70
B	-0.45	29.70	M	0.18	31.10
B	-0.23	30.20	M	0.54	31.90
D	1.96	35.05	N	-1.22	28.00
D	2.84	37.01	N	-0.32	30.00
D	-0.31	30.02	N	-0.77	29.00
D	1.63	34.33	N	-0.32	30.00
D	1.47	33.98	N	-0.32	30.00
D	1.80	34.71	N	-0.32	30.00
D	0.97	32.87	N	-0.77	29.00
D	0.21	31.17	N	-1.22	28.00

Results with outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Zr	4A_MICP	32	30.708	2.220	7.230	ppm

Between Laboratory Statistics							
Element	Gen Method	Lab ID	N	LAB_Mean	LAB_SD	RSD	RSD_%
Zr	4A_MICP	B	8	29.225	0.791	0.027	2.705
Zr	4A_MICP	D	8	33.643	2.232	0.066	6.635
Zr	4A_MICP	M	8	30.713	0.806	0.026	2.625
Zr	4A_MICP	N	8	29.250	0.886	0.030	3.030
<b>Average</b>				<b>30.708</b>	<b>1.327</b>	<b>0.037</b>	<b>3.749</b>



Results without outliers						
Element	Gen Method	N	Std_Mean	SD	RSD_%	Unit
Zr	4A_MICP	31	30.504	1.930	6.328	ppm

Std mean	30.504
SD	1.930
2SD	3.861
3SD	5.791
Std mean+2SD	34.365
Std mean-2SD	26.643
Std mean+3SD	36.295
Std mean-3SD	24.713

Measurement of uncertainty						
Element	Gen Method	CSU	BtwnLabVar	BtwnLabSD	WithinLabSD	Unit
Zr	4A_MICP	1.237	5.951	2.439	1.160	ppm

Note: 1 out of 32 results are rejected as outliers using z score

**End of report**