Test Group Summary Report
C17 Metals in Soil
January 2026 PT Round

Issued: March 2, 2026

PTC | Proficiency Testing Canada

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1.0 The Proficiency Testing Report

The Proficiency Testing Report consists of two parts.

- *PTC Proficiency Testing Report*: This report contains participant-specific data and other confidential information. This report is emailed to participants at the end of the PT round.
- *Test Group Summary Report*: A Test Group Summary Report is created for each quantified test group at the end of the PT round. These reports contain more detailed information on the round than is found in the participant-specific PTC Proficiency Testing Report. These reports do not contain any confidential information and are made available on the PTC web site.

2.0 Definitions

The participant-specific PTC Proficiency Testing Report contains some terms that new participants may not be familiar with.

Code:	The registration code that is unique to each analyte that a participant is registered for.
App:	If a participant is accredited by CALA, this three-digit number is the appendix number that the accredited method is assigned to.
N:	The number of participants results that were used to calculate the summary statistics. This excludes qualified data (e.g., <) and any results that were flagged as outliers.
Assigned:	The Assigned Value is the robust mean of the reported results, outliers excluded. This is often referred to as the "target" value.
± u:	The uncertainty of the assigned value.
Reported:	The result reported by the participant.
s:	The Standard Deviation of Proficiency Assessment (SDPA). This value is used to determine the acceptance limits for the PT evaluation.
z-Score:	A value assigned to each reported result that is a measure of the degree to which it deviates from the Assigned Value.
Score:	The composite score of the four results reported for each analyte. It is normalized to a score out of 100.
Bias:	A flag assigned if bias is detected using the re-scaled *z*-score procedure.

3.0 Scoring System

Participant performance is evaluated for each proficiency testing sample by a quantitative method that is consistent with ISO/IEC 17043 - *Conformity assessment- General requirements for the competence of proficiency testing providers*, the *International Harmonized Protocol for Proficiency Testing of (Chemical) Analytical Laboratories* (2006), and ISO 13528:2015 *Statistical methods for use in proficiency testing by interlaboratory comparisons*.

The following is a brief description of the evaluation procedure used by PTC. The detailed evaluation procedure is described in PROC09 – PT Evaluation *Procedure*, which is available on the PTC website www.PTCanada.org).

3.1 HOMOGENEITY AND STABILITY ASSESSMENT

Homogeneity and stability are assessed using participant data. Regression analysis is performed on reported result against order of sample production (Homogeneity) and reported result against date of analysis (Stability). If the slope is significantly different than zero for either then the Standard Deviation of Proficiency Assessment (s) is increased to minimize the impact.

3.2 THE Z SCORE

A "z-score" is calculated for each reported result as follows:

$$z - Score = \frac{(x - \bar{X})}{SDPA}$$

where: x = participant result;
$\overline{X}$ = the Assigned Value;
SDPA = the Standard Deviation for Proficiency Assessment.

The assigned value $\overline{X}$ is generally estimated from the inter-laboratory Robust mean after outliers due to obvious gross errors (e.g., reported in wrong units) have been removed.

The Standard Deviation for Proficiency Assessment, s, is determined as follows:

- The inter-laboratory Robust standard deviation ($Stdev_{rob}$) is calculated using reported results, obvious outliers removed;
- The regression equation standard deviation ($Stdev_{reg}$) is estimated from regression equations derived from previous studies (see PROC11- *PT Regression Equations* for details);
- The SDPA is the higher of $Stdev_{rob}$ and $Stdev_{reg}$;
- When a laboratory reports its detection limit, s will be estimated using a pooled variance procedure that uses both the inter-laboratory data and the reported detection limit.

3.2 COMPOSITE (PT) SCORE

Since each PT round involves four or two separate samples of distinct concentration for each test, it is necessary to calculate a composite PT score for each test to determine overall performance. The composite score is calculated by first averaging the absolute z-scores for the four results and then calculating a final score as 100 + (-15 x avg |z|).

Acceptable PT Scores equal or exceed 70.

3.3 IDENTIFYING BIAS

The proficiency testing report provides flags for bias. These are determined using the re-scaled z-score procedure.

$$RSZ = \frac{\sum z}{\sqrt{N}}$$

where z = the z- score
N = the number of samples

Flags are assigned for each test group/parameter combination as follows:

RSZ $\geq$ -2 and $\leq$ 2 no flag assigned

RSZ > 2	H (High)
RSZ > 3	VH (Very High)
RSZ < -2	L (LOW)
RSZ < -3	VL (Very Low)

3.4 DEVIATIONS FROM EVALUATION PROCEDURE

Other than changes to the Standard Deviation of Proficiency Assessment due to homogeneity or stability flags, any deviation from the published evaluation procedure is described on the cover page(s) of the final *PTC Proficiency Testing Report*.

4.0 PT Round Specific Data Summary

The following pages provide more detailed information about the PT round indicated in the cover page of this report than is found in the participant-specific PTC Proficiency Testing Report. The graphical representations and the statistical summaries are based upon the data after outliers have been removed.

4.1 SUMMARY STATISTICS

In addition to some of the statistics found in the customer reports, this table includes additional summary statistics such as Median, different measures of dispersion, the number of outliers removed, the number of results in the Questionable range (|z| between 2 and 3) and the Unacceptable range (z > 3), and whether a data set was flagged for Homogeneity or Stability. This section also includes sorted scatter plots of the data for each sample.

4.2 *z* - SCORE PLOTS

The z -scores for each sample are ranked in increasing order and plotted. When the data is normally distributed, the plot should show a slight sigmoidal curve, with an equal number of points above zero as below. Each bar in these plots is colour-coded to indicate the analytical method used by the participant.

4.3 KERNEL DENSITY PLOTS

Kernel density plots are generated for each data set. These plots are a graphical way to represent the overall data distribution and are used to visualize possible deviations from normality and unimodality.

4.4 STABILITY AND HOMOGENEITY PLOTS

Plots of reported result against analysis date, and reported result against order of bottling are displayed, along with the regression line. These regression analyses are used to determine if the SDPA should be adjusted due to homogeneity or stability.

4.5 BOX-AND-WHISKER PLOTS

Box-and-Whisker plots are another way to display the distribution of the data. The box denotes the first and third quartile and the whiskers are the 5th and 95th percentile.

4.6 HISTORIC COMPARISON PLOT

The Historic Comparison Plot is a plot of robust mean against robust standard deviation for the previous ten PT rounds as well as the current PT round. This plot can be used to identify possible changes in the sample formulation.

Aluminum

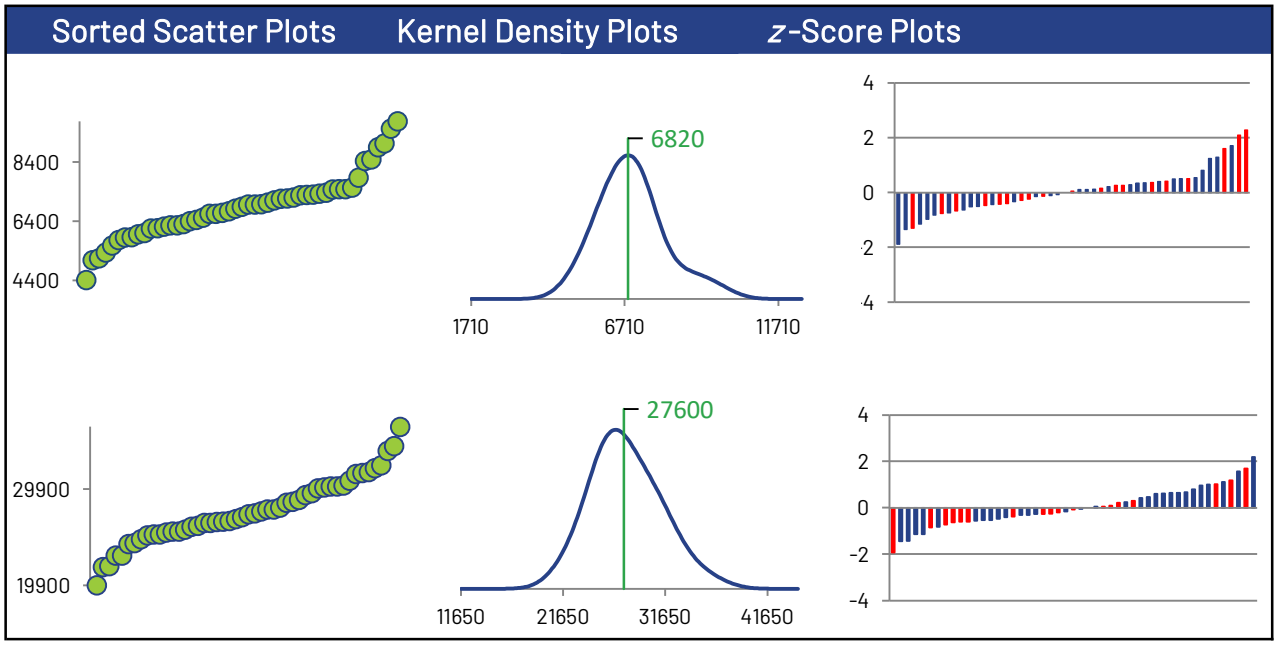
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	49	49	48	48
Median µg/g	6880	27300	45900	26400
Robust Mean µg/g	6820	27600	45900	26400
Uncdrtainty of the Assigned Value µg/g	169	595	821	458
Robust Standard Deviation µg/g	947	3330	4550	2540
Regression Standard Deviation µg/g	1290	4020	6410	3860
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	1290	4020	6410	3860
Flagged Outliers	0	0	1	1
|z|>3.0	0	0	0	0
2<|z|<3	2	1	2	0
Failure Rate %*	2.0			

Methods Used

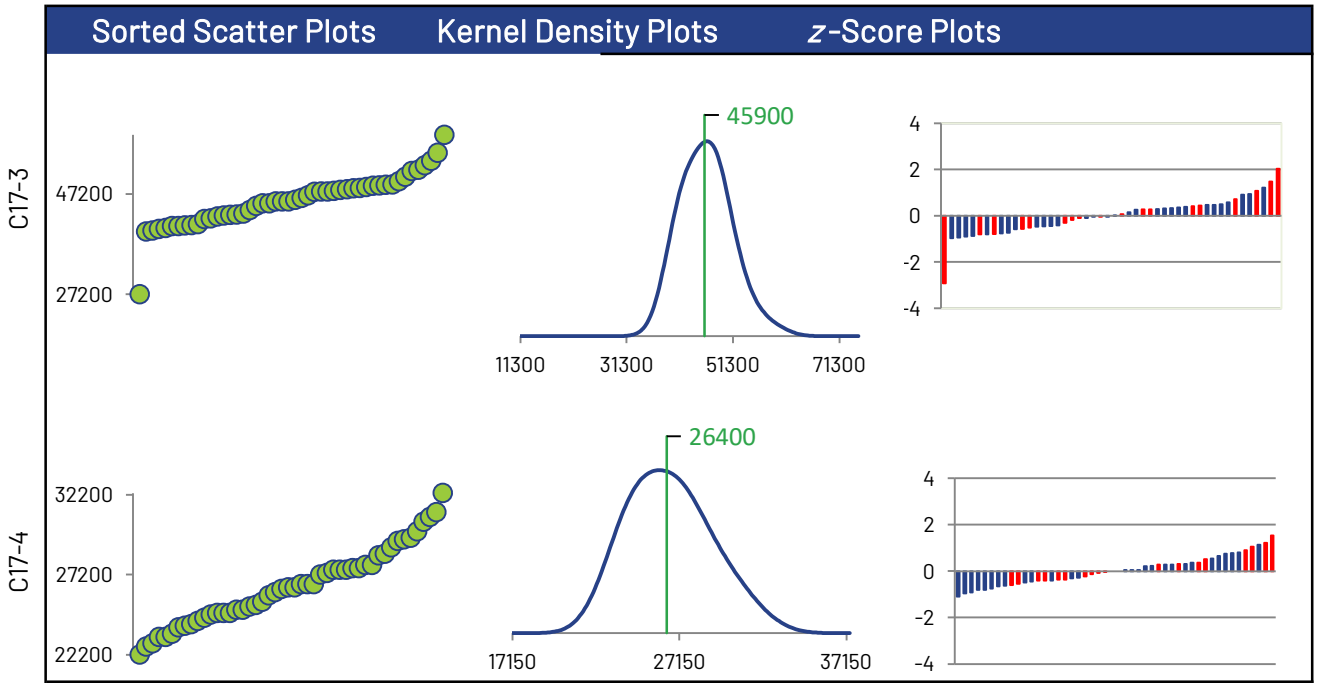
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	30	30	30	30
ICP/OES (Red)	19	19	18	18

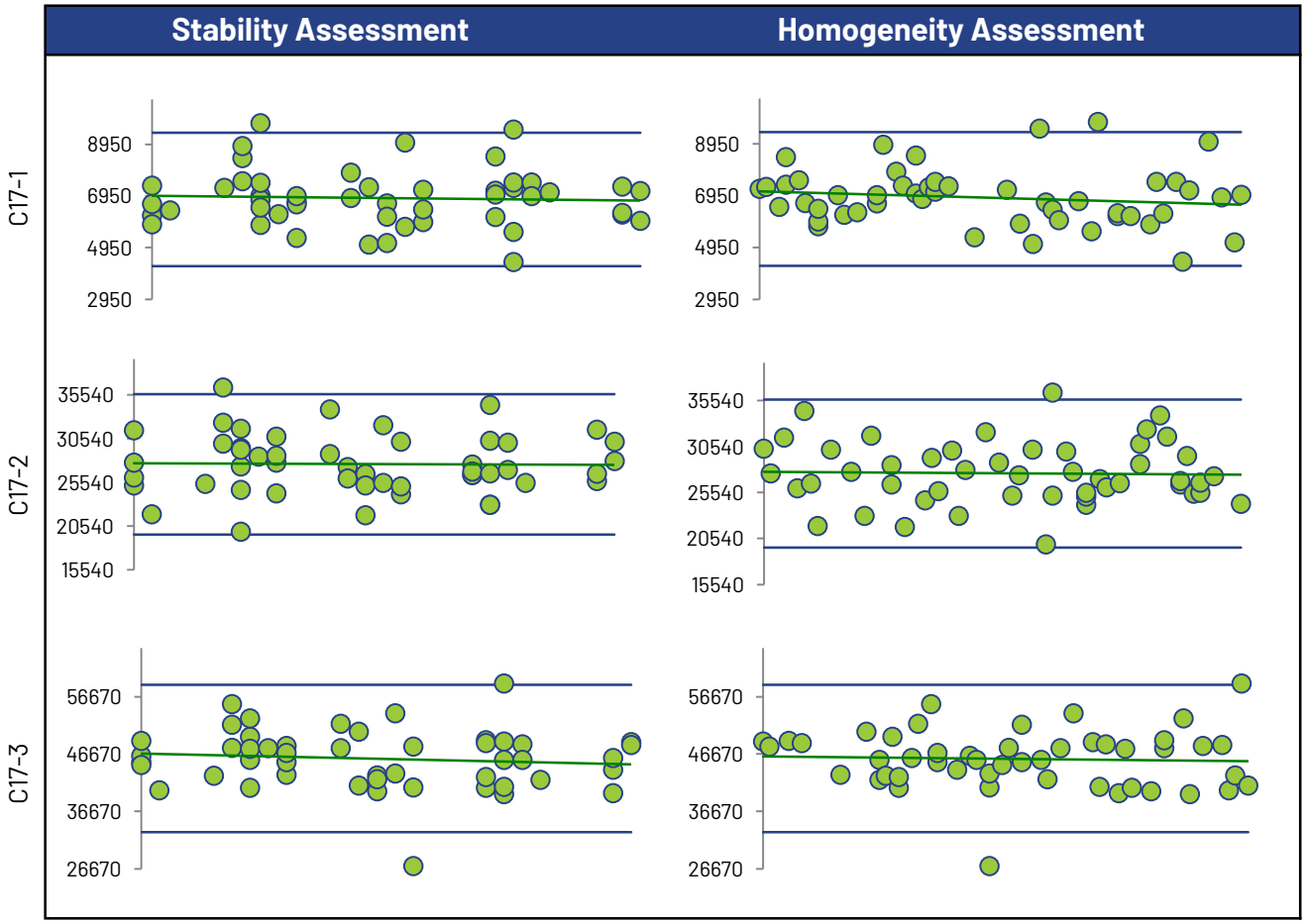
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

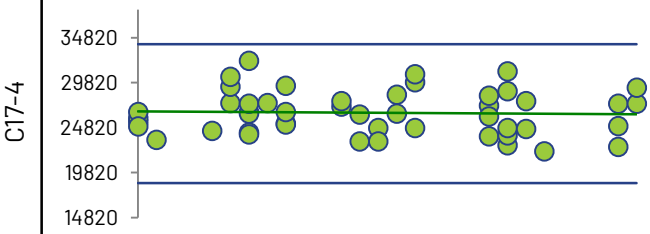
Aluminum


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
47200
27200
45900
11300
31300
51300
71300
4
2
0
-2
-4
C17-4
32200
27200
22200
26400
17150
27150
37150
4
2
0
-2
-4

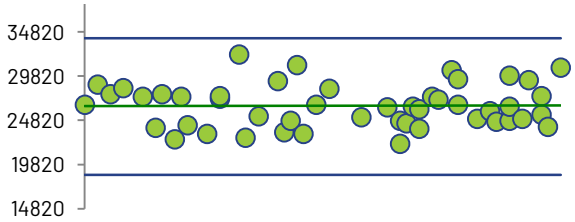

Stability Assessment
Homogeneity Assessment
C17-1
8950
6950
4950
2950
C17-2
35540
30540
25540
20540
15540
C17-3
56670
46670
36670
26670

Aluminum

Stability Assessment



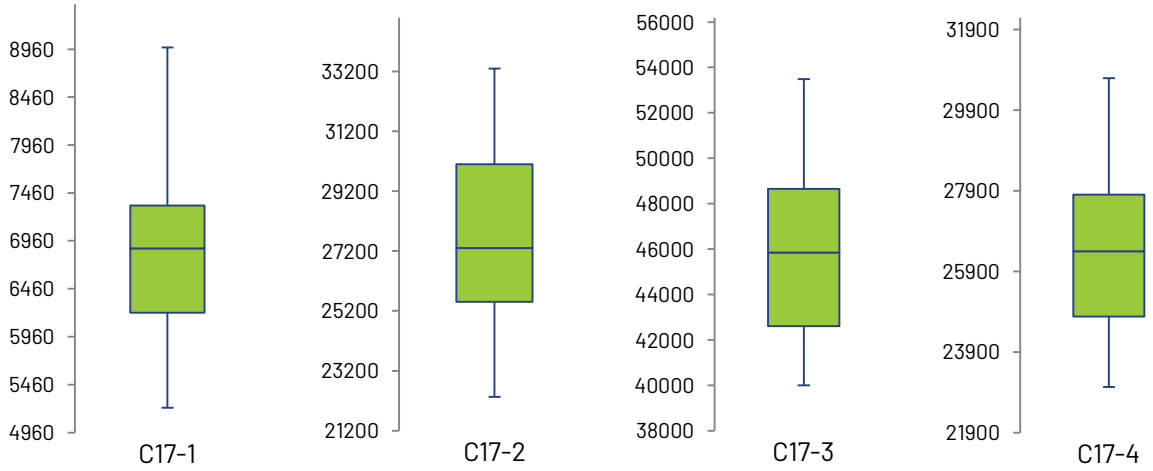
Homogeneity Assessment



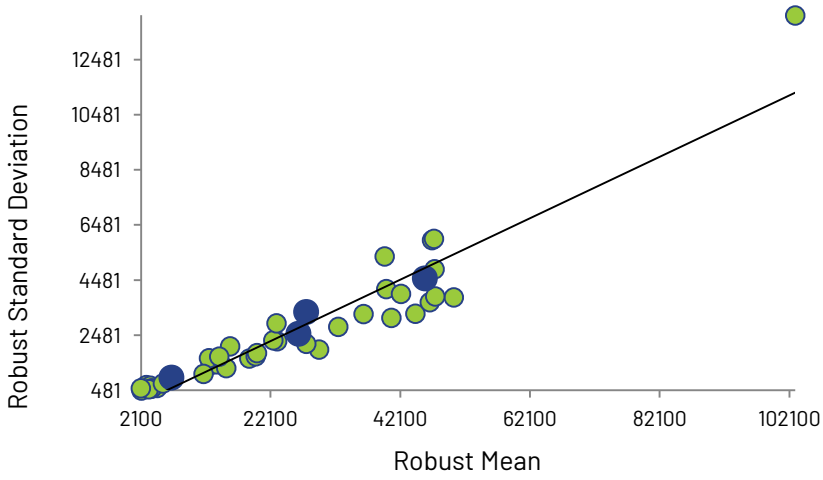
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Antimony

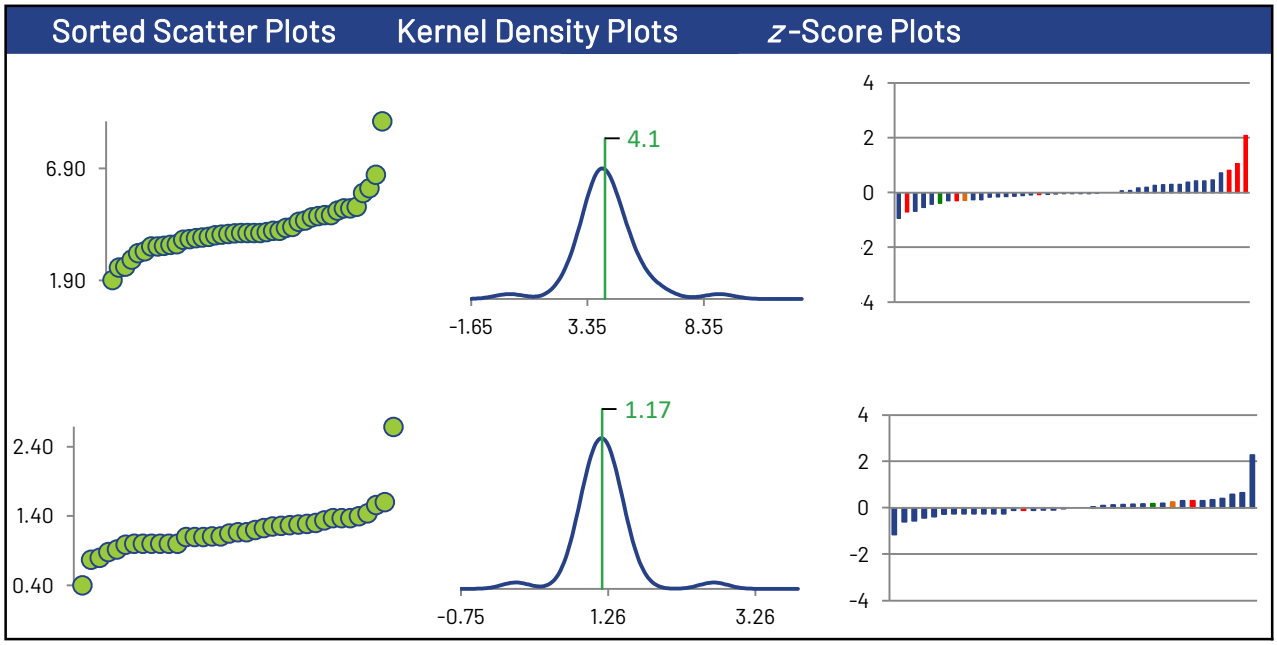
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	43	37	37	30
Median µg/g	4.00	1.17	1.50	0.745
Robust Mean µg/g	4.10	1.17	1.45	0.738
Uncdrtainty of the Assigned Value µg/g	0.164	0.0458	0.0645	0.0351
Robust Standard Deviation µg/g	0.862	0.223	0.314	0.154
Regression Standard Deviation µg/g	2.35	0.669	0.833	0.423
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	2.35	0.669	0.833	0.423
Flagged Outliers	1	2	2	2
|z|>3.0	0	0	0	0
2<|z|<3	1	1	0	0
Failure Rate %*	0.0			

Methods Used

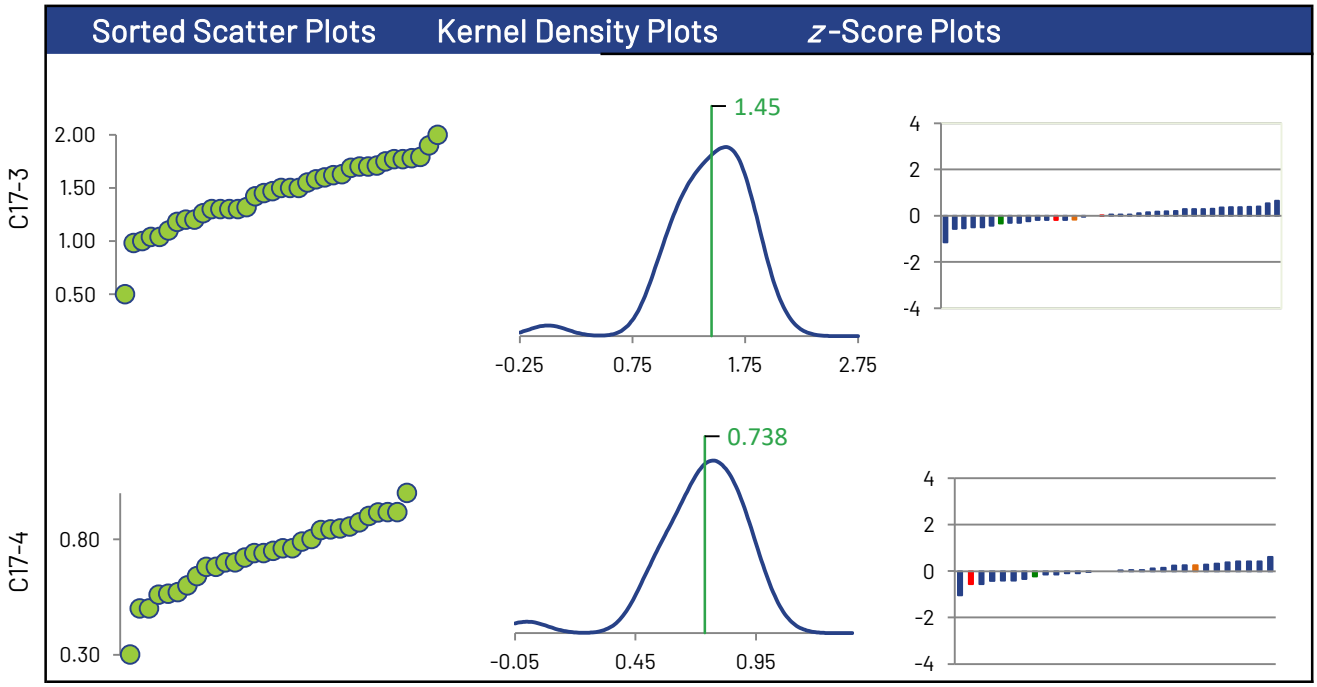
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	35	33	33	27
ICP/OES (Red)	6	2	2	1
HYDRIDE ICP (Green)	1	1	1	1
HYDRIDE AA (Orange)	1	1	1	1

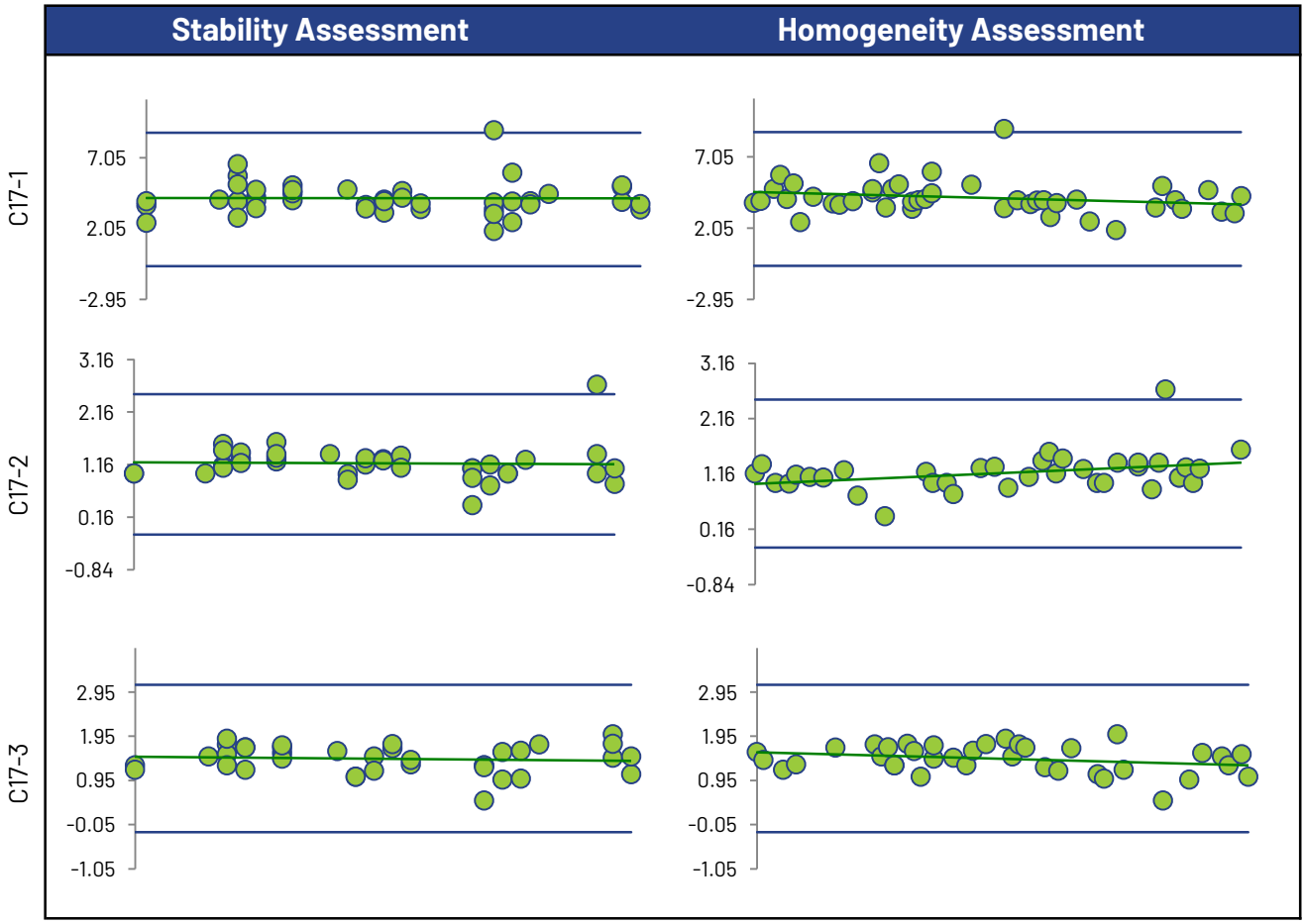
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

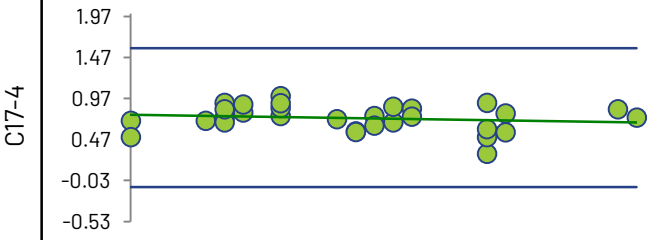
Antimony


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
2.00
1.50
1.00
0.50
1.45
-0.25
0.75
1.75
2.75
4
2
0
-2
-4
C17-4
0.80
0.30
0.738
-0.05
0.45
0.95
4
2
0
-2
-4

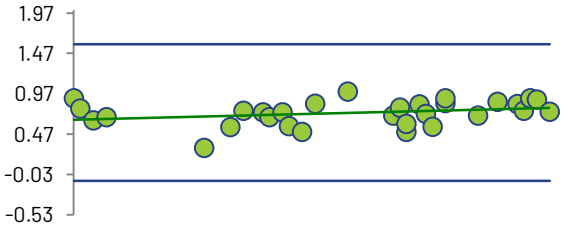

Stability Assessment
Homogeneity Assessment
C17-1
7.05
2.05
-2.95
7.05
2.05
-2.95
C17-2
3.16
2.16
1.16
0.16
-0.84
3.16
2.16
1.16
0.16
-0.84
C17-3
2.95
1.95
0.95
-0.05
-1.05
2.95
1.95
0.95
-0.05
-1.05

Antimony

Stability Assessment



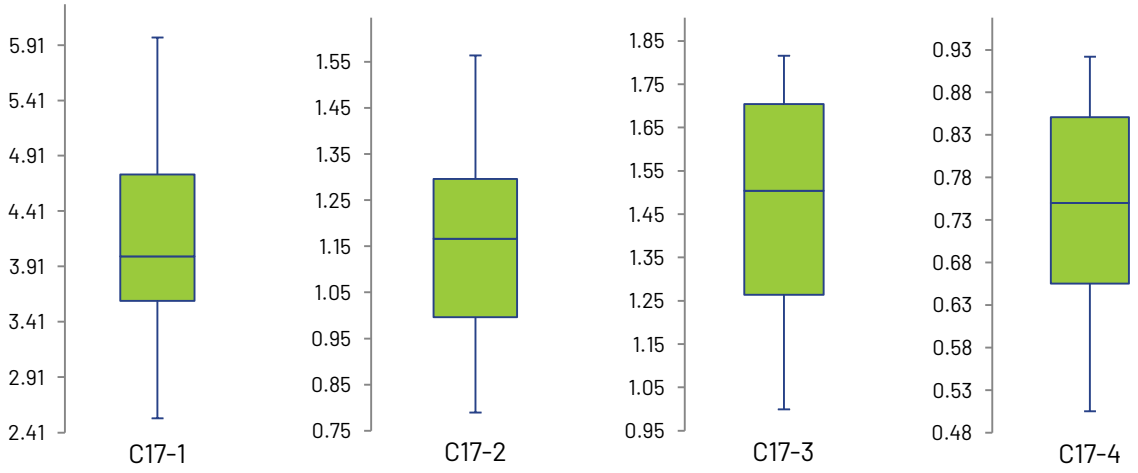
Homogeneity Assessment



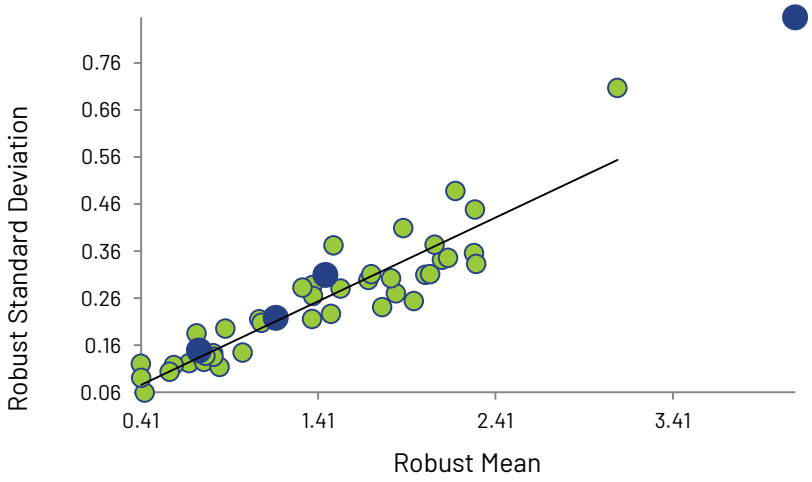
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Arsenic

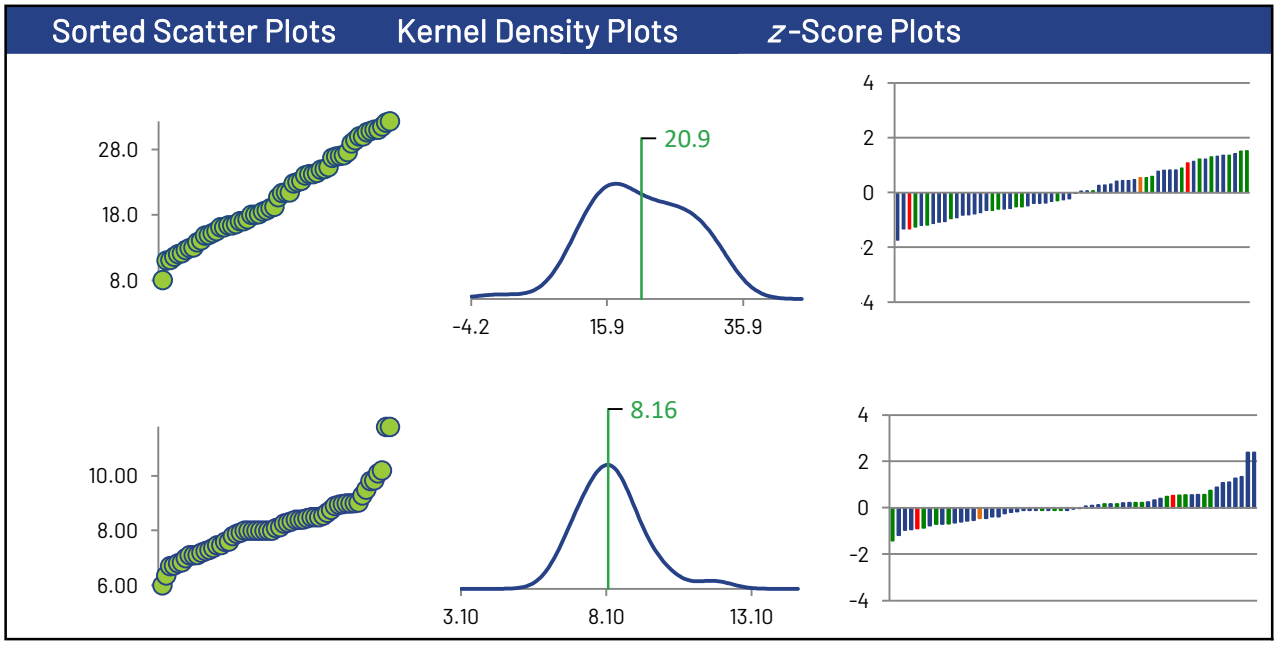
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	60	59	59	57
Median µg/g	20.0	8.10	14.4	5.54
Robust Mean µg/g	20.9	8.16	14.4	5.56
Uncdrtainty of the Assigned Value µg/g	1.20	0.162	0.223	0.127
Robust Standard Deviation µg/g	7.44	0.993	1.37	0.767
Regression Standard Deviation µg/g	2.94	1.53	2.22	1.24
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	7.44	1.53	2.22	1.24
Flagged Outliers	1	1	1	2
|z|>3.0	0	0	1	0
2<|z|<3	0	2	0	1
Failure Rate %*	0.0			

Methods Used

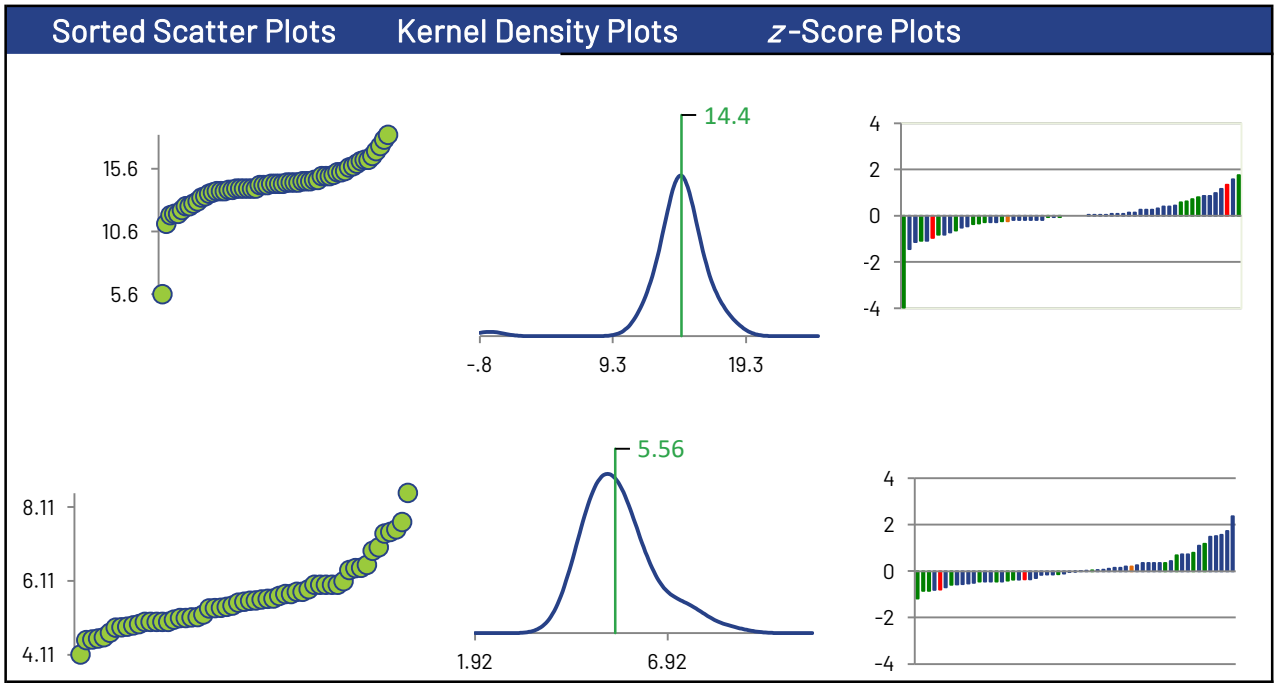
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	40	40	40	40
HYDRIDE AA (Red)	2	2	2	2
ICP/OES (Green)	17	16	16	14
HYDRIDE ICP (Orange)	1	1	1	1

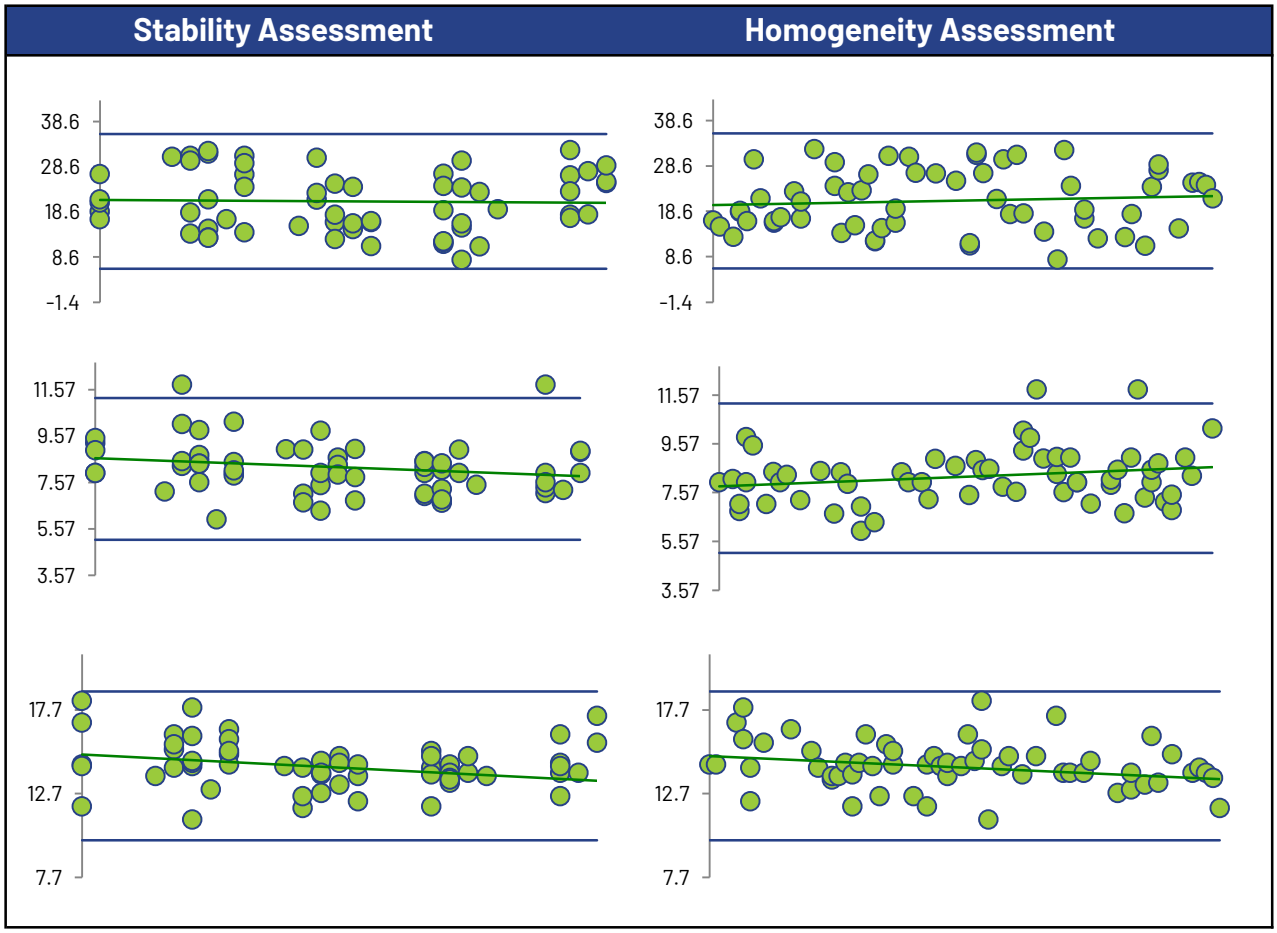
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

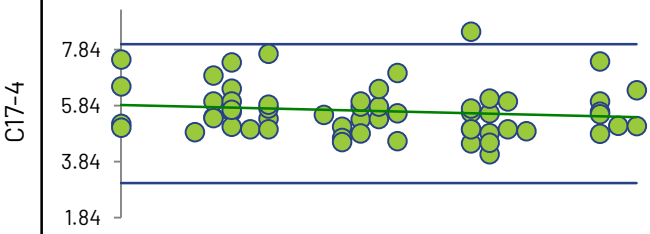
Arsenic


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
15.6
10.6
5.6
14.4
-.8
9.3
19.3
4
2
0
-2
-4
C17-4
8.11
6.11
4.11
5.56
1.92
6.92
4
2
0
-2
-4

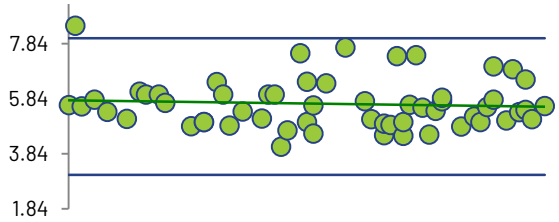

Stability Assessment
Homogeneity Assessment
C17-1
38.6
28.6
18.6
8.6
-1.4
38.6
28.6
18.6
8.6
-1.4
C17-2
11.57
9.57
7.57
5.57
3.57
11.57
9.57
7.57
5.57
3.57
C17-3
17.7
12.7
7.7
17.7
12.7
7.7

Arsenic

Stability Assessment



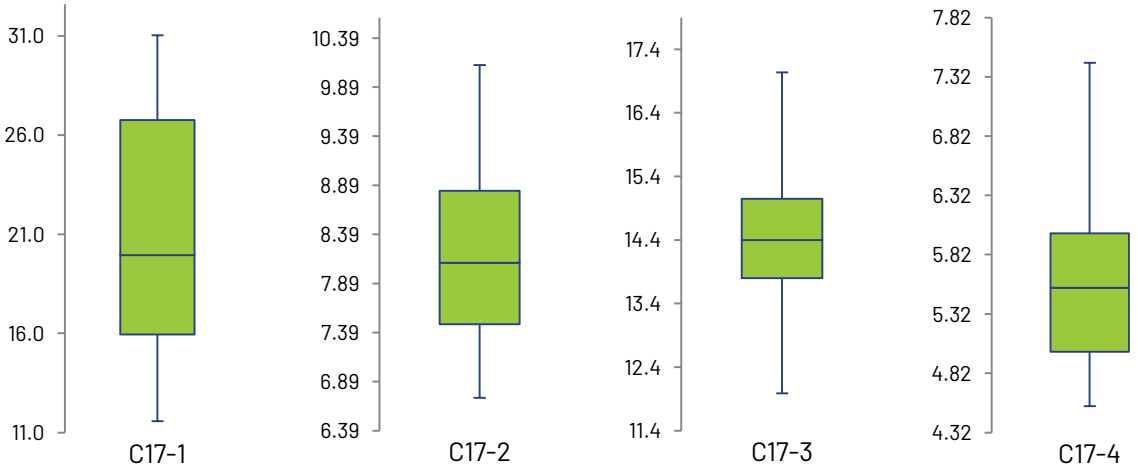
Homogeneity Assessment



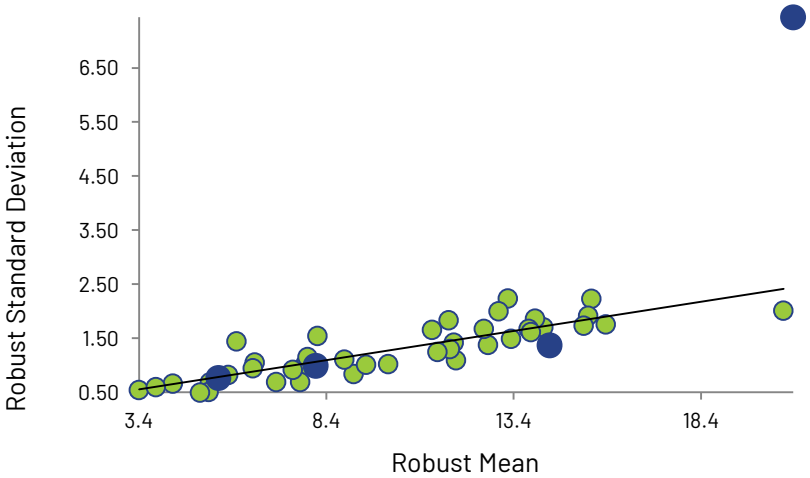
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Barium

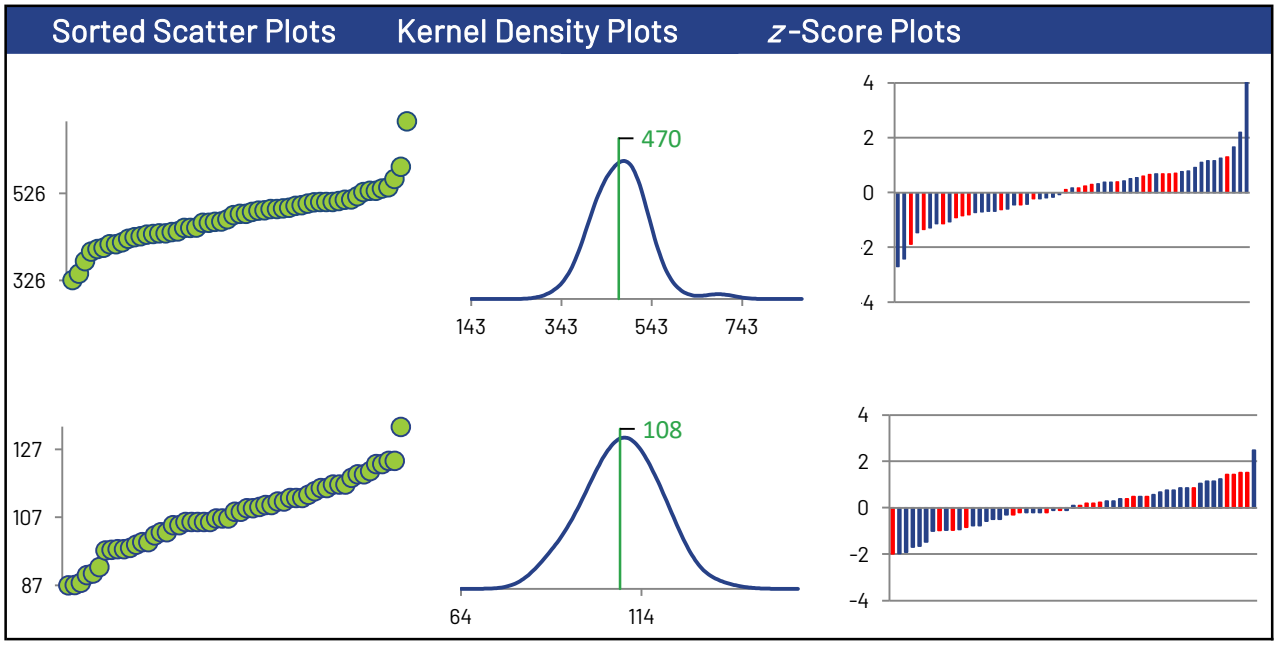
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	55	55	55	54
Median µg/g	479	109	246	51.1
Robust Mean µg/g	470	108	245	51.6
Uncdrtainty of the Assigned Value µg/g	8.98	1.77	3.56	0.978
Robust Standard Deviation µg/g	53.3	10.5	21.1	5.75
Regression Standard Deviation µg/g	34.6	9.58	19.1	5.66
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	53.3	10.5	21.1	5.75
Flagged Outliers	0	0	0	1
|z|>3.0	1	0	1	2
2<|z|<3	3	1	2	2
Failure Rate %*	1.8			

Methods Used

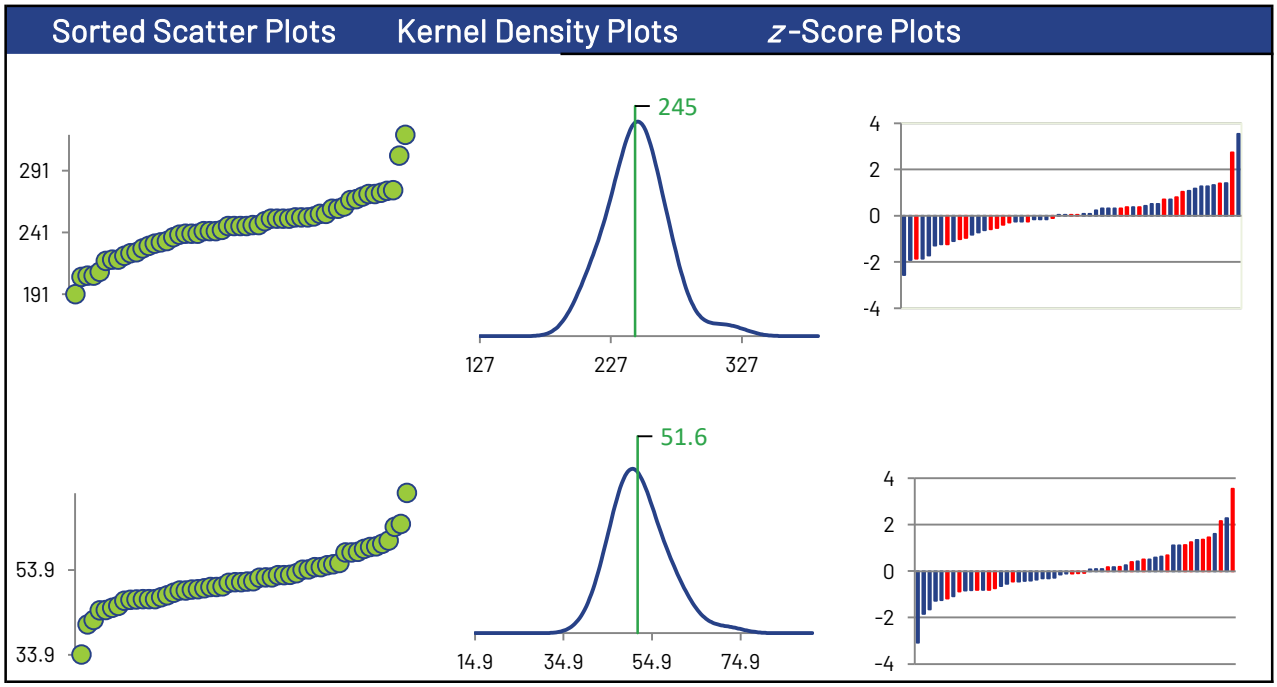
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	35	35	35	34
ICP/OES (Red)	20	20	20	20

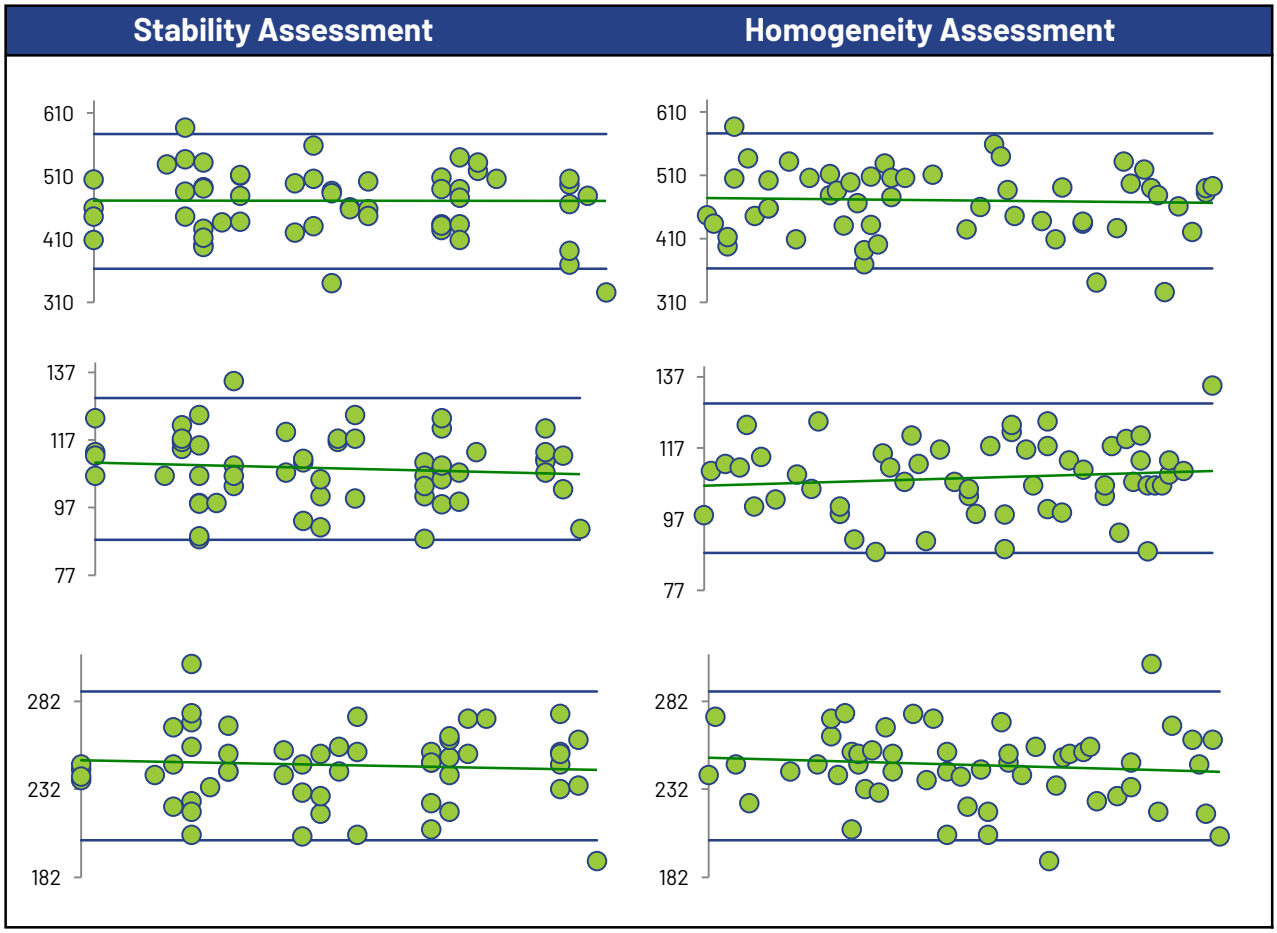
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

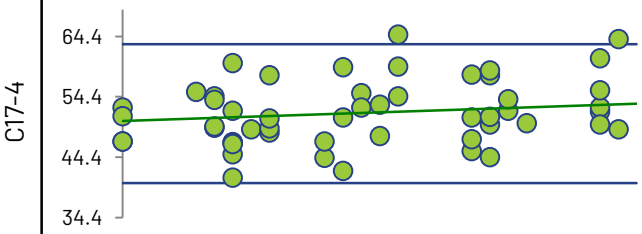
Barium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
291
241
191
245
127
227
327
4
2
0
-2
-4
C17-4
53.9
33.9
51.6
14.9
34.9
54.9
74.9

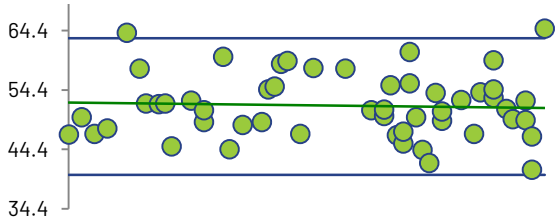

Stability Assessment
Homogeneity Assessment
C17-1
610
510
410
310
C17-2
137
117
97
77
C17-3
282
232
182

Barium

Stability Assessment



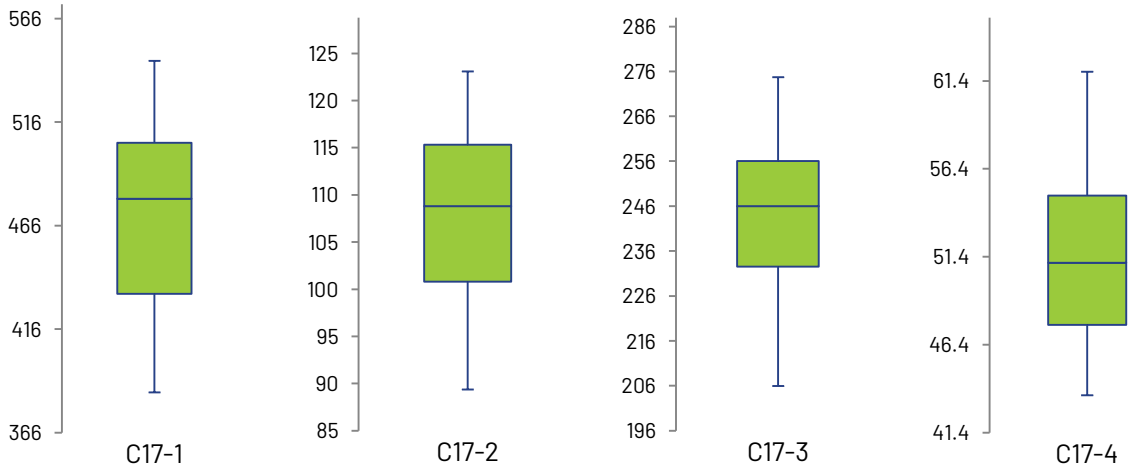
Homogeneity Assessment



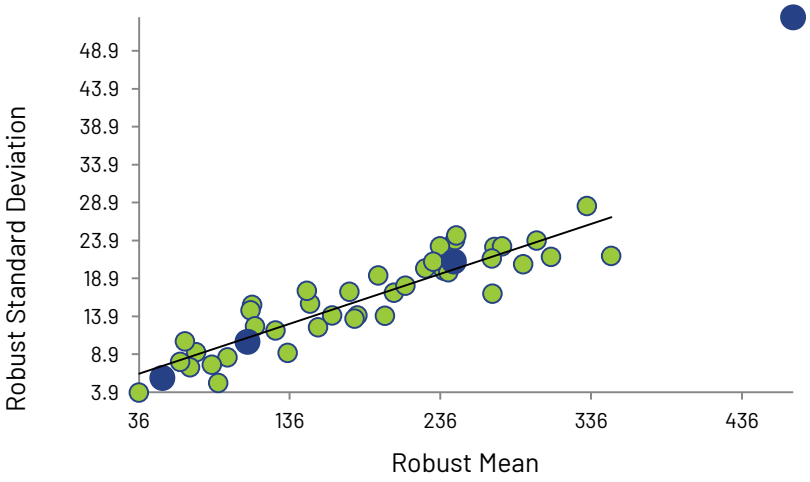
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Beryllium

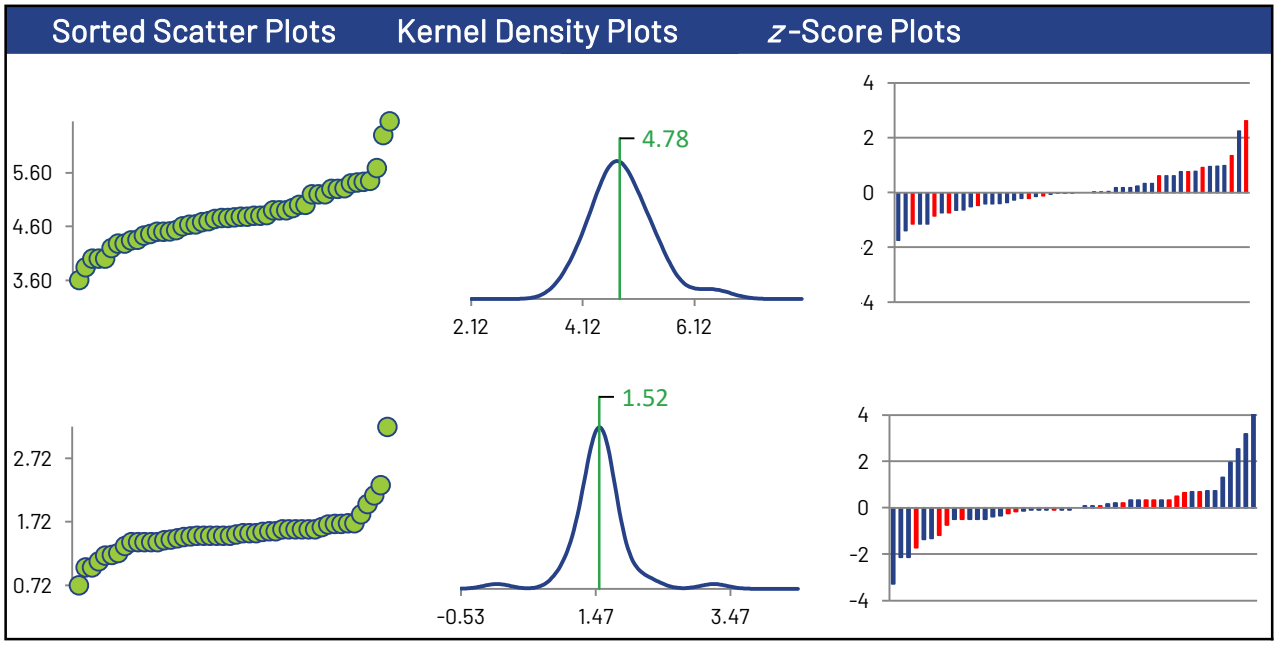
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	49	48	49	46
Median µg/g	4.77	1.51	1.74	0.879
Robust Mean µg/g	4.78	1.52	1.77	0.880
Uncdrtainty of the Assigned Value µg/g	0.0909	0.0339	0.0320	0.0170
Robust Standard Deviation µg/g	0.509	0.188	0.179	0.0925
Regression Standard Deviation µg/g	0.676	0.245	0.278	0.161
Stability Flag				
Homogeneity Flag				Homogeneity
Standard Deviation Used (SDPA) µg/g	0.676	0.245	0.278	0.254
Flagged Outliers	0	0	0	0
|z|>3.0	0	3	0	1
2<|z|<3	2	3	0	0
Failure Rate %*	0.0			

Methods Used

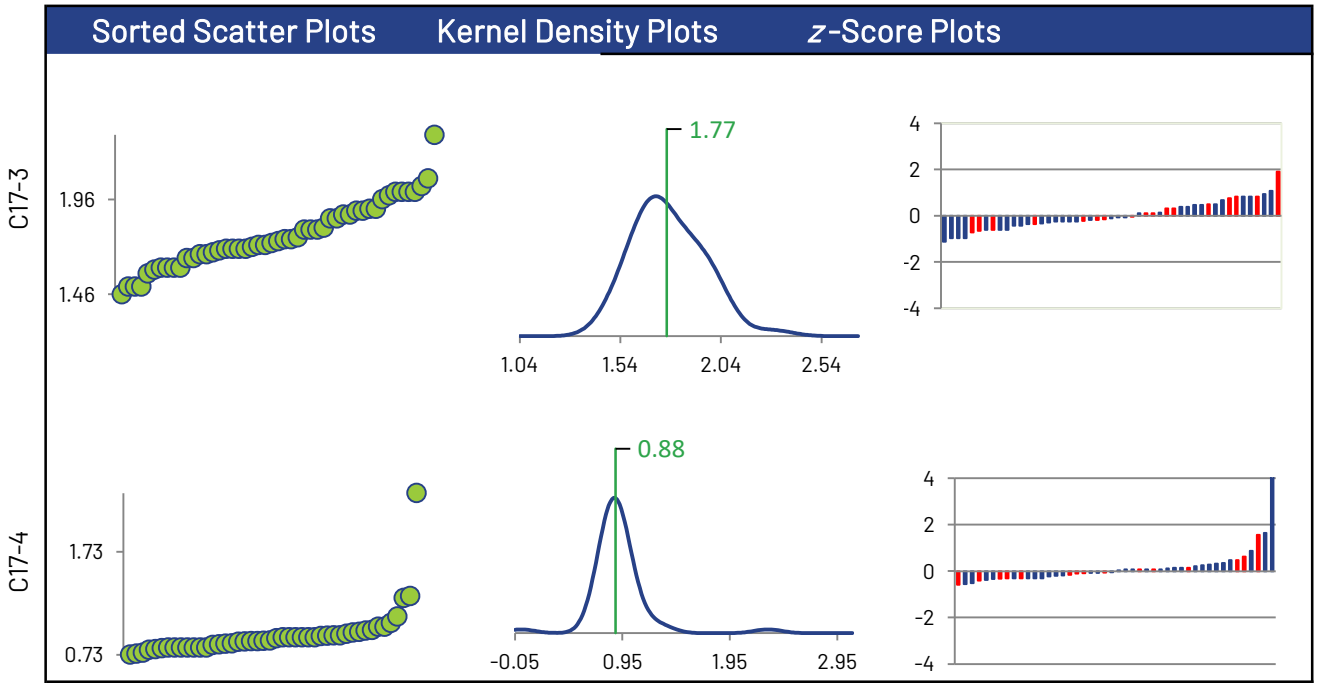
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	33	32	32	31
ICP/OES (Red)	16	16	17	15

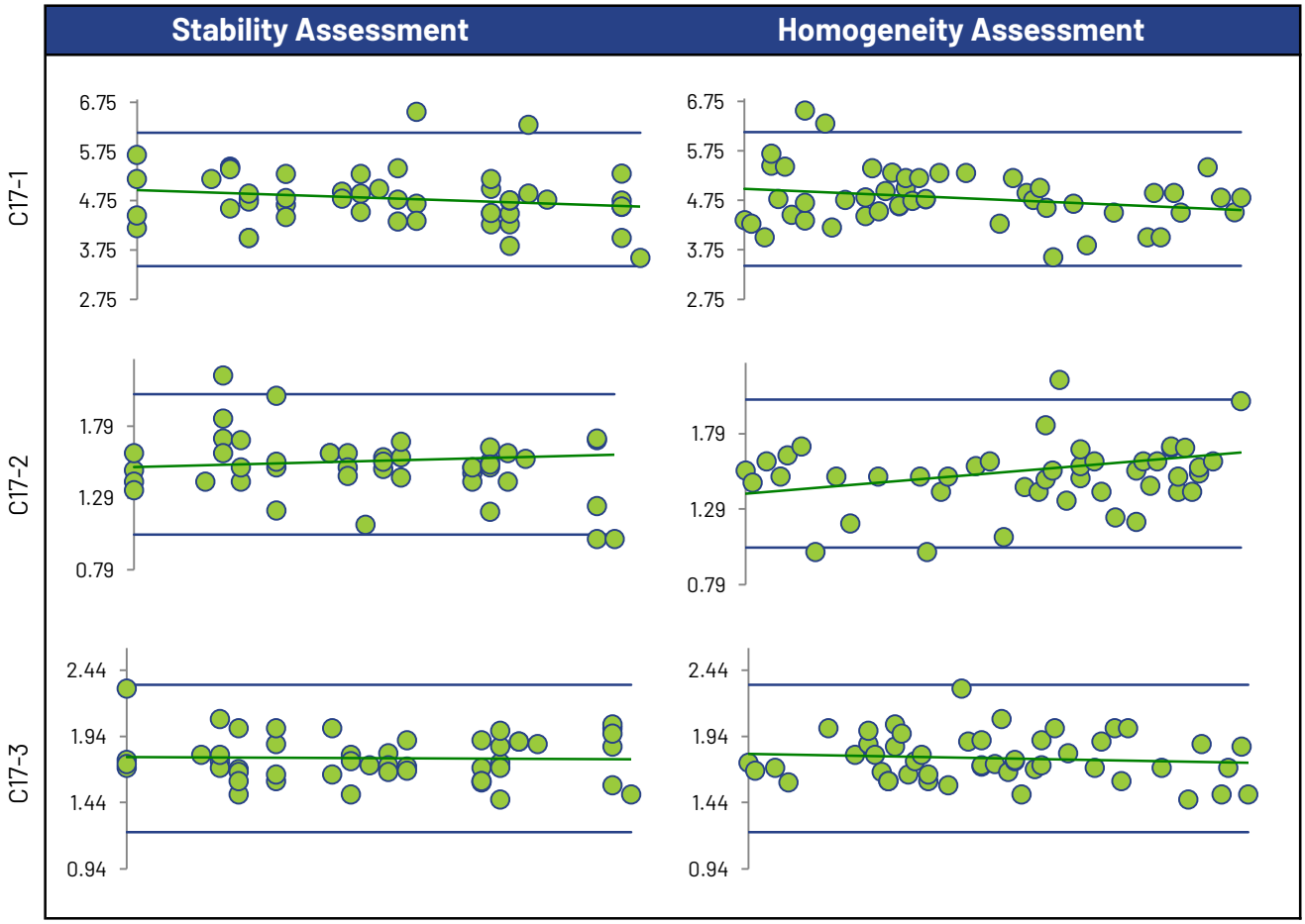
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

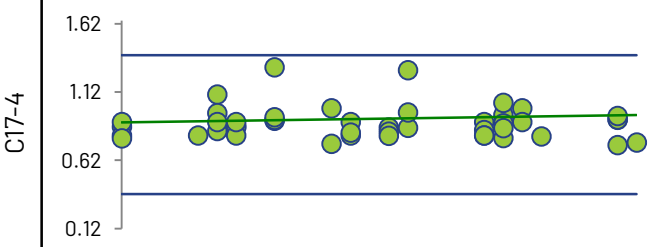
Beryllium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
1.96
1.46
1.77
1.04
1.54
2.04
2.54
4
2
0
-2
-4
C17-4
1.73
0.73
0.88
-0.05
0.95
1.95
2.95

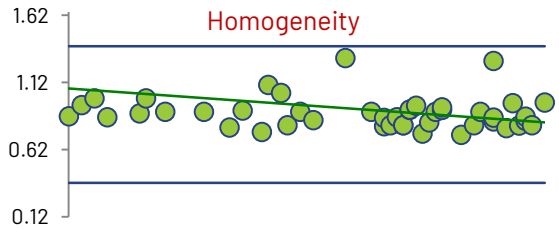

Stability Assessment
Homogeneity Assessment
C17-1
6.75
5.75
4.75
3.75
2.75
C17-2
1.79
1.29
0.79
C17-3
2.44
1.94
1.44
0.94

Beryllium

Stability Assessment



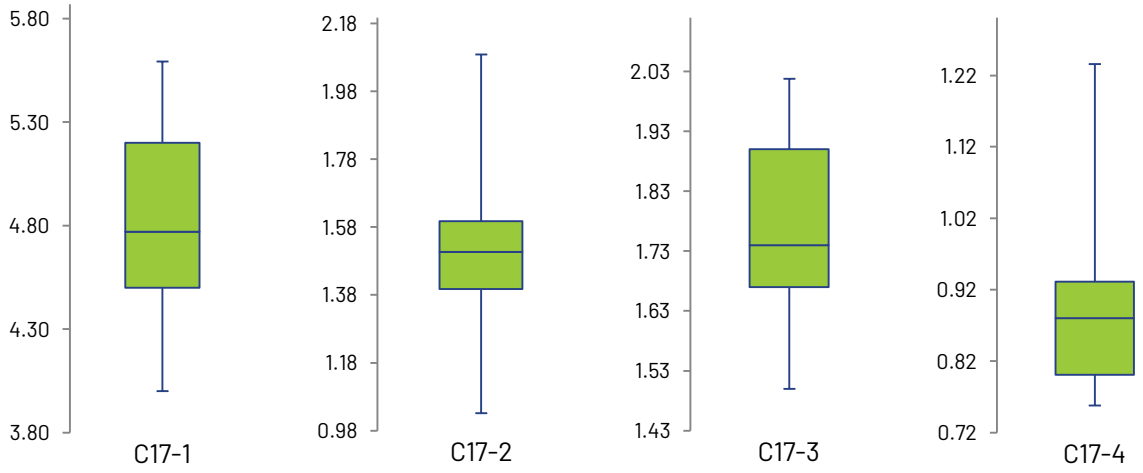
Homogeneity Assessment



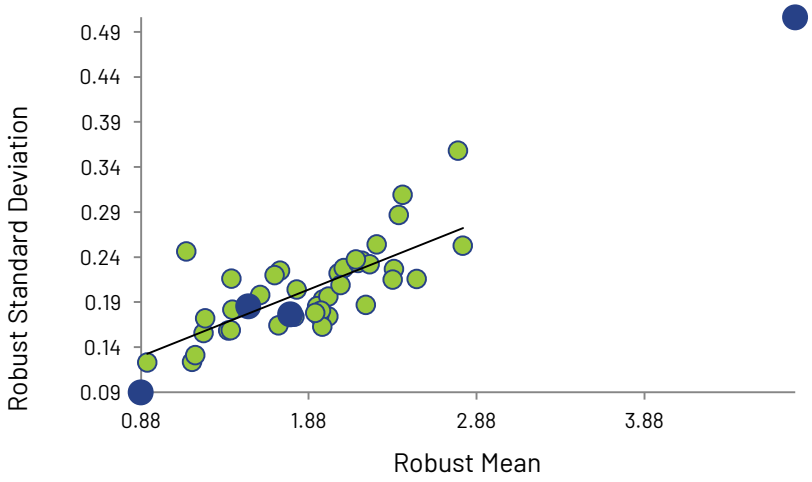
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Boron

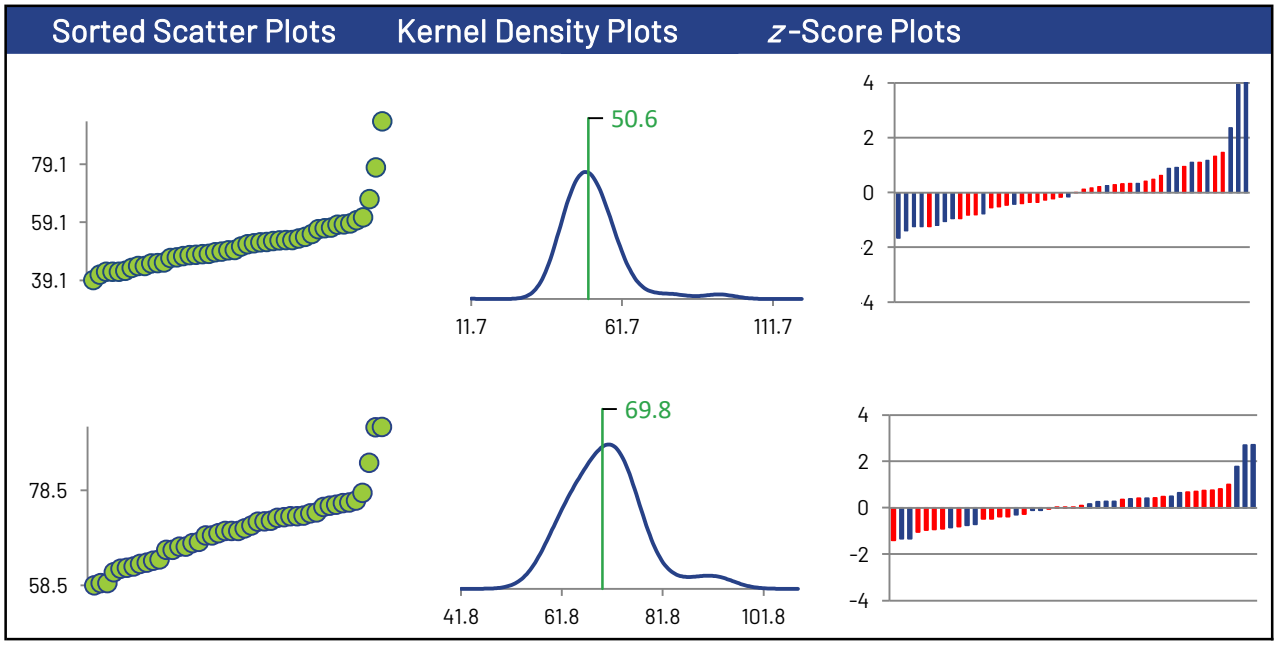
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	46	45	46	45
Median µg/g	50.1	70.0	133	48.4
Robust Mean µg/g	50.6	69.8	133	48.5
Uncdrtainty of the Assigned Value µg/g	1.28	1.19	2.17	0.868
Robust Standard Deviation µg/g	6.93	6.36	11.8	4.66
Regression Standard Deviation µg/g	6.12	8.14	14.8	5.90
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	6.93	8.14	14.8	5.90
Flagged Outliers	1	1	1	1
|z|>3.0	2	0	1	1
2<|z|<3	1	2	0	1
Failure Rate %*	6.4			

Methods Used

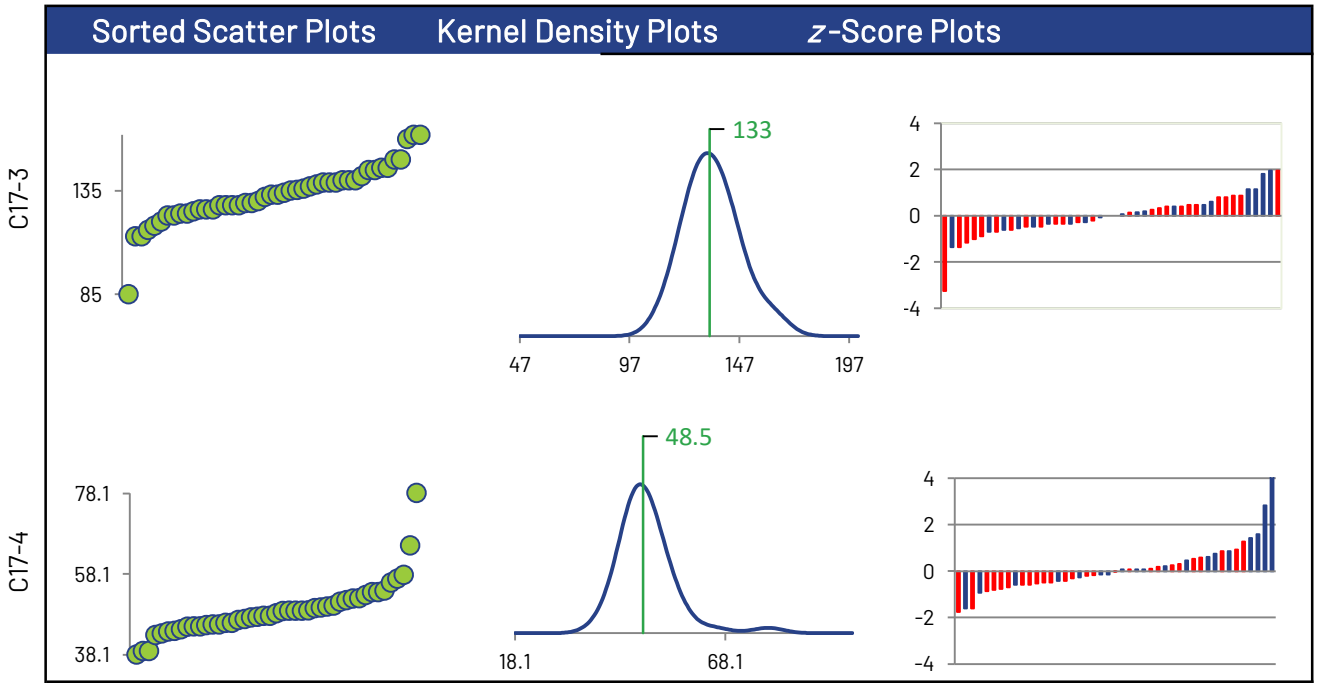
Method	C17-1	C17-2	C17-3	C17-4
ICP/OES (Blue)	19	19	19	19
ICP/MS (Red)	27	26	27	26

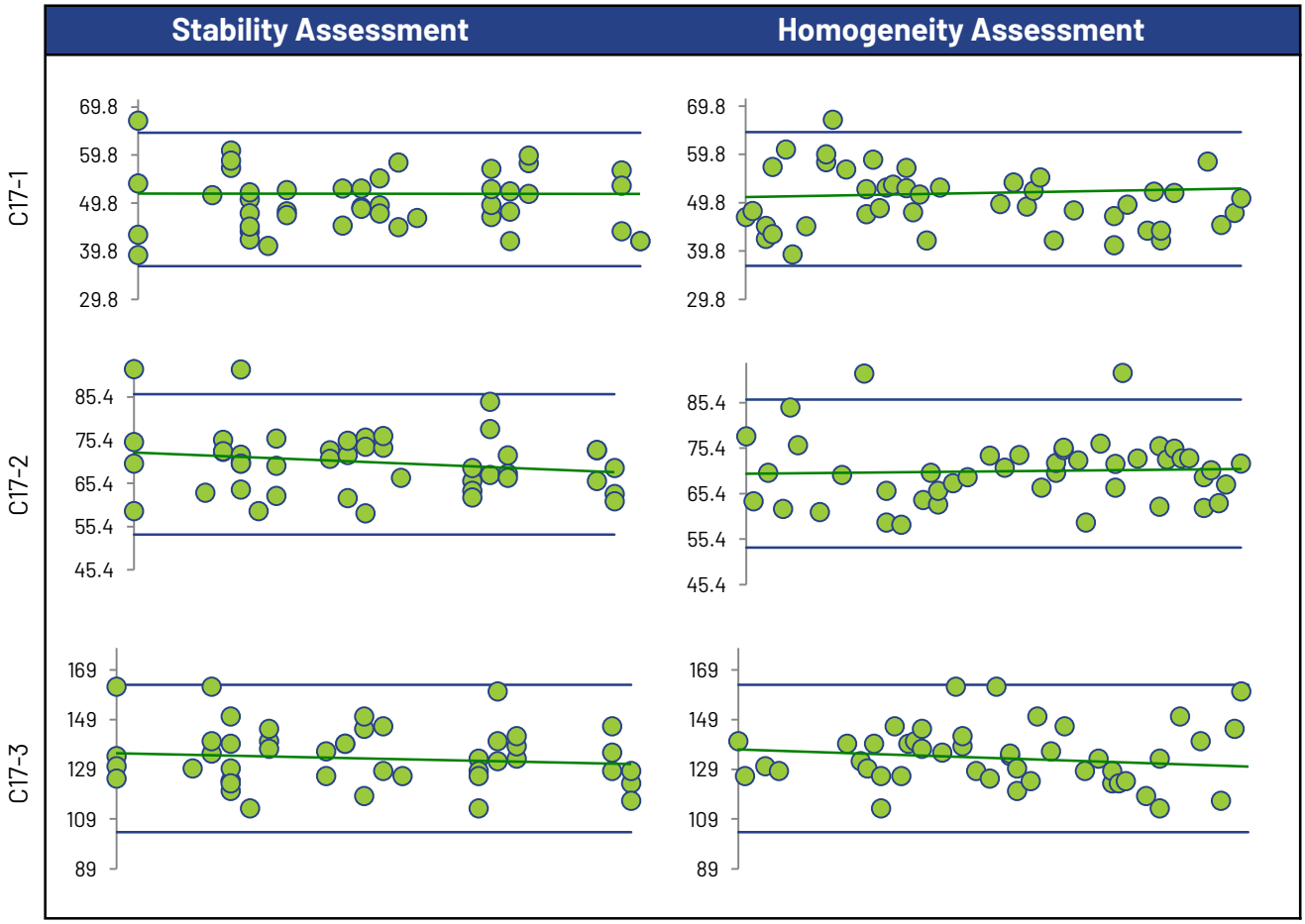
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

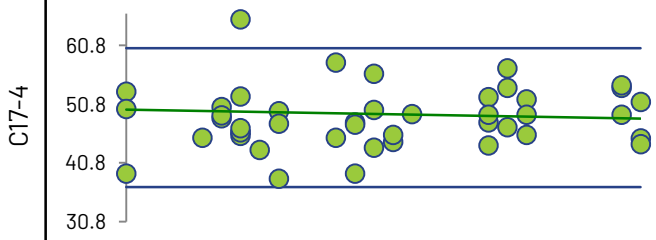
Boron


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
135
85
133
47
97
147
197
4
2
0
-2
-4
C17-4
78.1
58.1
38.1
48.5
18.1
68.1
4
2
0
-2
-4

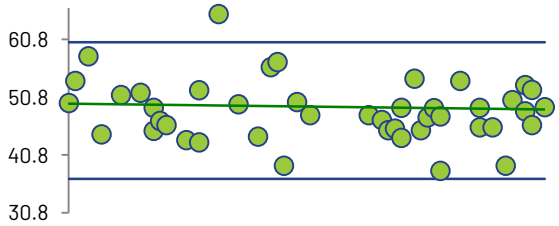

Stability Assessment
Homogeneity Assessment
C17-1
69.8
59.8
49.8
39.8
29.8
C17-2
85.4
75.4
65.4
55.4
45.4
C17-3
169
149
129
109
89

Boron

Stability Assessment



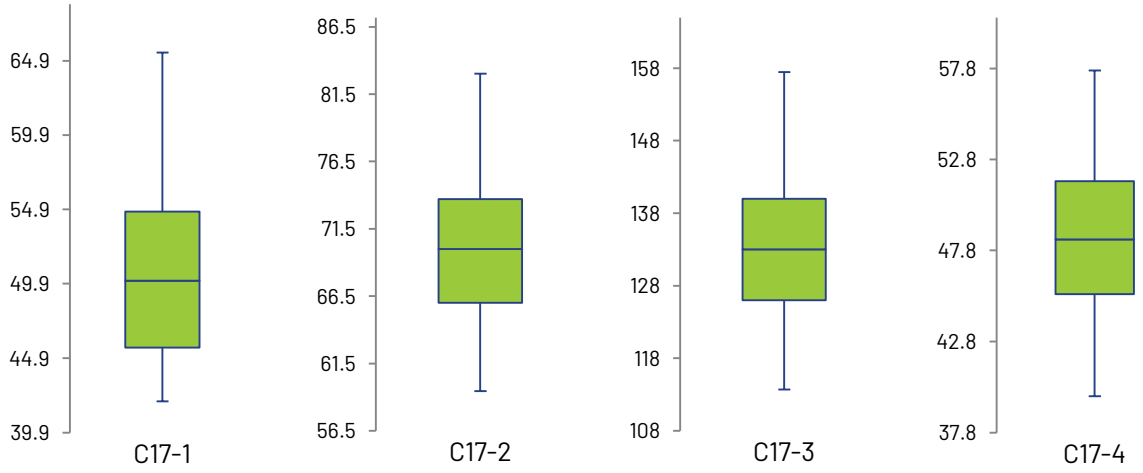
Homogeneity Assessment



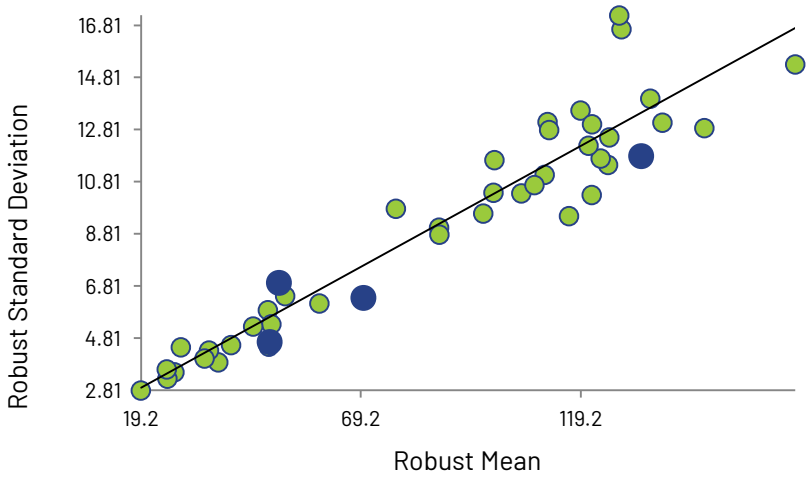
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Cadmium

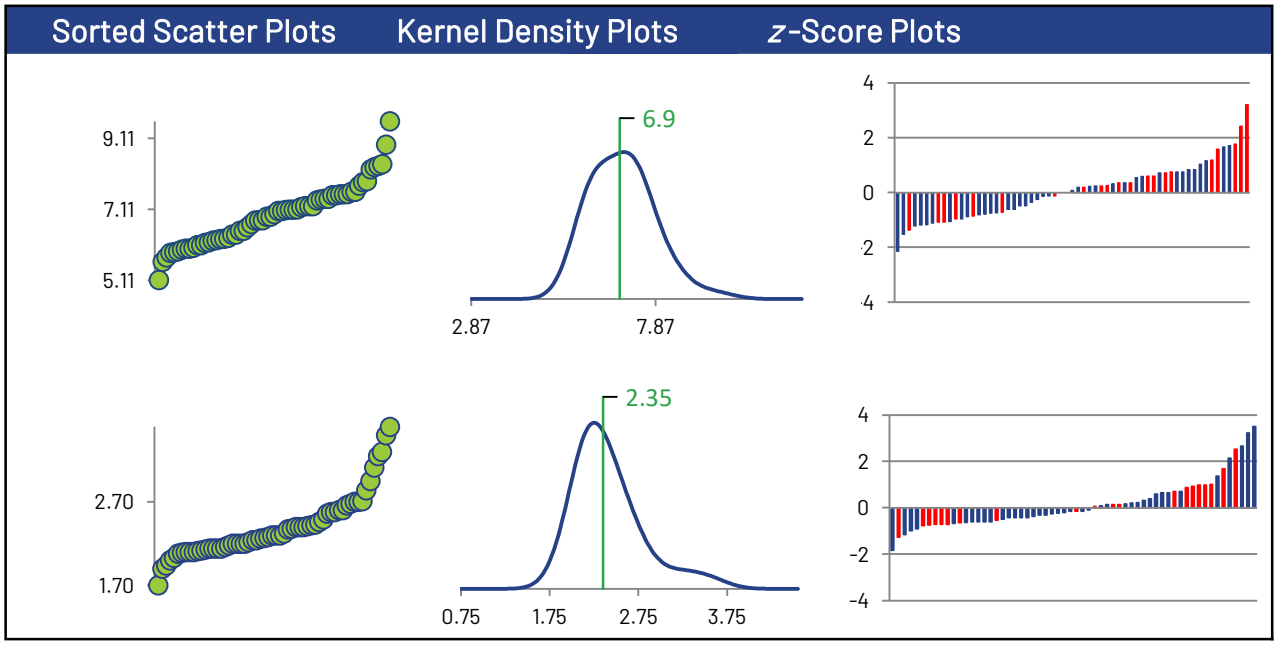
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	61	60	60	59
Median µg/g	6.97	2.30	2.99	0.800
Robust Mean µg/g	6.90	2.35	2.99	0.817
Uncdrtainty of the Assigned Value µg/g	0.134	0.0473	0.0436	0.0159
Robust Standard Deviation µg/g	0.837	0.293	0.270	0.0975
Regression Standard Deviation µg/g	0.751	0.357	0.412	0.224
Stability Flag				
Homogeneity Flag				Homogeneity
Standard Deviation Used (SDPA) µg/g	0.837	0.357	0.412	0.396
Flagged Outliers	0	0	0	0
|z|>3.0	1	2	1	2
2<|z|<3	2	3	1	0
Failure Rate %*	1.6			

Methods Used

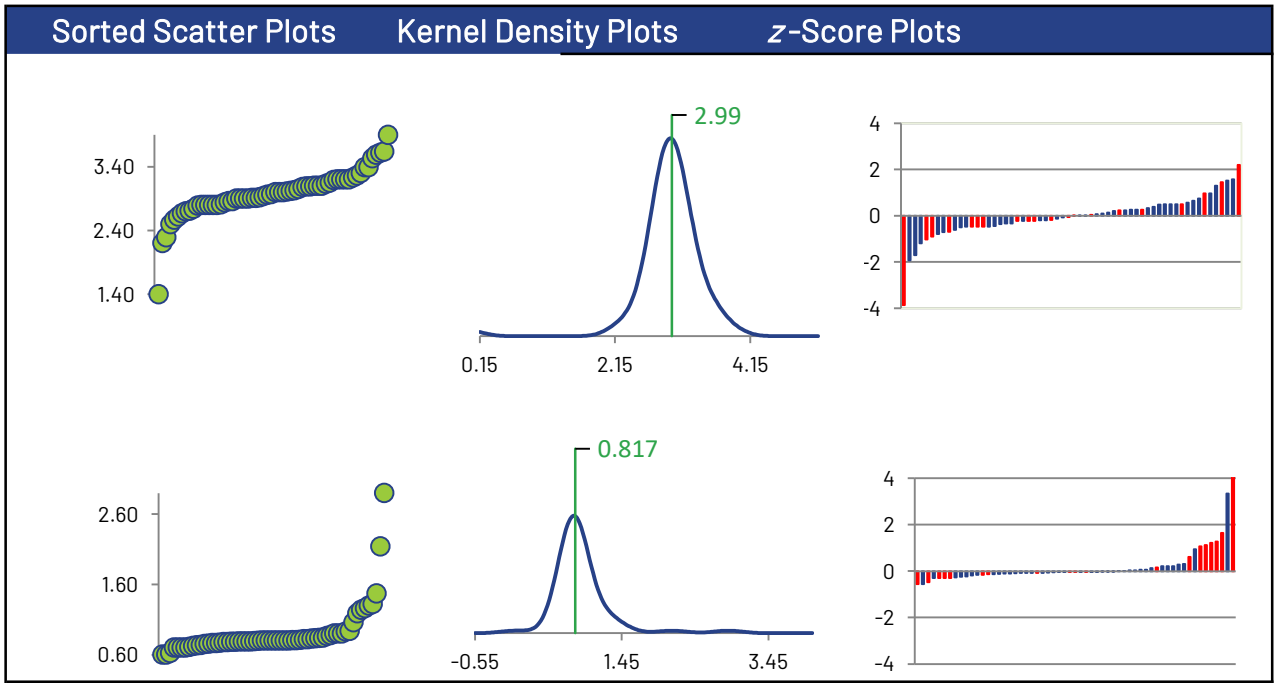
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	40	40	40	40
ICP/OES (Red)	21	20	20	19

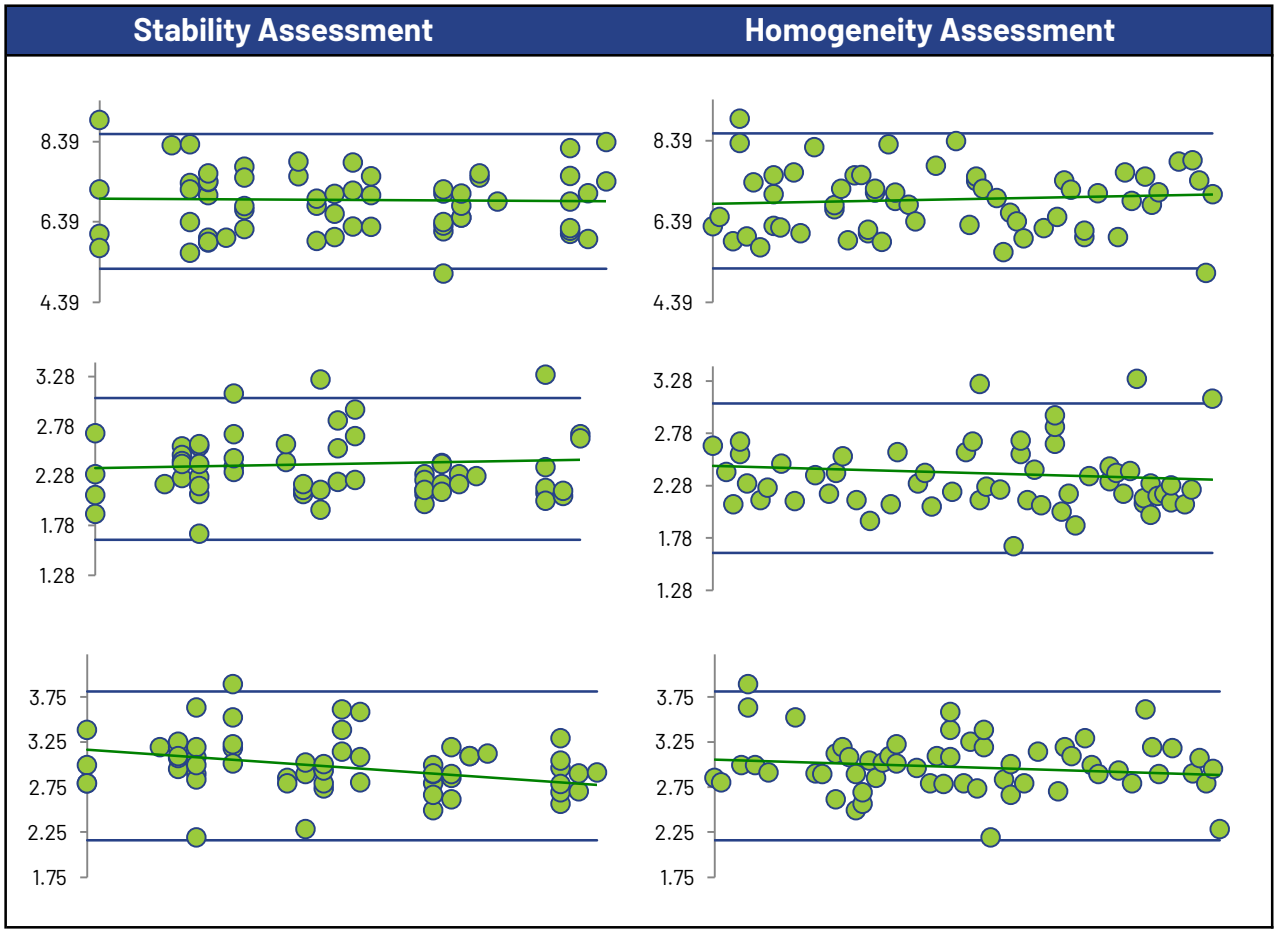
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

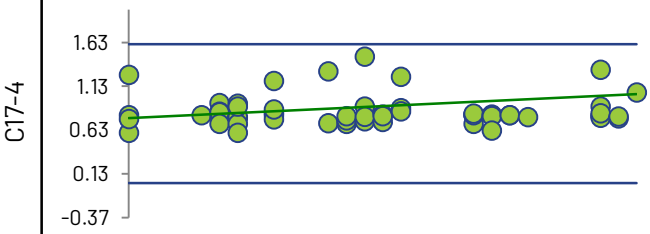
Cadmium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
3.40
2.40
1.40
2.99
0.15
2.15
4.15
4
2
0
-2
-4
C17-4
2.60
1.60
0.60
0.817
-0.55
1.45
3.45
4
2
0
-2
-4

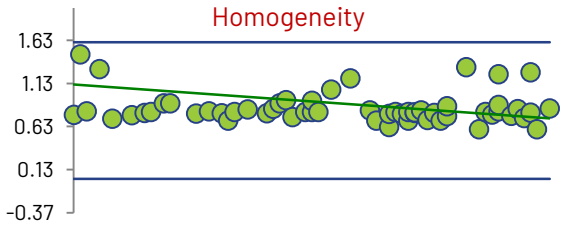

Stability Assessment
Homogeneity Assessment
C17-1
8.39
6.39
4.39
8.39
6.39
4.39
C17-2
3.28
2.78
2.28
1.78
1.28
3.28
2.78
2.28
1.78
1.28
C17-3
3.75
3.25
2.75
2.25
1.75
3.75
3.25
2.75
2.25
1.75

Cadmium

Stability Assessment



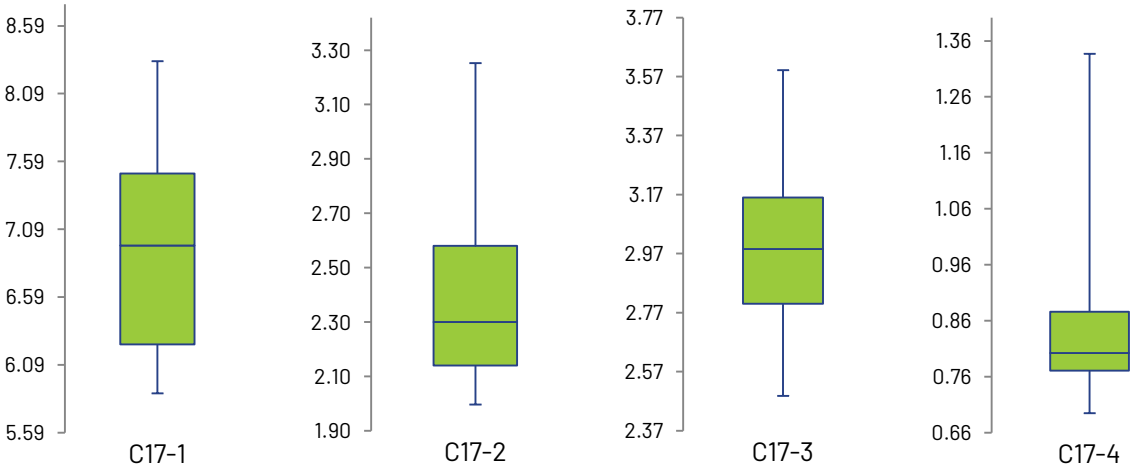
Homogeneity Assessment



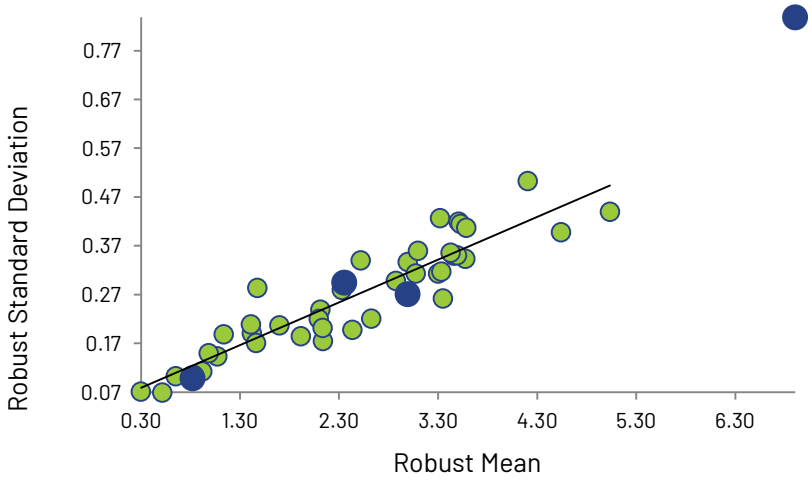
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Chromium

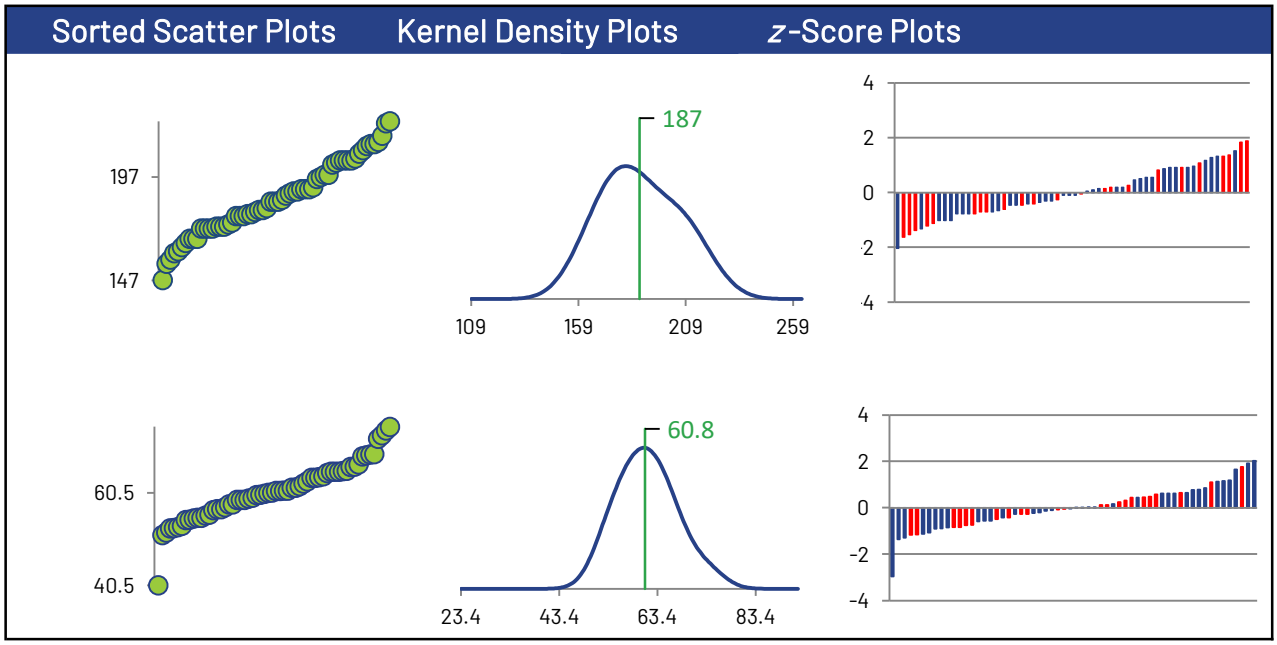
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	60	60	60	60
Median µg/g	185	60.8	65.9	42.0
Robust Mean µg/g	187	60.8	65.5	42.4
Uncdrtainty of the Assigned Value µg/g	3.16	0.955	0.689	0.573
Robust Standard Deviation µg/g	19.6	5.92	4.27	3.55
Regression Standard Deviation µg/g	15.7	6.16	6.51	4.76
Stability Flag		Stability		
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	19.6	6.89	6.51	4.76
Flagged Outliers	0	0	0	0
|z|>3.0	0	0	1	0
2<|z|<3	1	2	1	6
Failure Rate %*	3.3			

Methods Used

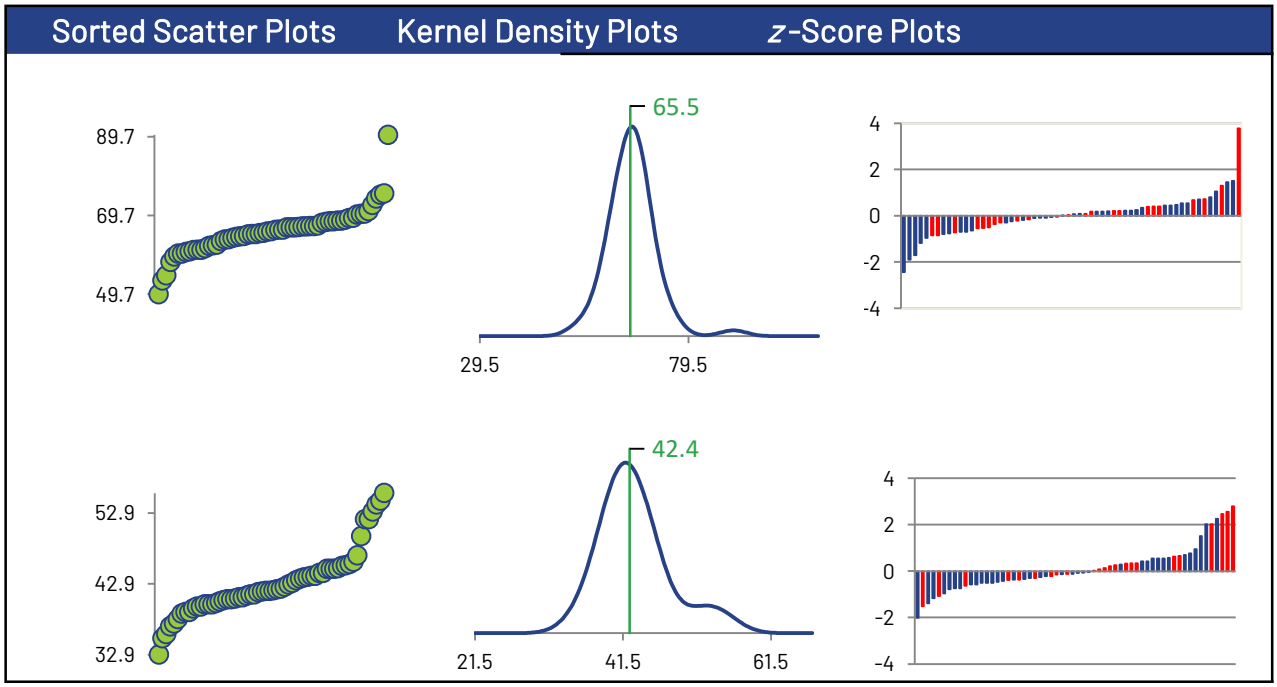
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	37	37	37	37
ICP/OES (Red)	23	23	23	23

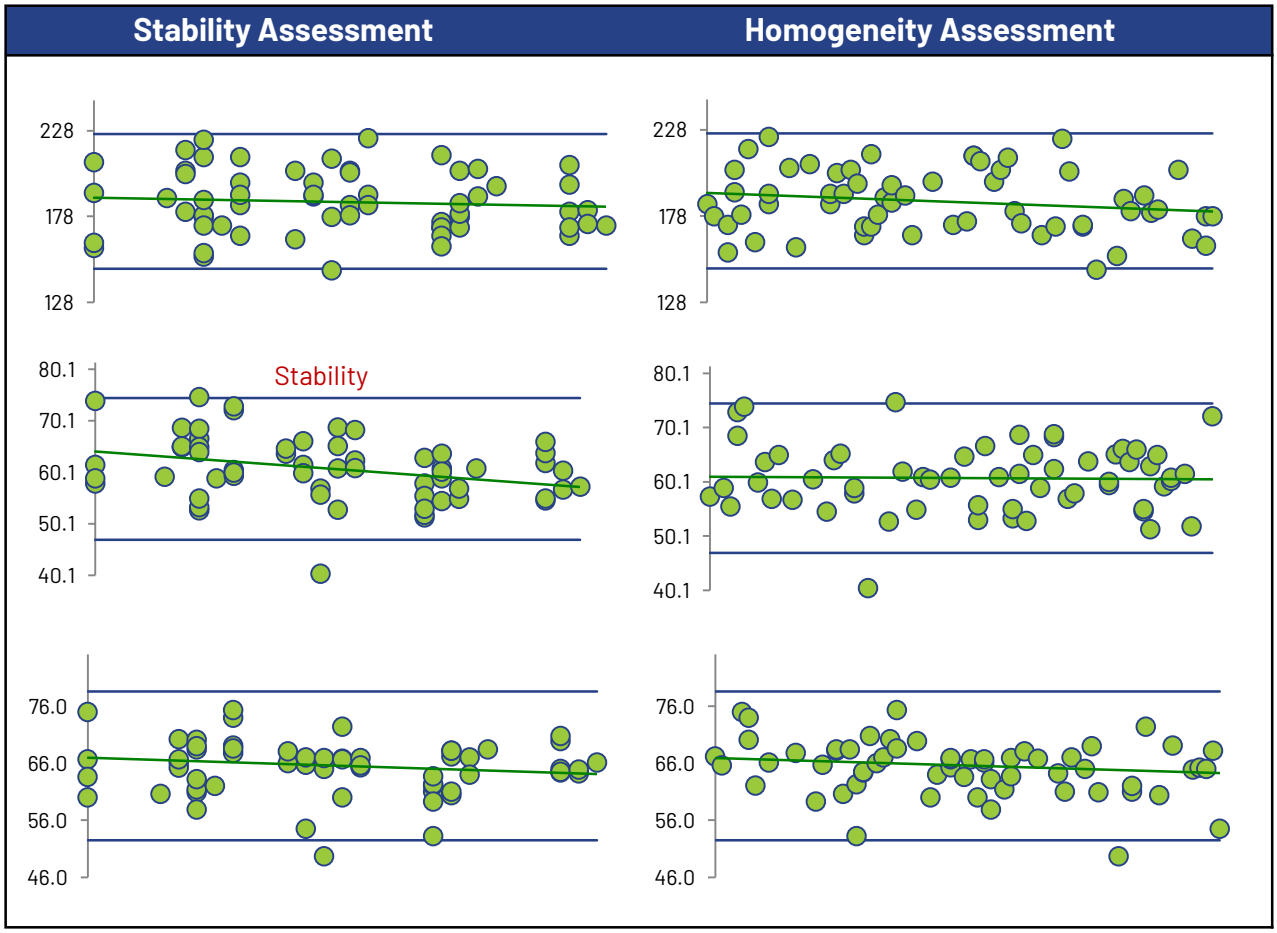
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

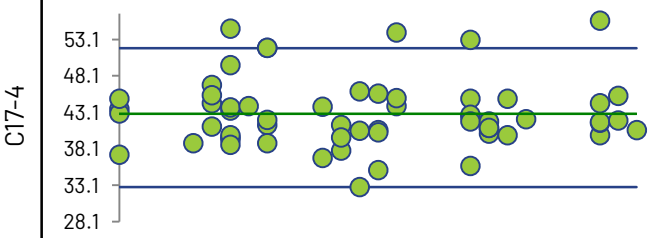
Chromium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
89.7
69.7
49.7
65.5
29.5
79.5
4
2
0
-2
-4
C17-4
52.9
42.9
32.9
42.4
21.5
41.5
61.5

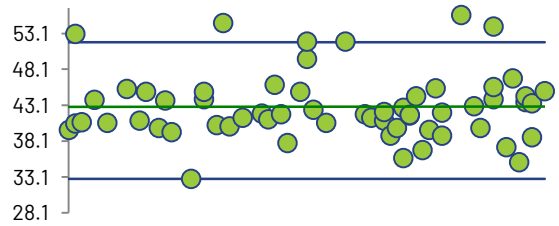

Stability Assessment
Homogeneity Assessment
C17-1
228
178
128
C17-2
80.1
70.1
60.1
50.1
40.1
Stability
C17-3
76.0
66.0
56.0
46.0

Chromium

Stability Assessment



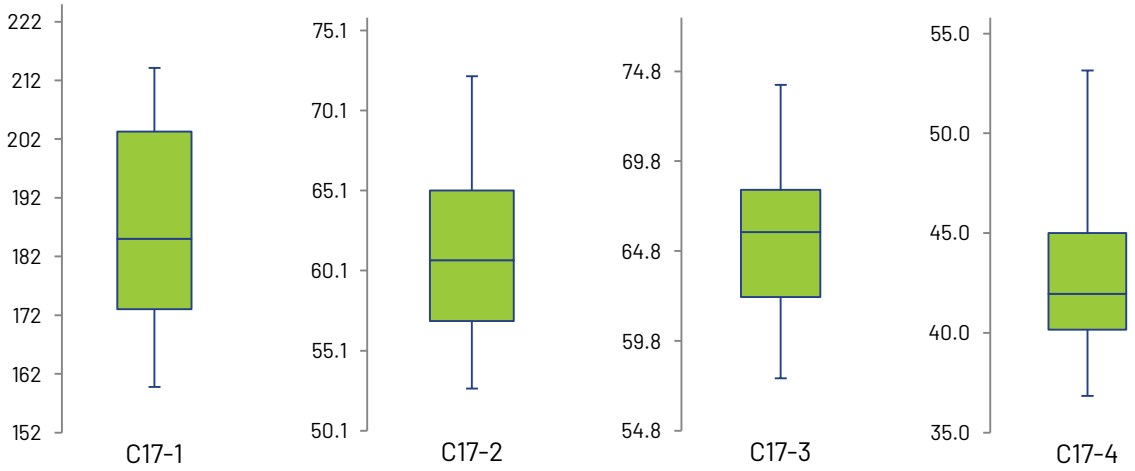
Homogeneity Assessment



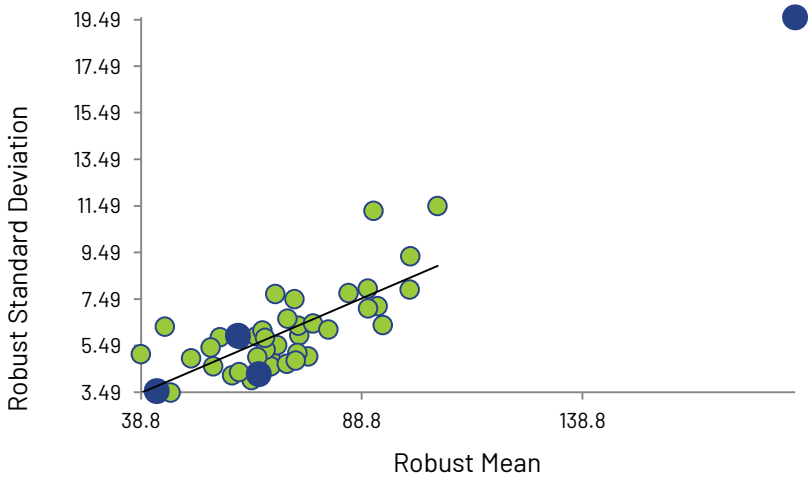
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Cobalt

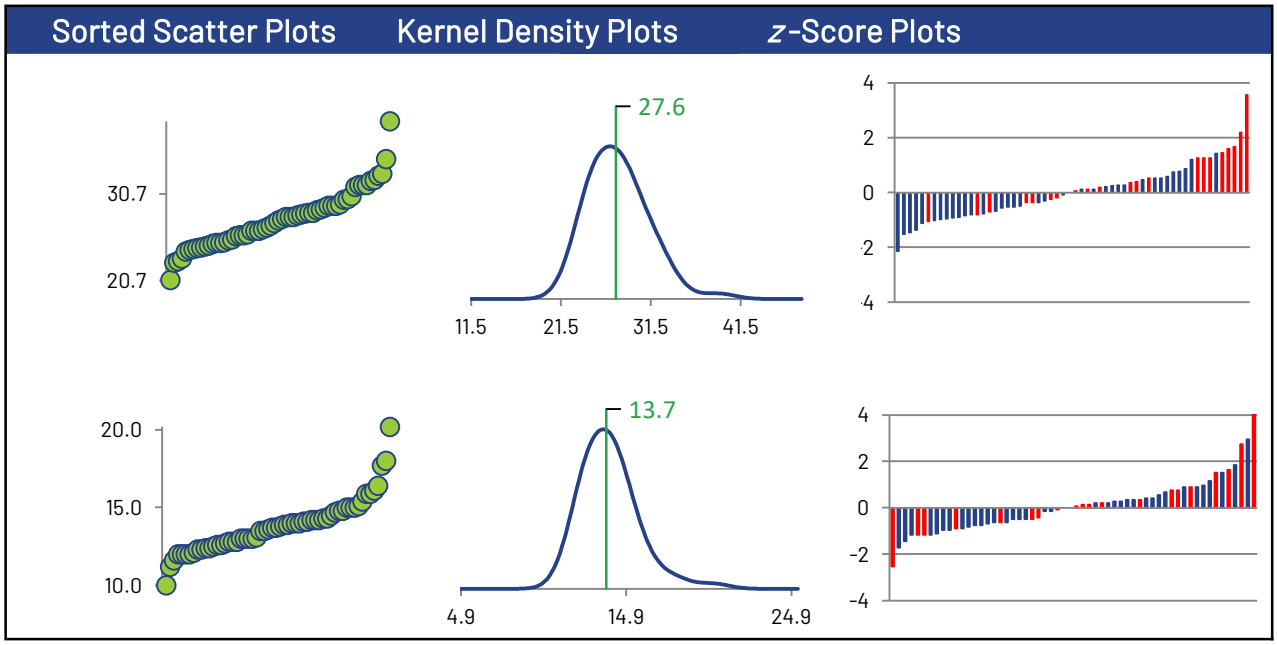
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	58	58	58	58
Median µg/g	27.7	13.8	12.6	9.12
Robust Mean µg/g	27.6	13.7	12.6	9.23
Uncdrtainty of the Assigned Value µg/g	0.529	0.240	0.184	0.152
Robust Standard Deviation µg/g	3.22	1.46	1.12	0.929
Regression Standard Deviation µg/g	2.70	1.34	1.23	0.903
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	3.22	1.46	1.23	0.929
Flagged Outliers	0	0	0	0
|z|>3.0	1	1	0	3
2<|z|<3	2	3	1	3
Failure Rate %*	3.4			

Methods Used

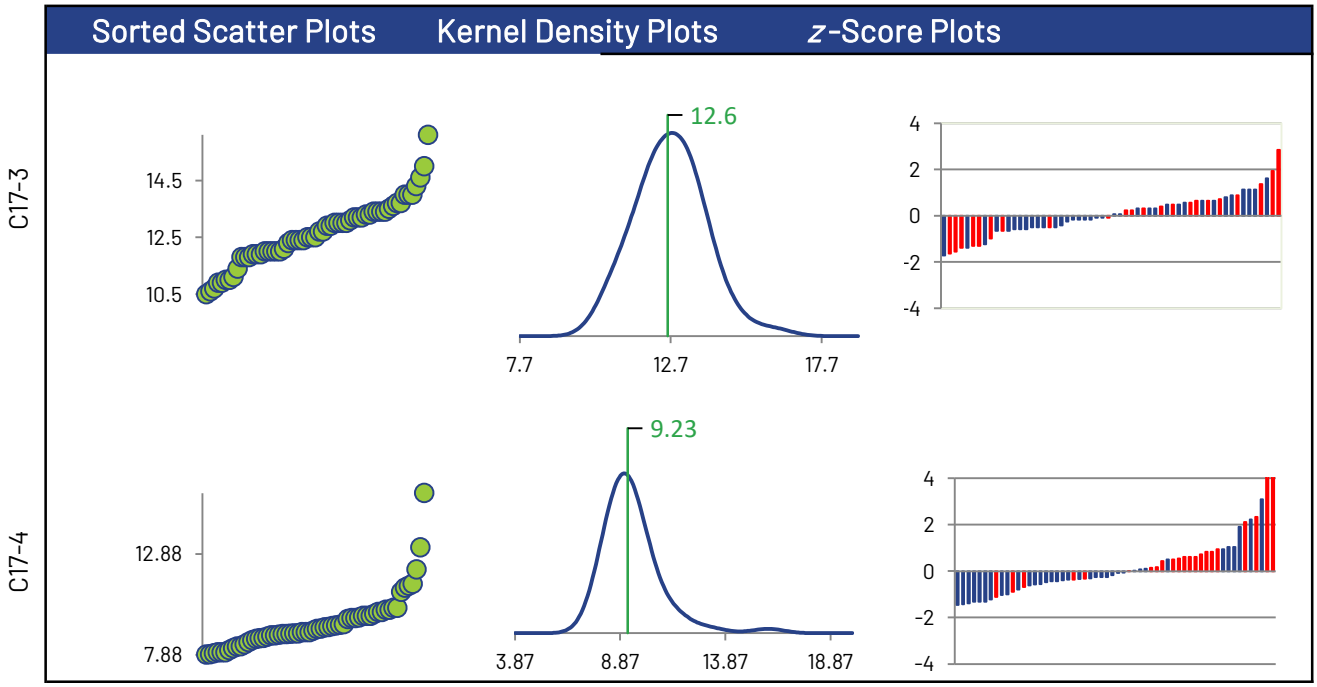
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	36	36	36	36
ICP/OES (Red)	22	22	22	22

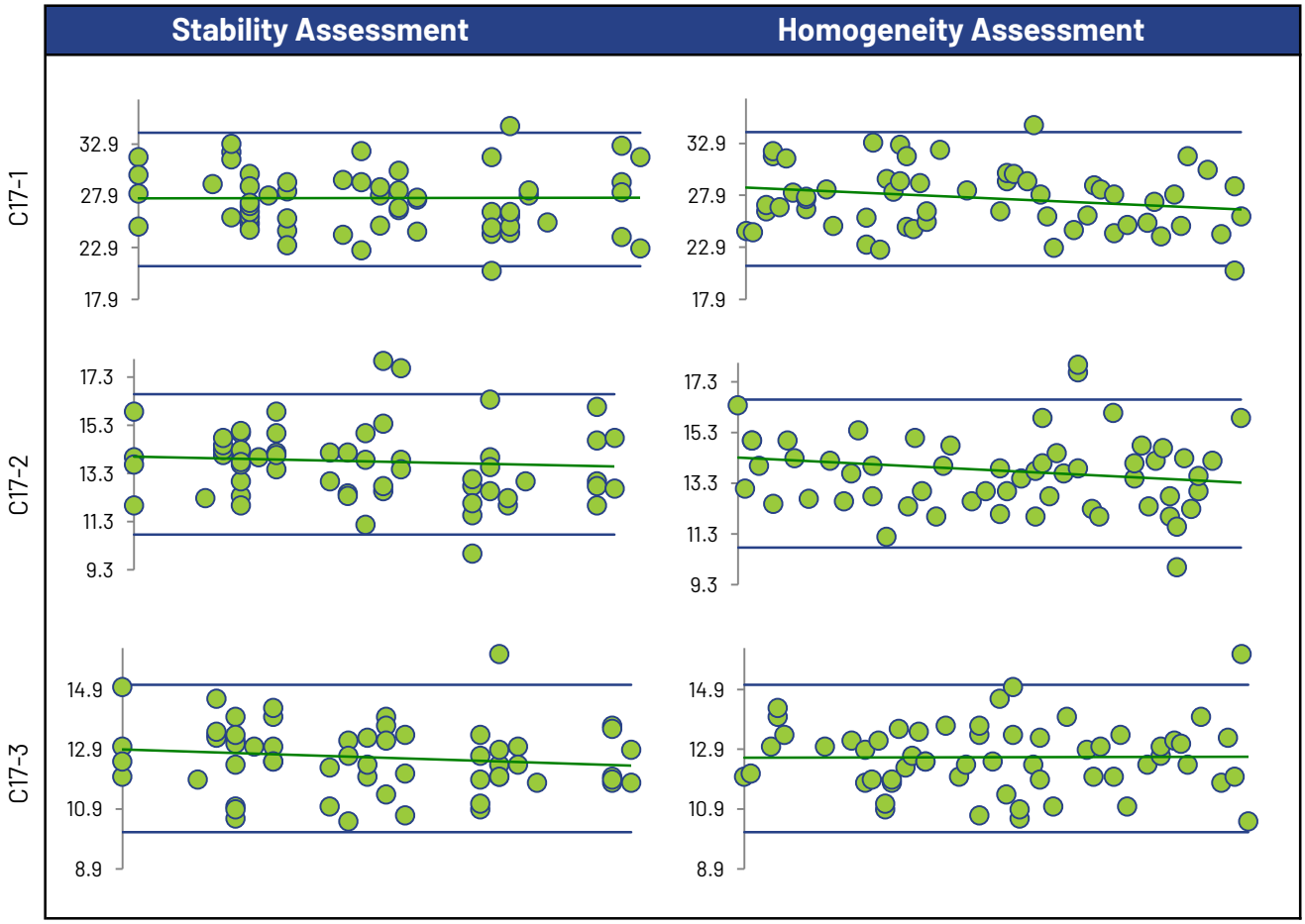
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

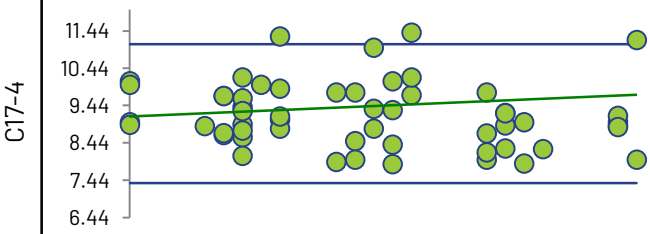
Cobalt


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
14.5
12.5
10.5
12.6
7.7
12.7
17.7
4
2
0
-2
-4
C17-4
12.88
7.88
9.23
3.87
8.87
13.87
18.87

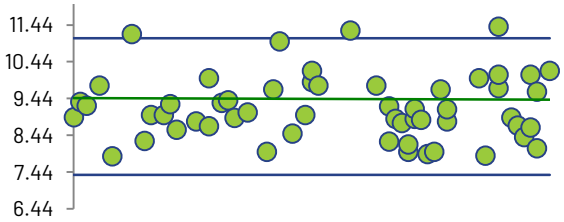

Stability Assessment
Homogeneity Assessment
C17-1
32.9
27.9
22.9
17.9
C17-2
17.3
15.3
13.3
11.3
9.3
C17-3
14.9
12.9
10.9
8.9

Cobalt

Stability Assessment



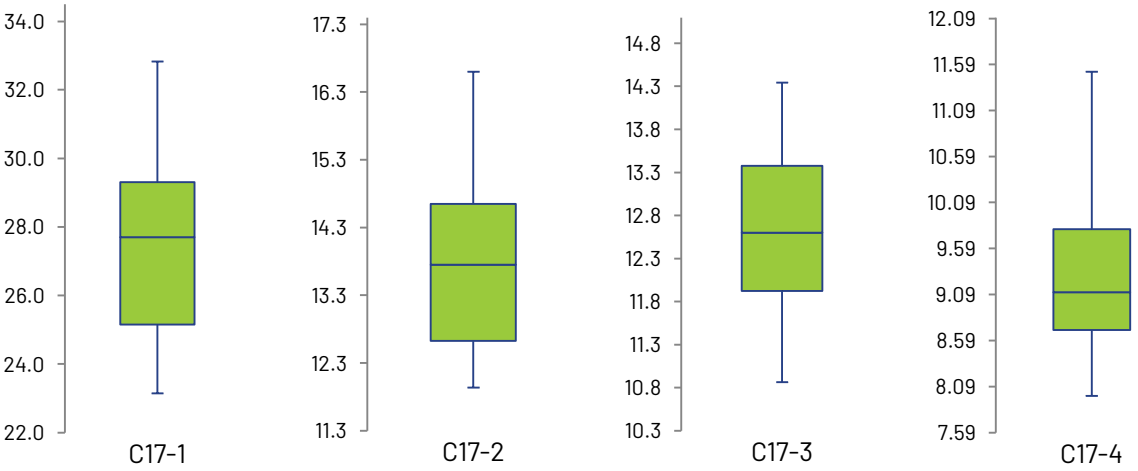
Homogeneity Assessment



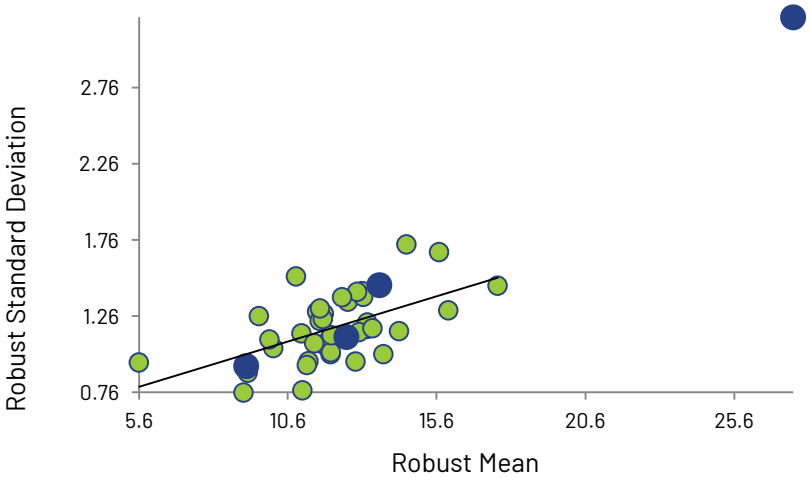
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Copper

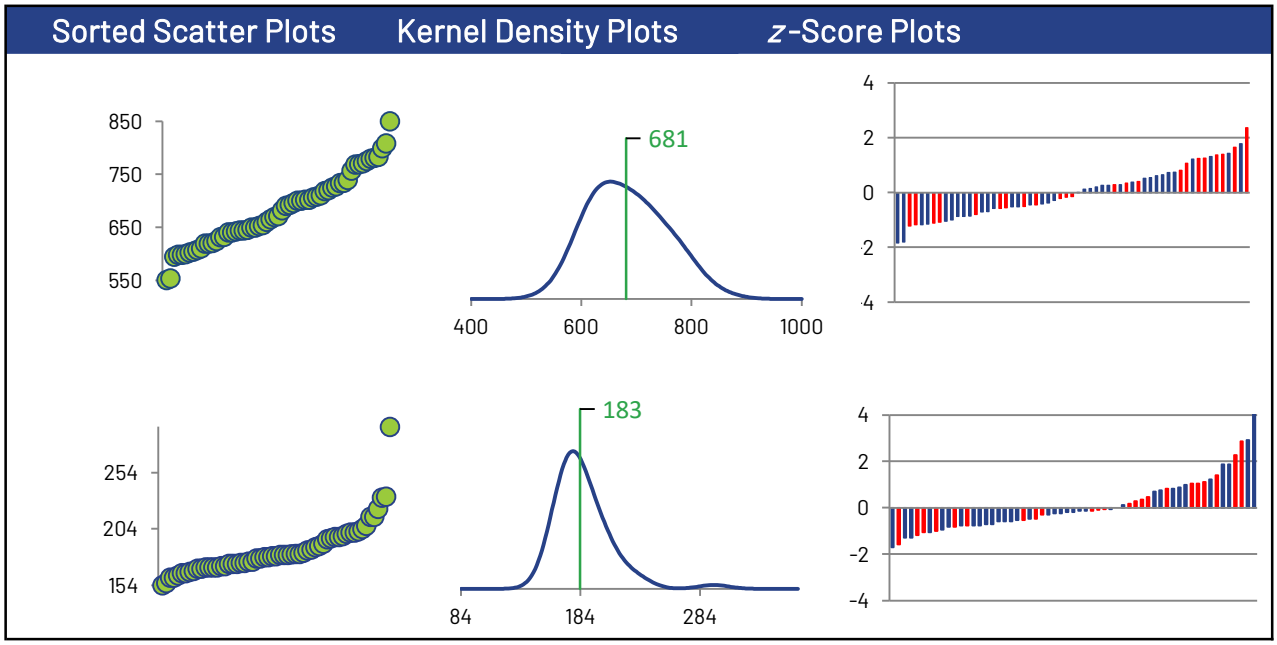
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	59	59	59	59
Median µg/g	671	180	218	109
Robust Mean µg/g	681	183	220	109
Uncdrtainty of the Assigned Value µg/g	11.6	2.78	3.53	1.46
Robust Standard Deviation µg/g	71.2	17.1	21.7	8.99
Regression Standard Deviation µg/g	56.9	15.3	18.4	9.12
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	71.2	17.1	21.7	9.12
Flagged Outliers	0	0	0	0
|z|>3.0	0	1	1	1
2<|z|<3	1	3	4	2
Failure Rate %*	1.7			

Methods Used

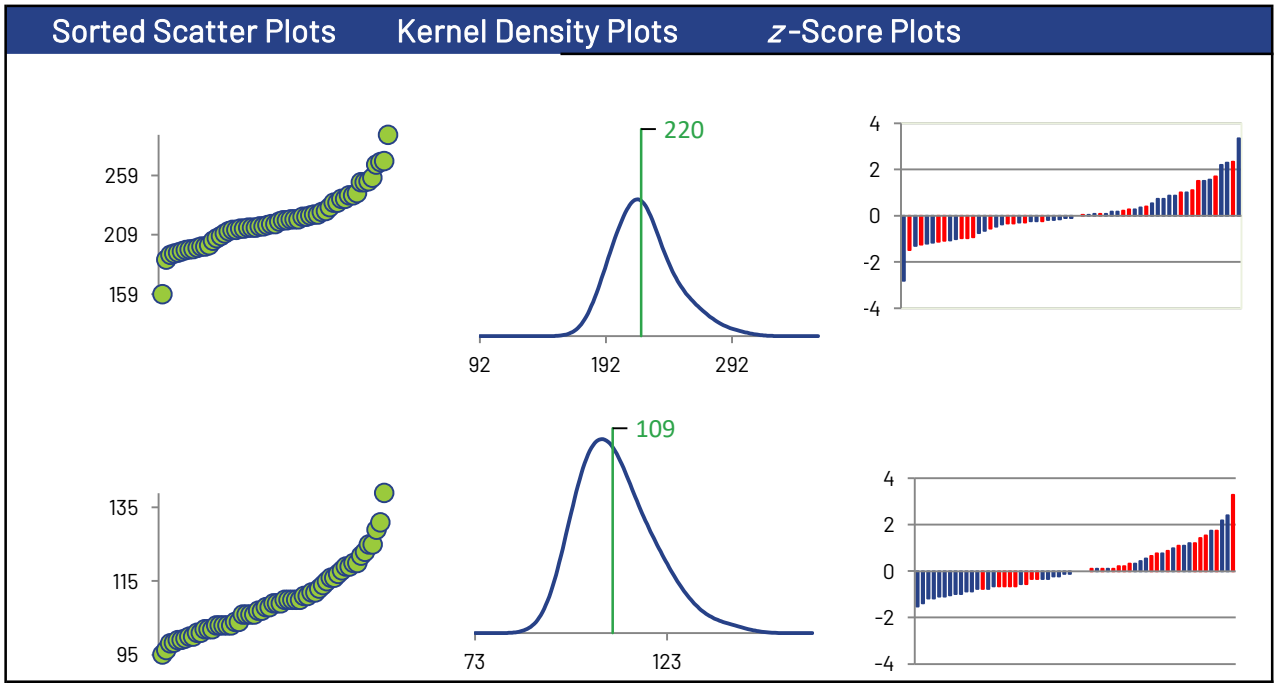
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	36	36	36	36
ICP/OES (Red)	23	23	23	23

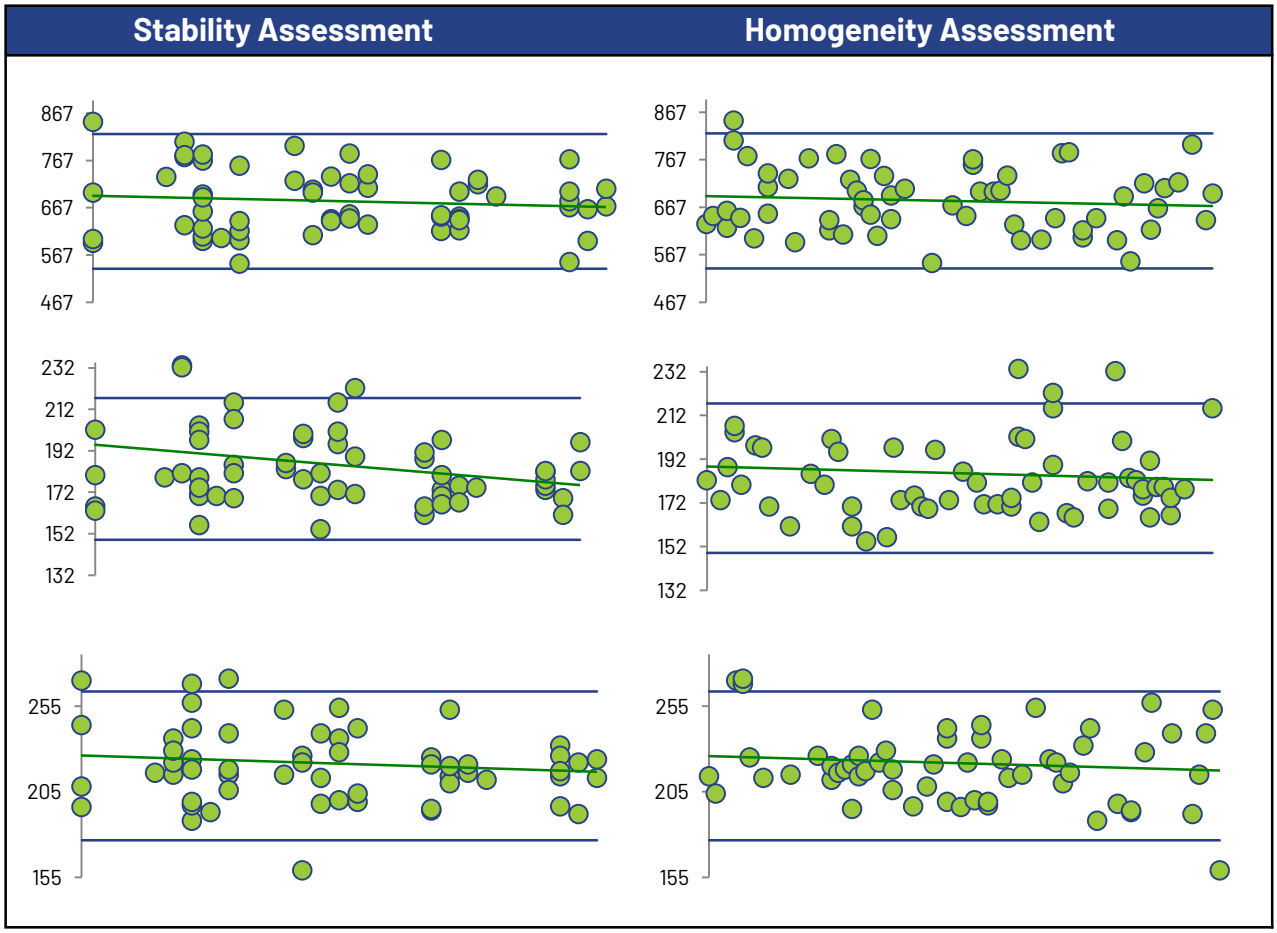
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

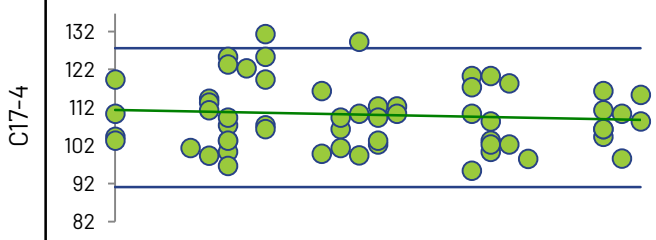
Copper


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
259
209
159
220
92
192
292
4
2
0
-2
-4
C17-4
135
115
95
109
73
123
4
2
0
-2
-4

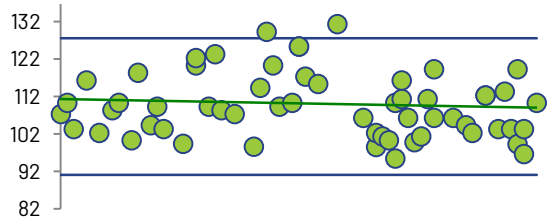

Stability Assessment
Homogeneity Assessment
C17-1
867
767
667
567
467
C17-2
232
212
192
172
152
132
C17-3
255
205
155

Copper

Stability Assessment



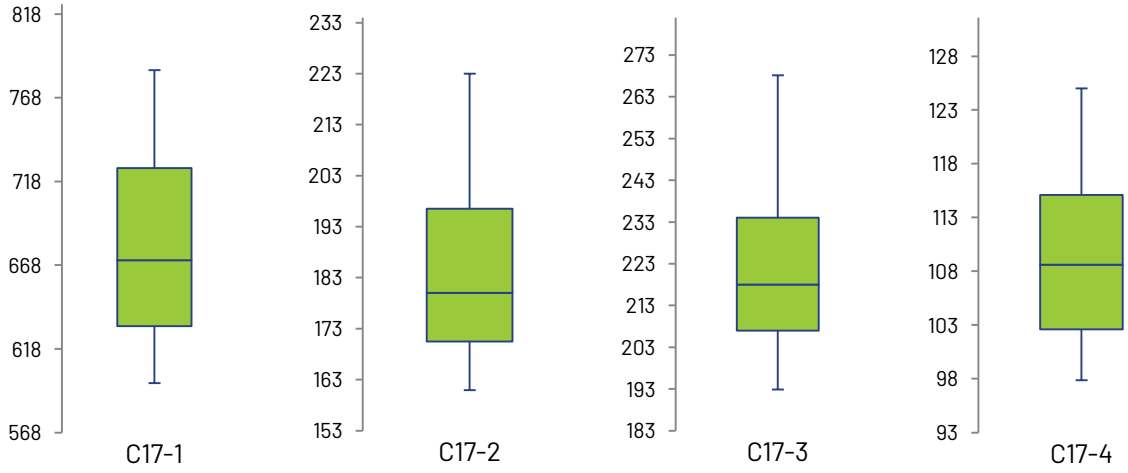
Homogeneity Assessment



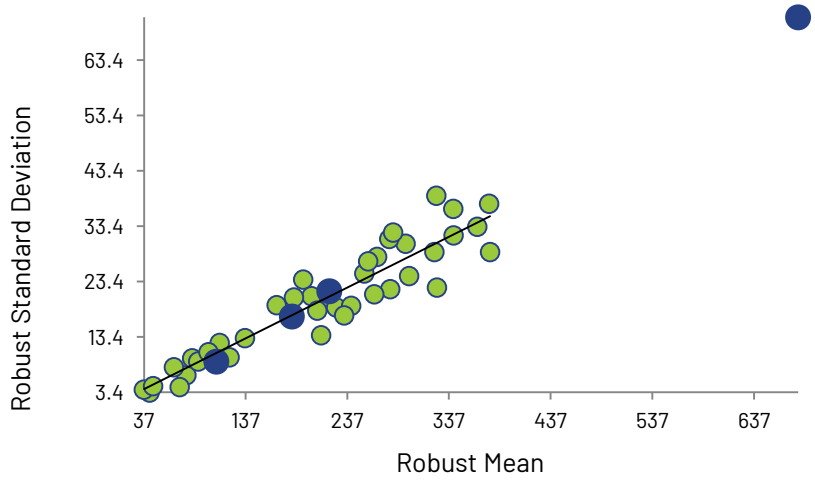
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Iron

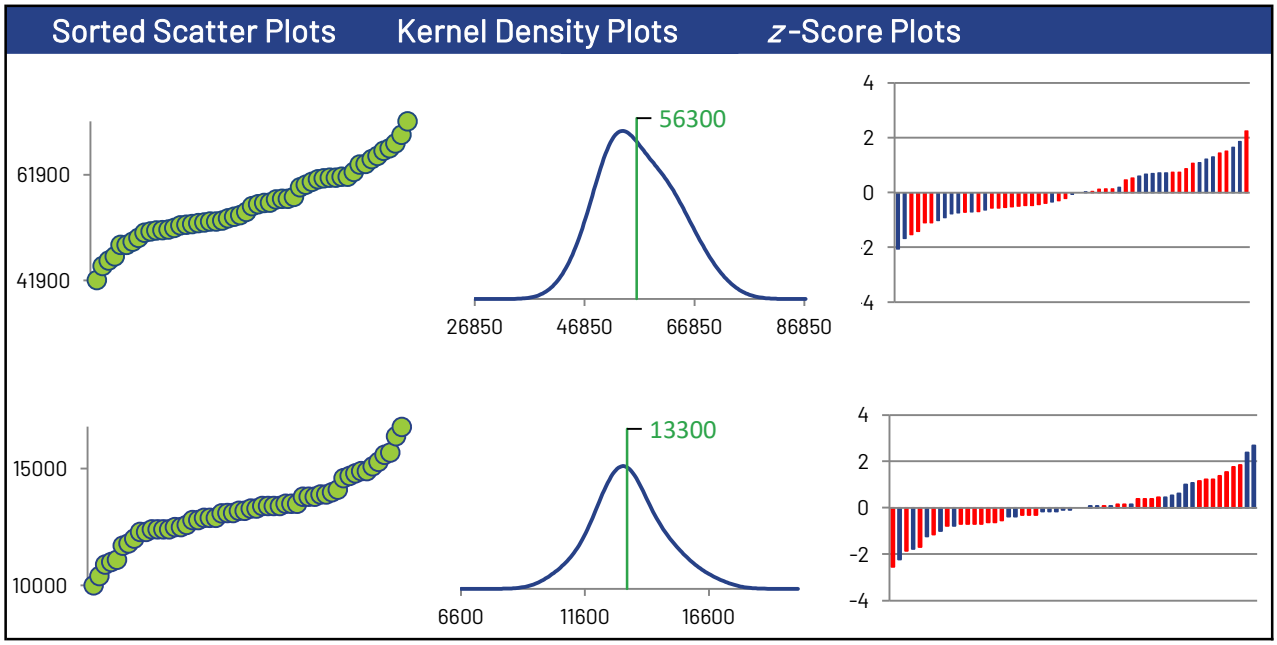
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	53	54	54	54
Median µg/g	55900	13300	1390	10600
Robust Mean µg/g	56300	13300	1390	10600
Uncdrtainty of the Assigned Value µg/g	1190	221	20.8	177
Robust Standard Deviation µg/g	6920	1300	122	1040
Regression Standard Deviation µg/g	5140	1210	127	968
Stability Flag				
Homogeneity Flag	Homogeneity			
Standard Deviation Used (SDPA) µg/g	6990	1300	127	1040
Flagged Outliers	1	0	0	0
|z|>3.0	0	0	0	0
2<|z|<3	2	4	2	5
Failure Rate %*	3.7			

Methods Used

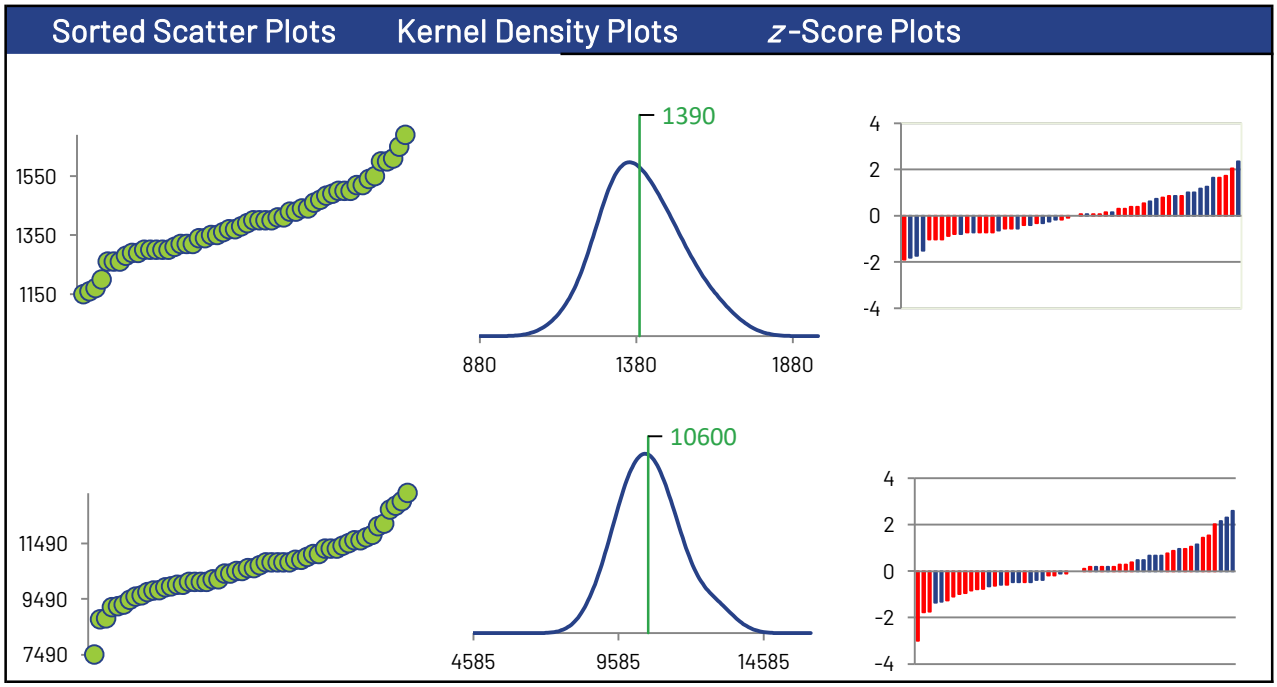
Method	C17-1	C17-2	C17-3	C17-4
ICP/OES (Blue)	23	23	23	23
ICP/MS (Red)	30	31	31	31

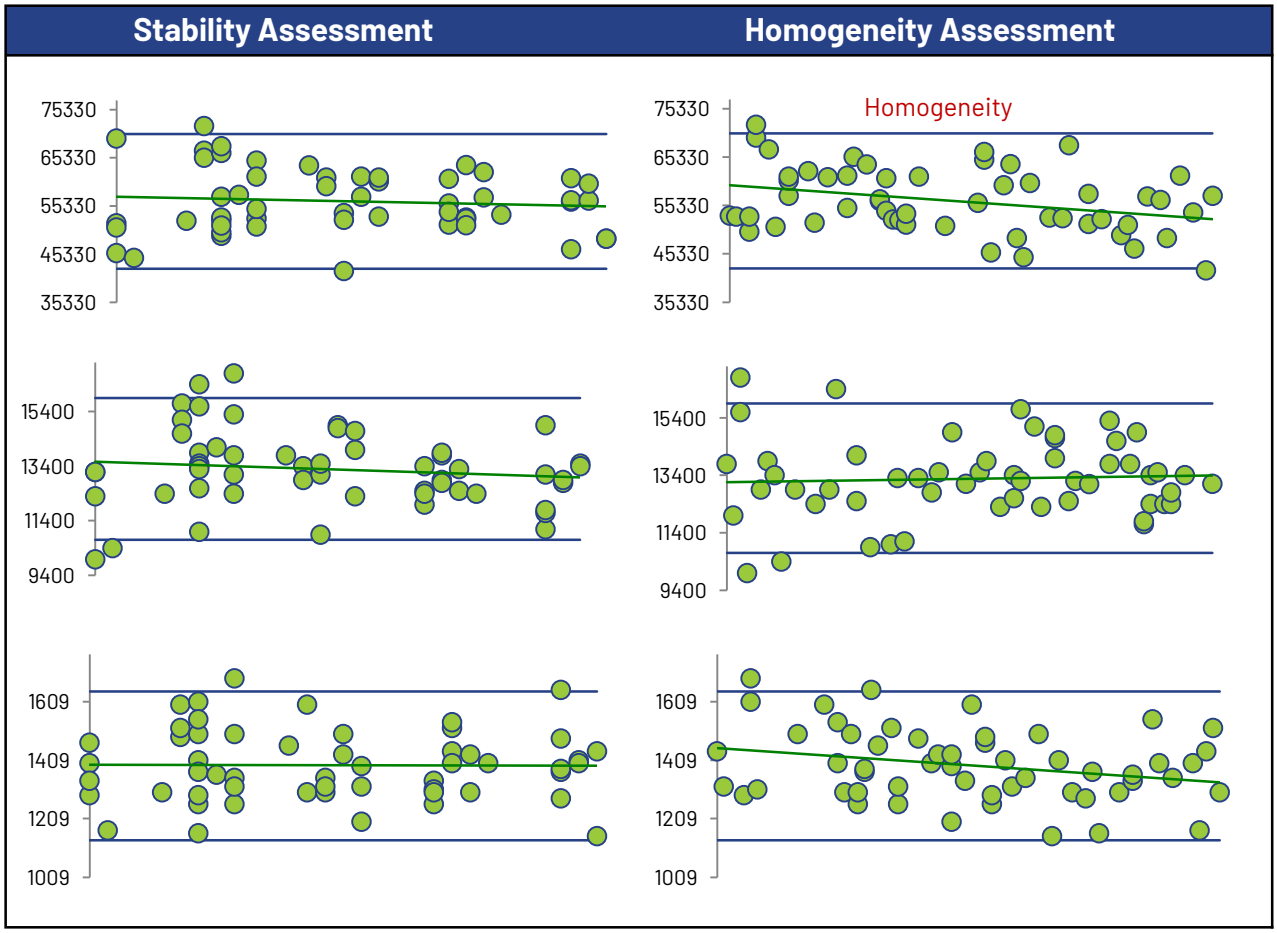
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

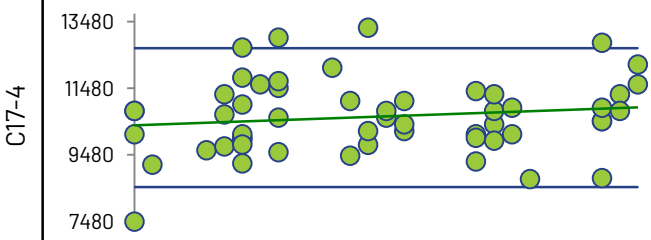
Iron


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
1550
1350
1150
1390
880
1380
1880
4
2
0
-2
-4
C17-4
11490
9490
7490
10600
4585
9585
14585

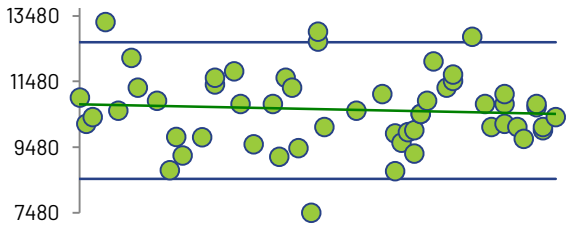

Stability Assessment
Homogeneity Assessment
Homogeneity
C17-1
75330
65330
55330
45330
35330
C17-2
15400
13400
11400
9400
C17-3
1609
1409
1209
1009

Iron

Stability Assessment



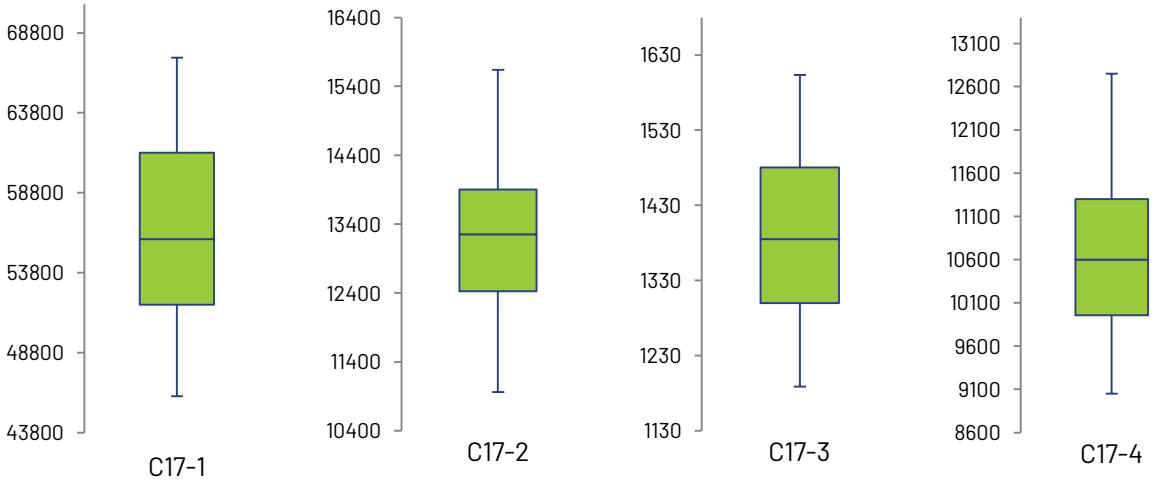
Homogeneity Assessment



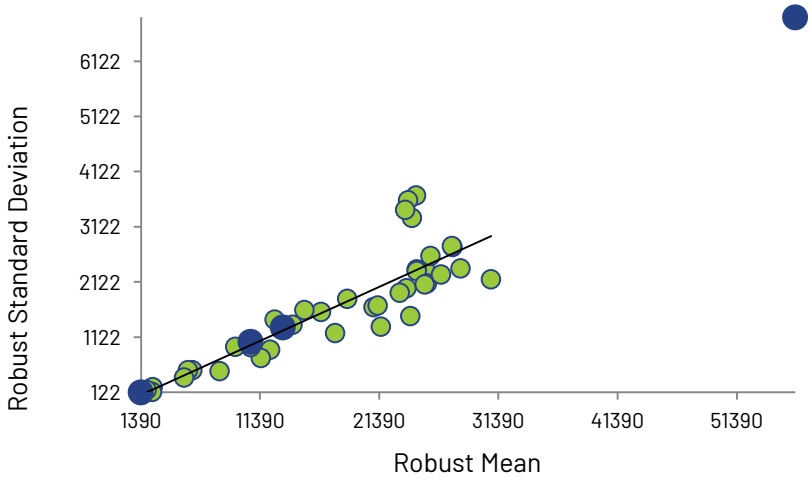
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Lead

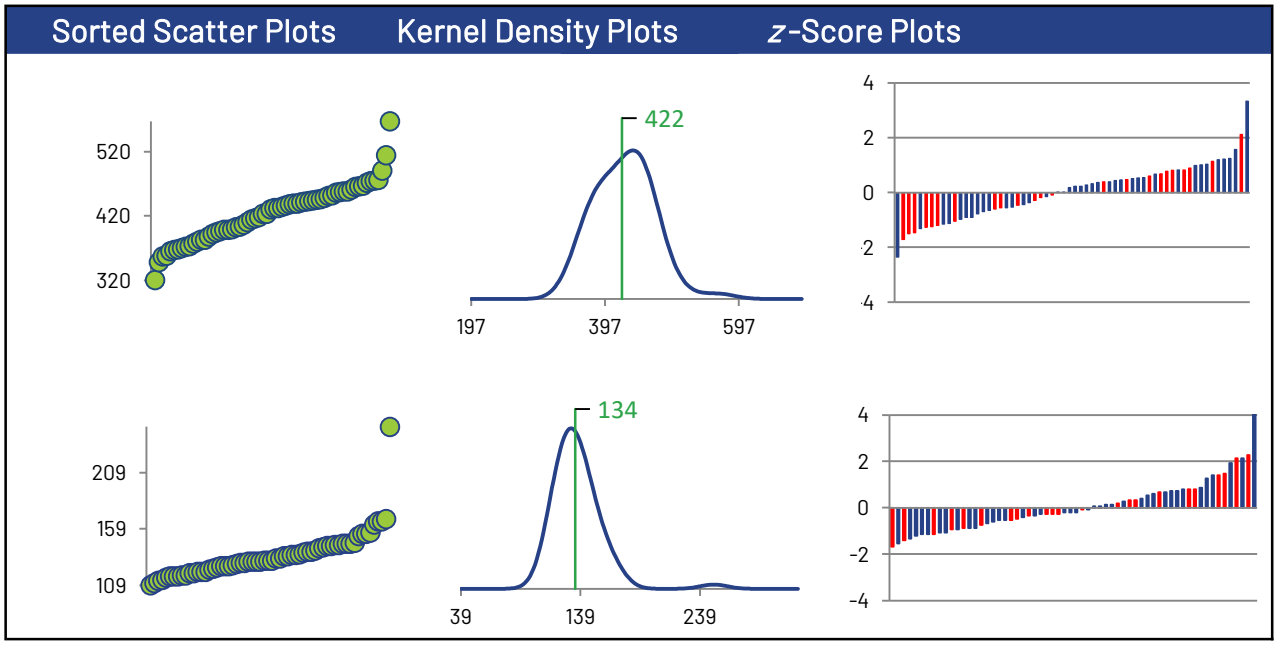
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	62	62	61	61
Median µg/g	431	131	241	54.3
Robust Mean µg/g	422	134	242	55.0
Uncdrtainty of the Assigned Value µg/g	6.89	2.38	3.20	0.866
Robust Standard Deviation µg/g	43.4	15.0	20.0	5.41
Regression Standard Deviation µg/g	33.2	11.6	19.7	5.78
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	43.4	15.0	20.0	5.78
Flagged Outliers	0	0	1	1
|z|>3.0	1	1	0	1
2<|z|<3	2	3	2	1
Failure Rate %*	4.8			

Methods Used

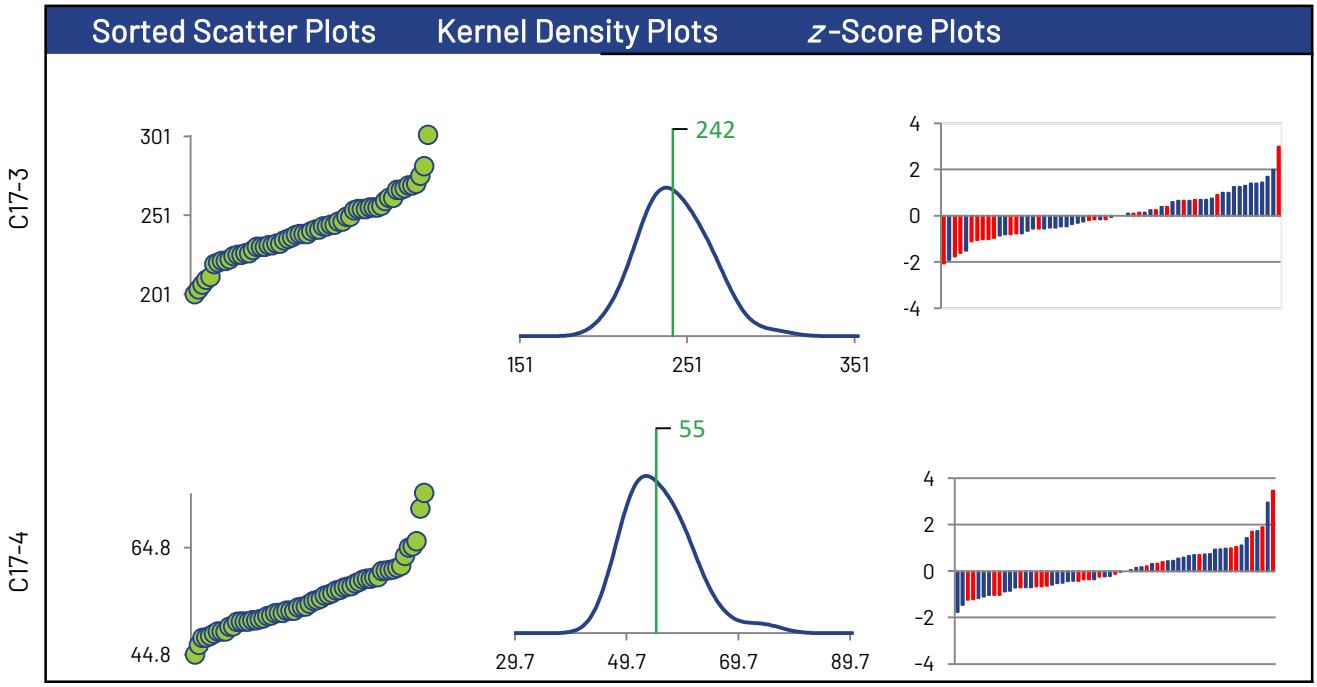
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	39	39	39	39
ICP/OES (Red)	23	23	22	22

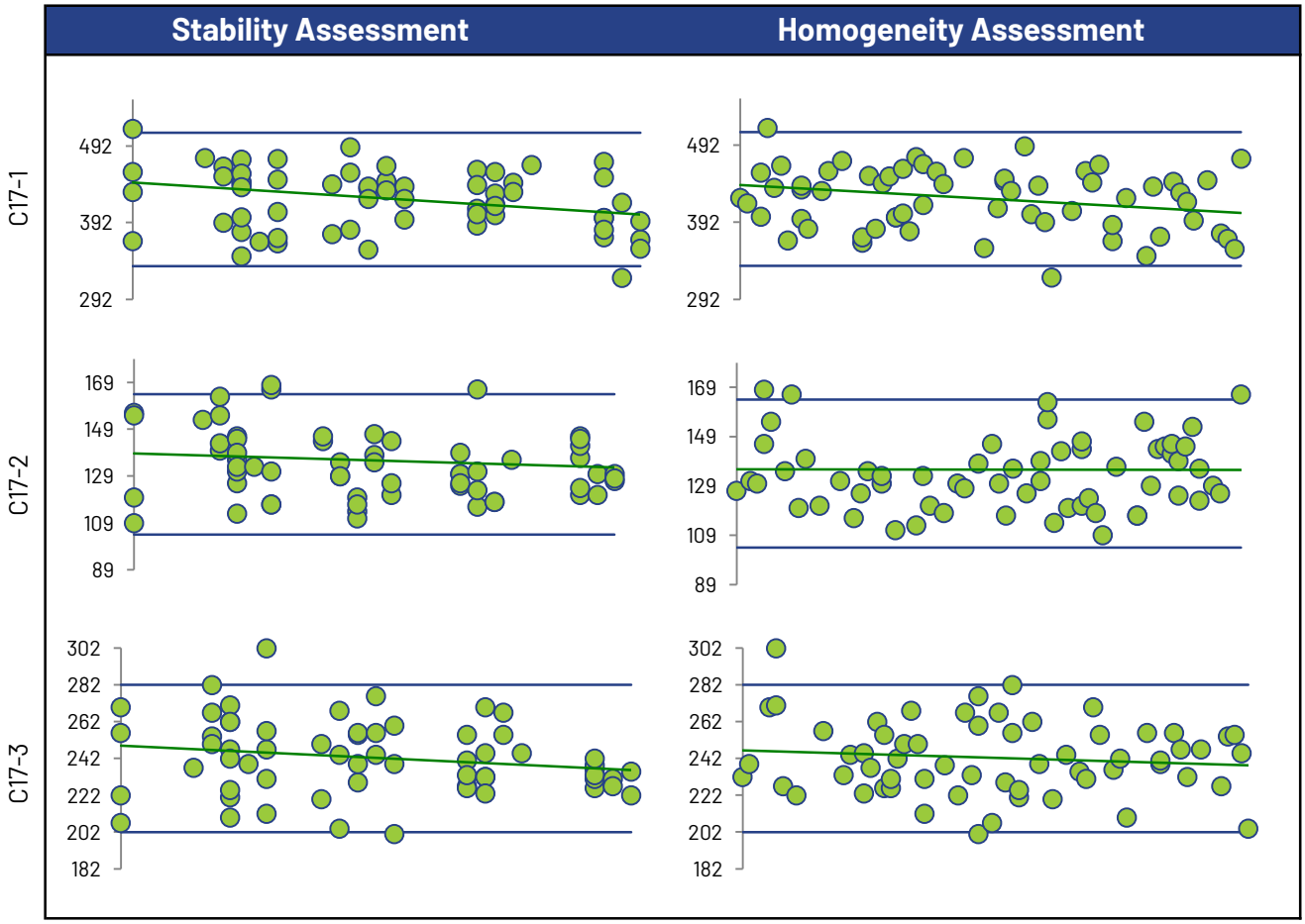
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

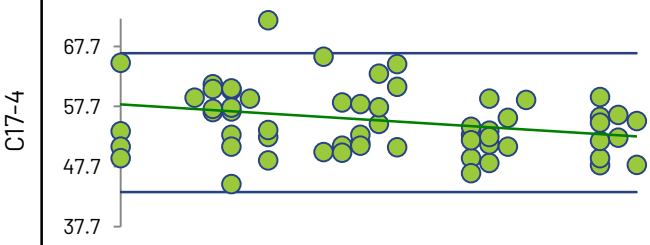
Lead


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
301
251
201
242
151
251
351
4
2
0
-2
-4
C17-4
64.8
44.8
55
29.7
49.7
69.7
89.7

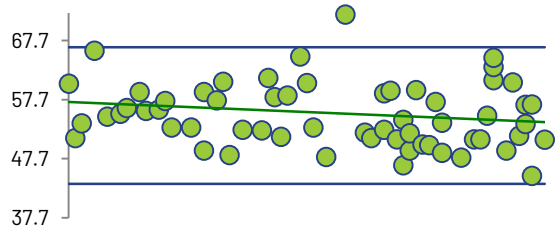

Stability Assessment
Homogeneity Assessment
C17-1
492
392
292
C17-2
169
149
129
109
89
C17-3
302
282
262
242
222
202
182

Lead

Stability Assessment



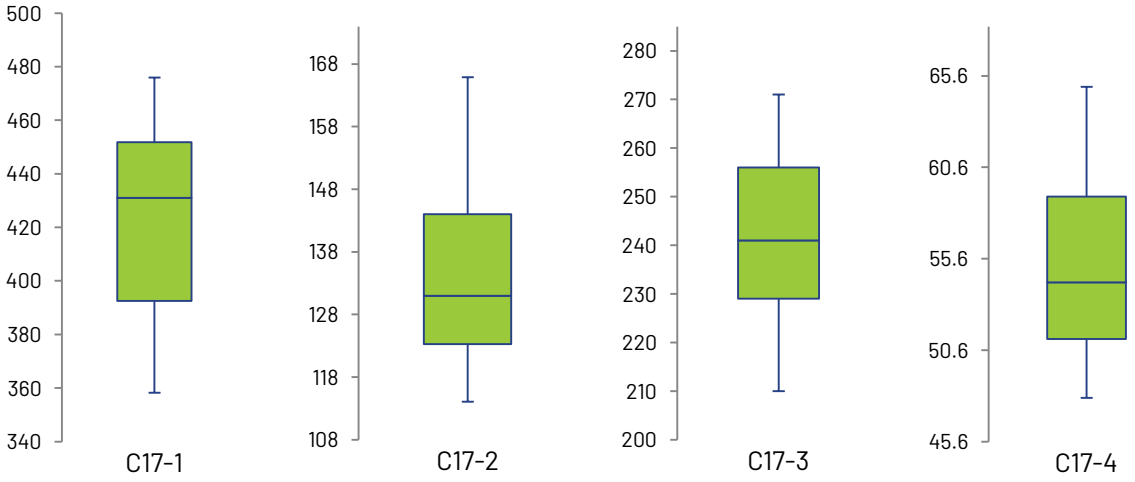
Homogeneity Assessment



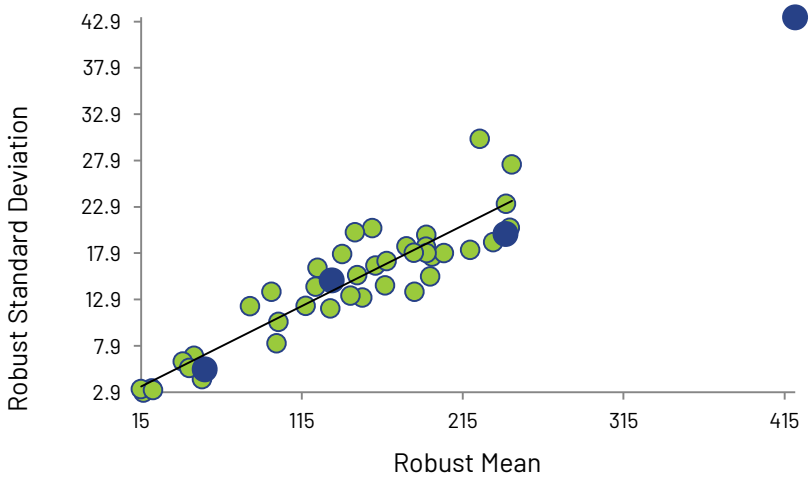
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Manganese

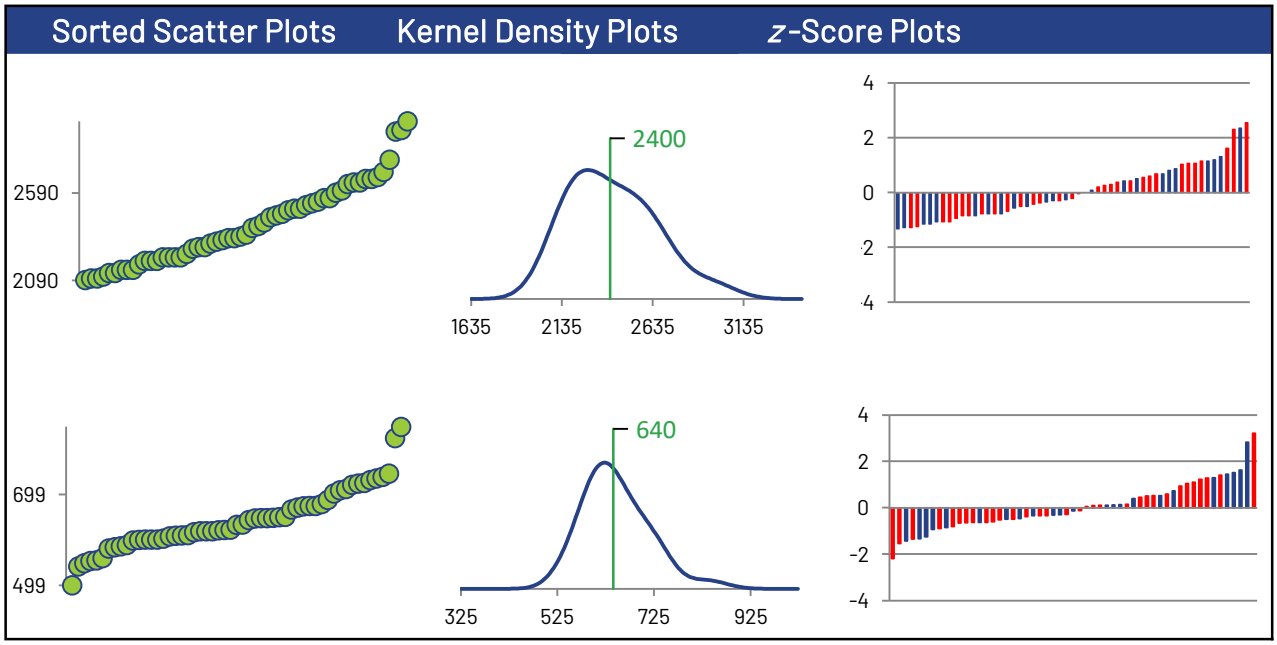
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	55	55	55	55
Median µg/g	2350	632	820	294
Robust Mean µg/g	2400	640	819	298
Uncdrtainty of the Assigned Value µg/g	39.4	10.9	10.6	5.51
Robust Standard Deviation µg/g	234	64.8	63.1	32.7
Regression Standard Deviation µg/g	176	46.9	60.0	21.9
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	234	64.8	63.1	32.7
Flagged Outliers	0	0	0	0
|z|>3.0	0	1	0	0
2<|z|<3	3	2	3	3
Failure Rate %*	0.0			

Methods Used

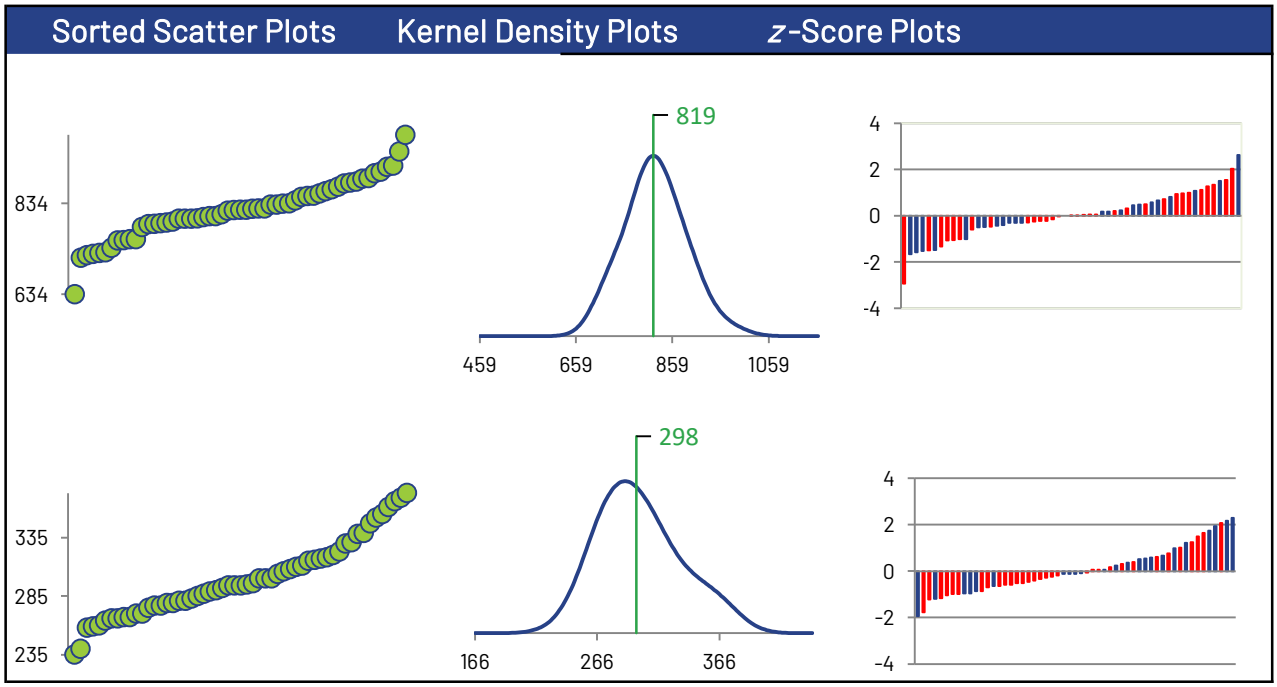
Method	C17-1	C17-2	C17-3	C17-4
ICP/OES (Blue)	23	23	23	23
ICP/MS (Red)	32	32	32	32

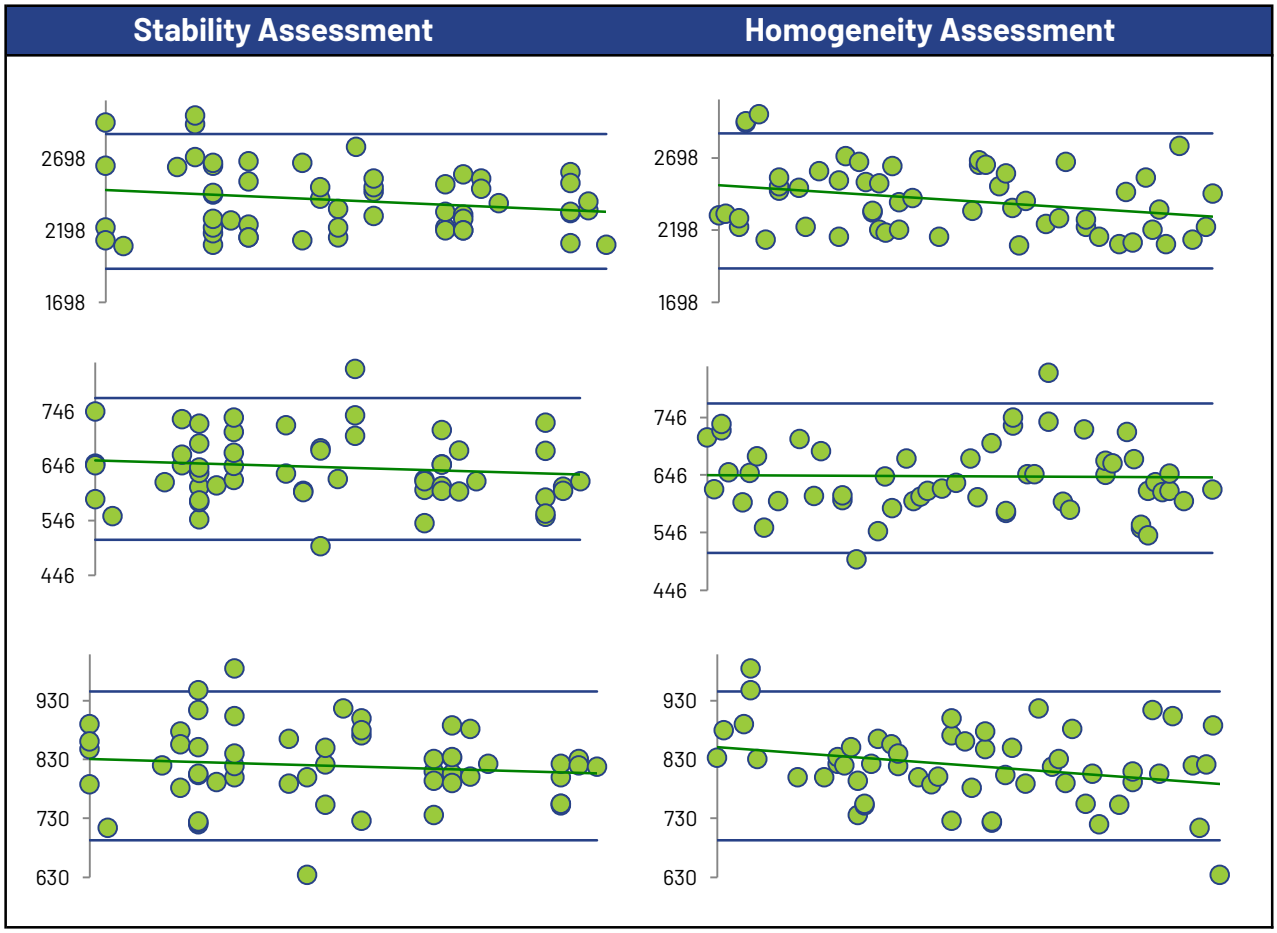
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

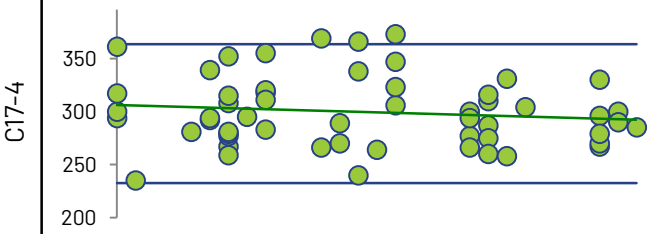
Manganese


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
834
634
819
459
659
859
1059
4
2
0
-2
-4
C17-4
335
285
235
298
166
266
366
4
2
0
-2
-4

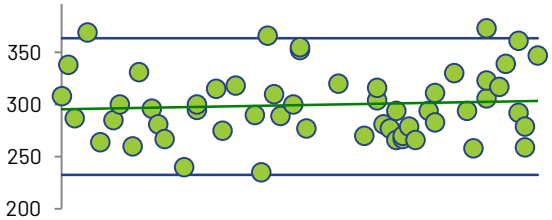

Stability Assessment
Homogeneity Assessment
C17-1
2698
2198
1698
2698
2198
1698
C17-2
746
646
546
446
746
646
546
446
C17-3
930
830
730
630
930
830
730
630

Manganese

Stability Assessment



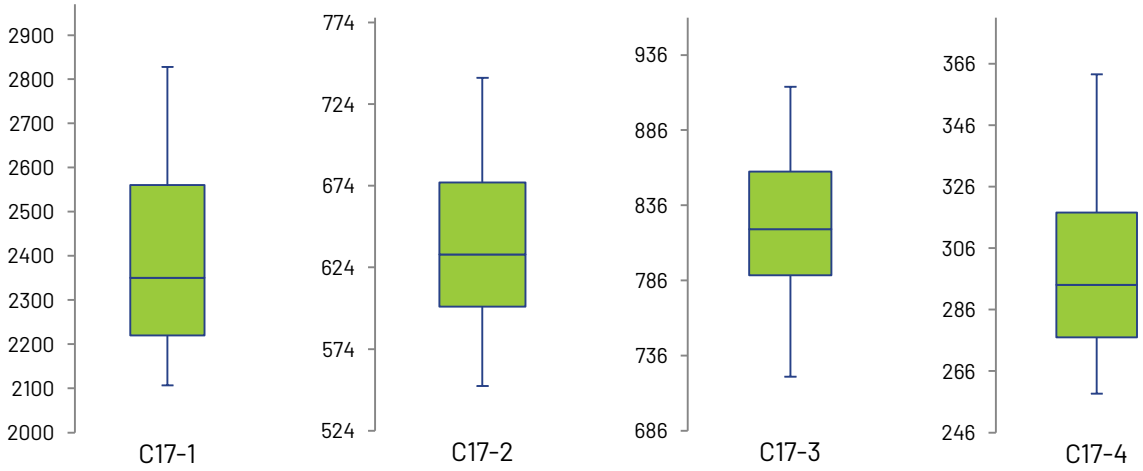
Homogeneity Assessment



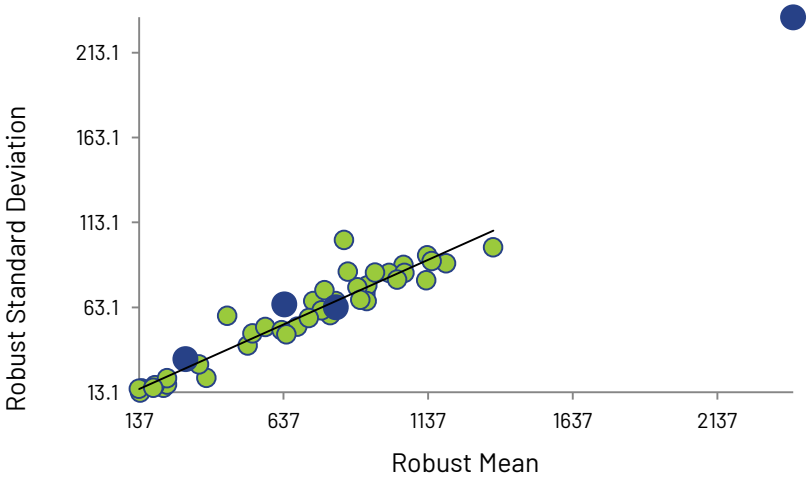
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Mercury

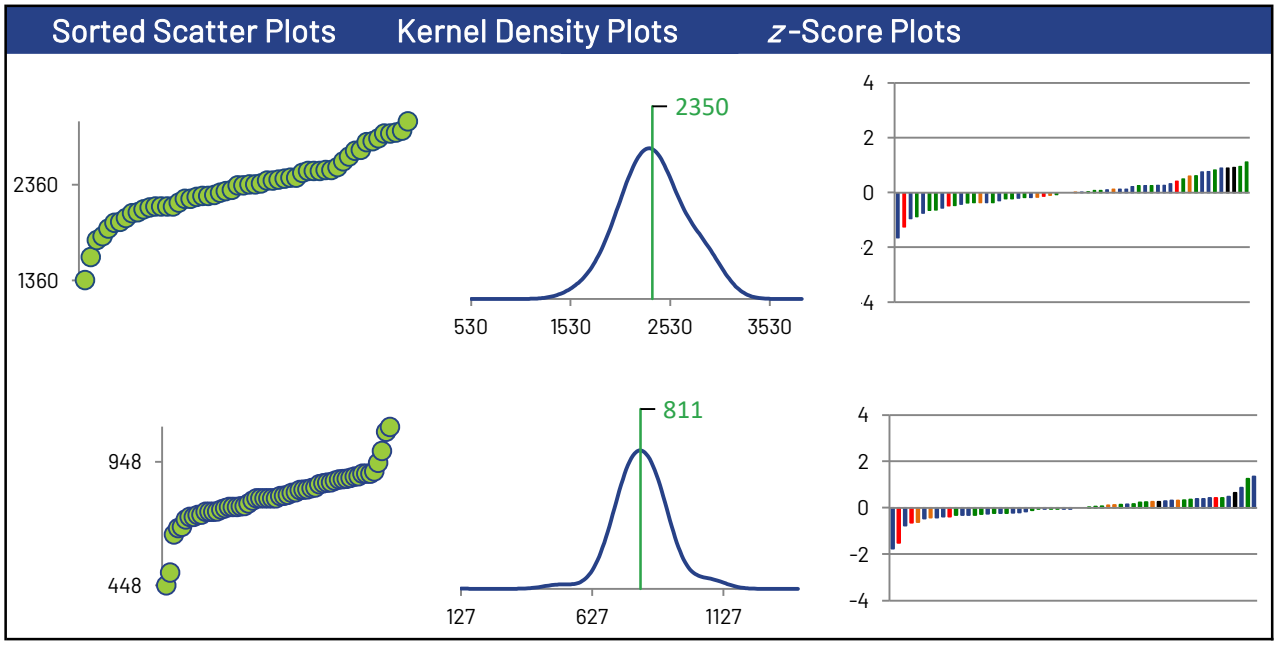
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	56	58	57	53
Median µg/g	2360	806	700	303
Robust Mean µg/g	2350	811	691	312
Uncdrtainty of the Assigned Value µg/g	55.6	13.1	15.4	6.25
Robust Standard Deviation µg/g	333	79.8	93.2	36.4
Regression Standard Deviation µg/g	600	207	176	79.6
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	600	207	176	79.6
Flagged Outliers	4	3	3	4
|z|>3.0	0	0	1	0
2<|z|<3	0	0	0	0
Failure Rate %*	3.2			

Methods Used

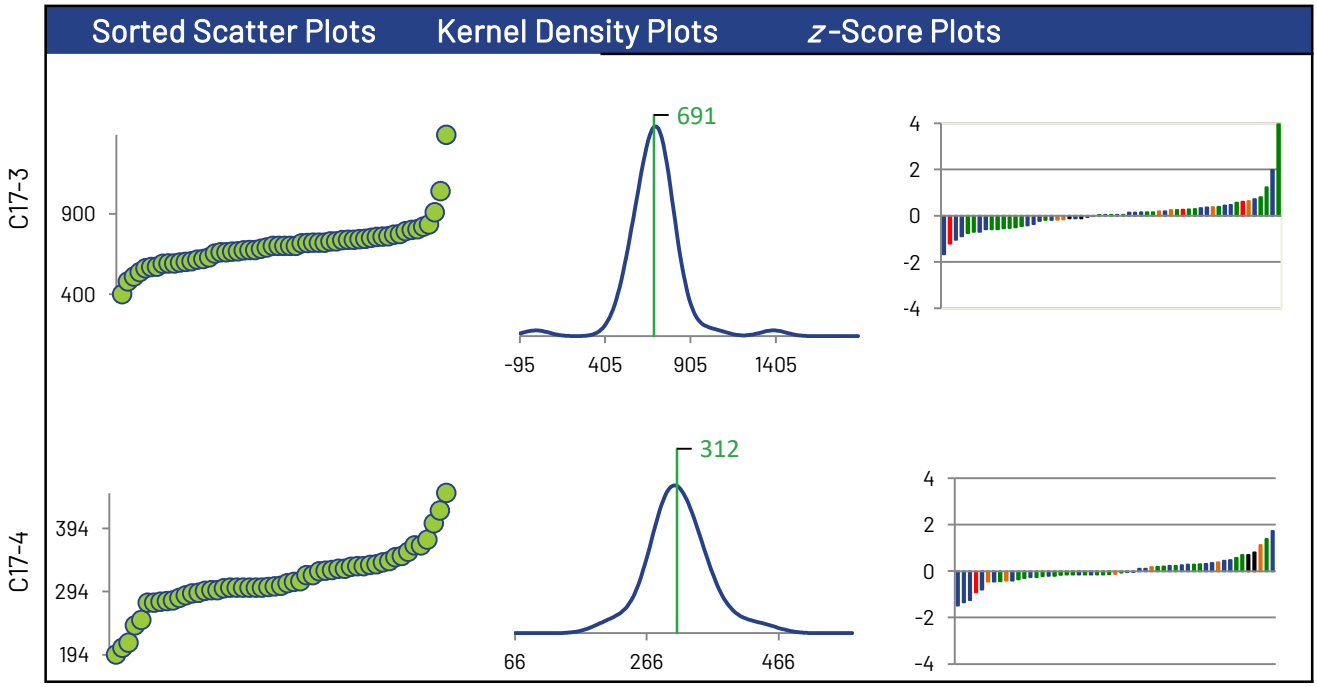
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	23	24	24	22
ICP/OES (Red)	4	4	3	1
COLD VAPOUR AA (Green)	21	22	22	22
ATOMIC FLUORESCENCE (Orange)	6	6	6	6
PYROLYTIC AA (Black)	2	2	2	2

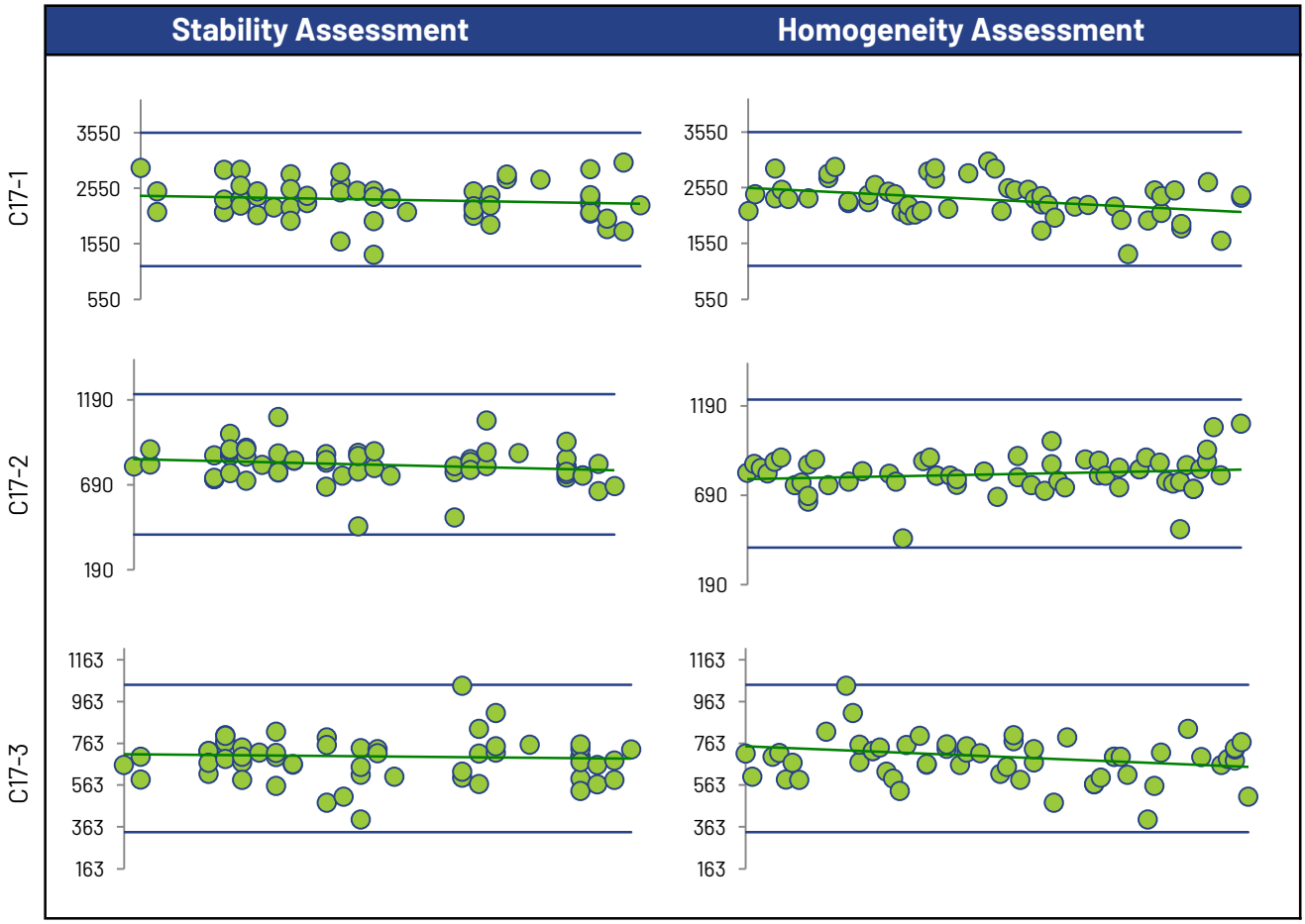
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

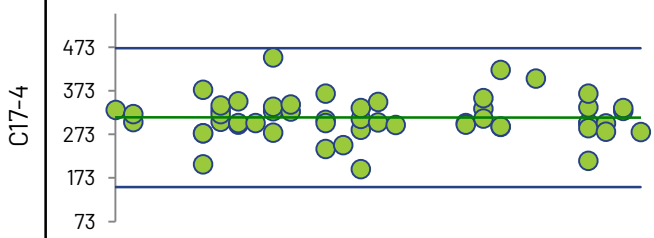
Mercury


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
900
400
691
-95
405
905
1405
4
2
0
-2
-4
C17-4
394
294
194
312
66
266
466

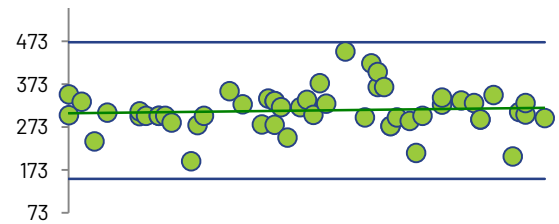

Stability Assessment
Homogeneity Assessment
C17-1
3550
2550
1550
550
C17-2
1190
690
190
C17-3
1163
963
763
563
363
163

Mercury

Stability Assessment



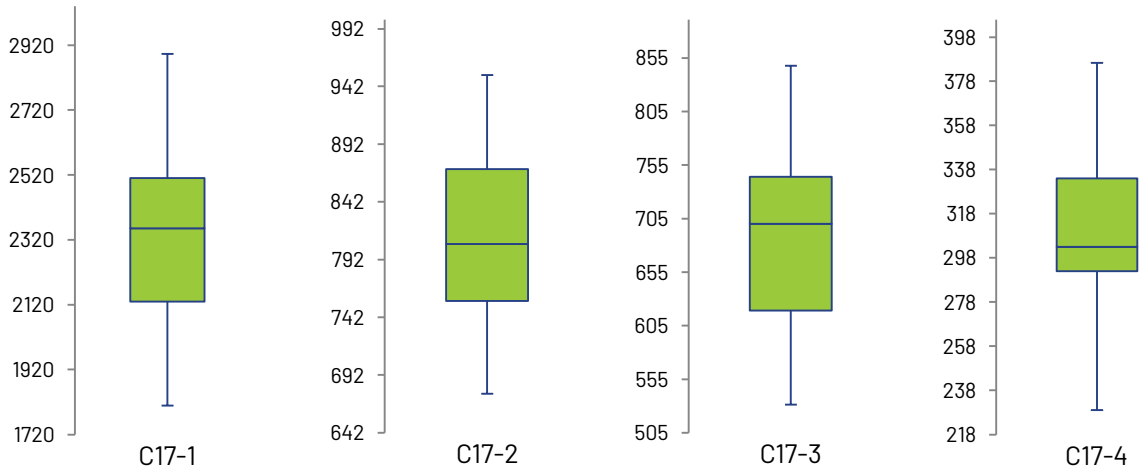
Homogeneity Assessment



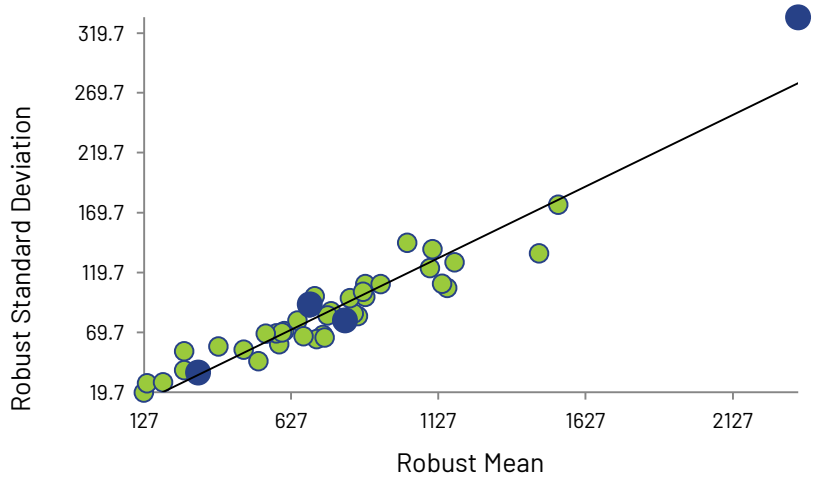
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Nickel

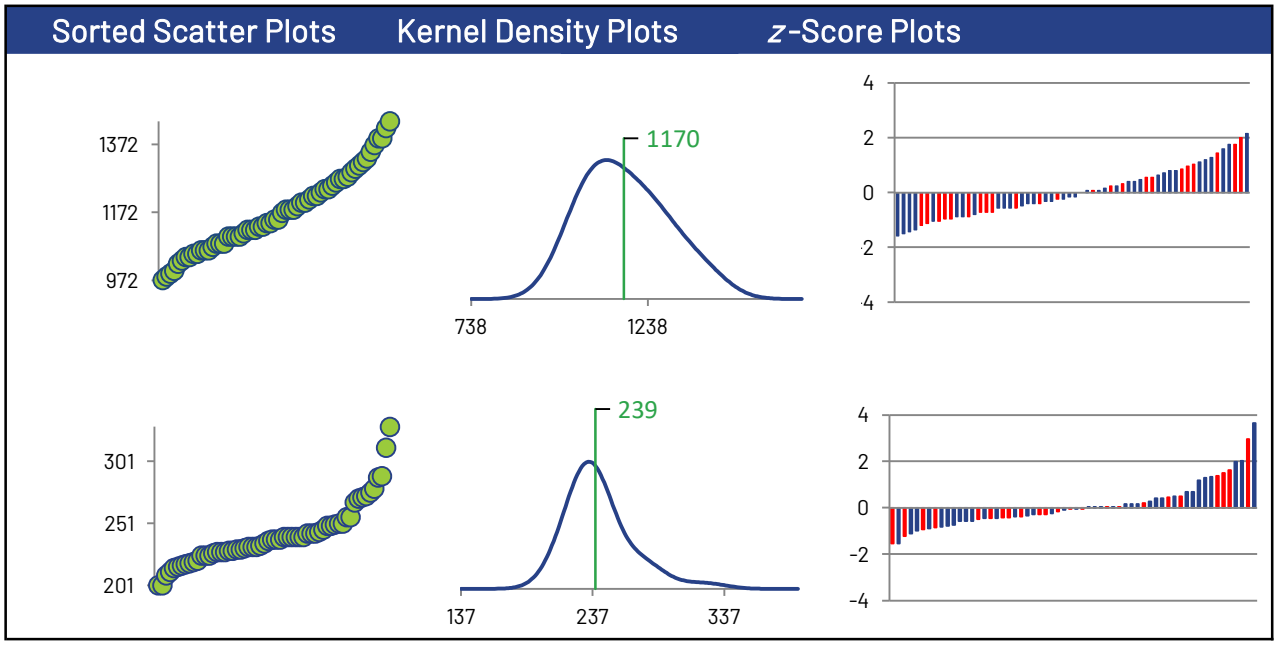
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	60	60	60	60
Median µg/g	1150	238	291	256
Robust Mean µg/g	1170	239	293	260
Uncdrtainty of the Assigned Value µg/g	20.2	3.24	3.20	4.07
Robust Standard Deviation µg/g	125	20.1	19.8	25.2
Regression Standard Deviation µg/g	120	24.6	30.1	26.8
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	125	24.6	30.1	26.8
Flagged Outliers	0	0	0	0
|z|>3.0	0	1	0	2
2<|z|<3	1	2	0	1
Failure Rate %*	0.0			

Methods Used

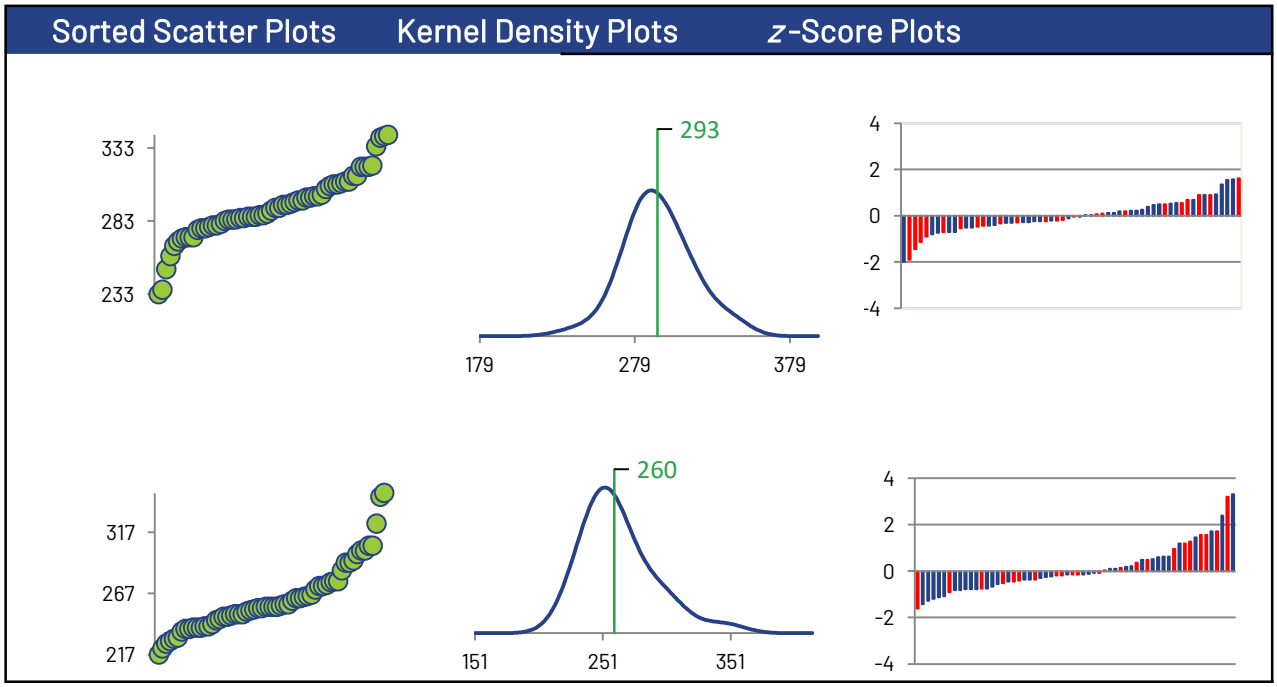
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	37	37	37	37
ICP/OES (Red)	23	23	23	23

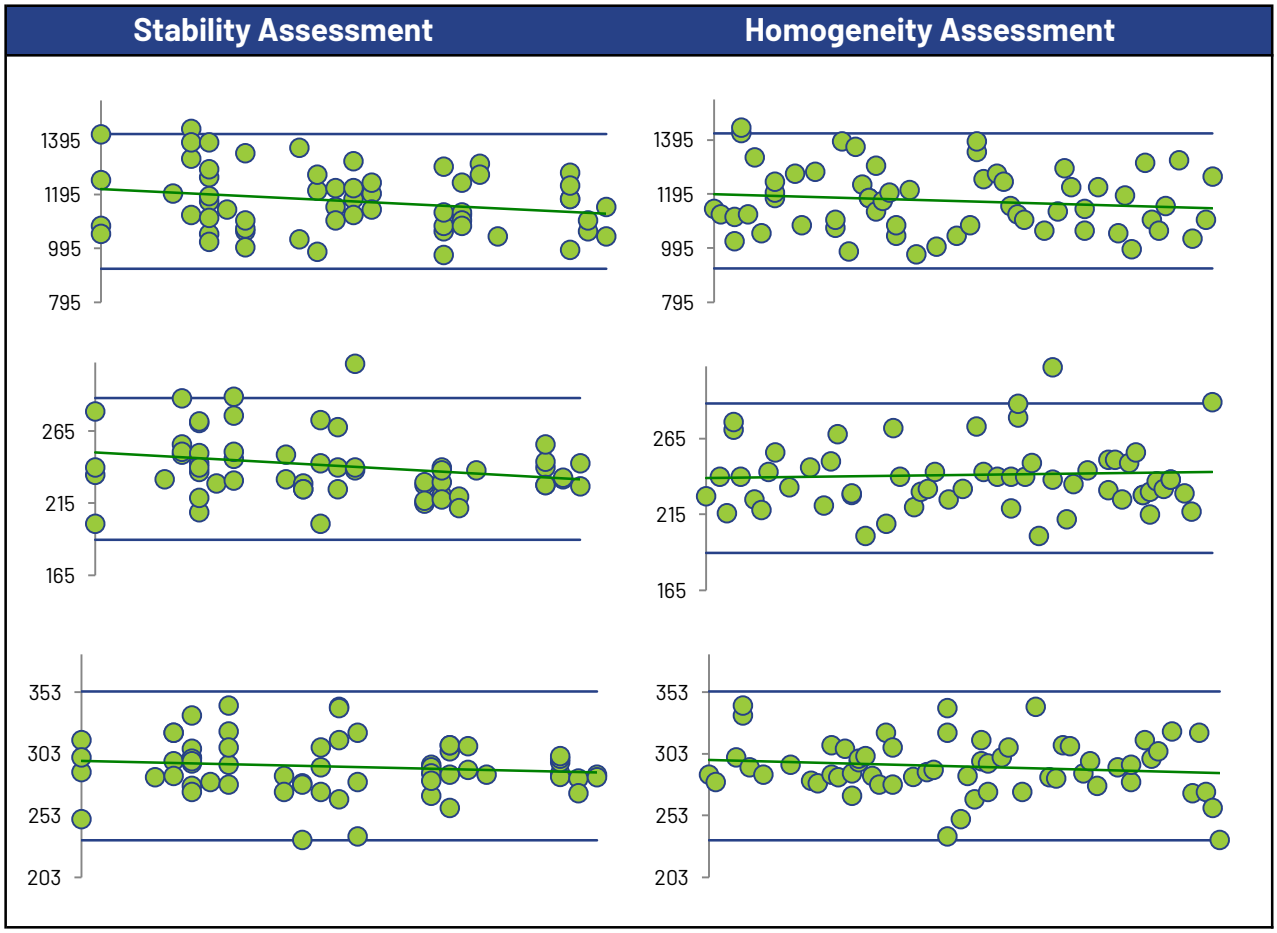
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

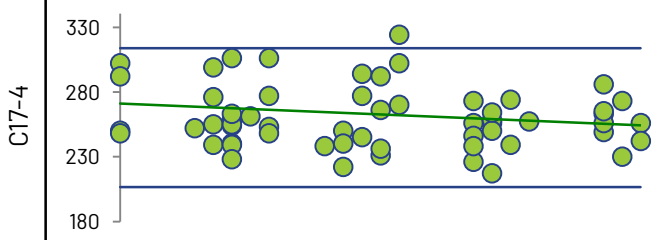
Nickel


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
333
283
233
293
179
279
379
4
2
0
-2
-4
C17-4
317
267
217
260
151
251
351
4
2
0
-2
-4

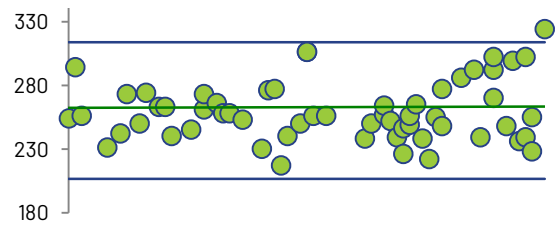

Stability Assessment
Homogeneity Assessment
C17-1
1395
1195
995
795
1395
1195
995
795
C17-2
265
215
165
265
215
165
C17-3
353
303
253
203
353
303
253
203

Nickel

Stability Assessment



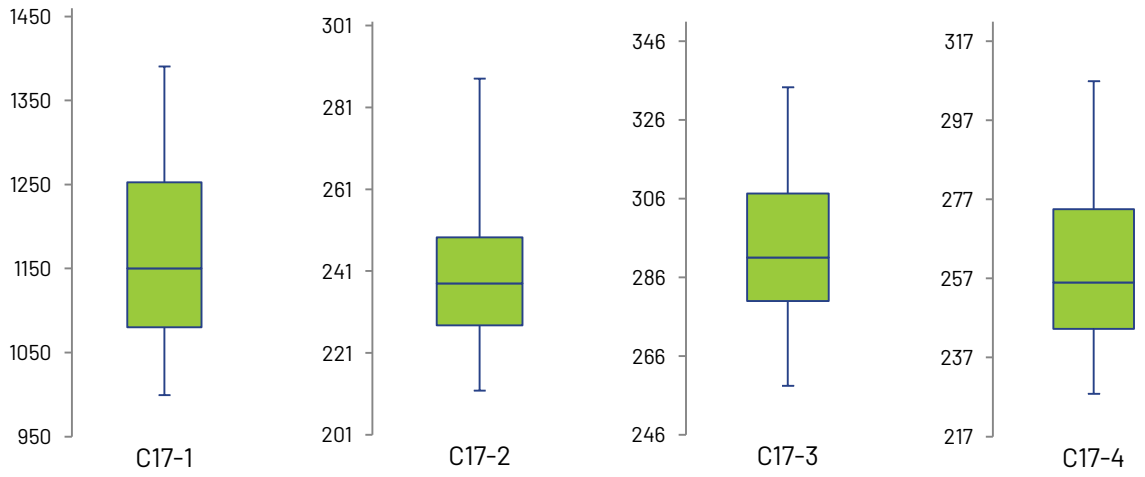
Homogeneity Assessment



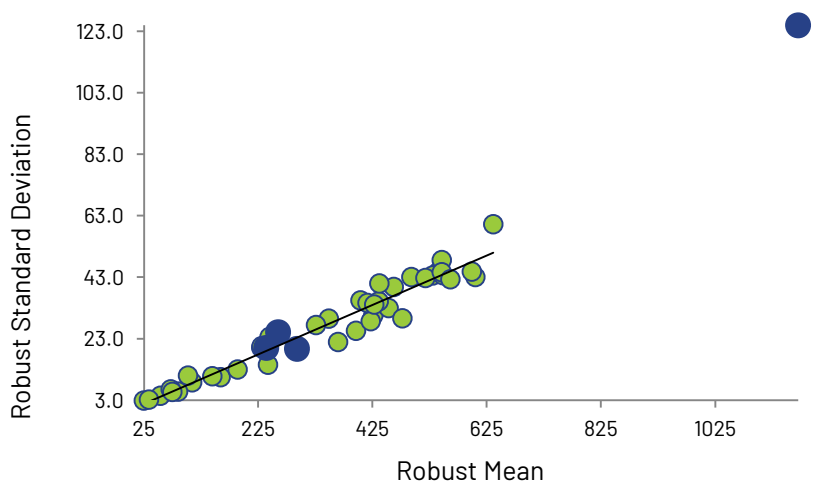
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Strontium

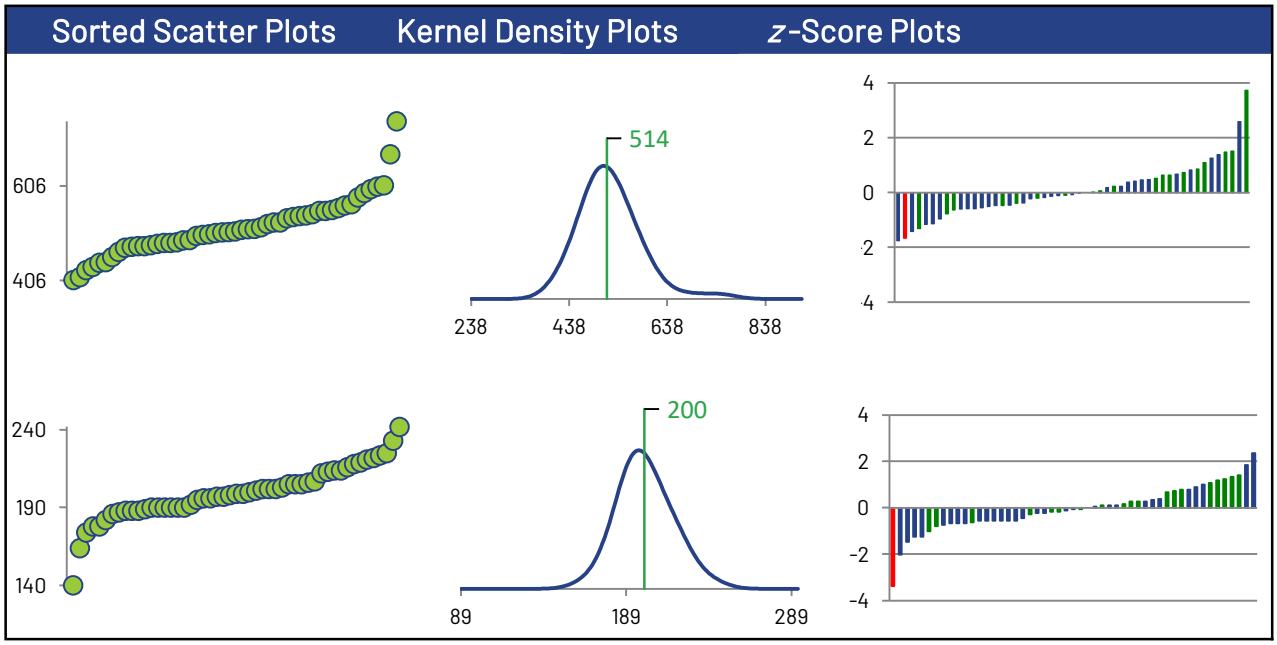
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	51	51	51	51
Median µg/g	509	199	280	102
Robust Mean µg/g	514	200	276	103
Uncdrtainty of the Assigned Value µg/g	9.45	2.75	4.08	1.50
Robust Standard Deviation µg/g	54.0	15.7	23.3	8.58
Regression Standard Deviation µg/g	45.3	17.8	24.5	9.39
Stability Flag	Stability			
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	61.3	17.8	24.5	9.39
Flagged Outliers	0	0	0	0
|z|>3.0	1	1	1	1
2<|z|<3	1	2	4	3
Failure Rate %*	2.0			

Methods Used

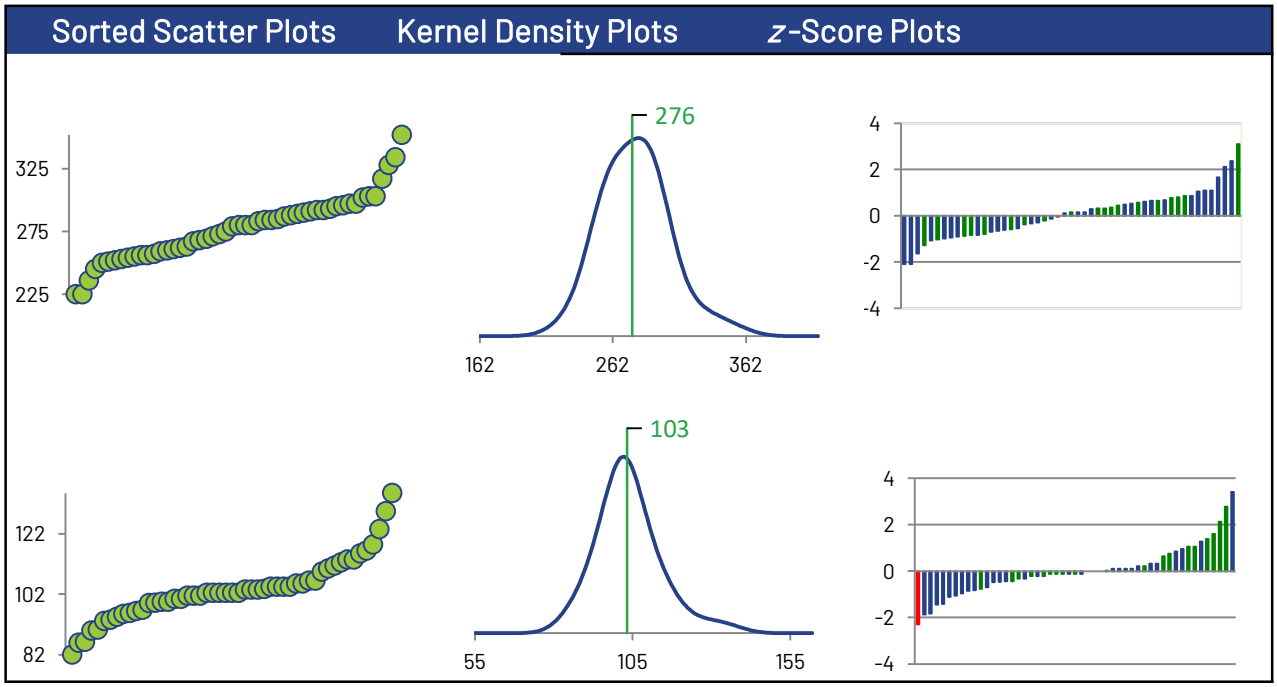
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	31	31	31	31
AA FLAME (Red)	1	1	1	1
ICP/OES (Green)	19	19	19	19

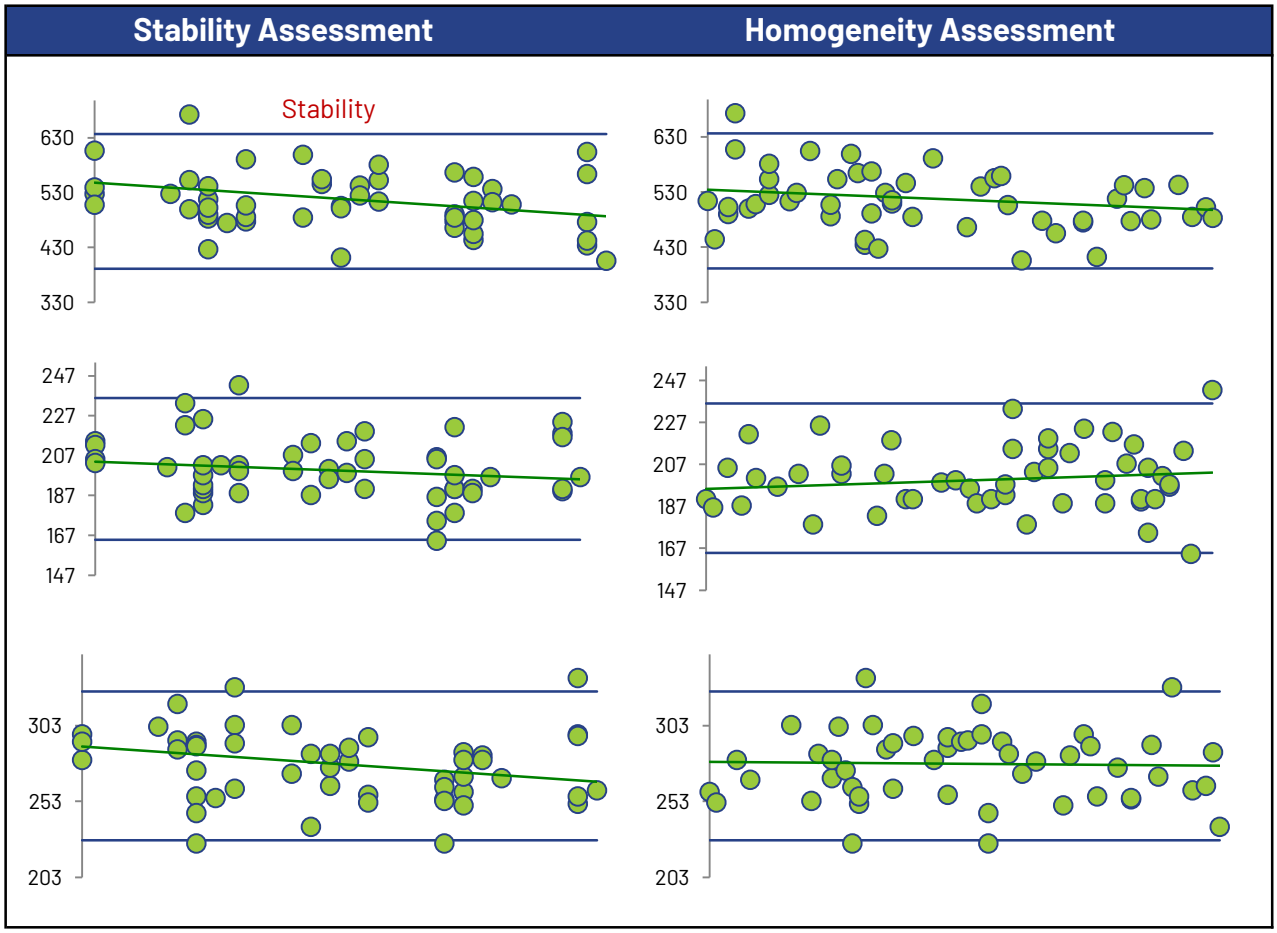
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

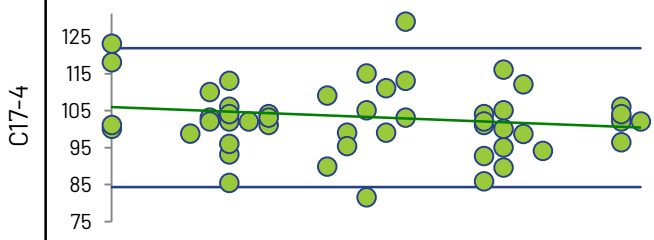
Strontium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
325
275
225
276
162
262
362
4
2
0
-2
-4
C17-4
122
102
82
103
55
105
155

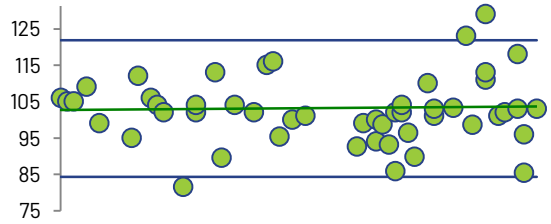

Stability Assessment
Homogeneity Assessment
Stability
C17-1
630
530
430
330
C17-2
247
227
207
187
167
147
C17-3
303
253
203

Strontium

Stability Assessment



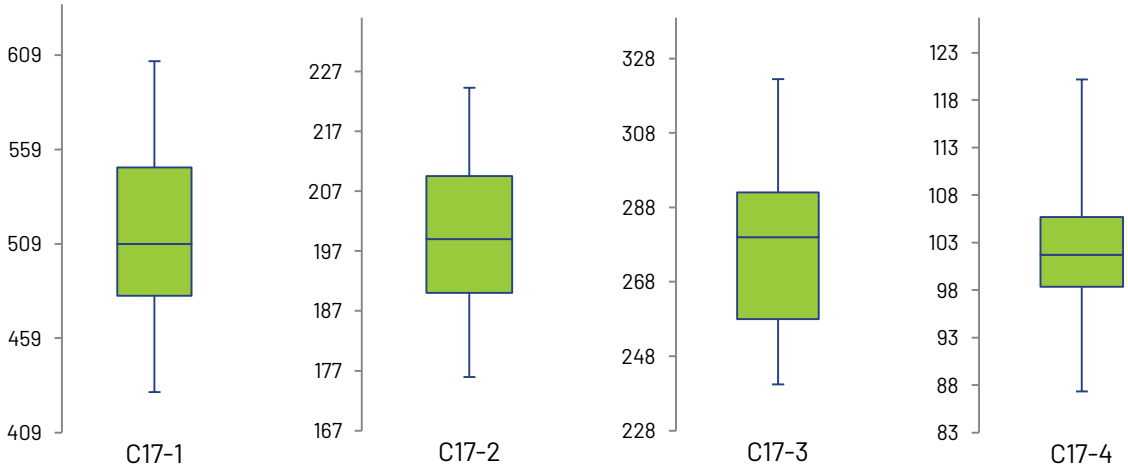
Homogeneity Assessment



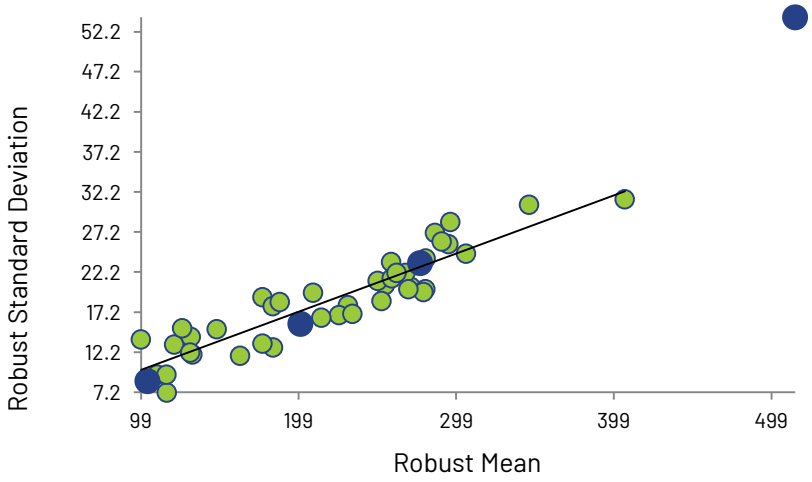
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Tin

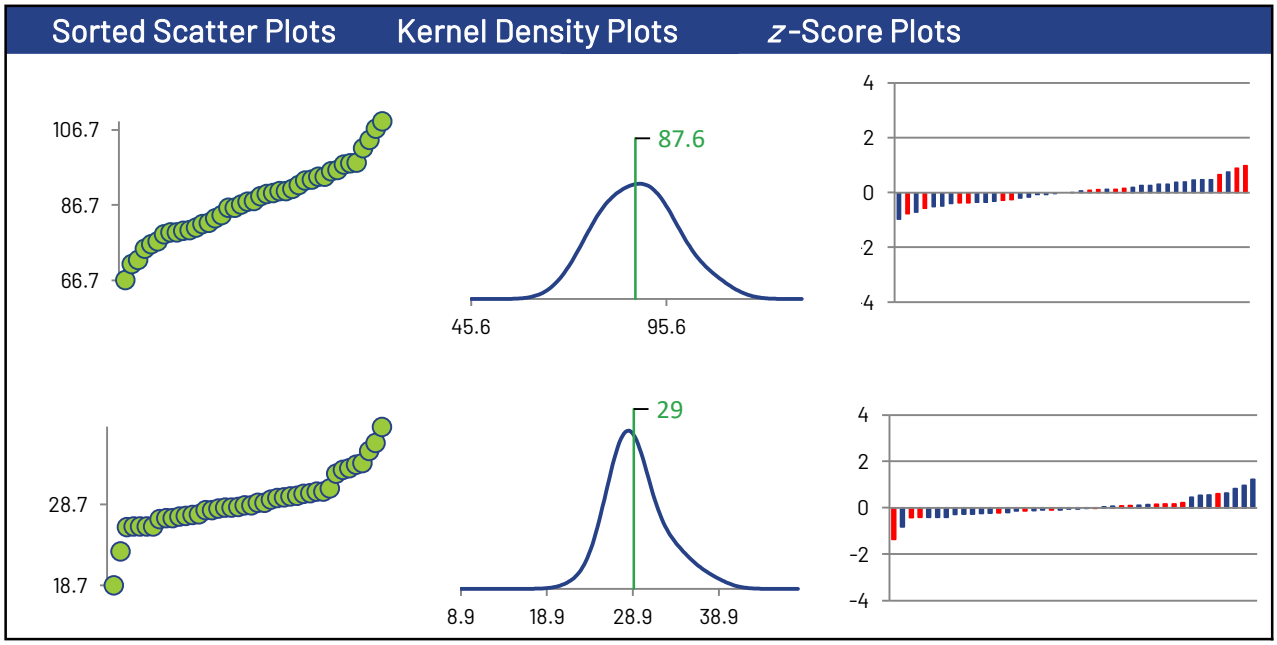
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	41	42	41	41
Median µg/g	87.8	28.6	34.4	14.3
Robust Mean µg/g	87.6	29.0	34.5	14.4
Uncdrtainty of the Assigned Value µg/g	1.94	0.546	0.660	0.238
Robust Standard Deviation µg/g	9.94	2.83	3.38	1.22
Regression Standard Deviation µg/g	21.6	7.57	8.88	4.07
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	21.6	7.57	8.88	4.07
Flagged Outliers	1	0	1	0
|z|>3.0	0	0	0	0
2<|z|<3	0	0	0	0
Failure Rate %*	0.0			

Methods Used

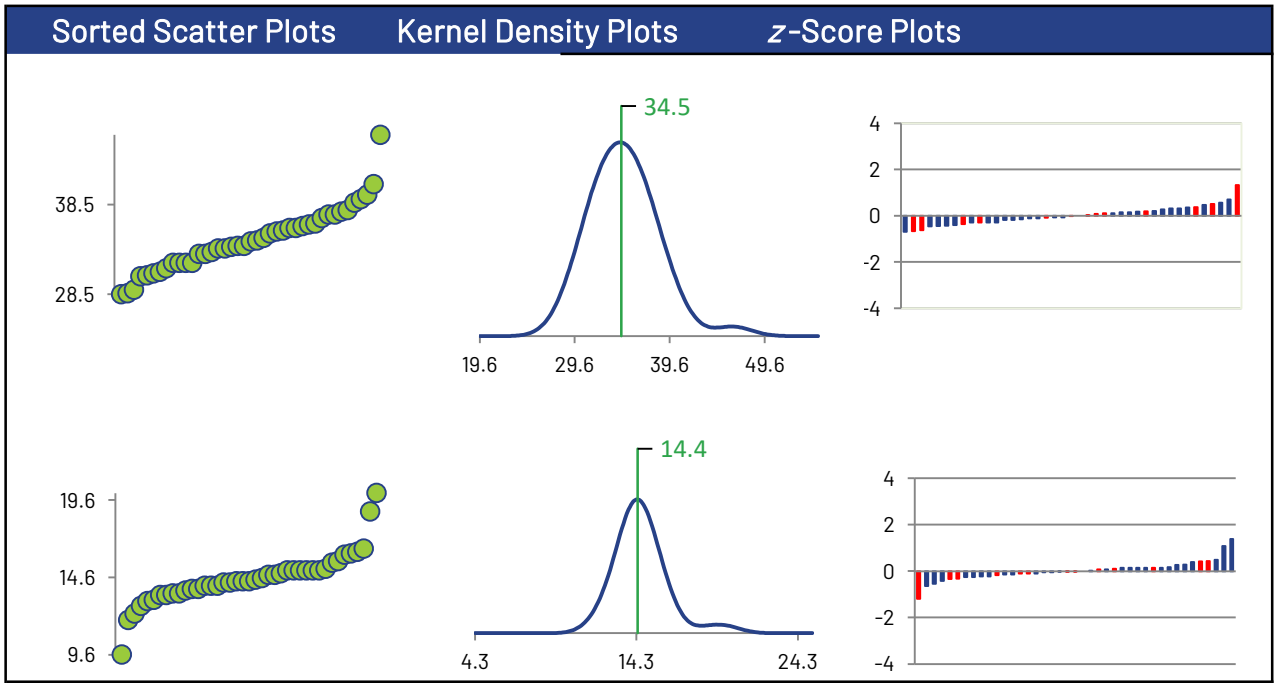
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	28	28	28	28
ICP/OES (Red)	13	14	13	13

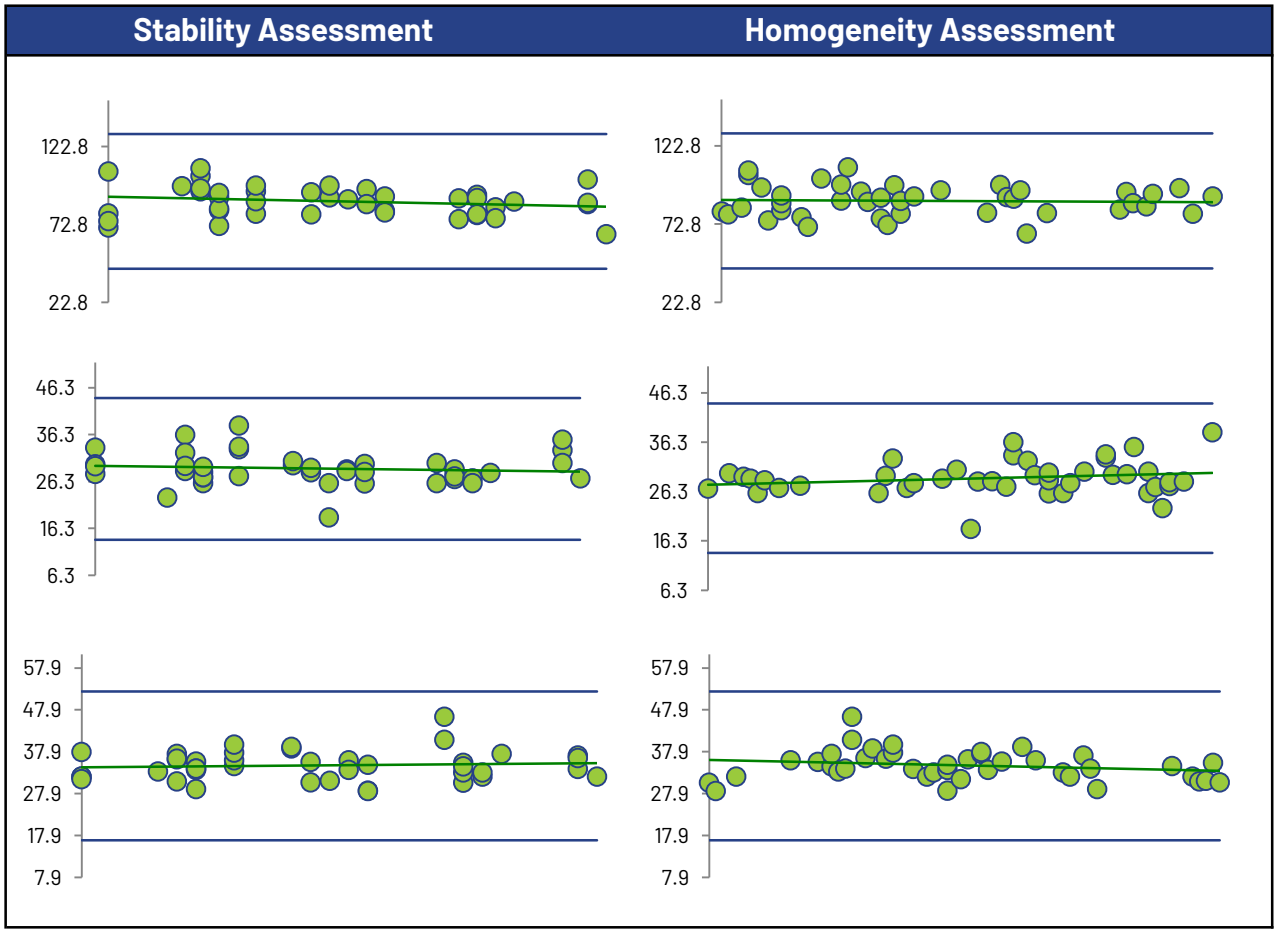
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

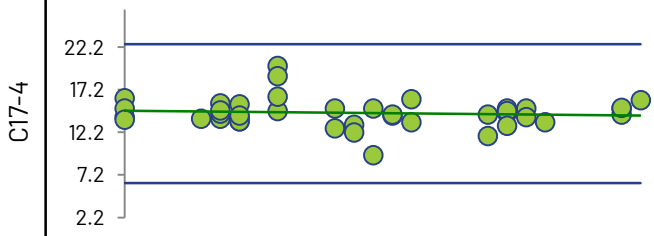
Tin


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
38.5
28.5
34.5
19.6
29.6
39.6
49.6
4
2
0
-2
-4
C17-4
19.6
14.6
9.6
14.4
4.3
14.3
24.3

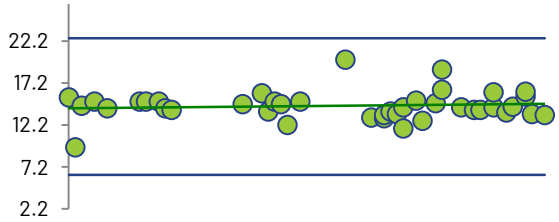

Stability Assessment
Homogeneity Assessment
C17-1
122.8
72.8
22.8
C17-2
46.3
36.3
26.3
16.3
6.3
C17-3
57.9
47.9
37.9
27.9
17.9
7.9

Tin

Stability Assessment



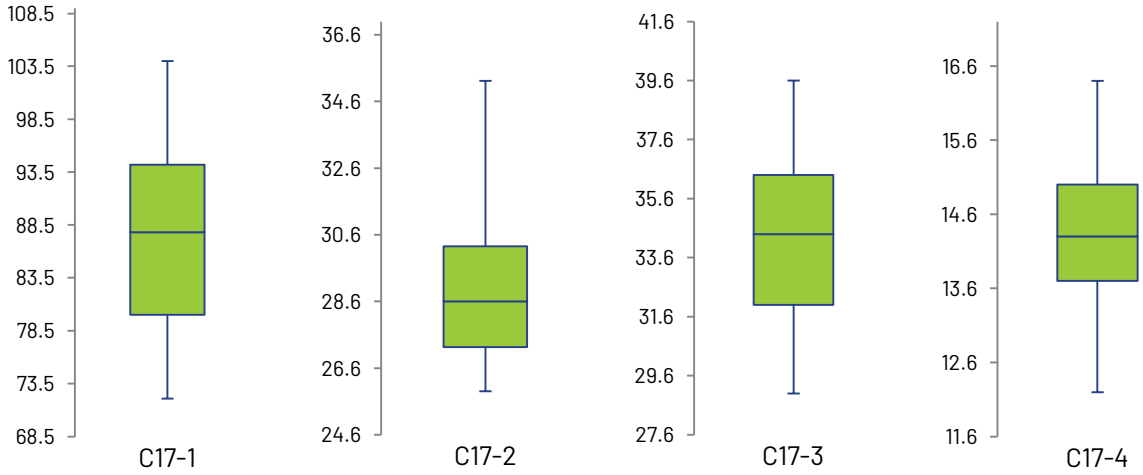
Homogeneity Assessment



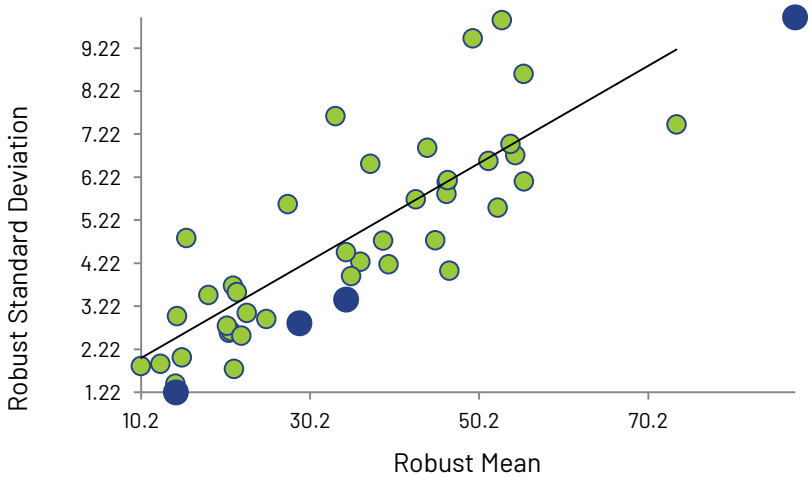
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Titanium

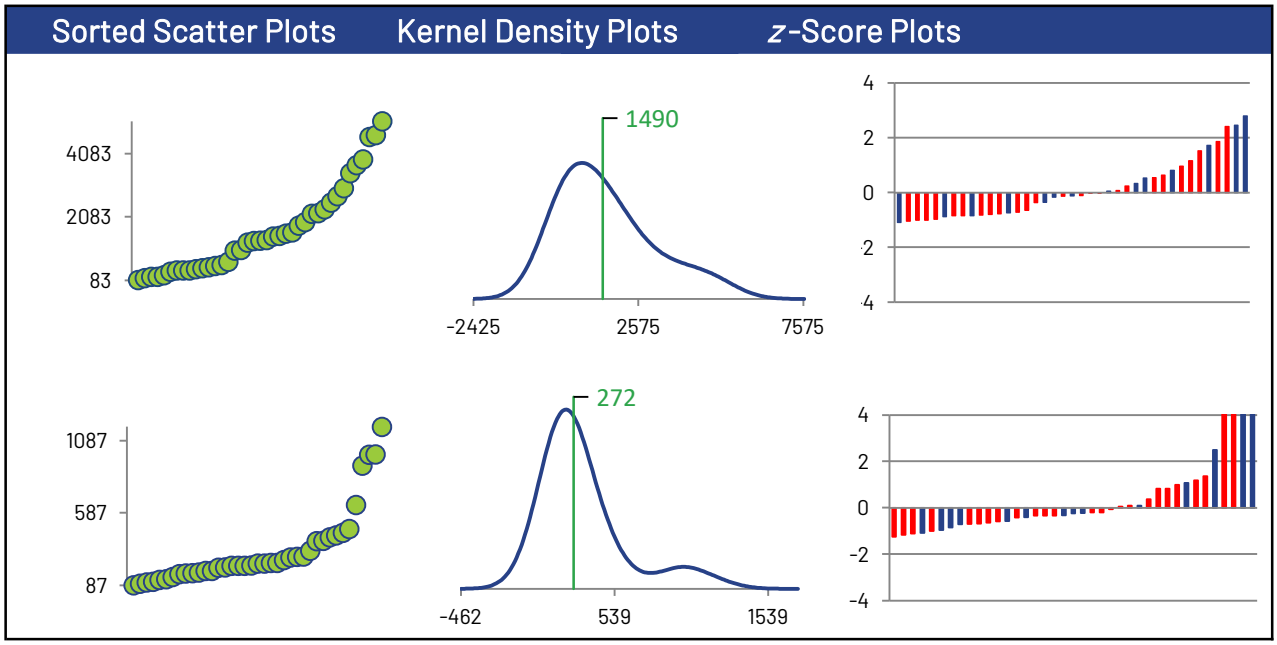
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	39	39	39	40
Median µg/g	1330	237	265	296
Robust Mean µg/g	1490	272	296	324
Uncdrtainty of the Assigned Value µg/g	258	29.8	26.2	37.7
Robust Standard Deviation µg/g	1290	149	131	191
Regression Standard Deviation µg/g	391	83.1	89.2	96.3
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	1290	149	131	191
Flagged Outliers	1	1	1	0
|z|>3.0	0	4	2	3
2<|z|<3	3	1	1	1
Failure Rate %*	10.0			

Methods Used

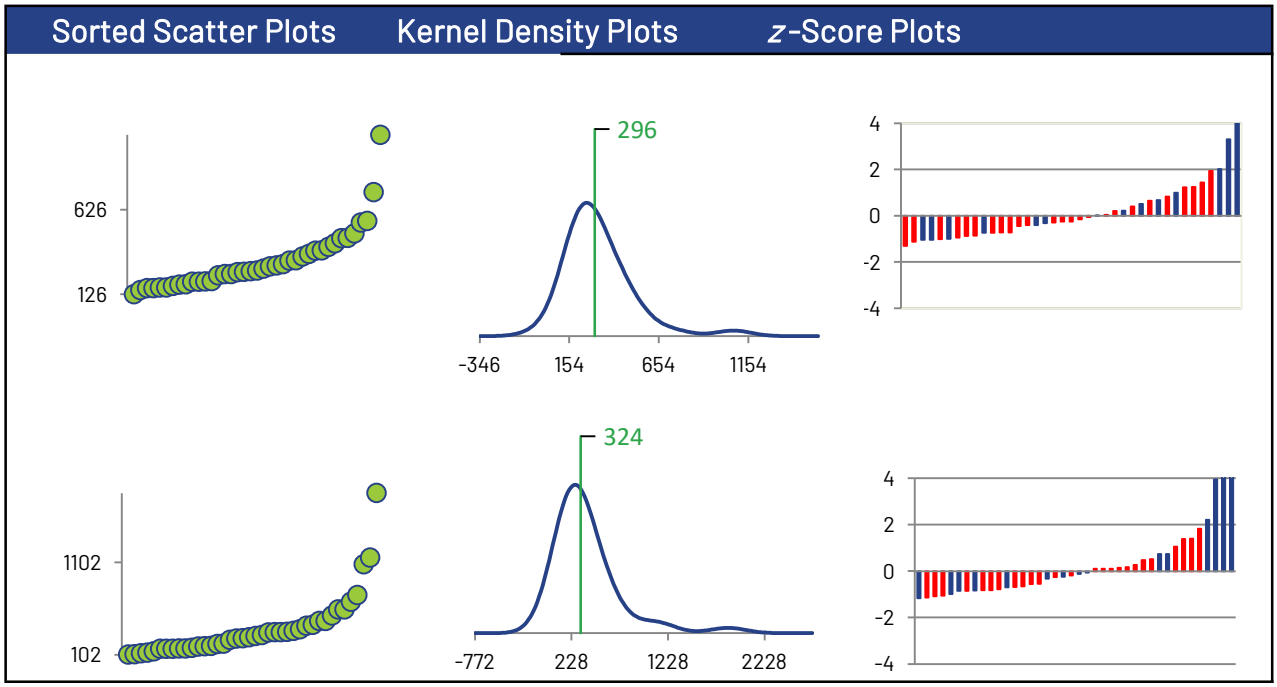
Method	C17-1	C17-2	C17-3	C17-4
ICP/OES (Blue)	14	14	14	15
ICP/MS (Red)	25	25	25	25

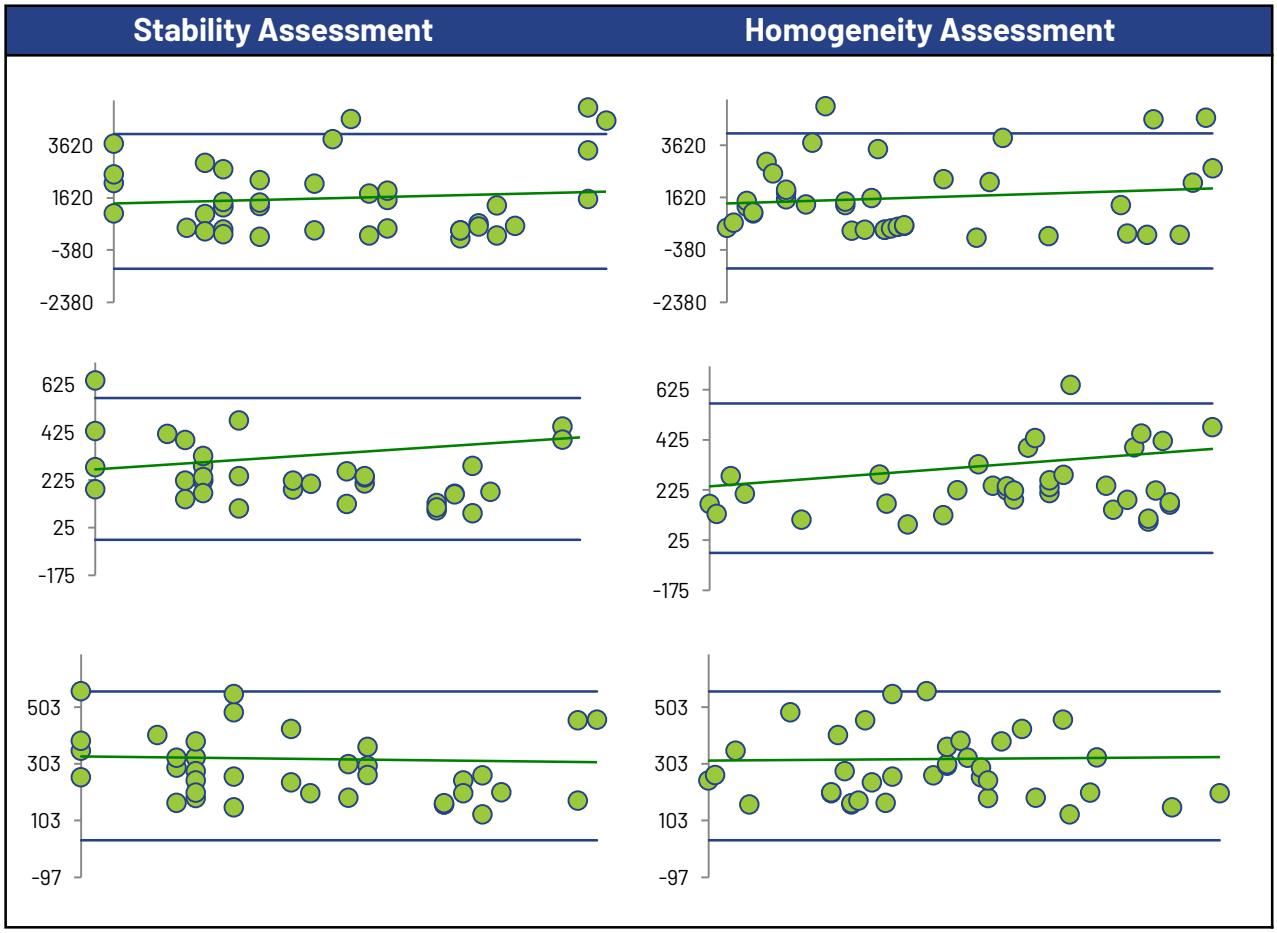
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

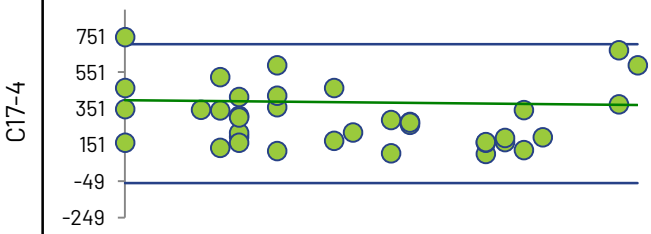
Titanium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
626
126
296
-346
154
654
1154
4
2
0
-2
-4
C17-4
1102
102
324
-772
228
1228
2228
4
2
0
-2
-4

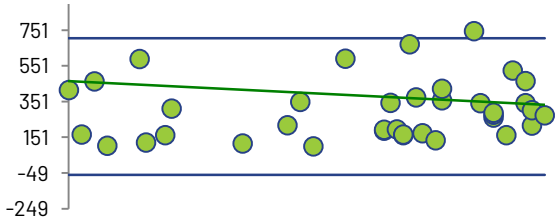

Stability Assessment
Homogeneity Assessment
C17-1
3620
1620
-380
-2380
3620
1620
-380
-2380
C17-2
625
425
225
25
-175
625
425
225
25
-175
C17-3
503
303
103
-97
503
303
103
-97

Titanium

Stability Assessment



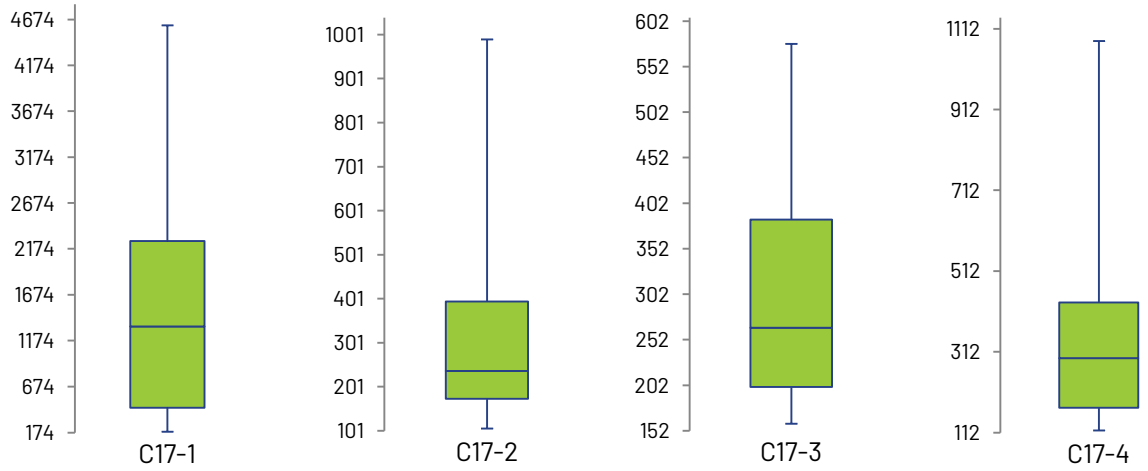
Homogeneity Assessment



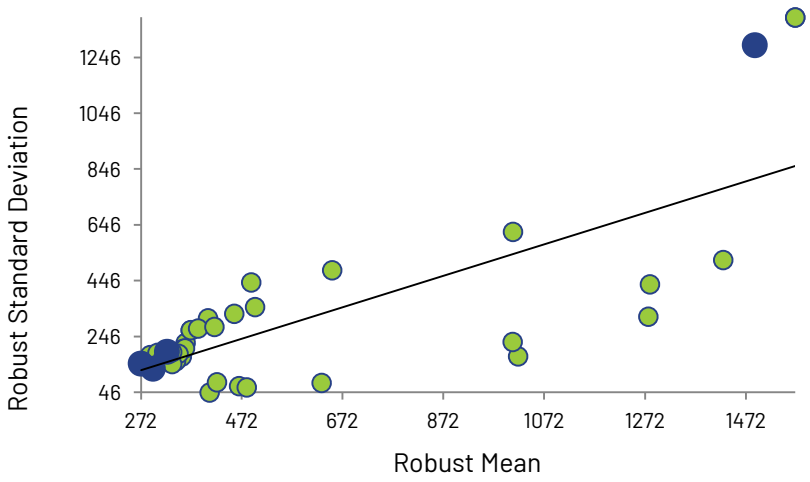
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Uranium

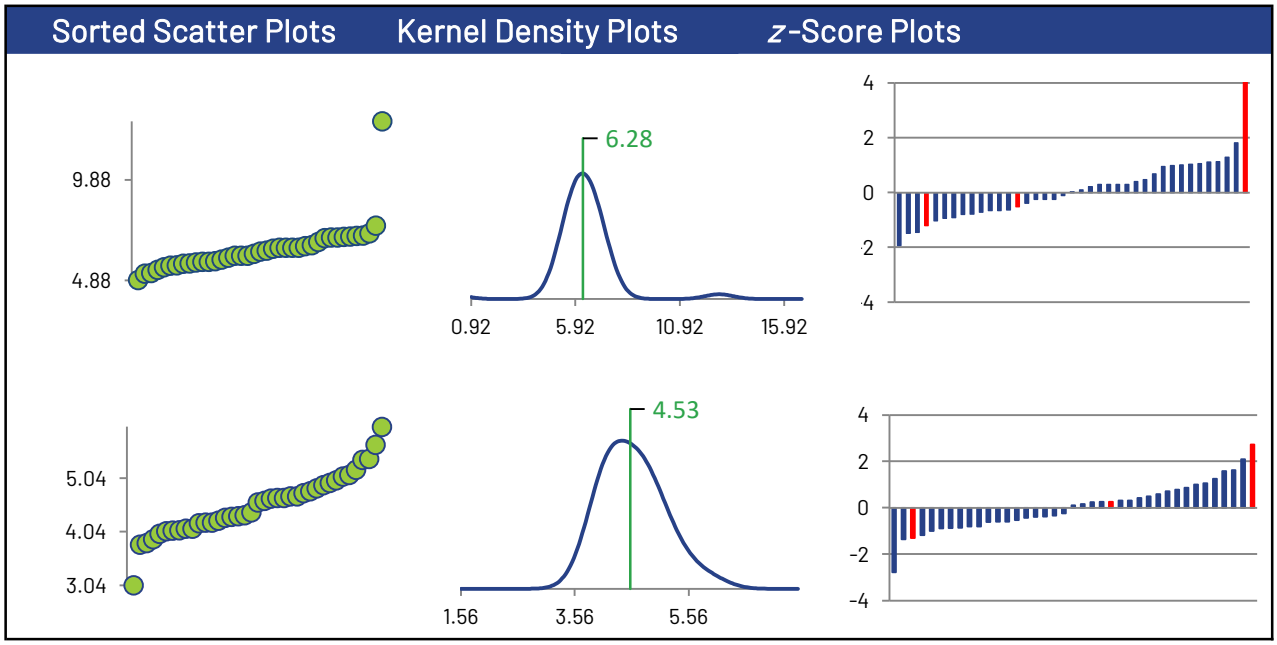
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	39	39	38	38
Median µg/g	6.30	4.59	2.66	1.10
Robust Mean µg/g	6.28	4.53	2.70	1.13
Uncdrtainty of the Assigned Value µg/g	0.145	0.108	0.100	0.0397
Robust Standard Deviation µg/g	0.726	0.538	0.495	0.196
Regression Standard Deviation µg/g	0.613	0.460	0.300	0.164
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	0.726	0.538	0.495	0.196
Flagged Outliers	2	1	1	1
|z|>3.0	1	0	0	4
2<|z|<3	0	3	1	1
Failure Rate %*	0.0			

Methods Used

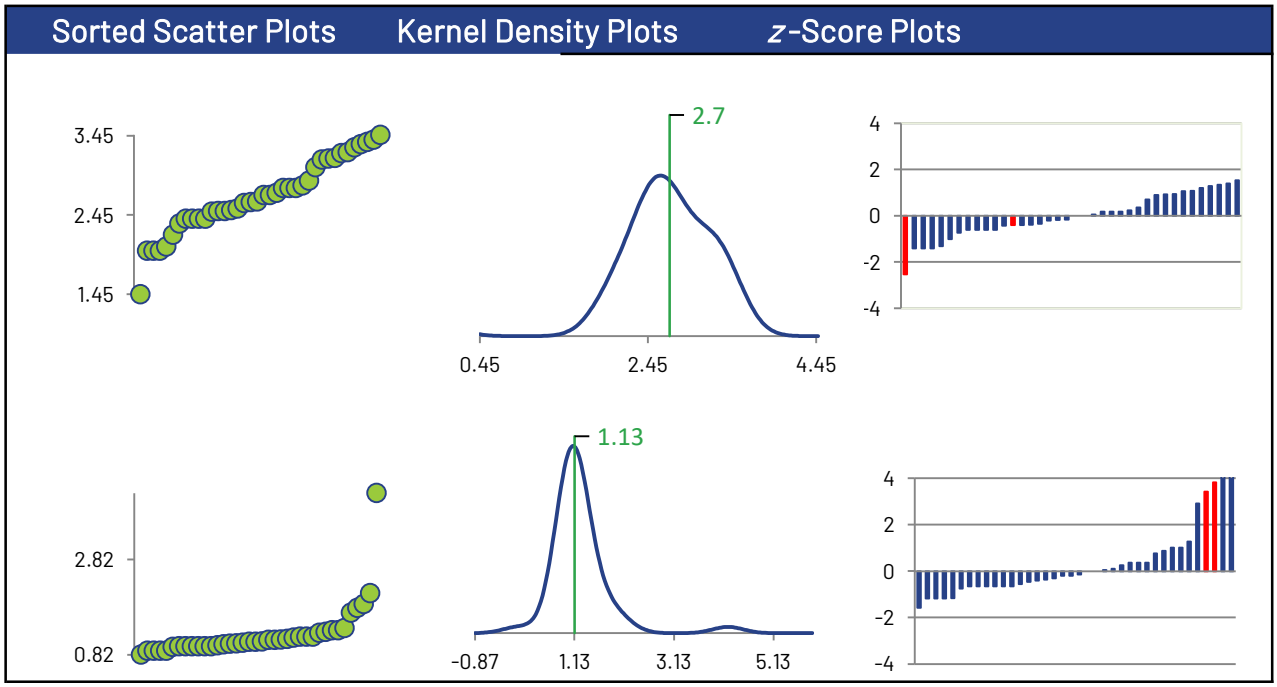
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	36	36	36	36
ICP/OES (Red)	3	3	2	2

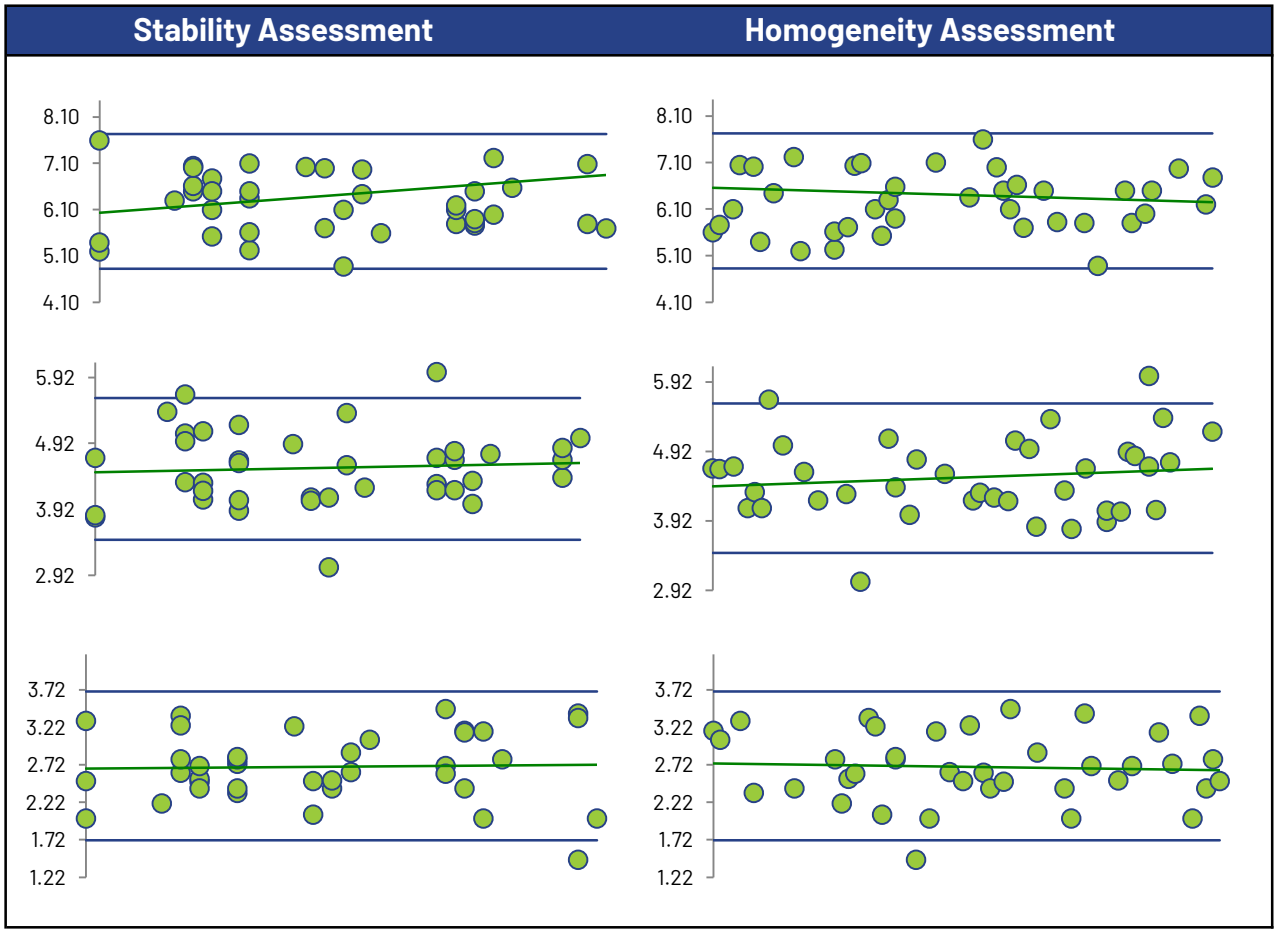
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

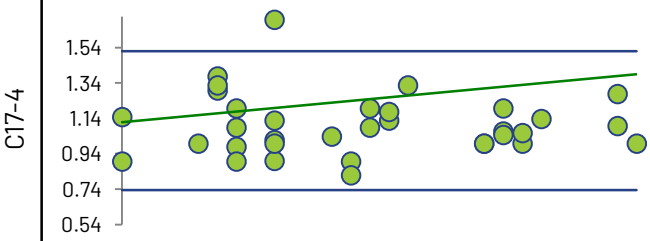
Uranium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
3.45
2.45
1.45
2.7
0.45
2.45
4.45
4
2
0
-2
-4
C17-4
2.82
0.82
1.13
-0.87
1.13
3.13
5.13
4
2
0
-2
-4

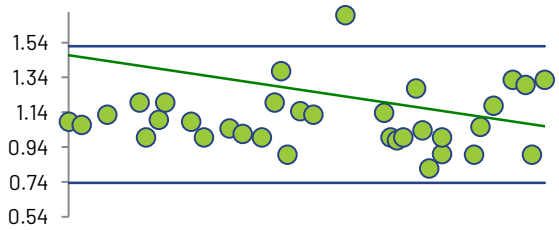

Stability Assessment
Homogeneity Assessment
C17-1
8.10
7.10
6.10
5.10
4.10
8.10
7.10
6.10
5.10
4.10
C17-2
5.92
4.92
3.92
2.92
5.92
4.92
3.92
2.92
C17-3
3.72
3.22
2.72
2.22
1.72
1.22
3.72
3.22
2.72
2.22
1.72
1.22

Uranium

Stability Assessment



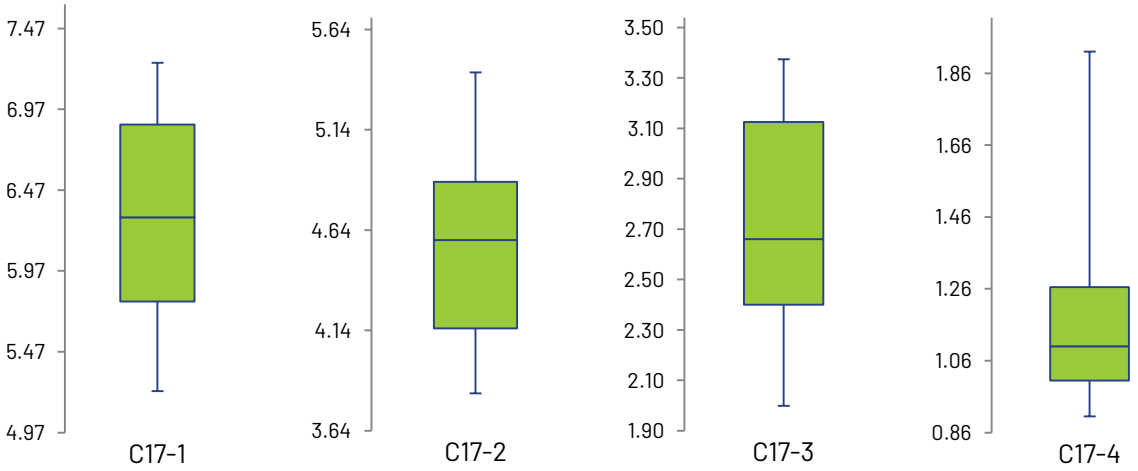
Homogeneity Assessment



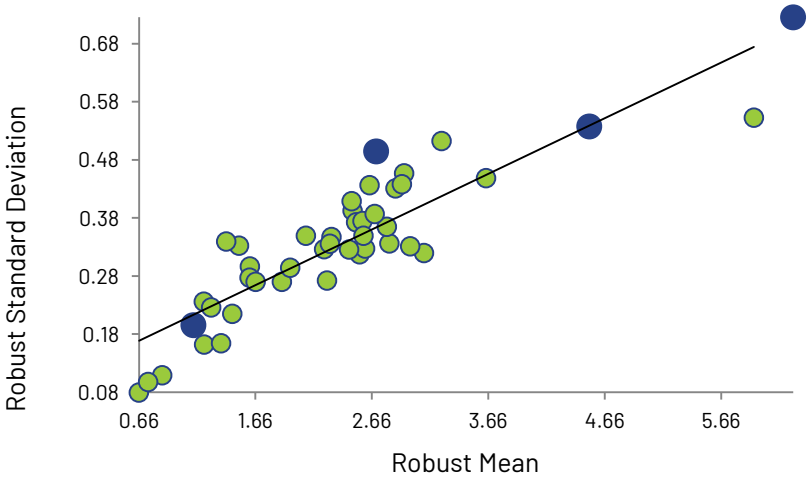
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Vanadium

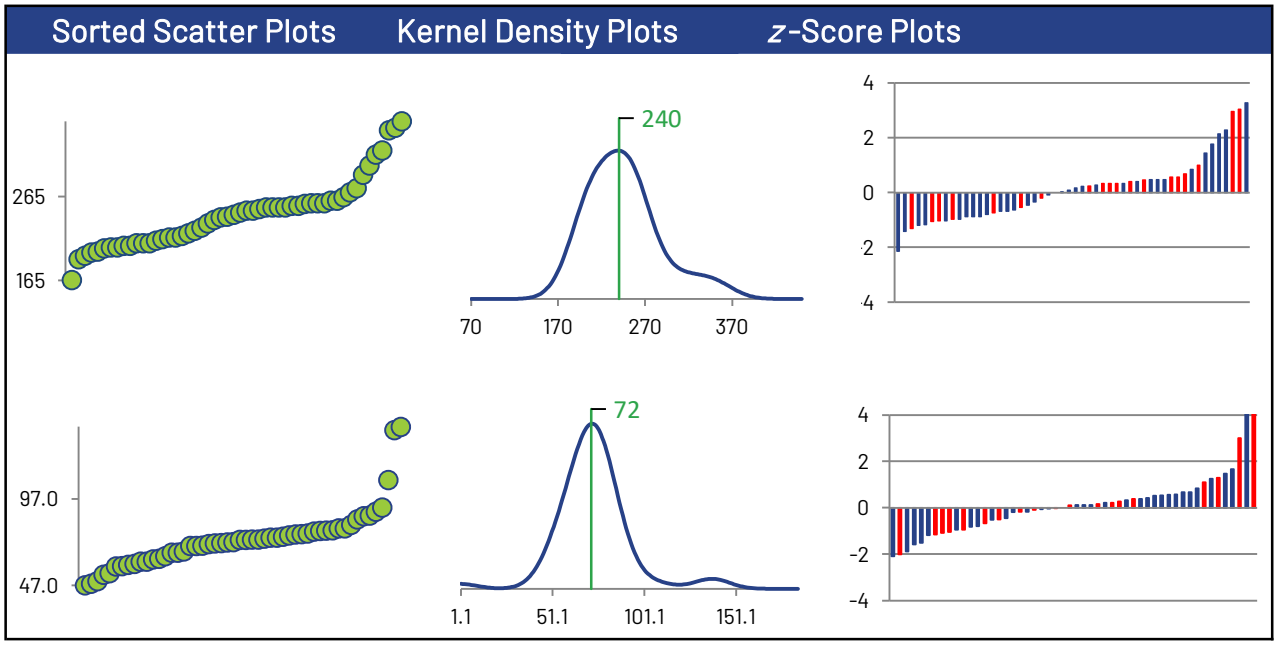
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	52	52	52	52
Median µg/g	245	73.4	97.4	32.9
Robust Mean µg/g	240	72.0	98.4	33.8
Uncdrtainty of the Assigned Value µg/g	6.08	2.08	2.22	1.65
Robust Standard Deviation µg/g	35.1	12.0	12.8	9.53
Regression Standard Deviation µg/g	34.0	10.3	14.0	4.92
Stability Flag			Stability	
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	35.1	12.0	23.3	9.53
Flagged Outliers	0	0	0	0
|z|>3.0	2	2	0	2
2<|z|<3	4	2	0	2
Failure Rate %*	0.0			

Methods Used

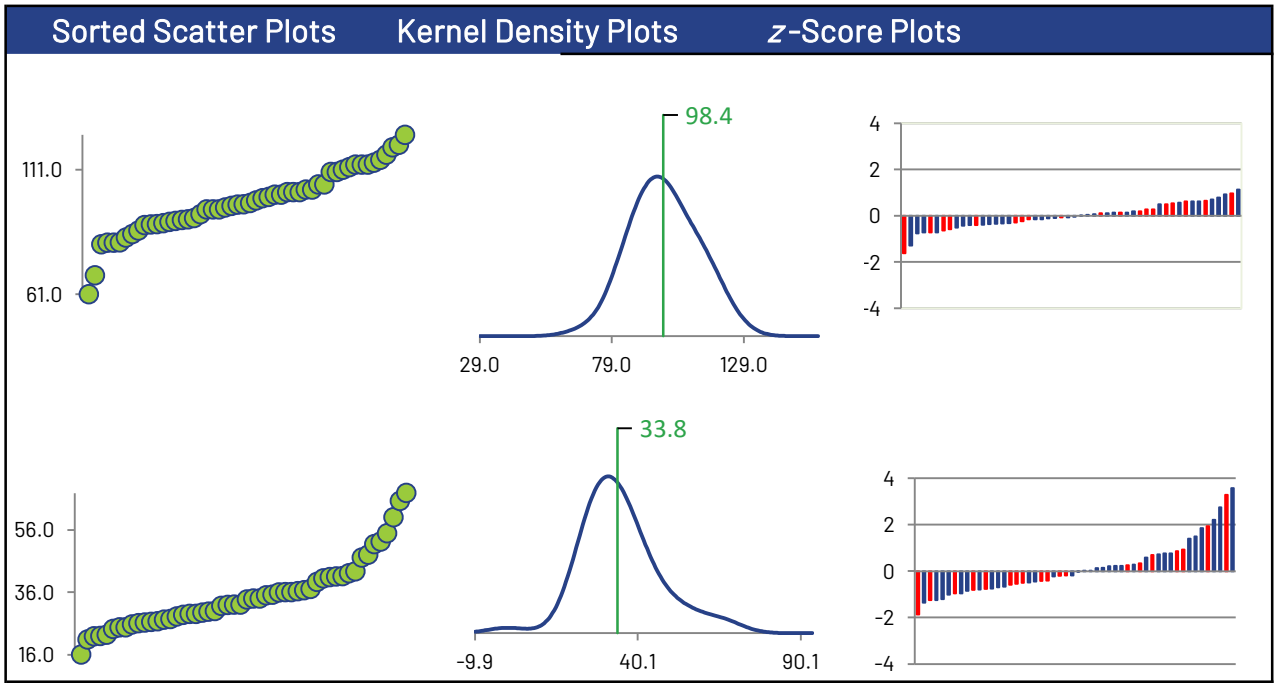
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	33	33	33	33
ICP/OES (Red)	19	19	19	19

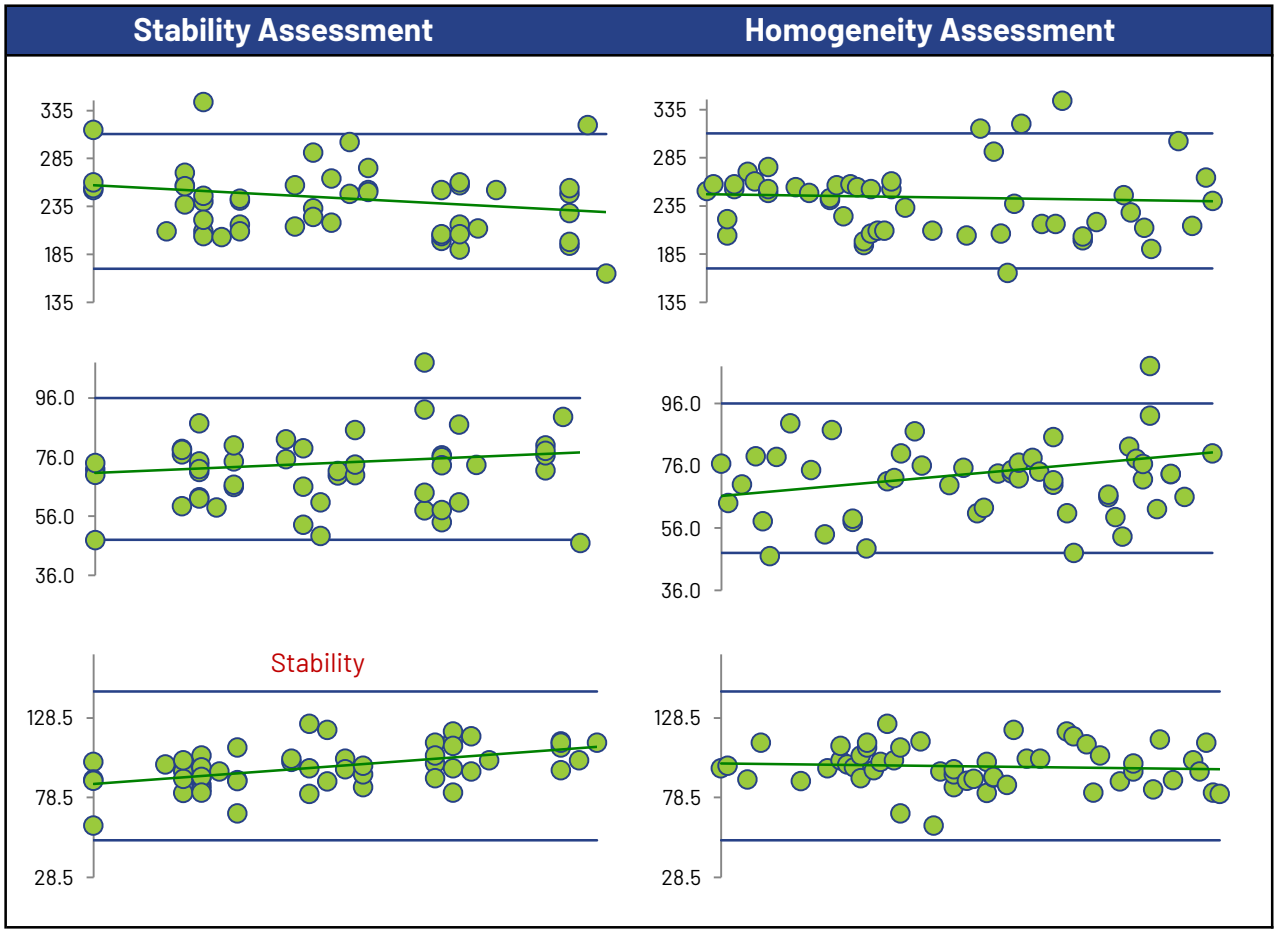
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

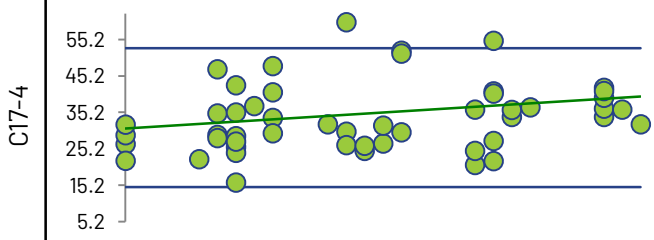
Vanadium


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
111.0
61.0
98.4
29.0
79.0
129.0
4
2
0
-2
-4
C17-4
56.0
36.0
16.0
33.8
-9.9
40.1
90.1

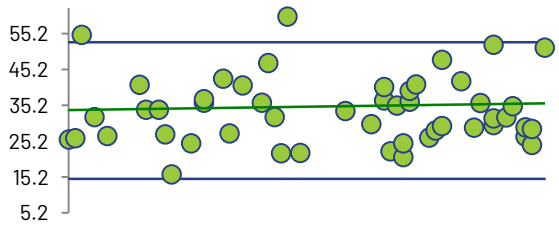

Stability Assessment
Homogeneity Assessment
C17-1
335
285
235
185
135
C17-2
96.0
76.0
56.0
36.0
Stability
C17-3
128.5
78.5
28.5

Vanadium

Stability Assessment



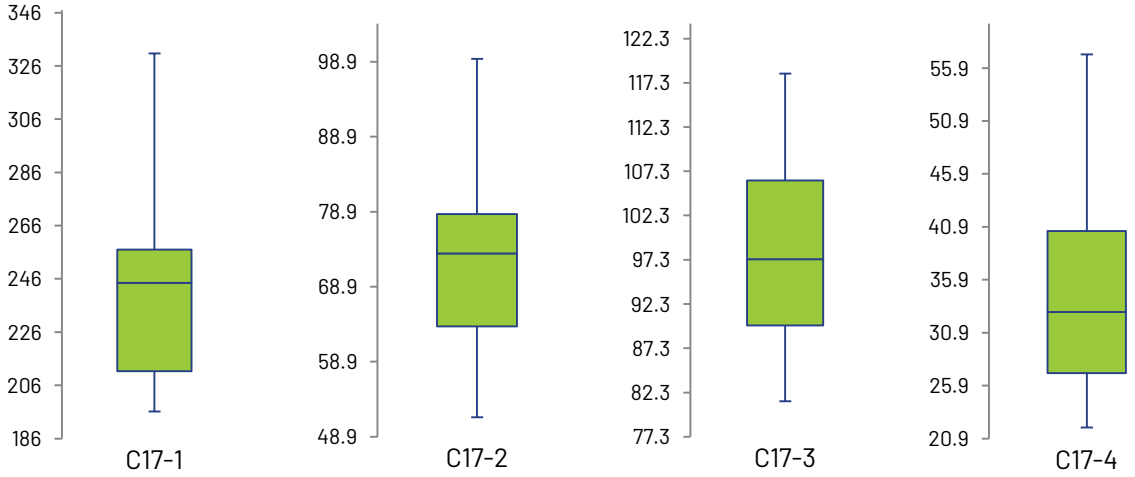
Homogeneity Assessment



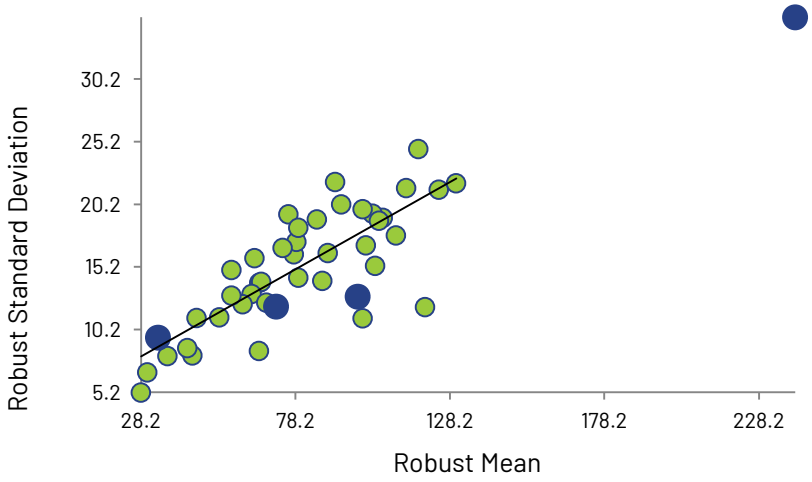
Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)



Zinc

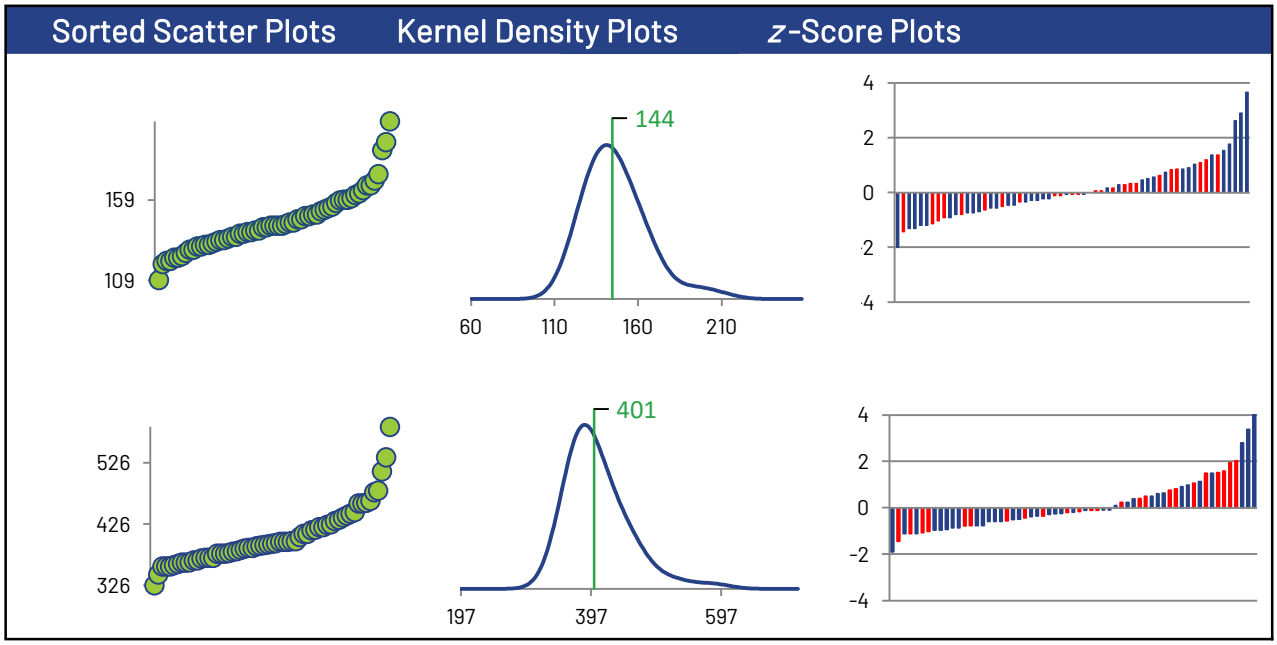
Summary Statistics

Statistic	C17-1	C17-2	C17-3	C17-4
No. of results used for summary statistics	61	61	60	60
Median µg/g	143	394	1060	402
Robust Mean µg/g	144	401	1080	408
Uncdrtainty of the Assigned Value µg/g	2.67	6.35	14.8	4.86
Robust Standard Deviation µg/g	16.7	39.7	91.5	30.1
Regression Standard Deviation µg/g	11.8	32.4	86.9	32.9
Stability Flag	Stability			
Homogeneity Flag				
Standard Deviation Used (SDPA) µg/g	17.5	39.7	91.5	32.9
Flagged Outliers	0	0	1	1
|z|>3.0	1	2	1	2
2<|z|<3	2	2	3	1
Failure Rate %*	3.3			

Methods Used

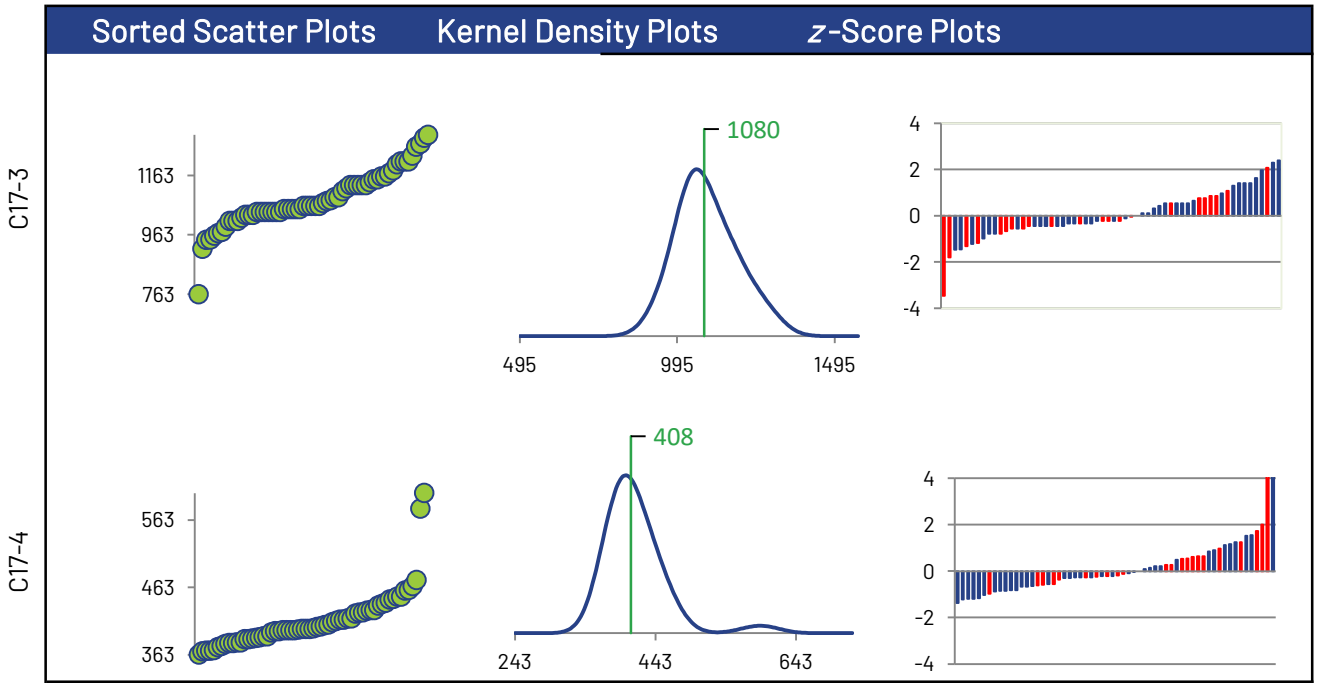
Method	C17-1	C17-2	C17-3	C17-4
ICP/MS (Blue)	37	37	37	37
ICP/OES (Red)	24	24	23	23

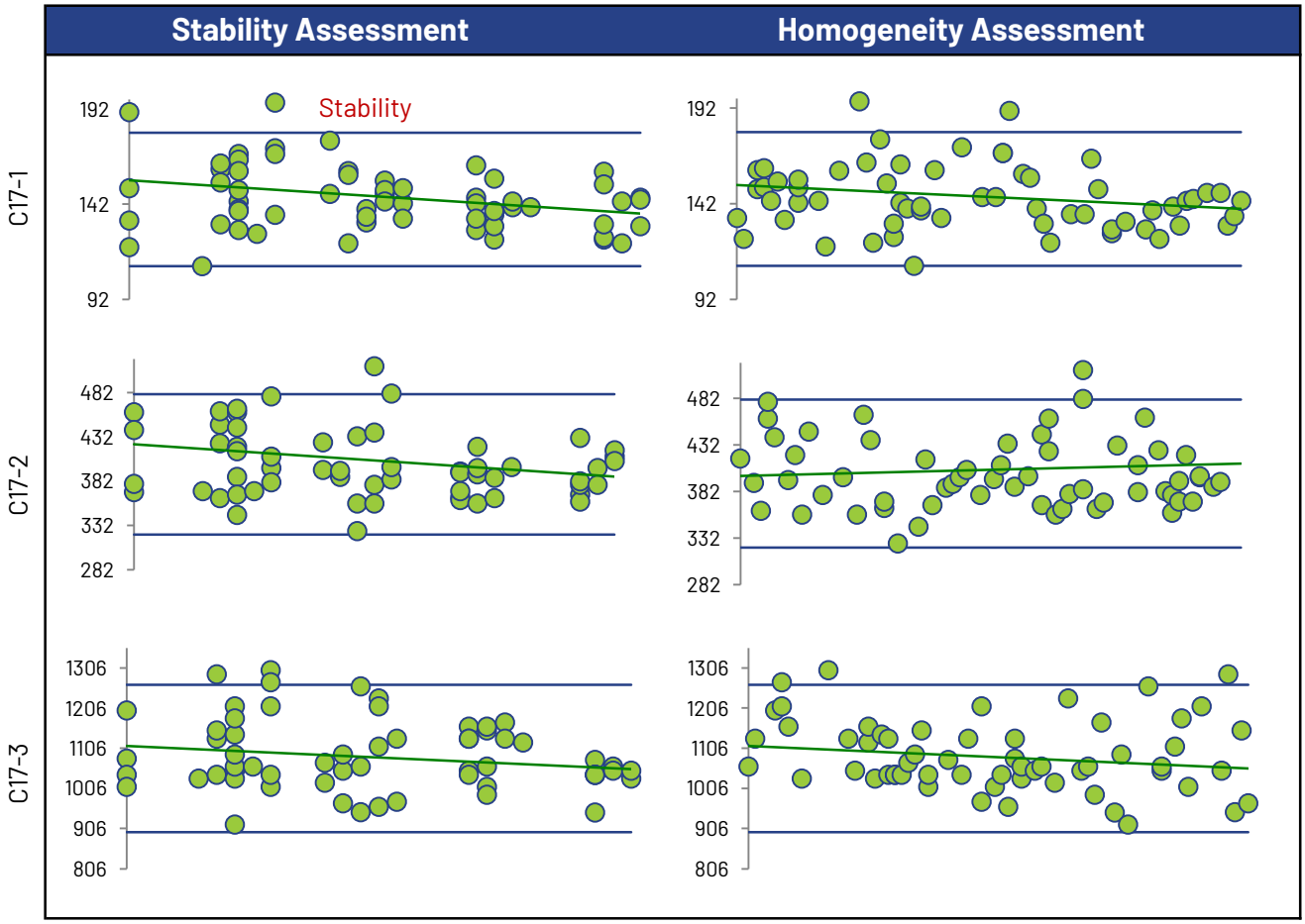
All summary stats, except the failure rate, and the plots below are based on the data excluding any flagged outliers



* Displayed failure rate does not account for the RDL modified z-Scores or inaccurately reported non-detects.

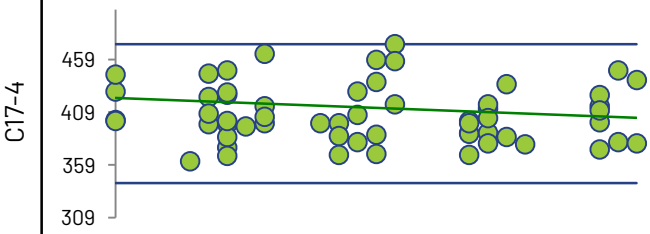
Zinc


Sorted Scatter Plots
Kernel Density Plots
z-Score Plots
C17-3
1163
963
763
1080
495
995
1495
4
2
0
-2
-4
C17-4
563
463
363
408
243
443
643

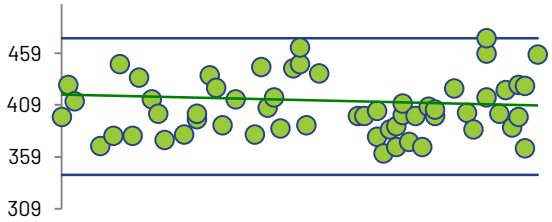

Stability Assessment
Homogeneity Assessment
Stability
C17-1
192
142
92
C17-2
482
432
382
332
282
C17-3
1306
1206
1106
1006
906
806

Zinc

Stability Assessment



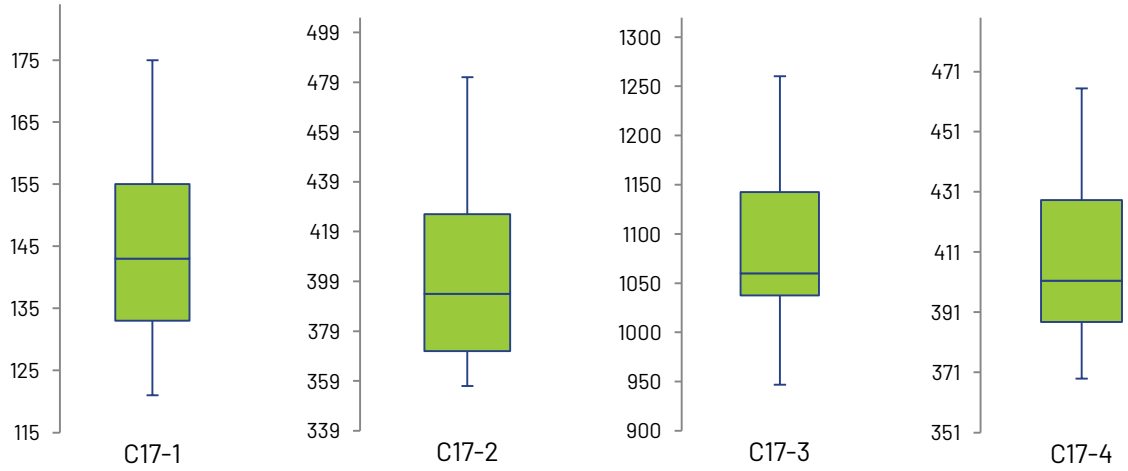
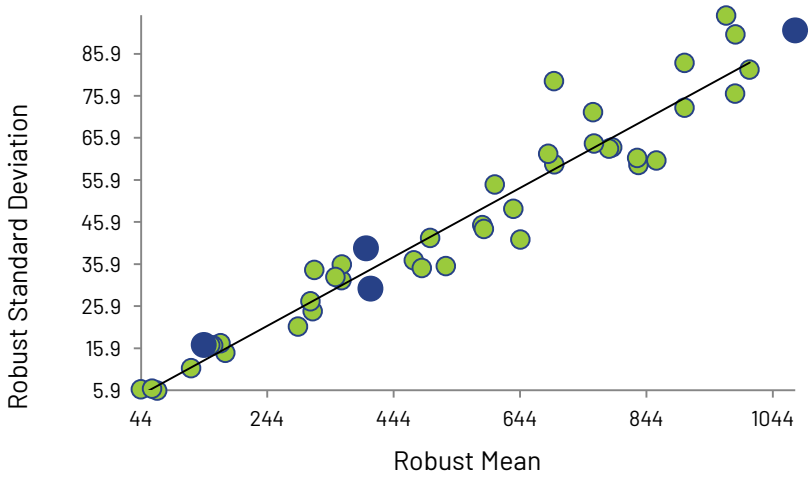
Homogeneity Assessment



Stability assessments are regression analysis of reported result against date of analysis.

Homogeneity assessments are regression analysis of reported result against bottling order.

Box and Whisker Plots



Current Round (blue) Compared to Historic Rounds (green)