

# **Test Group Summary Report**

## **C02B Metals in Water – High Range**

### **March 2025 PT Round**

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**Issued: May 9, 2025**

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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.
$\pm u$ :	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](http://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:

$$z - Score = \frac{(x - \bar{X})}{SDPA} \quad \text{where: } \begin{aligned} x &= \text{participant result;} \\ \bar{X} &= \text{the Assigned Value;} \\ SDPA &= \text{the Standard Deviation for Proficiency Assessment.} \end{aligned}$$

The assigned value  $\bar{X}$  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  $100 + (-15 \times \text{avg } |z|)$ .

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.

$$RSZ = \frac{\sum z}{\sqrt{N}} \quad \text{where } z = \text{the z-score} \\ N = \text{the number of samples}$$

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 5<sup>th</sup> and 95<sup>th</sup> 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

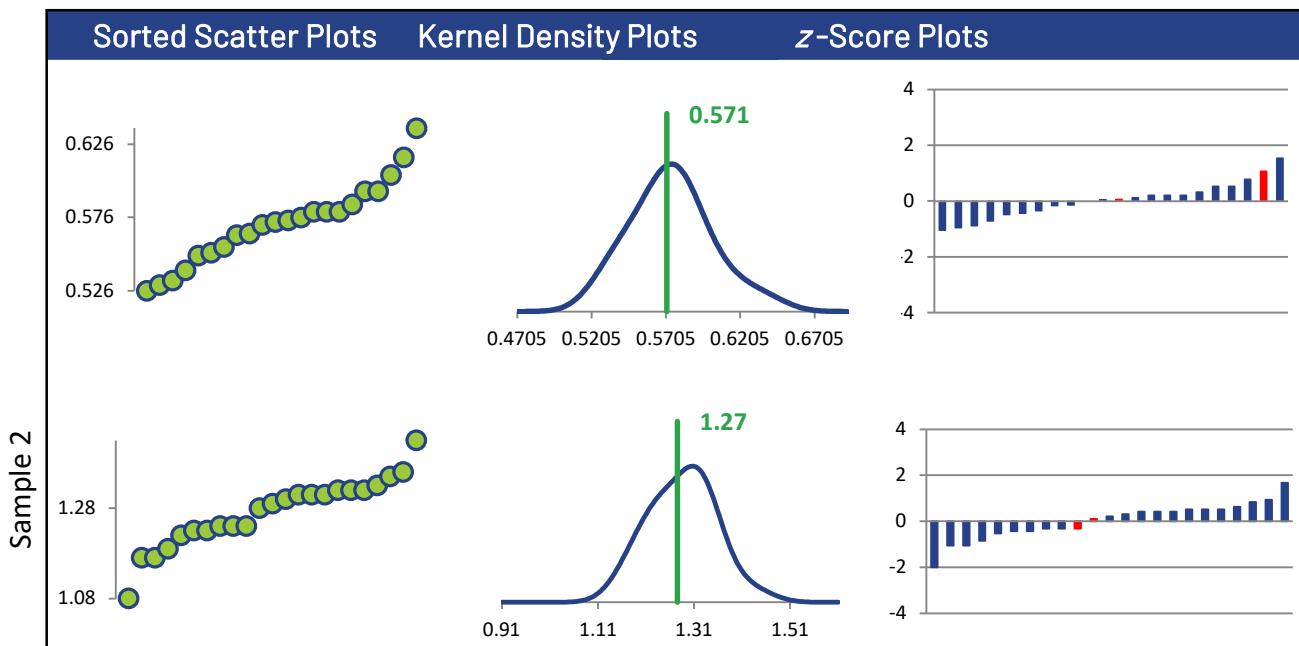
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	22	23	22	23
Median mg/L	0.574	1.29	0.544	1.13
Robust Mean mg/L	0.571	1.27	0.539	1.12
U mg/L	0.00765	0.0189	0.00714	0.0166
Robust Standard Deviation mg/L	0.0287	0.0726	0.0268	0.0638
Regression Standard Deviation mg/L	0.0428	0.0955	0.0404	0.0838
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0428	0.0955	0.0404	0.0838
Outliers	1	0	0	0
$ z >3.0$	0	0	0	1
$2< z <3$	0	0	1	0

## Methods Used

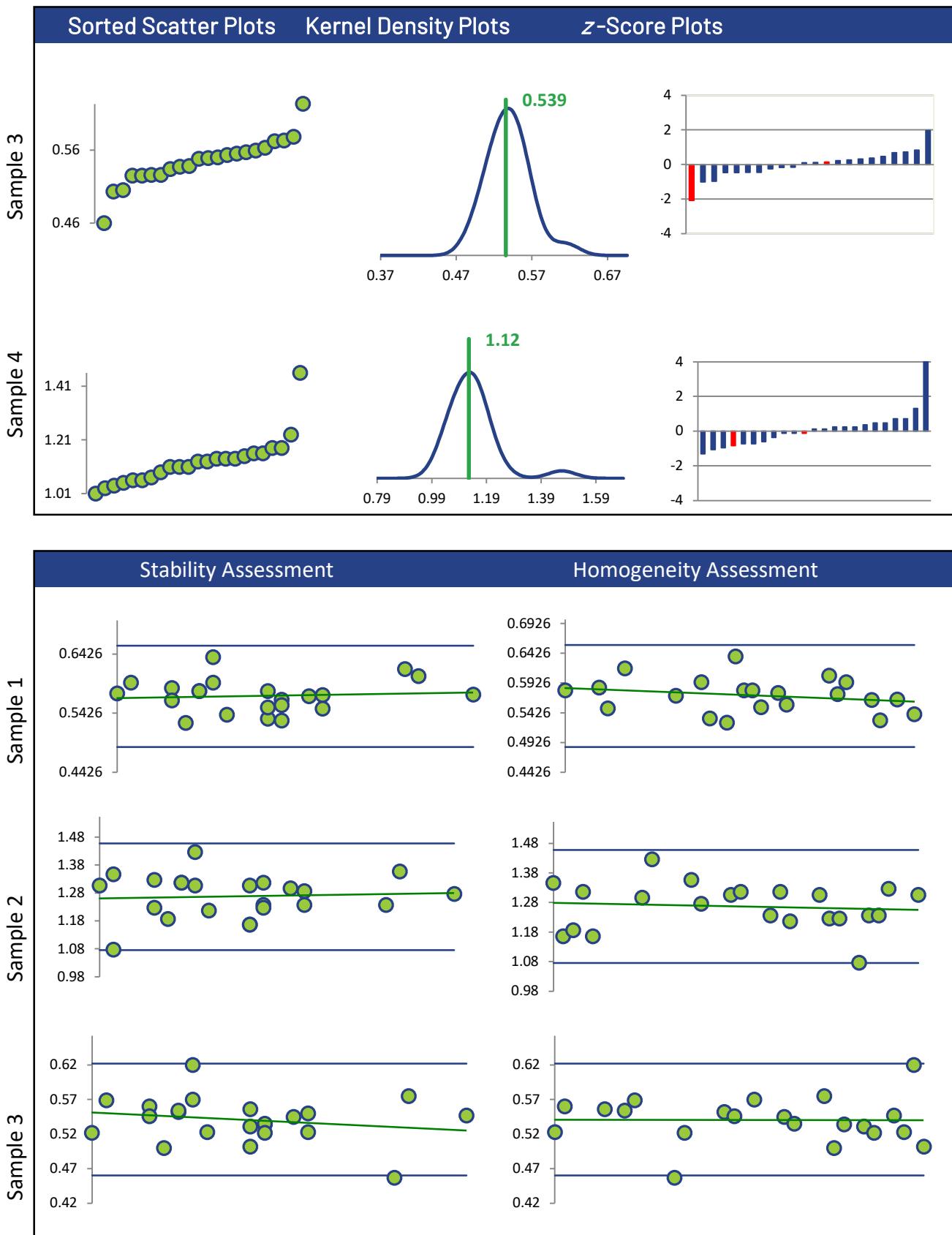
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	20	21	20	21
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



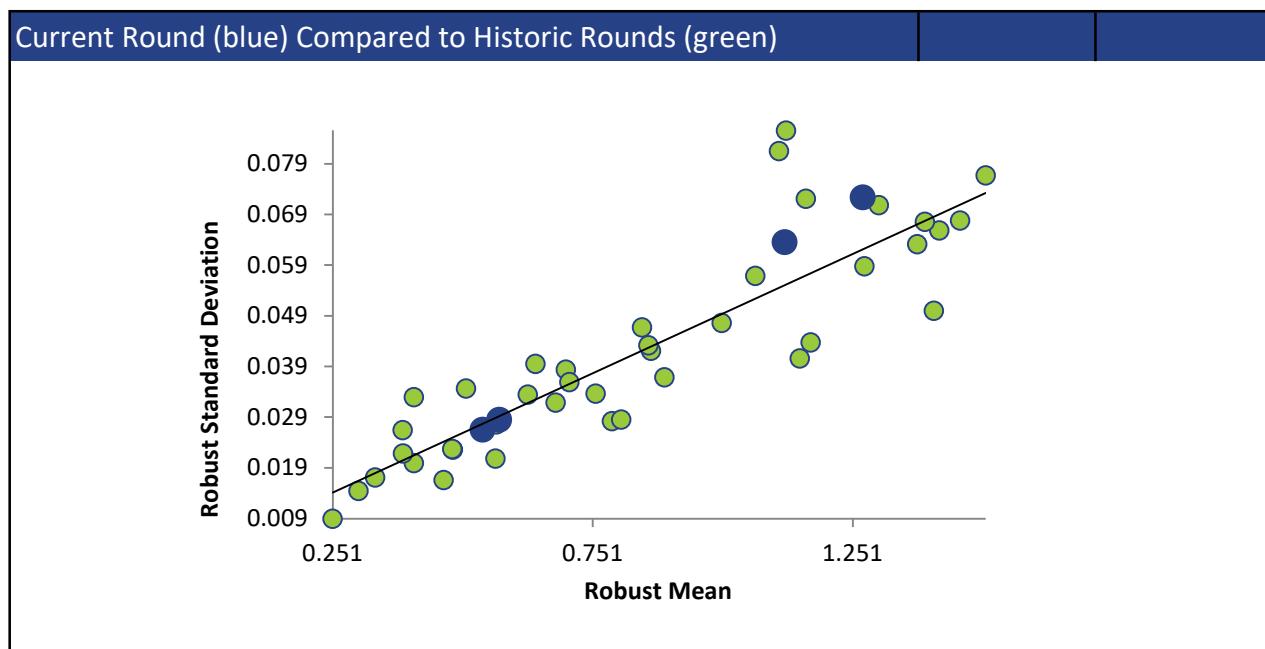
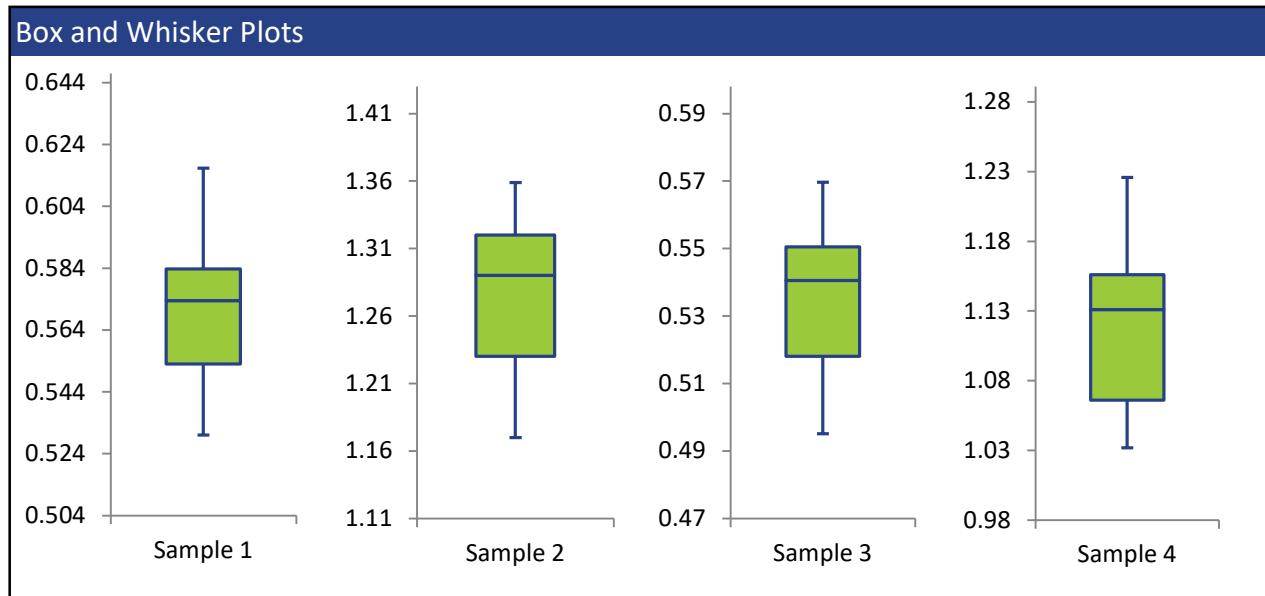
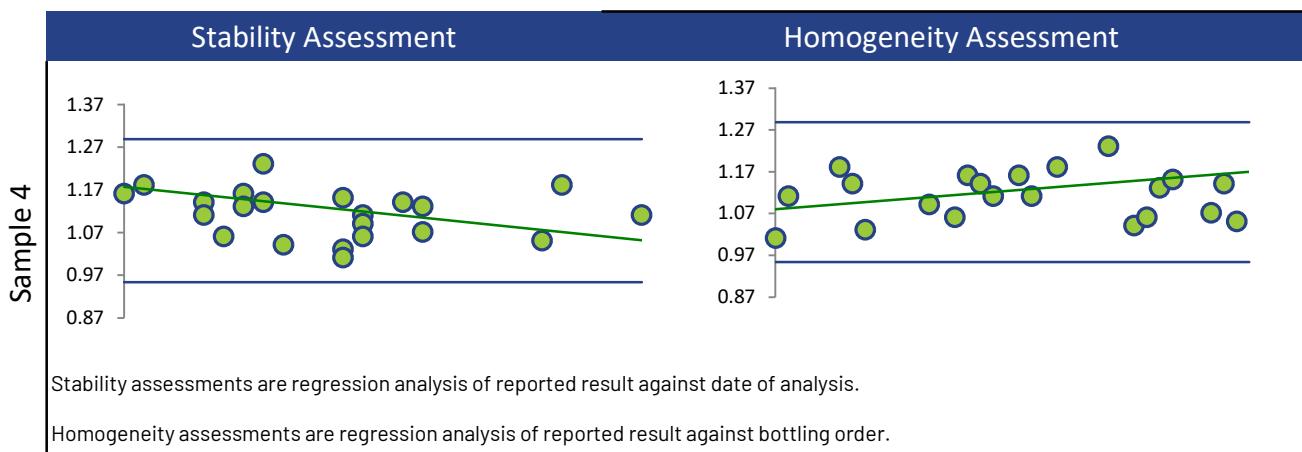
## Annex A Summary by Analyte

### ALUMINUM



## Annex A Summary by Analyte

### ALUMINUM



## BARIUM

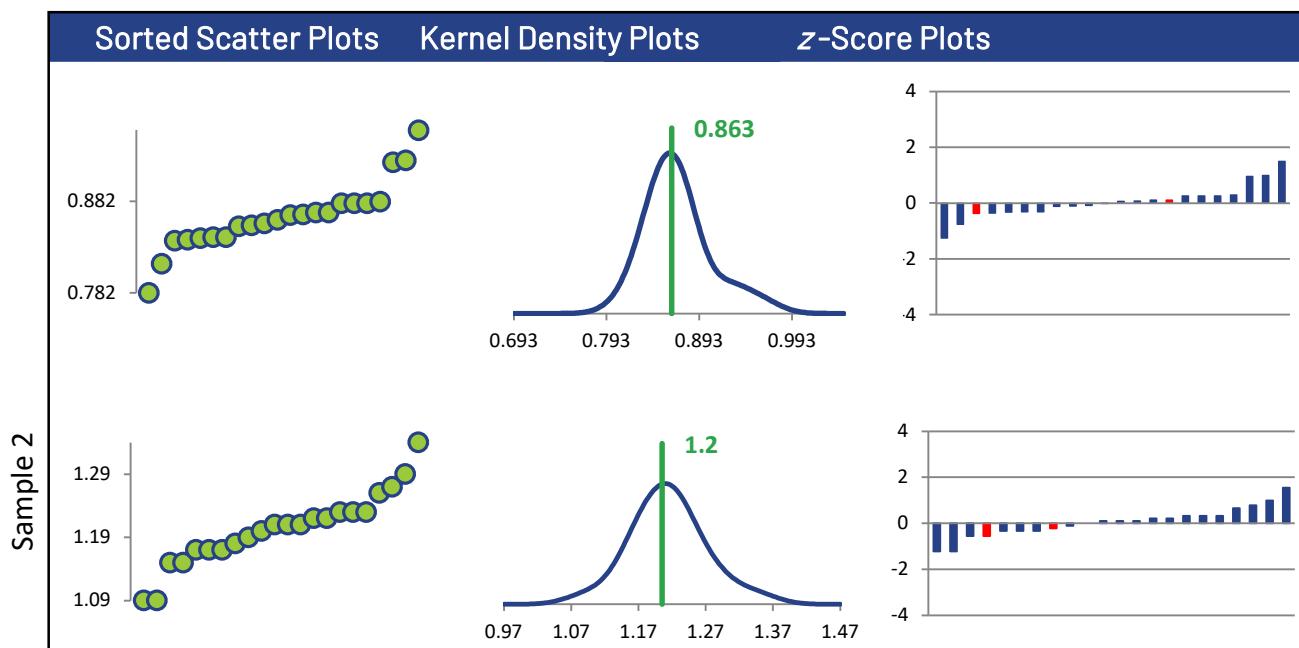
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	22	22	22	22
Median mg/L	0.865	1.21	0.396	1.18
Robust Mean mg/L	0.863	1.20	0.396	1.18
U mg/L	0.00736	0.0140	0.00360	0.0162
Robust Standard Deviation mg/L	0.0276	0.0525	0.0135	0.0608
Regression Standard Deviation mg/L	0.0647	0.0903	0.0297	0.0886
Stability Flag			Stability	Stability
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0647	0.0903	0.0380	0.101
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	0

## Methods Used

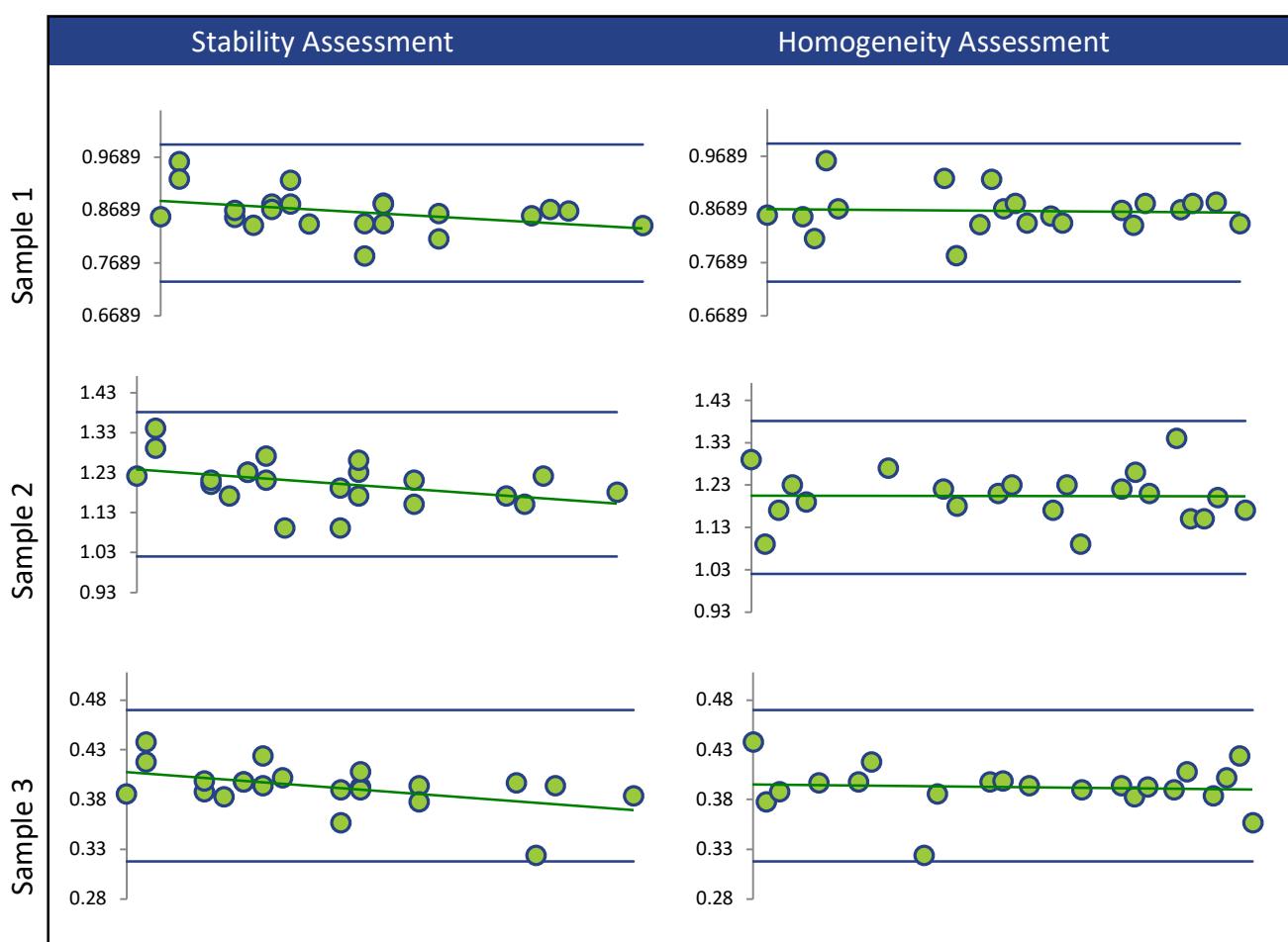
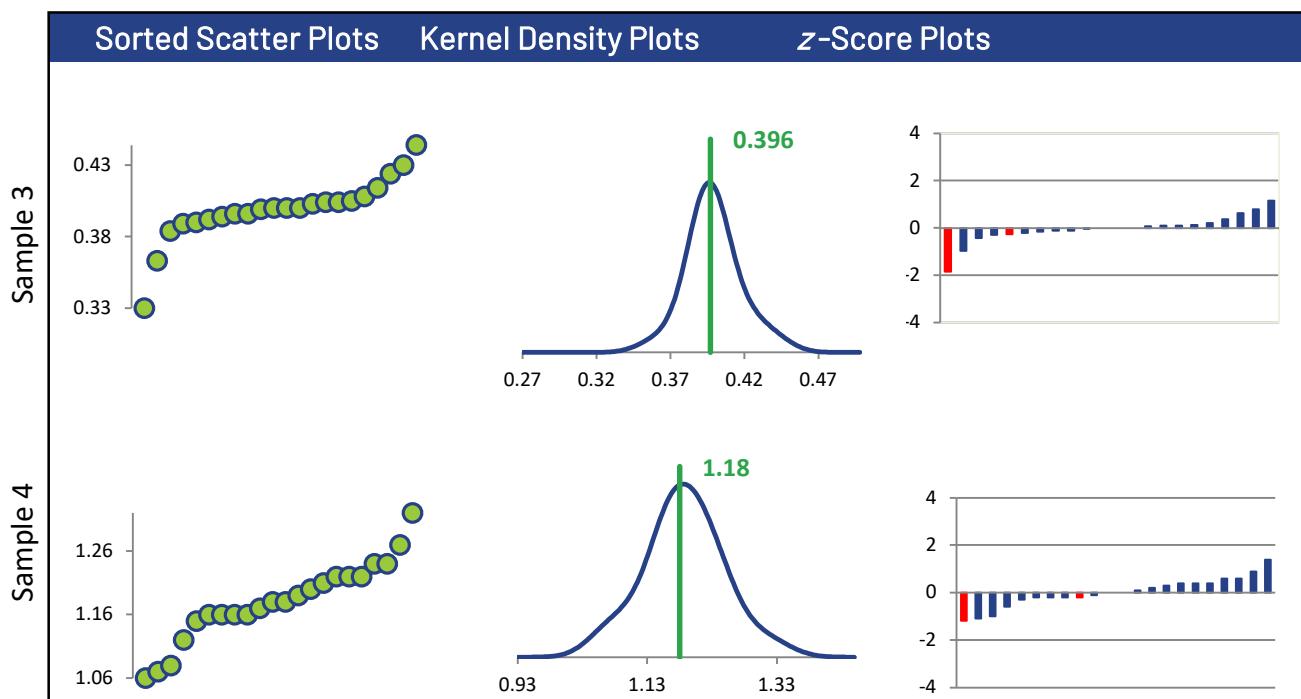
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	20	20	20	20
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



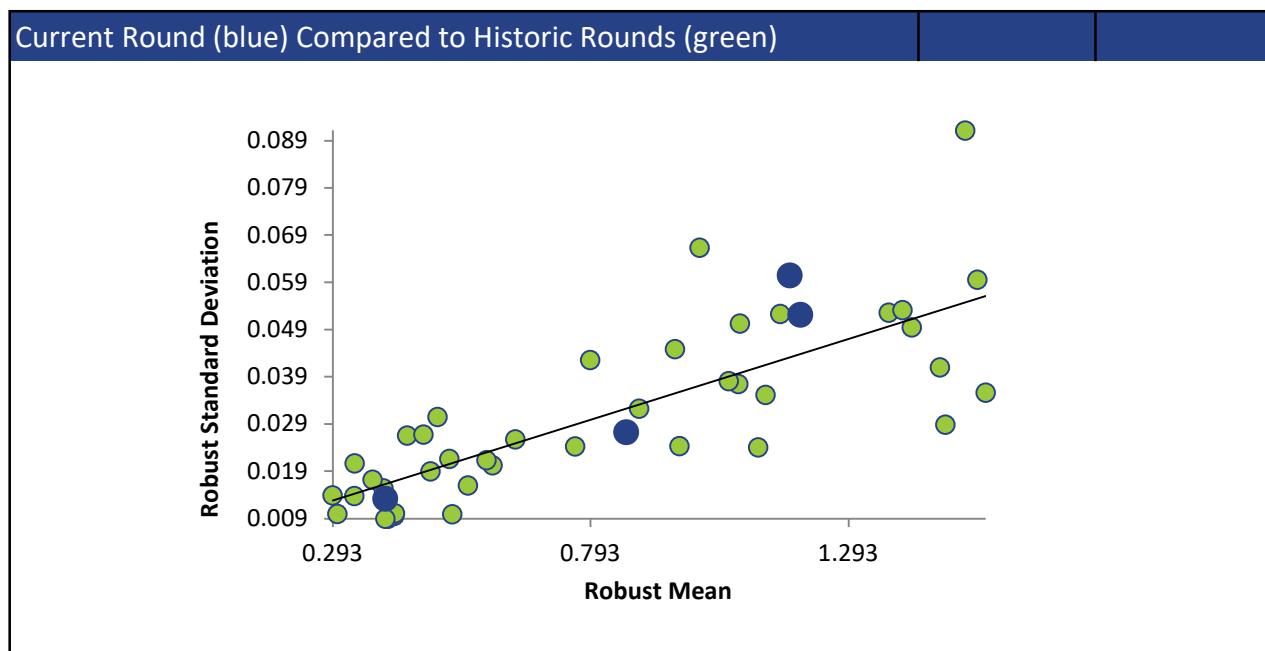
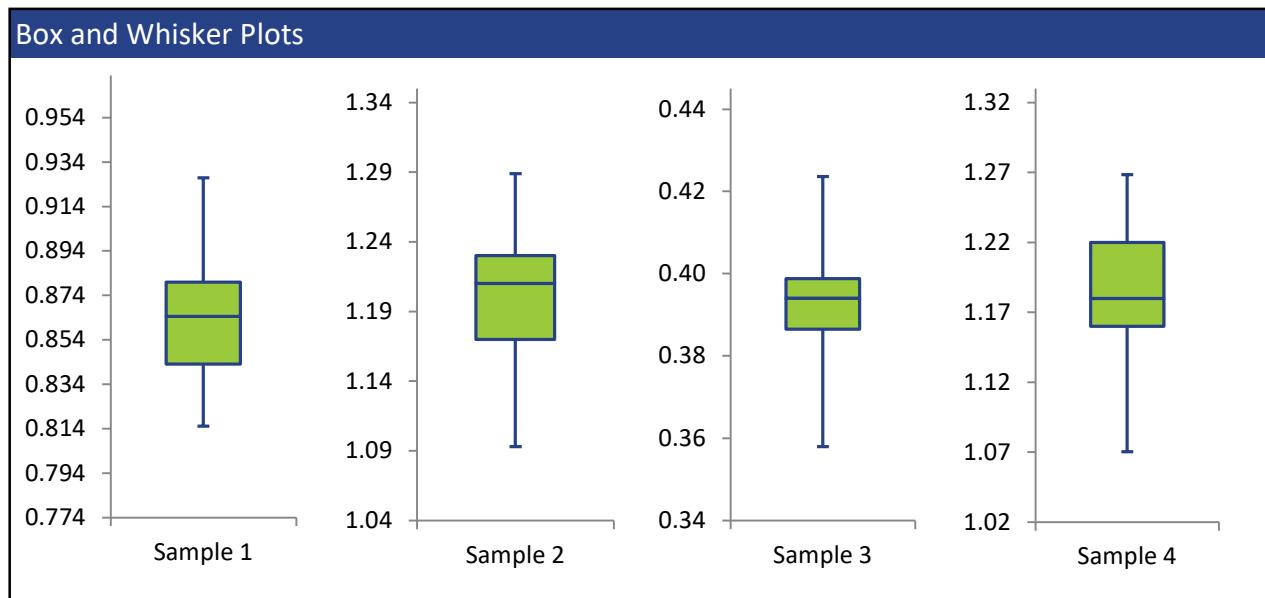
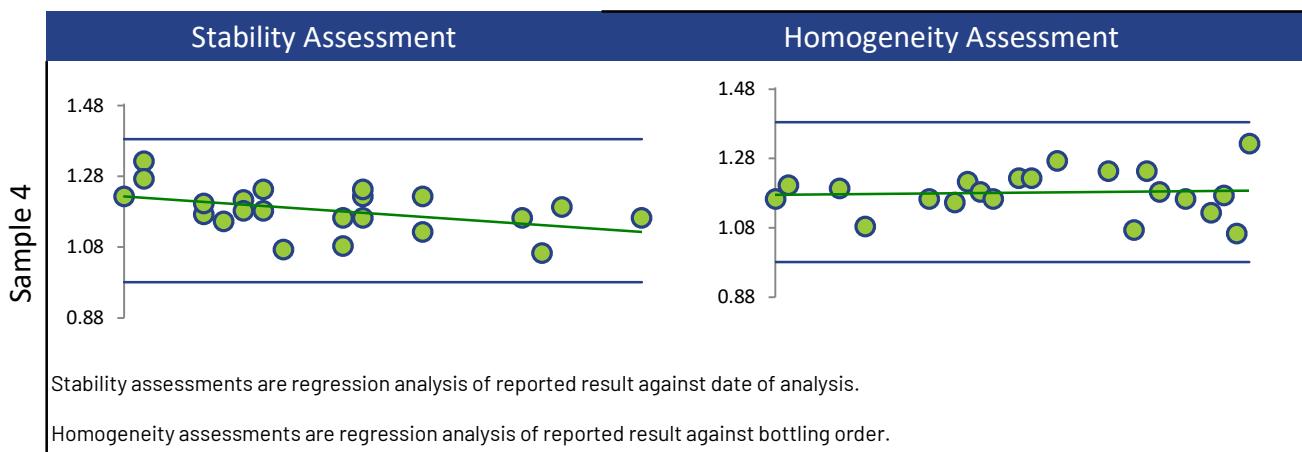
## Annex A Summary by Analyte

### BARIUM



## Annex A Summary by Analyte

### BARIUM



## BORON

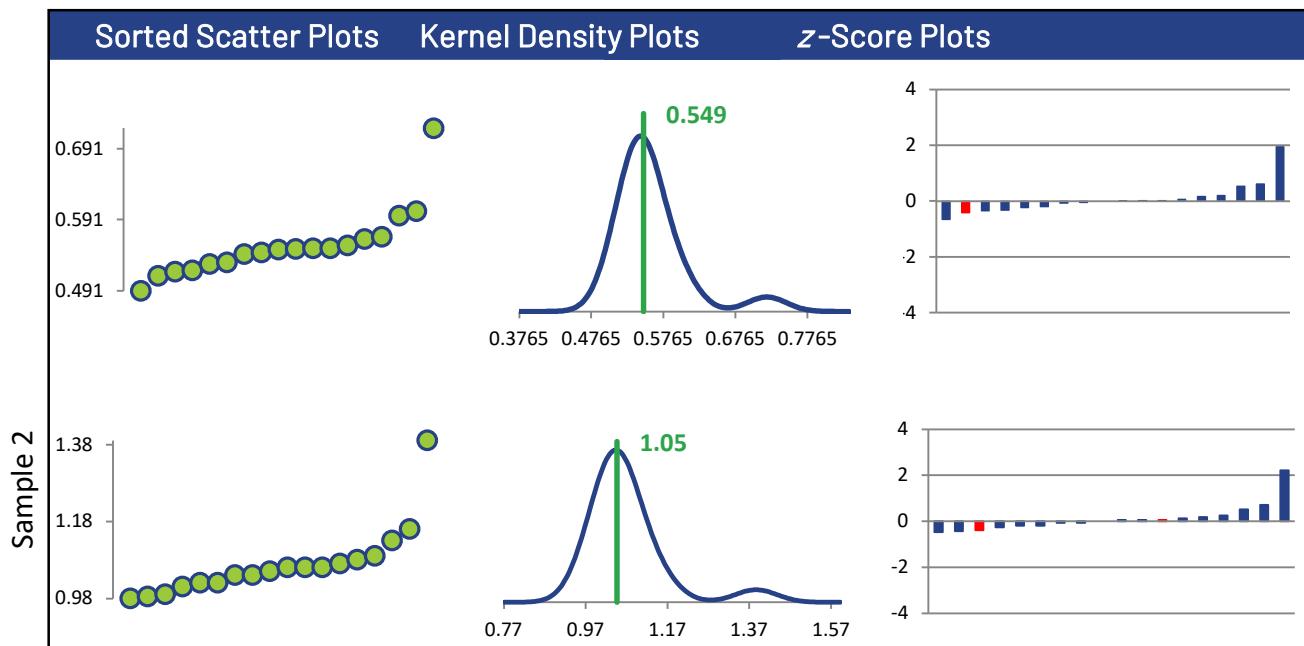
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	18	18	18	18
Median mg/L	0.550	1.06	0.396	1.61
Robust Mean mg/L	0.549	1.05	0.395	1.60
U mg/L	0.00958	0.0164	0.00725	0.0264
Robust Standard Deviation mg/L	0.0325	0.0557	0.0246	0.0897
Regression Standard Deviation mg/L	0.0412	0.0790	0.0296	0.120
Stability Flag	Stability	Stability	Stability	Stability
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0882	0.154	0.0610	0.285
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	1	1	0

## Methods Used

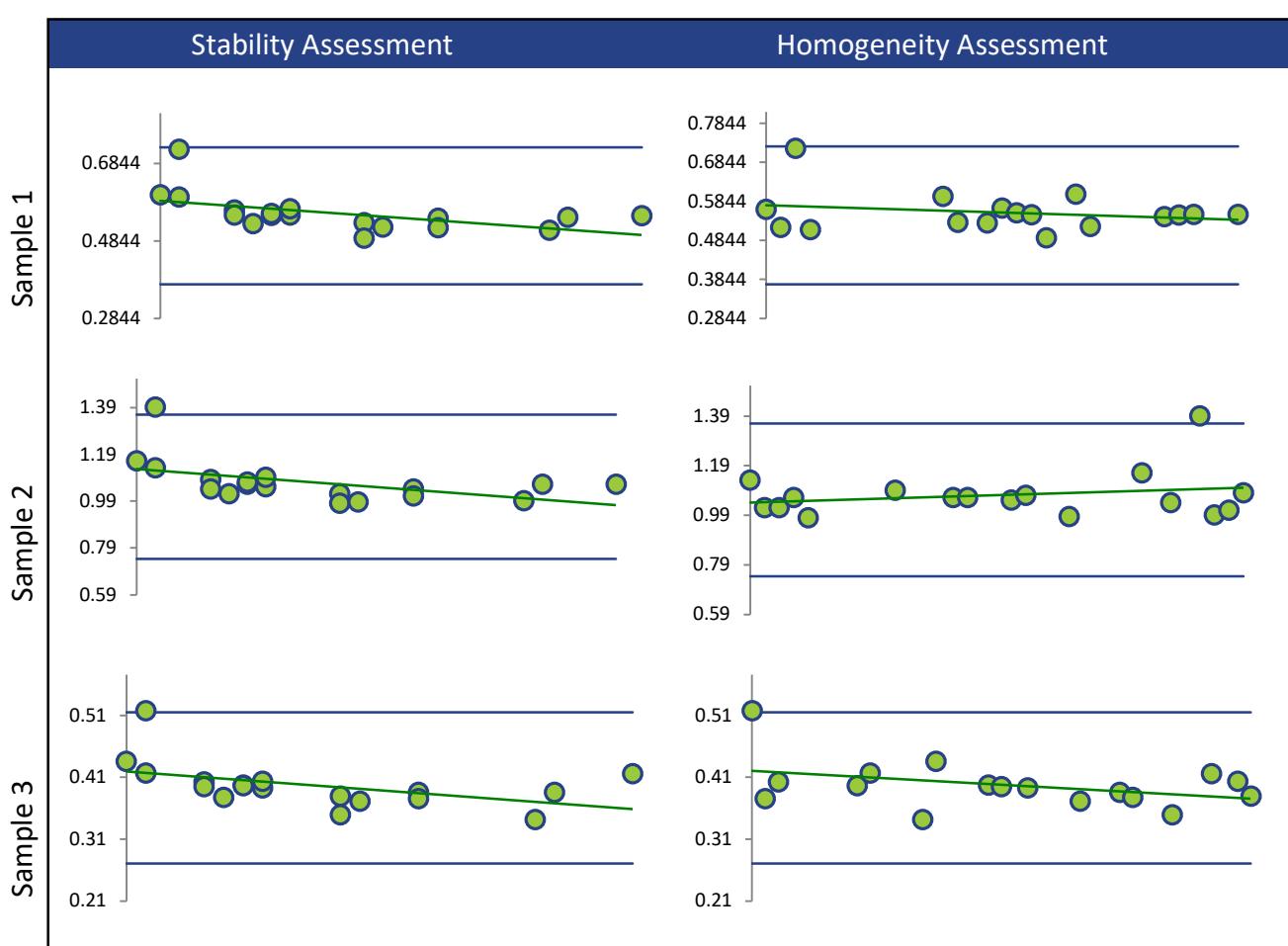
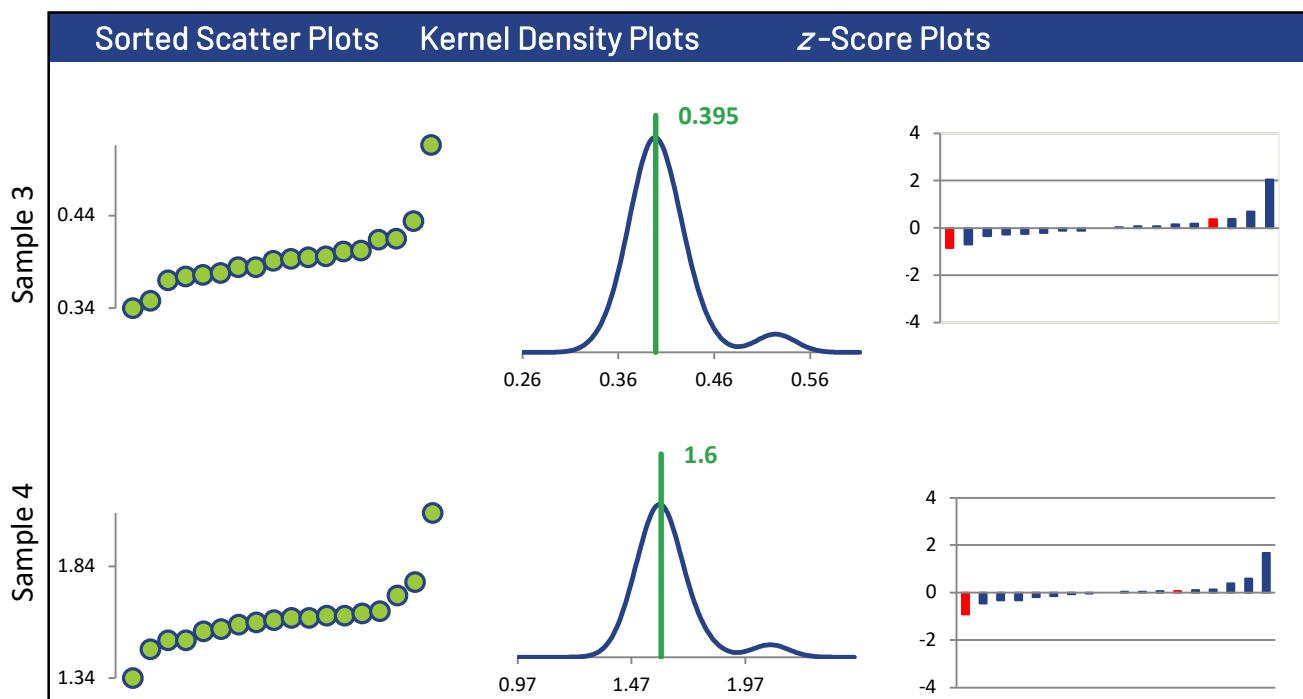
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	16	16	16	16
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



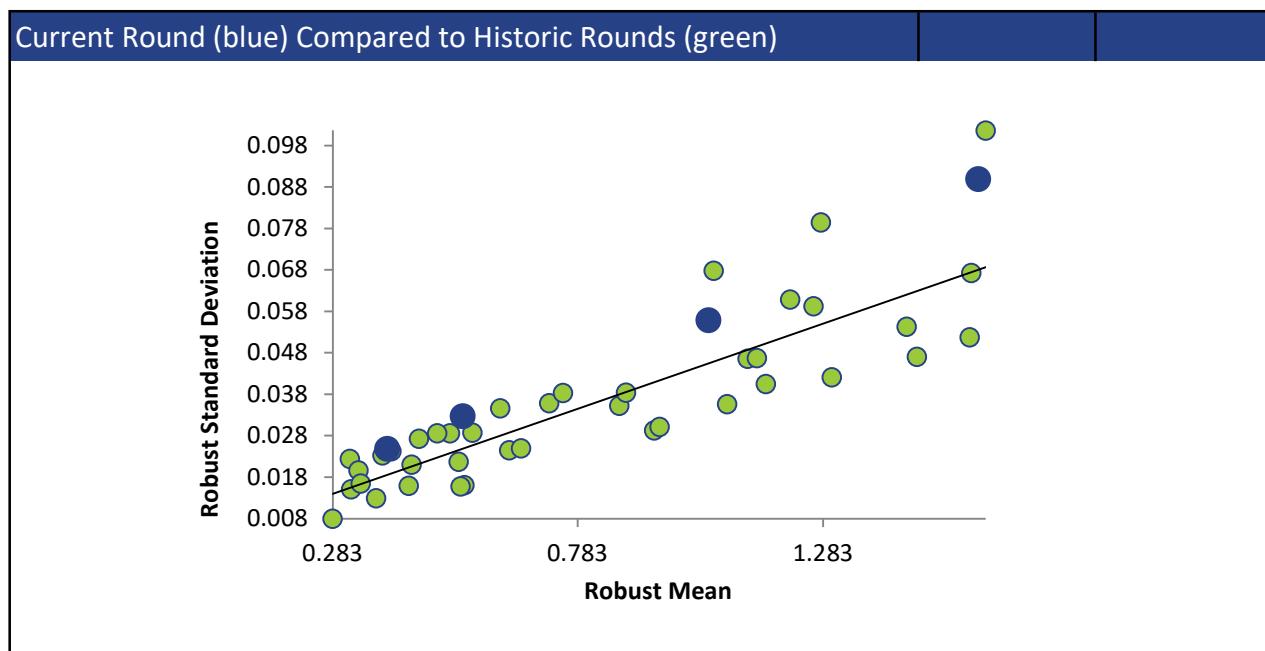
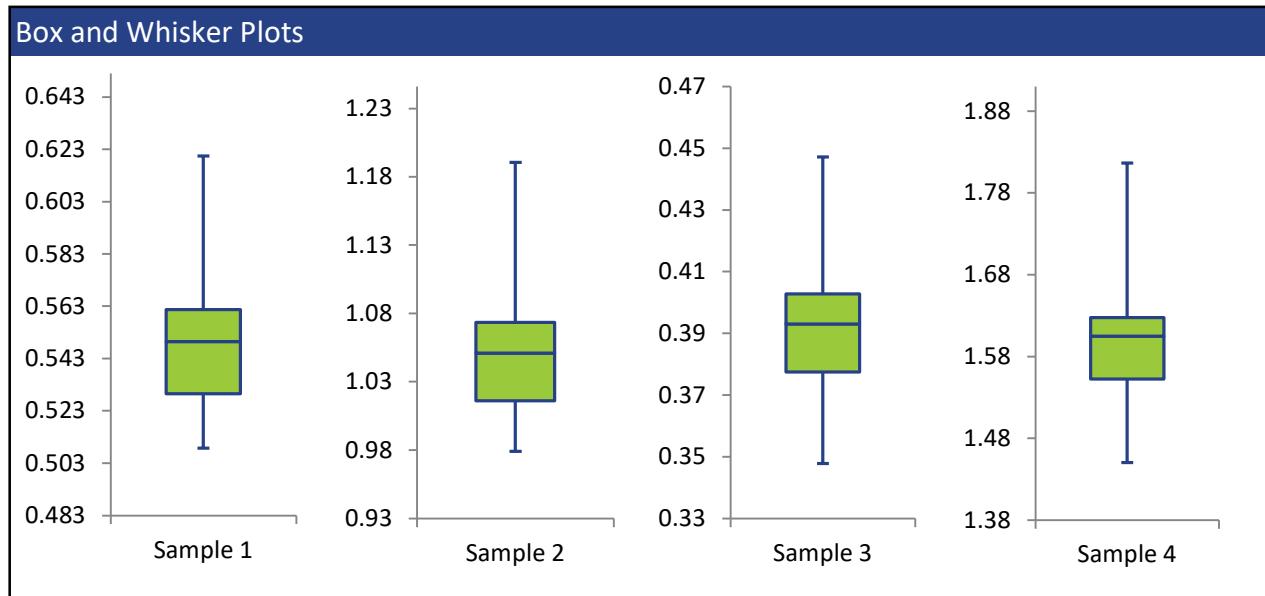
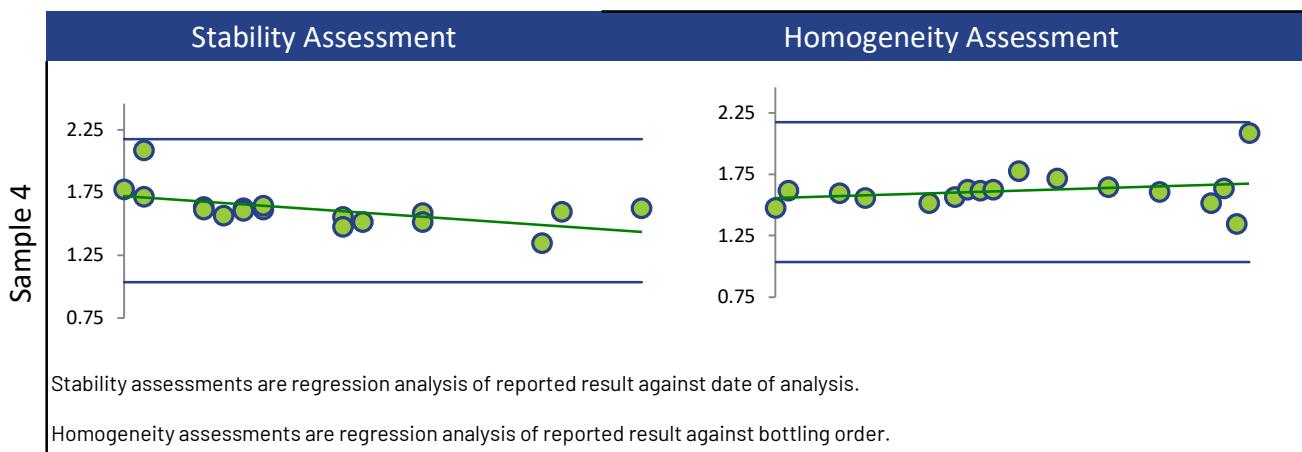
## Annex A Summary by Analyte

### BORON



## Annex A Summary by Analyte

### BORON



## CHROMIUM

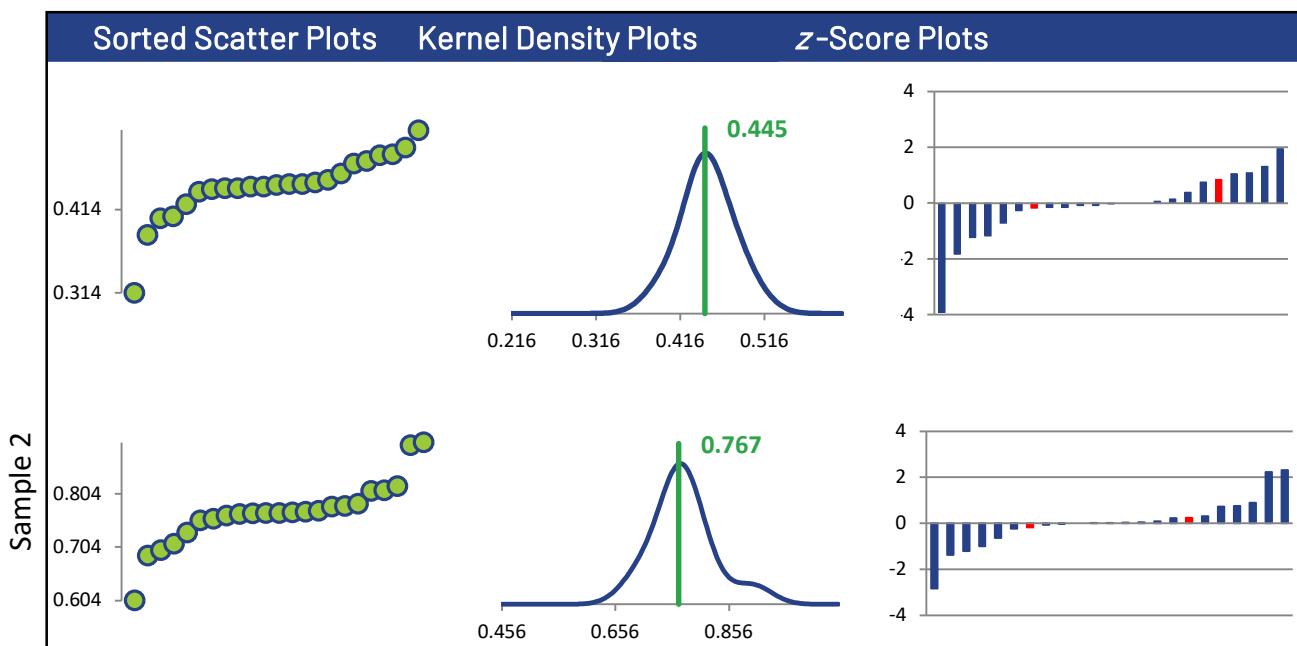
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	23	23	23	23
Median mg/L	0.444	0.768	0.307	1.24
Robust Mean mg/L	0.445	0.767	0.307	1.24
U mg/L	0.00811	0.0117	0.00521	0.0209
Robust Standard Deviation mg/L	0.0311	0.0448	0.0200	0.0800
Regression Standard Deviation mg/L	0.0334	0.0575	0.0230	0.0928
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0334	0.0575	0.0230	0.0928
Outliers	0	0	0	0
$ z >3.0$	1	0	1	0
$2< z <3$	0	3	1	2

## Methods Used

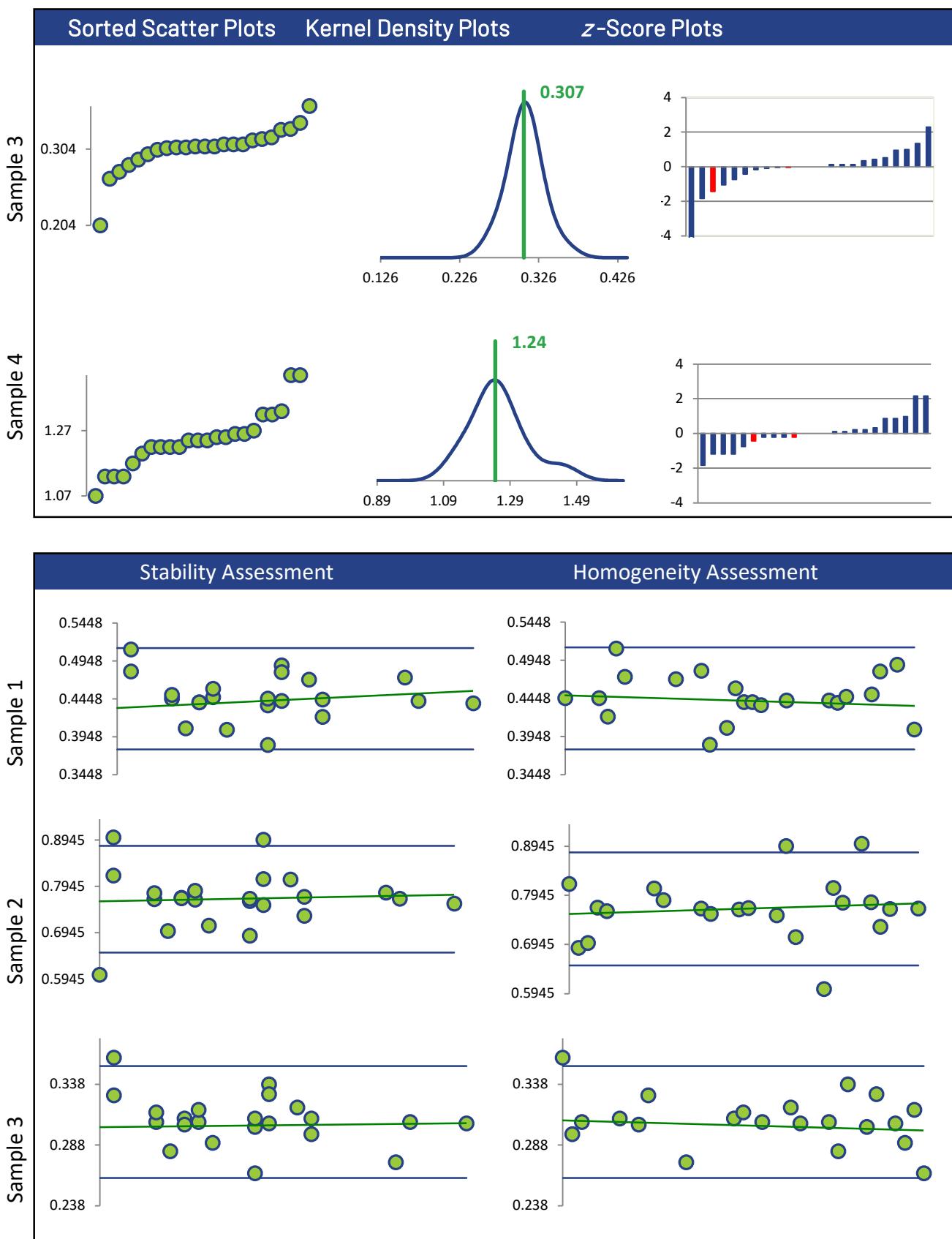
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	21	21	21	21
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



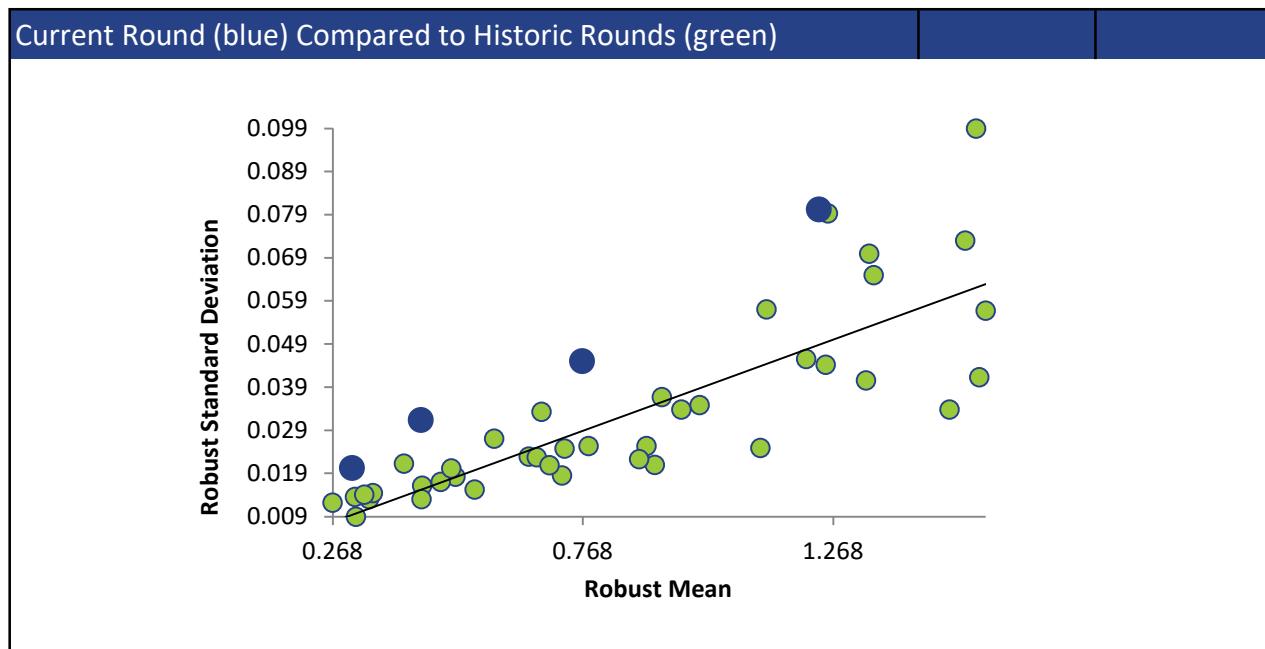
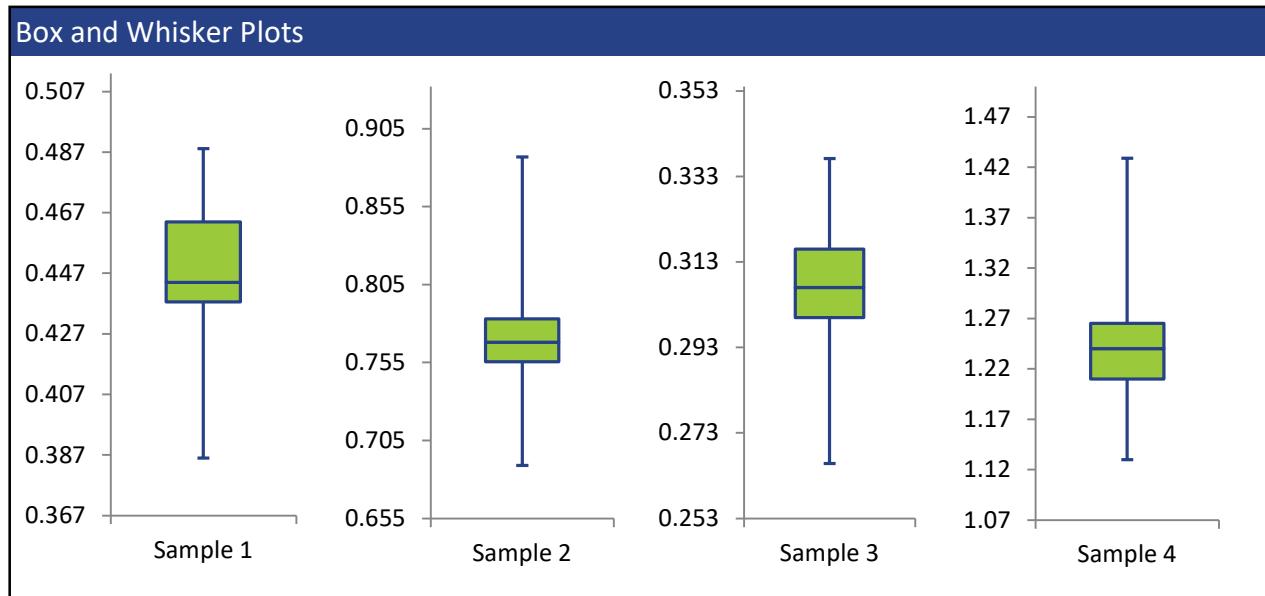
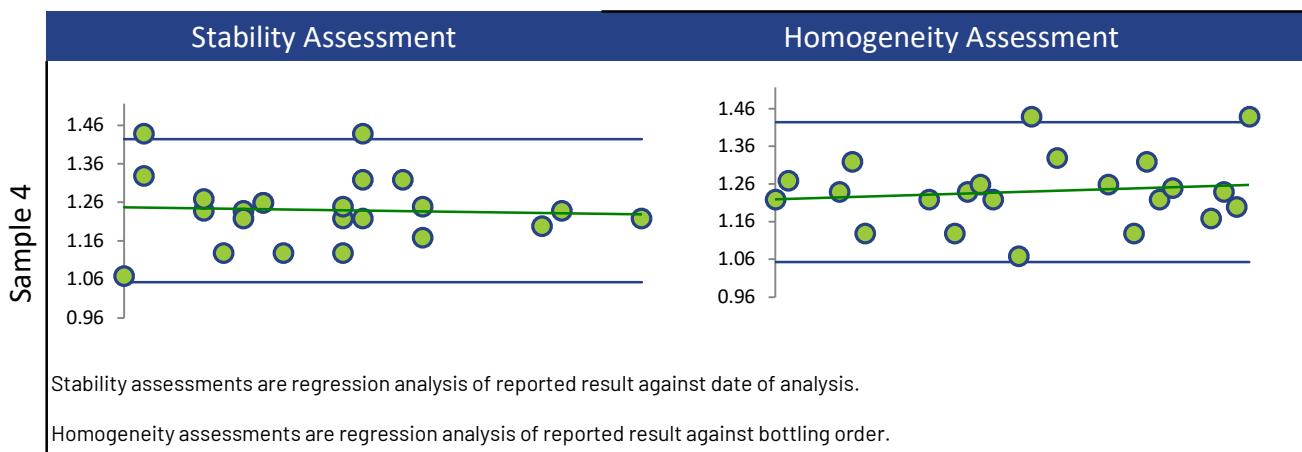
## Annex A Summary by Analyte

### CHROMIUM



## Annex A Summary by Analyte

### CHROMIUM



## COBALT

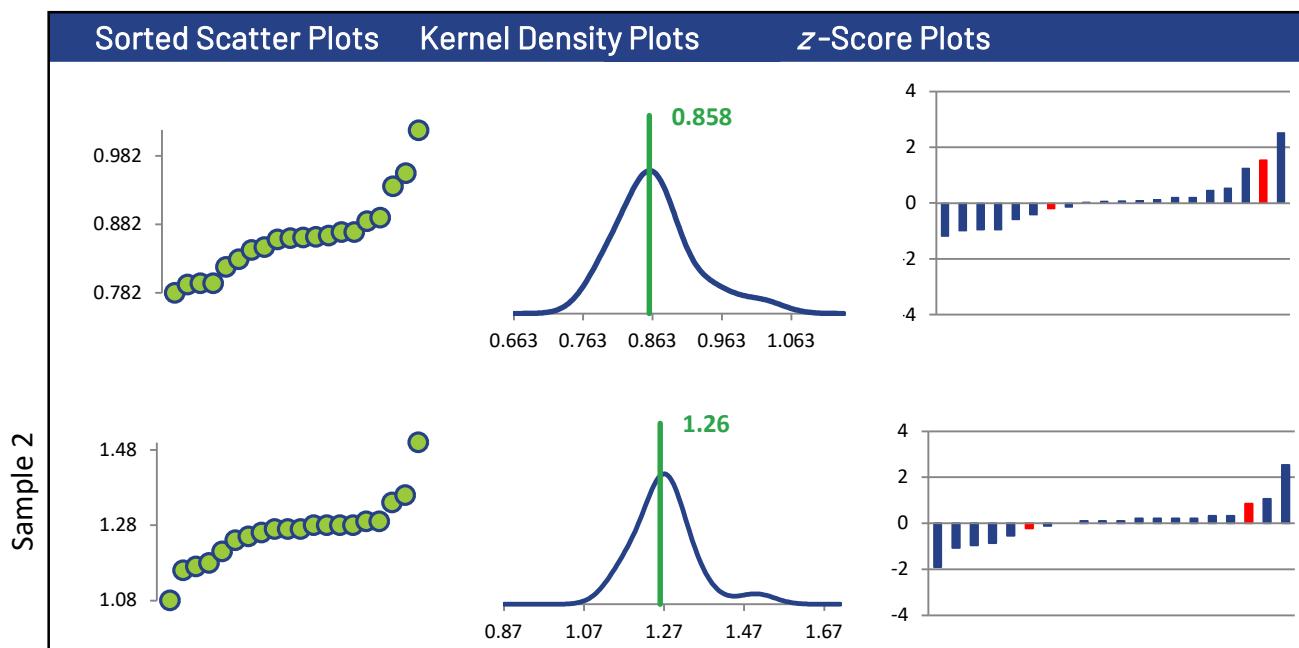
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	20	20	20	20
Median mg/L	0.863	1.27	1.26	1.20
Robust Mean mg/L	0.858	1.26	1.25	1.19
U mg/L	0.0148	0.0190	0.0198	0.0179
Robust Standard Deviation mg/L	0.0529	0.0680	0.0708	0.0642
Regression Standard Deviation mg/L	0.0644	0.0945	0.0936	0.0889
Stability Flag				
Homogeneity Flag			Homogeneity	
Standard Deviation Used (SDPA) mg/L	0.0644	0.0945	0.134	0.0889
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	1	1	1	1

## Methods Used

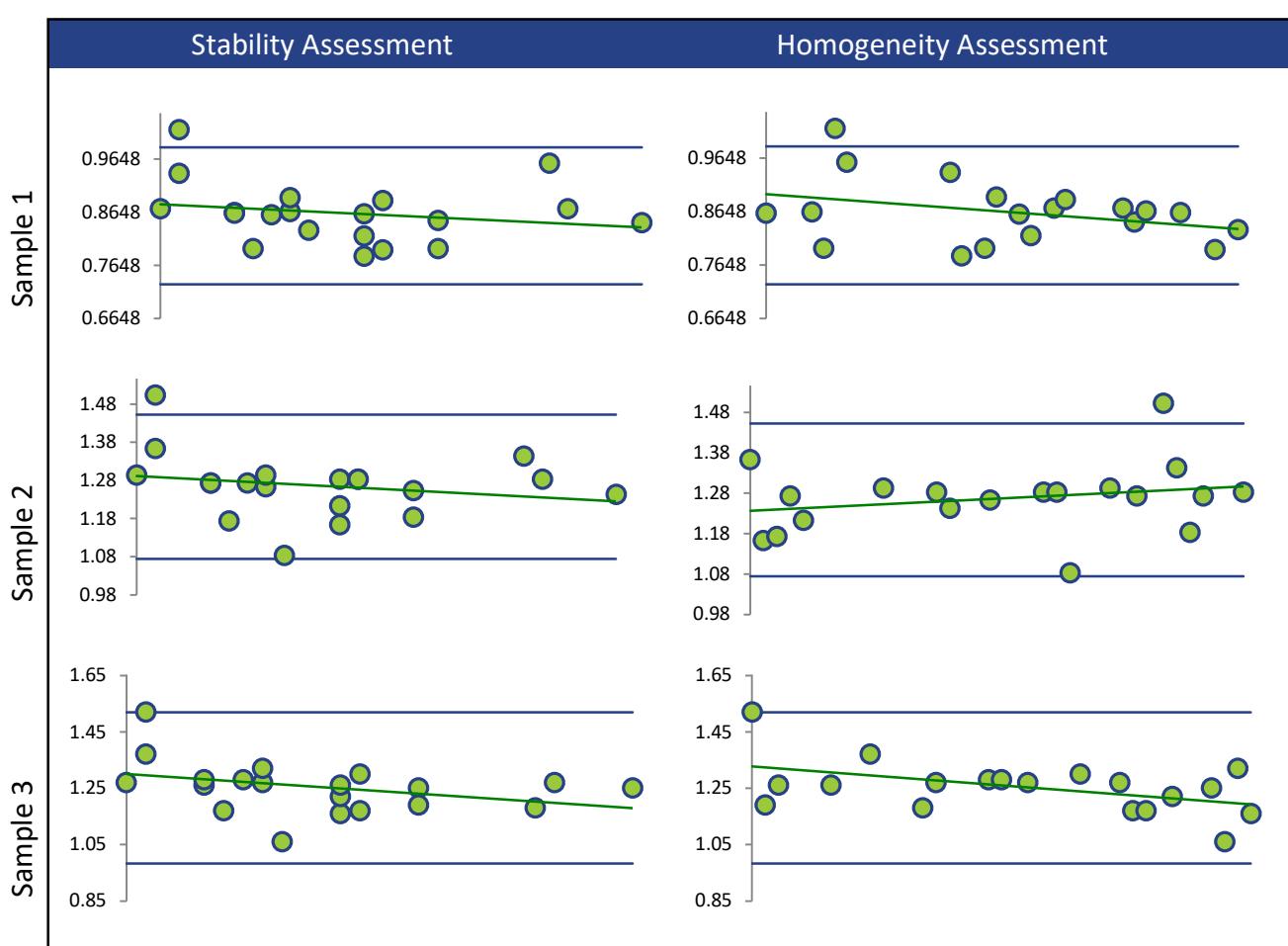
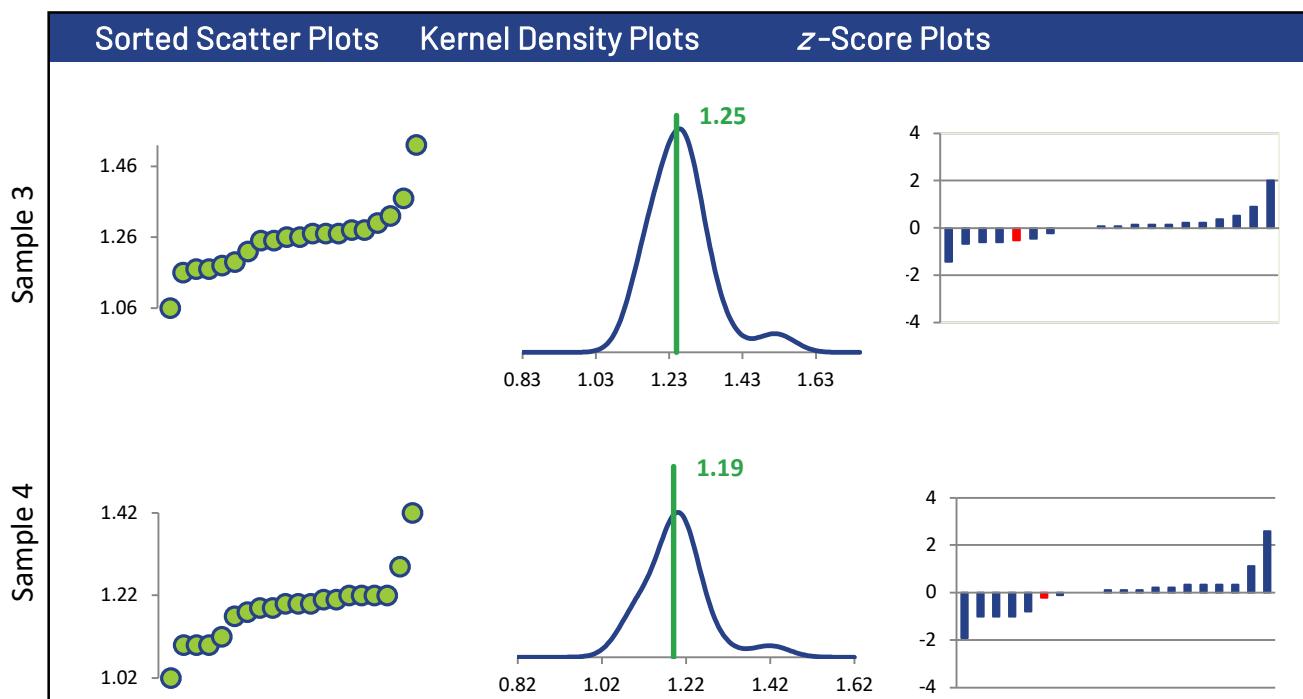
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	18	18	18	18
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



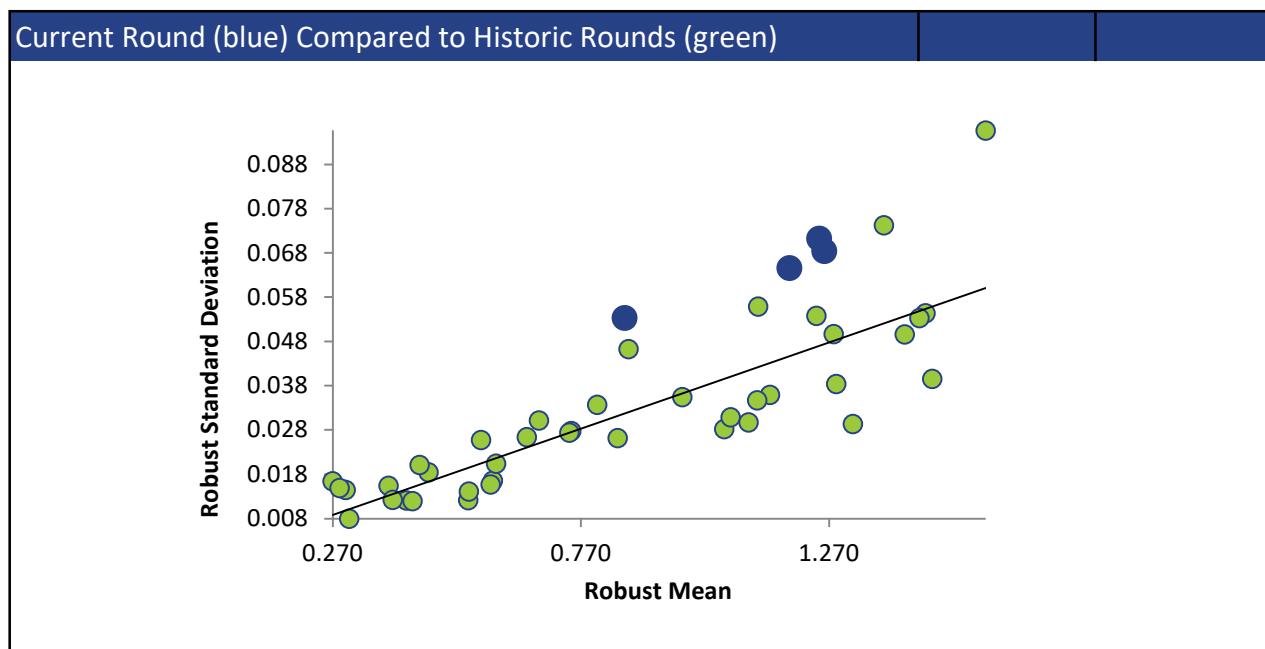
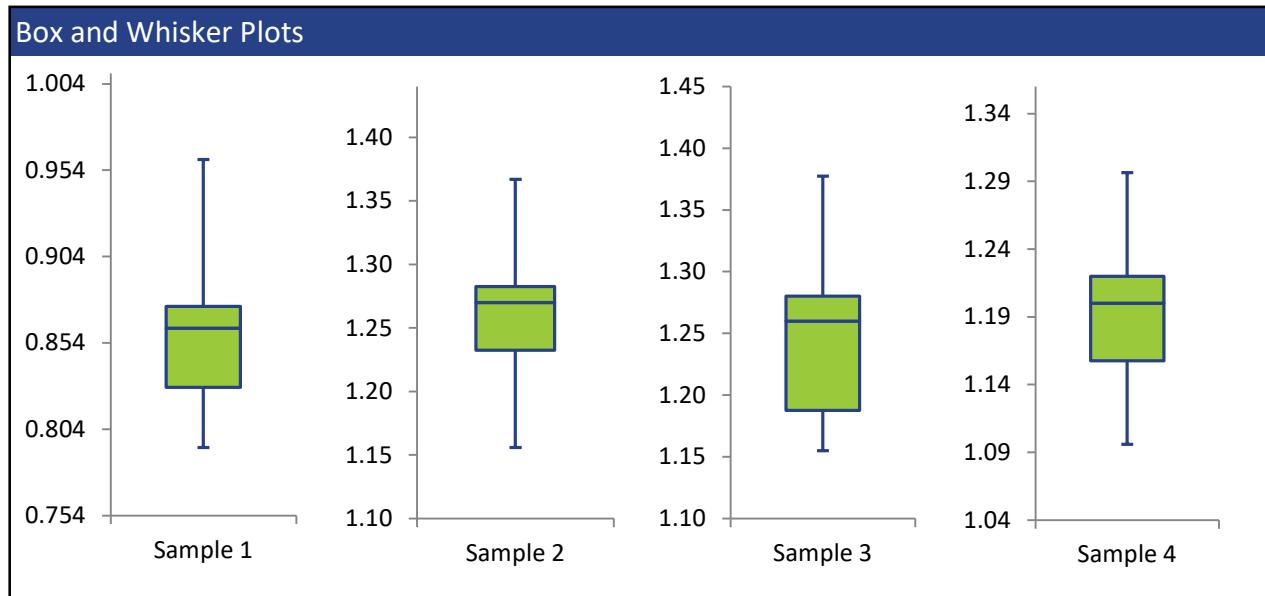
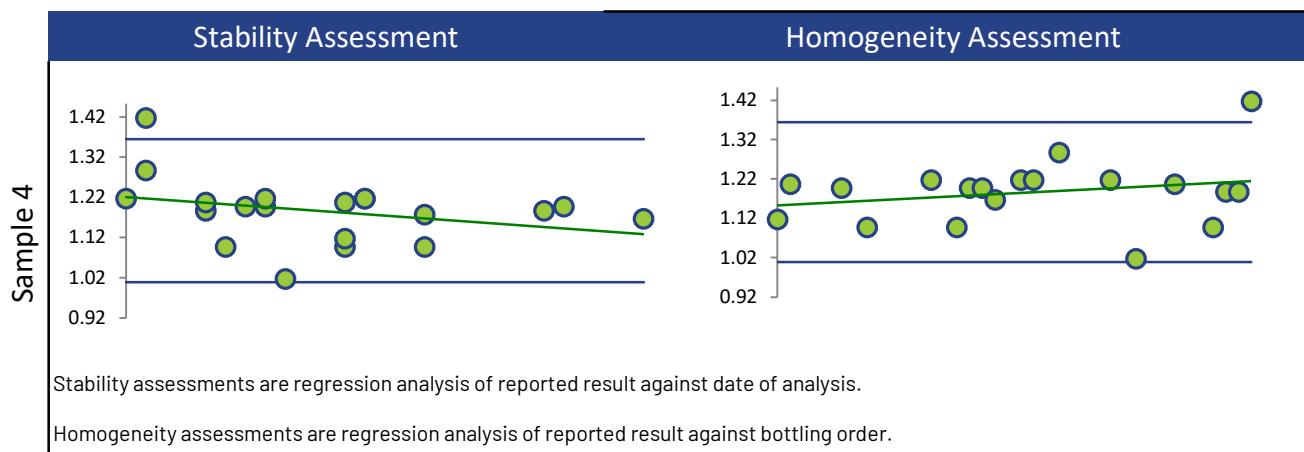
## Annex A Summary by Analyte

### COBALT



## Annex A Summary by Analyte

### COBALT



## COPPER

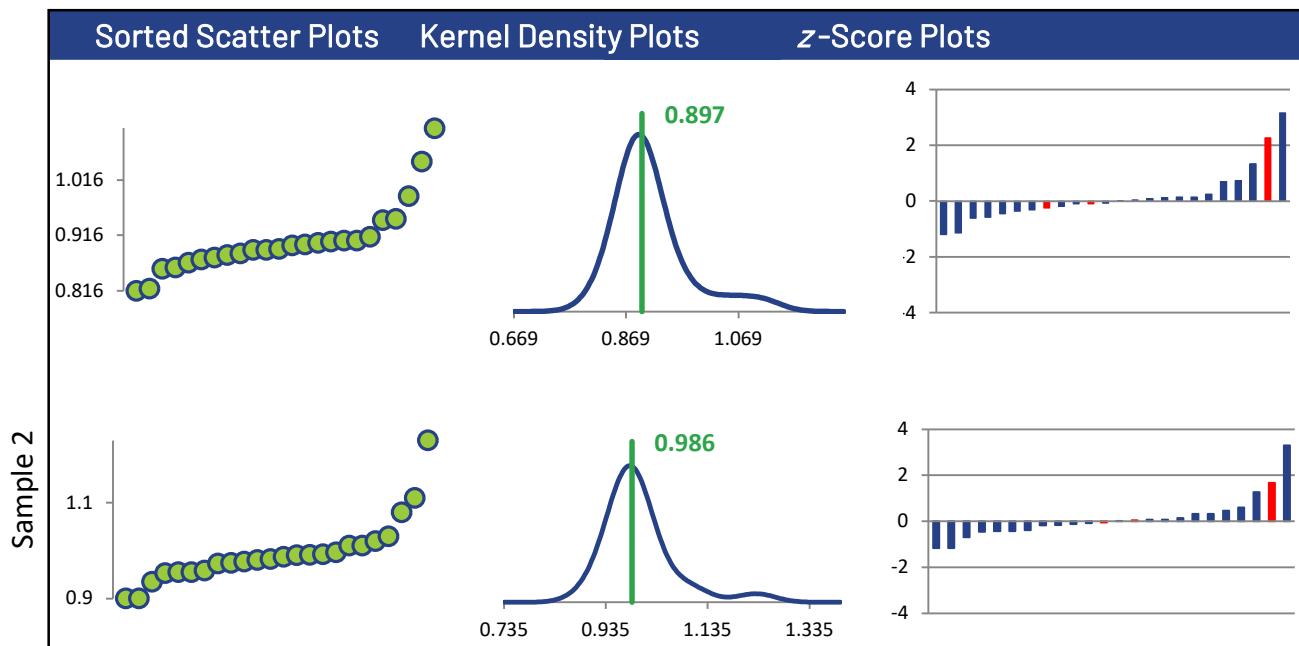
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	24	24	24	24
Median mg/L	0.895	0.985	0.371	1.58
Robust Mean mg/L	0.897	0.986	0.371	1.58
U mg/L	0.0104	0.0105	0.00337	0.0166
Robust Standard Deviation mg/L	0.0406	0.0411	0.0132	0.0651
Regression Standard Deviation mg/L	0.0673	0.0739	0.0279	0.118
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0673	0.0739	0.0279	0.118
Outliers	0	0	0	0
$ z >3.0$	1	1	1	1
$2< z <3$	1	0	0	0

## Methods Used

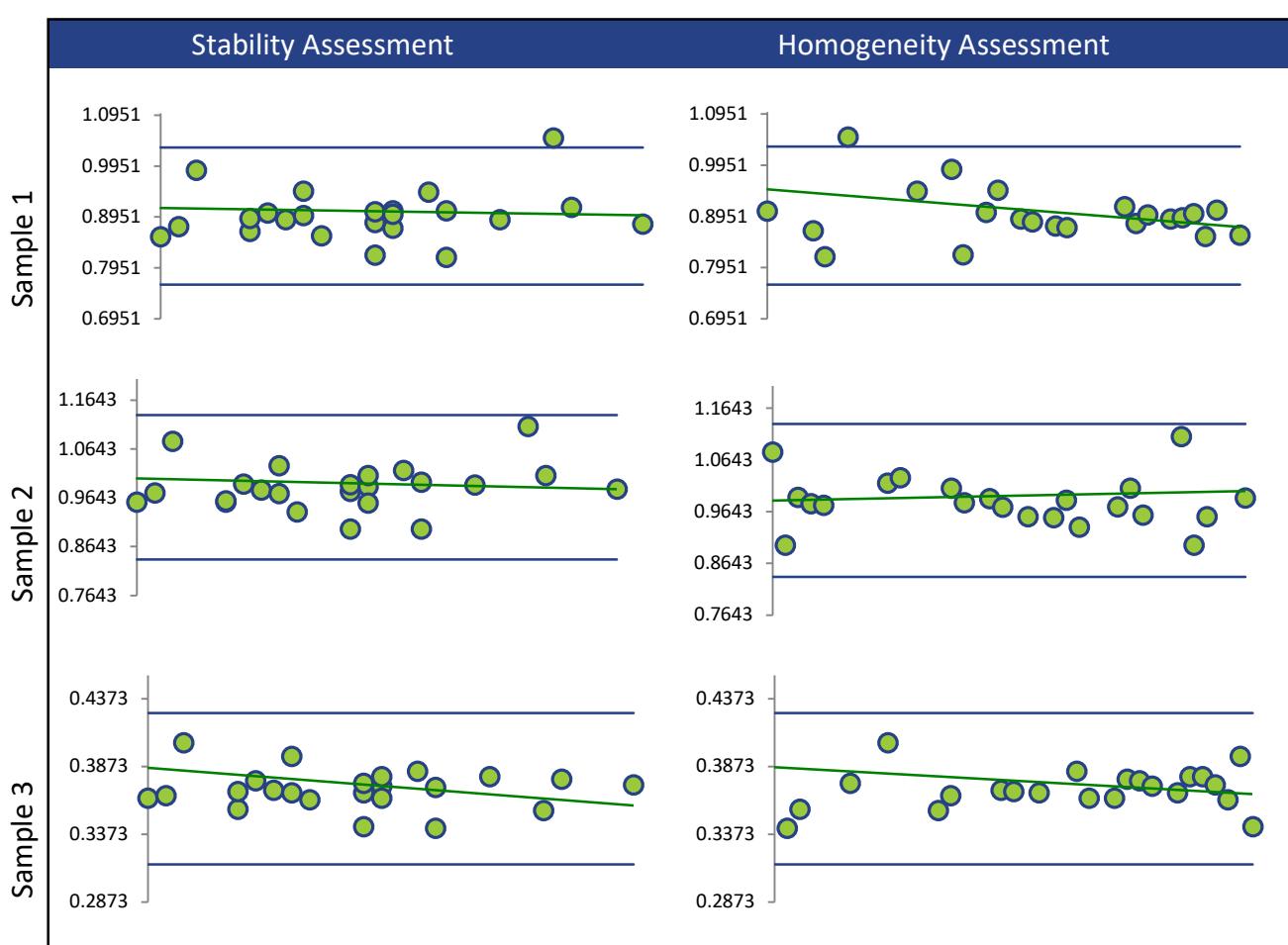
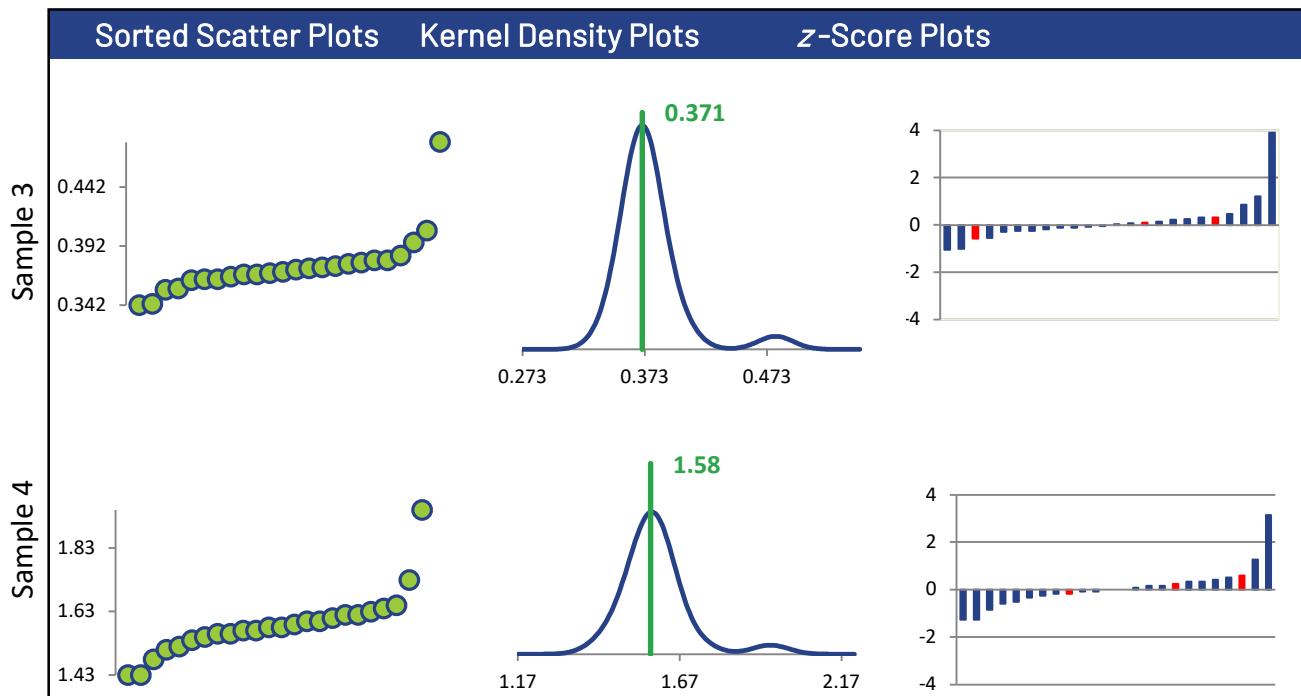
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	21	21	21	21
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers



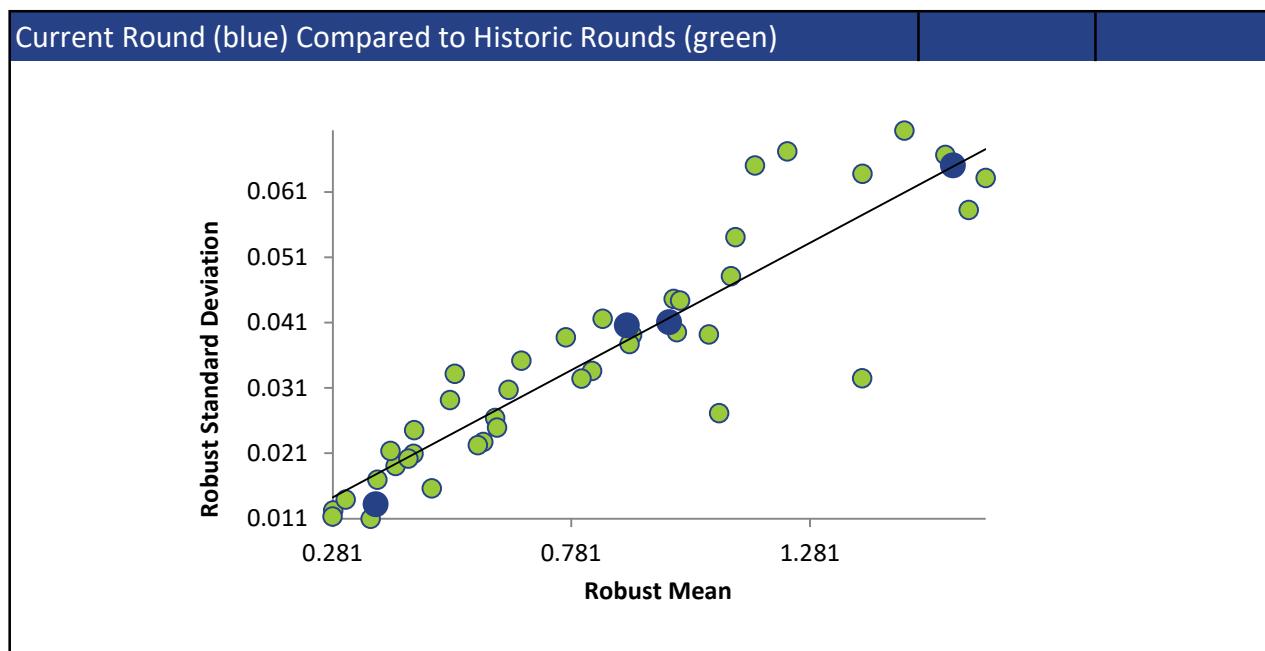
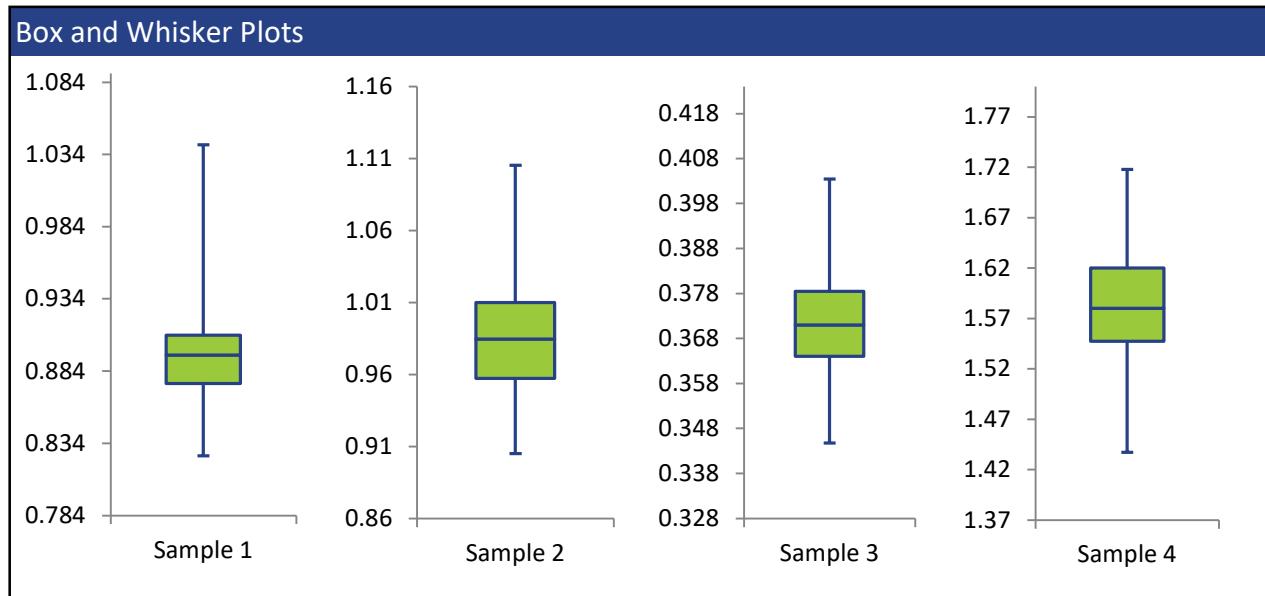
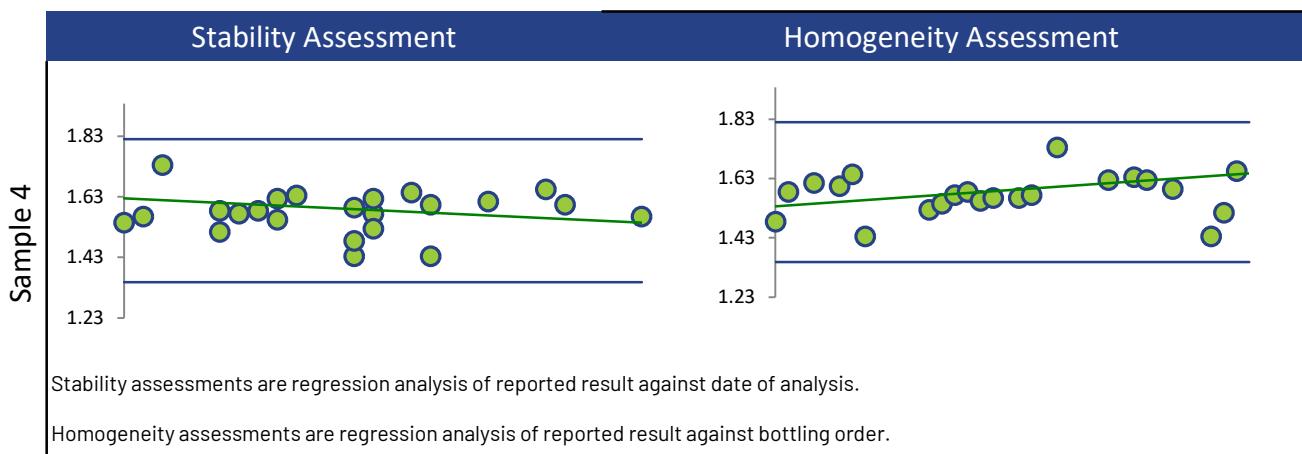
## Annex A Summary by Analyte

### COPPER



## Annex A Summary by Analyte

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## IRON

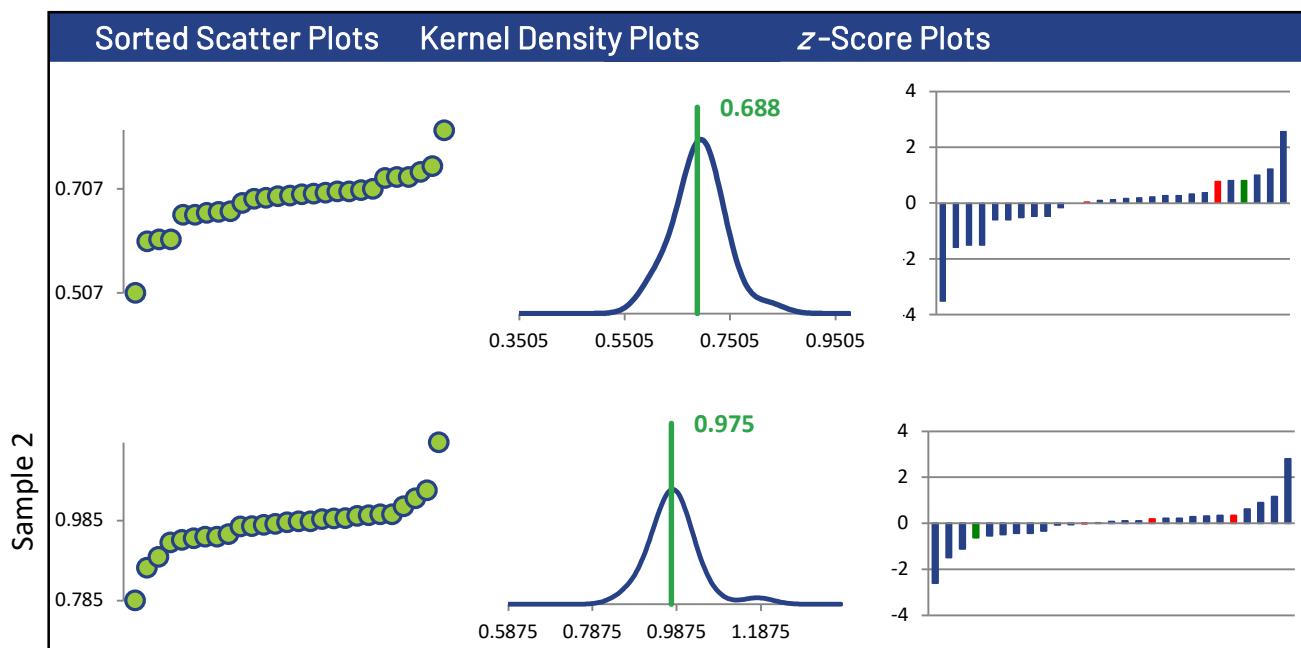
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	27	27	27	27
Median mg/L	0.694	0.980	0.276	1.63
Robust Mean mg/L	0.688	0.975	0.271	1.60
U mg/L	0.0105	0.0102	0.00464	0.0202
Robust Standard Deviation mg/L	0.0436	0.0422	0.0193	0.0840
Regression Standard Deviation mg/L	0.0516	0.0731	0.0203	0.120
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0516	0.0731	0.0203	0.120
Outliers	0	0	0	0
$ z >3.0$	1	0	2	0
$2< z <3$	1	2	2	2

## Methods Used

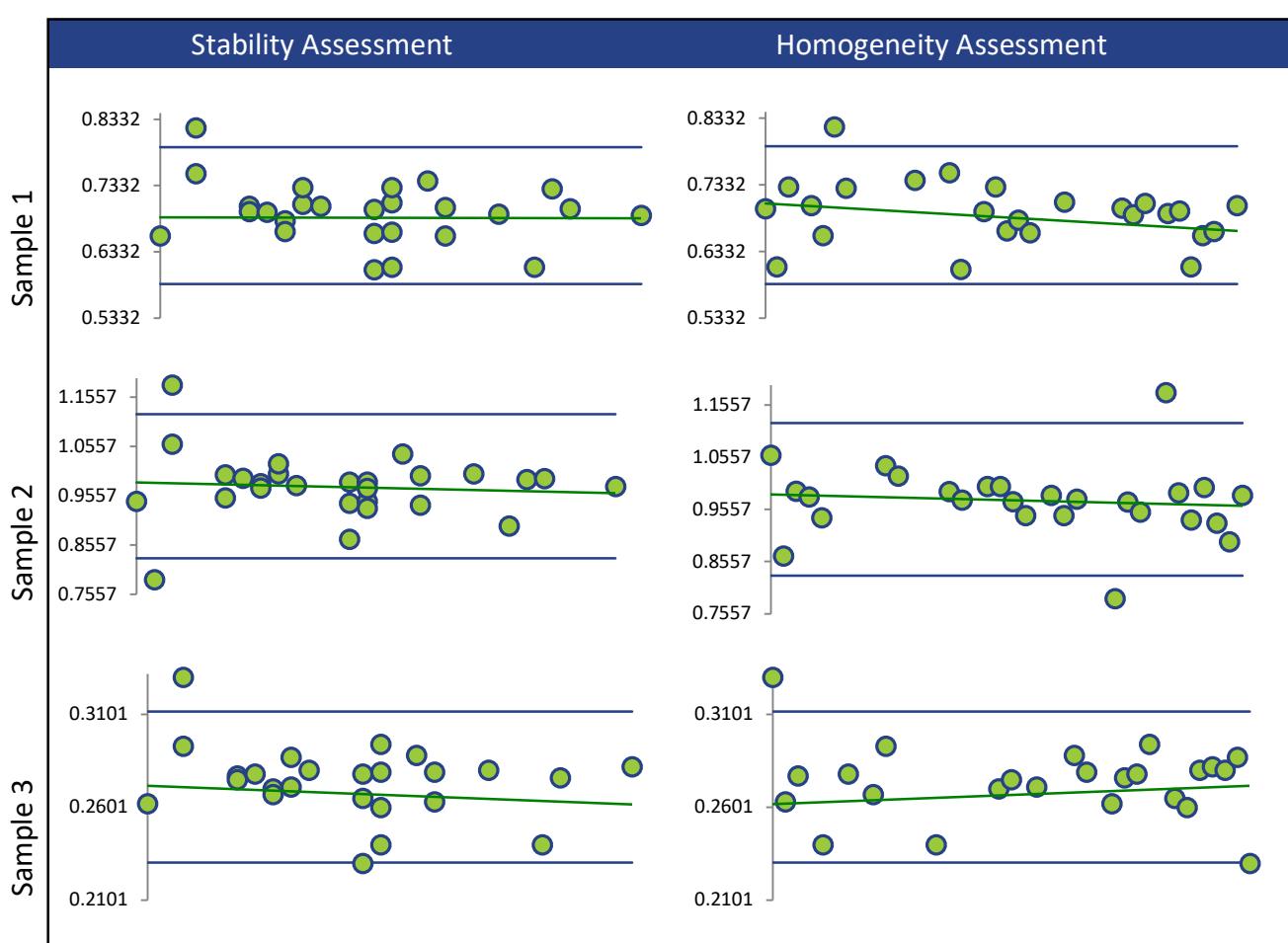
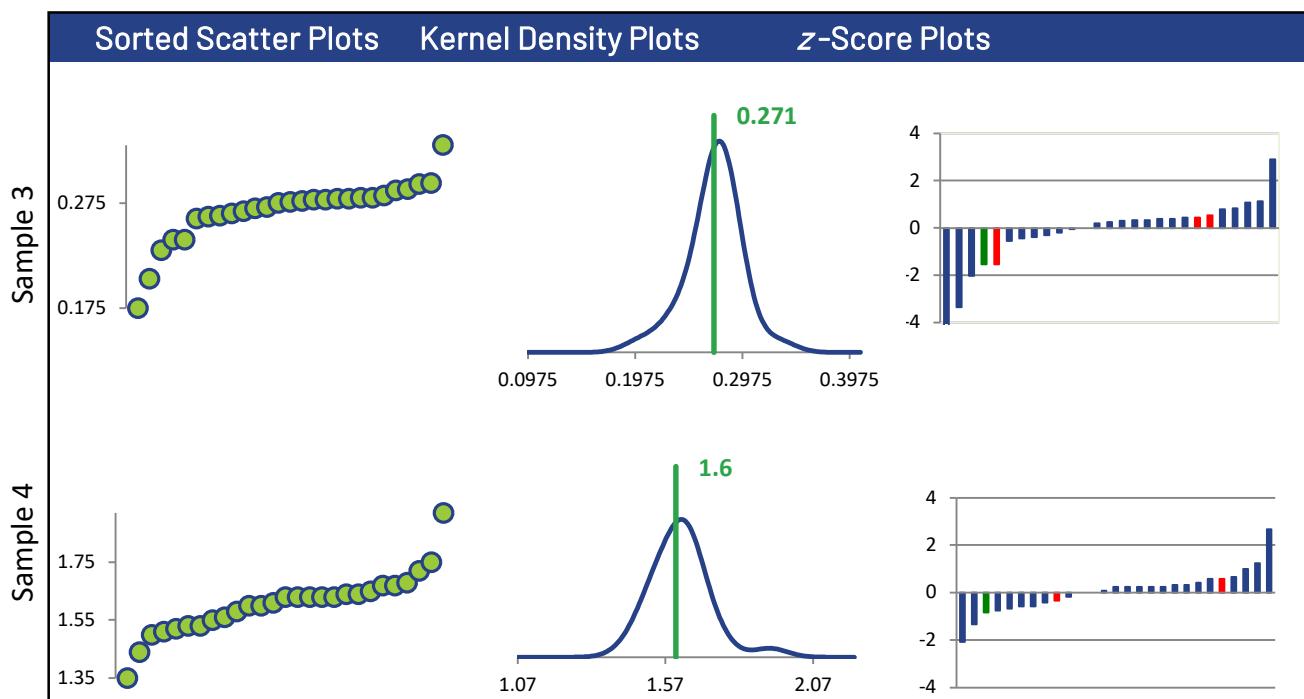
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	23	23	23	23
ICP/MS (Red)	3	3	3	3
COLORIMETRIC (Green)	1	1	1	1

All summary stats and the plots below are based on the data excluding any flagged outliers



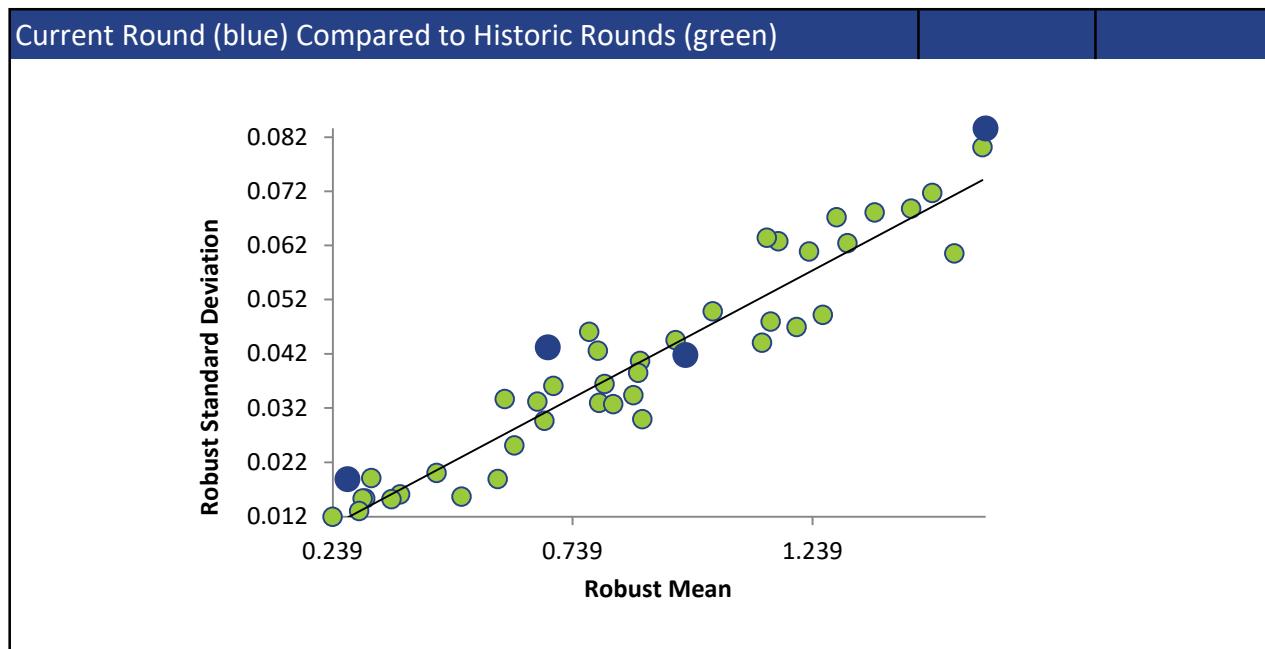
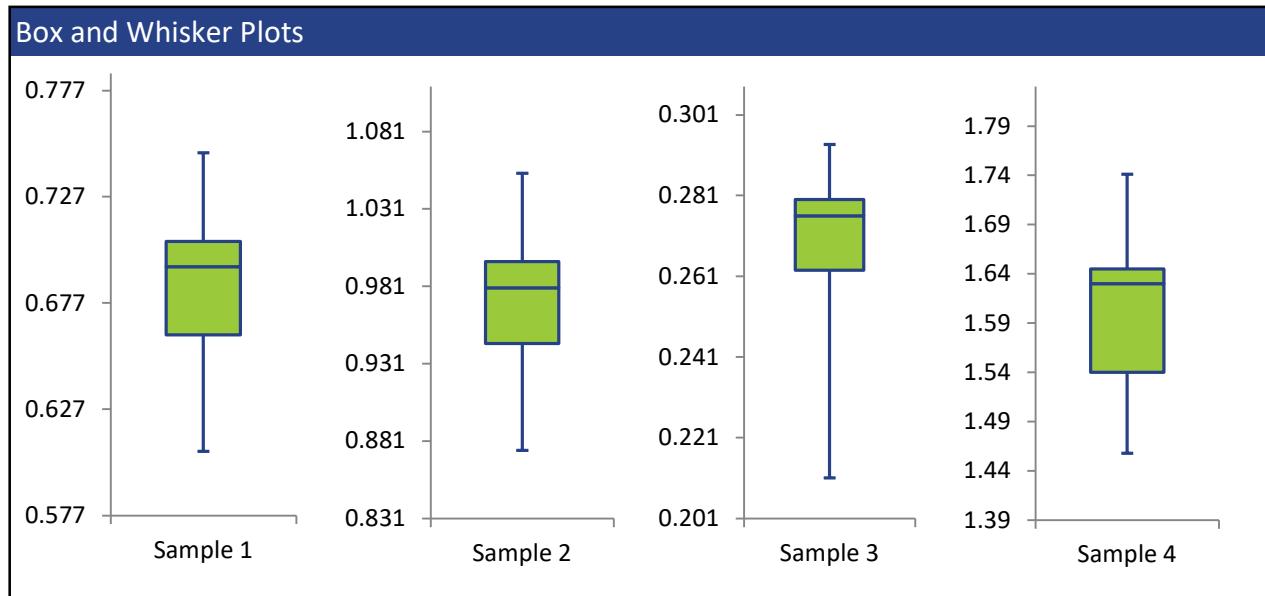
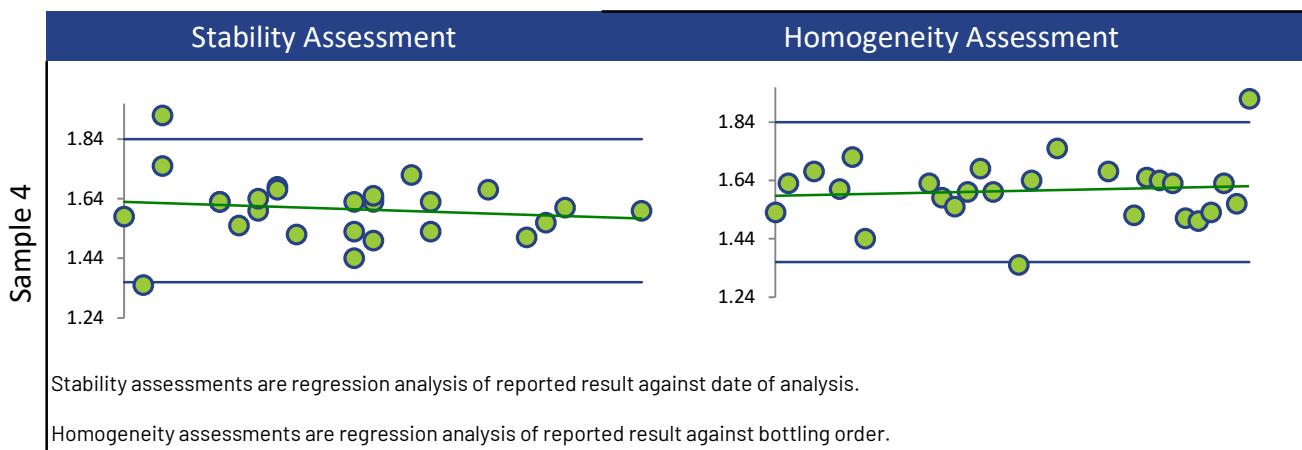
## Annex A Summary by Analyte

### IRON



## Annex A Summary by Analyte

### IRON



## LEAD

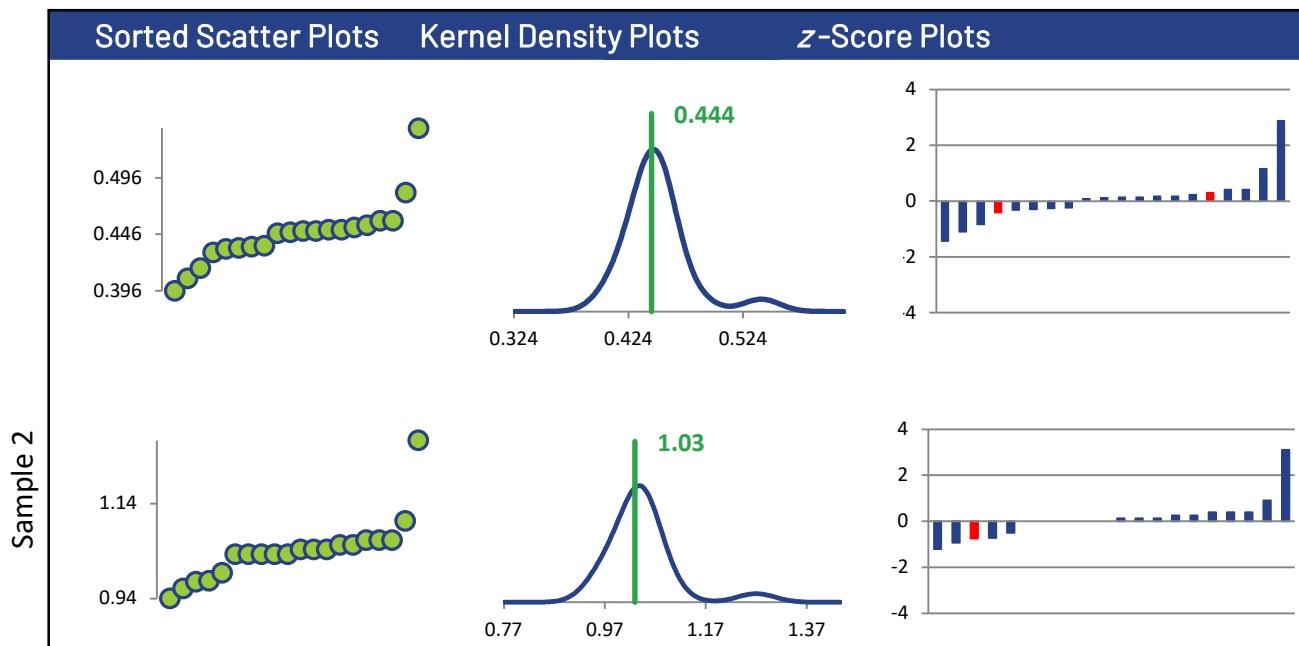
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	20	20	20	20
Median mg/L	0.449	1.04	0.291	1.08
Robust Mean mg/L	0.444	1.03	0.287	1.07
U mg/L	0.00525	0.0125	0.00419	0.0114
Robust Standard Deviation mg/L	0.0188	0.0449	0.0150	0.0409
Regression Standard Deviation mg/L	0.0333	0.0773	0.0215	0.0805
Stability Flag			Stability	Stability
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0333	0.0773	0.0422	0.141
Outliers	0	0	0	0
$ z >3.0$	0	1	0	0
$2< z <3$	1	0	0	0

## Methods Used

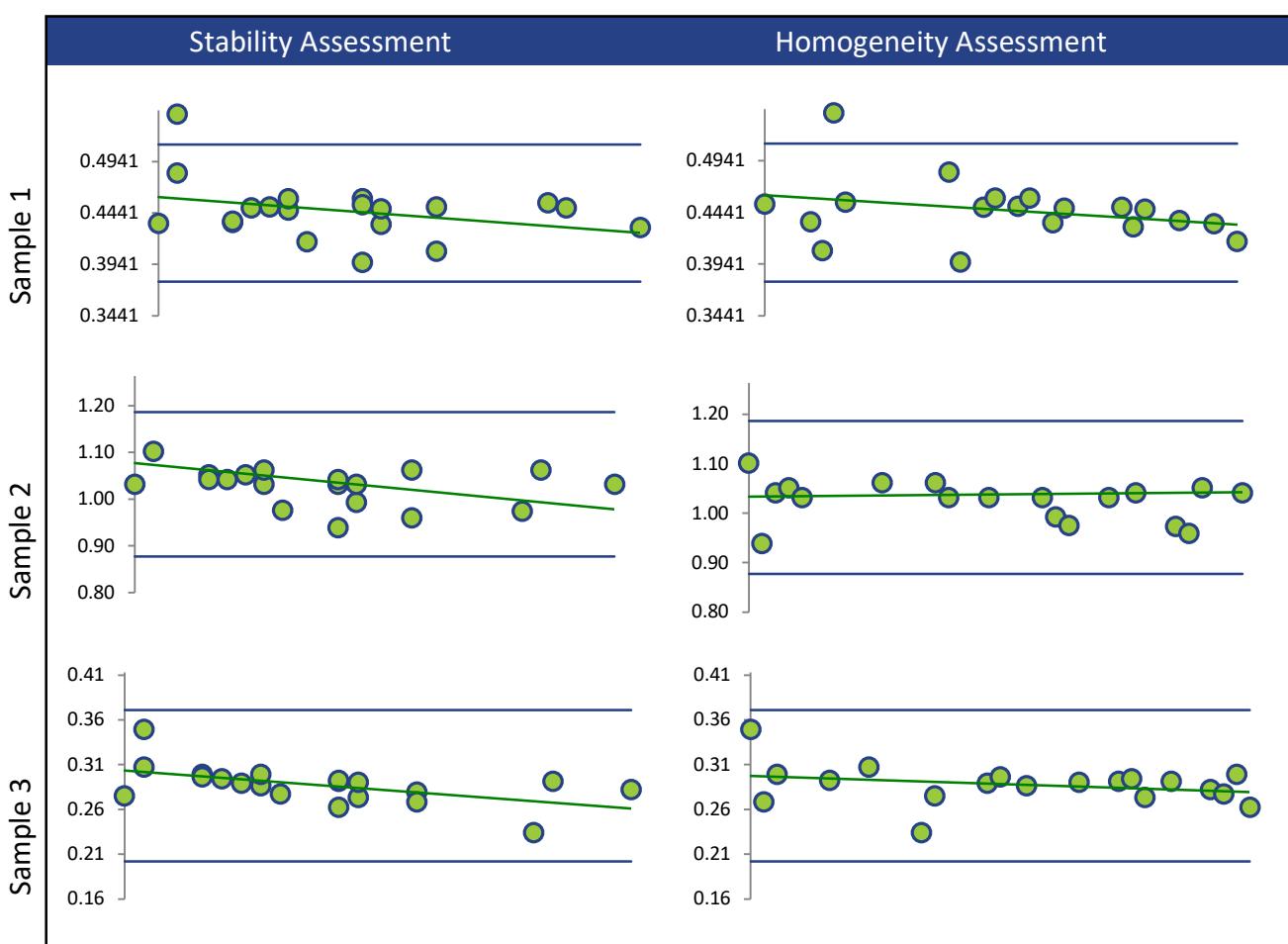
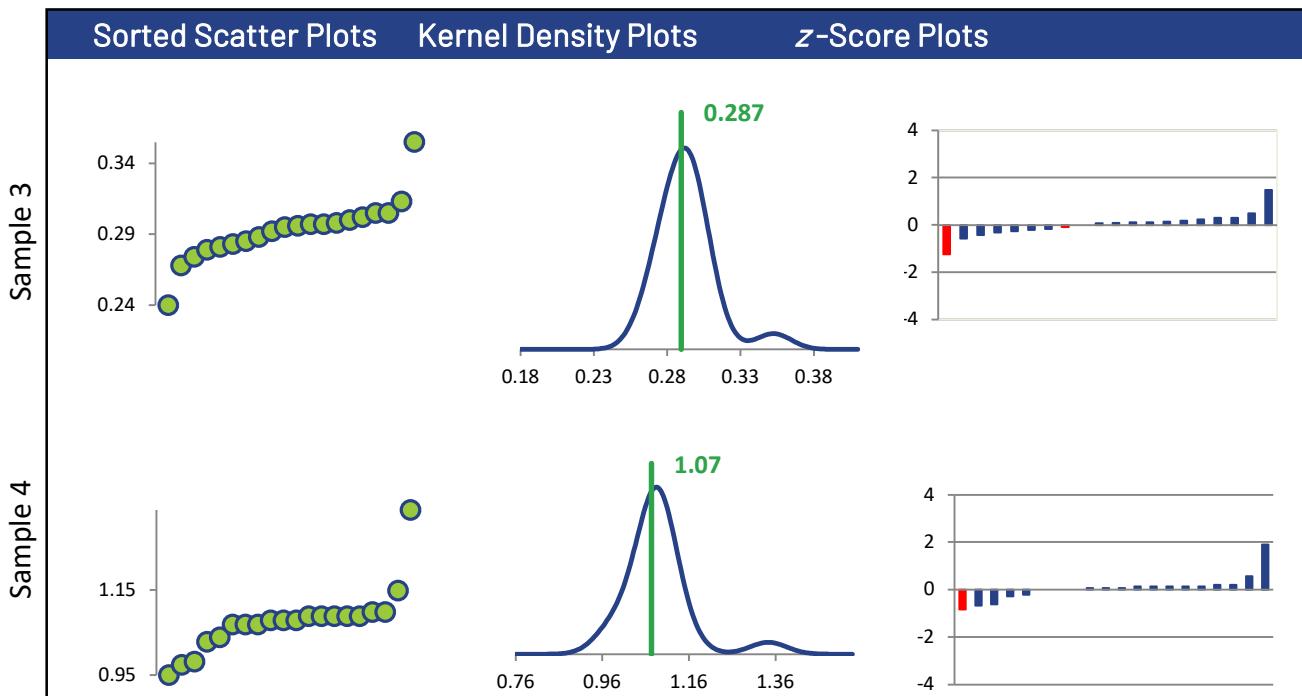
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	18	18	18	18
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



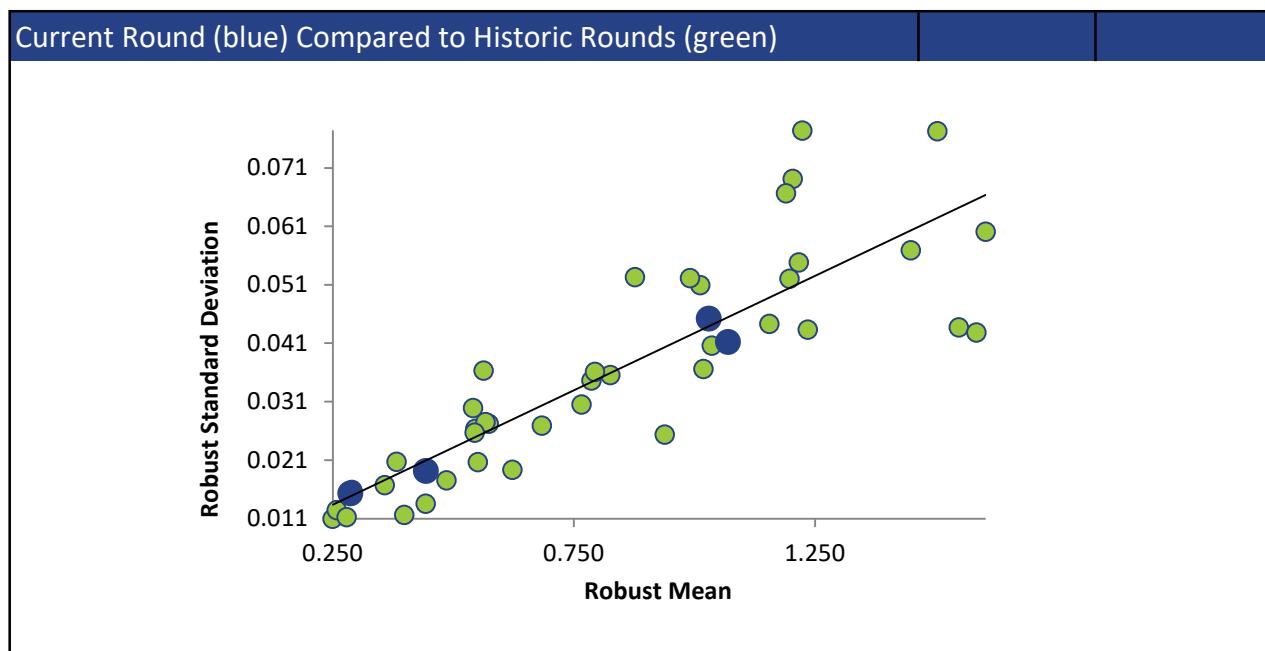
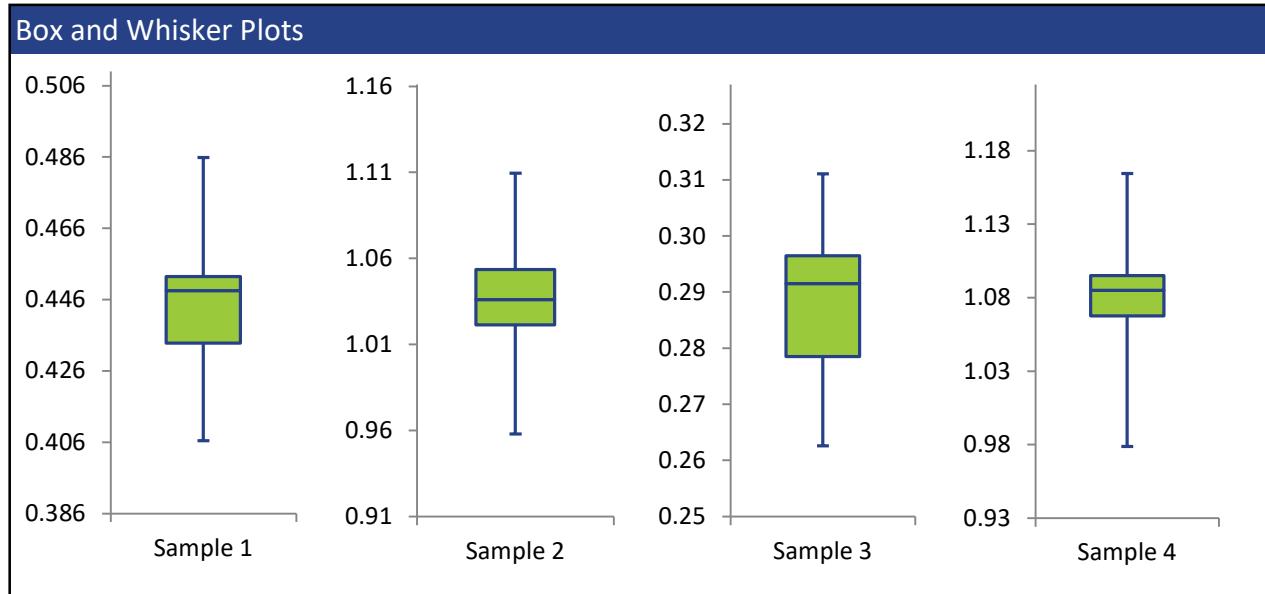
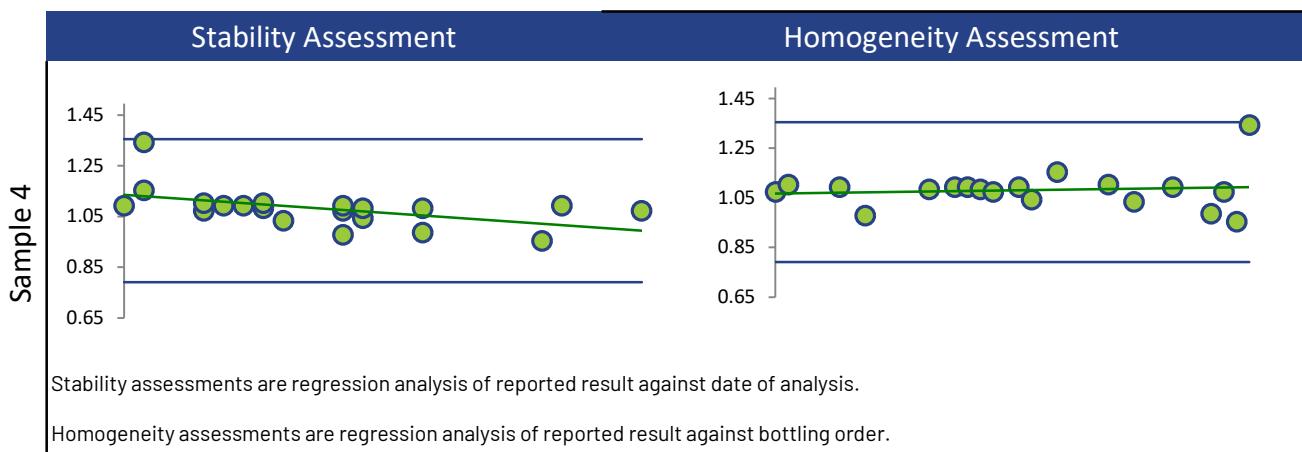
## Annex A Summary by Analyte

### LEAD



## Annex A Summary by Analyte

### LEAD



## LITHIUM

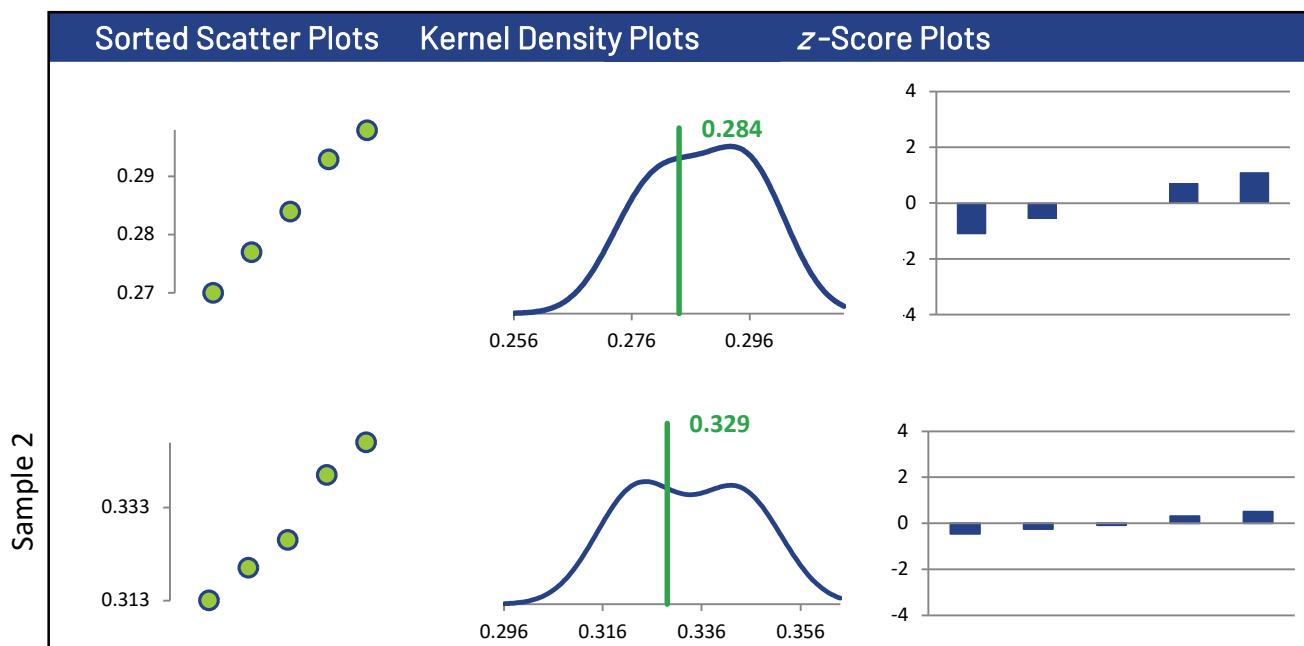
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	5	5	5	5
Median mg/L	0.284	0.326	0.0543	0.501
Robust Mean mg/L	0.284	0.329	0.0536	0.504
U mg/L	0.00721	0.00889	0.00274	0.00928
Robust Standard Deviation mg/L	0.0129	0.0159	0.00491	0.0166
Regression Standard Deviation mg/L				
Stability Flag				
Homogeneity Flag		Homogeneity		
Standard Deviation Used (SDPA) mg/L	0.0129	0.0353	0.00491	0.0166
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	0

## Methods Used

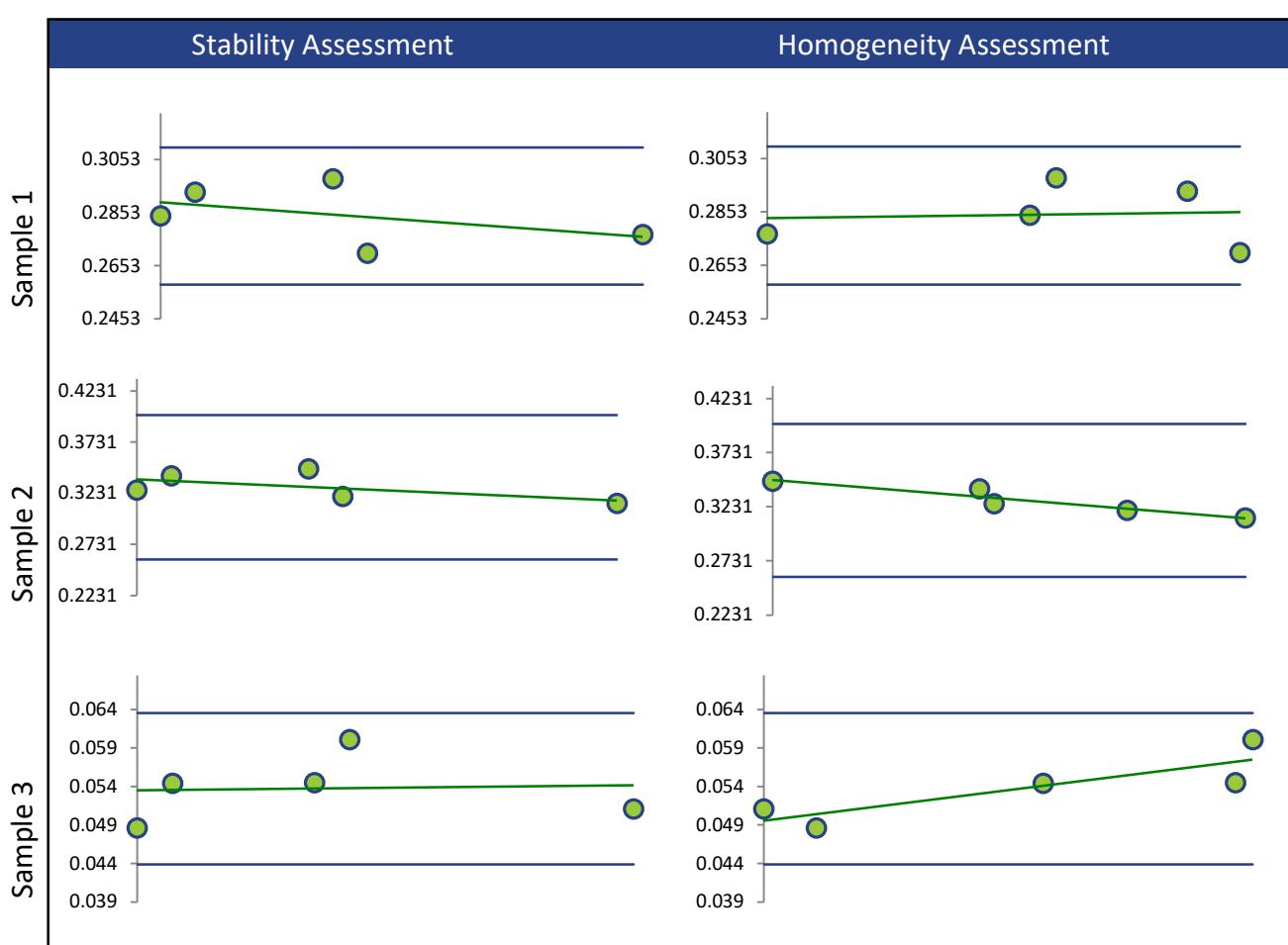
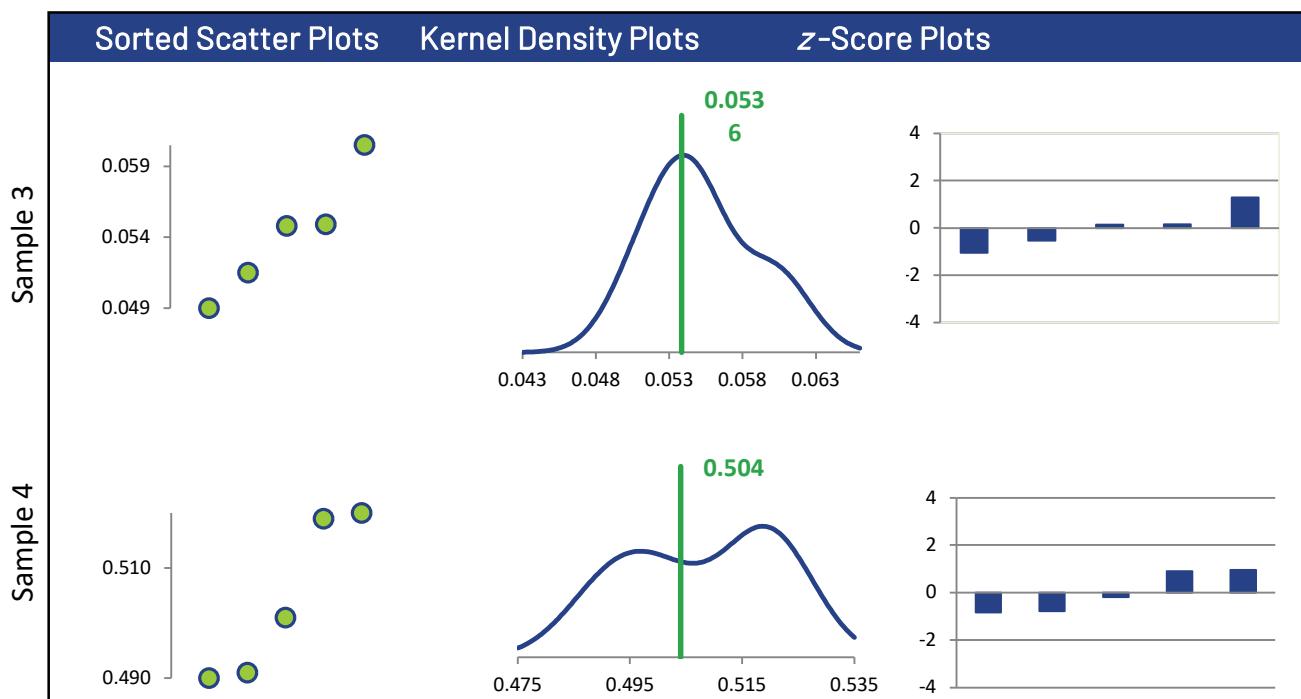
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	5	5	5	5

All summary stats and the plots below are based on the data excluding any flagged outliers



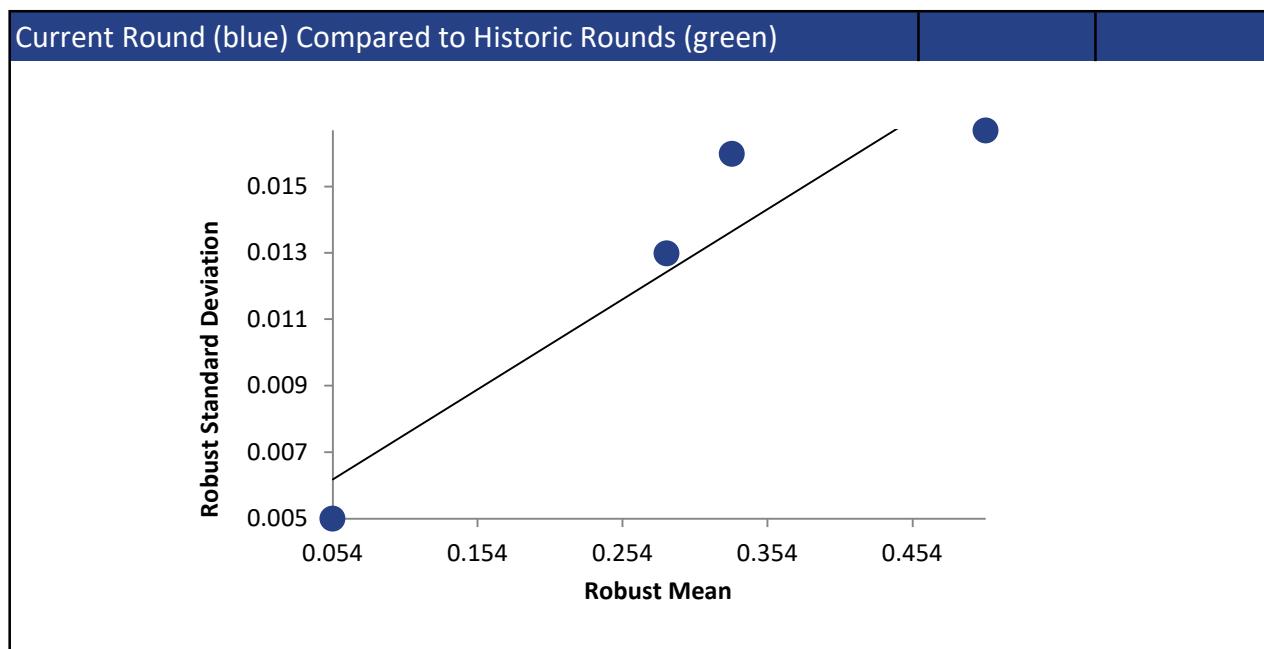
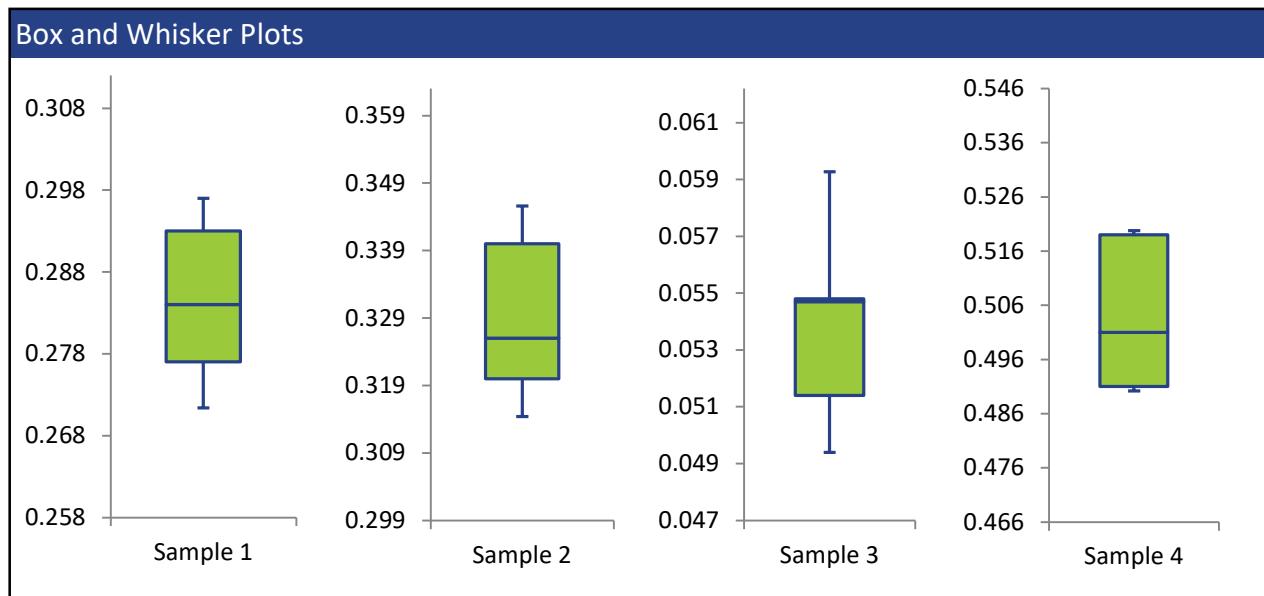
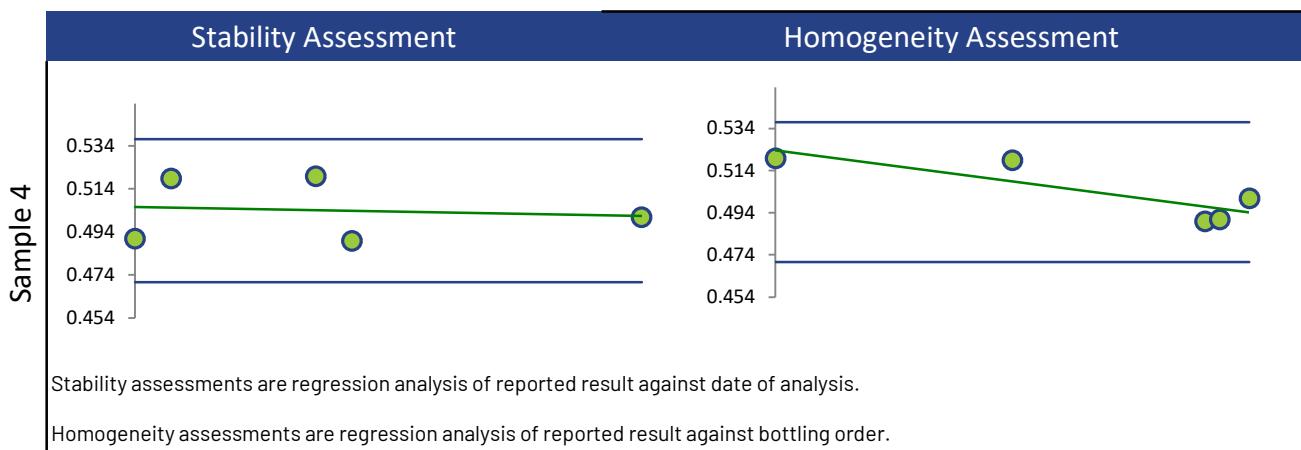
## Annex A Summary by Analyte

### LITHIUM



## Annex A Summary by Analyte

### LITHIUM



## MANGANESE

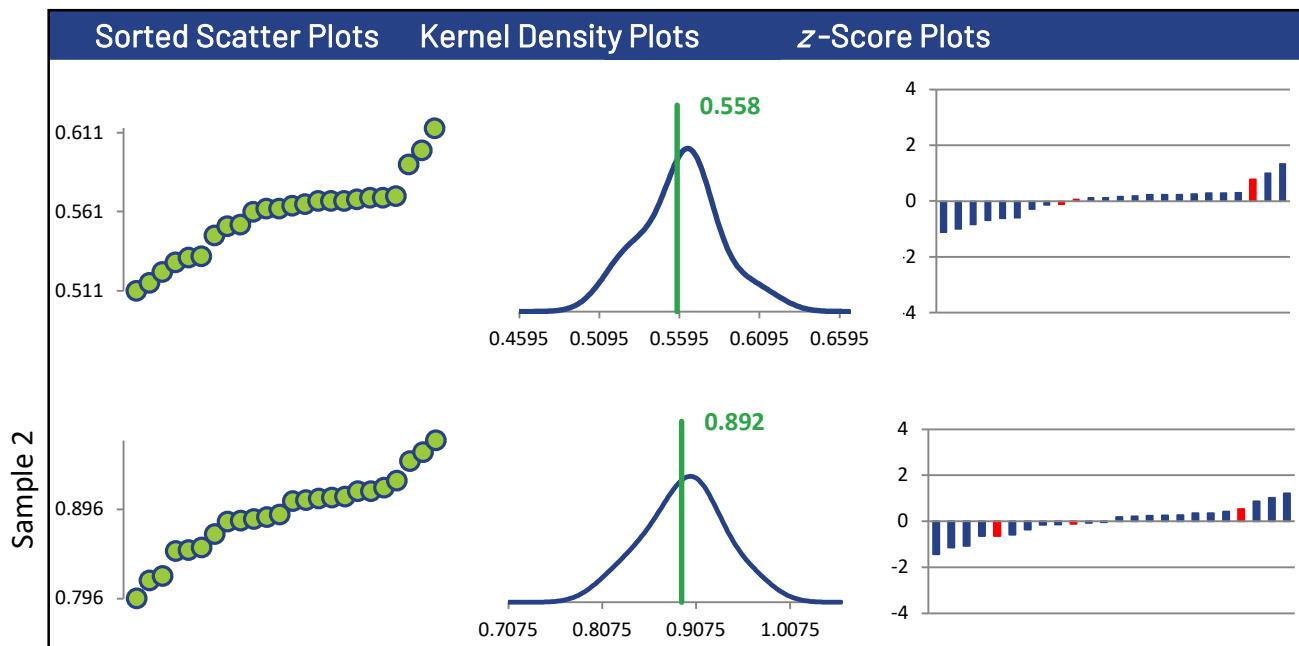
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	24	24	24	24
Median mg/L	0.564	0.898	0.333	1.20
Robust Mean mg/L	0.558	0.892	0.331	1.18
U mg/L	0.00646	0.0116	0.00388	0.0169
Robust Standard Deviation mg/L	0.0253	0.0456	0.0152	0.0661
Regression Standard Deviation mg/L	0.0419	0.0669	0.0248	0.0887
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0419	0.0669	0.0248	0.0887
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	0

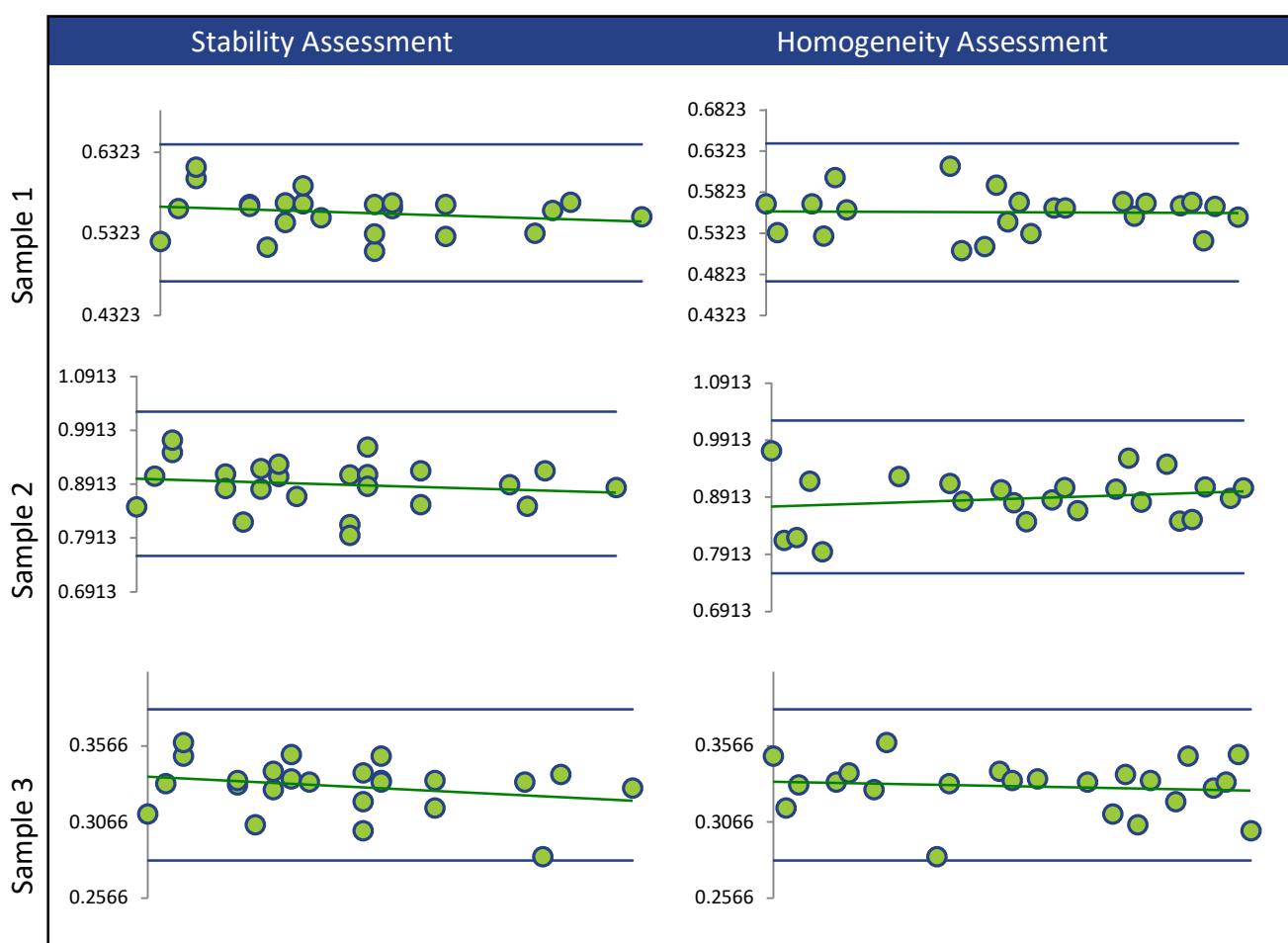
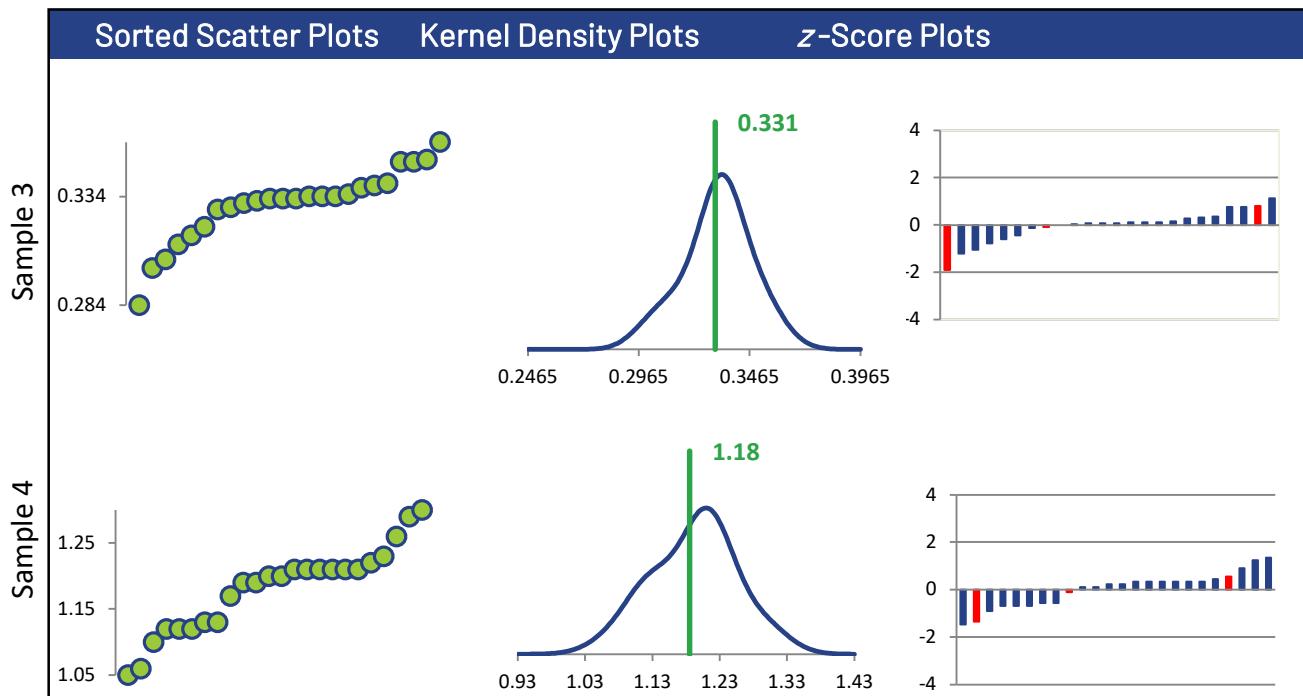
## Methods Used

Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	21	21	21	21
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers

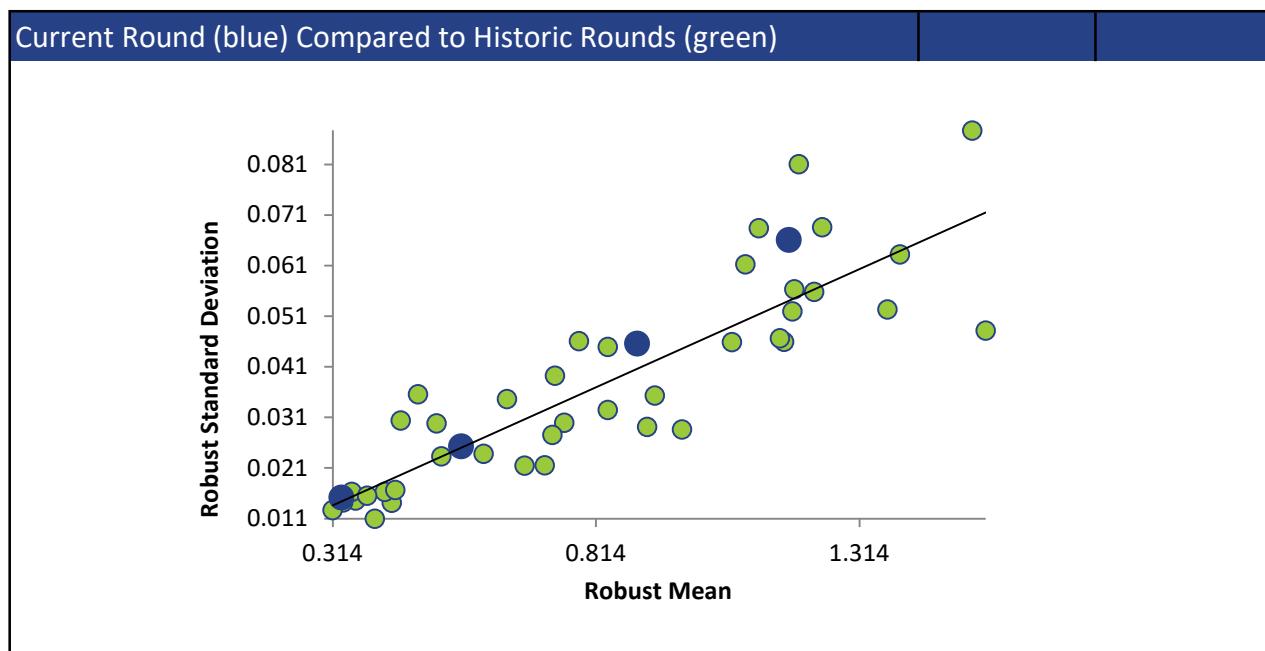
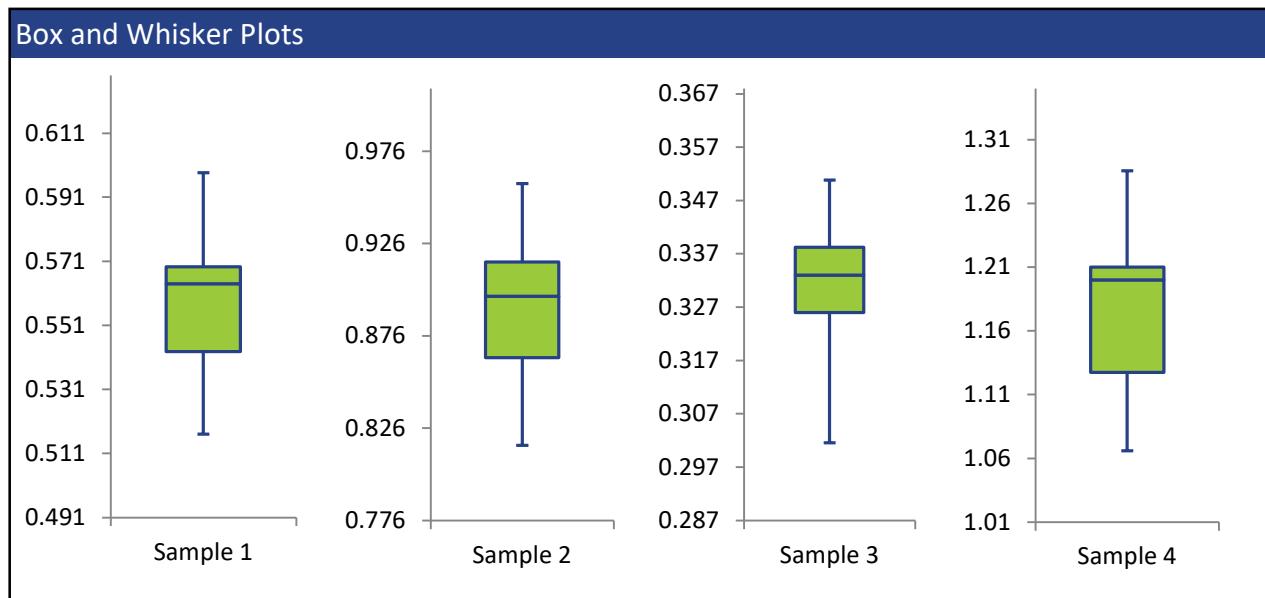
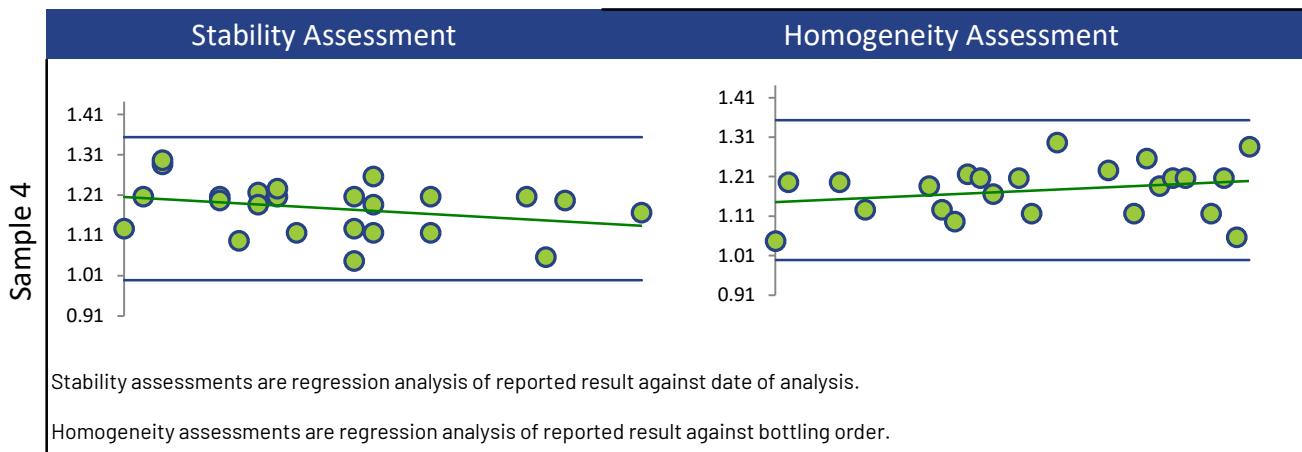


## MANGANESE



## Annex A Summary by Analyte

### MANGANESE



## MOLYBDENUM

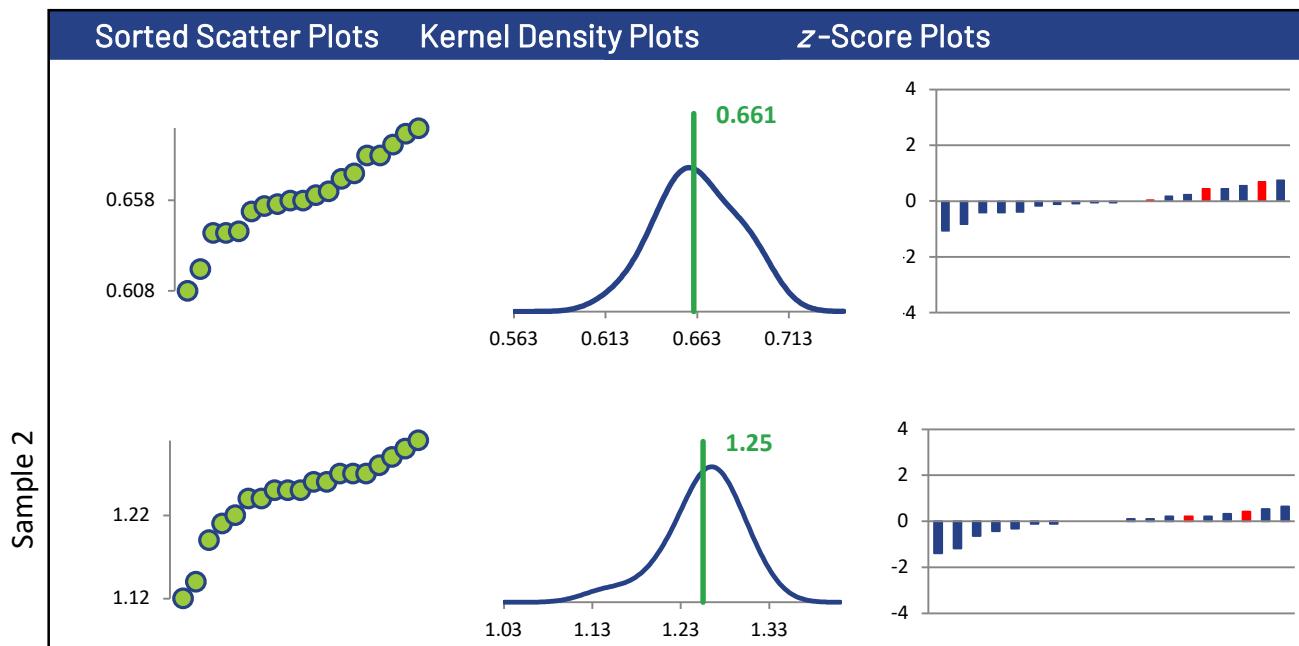
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	19	19	19	19
Median mg/L	0.658	1.25	0.540	1.42
Robust Mean mg/L	0.661	1.25	0.542	1.41
U mg/L	0.00717	0.0120	0.00545	0.0124
Robust Standard Deviation mg/L	0.0250	0.0417	0.0190	0.0433
Regression Standard Deviation mg/L	0.0496	0.0937	0.0406	0.106
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0496	0.0937	0.0406	0.106
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	0

## Methods Used

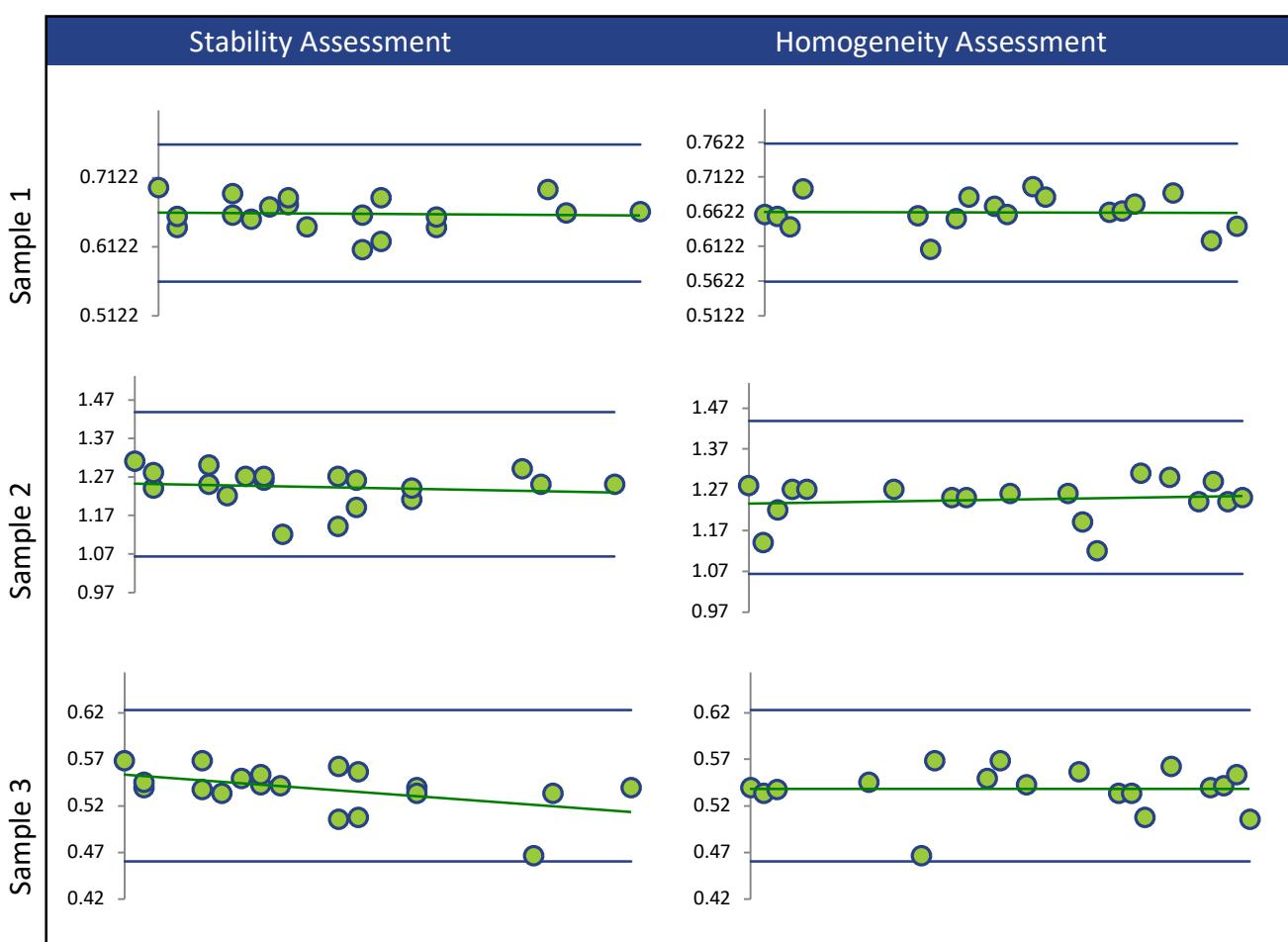
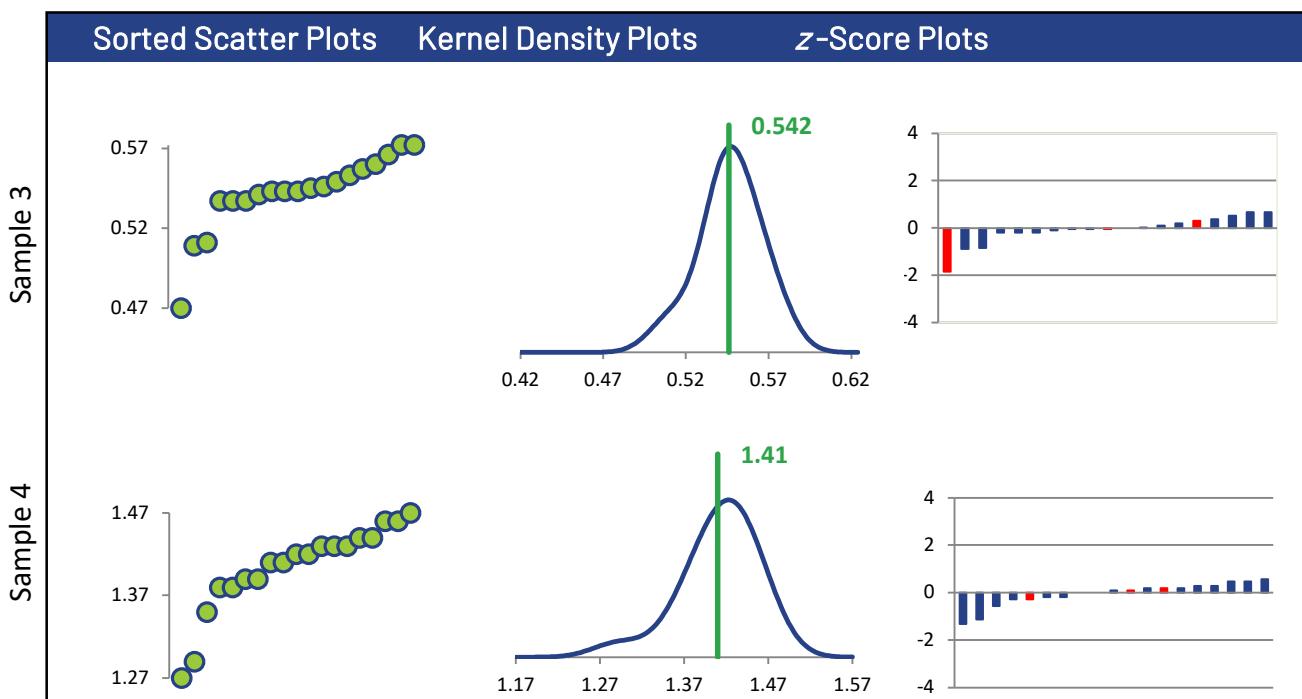
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	16	16	16	16
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers



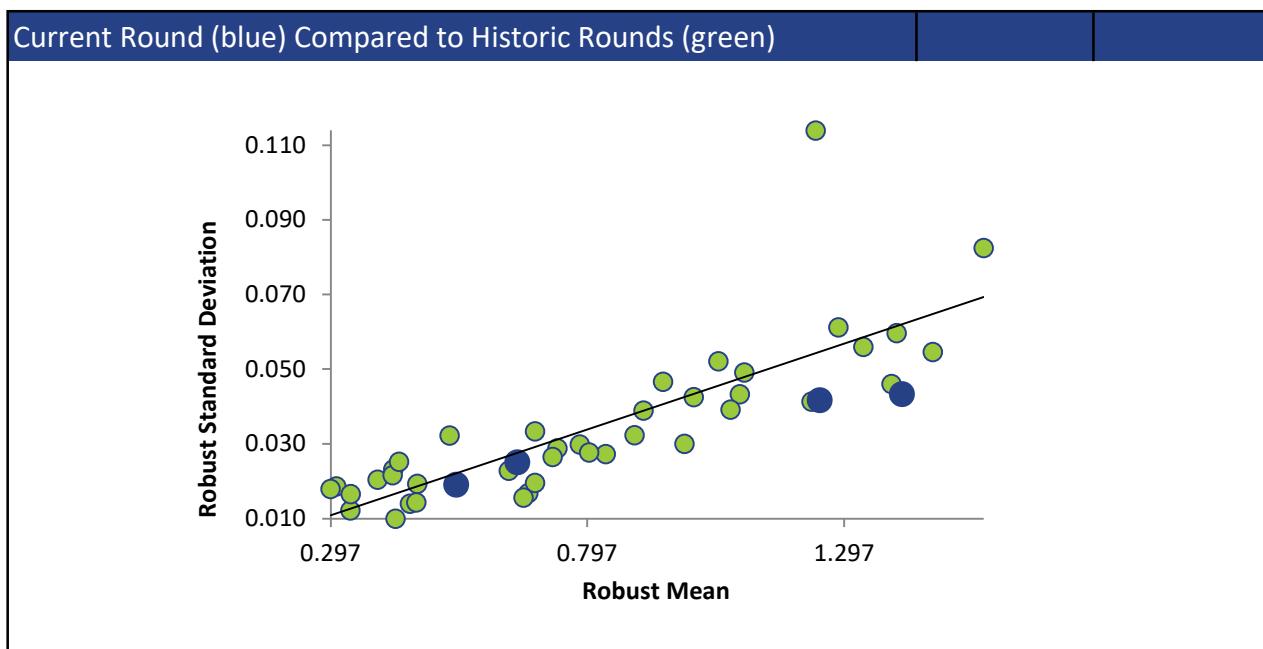
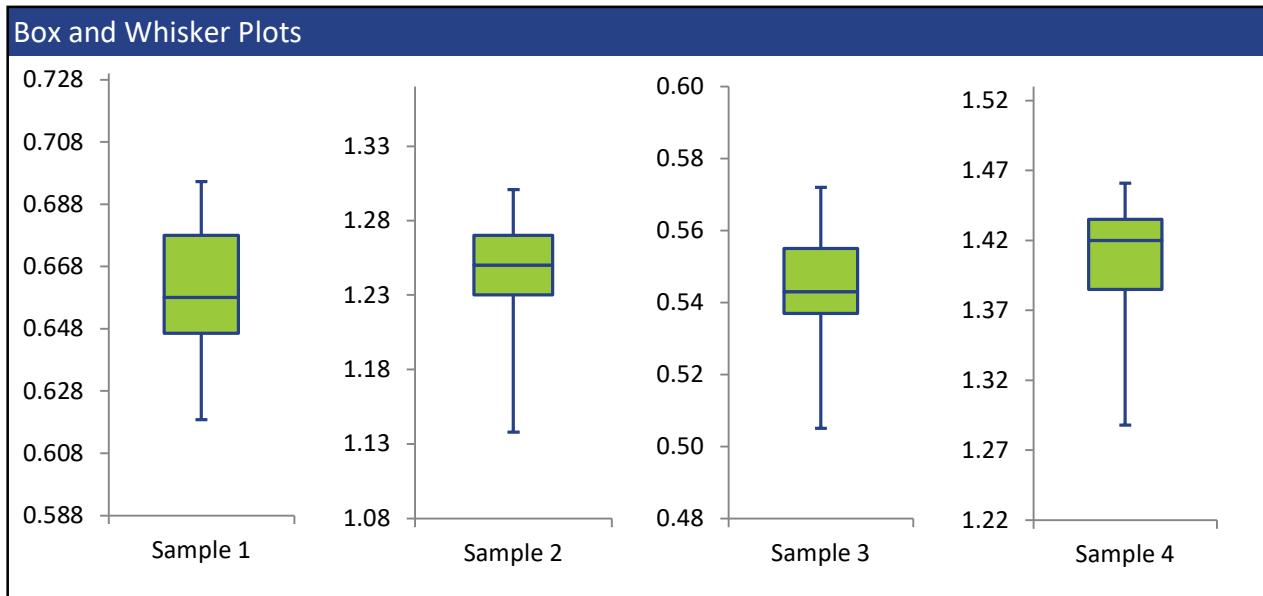
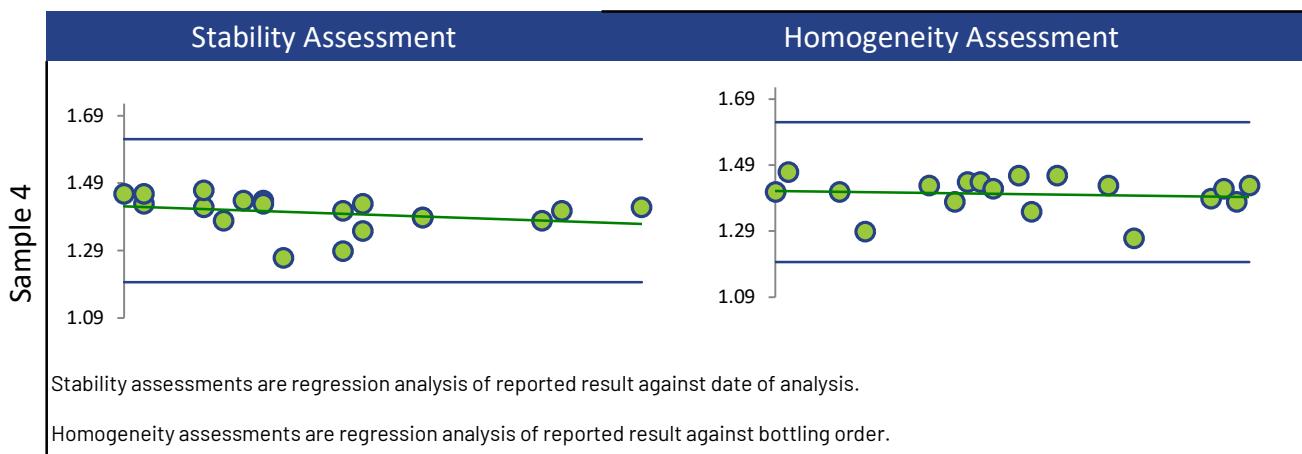
## Annex A Summary by Analyte

### MOLYBDENUM



## Annex A Summary by Analyte

### MOLYBDENUM



## NICKEL

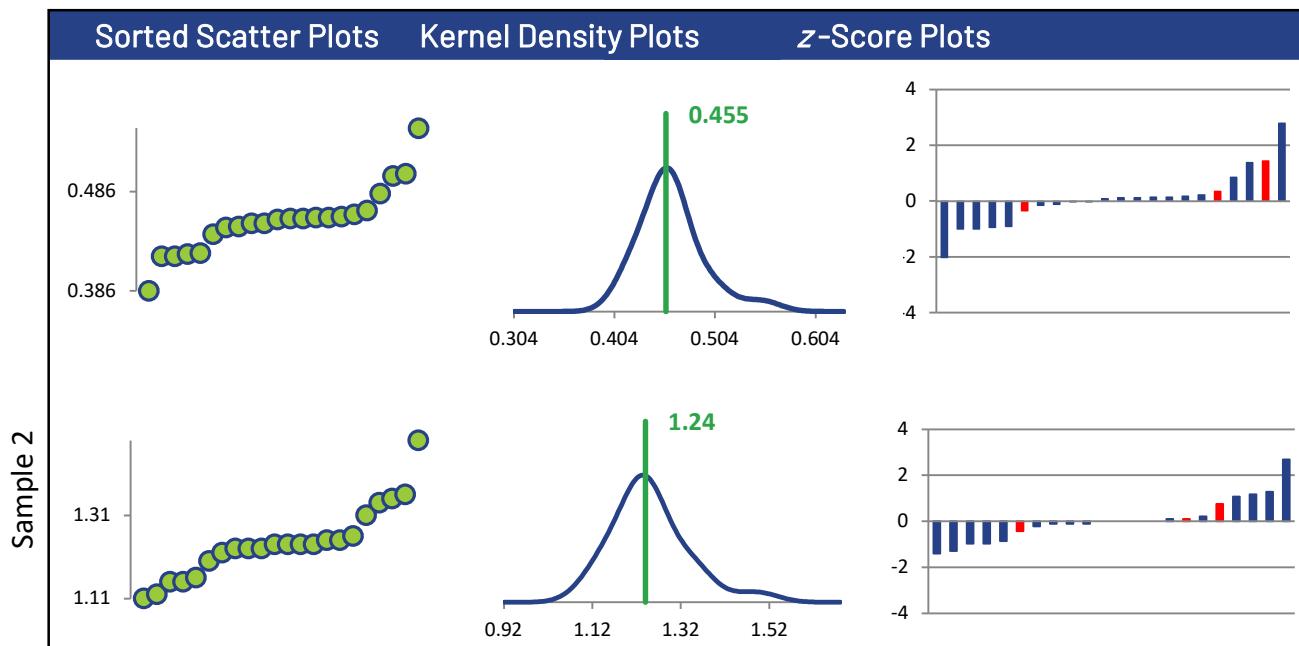
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	22	22	22	22
Median mg/L	0.459	1.24	0.580	1.31
Robust Mean mg/L	0.455	1.24	0.576	1.30
U mg/L	0.00744	0.0221	0.00938	0.0226
Robust Standard Deviation mg/L	0.0279	0.0829	0.0352	0.0847
Regression Standard Deviation mg/L	0.0341	0.0929	0.0432	0.0975
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0341	0.0929	0.0432	0.0975
Outliers	0	0	0	0
$ z >3.0$	0	0	1	0
$2< z <3$	2	1	0	1

## Methods Used

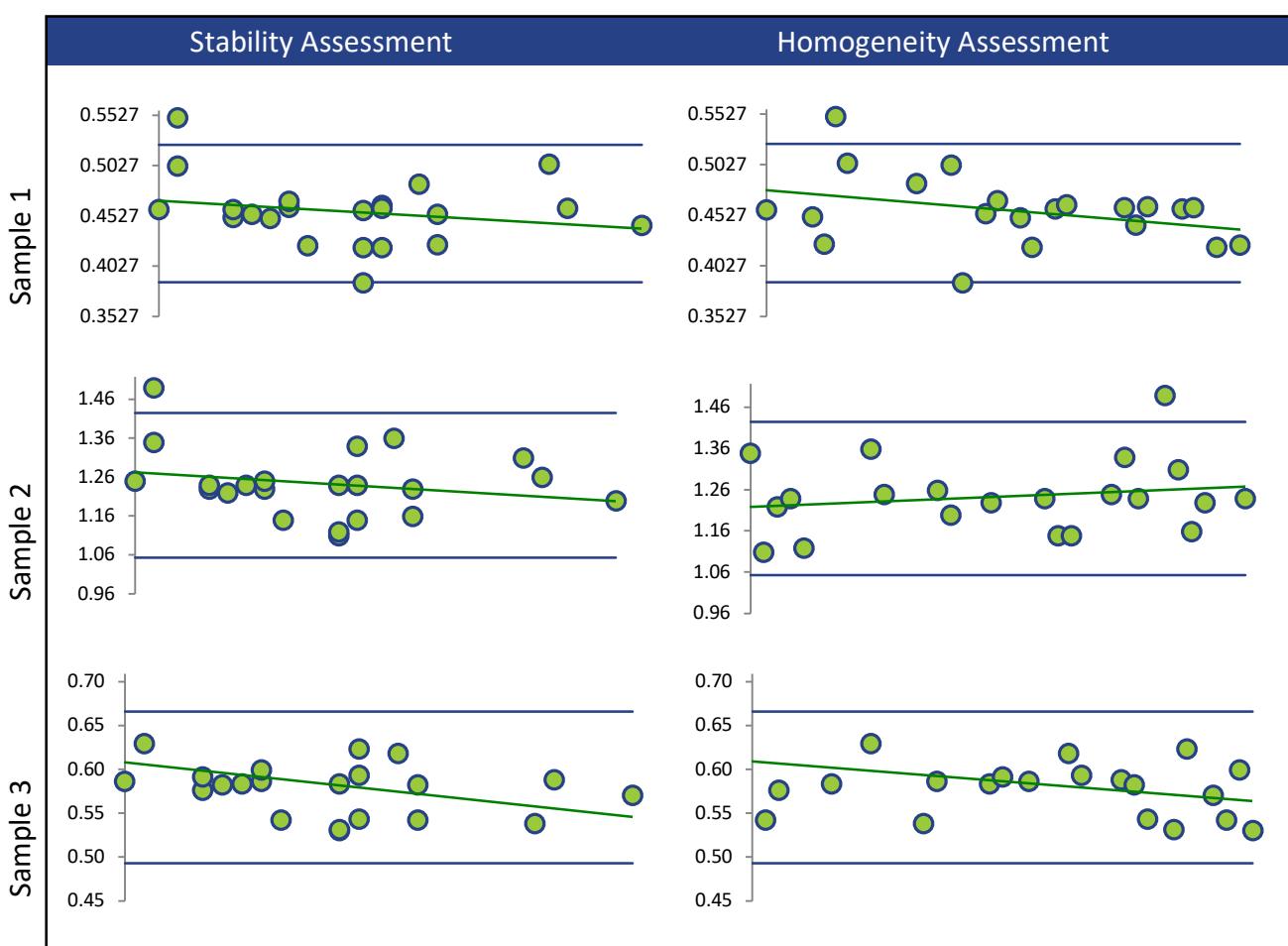
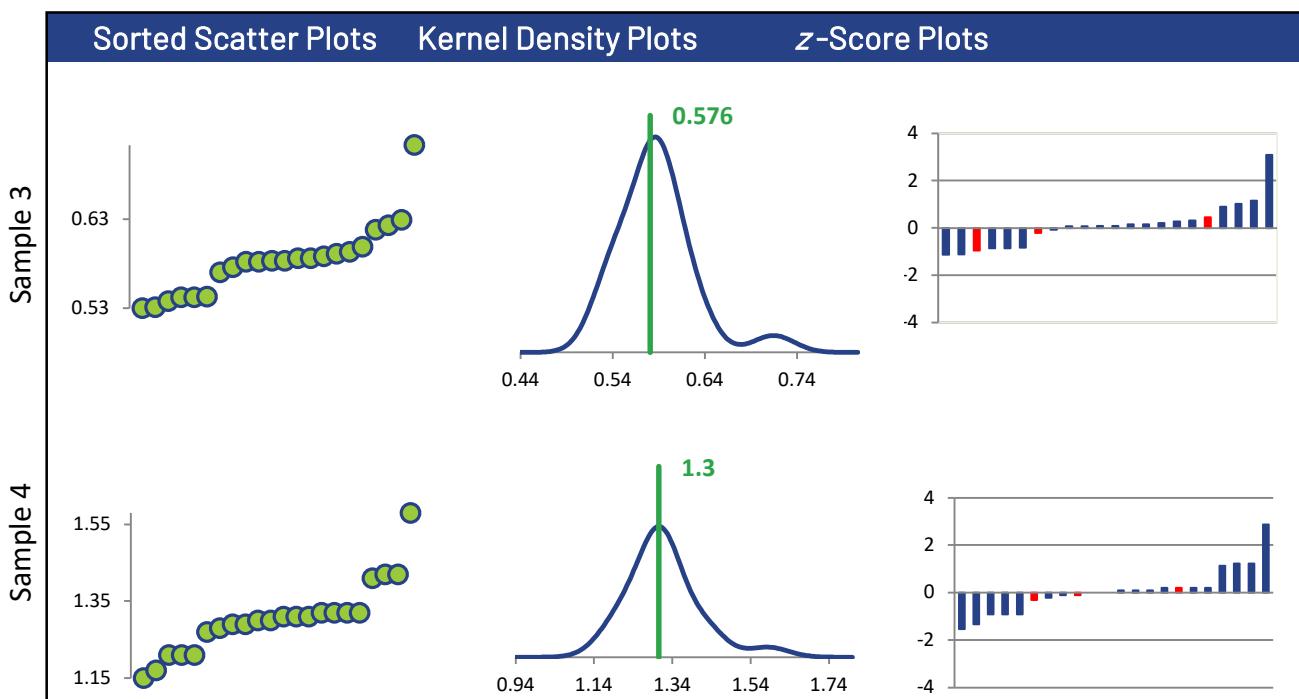
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	19	19	19	19
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers



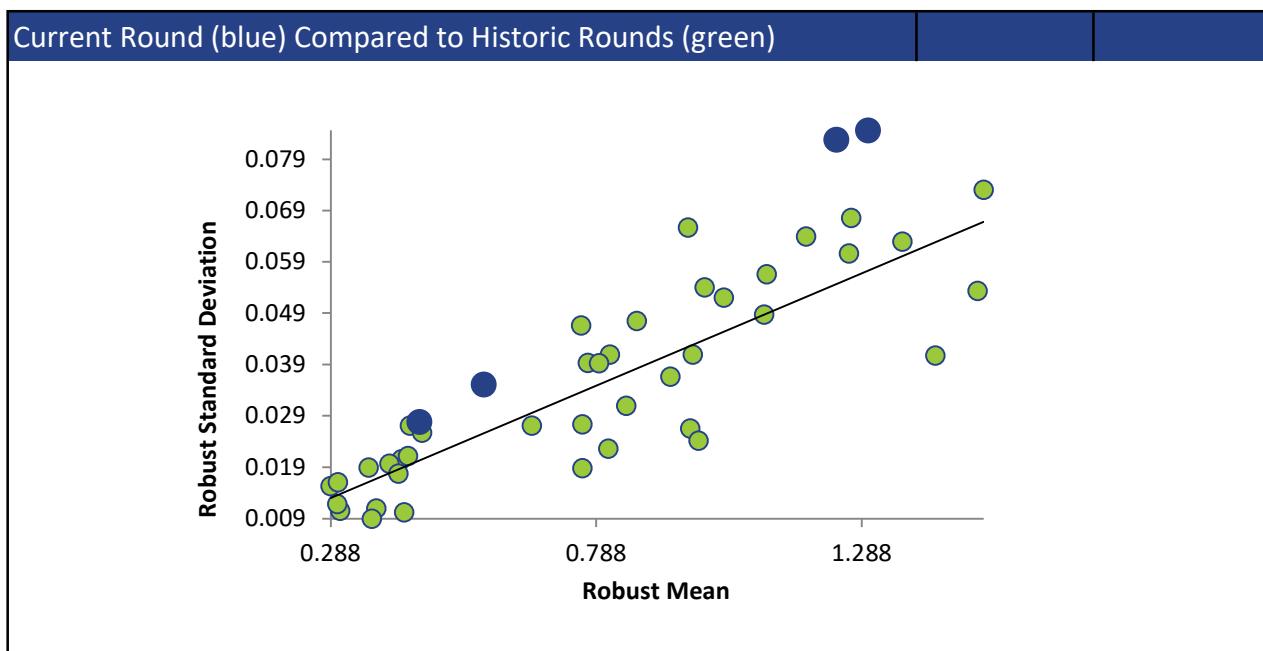
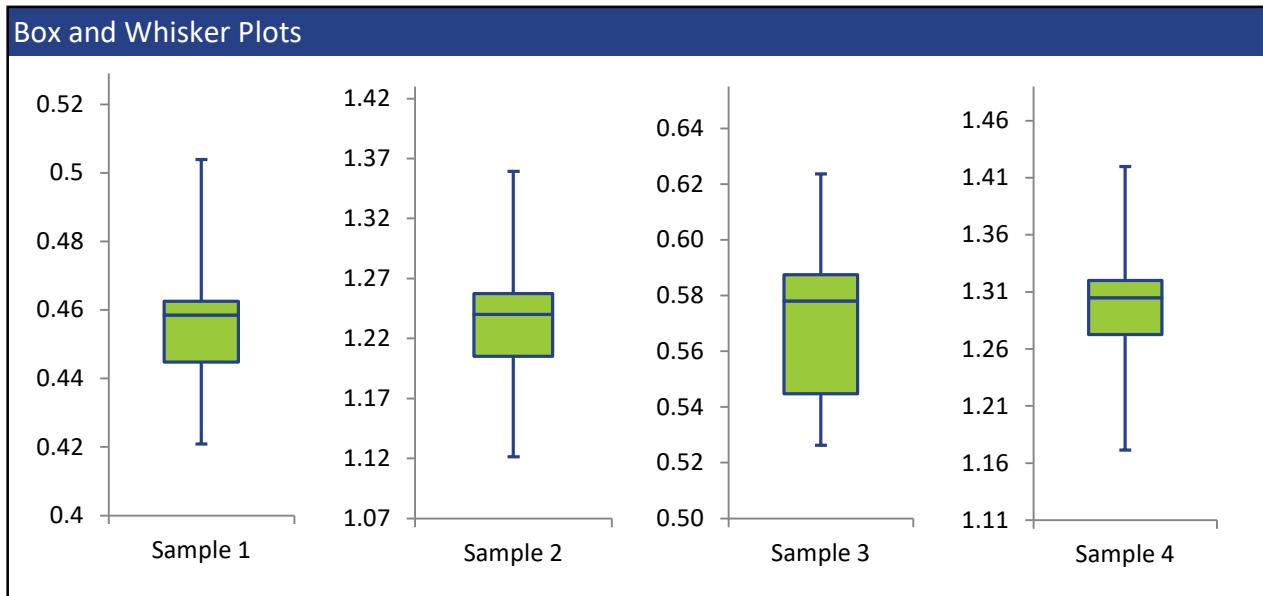
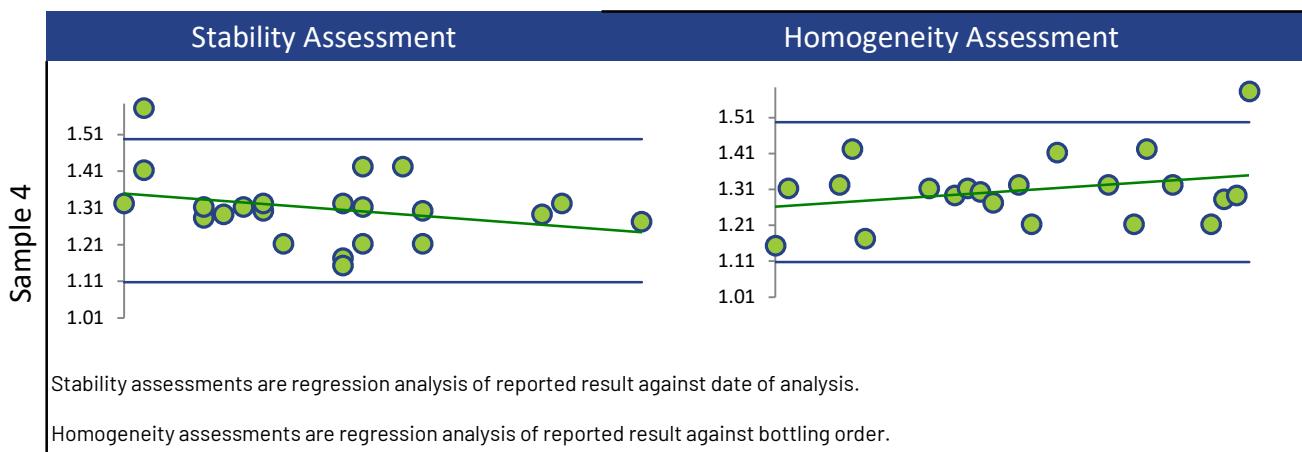
## Annex A Summary by Analyte

### NICKEL



## Annex A Summary by Analyte

### NICKEL



## STRONTIUM

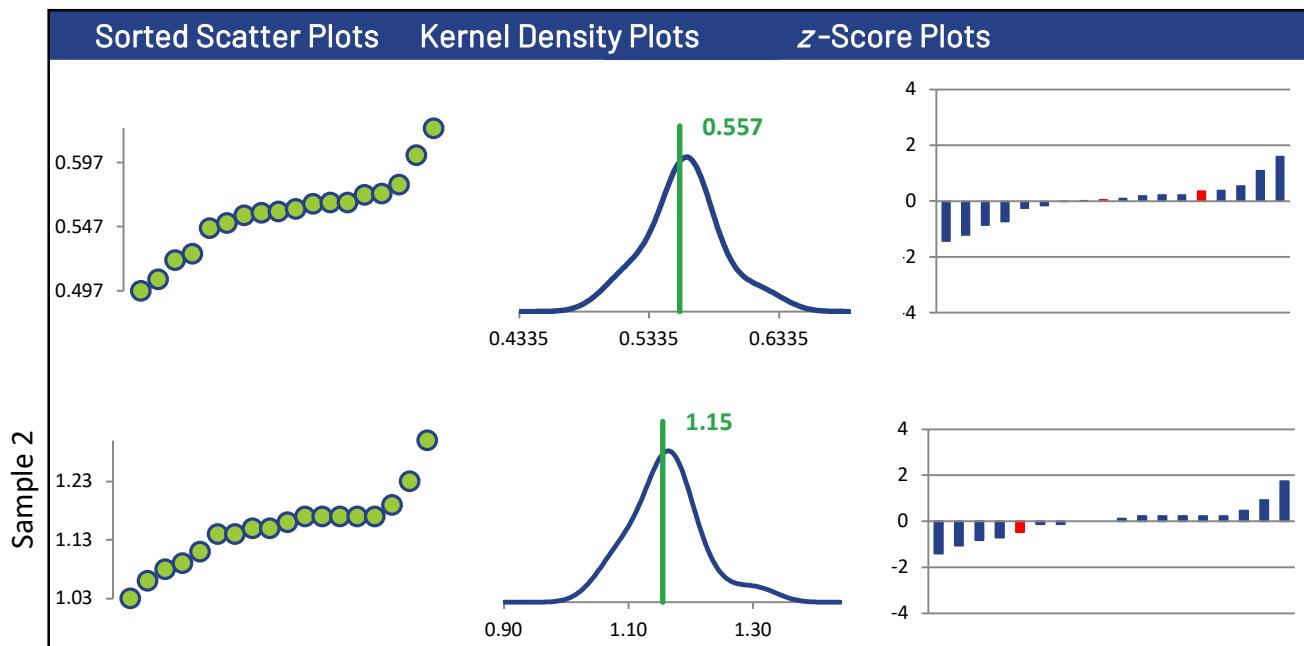
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	18	18	18	18
Median mg/L	0.560	1.16	0.332	1.11
Robust Mean mg/L	0.557	1.15	0.329	1.09
U mg/L	0.00857	0.0167	0.00660	0.0179
Robust Standard Deviation mg/L	0.0291	0.0567	0.0224	0.0607
Regression Standard Deviation mg/L	0.0418	0.0860	0.0247	0.0817
Stability Flag			Stability	
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0418	0.0860	0.0535	0.0817
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	0

## Methods Used

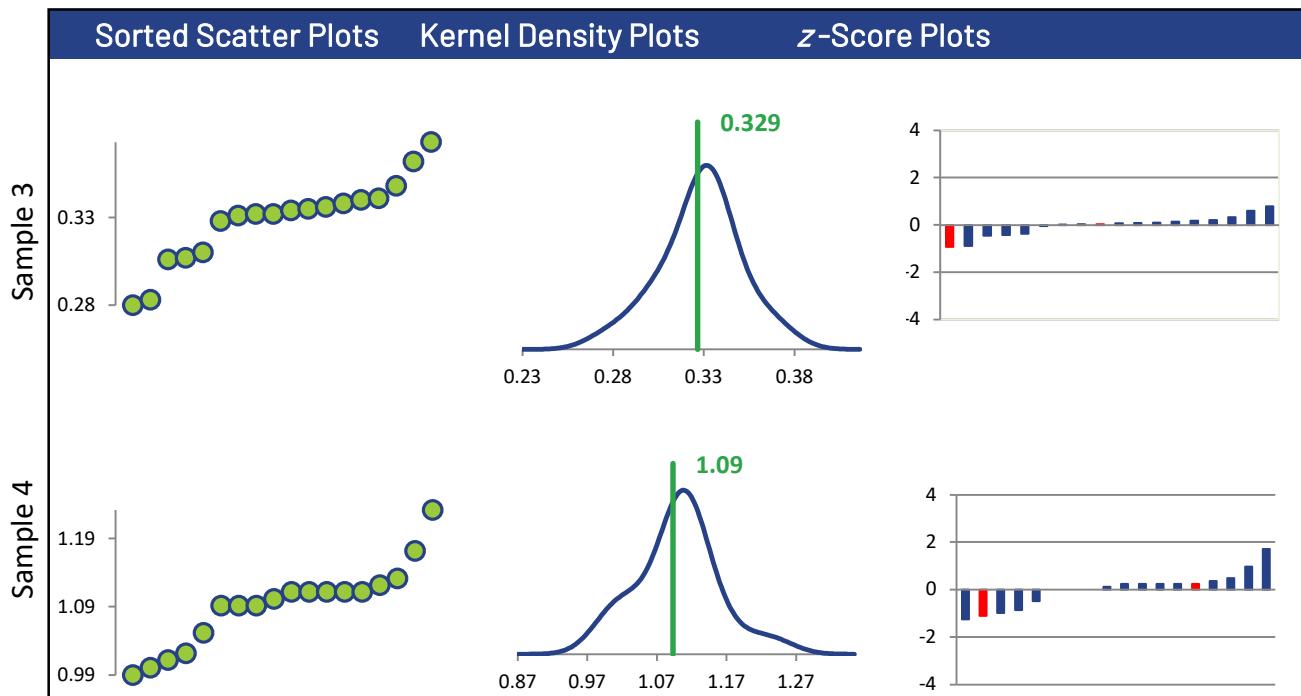
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	16	16	16	16
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



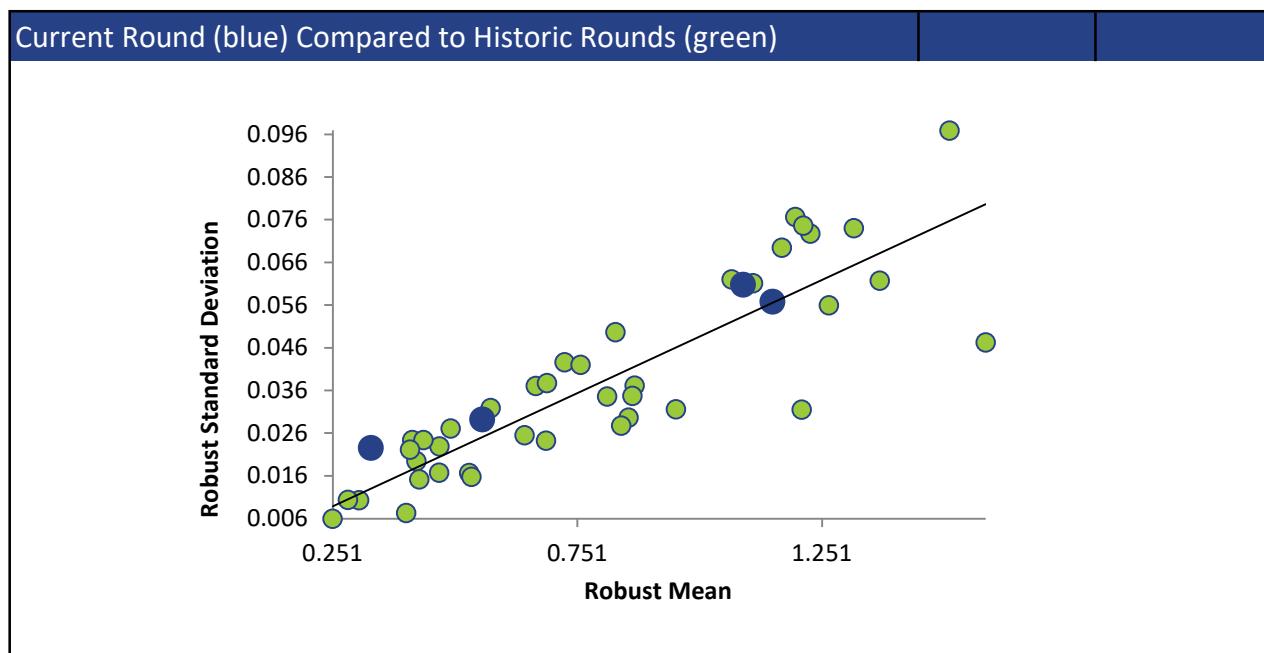
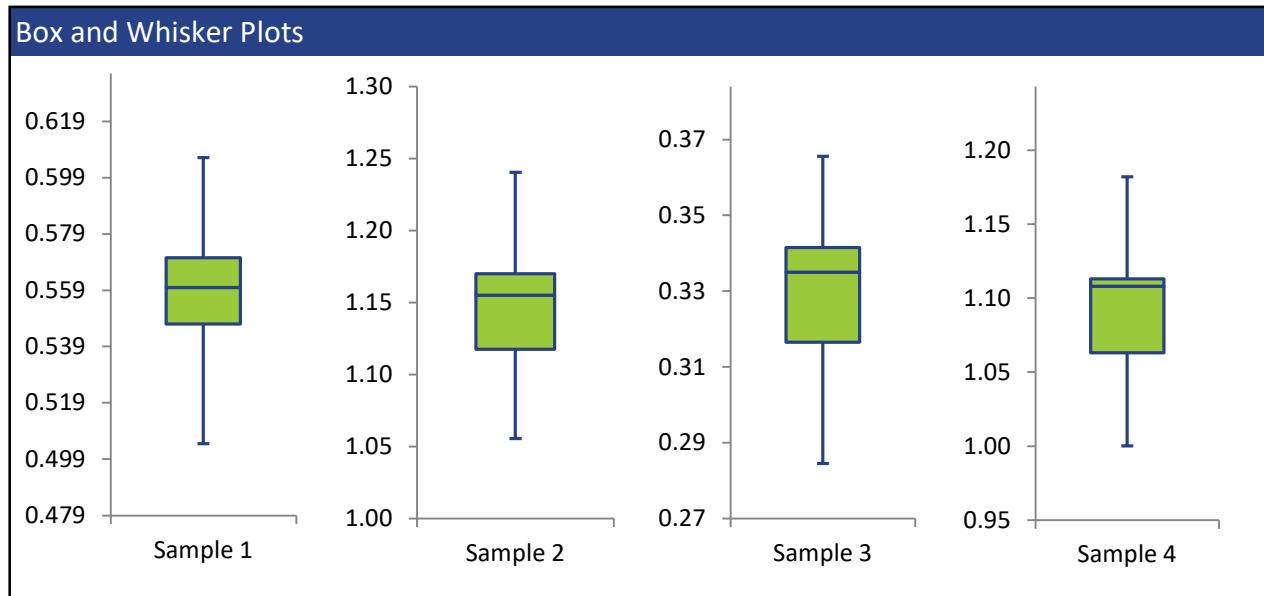
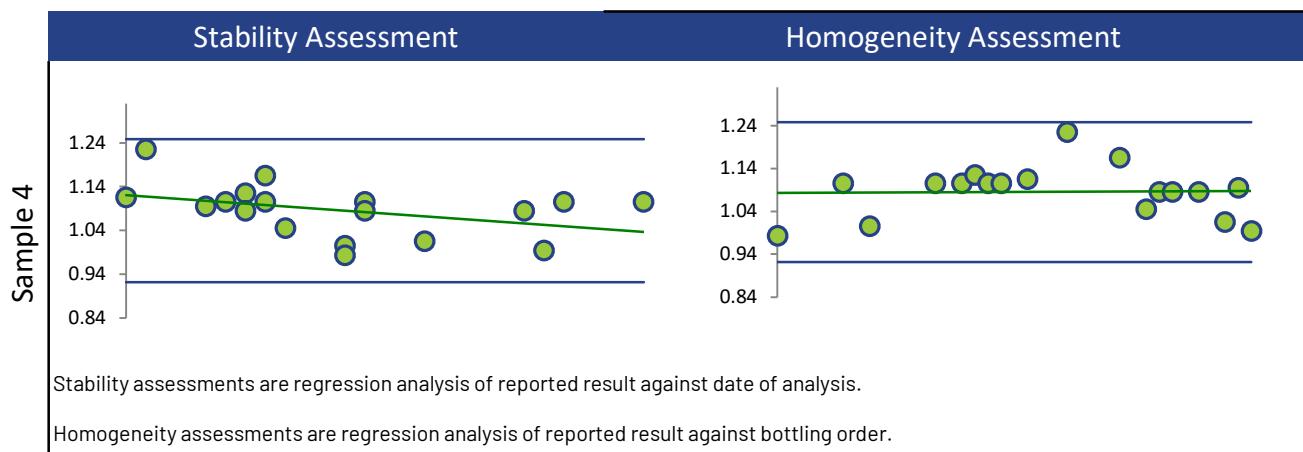
## Annex A Summary by Analyte

### STRONTIUM



## Annex A Summary by Analyte

### STRONTIUM



## THALLIUM

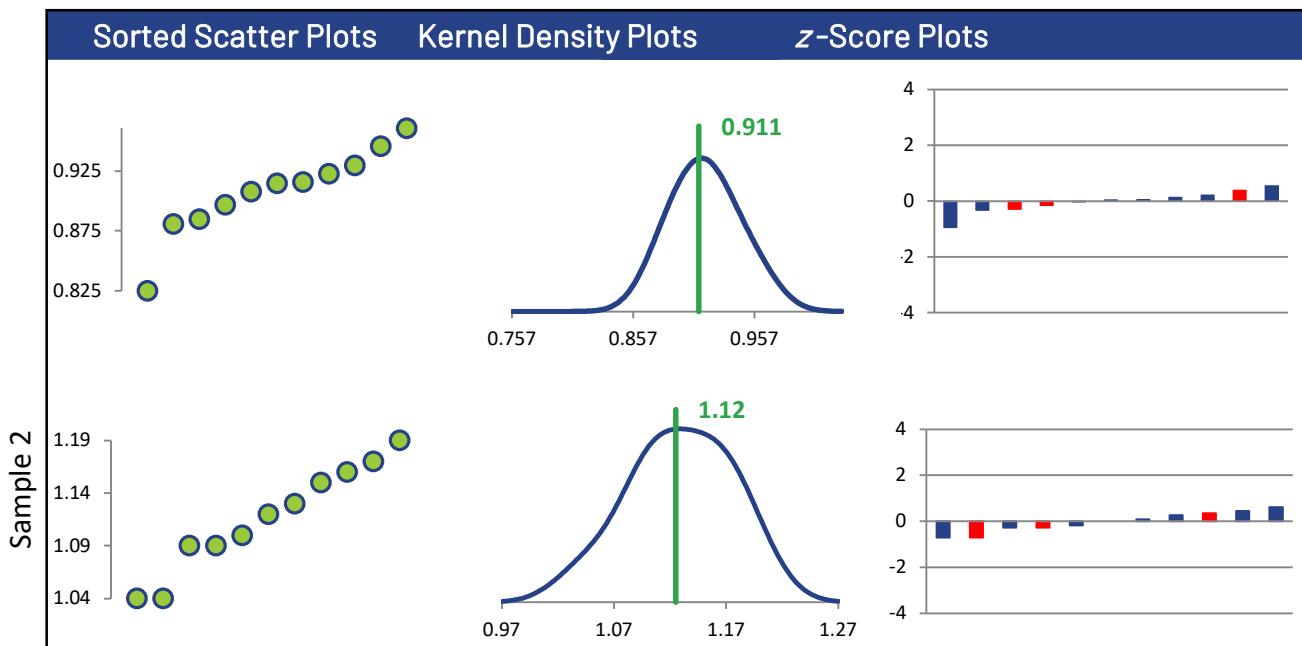
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	11	11	11	11
Median mg/L	0.915	1.12	0.465	1.24
Robust Mean mg/L	0.911	1.12	0.461	1.24
U mg/L	0.0123	0.0213	0.0103	0.0268
Robust Standard Deviation mg/L	0.0327	0.0565	0.0272	0.0712
Regression Standard Deviation mg/L	0.0911	0.112	0.0461	0.124
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0911	0.112	0.0461	0.124
Outliers	0	0	0	0
$ z  > 3.0$	0	0	0	0
$2 <  z  < 3$	0	0	0	0

## Methods Used

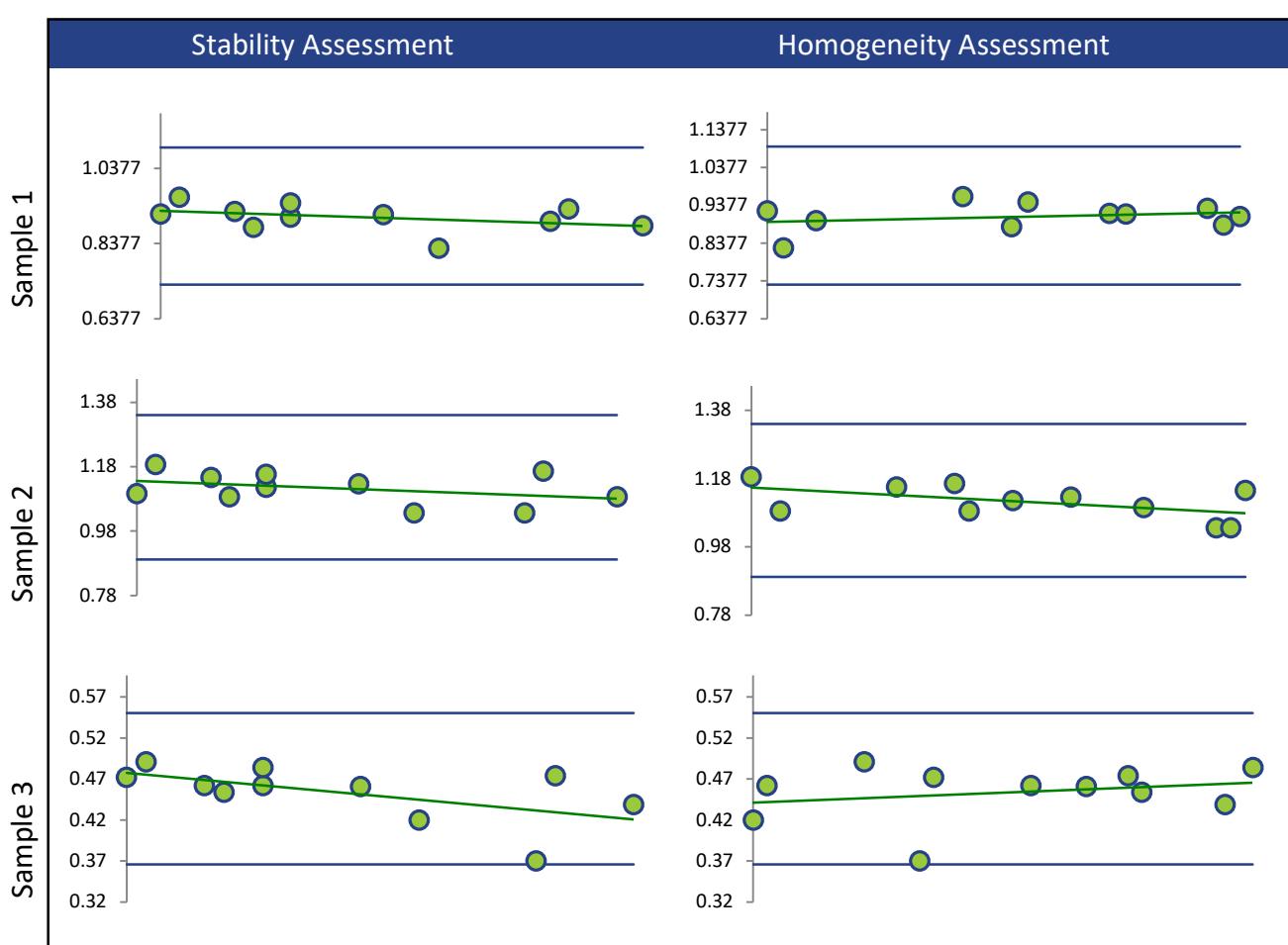
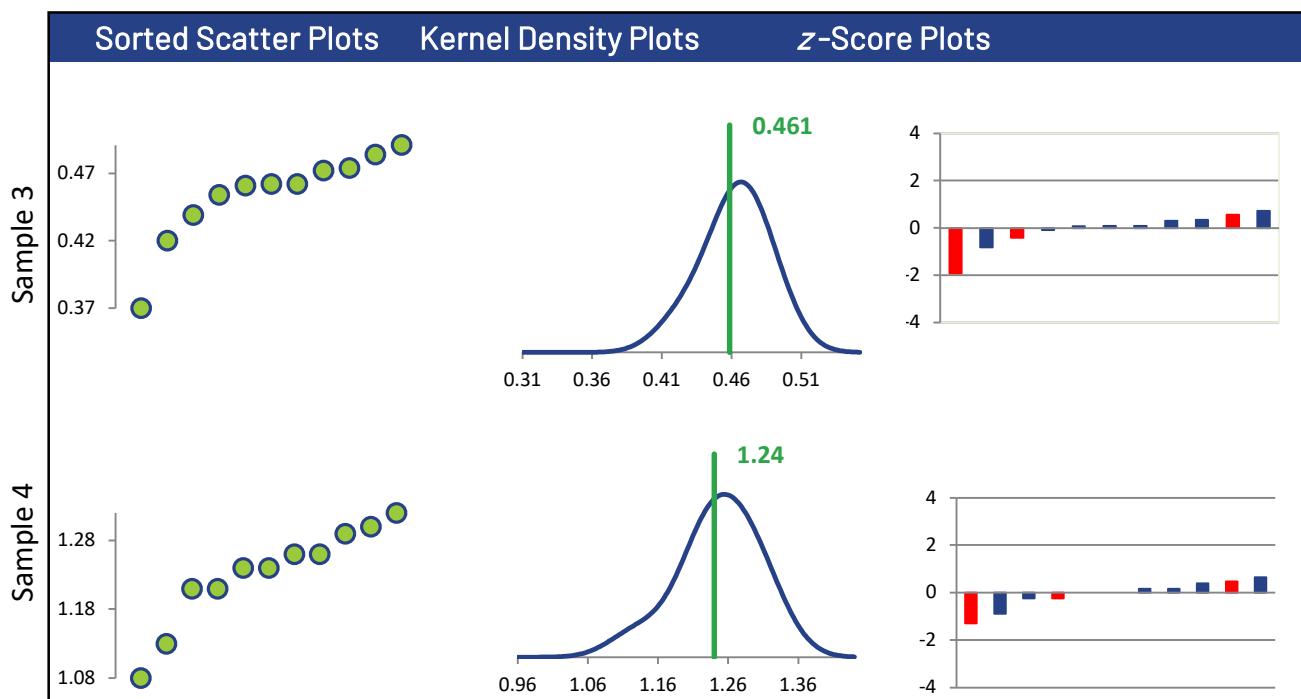
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	8	8	8	8
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers



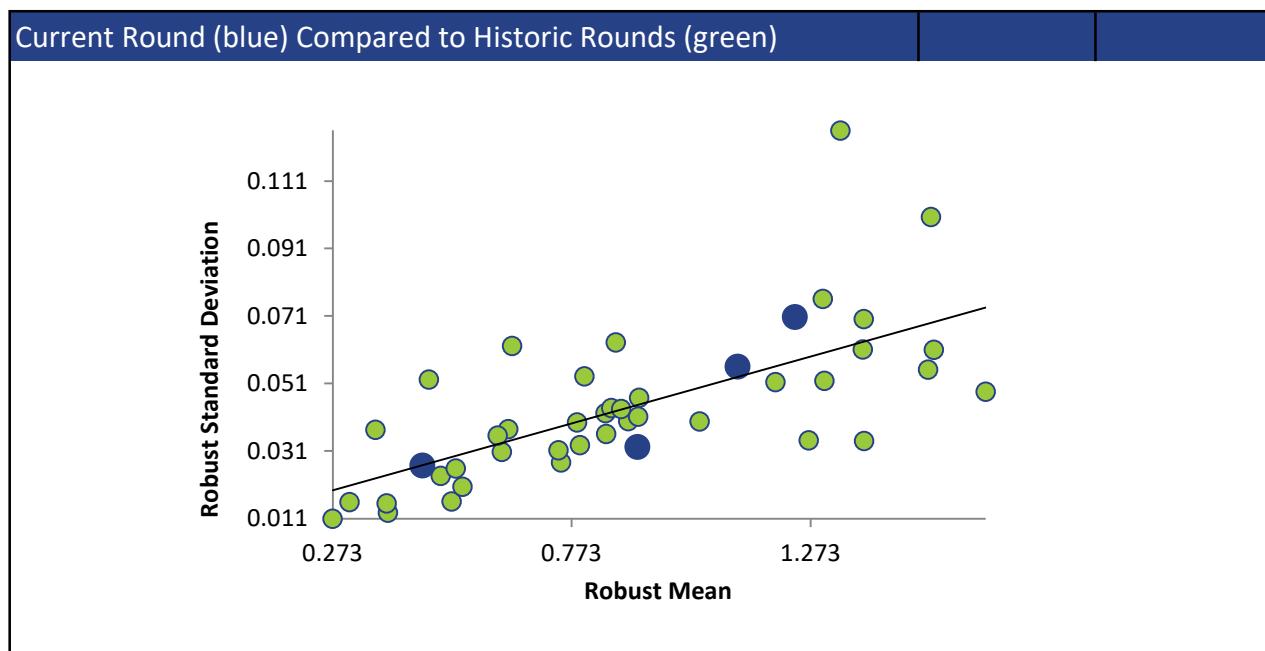
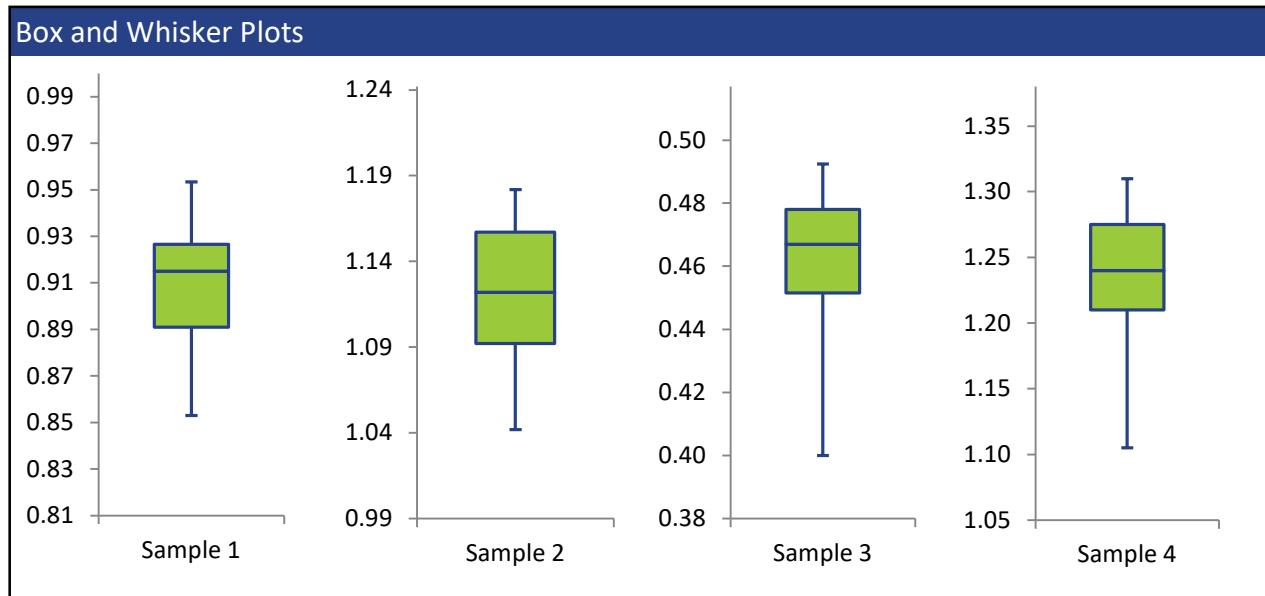
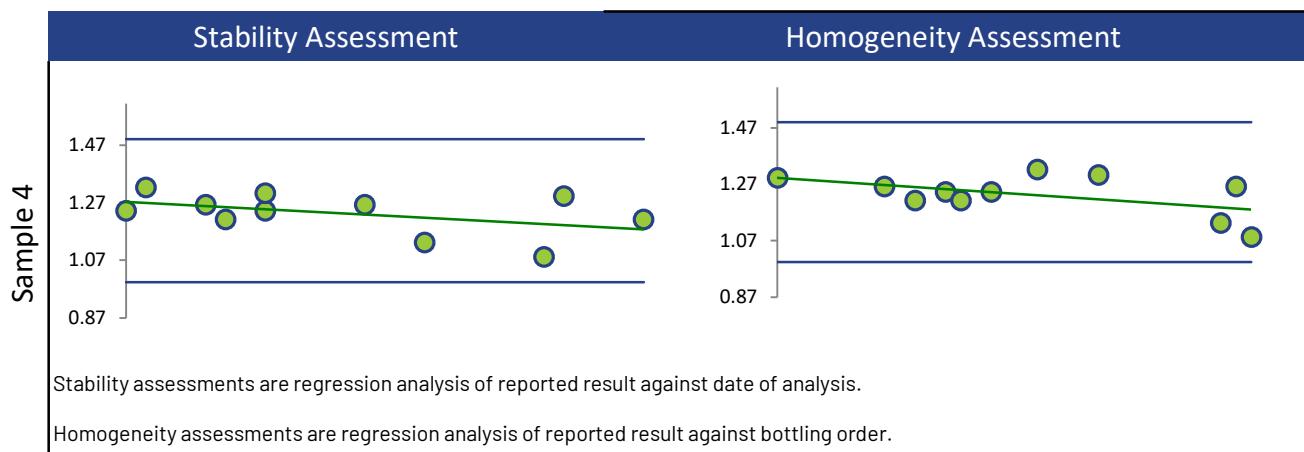
## Annex A Summary by Analyte

### THALLIUM



## Annex A Summary by Analyte

### THALLIUM



## TITANIUM

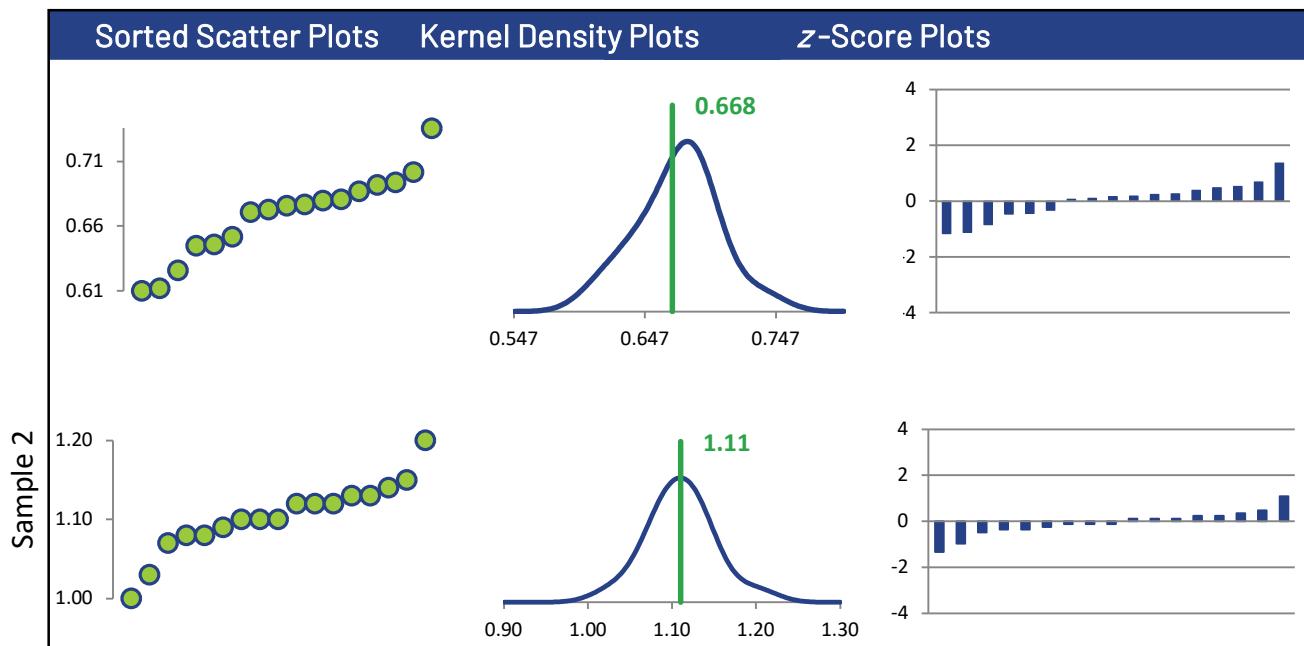
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	17	17	17	17
Median mg/L	0.676	1.10	0.291	1.02
Robust Mean mg/L	0.668	1.11	0.289	1.01
U mg/L	0.0101	0.0113	0.00497	0.0107
Robust Standard Deviation mg/L	0.0332	0.0373	0.0164	0.0352
Regression Standard Deviation mg/L	0.0501	0.0829	0.0217	0.0756
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0501	0.0829	0.0217	0.0756
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	0	0	1

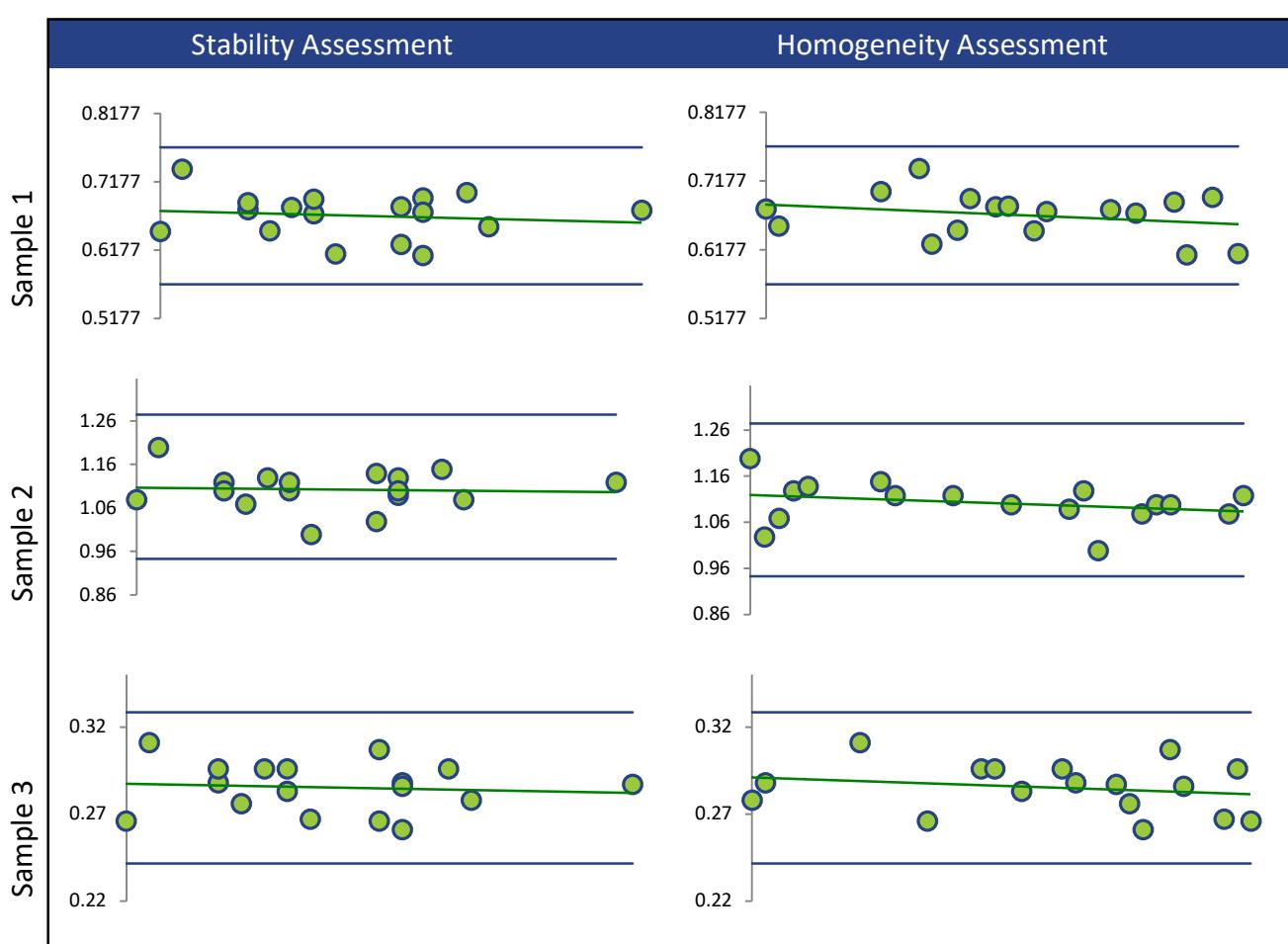
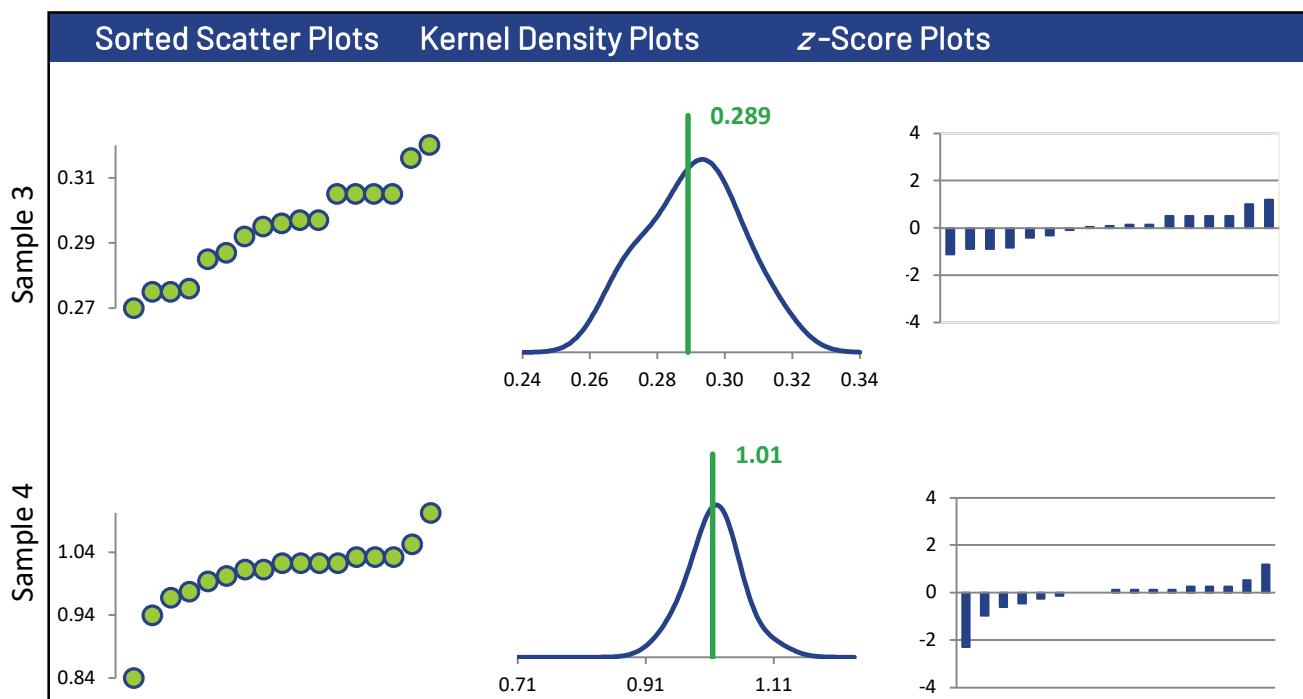
## Methods Used

Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	17	17	17	17

All summary stats and the plots below are based on the data excluding any flagged outliers

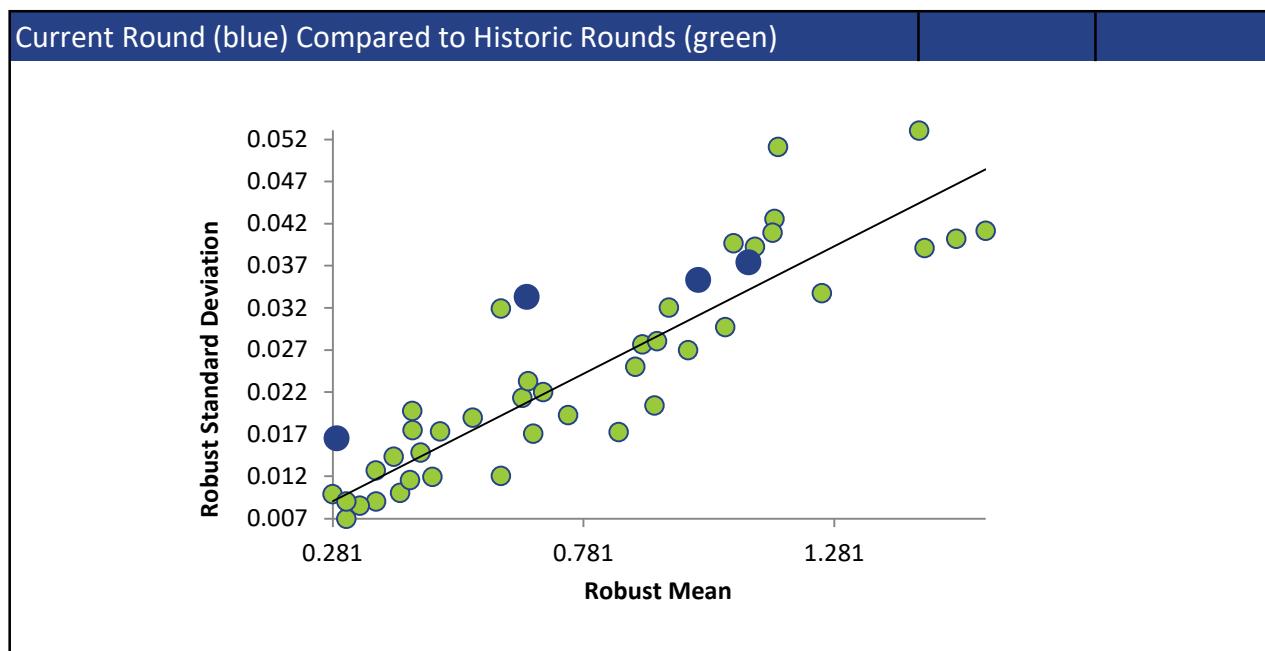
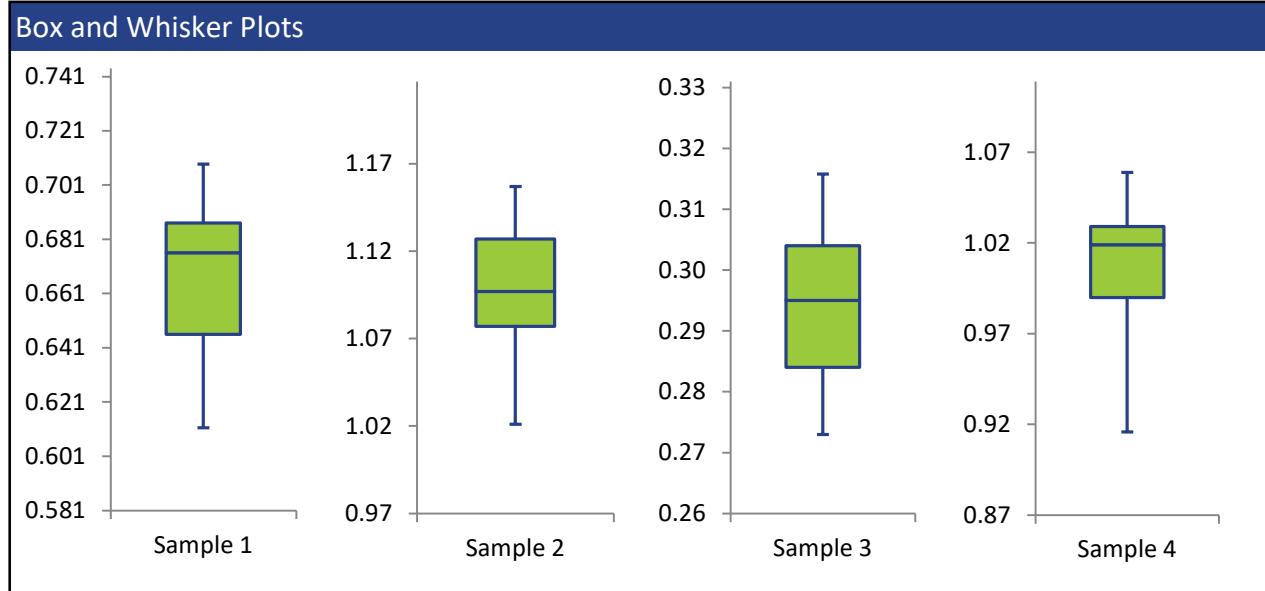
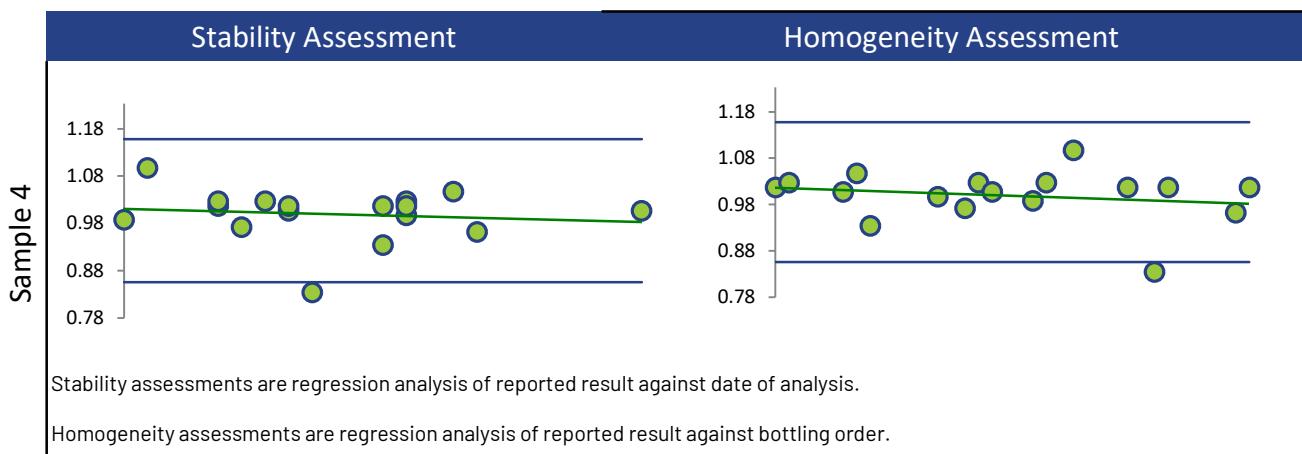


## TITANIUM



## Annex A Summary by Analyte

### TITANIUM



## Annex A Summary by Analyte

### VANADIUM

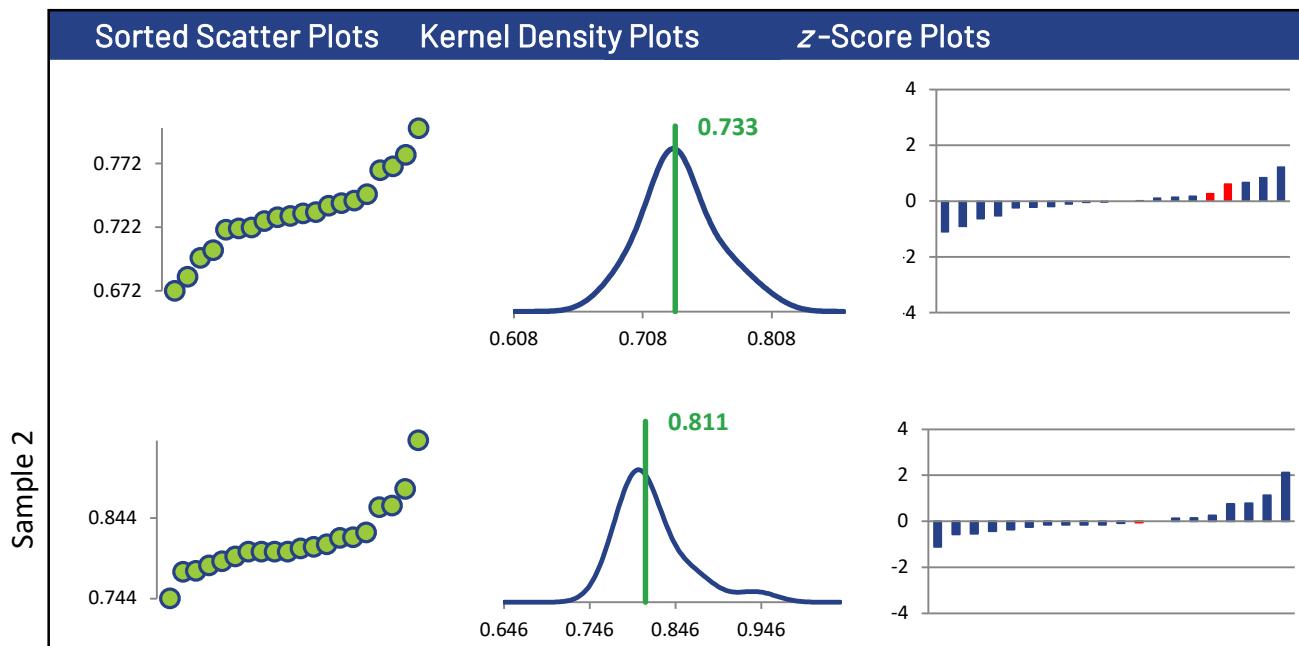
#### Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	20	20	20	20
Median mg/L	0.732	0.804	0.315	1.60
Robust Mean mg/L	0.733	0.811	0.312	1.60
U mg/L	0.00853	0.00922	0.00394	0.0170
Robust Standard Deviation mg/L	0.0305	0.0330	0.0141	0.0607
Regression Standard Deviation mg/L	0.0550	0.0608	0.0234	0.120
Stability Flag			Stability	
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0550	0.0608	0.0318	0.120
Outliers	0	0	0	0
$ z >3.0$	0	0	0	0
$2< z <3$	0	1	0	0

#### Methods Used

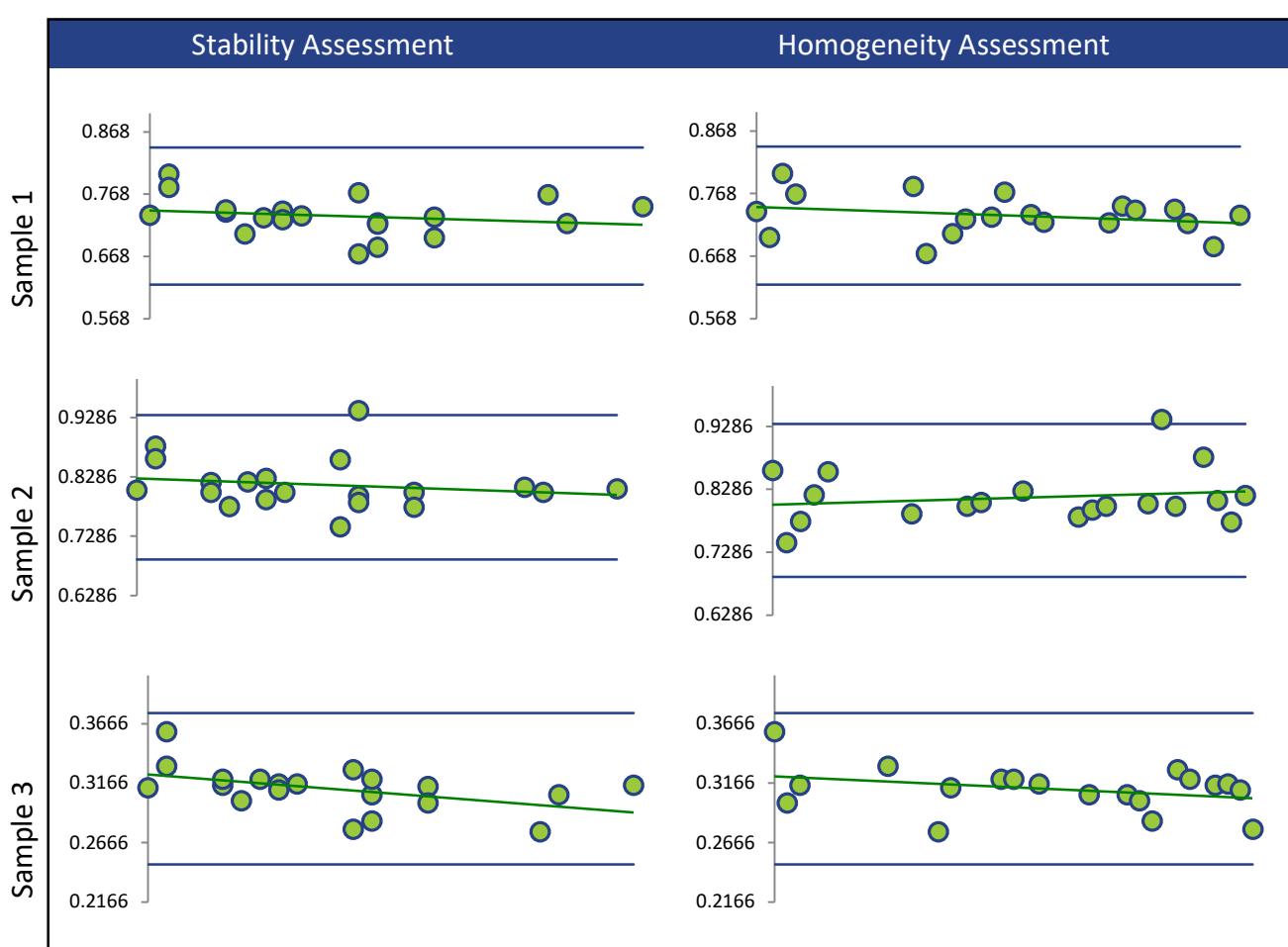
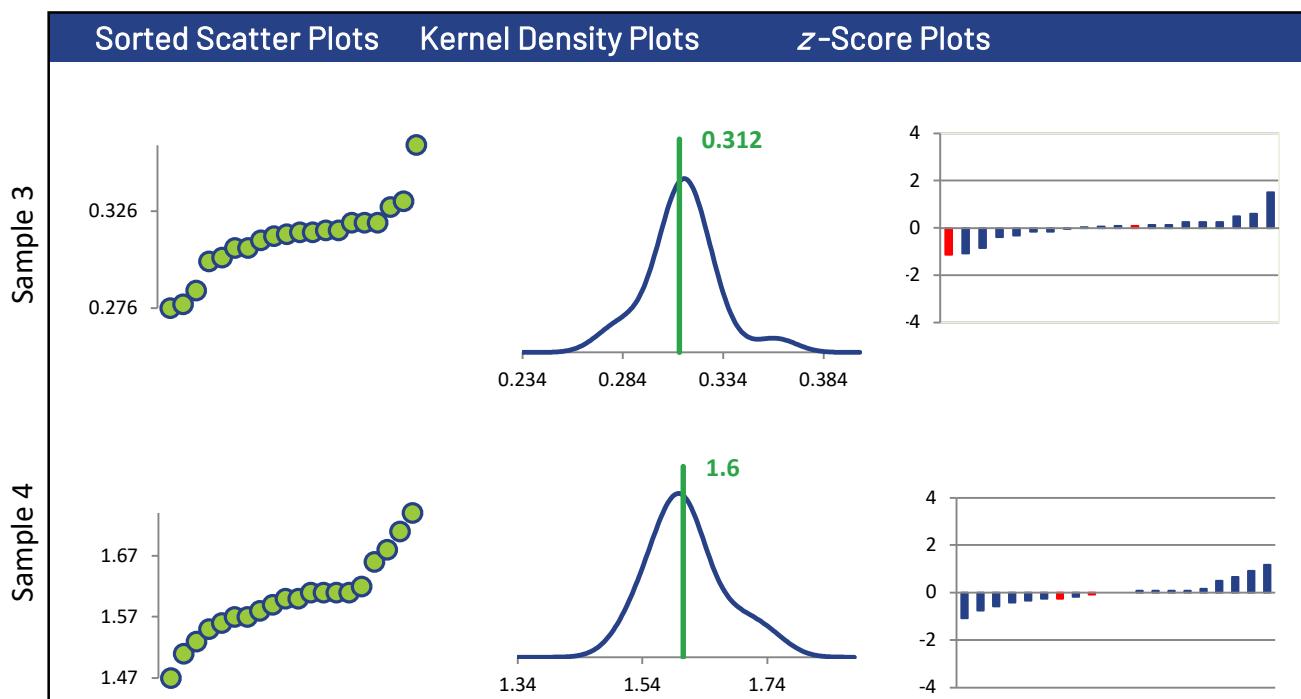
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	18	18	18	18
ICP/MS (Red)	2	2	2	2

All summary stats and the plots below are based on the data excluding any flagged outliers



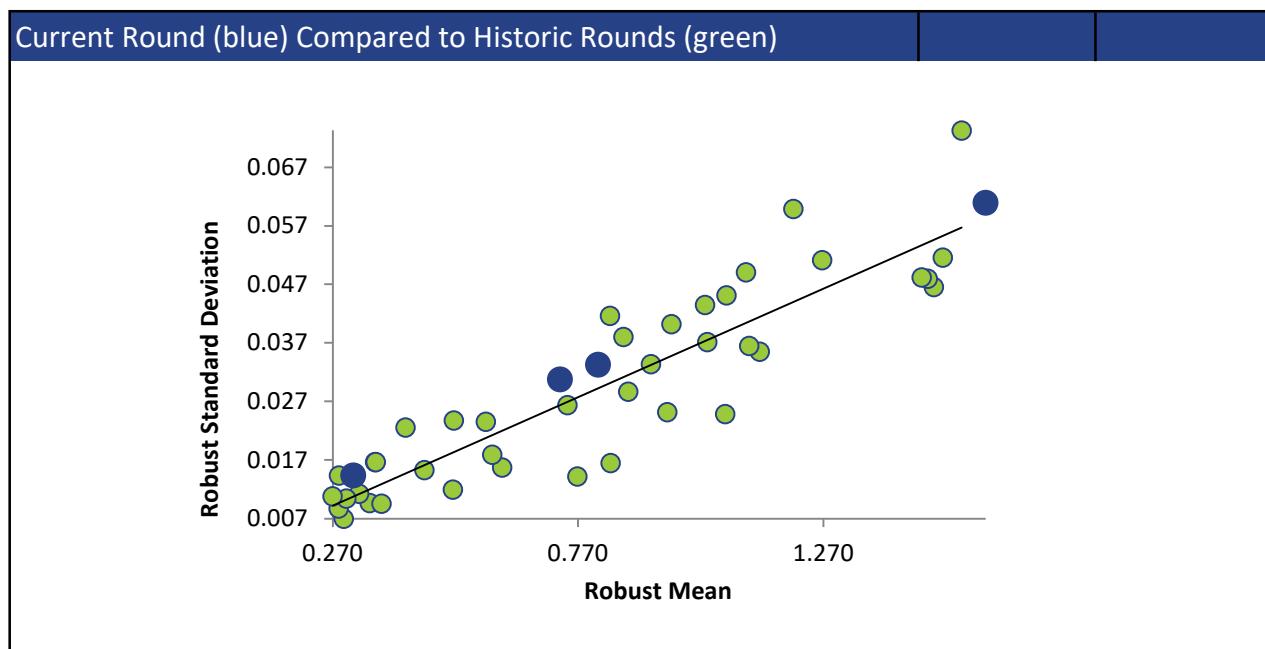
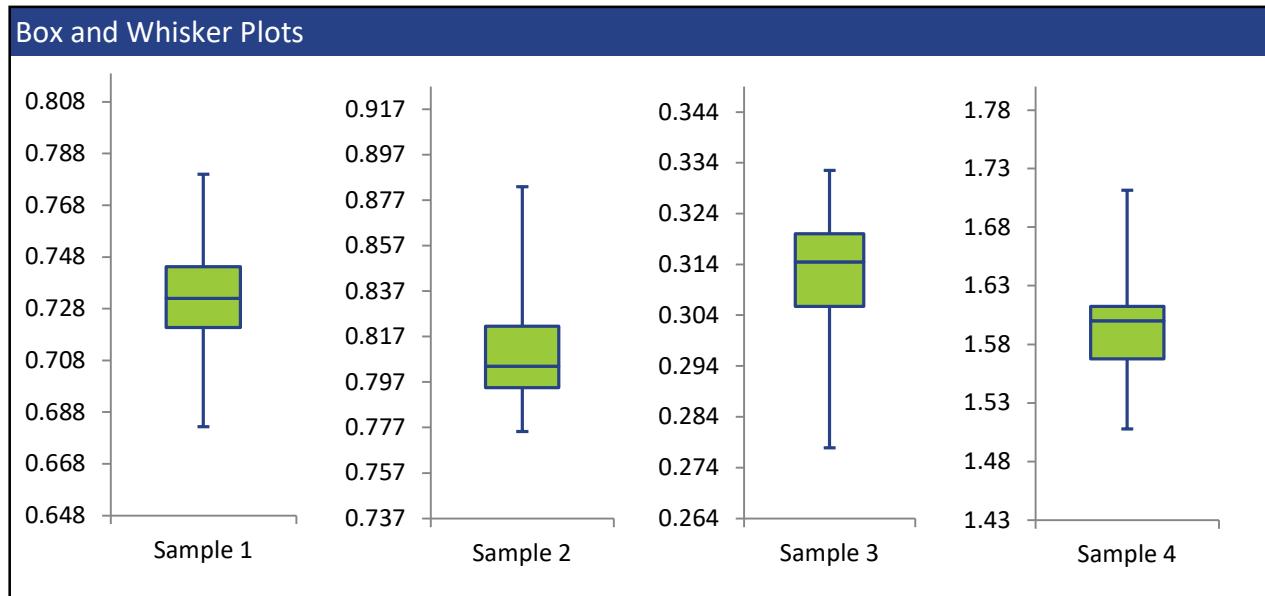
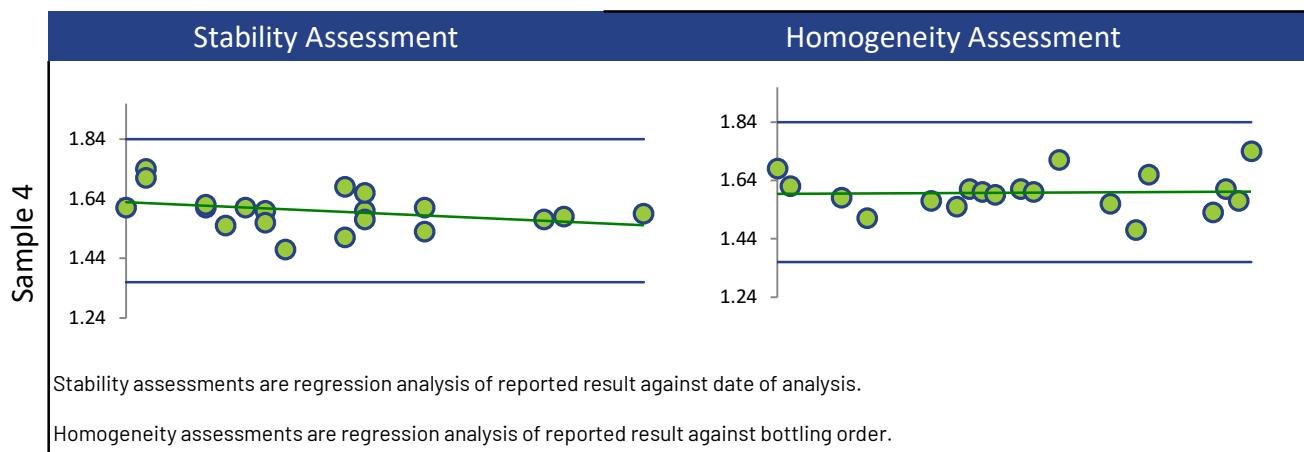
## Annex A Summary by Analyte

### VANADIUM



## Annex A Summary by Analyte

### VANADIUM



## ZINC

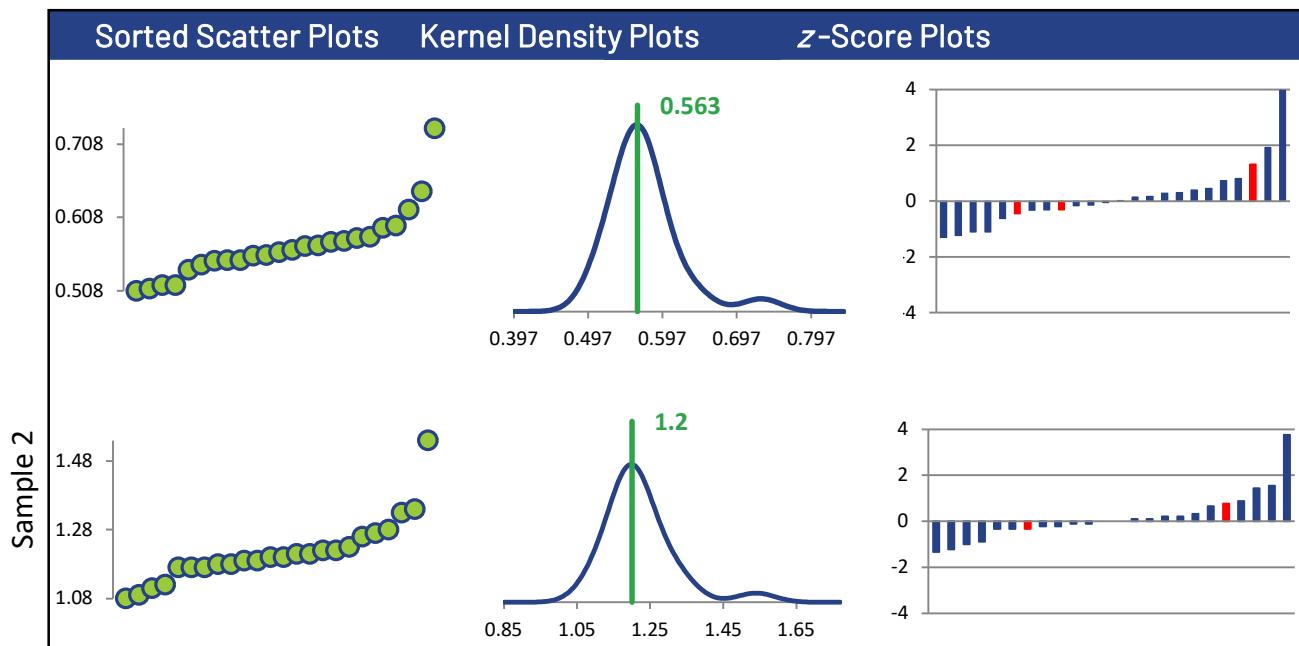
## Summary Statistics

Statistic	C02B-1	C02B-2	C02B-3	C02B-4
N	24	24	24	24
Median mg/L	0.563	1.20	0.443	1.19
Robust Mean mg/L	0.563	1.20	0.440	1.20
U mg/L	0.00936	0.0187	0.00791	0.0171
Robust Standard Deviation mg/L	0.0367	0.0733	0.0310	0.0672
Regression Standard Deviation mg/L	0.0422	0.0904	0.0330	0.0897
Stability Flag				
Homogeneity Flag				
Standard Deviation Used (SDPA) mg/L	0.0422	0.0904	0.0330	0.0897
Outliers	0	0	0	0
$ z >3.0$	1	1	1	1
$2< z <3$	0	0	0	0

## Methods Used

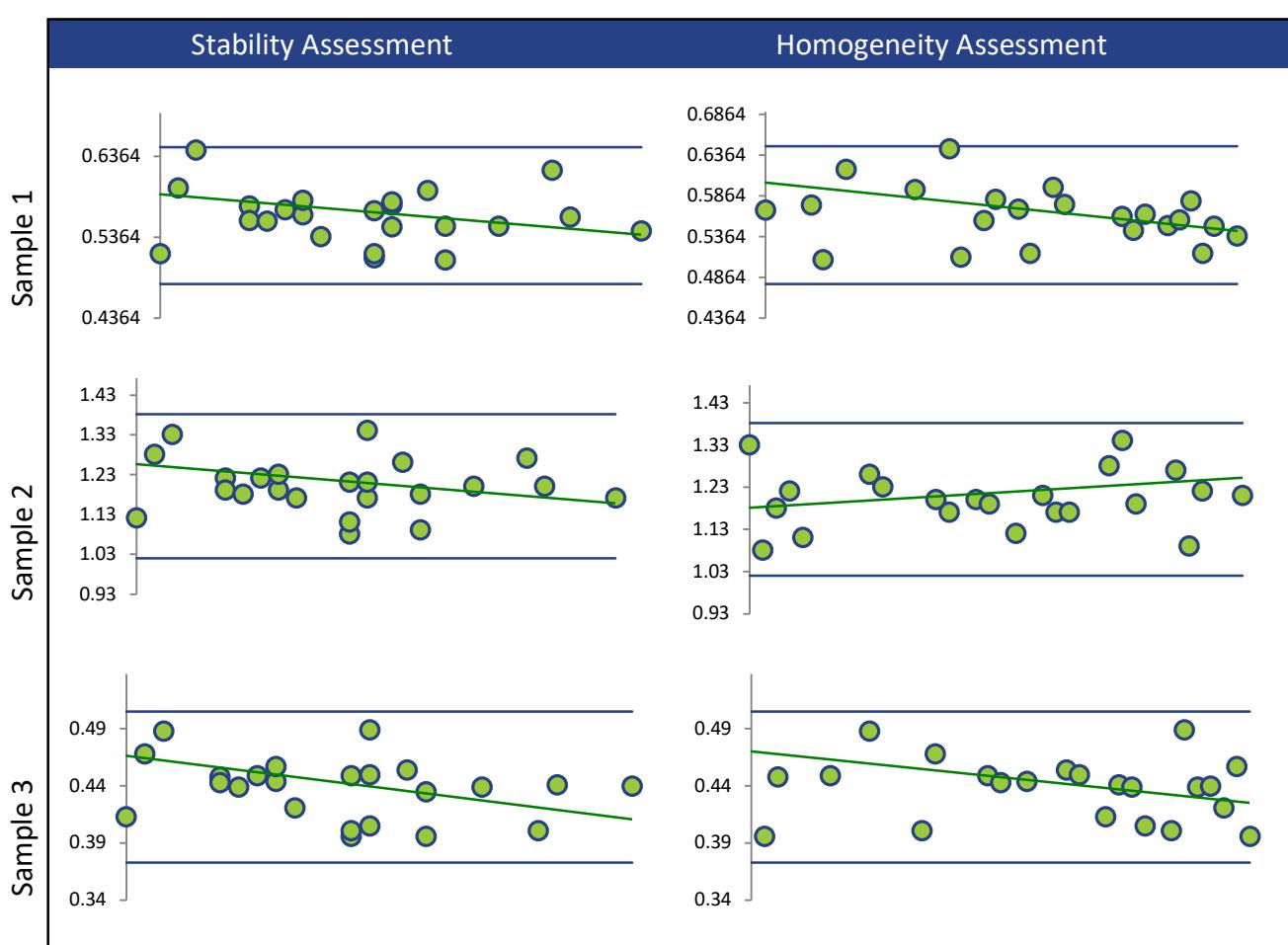
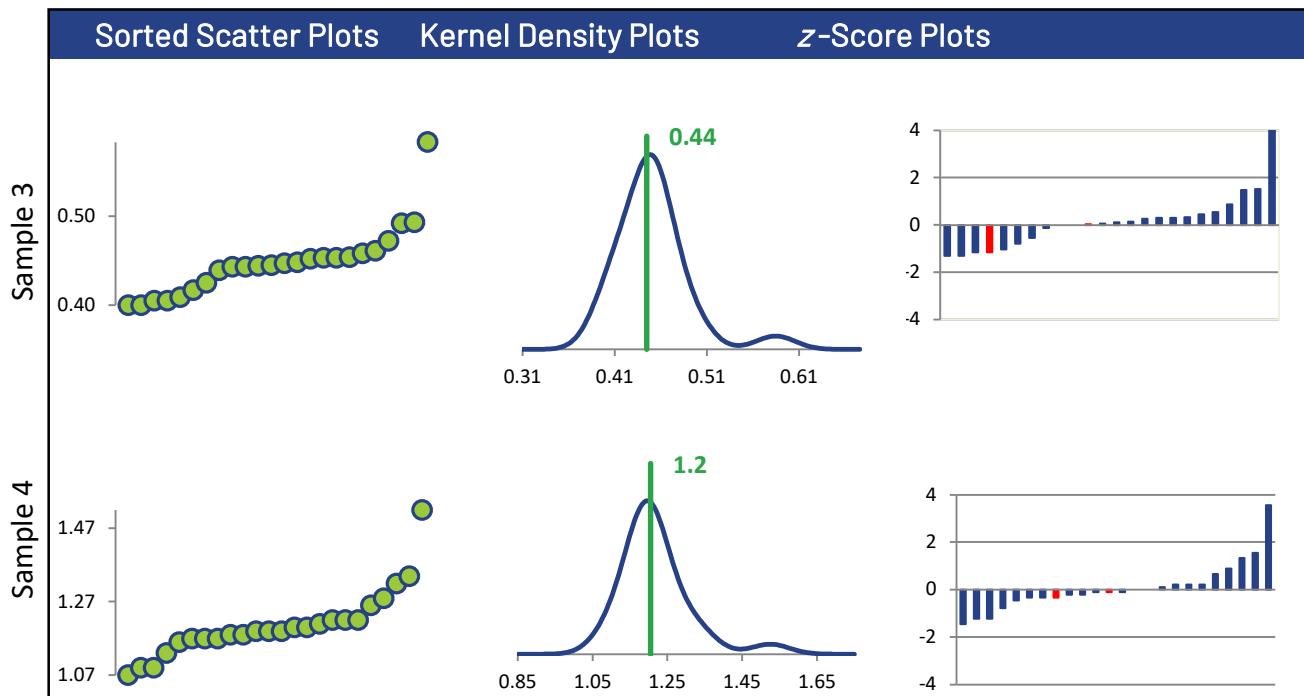
Method	C02B-1	C02B-2	C02B-3	C02B-4
ICP/OES (Blue)	21	21	21	21
ICP/MS (Red)	3	3	3	3

All summary stats and the plots below are based on the data excluding any flagged outliers



## Annex A Summary by Analyte

ZINC



## Annex A Summary by Analyte

### ZINC

