D ProUCL Input and Output Data

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Surface Soil ProUCL Data

Surface Soil Background (mg/kg)
Lowest duplicate kept

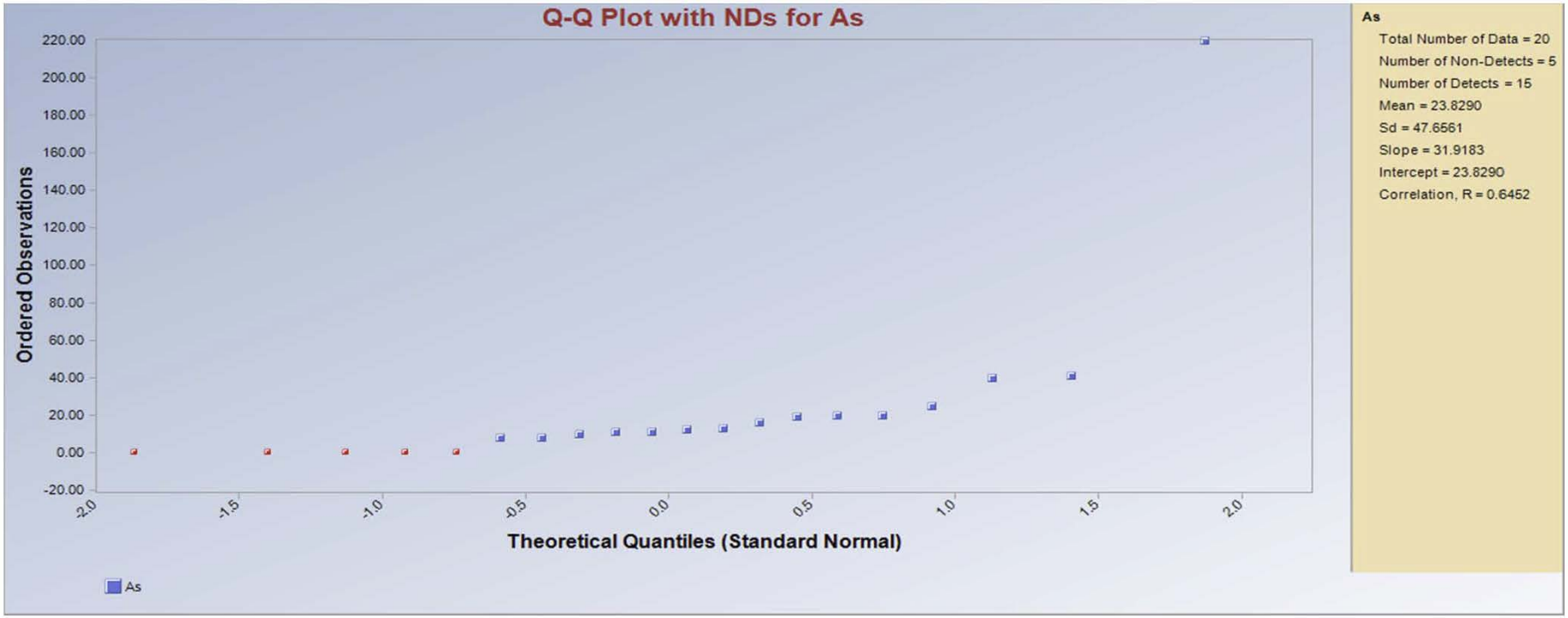
	Al	D_Al	Ba	D_Ba	Be	D_Be	Ca	D_Ca	Cr	D_Cr	Co	D_Co	Cu	D_Cu	Fe	D_Fe	Pb	D_Pb	Mg	D_Mg	Mn	D_Mn	Hg	D_Hg	Ni	D_Ni	K	D_K	V	D_V	Zn	D_Zn
10UP09SS	17500	1					796	1	26.7	1	7.7	1	20.7	1			9	1	2870	1	268	1	0.25	1	23	1	760	1	57.8	1	56	1
10UP30SS (Dup)			84.9	1	0.4	1									31900	1																
10RD14SS			148	1	0.4	1	4620	1			7.4	1	16.5	1	17100	1	6	1			276	1	0.96	1	20	1	740	1			53	1
10RD31SS (Dup)	13800	1							21.4	1									3780	1									33.4	1		
10RD10SS	9470	1	135	1	0.5	1	2040	1	20	1	16.7	1	39.3	1	31700	1	12	1	2230	1	570	1	6.4	1	50	1	990	1	37.3	1	100	1
10RD11SS	15900	1	172	1	0.4	1	6380	1	28.4	1	8.5	1	17.9	1	20600	1	7	1	3720	1	321	1	6.6	1	23	1	790	1	41	1	48	1
10RD12SS	14500	1	231	1	0.5	1	6590	1	22.5	1	11.6	1	17.9	1	23100	1	7	1	3750	1	816	1	0.79	1	26	1	860	1	36.6	1	61	1
10RD13SS	14100	1	266	1	0.5	1	10100	1	21	1	8.2	1	18.8	1	16700	1	6	1	3420	1	465	1	0.6	1	24	1	790	1	30.8	1	39	1
10RD15SS	14700	1	120	1	0.3	1	2320	1	21.8	1	6.3	1	15.3	1	20300	1	6	1	3610	1	144	1	0.13	1	19	1	680	1	37.6	1	49	1
10RD16SS	13400	1	131	1	0.3	1	3040	1	20.2	1	6.5	1	14.7	1	15000	1	5	1	3470	1	135	1	0.25	1	19	1	700	1	32.9	1	49	1
10RD17SS	14000	1	129	1	0.3	1	2560	1	21.7	1	6.7	1	17.3	1	15600	1	6	1	3580	1	139	1	0.14	1	20	1	740	1	35.4	1	51	1
10RD18SS	15600	1	220	1	0.5	1	6490	1	24	1	10.8	1	22.8	1	26300	1	9	1	3760	1	251	1	1.57	1	28	1	1030	1	39.8	1	67	1
10RD19SS	16700	1	188	1	0.5	1	3210	1	26.3	1	8.5	1	23.7	1	19300	1	8	1	3870	1	148	1	1.86	1	25	1	800	1	41.6	1	58	1
10UP01SS	18300	1	78.4	1	0.3	1	972	1	23.9	1	5.6	1	18.3	1	22800	1	9	1	2980	1	157	1	0.18	1	18	1	650	1	44.8	1	45	1
10UP02SS	14400	1	63.5	1	0.2	1	620	1	18	1	3.4	1	11.6	1	20300	1	7	1	1520	1	112	1	0.23	1	9	1	470	1	35.1	1	23	1
10UP03SS	17400	1	145	1	0.3	1	4090	1	23	1	5.9	1	12.8	1	18400	1	9	1	3200	1	118	1	0.19	1	17	1	570	1	43.7	1	47	1
10UP04SS	14100	1	115	1	0.3	1	1150	1	19.2	1	5.1	1	9.4	1	15500	1	8	1	2140	1	106	1	0.2	1	14	1	550	1	34	1	39	1
10UP05SS	15900	1	95.6	1	0.3	1	1040	1	21.4	1	6.5	1	12.2	1	20300	1	8	1	2920	1	142	1	0.19	1	16	1	560	1	38.2	1	45	1
10UP06SS	17600	1	76.5	1	0.3	1	863	1	24	1	5.7	1	13.4	1	25300	1	9	1	2560	1	139	1	0.23	1	16	1	570	1	45.8	1	41	1
10UP07SS	15300	1	69.4	1	0.3	1	551	1	19.1	1	5.6	1	13.2	1	17900	1	7	1	2130	1	182	1	0.15	1	14	1	440	1	35.6	1	33	1
10UP08SS	19600	1	105	1	0.4	1	1080	1	30	1	11.9	1	17	1	32400	1	10	1	3570	1	455	1	0.32	1	24	1	800	1	62.9	1	58	1
10UP10SS	19500	1	101	1	0.3	1	1010	1	27.6	1	6.5	1	13.7	1	26600	1	9	1	3190	1	198	1	0.22	1	19	1	730	1	57.6	1	45	1

10UP09SS	Sb	D_Sb	As	D_As	Cd	D_Cd	Se	D_Se	Ag	D_Ag	Na	D_Na	Tl	D_Tl
10UP30SS (Dup)	0.56	0			0.3	1	0.8	0	0.054	0	20.5	0	0.34	0
10RD14SS			19	1			0.83	0	0.056	0			0.35	0
10RD31SS (Dup)	0.7	0	13	1	0.034	0	1.01	0	0.069	0	90	1	0.43	0
10RD10SS							1.04	0	0.071	0			0.44	0
10RD11SS	30	1	220	1	0.7	1	1.7	0	0.113	0	42.6	0	0.7	0
10RD12SS	14	1	41	1	0.4	1	1	0	0.068	0	90	1	0.43	0
10RD13SS	0.69	0	25	1	0.4	1	8	0	0.5	0	25.4	0	8	0
10RD15SS	0.8	0	20	1	0.041	0	10	0	0.6	0	30.8	0	10	0
10RD16SS	0.65	0	8	1	0.032	0	8	0	0.5	0	90	1	8	0
10RD17SS	8	1	0.47	0	0.03	0	8	0	0.5	0	90	1	8	0
10RD18SS	0.62	0	0.47	0	0.3	1	8	0	0.5	0	90	1	8	0
10RD19SS	0.8	0	40	1	0.4	1	10	0	0.6	0	100	1	10	0
10UP01SS	0.76	0	12	1	0.037	0	9	0	0.6	0	100	1	9	0
10UP02SS	0.58	0	11	1	0.028	0	7	0	0.4	0	70	1	7	0
10UP03SS	0.8	0	10	1	0.039	0	10	0	0.6	0	29.5	0	10	0
10UP04SS	0.8	0	0.6	0	0.039	0	10	0	0.6	0	100	1	10	0
10UP05SS	0.76	0	0.58	0	0.037	0	9	0	0.6	0	28.1	0	9	0
10UP06SS	0.63	0	8	1	0.031	0	8	0	0.5	0	80	1	8	0
10UP07SS	0.6	0	11	1	0.029	0	7	0	0.4	0	90	1	7	0
10UP08SS	0.61	0	0.46	0	0.03	0	7	0	0.4	0	22.4	0	7	0
10UP10SS	1.3	0	20	1	0.063	0	20	0	0.9	0	47.8	0	20	0
	0.59	0	16	1	0.029	0	7	0	0.4	0	80	1	7	0

Two outliers removed (10RD10SS and 10RD11SS) due to arsenic and mercury concentrations, additional outliers removed (single point only)

	Al	D_Al	Ba	D_Ba	Be	D_Be	Ca	D_Ca	Cr	D_Cr	Co	D_Co	Cu	D_Cu	Fe	D_Fe	Pb	D_Pb	Mg	D_Mg	Mn	D_Mn	Hg	D_Hg	Ni	D_Ni	K	D_K	V	D_V	Zn	D_Zn
10UP09SS	17500	1					796	1	26.7	1	7.7	1	20.7	1			9	1	2870	1	268	1	0.25	1	23	1	760	1	57.8	1	56	1
10UP30SS (Dup)			84.9	1	0.4	1									31900	1																
10RD14SS			148	1	0.4	1	4620	1			7.4	1	16.5	1	17100	1	6	1			276	1	0.96	1	20	1	740	1			53	1
10RD31SS (Dup)	13800	1							21.4	1									3780	1									33.4	1		
10RD12SS	14500	1	231	1	0.5	1	6590	1	22.5	1	11.6	1	17.9	1	23100	1	7	1	3750	1		1	0.79	1	26	1	860	1	36.6	1	61	1
10RD13SS	14100	1	266	1	0.5	1	10100	1	21	1	8.2	1	18.8	1	16700	1	6	1	3420	1	465	1	0.6	1	24	1	790	1	30.8	1	39	1
10RD15SS	14700	1	120	1	0.3	1	2320	1	21.8	1	6.3	1	15.3	1	20300	1	6	1	3610	1	144	1	0.13	1	19	1	680	1	37.6	1	49	1
10RD16SS	13400	1	131	1	0.3	1	3040	1	20.2	1	6.5	1	14.7	1	15000	1	5	1	3470	1	135	1	0.25	1	19	1	700	1	32.9	1	49	1
10RD17SS	14000	1	129	1	0.3	1	2560	1	21.7	1	6.7	1	17.3	1	15600	1	6	1	3580	1	139	1	0.14	1	20	1	740	1	35.4	1	51	1
10RD18SS	15600	1	220	1	0.5	1	6490	1	24	1	10.8	1	22.8	1	26300	1	9	1	3760	1	251	1	1.57	1	28	1	1030	1	39.8	1	67	1
10RD19SS	16700	1	188	1	0.5	1	3210	1	26.3	1	8.5	1	23.7	1	19300	1	8	1	3870	1	148	1	1.86	1	25	1	800	1	41.6	1	58	1
10UP01SS	18300	1	78.4	1	0.3	1	972	1	23.9	1	5.6	1	18.3	1	22800	1	9	1	2980	1	157	1	0.18	1	18	1	650	1	44.8	1	45	1
10UP02SS	14400	1	63.5	1	0.2	1	620	1	18	1	3.4	1	11.6	1	20300	1	7	1	1520	1	112	1	0.23	1	9	1	470	1	35.1	1	23	1
10UP03SS	17400	1	145	1	0.3	1	4090	1	23	1	5.9	1	12.8	1	18400	1	9	1	3200	1	118	1	0.19	1	17	1	570	1	43.7	1	47	1
10UP04SS	14100	1	115	1	0.3	1	1150	1	19.2	1	5.1	1	9.4	1	15500	1	8	1	2140	1	106	1	0.2	1	14	1	550	1	34	1	39	1
10UP05SS	15900	1	95.6	1	0.3	1	1040	1	21.4	1	6.5	1	12.2	1	20300	1	8	1	2920	1	142	1	0.19	1	16	1	560	1	38.2	1	45	1
10UP06SS	17600	1	76.5	1	0.3	1	863	1	24	1	5.7	1	13.4	1	25300	1	9	1	2560	1	139	1	0.23	1	16	1	570	1	45.8	1	41	1
10UP07SS	15300	1	69.4	1	0.3	1	551	1	19.1	1	5.6	1	13.2	1	17900	1	7	1	2130	1	182	1	0.15	1	14	1	440	1	35.6	1	33	1
10UP08SS	19600	1	105	1	0.4	1	1080	1	30	1	11.9	1	17	1	32400	1	10	1	3570	1	455	1	0.32	1	24	1	800	1	62.9	1	58	1
10UP10SS	19500	1	101	1	0.3	1	1010	1	27.6	1	6.5	1	13.7	1	26600	1	9	1	3190	1	198	1	0.22	1	19	1	730	1	57.6	1	45	1

10UP09SS	Sb	D_Sb	As	D_As	Cd	D_Cd	Se	D_Se	Ag	D_Ag	Na	D_Na	Tl	D_Tl
10UP09SS	0.56	0			0.3	1	0.8	0	0.054	0	20.5	0	0.34	0
10UP30SS (Dup)			19	1			0.83	0	0.056	0			0.35	0
10RD14SS	0.7	0	13	1	0.034	0	1.01	0	0.069	0	90	1	0.43	0
10RD31SS (Dup)							1.04	0	0.071	0			0.44	0
10RD12SS	0.69	0	25	1	0.4	1	8	0	0.5	0	25.4	0	8	0
10RD13SS	0.8	0	20	1	0.041	0	10	0	0.6	0	30.8	0	10	0
10RD15SS	0.65	0	8	1	0.032	0	8	0	0.5	0	90	1	8	0
10RD16SS	8	1	0.47	0	0.03	0	8	0	0.5	0	90	1	8	0
10RD17SS	0.62	0	0.47	0	0.3	1	8	0	0.5	0	90	1	8	0
10RD18SS	0.8	0	40	1	0.4	1	10	0	0.6	0	100	1	10	0
10RD19SS	0.76	0	12	1	0.037	0	9	0	0.6	0	100	1	9	0
10UP01SS	0.58	0	11	1	0.028	0	7	0	0.4	0	70	1	7	0
10UP02SS	0.8	0	10	1	0.039	0	10	0	0.6	0	29.5	0	10	0
10UP03SS	0.8	0	0.6	0	0.039	0	10	0	0.6	0	100	1	10	0
10UP04SS	0.76	0	0.58	0	0.037	0	9	0	0.6	0	28.1	0	9	0
10UP05SS	0.63	0	8	1	0.031	0	8	0	0.5	0	80	1	8	0
10UP06SS	0.6	0	11	1	0.029	0	7	0	0.4	0	90	1	7	0
10UP07SS	0.61	0	0.46	0	0.03	0	7	0	0.4	0	22.4	0	7	0
10UP08SS	1.3	0	20	1	0.063	0	20	0	0.9	0	47.8	0	20	0
10UP10SS	0.59	0	16	1	0.029	0	7	0	0.4	0	80	1	7	0


Q-Q Plot with NDs for As
Ordered Observations
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
As
As
Total Number of Data = 20
Number of Non-Detects = 5
Number of Detects = 15
Mean = 23.8290
Sd = 47.6561
Slope = 31.9183
Intercept = 23.8290
Correlation, R = 0.6452

Outlier Tests for Selected Variables

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for As

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 220 is a Potential Outlier (Upper Tail)?

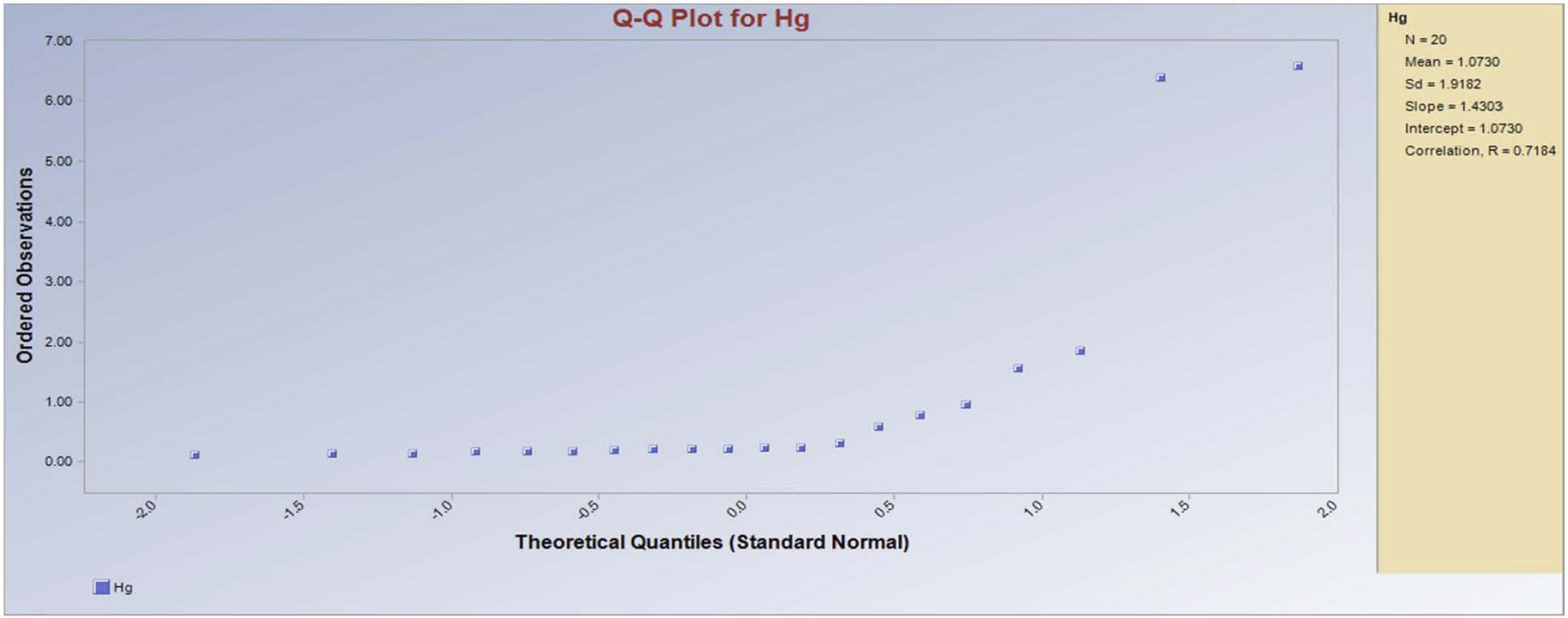
Test Statistic: 0.819

For 10% significance level, 220 is an outlier.
For 5% significance level, 220 is an outlier.
For 1% significance level, 220 is an outlier.

2. Data Value 0.23 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.23 is not an outlier.
For 5% significance level, 0.23 is not an outlier.
For 1% significance level, 0.23 is not an outlier.


Q-Q Plot for Hg
Ordered Observations
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Hg
Hg
N = 20
Mean = 1.0730
Sd = 1.9182
Slope = 1.4303
Intercept = 1.0730
Correlation, R = 0.7184

Outlier Tests for Selected Variables

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Hg

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 6.6 is a Potential Outlier (Upper Tail)?

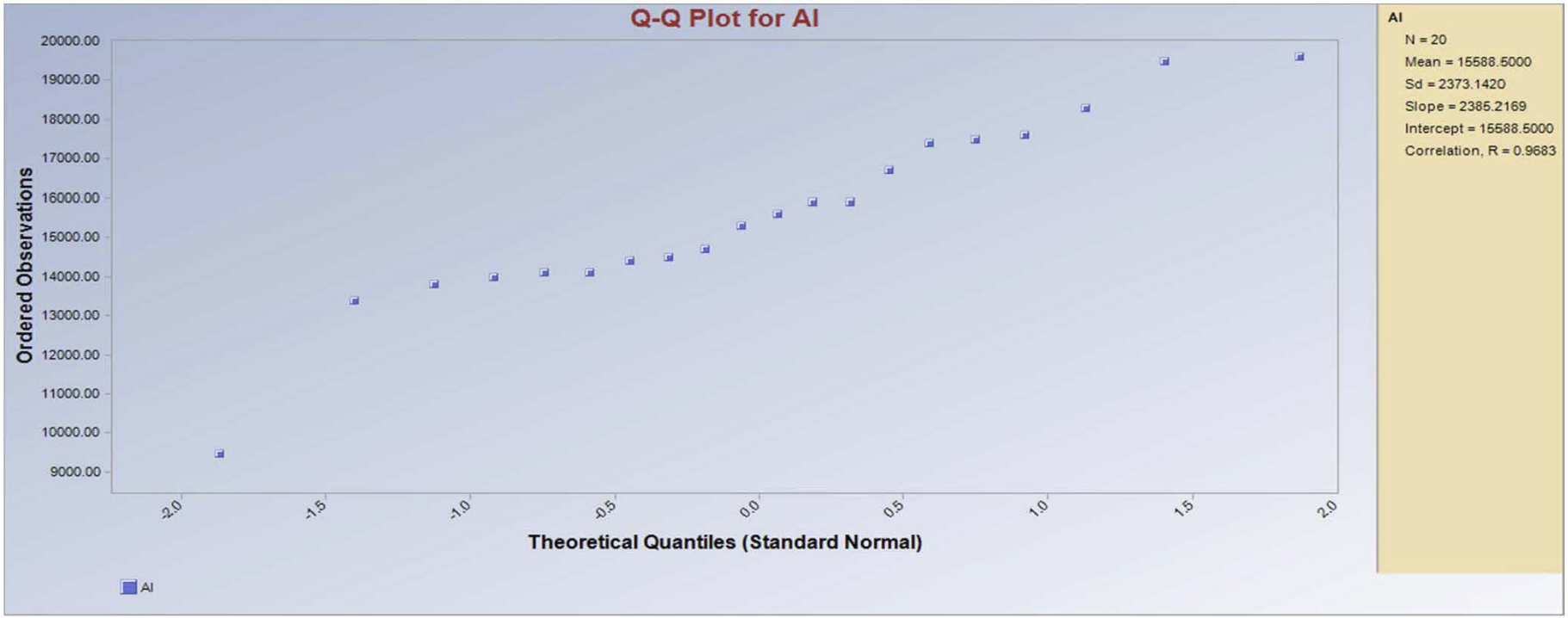
Test Statistic: 0.735

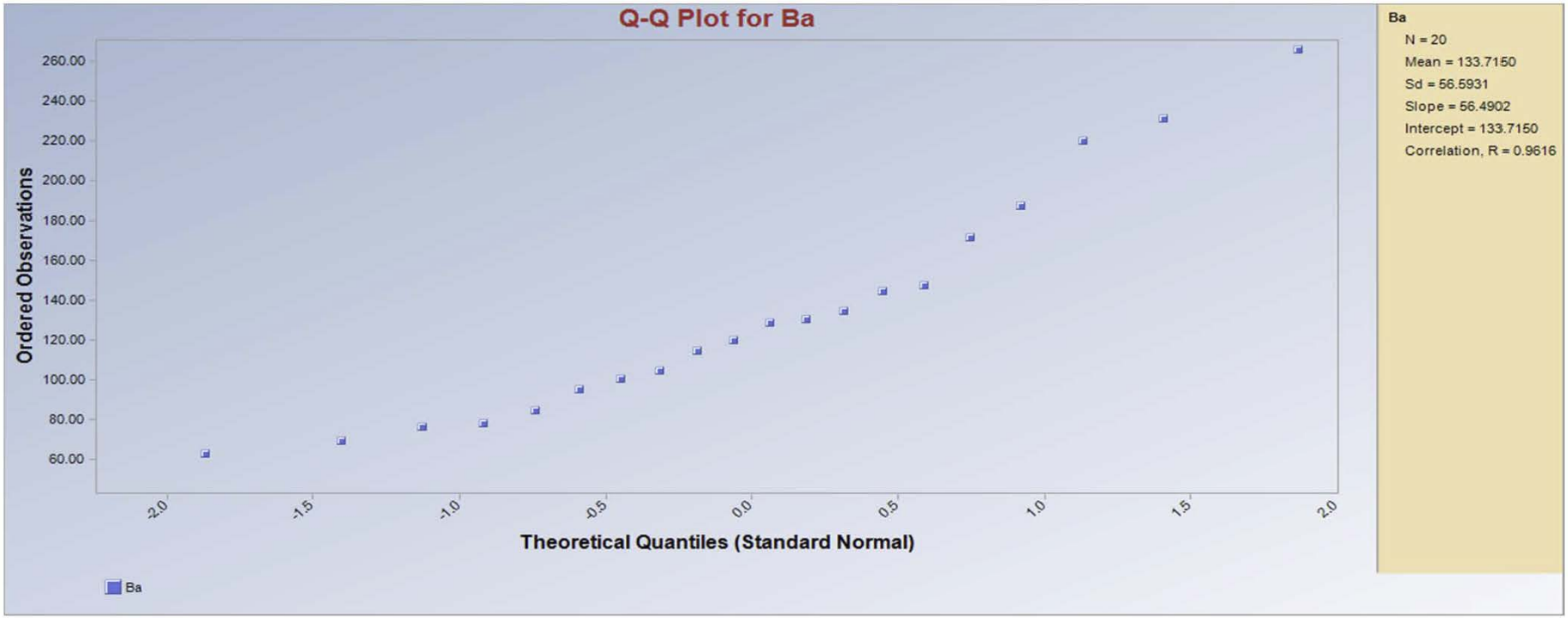
For 10% significance level, 6.6 is an outlier.
For 5% significance level, 6.6 is an outlier.
For 1% significance level, 6.6 is an outlier.

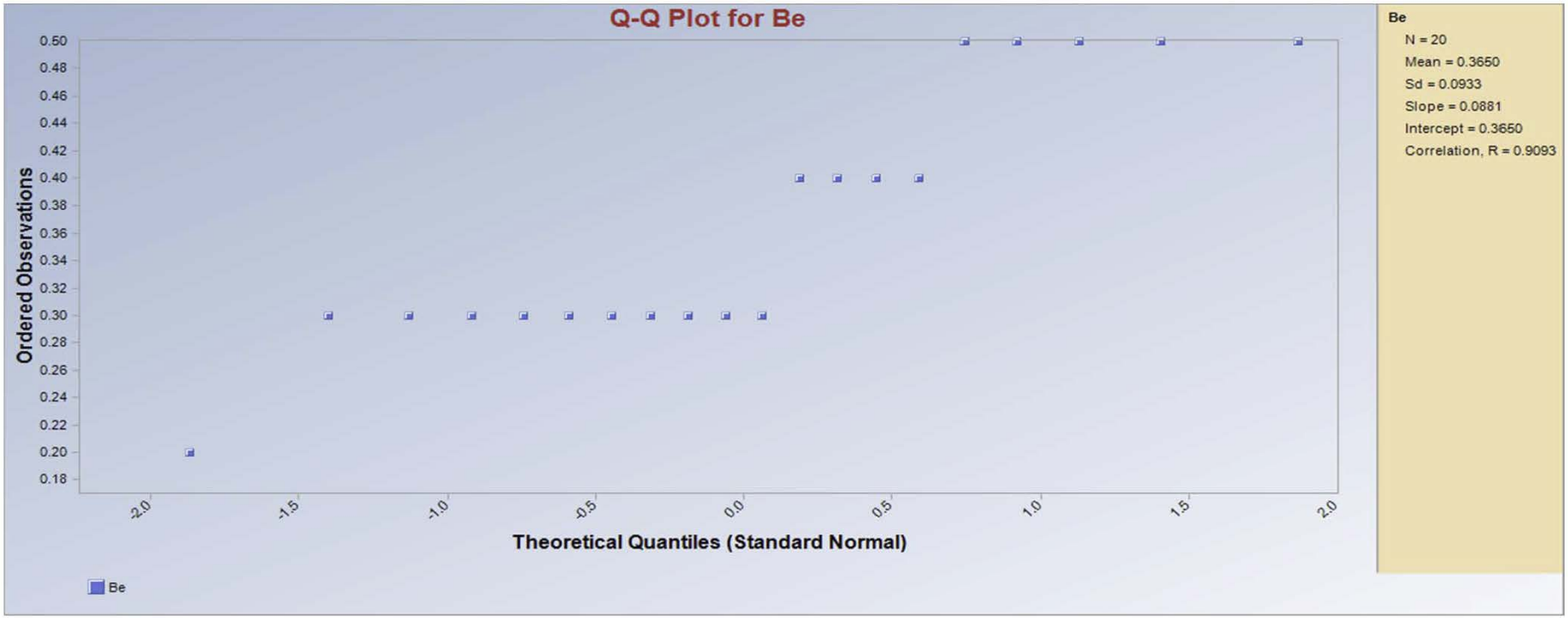
2. Data Value 0.13 is a Potential Outlier (Lower Tail)?

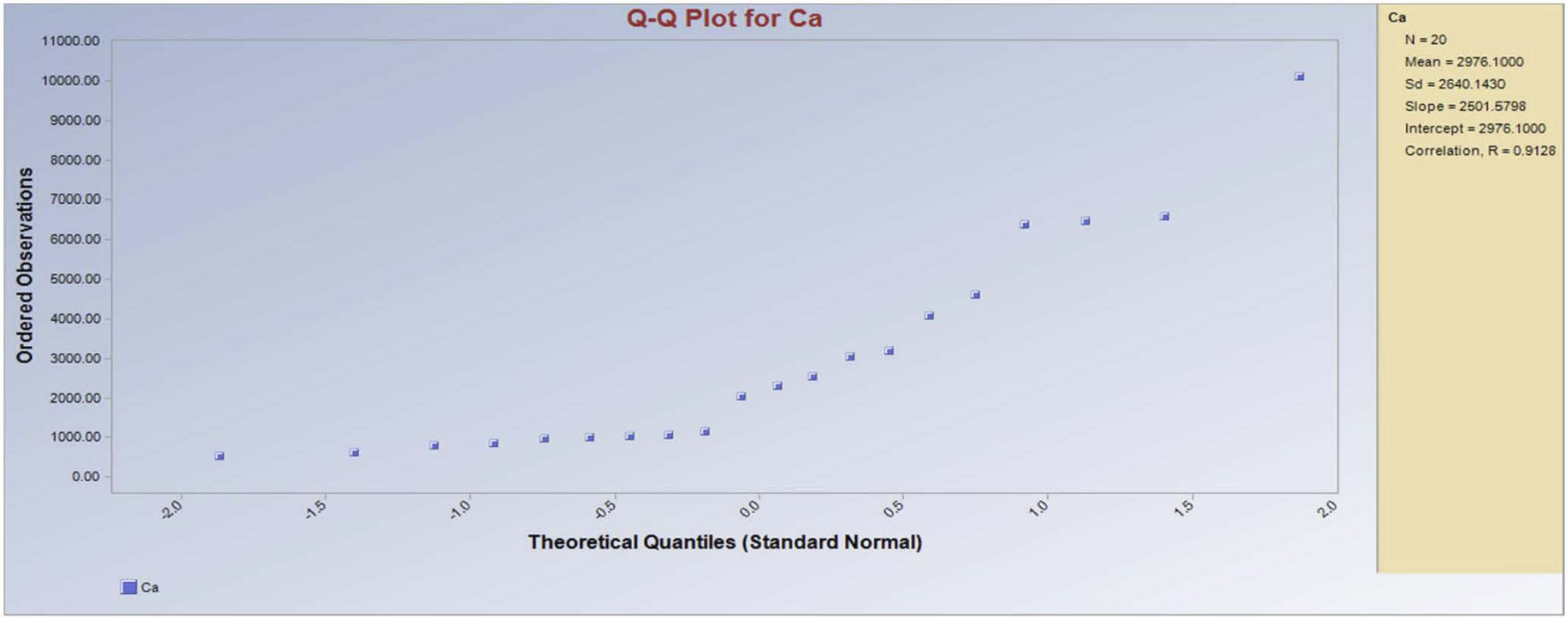
Test Statistic: 0.012

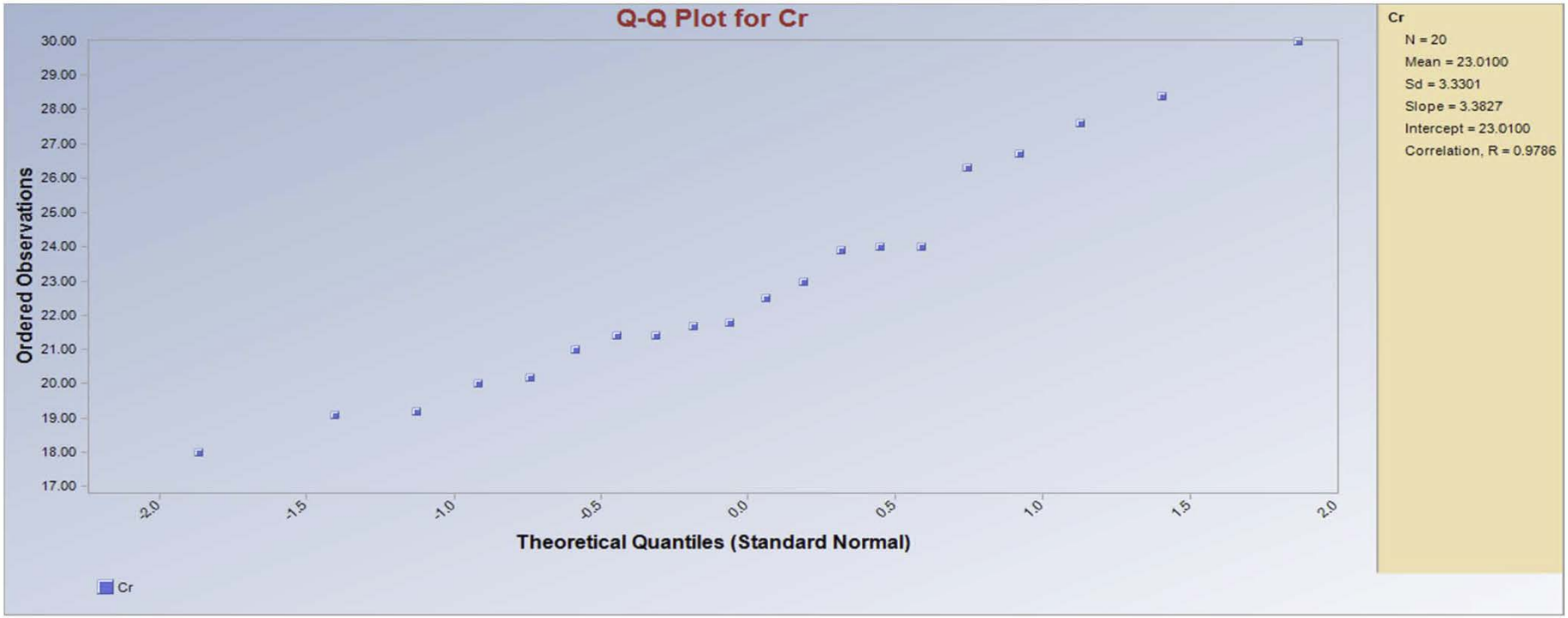
For 10% significance level, 0.13 is not an outlier.
For 5% significance level, 0.13 is not an outlier.
For 1% significance level, 0.13 is not an outlier.

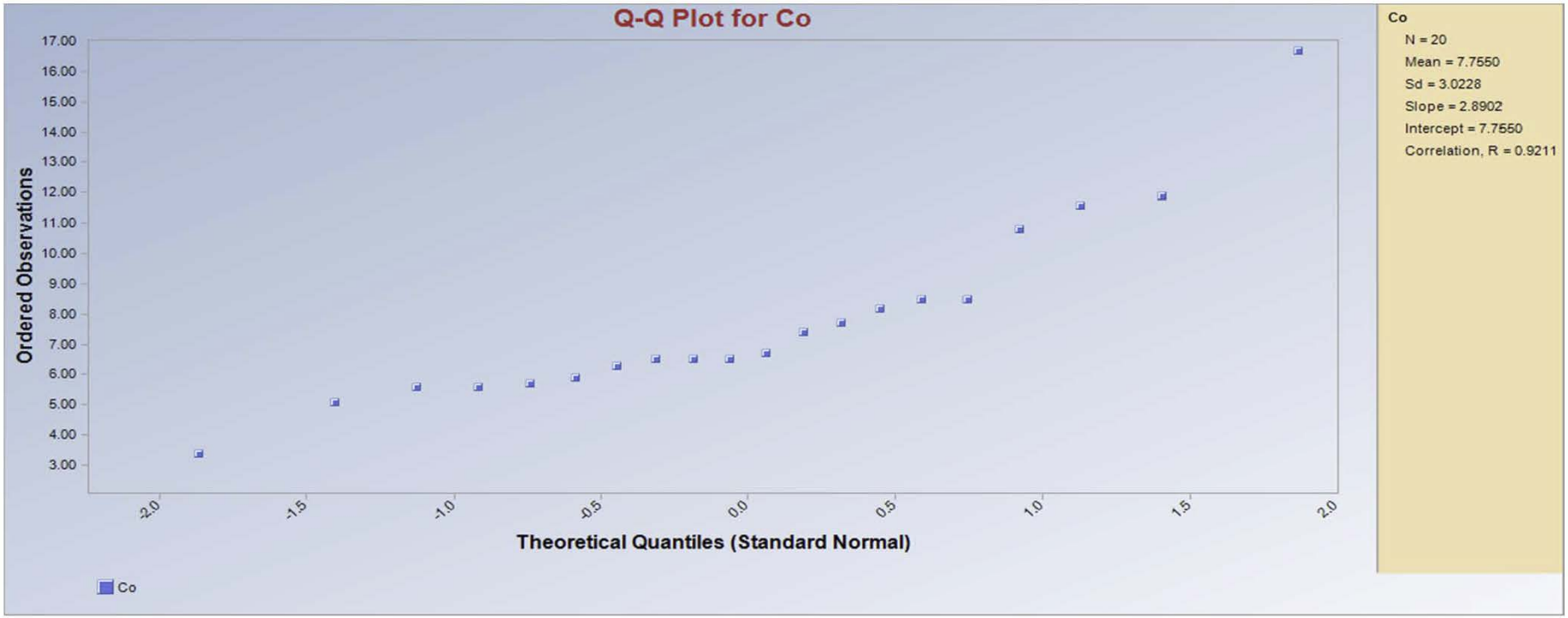

Q-Q Plot for Al
Ordered Observations
20000.00
19000.00
18000.00
17000.00
16000.00
15000.00
14000.00
13000.00
12000.00
11000.00
10000.00
9000.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Al
Al
N = 20
Mean = 15588.5000
Sd = 2373.1420
Slope = 2385.2169
Intercept = 15588.5000
Correlation, R = 0.9683

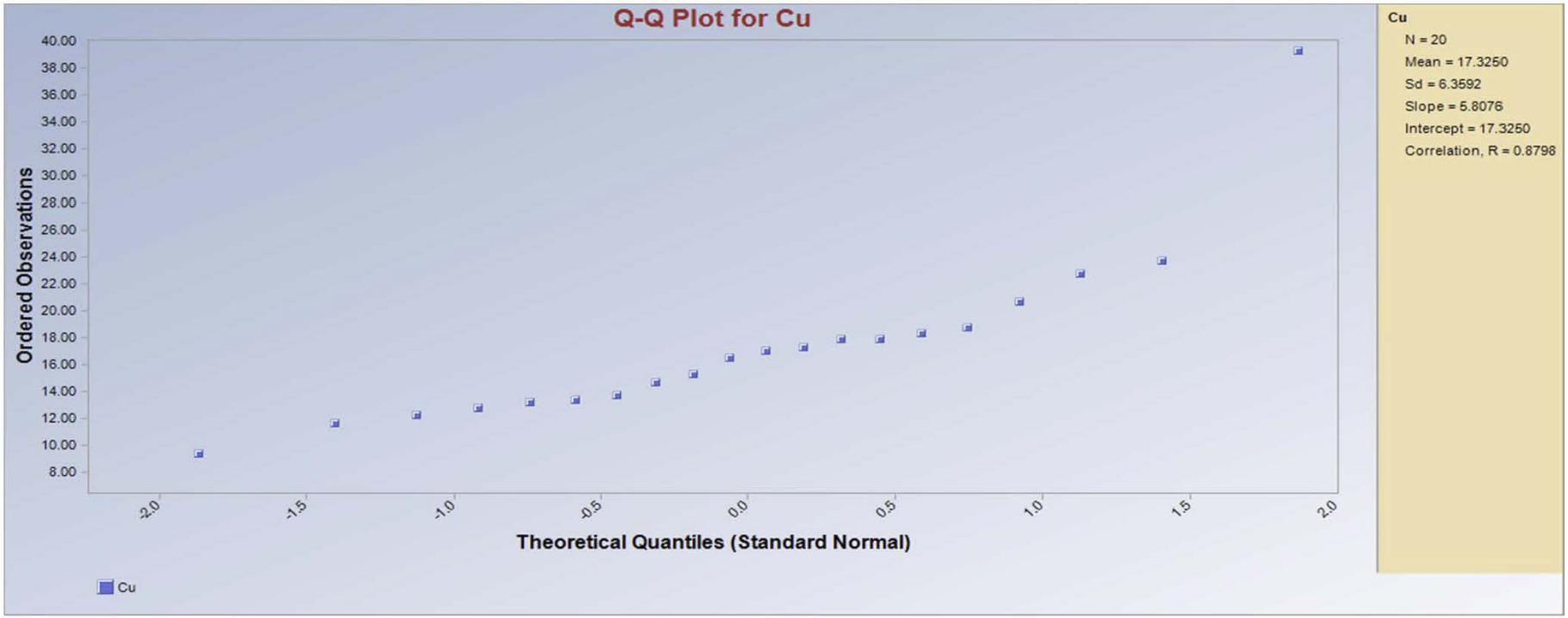

Q-Q Plot for Ba
Ordered Observations
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Ba
Ba
N = 20
Mean = 133.7150
Sd = 56.6931
Slope = 56.4902
Intercept = 133.7150
Correlation, R = 0.9616

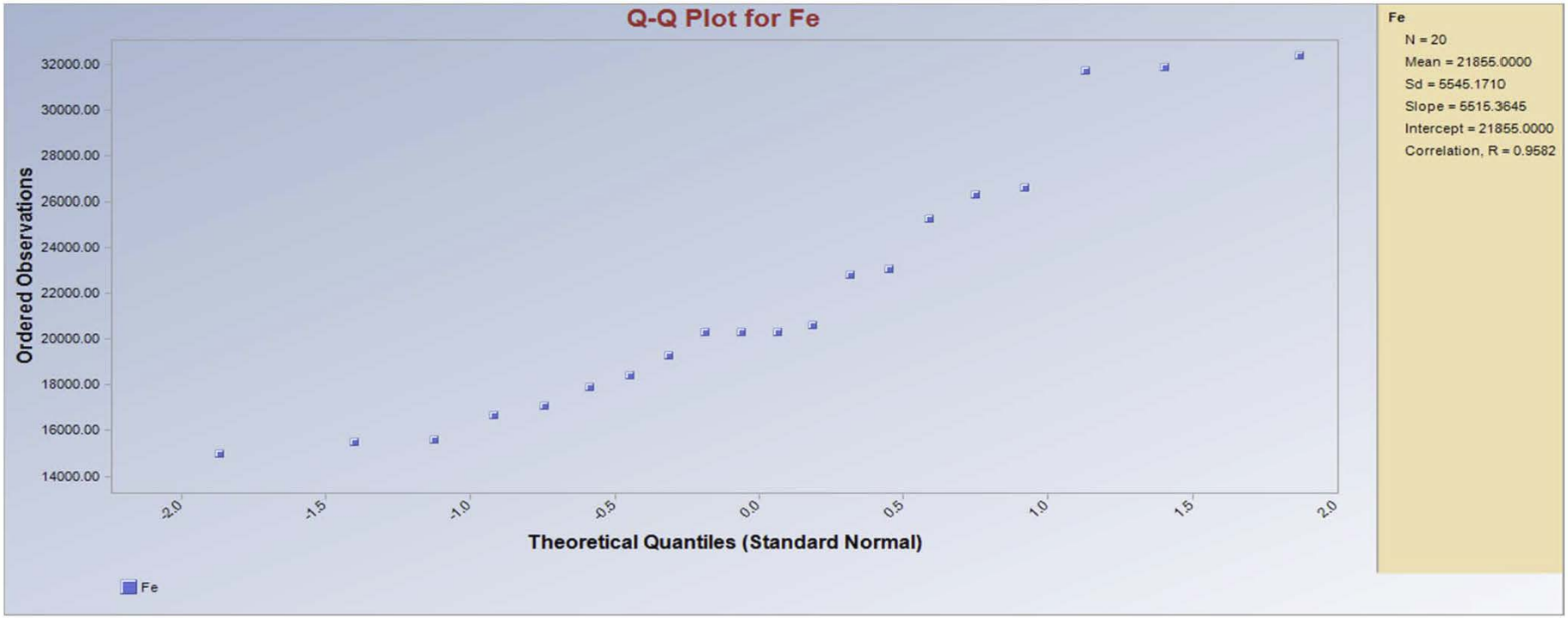

Q-Q Plot for Be
Ordered Observations
0.50
0.48
0.46
0.44
0.42
0.40
0.38
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Be
Be
N = 20
Mean = 0.3650
Sd = 0.0933
Slope = 0.0881
Intercept = 0.3650
Correlation, R = 0.9093

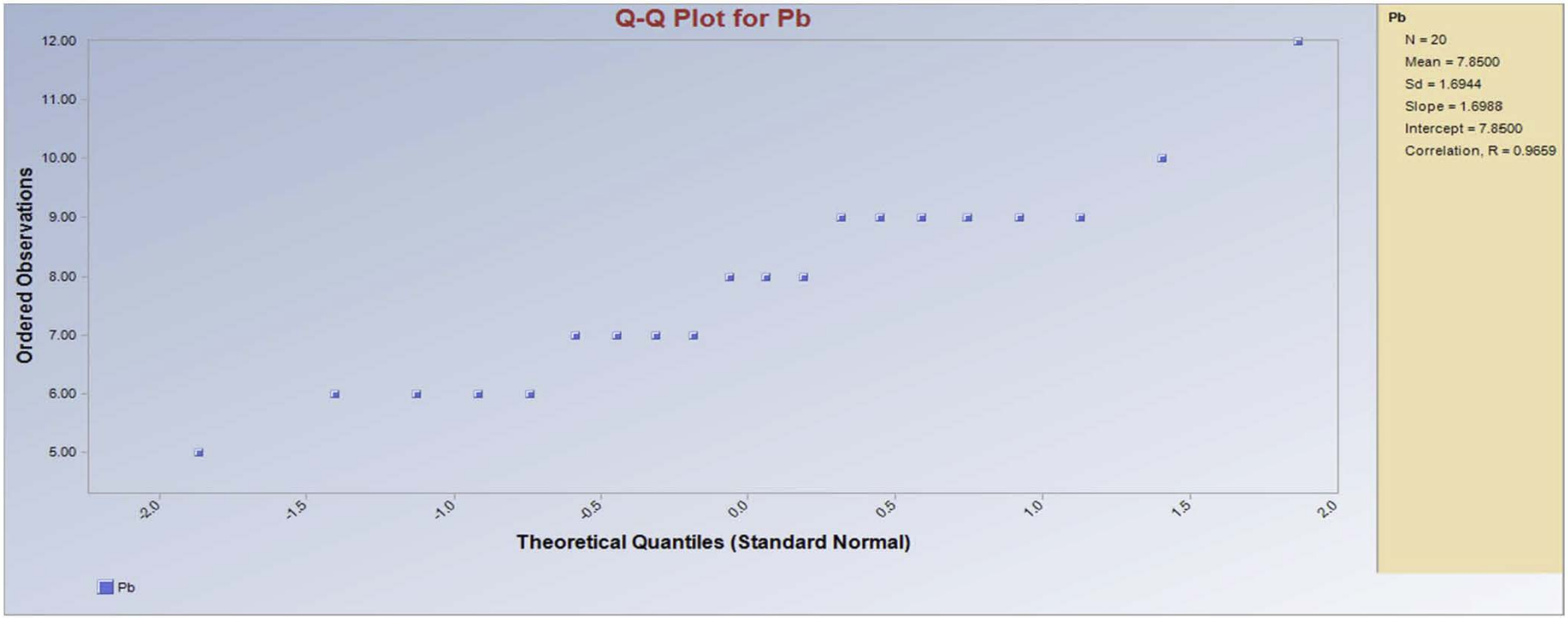

Q-Q Plot for Ca
Ordered Observations
11000.00
10000.00
9000.00
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Ca
Ca
N = 20
Mean = 2976.1000
Sd = 2640.1430
Slope = 2501.5798
Intercept = 2976.1000
Correlation, R = 0.9128

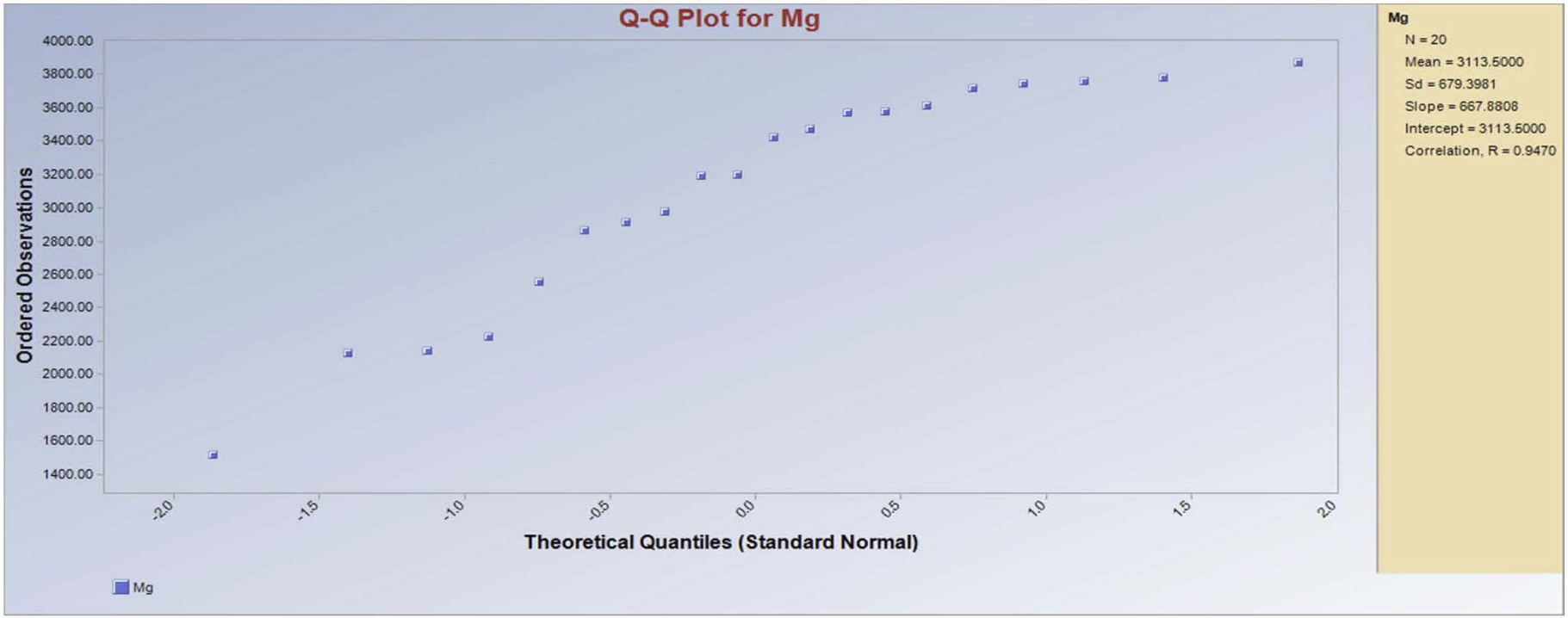

Q-Q Plot for Cr
Ordered Observations
30.00
29.00
28.00
27.00
26.00
25.00
24.00
23.00
22.00
21.00
20.00
19.00
18.00
17.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Cr
Cr
N = 20
Mean = 23.0100
Sd = 3.3301
Slope = 3.3827
Intercept = 23.0100
Correlation, R = 0.9786

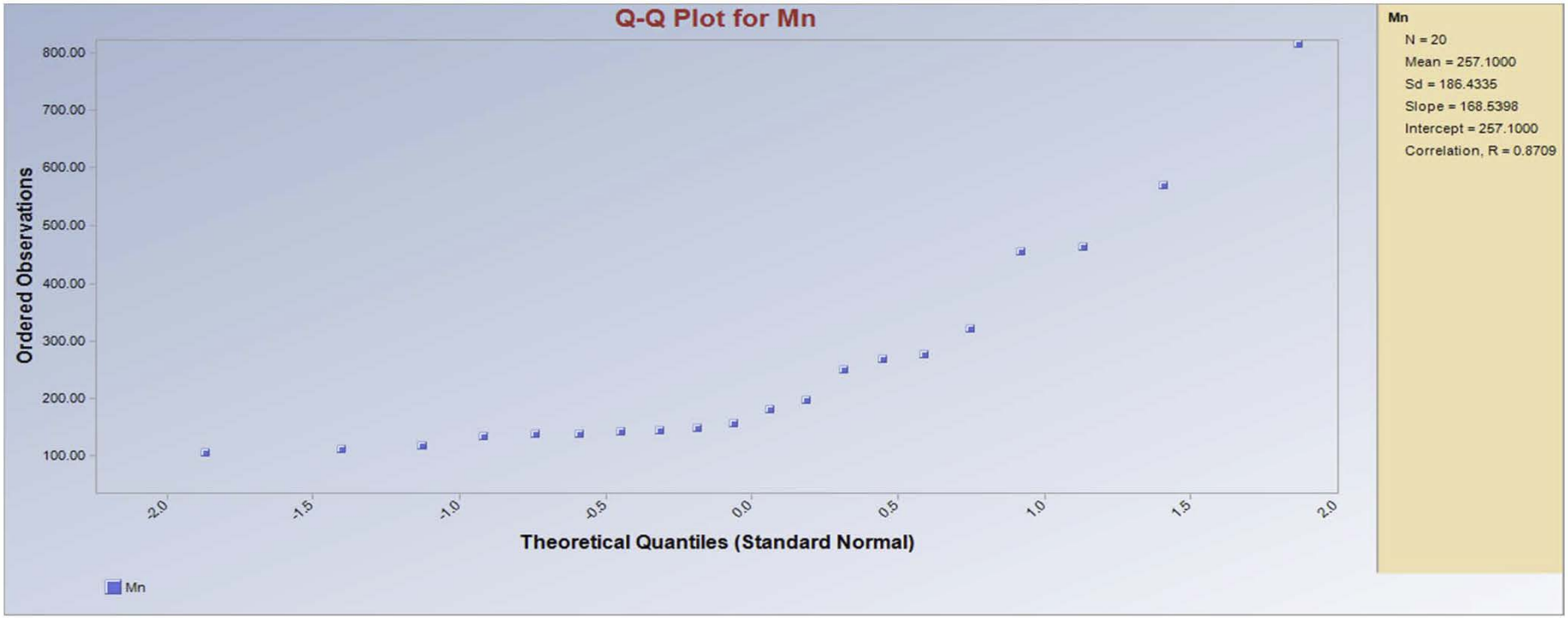

Q-Q Plot for Co
Ordered Observations
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Co
Co
N = 20
Mean = 7.7550
Sd = 3.0228
Slope = 2.8902
Intercept = 7.7550
Correlation, R = 0.9211

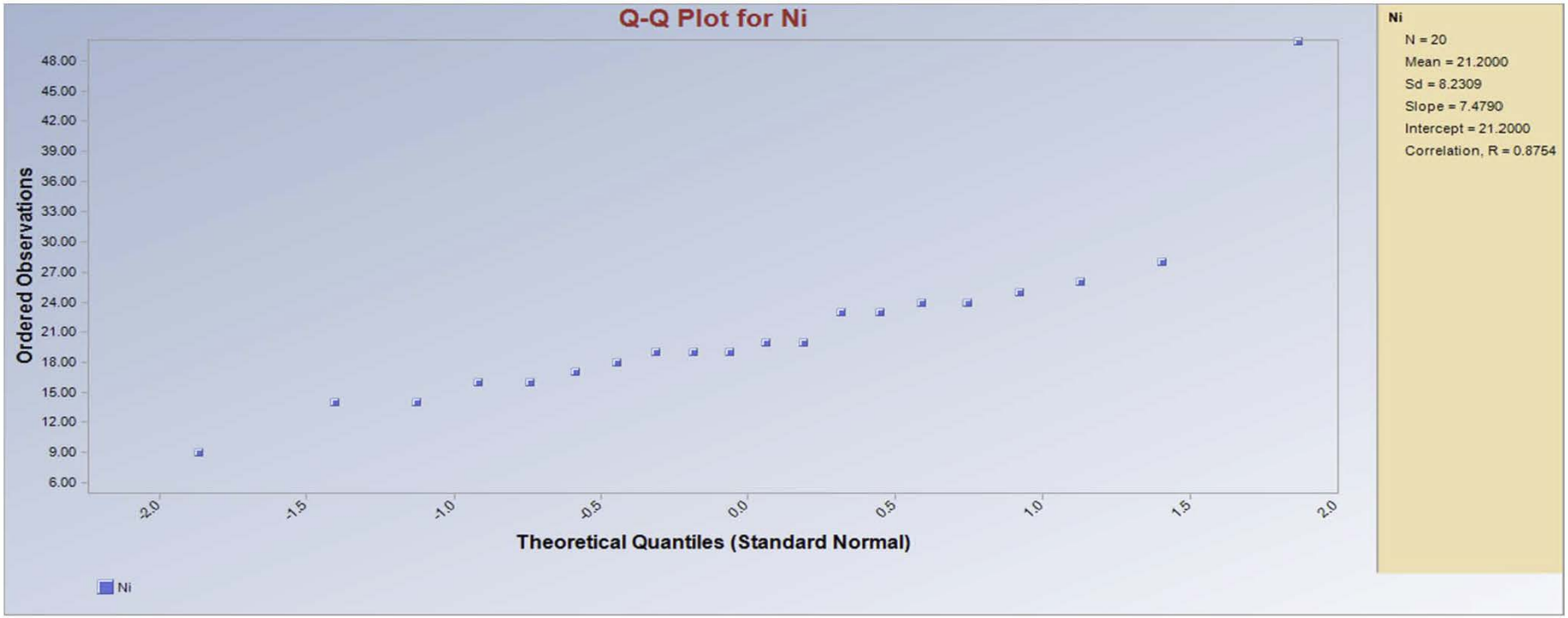

Q-Q Plot for Cu
Ordered Observations
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Cu
Cu
N = 20
Mean = 17.3250
Sd = 6.3592
Slope = 5.8076
Intercept = 17.3250
Correlation, R = 0.8798

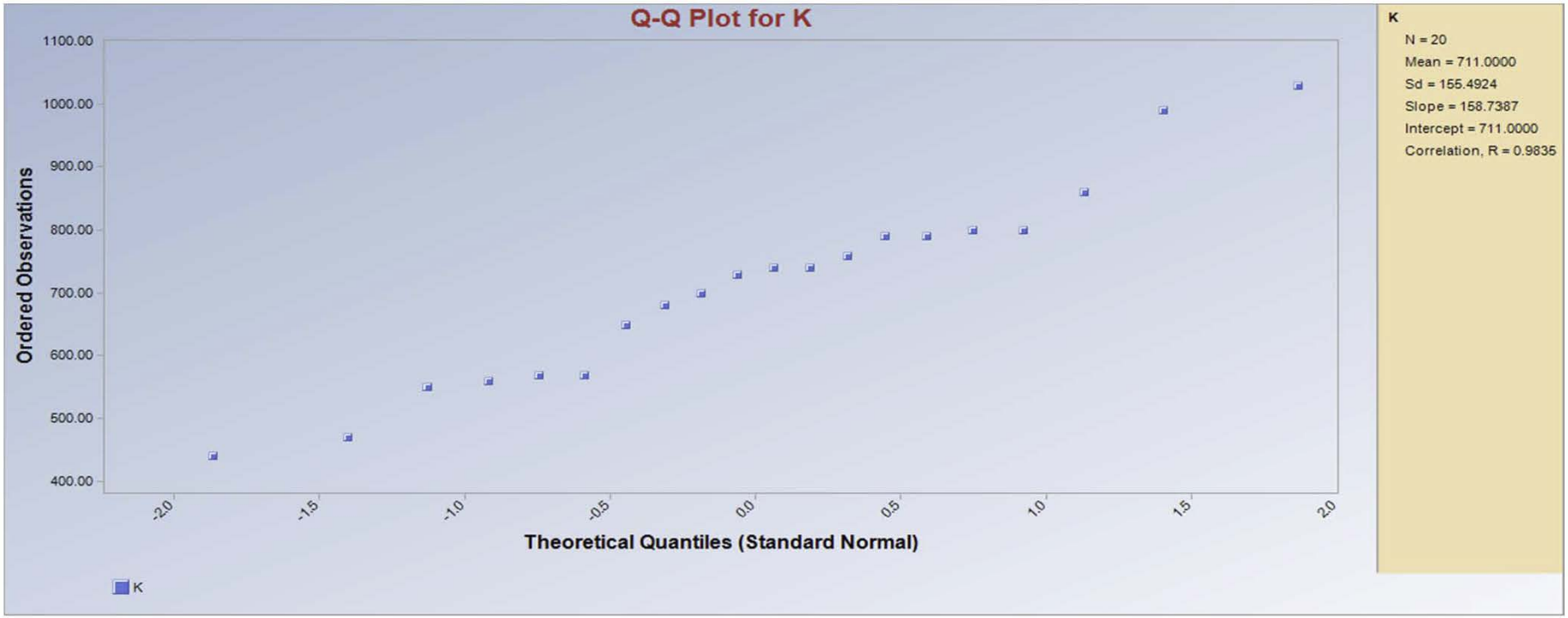

Q-Q Plot for Fe
Ordered Observations
32000.00
30000.00
28000.00
26000.00
24000.00
22000.00
20000.00
18000.00
16000.00
14000.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Fe
Fe
N = 20
Mean = 21855.0000
Sd = 5545.1710
Slope = 5515.3645
Intercept = 21855.0000
Correlation, R = 0.9582

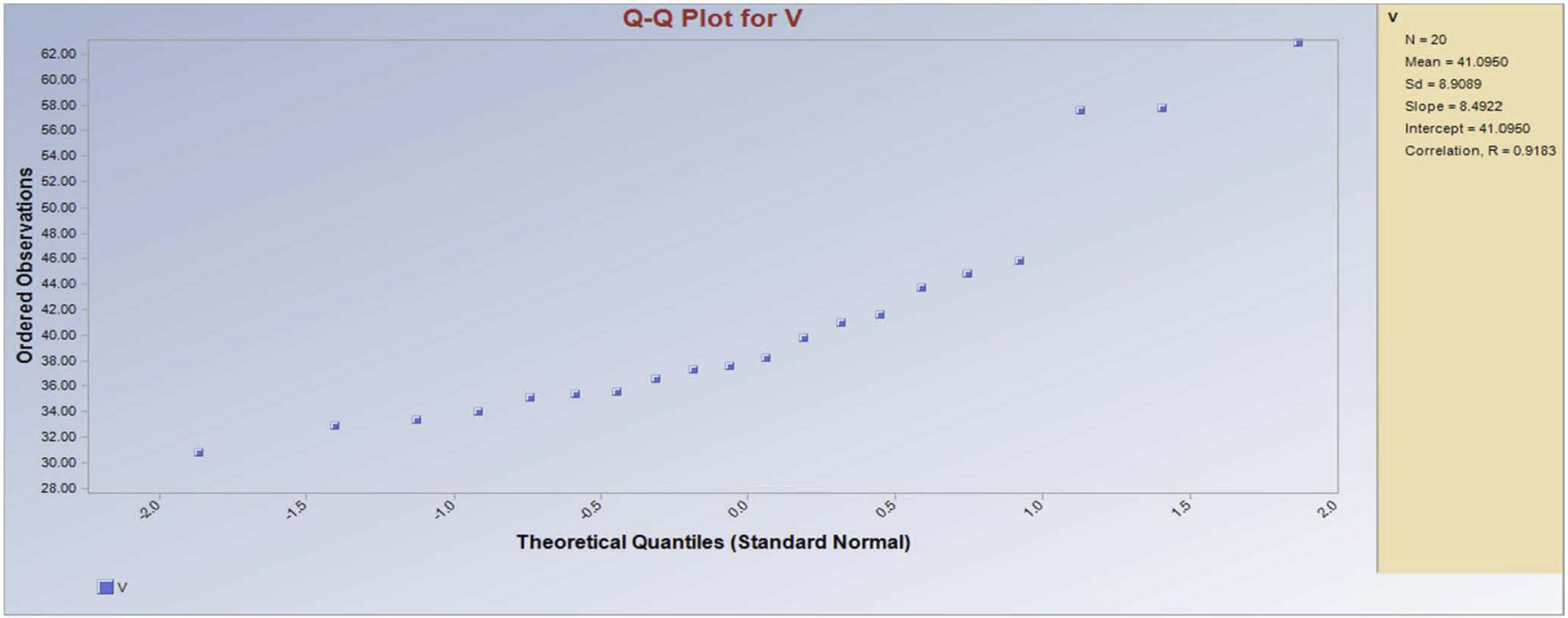

Q-Q Plot for Pb
Ordered Observations
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Pb
Pb
N = 20
Mean = 7.8500
Sd = 1.6944
Slope = 1.6988
Intercept = 7.8500
Correlation, R = 0.9659

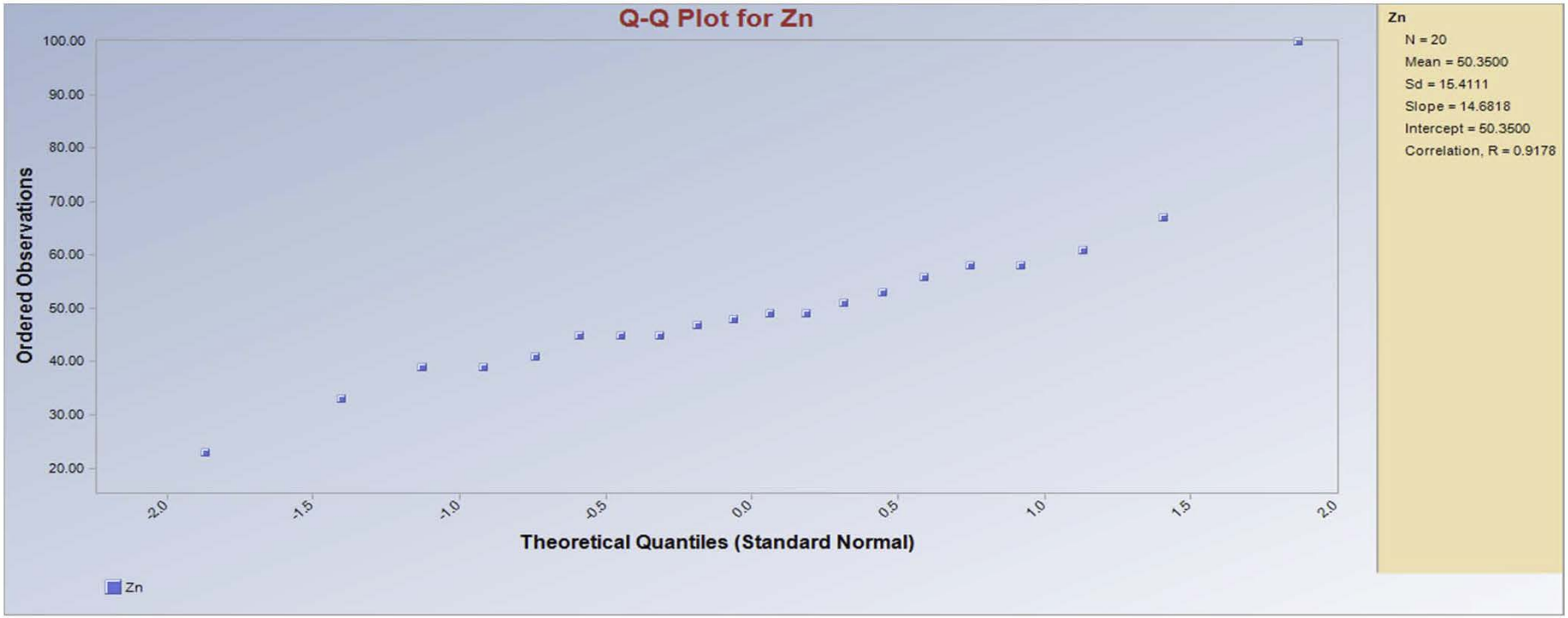

Q-Q Plot for Mg
Ordered Observations
4000.00
3800.00
3600.00
3400.00
3200.00
3000.00
2800.00
2600.00
2400.00
2200.00
2000.00
1800.00
1600.00
1400.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Mg
Mg
N = 20
Mean = 3113.5000
Sd = 679.3981
Slope = 667.8808
Intercept = 3113.5000
Correlation, R = 0.9470

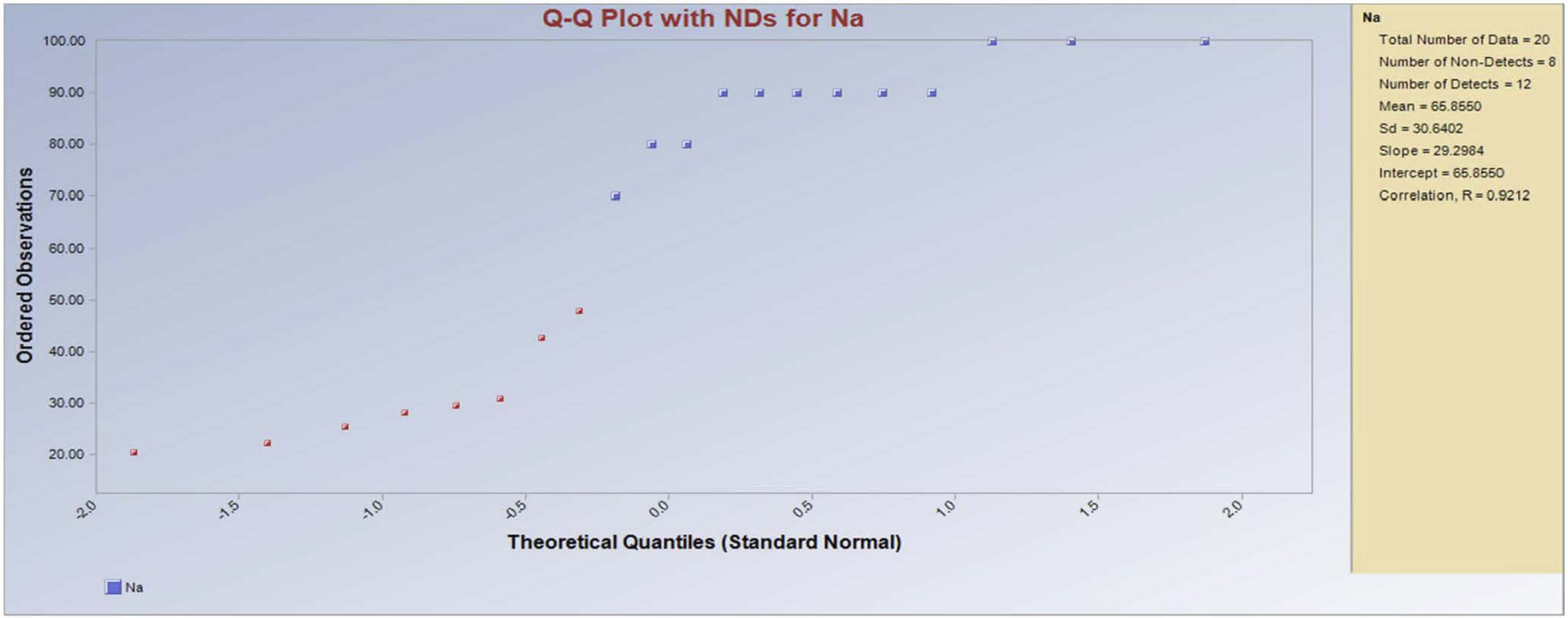

Q-Q Plot for Mn
Ordered Observations
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Mn
Mn
N = 20
Mean = 257.1000
Sd = 186.4335
Slope = 168.5398
Intercept = 257.1000
Correlation, R = 0.8709


Q-Q Plot for Ni
Ordered Observations
48.00
45.00
42.00
39.00
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Ni
Ni
N = 20
Mean = 21.2000
Sd = 8.2309
Slope = 7.4790
Intercept = 21.2000
Correlation, R = 0.8754


Q-Q Plot for K
Ordered Observations
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
K
K
N = 20
Mean = 711.0000
Sd = 155.4924
Slope = 158.7387
Intercept = 711.0000
Correlation, R = 0.9835


Q-Q Plot for V
Ordered Observations
62.00
60.00
58.00
56.00
54.00
52.00
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
V
V
N = 20
Mean = 41.0950
Sd = 8.9089
Slope = 8.4922
Intercept = 41.0950
Correlation, R = 0.9183


Q-Q Plot for Zn
Ordered Observations
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Zn
Zn
N = 20
Mean = 50.3500
Sd = 15.4111
Slope = 14.6818
Intercept = 50.3500
Correlation, R = 0.9178


Q-Q Plot with NDs for Na
Ordered Observations
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Theoretical Quantiles (Standard Normal)
Na
Na
Total Number of Data = 20
Number of Non-Detects = 8
Number of Detects = 12
Mean = 65.8550
Sd = 30.6402
Slope = 29.2984
Intercept = 65.8550
Correlation, R = 0.9212

Outlier Tests for Selected Variables

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Ba

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 266 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.243

For 10% significance level, 266 is not an outlier.
For 5% significance level, 266 is not an outlier.
For 1% significance level, 266 is not an outlier.

2. Data Value 63.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.083

For 10% significance level, 63.5 is not an outlier.
For 5% significance level, 63.5 is not an outlier.
For 1% significance level, 63.5 is not an outlier.

Dixon's Outlier Test for Ca

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 10100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.388

For 10% significance level, 10100 is not an outlier.
For 5% significance level, 10100 is not an outlier.

For 1% significance level, 10100 is not an outlier.

2. Data Value 551 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.041

For 10% significance level, 551 is not an outlier.
For 5% significance level, 551 is not an outlier.
For 1% significance level, 551 is not an outlier.

Dixon's Outlier Test for Co

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 16.7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.459

For 10% significance level, 16.7 is an outlier.
For 5% significance level, 16.7 is an outlier.
For 1% significance level, 16.7 is not an outlier.

2. Data Value 3.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.268

For 10% significance level, 3.4 is not an outlier.
For 5% significance level, 3.4 is not an outlier.
For 1% significance level, 3.4 is not an outlier.

Dixon's Outlier Test for Cu

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 39.3 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.609

For 10% significance level, 39.3 is an outlier.
For 5% significance level, 39.3 is an outlier.
For 1% significance level, 39.3 is an outlier.

2. Data Value 9.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.209

For 10% significance level, 9.4 is not an outlier.
For 5% significance level, 9.4 is not an outlier.
For 1% significance level, 9.4 is not an outlier.

Dixon's Outlier Test for Pb

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 12 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.500

For 10% significance level, 12 is an outlier.
For 5% significance level, 12 is an outlier.
For 1% significance level, 12 is not an outlier.

2. Data Value 5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.250

For 10% significance level, 5 is not an outlier.
For 5% significance level, 5 is not an outlier.
For 1% significance level, 5 is not an outlier.

Dixon's Outlier Test for Mn

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 816 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.503

For 10% significance level, 816 is an outlier.
For 5% significance level, 816 is an outlier.
For 1% significance level, 816 is not an outlier.

2. Data Value 106 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.033

For 10% significance level, 106 is not an outlier.
For 5% significance level, 106 is not an outlier.
For 1% significance level, 106 is not an outlier.

Dixon's Outlier Test for Ni

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 50 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.667

For 10% significance level, 50 is an outlier.
For 5% significance level, 50 is an outlier.
For 1% significance level, 50 is an outlier.

2. Data Value 9 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.294

For 10% significance level, 9 is not an outlier.
For 5% significance level, 9 is not an outlier.
For 1% significance level, 9 is not an outlier.

Dixon's Outlier Test for V

Number of data = 20
10% critical value: 0.401

5% critical value: 0.45
1% critical value: 0.535

1. Data Value 62.9 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.180

For 10% significance level, 62.9 is not an outlier.
For 5% significance level, 62.9 is not an outlier.
For 1% significance level, 62.9 is not an outlier.

2. Data Value 30.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.097

For 10% significance level, 30.8 is not an outlier.
For 5% significance level, 30.8 is not an outlier.
For 1% significance level, 30.8 is not an outlier.

Dixon's Outlier Test for Zn

Number of data = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Data Value 100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.639

For 10% significance level, 100 is an outlier.
For 5% significance level, 100 is an outlier.
For 1% significance level, 100 is an outlier.

2. Data Value 23 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.421

For 10% significance level, 23 is an outlier.
For 5% significance level, 23 is not an outlier.
For 1% significance level, 23 is not an outlier.

General Background Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Al

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	17
Tolerance Factor	1.974	Number of Missing Values	2

Raw Statistics		Log-Transformed Statistics	
Minimum	13400	Minimum	9.503
Maximum	19600	Maximum	9.883
Second Largest	19500	Second Largest	9.878
First Quartile	14175	First Quartile	9.559
Median	15450	Median	9.645
Third Quartile	17475	Third Quartile	9.769
Mean	15911	Mean	9.668
Geometric Mean	15797	SD	0.123
SD	1994		
Coefficient of Variation	0.125		
Skewness	0.587		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	19847	95% UTL with 90% Coverage	20119
95% UPL (t)	19475	95% UPL (t)	19664
90% Percentile (z)	18467	90% Percentile (z)	18483
95% Percentile (z)	19191	95% Percentile (z)	19324
99% Percentile (z)	20550	99% Percentile (z)	21007

Gamma Distribution Test		Data Distribution Test
k star	58.09	Data appear Normal at 5% Significance Level
Theta Star	273.9	
MLE of Mean	15911	
MLE of Standard Deviation	2088	
nu star	2091	

A-D Test Statistic	0.596	Nonparametric Statistics	
5% A-D Critical Value	0.738	90% Percentile	18660
K-S Test Statistic	0.174	95% Percentile	19515
5% K-S Critical Value	0.203	99% Percentile	19583
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	19600
90% Percentile	18638	95% Percentile Bootstrap UTL with 90% Coverage	19600
95% Percentile	19493	95% BCA Bootstrap UTL with 90% Coverage	19600
99% Percentile	21166	95% UPL	19600
		95% Chebyshev UPL	24841
95% WH Approx. Gamma UPL	19593	Upper Threshold Limit Based upon IQR	22425
95% HW Approx. Gamma UPL	19610		
95% WH Approx. Gamma UTL with 90% Coverage	20017		
95% HW Approx. Gamma UTL with 90% Coverage	20041		

Ba

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	63.5	Minimum	4.151
Maximum	266	Maximum	5.583
Second Largest	231	Second Largest	5.442
First Quartile	87.58	First Quartile	4.471
Median	117.5	Median	4.766
Third Quartile	147.3	Third Quartile	4.992
Mean	131.5	Mean	4.792
Geometric Mean	120.6	SD	0.422
SD	59.06		
Coefficient of Variation	0.449		
Skewness	1.036		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	248.1	95% UTL with 90% Coverage	277.5
95% UPL (t)	237.1	95% UPL (t)	256.5
90% Percentile (z)	207.2	90% Percentile (z)	207.2
95% Percentile (z)	228.7	95% Percentile (z)	241.5
99% Percentile (z)	268.9	99% Percentile (z)	322.1
Gamma Distribution Test		Data Distribution Test	
k star	4.96	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	26.51		
MLE of Mean	131.5		
MLE of Standard Deviation	59.05		
nu star	178.6		
A-D Test Statistic	0.366	Nonparametric Statistics	
5% A-D Critical Value	0.742	90% Percentile	223.3
K-S Test Statistic	0.116	95% Percentile	236.3
5% K-S Critical Value	0.204	99% Percentile	260.1
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	266
90% Percentile	210.6	95% Percentile Bootstrap UTL with 90% Coverage	266
95% Percentile	241.2	95% BCA Bootstrap UTL with 90% Coverage	266
99% Percentile	306.1	95% UPL	266
		95% Chebyshev UPL	396
95% WH Approx. Gamma UPL	246.6	Upper Threshold Limit Based upon IQR	236.8
95% HW Approx. Gamma UPL	248.6		
95% WH Approx. Gamma UTL with 90% Coverage	262.8		
95% HW Approx. Gamma UTL with 90% Coverage	265.8		

Be

General Statistics

Total Number of Observations	18	Number of Distinct Observations	4
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	0.2	Minimum	-1.609
Maximum	0.5	Maximum	-0.693
Second Largest	0.5	Second Largest	-0.693
First Quartile	0.3	First Quartile	-1.204
Median	0.3	Median	-1.204
Third Quartile	0.4	Third Quartile	-0.916
Mean	0.356	Mean	-1.065
Geometric Mean	0.345	SD	0.255
SD	0.0922		
Coefficient of Variation	0.259		
Skewness	0.578		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.817
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.538	95% UTL with 90% Coverage	0.571
95% UPL (t)	0.52	95% UPL (t)	0.544
90% Percentile (z)	0.474	90% Percentile (z)	0.478
95% Percentile (z)	0.507	95% Percentile (z)	0.525
99% Percentile (z)	0.57	99% Percentile (z)	0.624

Gamma Distribution Test		Data Distribution Test	
k star	13.63	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0261		
MLE of Mean	0.356		
MLE of Standard Deviation	0.0963		
nu star	490.8		
A-D Test Statistic	1.751	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	0.5
K-S Test Statistic	0.331	95% Percentile	0.5
5% K-S Critical Value	0.203	99% Percentile	0.5
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	0.5
90% Percentile	0.483	95% Percentile Bootstrap UTL with 90% Coverage	0.5
95% Percentile	0.527	95% BCA Bootstrap UTL with 90% Coverage	0.5
99% Percentile	0.617	95% UPL	0.5
		95% Chebyshev UPL	0.768
95% WH Approx. Gamma UPL	0.534	Upper Threshold Limit Based upon IQR	0.55
95% HW Approx. Gamma UPL	0.536		
95% WH Approx. Gamma UTL with 90% Coverage	0.556		
95% HW Approx. Gamma UTL with 90% Coverage	0.559		

Ca

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	551	Minimum	6.312
Maximum	10100	Maximum	9.22
Second Largest	6590	Second Largest	8.793
First Quartile	981.5	First Quartile	6.889
Median	1735	Median	7.398
Third Quartile	3870	Third Quartile	8.256
Mean	2839	Mean	7.566
Geometric Mean	1932	SD	0.901
SD	2653		
Coefficient of Variation	0.934		
Skewness	1.503		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.809	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	8076	95% UTL with 90% Coverage	11435
95% UPL (t)	7580	95% UPL (t)	9665
90% Percentile (z)	6239	90% Percentile (z)	6129
95% Percentile (z)	7202	95% Percentile (z)	8501
99% Percentile (z)	9010	99% Percentile (z)	15706

Gamma Distribution Test		Data Distribution Test	
k star	1.24	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2290		
MLE of Mean	2839		
MLE of Standard Deviation	2550		
nu star	44.63		
A-D Test Statistic	0.711	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	6520
K-S Test Statistic	0.242	95% Percentile	7116
5% K-S Critical Value	0.207	99% Percentile	9503
Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	10100
90% Percentile	6199	95% Percentile Bootstrap UTL with 90% Coverage	10100
95% Percentile	7890	95% BCA Bootstrap UTL with 90% Coverage	10100
99% Percentile	11756	95% UPL	10100
		95% Chebyshev UPL	14719
95% WH Approx. Gamma UPL	8269	Upper Threshold Limit Based upon IQR	8203
95% HW Approx. Gamma UPL	8499		
95% WH Approx. Gamma UTL with 90% Coverage	9228		
95% HW Approx. Gamma UTL with 90% Coverage	9587		

Cr

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	16
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	18	Minimum	2.89
Maximum	30	Maximum	3.401
Second Largest	27.6	Second Largest	3.318
First Quartile	21.1	First Quartile	3.049
Median	22.15	Median	3.098
Third Quartile	24	Third Quartile	3.178
Mean	22.88	Mean	3.121
Geometric Mean	22.68	SD	0.136
SD	3.183		
Coefficient of Variation	0.139		
Skewness	0.639		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.959	Shapiro Wilk Test Statistic	0.976
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	29.16	95% UTL with 90% Coverage	29.67
95% UPL (t)	28.57	95% UPL (t)	28.92
90% Percentile (z)	26.96	90% Percentile (z)	27
95% Percentile (z)	28.11	95% Percentile (z)	28.37
99% Percentile (z)	30.28	99% Percentile (z)	31.12

Gamma Distribution Test		Data Distribution Test	
k star	47.18	Data appear Normal at 5% Significance Level	
Theta Star	0.485		
MLE of Mean	22.88		
MLE of Standard Deviation	3.331		
nu star	1698		
A-D Test Statistic	0.254	Nonparametric Statistics	
5% A-D Critical Value	0.738	90% Percentile	26.97
K-S Test Statistic	0.124	95% Percentile	27.96
5% K-S Critical Value	0.203	99% Percentile	29.59
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	30
90% Percentile	27.24	95% Percentile Bootstrap UTL with 90% Coverage	30
95% Percentile	28.62	95% BCA Bootstrap UTL with 90% Coverage	30
99% Percentile	31.33	95% UPL	30
		95% Chebyshev UPL	37.13
95% WH Approx. Gamma UPL	28.78	Upper Threshold Limit Based upon IQR	28.35
95% HW Approx. Gamma UPL	28.82		
95% WH Approx. Gamma UTL with 90% Coverage	29.47		
95% HW Approx. Gamma UTL with 90% Coverage	29.52		

Co

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	15
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	3.4	Minimum	1.224
Maximum	11.9	Maximum	2.477
Second Largest	11.6	Second Largest	2.451
First Quartile	5.75	First Quartile	1.749
Median	6.5	Median	1.872
Third Quartile	8.075	Third Quartile	2.088
Mean	7.217	Mean	1.931
Geometric Mean	6.899	SD	0.309
SD	2.273		
Coefficient of Variation	0.315		
Skewness	0.873		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	11.7	95% UTL with 90% Coverage	12.69
95% UPL (t)	11.28	95% UPL (t)	11.98
90% Percentile (z)	10.13	90% Percentile (z)	10.25
95% Percentile (z)	10.96	95% Percentile (z)	11.46
99% Percentile (z)	12.5	99% Percentile (z)	14.14

Gamma Distribution Test		Data Distribution Test	
k star	9.444	Data appear Normal at 5% Significance Level	
Theta Star	0.764		
MLE of Mean	7.217		
MLE of Standard Deviation	2.348		
nu star	340		
A-D Test Statistic	0.543	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	11.04
K-S Test Statistic	0.169	95% Percentile	11.65
5% K-S Critical Value	0.203	99% Percentile	11.85
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	11.9
90% Percentile	10.34	95% Percentile Bootstrap UTL with 90% Coverage	11.9
95% Percentile	11.46	95% BCA Bootstrap UTL with 90% Coverage	11.9
99% Percentile	13.77	95% UPL	11.9
		95% Chebyshev UPL	17.4
95% WH Approx. Gamma UPL	11.63	Upper Threshold Limit Based upon IQR	11.56
95% HW Approx. Gamma UPL	11.7		
95% WH Approx. Gamma UTL with 90% Coverage	12.21		
95% HW Approx. Gamma UTL with 90% Coverage	12.31		

Cu

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	9.4	Minimum	2.241
Maximum	23.7	Maximum	3.165
Second Largest	22.8	Second Largest	3.127
First Quartile	13.25	First Quartile	2.584
Median	15.9	Median	2.766
Third Quartile	18.2	Third Quartile	2.901
Mean	16.07	Mean	2.749
Geometric Mean	15.63	SD	0.244
SD	3.887		
Coefficient of Variation	0.242		
Skewness	0.393		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.983
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	23.75	95% UTL with 90% Coverage	25.32
95% UPL (t)	23.02	95% UPL (t)	24.19
90% Percentile (z)	21.05	90% Percentile (z)	21.38
95% Percentile (z)	22.47	95% Percentile (z)	23.36
99% Percentile (z)	25.12	99% Percentile (z)	27.6

Gamma Distribution Test		Data Distribution Test	
k star	15.14	Data appear Normal at 5% Significance Level	
Theta Star	1.062		
MLE of Mean	16.07		
MLE of Standard Deviation	4.131		
nu star	544.9		
A-D Test Statistic	0.163	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	21.33
K-S Test Statistic	0.109	95% Percentile	22.94
5% K-S Critical Value	0.203	99% Percentile	23.55
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	23.7
90% Percentile	21.54	95% Percentile Bootstrap UTL with 90% Coverage	23.7
95% Percentile	23.42	95% BCA Bootstrap UTL with 90% Coverage	23.7
99% Percentile	27.21	95% UPL	23.7
		95% Chebyshev UPL	33.48
95% WH Approx. Gamma UPL	23.68	Upper Threshold Limit Based upon IQR	25.63
95% HW Approx. Gamma UPL	23.79		
95% WH Approx. Gamma UTL with 90% Coverage	24.63		
95% HW Approx. Gamma UTL with 90% Coverage	24.79		

Fe

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	16
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	15000	Minimum	9.616
Maximum	32400	Maximum	10.39
Second Largest	31900	Second Largest	10.37
First Quartile	17300	First Quartile	9.758
Median	20300	Median	9.918
Third Quartile	24750	Third Quartile	10.12
Mean	21378	Mean	9.943
Geometric Mean	20799	SD	0.238
SD	5323		
Coefficient of Variation	0.249		
Skewness	0.841		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	31885	95% UTL with 90% Coverage	33251
95% UPL (t)	30891	95% UPL (t)	31807
90% Percentile (z)	28199	90% Percentile (z)	28205
95% Percentile (z)	30133	95% Percentile (z)	30749
99% Percentile (z)	33760	99% Percentile (z)	36155

Gamma Distribution Test		Data Distribution Test	
k star	15.36	Data appear Normal at 5% Significance Level	
Theta Star	1392		
MLE of Mean	21378		
MLE of Standard Deviation	5455		
nu star	552.9		
A-D Test Statistic	0.399	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	28190
K-S Test Statistic	0.167	95% Percentile	31975
5% K-S Critical Value	0.203	99% Percentile	32315
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	32400
90% Percentile	28598	95% Percentile Bootstrap UTL with 90% Coverage	32400
95% Percentile	31069	95% BCA Bootstrap UTL with 90% Coverage	32400
99% Percentile	36067	95% UPL	32400
		95% Chebyshev UPL	45215
95% WH Approx. Gamma UPL	31413	Upper Threshold Limit Based upon IQR	35925
95% HW Approx. Gamma UPL	31502		
95% WH Approx. Gamma UTL with 90% Coverage	32668		
95% HW Approx. Gamma UTL with 90% Coverage	32799		

Pb

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	6
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	5	Minimum	1.609
Maximum	10	Maximum	2.303
Second Largest	9	Second Largest	2.197
First Quartile	6.25	First Quartile	1.83
Median	8	Median	2.079
Third Quartile	9	Third Quartile	2.197
Mean	7.667	Mean	2.019
Geometric Mean	7.529	SD	0.199
SD	1.455		
Coefficient of Variation	0.19		
Skewness	-0.243		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	10.54	95% UTL with 90% Coverage	11.15
95% UPL (t)	10.27	95% UPL (t)	10.74
90% Percentile (z)	9.532	90% Percentile (z)	9.715
95% Percentile (z)	10.06	95% Percentile (z)	10.44
99% Percentile (z)	11.05	99% Percentile (z)	11.96

Gamma Distribution Test		Data Distribution Test	
k star	23.22	Data appear Normal at 5% Significance Level	
Theta Star	0.33		
MLE of Mean	7.667		
MLE of Standard Deviation	1.591		
nu star	836		
A-D Test Statistic	0.829	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	9
K-S Test Statistic	0.213	95% Percentile	9.15
5% K-S Critical Value	0.203	99% Percentile	9.83
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	10
90% Percentile	9.763	95% Percentile Bootstrap UTL with 90% Coverage	10
95% Percentile	10.46	95% BCA Bootstrap UTL with 90% Coverage	8
99% Percentile	11.84	95% UPL	10
		95% Chebyshev UPL	14.18
95% WH Approx. Gamma UPL	10.55	Upper Threshold Limit Based upon IQR	13.13
95% HW Approx. Gamma UPL	10.59		
95% WH Approx. Gamma UTL with 90% Coverage	10.9		
95% HW Approx. Gamma UTL with 90% Coverage	10.96		

Mg

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	1520	Minimum	7.326
Maximum	3870	Maximum	8.261
Second Largest	3780	Second Largest	8.237
First Quartile	2883	First Quartile	7.966
Median	3310	Median	8.104
Third Quartile	3603	Third Quartile	8.189
Mean	3129	Mean	8.022
Geometric Mean	3046	SD	0.252
SD	669.4		
Coefficient of Variation	0.214		
Skewness	-1.062		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	4450	95% UTL with 90% Coverage	5009
95% UPL (t)	4325	95% UPL (t)	4778
90% Percentile (z)	3987	90% Percentile (z)	4207
95% Percentile (z)	4230	95% Percentile (z)	4610
99% Percentile (z)	4686	99% Percentile (z)	5473

Gamma Distribution Test		Data Distribution Test	
k star	15.77	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	198.4		
MLE of Mean	3129		
MLE of Standard Deviation	788		
nu star	567.6		
A-D Test Statistic	0.965	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	3766
K-S Test Statistic	0.18	95% Percentile	3794
5% K-S Critical Value	0.203	99% Percentile	3855
Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	3870
90% Percentile	4172	95% Percentile Bootstrap UTL with 90% Coverage	3870
95% Percentile	4528	95% BCA Bootstrap UTL with 90% Coverage	3870
99% Percentile	5247	95% UPL	3870
		95% Chebyshev UPL	6127
95% WH Approx. Gamma UPL	4579	Upper Threshold Limit Based upon IQR	4683
95% HW Approx. Gamma UPL	4622		
95% WH Approx. Gamma UTL with 90% Coverage	4759		
95% HW Approx. Gamma UTL with 90% Coverage	4813		

Mn

General Statistics			
Total Number of Observations	17	Number of Distinct Observations	16
Tolerance Factor	2.002	Number of Missing Values	3
Raw Statistics		Log-Transformed Statistics	
Minimum	106	Minimum	4.663
Maximum	465	Maximum	6.142
Second Largest	455	Second Largest	6.12
First Quartile	139	First Quartile	4.934
Median	148	Median	4.997
Third Quartile	251	Third Quartile	5.525
Mean	202.1	Mean	5.2
Geometric Mean	181.2	SD	0.453
SD	110.3		
Coefficient of Variation	0.546		
Skewness	1.664		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	422.8	95% UTL with 90% Coverage	448.9
95% UPL (t)	400.1	95% UPL (t)	409
90% Percentile (z)	343.4	90% Percentile (z)	323.9
95% Percentile (z)	383.4	95% Percentile (z)	381.9
99% Percentile (z)	458.6	99% Percentile (z)	520

Gamma Distribution Test		Data Distribution Test	
k star	3.959	Data do not follow a Discernable Distribution (0.05)	
Theta Star	51.04		
MLE of Mean	202.1		
MLE of Standard Deviation	101.6		
nu star	134.6		
A-D Test Statistic	1.089	Nonparametric Statistics	
5% A-D Critical Value	0.742	90% Percentile	347.6
K-S Test Statistic	0.233	95% Percentile	457
5% K-S Critical Value	0.21	99% Percentile	463.4
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	465
90% Percentile	338.2	95% Percentile Bootstrap UTL with 90% Coverage	465
95% Percentile	392.7	95% BCA Bootstrap UTL with 90% Coverage	465
99% Percentile	509.3	95% UPL	465
		95% Chebyshev UPL	696.6
95% WH Approx. Gamma UPL	402.5	Upper Threshold Limit Based upon IQR	419
95% HW Approx. Gamma UPL	403.6		
95% WH Approx. Gamma UTL with 90% Coverage	434.3		
95% HW Approx. Gamma UTL with 90% Coverage	437.2		

Hg

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	15
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	0.13	Minimum	-2.04
Maximum	1.86	Maximum	0.621
Second Largest	1.57	Second Largest	0.451
First Quartile	0.19	First Quartile	-1.661
Median	0.23	Median	-1.47
Third Quartile	0.53	Third Quartile	-0.668
Mean	0.47	Mean	-1.146
Geometric Mean	0.318	SD	0.829
SD	0.511		
Coefficient of Variation	1.087		
Skewness	1.937		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.838
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	1.479	95% UTL with 90% Coverage	1.634
95% UPL (t)	1.383	95% UPL (t)	1.399
90% Percentile (z)	1.125	90% Percentile (z)	0.92
95% Percentile (z)	1.311	95% Percentile (z)	1.243
99% Percentile (z)	1.659	99% Percentile (z)	2.188

Gamma Distribution Test		Data Distribution Test	
k star	1.222	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.385		
MLE of Mean	0.47		
MLE of Standard Deviation	0.425		
nu star	44		
A-D Test Statistic	1.738	Nonparametric Statistics	
5% A-D Critical Value	0.758	90% Percentile	1.143
K-S Test Statistic	0.317	95% Percentile	1.614
5% K-S Critical Value	0.208	99% Percentile	1.811
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	1.86
90% Percentile	1.03	95% Percentile Bootstrap UTL with 90% Coverage	1.86
95% Percentile	1.313	95% BCA Bootstrap UTL with 90% Coverage	1.86
99% Percentile	1.96	95% UPL	1.86
		95% Chebyshev UPL	2.758
95% WH Approx. Gamma UPL	1.358	Upper Threshold Limit Based upon IQR	1.04
95% HW Approx. Gamma UPL	1.363		
95% WH Approx. Gamma UTL with 90% Coverage	1.517		
95% HW Approx. Gamma UTL with 90% Coverage	1.536		

Ni

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	12
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	9	Minimum	2.197
Maximum	28	Maximum	3.332
Second Largest	26	Second Largest	3.258
First Quartile	16.25	First Quartile	2.788
Median	19	Median	2.944
Third Quartile	23.75	Third Quartile	3.167
Mean	19.5	Mean	2.937
Geometric Mean	18.86	SD	0.276
SD	4.866		
Coefficient of Variation	0.25		
Skewness	-0.181		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.976	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	29.11	95% UTL with 90% Coverage	32.51
95% UPL (t)	28.2	95% UPL (t)	30.88
90% Percentile (z)	25.74	90% Percentile (z)	26.86
95% Percentile (z)	27.5	95% Percentile (z)	29.69
99% Percentile (z)	30.82	99% Percentile (z)	35.83

Gamma Distribution Test		Data Distribution Test	
k star	12.72	Data appear Normal at 5% Significance Level	
Theta Star	1.533		
MLE of Mean	19.5		
MLE of Standard Deviation	5.467		
nu star	457.9		
A-D Test Statistic	0.293	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	25.3
K-S Test Statistic	0.106	95% Percentile	26.3
5% K-S Critical Value	0.203	99% Percentile	27.66
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	28
90% Percentile	26.75	95% Percentile Bootstrap UTL with 90% Coverage	28
95% Percentile	29.28	95% BCA Bootstrap UTL with 90% Coverage	28
99% Percentile	34.42	95% UPL	28
		95% Chebyshev UPL	41.29
95% WH Approx. Gamma UPL	29.65	Upper Threshold Limit Based upon IQR	35
95% HW Approx. Gamma UPL	29.91		
95% WH Approx. Gamma UTL with 90% Coverage	30.94		
95% HW Approx. Gamma UTL with 90% Coverage	31.27		

K

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	15
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	440	Minimum	6.087
Maximum	1030	Maximum	6.937
Second Largest	860	Second Largest	6.757
First Quartile	570	First Quartile	6.346
Median	715	Median	6.572
Third Quartile	782.5	Third Quartile	6.662
Mean	691.1	Mean	6.516
Geometric Mean	676.1	SD	0.218
SD	147.2		
Coefficient of Variation	0.213		
Skewness	0.261		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	981.6	95% UTL with 90% Coverage	1040
95% UPL (t)	954.1	95% UPL (t)	998.2
90% Percentile (z)	879.7	90% Percentile (z)	894
95% Percentile (z)	933.2	95% Percentile (z)	967.7
99% Percentile (z)	1033	99% Percentile (z)	1123

Gamma Distribution Test		Data Distribution Test	
k star	19.14	Data appear Normal at 5% Significance Level	
Theta Star	36.11		
MLE of Mean	691.1		
MLE of Standard Deviation	158		
nu star	689		
A-D Test Statistic	0.339	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	818
K-S Test Statistic	0.131	95% Percentile	885.5
5% K-S Critical Value	0.203	99% Percentile	1001
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	1030
90% Percentile	899.7	95% Percentile Bootstrap UTL with 90% Coverage	1030
95% Percentile	969.8	95% BCA Bootstrap UTL with 90% Coverage	911
99% Percentile	1111	95% UPL	1030
		95% Chebyshev UPL	1350
95% WH Approx. Gamma UPL	979.4	Upper Threshold Limit Based upon IQR	1101
95% HW Approx. Gamma UPL	983.6		
95% WH Approx. Gamma UTL with 90% Coverage	1015		
95% HW Approx. Gamma UTL with 90% Coverage	1020		

V

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	30.8	Minimum	3.428
Maximum	62.9	Maximum	4.142
Second Largest	57.8	Second Largest	4.057
First Quartile	35.18	First Quartile	3.56
Median	37.9	Median	3.635
Third Quartile	44.53	Third Quartile	3.796
Mean	41.31	Mean	3.699
Geometric Mean	40.43	SD	0.208
SD	9.371		
Coefficient of Variation	0.227		
Skewness	1.251		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.847	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	59.81	95% UTL with 90% Coverage	60.97
95% UPL (t)	58.06	95% UPL (t)	58.65
90% Percentile (z)	53.32	90% Percentile (z)	52.79
95% Percentile (z)	56.72	95% Percentile (z)	56.94
99% Percentile (z)	63.11	99% Percentile (z)	65.61

Gamma Distribution Test		Data Distribution Test	
k star	19.43	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2.126		
MLE of Mean	41.31		
MLE of Standard Deviation	9.371		
nu star	699.6		
A-D Test Statistic	0.861	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	57.66
K-S Test Statistic	0.175	95% Percentile	58.57
5% K-S Critical Value	0.203	99% Percentile	62.03
Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	62.9
90% Percentile	53.68	95% Percentile Bootstrap UTL with 90% Coverage	62.9
95% Percentile	57.84	95% BCA Bootstrap UTL with 90% Coverage	62.9
99% Percentile	66.18	95% UPL	62.9
		95% Chebyshev UPL	83.28
95% WH Approx. Gamma UPL	58.38	Upper Threshold Limit Based upon IQR	58.55
95% HW Approx. Gamma UPL	58.44		
95% WH Approx. Gamma UTL with 90% Coverage	60.48		
95% HW Approx. Gamma UTL with 90% Coverage	60.59		

Zn

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	13
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	23	Minimum	3.135
Maximum	67	Maximum	4.205
Second Largest	61	Second Largest	4.111
First Quartile	42	First Quartile	3.737
Median	48	Median	3.871
Third Quartile	55.25	Third Quartile	4.012
Mean	47.72	Mean	3.838
Geometric Mean	46.45	SD	0.25
SD	10.62		
Coefficient of Variation	0.223		
Skewness	-0.418		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.981	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	68.69	95% UTL with 90% Coverage	76.12
95% UPL (t)	66.7	95% UPL (t)	72.65
90% Percentile (z)	61.33	90% Percentile (z)	64.01
95% Percentile (z)	65.19	95% Percentile (z)	70.1
99% Percentile (z)	72.43	99% Percentile (z)	83.14

Gamma Distribution Test		Data Distribution Test	
k star	15.58	Data appear Normal at 5% Significance Level	
Theta Star	3.062		
MLE of Mean	47.72		
MLE of Standard Deviation	12.09		
nu star	561		
A-D Test Statistic	0.324	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	58.9
K-S Test Statistic	0.153	95% Percentile	61.9
5% K-S Critical Value	0.203	99% Percentile	65.98
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	67
90% Percentile	63.72	95% Percentile Bootstrap UTL with 90% Coverage	67
95% Percentile	69.19	95% BCA Bootstrap UTL with 90% Coverage	62.8
99% Percentile	80.25	95% UPL	67
		95% Chebyshev UPL	95.29
95% WH Approx. Gamma UPL	69.96	Upper Threshold Limit Based upon IQR	75.13
95% HW Approx. Gamma UPL	70.54		
95% WH Approx. Gamma UTL with 90% Coverage	72.74		
95% HW Approx. Gamma UTL with 90% Coverage	73.46		

General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File			WorkShee									
Full			OFF									
Confidenc			95%									
Coverage			90%									
Different			1									
Number			2000									
Sb												
General												
Number					18	Number				1		
Number					1	Number				17		
Warning:												
It is												
The data												

As

General Statistics

Number of Valid Data	18	Number of Detected Data	13
Number of Distinct Detected Data	10	Number of Non-Detect Data	5
Tolerance Factor	1.974	Percent Non-Detects	27.78%
Number of Missing Values	2		

Raw Statistics		Log-transformed Statistics	
Minimum Detected	8	Minimum Detected	2.079
Maximum Detected	40	Maximum Detected	3.689
Mean of Detected	16.38	Mean of Detected	2.686
SD of Detected	8.827	SD of Detected	0.471
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.6	Maximum Non-Detect	-0.511

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	27.78%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.946
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	11.91	Mean (Log Scale)	1.562
SD	10.5	SD (Log Scale)	1.908
95% UTL 90% Coverage	32.63	95% UTL 90% Coverage	206.2
95% UPL (t)	30.67	95% UPL (t)	144.4
90% Percentile (z)	25.36	90% Percentile (z)	55
95% Percentile (z)	29.18	95% Percentile (z)	110
99% Percentile (z)	36.33	99% Percentile (z)	403.8

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.824	Mean in Original Scale	13.16
SD	13.25	SD in Original Scale	9.151
95% UTL with 90% Coverage	35.97	95% UTL with 90% Coverage	39.17
		95% BCA UTL with 90% Coverage	29.5
		95% Bootstrap (%) UTL with 90% Coverage	40
95% UPL (t)	33.5	95% UPL (t)	34.65
90% Percentile (z)	26.8	90% Percentile (z)	24.87
95% Percentile (z)	31.61	95% Percentile (z)	31.56
99% Percentile (z)	40.64	99% Percentile (z)	49.36

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.673	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.46		
nu star	95.51		
A-D Test Statistic	0.4	Nonparametric Statistics	
5% A-D Critical Value	0.736	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.166	Mean	14.06
5% K-S Critical Value	0.238	SD	8.127
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.994
		95% KM UTL with 90% Coverage	30.1
Assuming Gamma Distribution		95% KM Chebyshev UPL	50.45
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	28.58
Mean	11.83	90% Percentile (z)	24.47
Median	11	95% Percentile (z)	27.42
SD	10.58	99% Percentile (z)	32.96
k star	0.181		
Theta star	65.5	Gamma ROS Limits with Extrapolated Data	
Nu star	6.504	95% Wilson Hilferty (WH) Approx. Gamma UPL	59.95
95% Percentile of Chisquare (2k)	1.91	95% Hawkins Wixley (HW) Approx. Gamma UPL	88.66
		95% WH Approx. Gamma UTL with 90% Coverage	70.72
90% Percentile	35.69	95% HW Approx. Gamma UTL with 90% Coverage	110.1
95% Percentile	62.54		
99% Percentile	137.8		

Note: DL/2 is not a recommended method.

Cd

General Statistics			
Number of Valid Data	18	Number of Detected Data	4
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
Tolerance Factor	1.974	Percent Non-Detects	77.78%
Number of Missing Values	2		
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.3	Minimum Detected	-1.204
Maximum Detected	0.4	Maximum Detected	-0.916
Mean of Detected	0.35	Mean of Detected	-1.06
SD of Detected	0.0577	SD of Detected	0.166
Minimum Non-Detect	0.028	Minimum Non-Detect	-3.576
Maximum Non-Detect	0.063	Maximum Non-Detect	-2.765
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.78%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.731	Shapiro Wilk Test Statistic	0.731
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0916	Mean (Log Scale)	-3.386
SD	0.144	SD (Log Scale)	1.295
95% UTL 90% Coverage	0.376	95% UTL 90% Coverage	0.436
95% UPL (t)	0.349	95% UPL (t)	0.342
90% Percentile (z)	0.276	90% Percentile (z)	0.178
95% Percentile (z)	0.329	95% Percentile (z)	0.285
99% Percentile (z)	0.427	99% Percentile (z)	0.688
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	N/A	Mean in Original Scale	0.216
SD	N/A	SD in Original Scale	0.0798
95% UTL with 90% Coverage	N/A	95% UTL with 90% Coverage	0.381
		95% BCA UTL with 90% Coverage	0.4
		95% Bootstrap (%) UTL with 90% Coverage	0.4
95% UPL (t)	N/A	95% UPL (t)	0.359
90% Percentile (z)	N/A	90% Percentile (z)	0.306
95% Percentile (z)	N/A	95% Percentile (z)	0.344
99% Percentile (z)	N/A	99% Percentile (z)	0.426
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	12.33	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0284		
nu star	98.66		
A-D Test Statistic	0.719	Nonparametric Statistics	
5% A-D Critical Value	0.656	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.341	Mean	0.311
5% K-S Critical Value	0.394	SD	0.0314
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.00855
		95% KM UTL with 90% Coverage	0.373
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.452
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.367
Mean	0.0778	90% Percentile (z)	0.351
Median	1.00E-06	95% Percentile (z)	0.363
SD	0.152	99% Percentile (z)	0.384
k star	0.118		
Theta star	0.661	Gamma ROS Limits with Extrapolated Data	
Nu star	4.236	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.335
95% Percentile of Chisquare (2k)	1.346	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.331
		95% WH Approx. Gamma UTL with 90% Coverage	0.422
90% Percentile	0.219	95% HW Approx. Gamma UTL with 90% Coverage	0.446
95% Percentile	0.445		
99% Percentile	1.137		

Note: DL/2 is not a recommended method.

Se

General Statistics			
Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Se was not processed!

Ag

General Statistics

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Ag was not processed!

Na

General Statistics

Number of Valid Data	18	Number of Detected Data	11
Number of Distinct Detected Data	4	Number of Non-Detect Data	7
Tolerance Factor	1.974	Percent Non-Detects	38.89%
Number of Missing Values	2		

Raw Statistics		Log-transformed Statistics	
Minimum Detected	70	Minimum Detected	4.248
Maximum Detected	100	Maximum Detected	4.605
Mean of Detected	89.09	Mean of Detected	4.484
SD of Detected	9.439	SD of Detected	0.11
Minimum Non-Detect	20.5	Minimum Non-Detect	3.02
Maximum Non-Detect	47.8	Maximum Non-Detect	3.867

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	7
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	38.89%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.865
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	60.13	Mean (Log Scale)	3.77
SD	38.15	SD (Log Scale)	0.94
95% UTL 90% Coverage	135.4	95% UTL 90% Coverage	277.3
95% UPL (t)	128.3	95% UPL (t)	232.7
90% Percentile (z)	109	90% Percentile (z)	144.6
95% Percentile (z)	122.9	95% Percentile (z)	203.5
99% Percentile (z)	148.9	99% Percentile (z)	386.2

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	89.09	Mean in Original Scale	81.29
SD	9	SD in Original Scale	12.39
95% UTL with 90% Coverage	106.9	95% UTL with 90% Coverage	108.4
		95% BCA UTL with 90% Coverage	100
		95% Bootstrap (%) UTL with 90% Coverage	100
95% UPL (t)	105.2	95% UPL (t)	105.3
90% Percentile (z)	100.6	90% Percentile (z)	97.6
95% Percentile (z)	103.9	95% Percentile (z)	103.1
99% Percentile (z)	110	99% Percentile (z)	114.3

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	67.84	Data appear Normal at 5% Significance Level	
Theta Star	1.313		
nu star	1492		
A-D Test Statistic	0.702	Nonparametric Statistics	
5% A-D Critical Value	0.726	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.28	Mean	81.67
5% K-S Critical Value	0.254	SD	11.67
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	2.884
		95% KM UTL with 90% Coverage	104.7
Assuming Gamma Distribution		95% KM Chebyshev UPL	133.9
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	102.5
Mean	73.92	90% Percentile (z)	96.62
Median	80	95% Percentile (z)	100.9
SD	20.87	99% Percentile (z)	108.8
k star	10.43		
Theta star	7.089	Gamma ROS Limits with Extrapolated Data	
Nu star	375.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	116.9
95% Percentile of Chisquare (2k)	32.49	95% Hawkins Wixley (HW) Approx. Gamma UPL	117.8
		95% WH Approx. Gamma UTL with 90% Coverage	122.4
90% Percentile	104.4	95% HW Approx. Gamma UTL with 90% Coverage	123.6
95% Percentile	115.2		
99% Percentile	137.3		

Note: DL/2 is not a recommended method.

Tl

General Statistics			
Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Tl was not processed!

Mercury

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: RD
Background Data: UP

Raw Statistics

	Site	Background
Number of Valid Observations	8	10
Number of Missing Values	2	0
Number of Distinct Observations	8	8
Minimum	0.13	0.15
Maximum	1.86	0.32
Mean	0.788	0.216
Median	0.695	0.21
SD	0.651	0.0467
SE of Mean	0.23	0.0148

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	94.5
WMW Test U-Stat	58.5
WMW Critical Value (0.050)	59
Approximate P-Value	0.0549

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background

Arsenic

User	
From File	
Full	
Confidenc	
Substantia	
Selected	
Alternativ	

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

WorkSheet.wst
OFF
95%
0
Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: RD
Background Data: UP

Raw Statistics

	Site	Background
Number of Valid Data	8	10
Number of Missing Values	2	0
Number of Non-Detect Data	2	3
Number of Detect Data	6	7
Minimum Non-Detect	0.47	0.46
Maximum Non-Detect	0.47	0.6
Percent Non detects	25.00%	30.00%
Minimum Detected	8	8
Maximum Detected	40	20
Mean of Detected Data	19.67	13.57
Median of Detected Data	16.5	11
SD of Detected Data	11.67	4.721

Wilcoxon-Mann-Whitney Site vs Background Test
All observations <= 0.6 (Max DL) are ranked the same
Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	86
WMW Test U-Stat	50
WMW Critical Value (0.050)	59
Approximate P-Value	0.199

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background

Sediment ProUCL Data

KR Sediments Background (mg/kg)
Lowest Duplicate kept

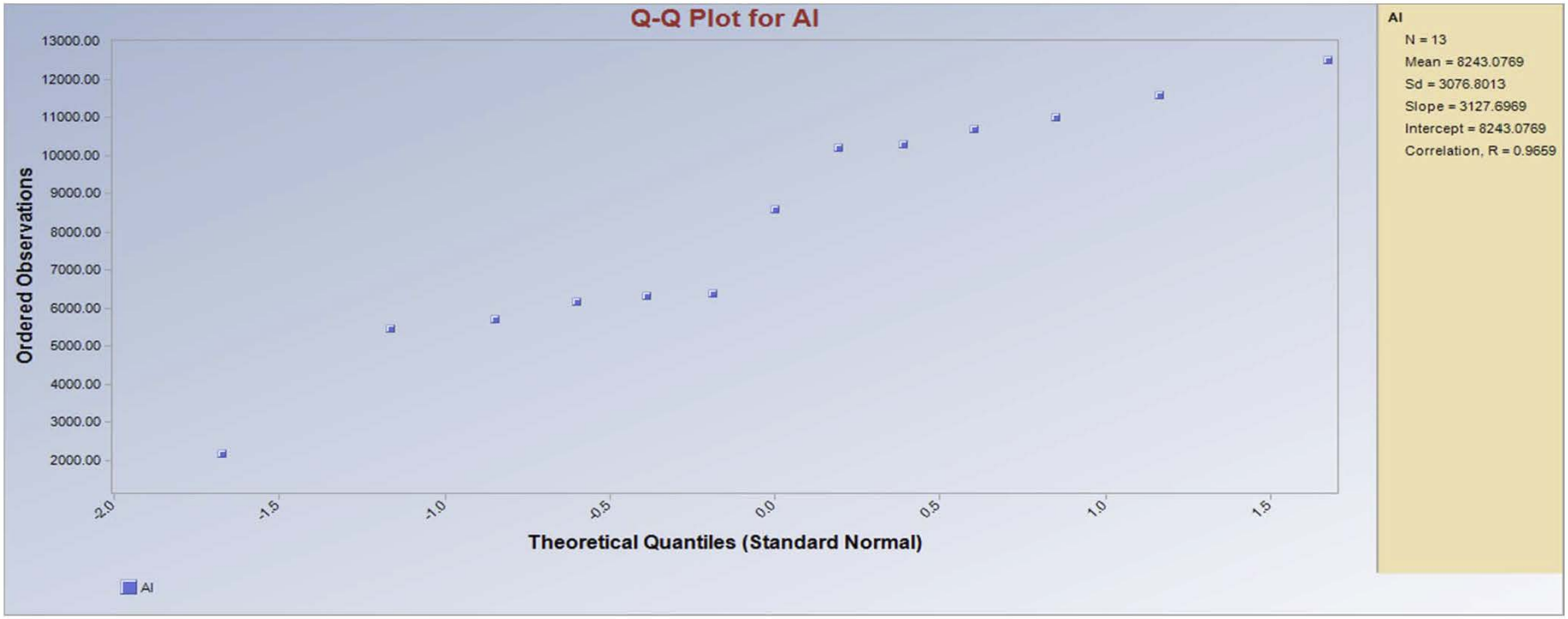
	Al	D_Al	Sb	D_Sb	As	D_As	Ba	D_Ba	Be	D_Be	Cd	D_Cd	Ca	D_Ca	Cr	D_Cr	Co	D_Co	Cu	D_Cu	Fe	D_Fe	Pb	D_Pb	Mg	D_Mg	Mn	D_Mn	Hg	D_Hg	Ni	D_Ni
10KR13SD	11600	1	0.56	0	15	1	152	1	0.5	1	0.5	1	4800	1	25.3	1	10.9	1	25.3	1	27100	1	7	1	4840	1	451	1	0.09	1	32	1
11KR12SD	6340	1	0.271	1	8.77	1	138	1	0.538	1	0.42	1	2250	1	17.7	1	14.8	1	56.2	1	31200	1	12.3	1	2950	1	280	1	0.374	1	51.7	1
11KR18SD	10700	1	0.185	1	4.75	1	146	1	0.343	1	0.263	1	2960	1	22.2	1	8.91	1	20.9	1	21800	1	7.11	1	4440	1	395	1	0.089	1	25.3	1
11KR19SD	2160	1	0.133	1	6.06	1	77.5	1	0.352	1	0.82	1	762	1	13.6	1	11.5	1	36.9	1	8170	1	13.5	1	1400	1	465	1	0.143	1	37	1
11KR20SD	5470	1	0.239	1	3.67	1	58.6	1	0.146	1	0.099	1	1610	1	11.1	1	4.54	1	7.15	1	13500	1	2.4	1	2860	1	246	1	0.013	1	13	1
11KR21SD	5710	1	0.189	1	3.67	1	55.6	1	0.13	1	0.069	1	1700	1	10.7	1	3.83	1	4.62	1	13400	1	1.82	1	3190	1	197	1	0.013	1	10.7	1
11KR22SD	10200	1	0.22	1	12.7	1	79.5	1	0.196	1	0.12	1	2930	1	15.8	1	4.94	1	10.4	1	21900	1	3.35	1	5900	1	366	1	0.03	1	14.4	1
11KR23SD	10300	1	0.188	1	6.32	1	141	1	0.408	1	0.268	1	2670	1	20.2	1	13.5	1	28	1	32300	1	10.5	1	4400	1	536	1	0.126	1	36.2	1
11KR26SD	11000	1	0.45	1	4.93	1	113	1	0.314	1	0.231	1	2930	1	21.4	1	8.2	1	16.9	1	20700	1	5.73	1	5000	1	261	1	0.044	1	23.9	1
11KR27SD	6400	1	0.473	1	5.98	1	70.3	1	0.157	1	0.127	1	1880	1	14.4	1	5.69	1	7.69	1	17200	1	2.41	1	3460	1	743	1	0.015	1	14.8	1
11KR01SD	12500	1					142	1	0.383	1	0.288	1	2390	1	16.6	1			29.4	1					5040	1	740	1	0.081	1	29.2	1
11KR71SD (Dup)			0.228	1	7.95	1											11.9	1			33600	1	10.2	1								
11KR24SD	6180	1							0.265	1									16.7	1			4.43	1								
11KR72SD (Dup)			0.114	1	5.6	1	75.2	1			0.157	1	1490	1	12	1	7.29	1			16500	1			2830	1	281	1	0.05	1	22.4	1
11KR25SD													2220	1																		
11KR73SD (Dup)	8600	1	0.155	1	3.95	1	98.3	1	0.255	1	0.168	1			16.2	1	6.3	1	12.1	1	15100	1	4.24	1	3410	1	215	1	0.051	1	18.4	1

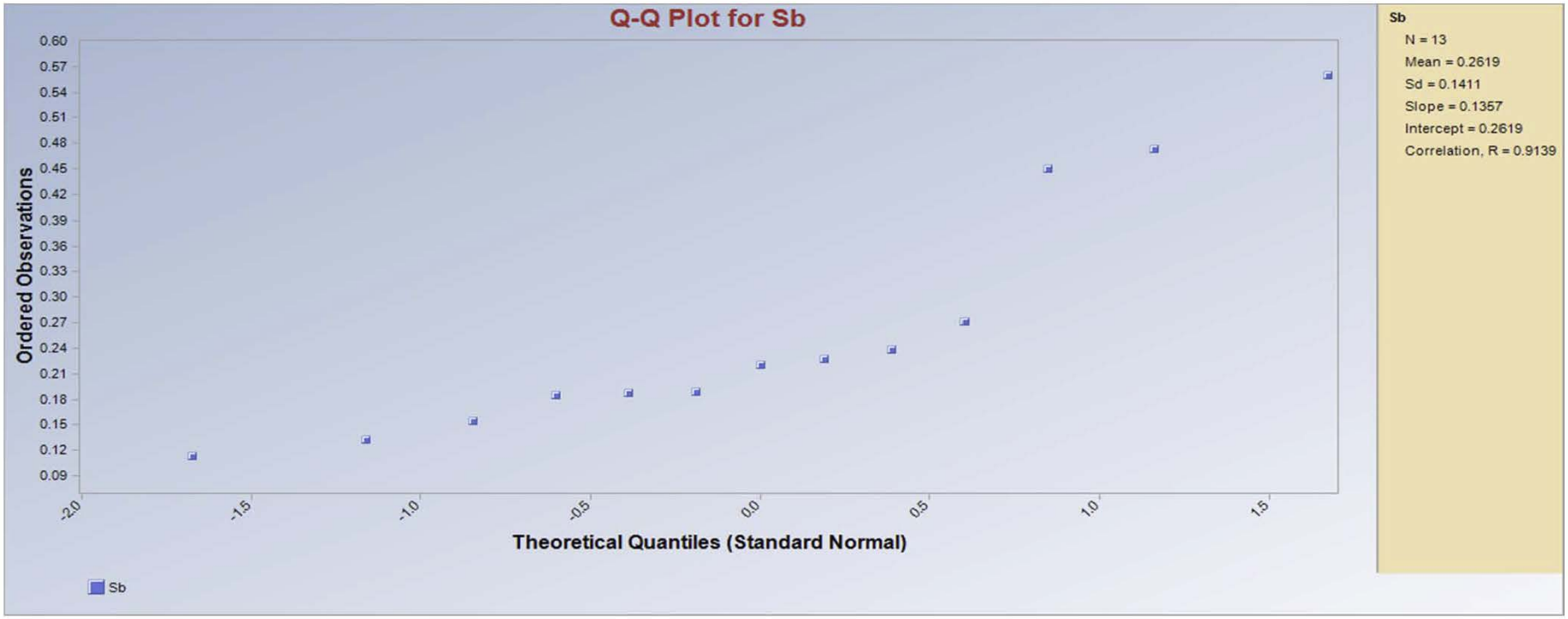
	K	D_K	Se	D_Se	Ag	D_Ag	Na	D_Na	Tl	D_Tl	V	D_V	Zn	D_Zn
10KR13SD	1280	1	0.81	0	0.055	0	170	1	0.34	0	36.3	1	84	1
11KR12SD	853	1	0.74	1	0.123	1	57.3	1	0.077	1	27.8	1	116	1
11KR18SD	668	1	0.42	1	0.124	1	79.3	1	0.096	1	29.8	1	69.5	1
11KR19SD	418	1	1.03	1	0.035	1	35.9	1	0.105	1	23.8	1	174	1
11KR20SD	637	1	0.08	1	0.043	1	70.3	1	0.051	1	15.7	1	30.9	1
11KR21SD	508	1	0.04	1	0.034	1	71.4	1	0.035	1	11.9	1	21.8	1
11KR22SD	614	1	0.22	1	0.062	1	86.5	1	0.075	1	27.3	1	36.2	1
11KR23SD	773	1	0.45	1	0.113	1	60.9	1	0.07	1	28.9	1	78	1
11KR26SD	961	1	0.28	1	0.105	1	125	1	0.089	1	29.8	1	62	1
11KR27SD	718	1	0.06	1	0.044	1	89.3	1	0.059	1	19.8	1	35.3	1
11KR01SD	721	1	0.31	1			37.9	1			21.9	1	74.3	1
11KR71SD (Dup)					0.062	1			0.073	1				
11KR24SD					0.046	1							52.4	1
11KR72SD (Dup)	521	1	0.12	1			37.2	1	0.049	1	16.3	1		
11KR25SD	685	1	0.19	1			83.1	1						
11KR73SD (Dup)					0.08	1			0.069	1	23.1	1	48.1	1

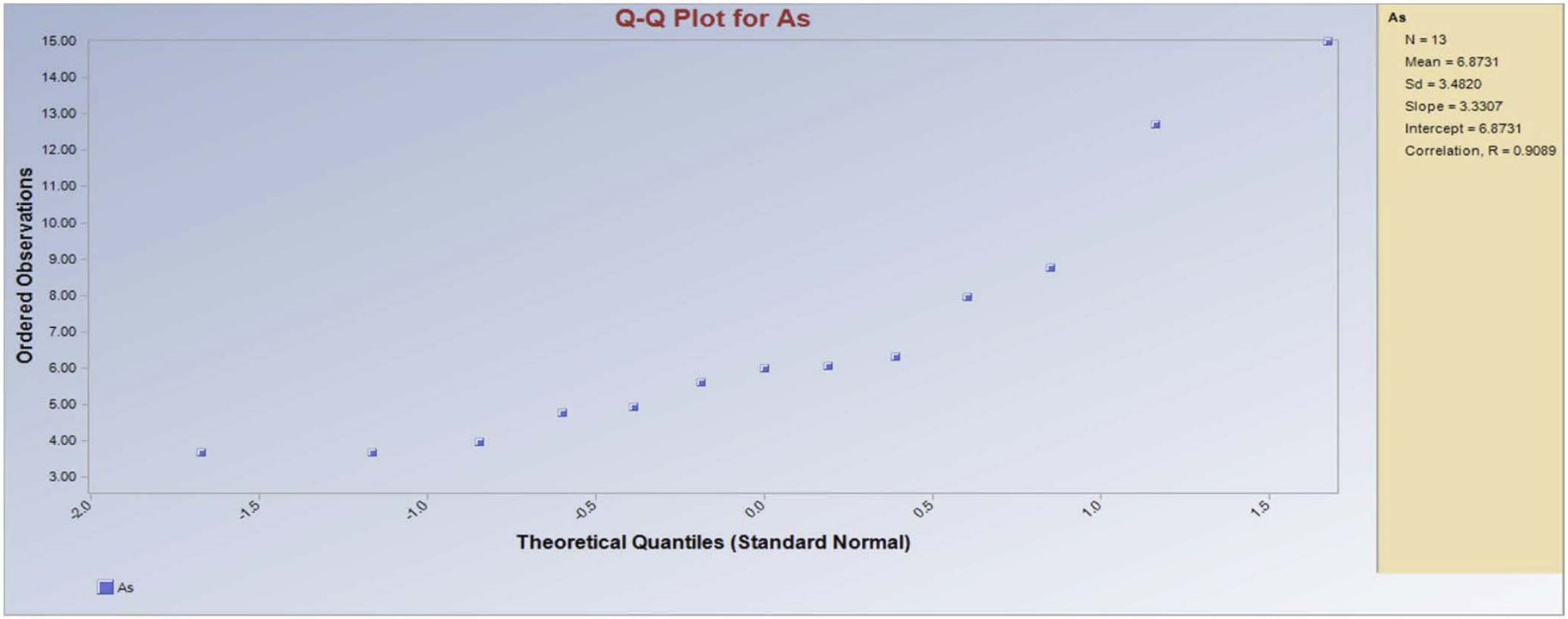
KR Sediments Background (mg/kg)
Lowest Duplicate kept; outliers removed (Shaded)

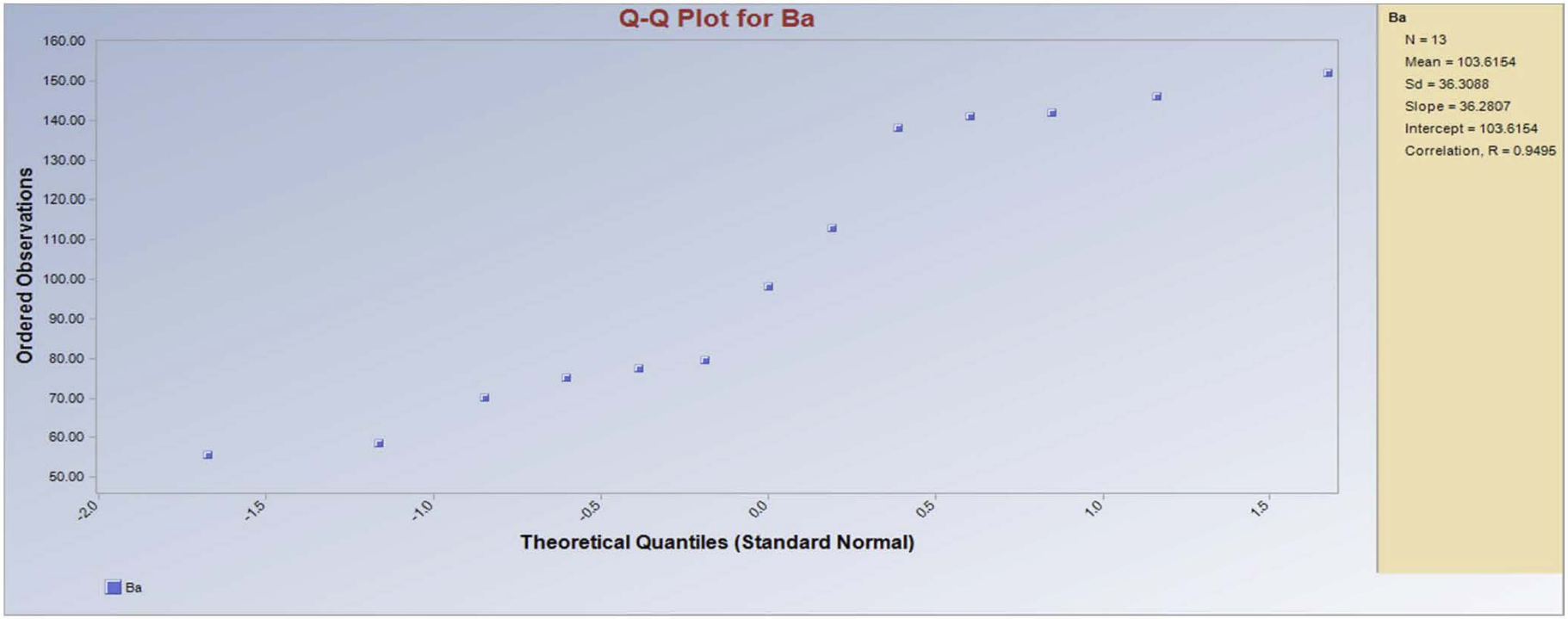
	Al	D_Al	Sb	D_Sb	As	D_As	Ba	D_Ba	Be	D_Be	Cd	D_Cd	Ca	D_Ca	Cr	D_Cr	Co	D_Co	Cu	D_Cu	Fe	D_Fe	Pb	D_Pb	Mg	D_Mg	Mn	D_Mn	Hg	D_Hg	Ni	D_Ni
11KR18SD	10700	1	0.185	1	4.75	1	146	1	0.343	1	0.263	1	2960	1	22.2	1	8.91	1	20.9	1	21800	1	7.11	1	4440	1	395	1	0.089	1	25.3	1
11KR19SD	2160	1	0.133	1	6.06	1	77.5	1	0.352	1		1	762	1	13.6	1	11.5	1	36.9	1	8170	1	13.5	1	1400	1	465	1	0.143	1	37	1
11KR20SD	5470	1	0.239	1	3.67	1	58.6	1	0.146	1	0.099	1	1610	1	11.1	1	4.54	1	7.15	1	13500	1	2.4	1	2860	1	246	1	0.013	1	13	1
11KR21SD	5710	1	0.189	1	3.67	1	55.6	1	0.13	1	0.069	1	1700	1	10.7	1	3.83	1	4.62	1	13400	1	1.82	1	3190	1	197	1	0.013	1	10.7	1
11KR22SD	10200	1	0.22	1	12.7	1	79.5	1	0.196	1	0.12	1	2930	1	15.8	1	4.94	1	10.4	1	21900	1	3.35	1	5900	1	366	1	0.03	1	14.4	1
11KR23SD	10300	1	0.188	1	6.32	1	141	1	0.408	1	0.268	1	2670	1	20.2	1	13.5	1	28	1	32300	1	10.5	1	4400	1	536	1	0.126	1	36.2	1
11KR26SD	11000	1	0.45	1	4.93	1	113	1	0.314	1	0.231	1	2930	1	21.4	1	8.2	1	16.9	1	20700	1	5.73	1	5000	1	261	1	0.044	1	23.9	1
11KR27SD	6400	1	0.473	1	5.98	1	70.3	1	0.157	1	0.127	1	1880	1	14.4	1	5.69	1	7.69	1	17200	1	2.41	1	3460	1	743	1	0.015	1	14.8	1
11KR01SD	12500	1					142	1	0.383	1	0.288	1	2390	1	16.6	1			29.4	1					5040	1	740	1	0.081	1	29.2	1
11KR71SD (Dup)			0.228	1	7.95	1											11.9	1			33600	1	10.2	1								
11KR24SD	6180	1							0.265	1									16.7	1			4.43	1								
11KR72SD (Dup)			0.114	1	5.6	1	75.2	1			0.157	1	1490	1	12	1	7.29	1			16500	1			2830	1	281	1	0.05	1	22.4	1
11KR25SD													2220	1																		
11KR73SD (Dup)	8600	1	0.155	1	3.95	1	98.3	1	0.255	1	0.168	1			16.2	1	6.3	1	12.1	1	15100	1	4.24	1	3410	1	215	1	0.051	1	18.4	1

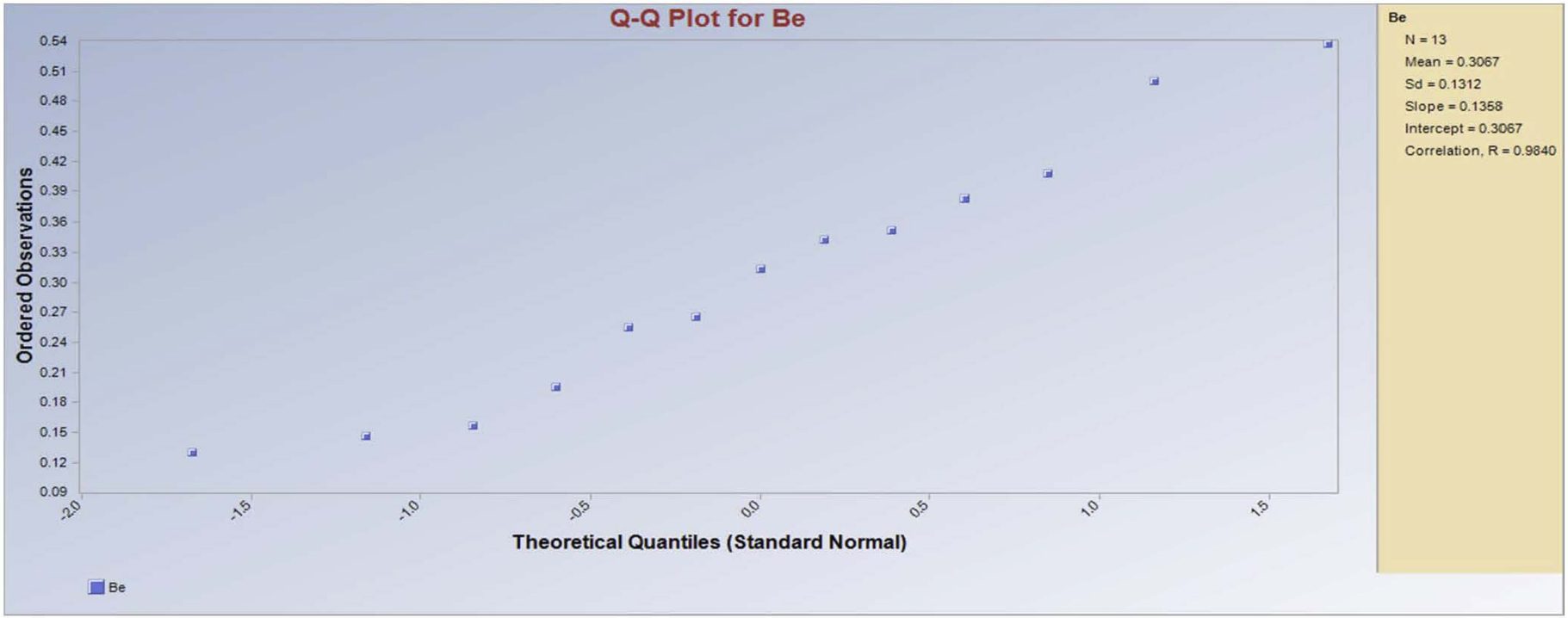
	K	D_K	Se	D_Se	Ag	D_Ag	Na	D_Na	Tl	D_Tl	V	D_V	Zn	D_Zn
11KR18SD	668	1	0.42	1	0.124	1	79.3	1	0.096	1	29.8	1	69.5	1
11KR19SD	418	1	1.03	1	0.035	1	35.9	1	0.105	1	23.8	1		1
11KR20SD	637	1	0.08	1	0.043	1	70.3	1	0.051	1	15.7	1	30.9	1
11KR21SD	508	1	0.04	1	0.034	1	71.4	1	0.035	1	11.9	1	21.8	1
11KR22SD	614	1	0.22	1	0.062	1	86.5	1	0.075	1	27.3	1	36.2	1
11KR23SD	773	1	0.45	1	0.113	1	60.9	1	0.07	1	28.9	1	78	1
11KR26SD	961	1	0.28	1	0.105	1	125	1	0.089	1	29.8	1	62	1
11KR27SD	718	1	0.06	1	0.044	1	89.3	1	0.059	1	19.8	1	35.3	1
11KR01SD	721	1	0.31	1			37.9	1			21.9	1	74.3	1
11KR71SD (Dup)					0.062	1			0.073	1				
11KR24SD					0.046	1							52.4	1
11KR72SD (Dup)	521	1	0.12	1			37.2	1	0.049	1	16.3	1		
11KR25SD	685	1	0.19	1			83.1	1						
11KR73SD (Dup)					0.08	1			0.069	1	23.1	1	48.1	1

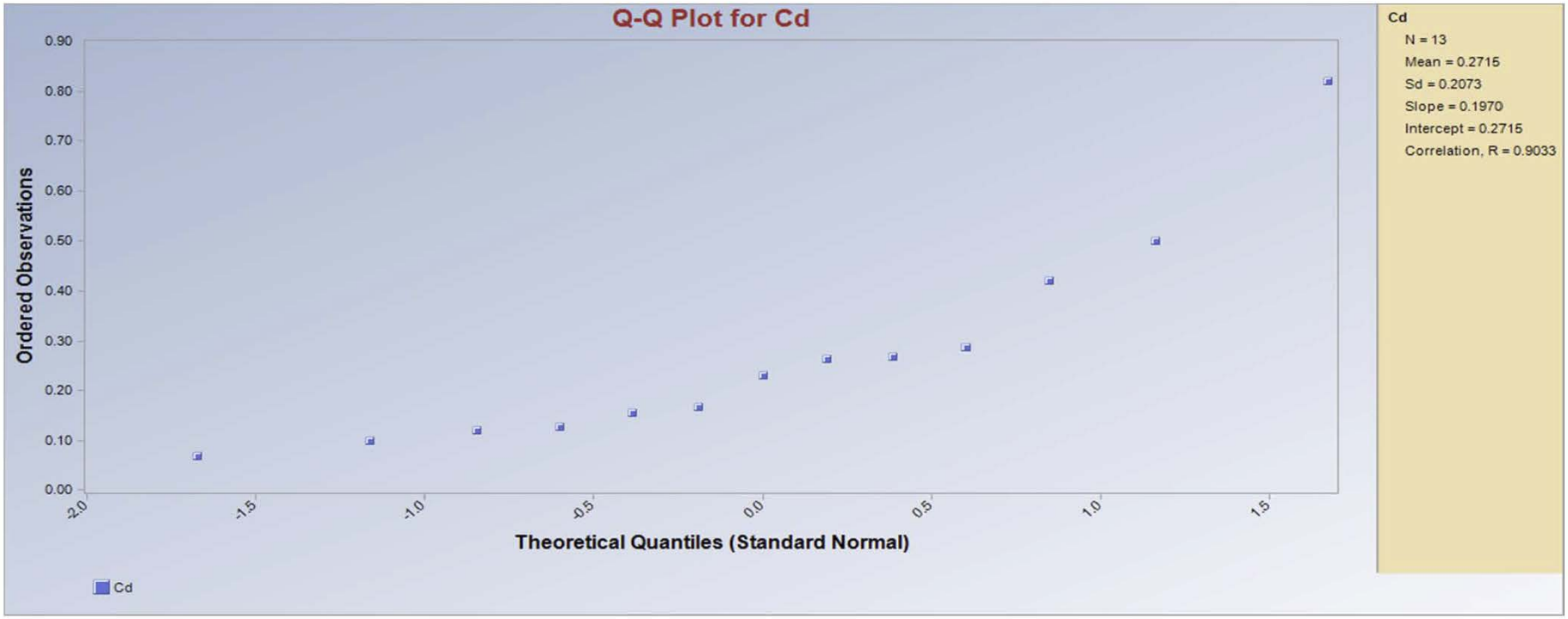

Q-Q Plot for Al
Ordered Observations
13000.00
12000.00
11000.00
10000.00
9000.00
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Al
Al
N = 13
Mean = 8243.0769
Sd = 3076.8013
Slope = 3127.6969
Intercept = 8243.0769
Correlation, R = 0.9659

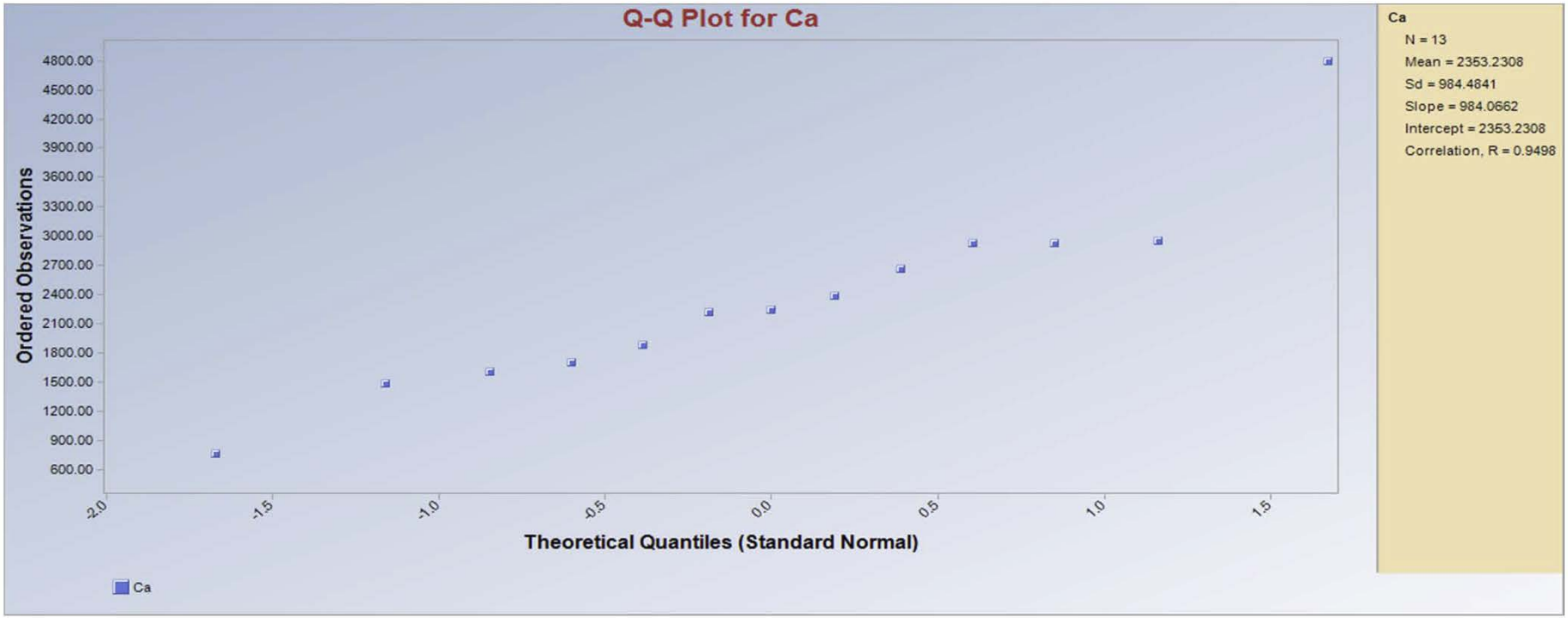

Q-Q Plot for Sb
Ordered Observations
0.60
0.57
0.54
0.51
0.48
0.45
0.42
0.39
0.36
0.33
0.30
0.27
0.24
0.21
0.18
0.15
0.12
0.09
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Sb
Sb
N = 13
Mean = 0.2619
Sd = 0.1411
Slope = 0.1357
Intercept = 0.2619
Correlation, R = 0.9139

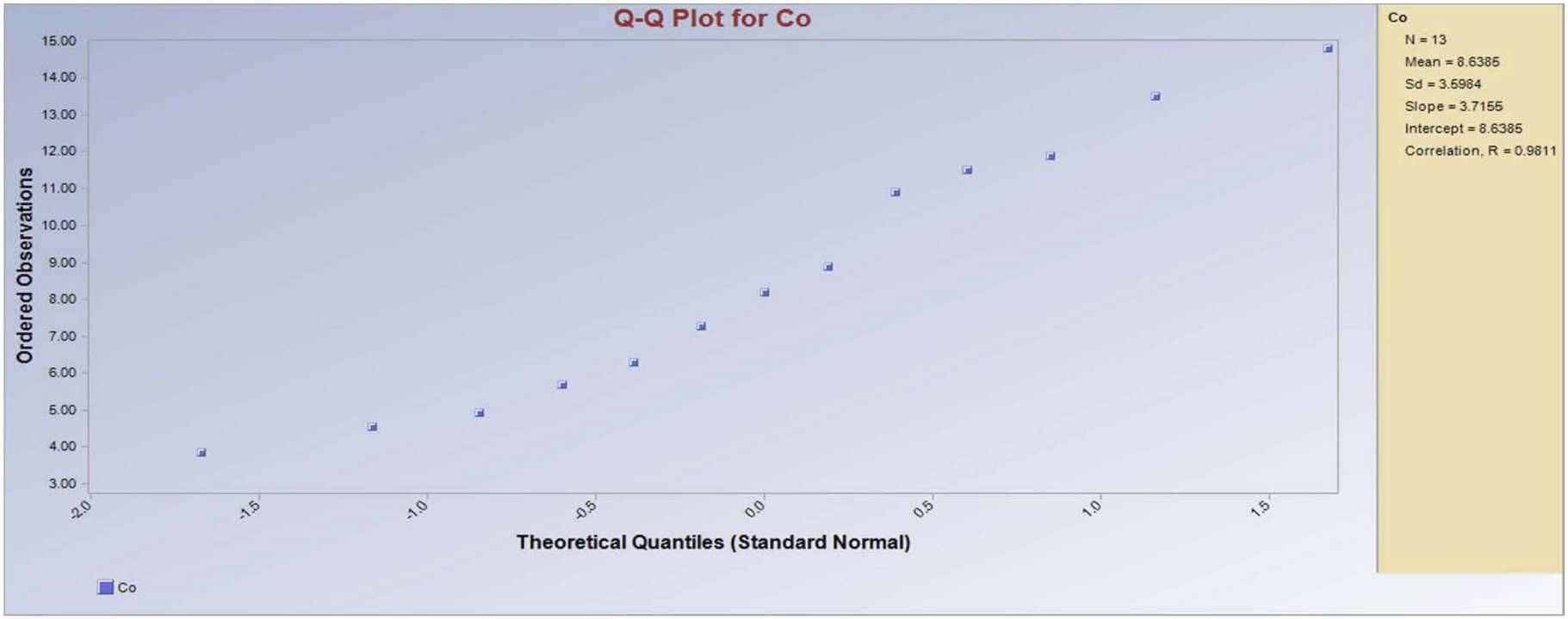

Q-Q Plot for As
Ordered Observations
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
As
As
N = 13
Mean = 6.8731
Sd = 3.4820
Slope = 3.3307
Intercept = 6.8731
Correlation, R = 0.9089

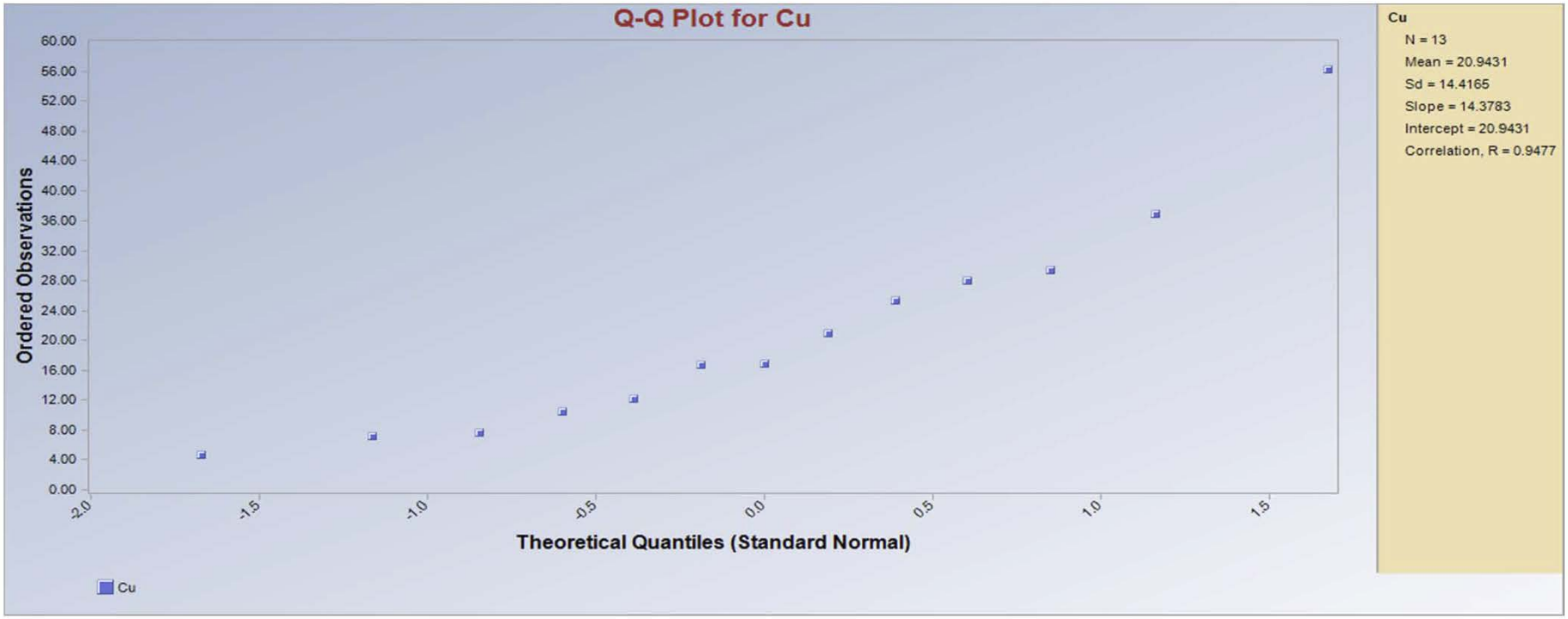

Q-Q Plot for Ba
Ordered Observations
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Ba
Ba
N = 13
Mean = 103.6154
Sd = 36.3088
Slope = 36.2807
Intercept = 103.6154
Correlation, R = 0.9495

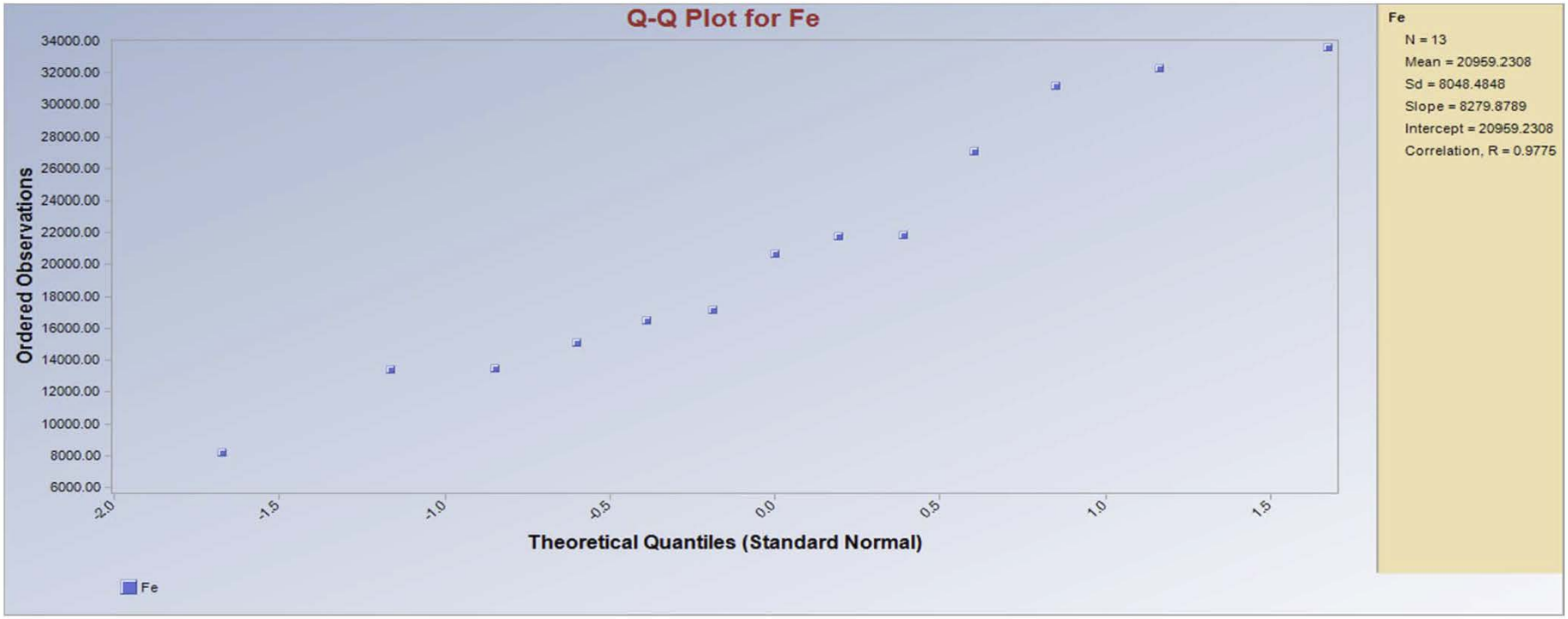

Q-Q Plot for Be
Ordered Observations
0.54
0.51
0.48
0.45
0.42
0.39
0.36
0.33
0.30
0.27
0.24
0.21
0.18
0.15
0.12
0.09
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Be
Be
N = 13
Mean = 0.3067
Sd = 0.1312
Slope = 0.1358
Intercept = 0.3067
Correlation, R = 0.9840

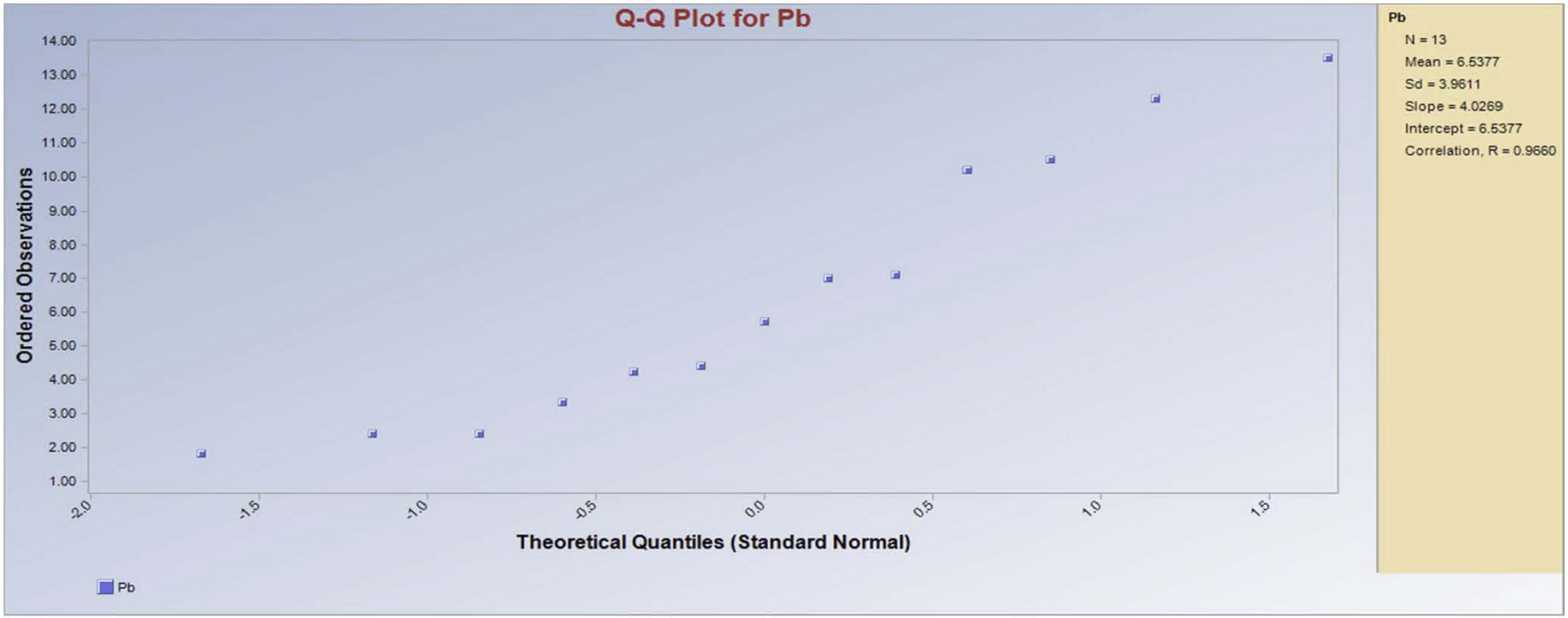

Q-Q Plot for Cd
Ordered Observations
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Cd
Cd
N = 13
Mean = 0.2715
Sd = 0.2073
Slope = 0.1970
Intercept = 0.2715
Correlation, R = 0.9033

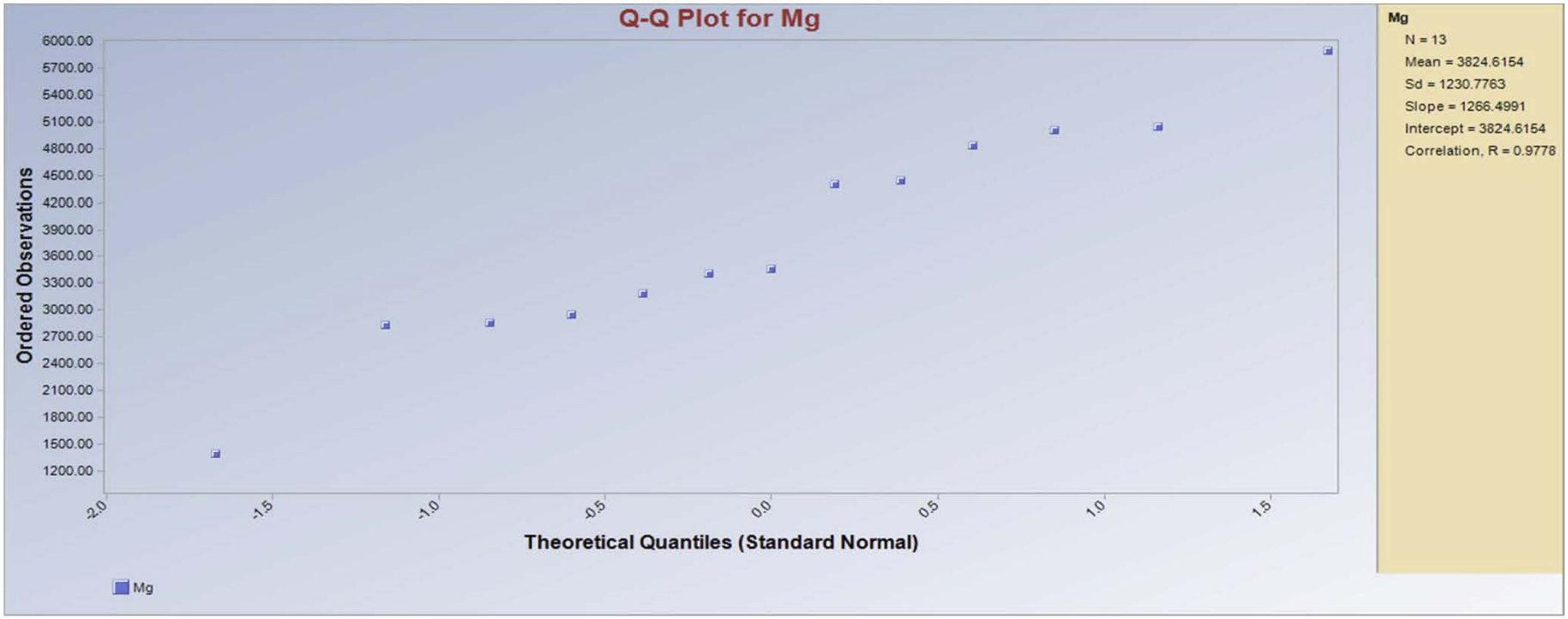

Q-Q Plot for Ca
Ordered Observations
4800.00
4500.00
4200.00
3900.00
3600.00
3300.00
3000.00
2700.00
2400.00
2100.00
1800.00
1500.00
1200.00
900.00
600.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Ca
Ca
N = 13
Mean = 2353.2308
Sd = 984.4841
Slope = 984.0662
Intercept = 2353.2308
Correlation, R = 0.9498

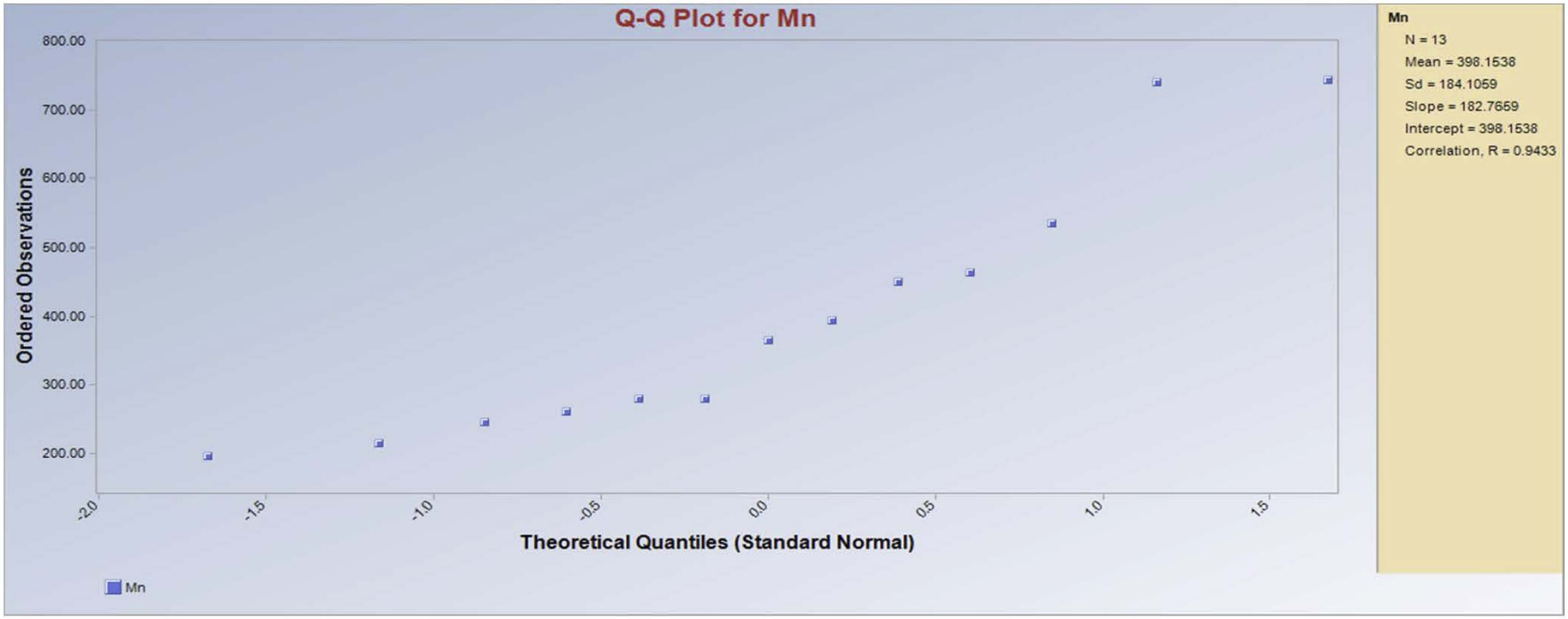

Q-Q Plot for Co
Ordered Observations
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Co
Co
N = 13
Mean = 8.6385
Sd = 3.5984
Slope = 3.7155
Intercept = 8.6385
Correlation, R = 0.9811

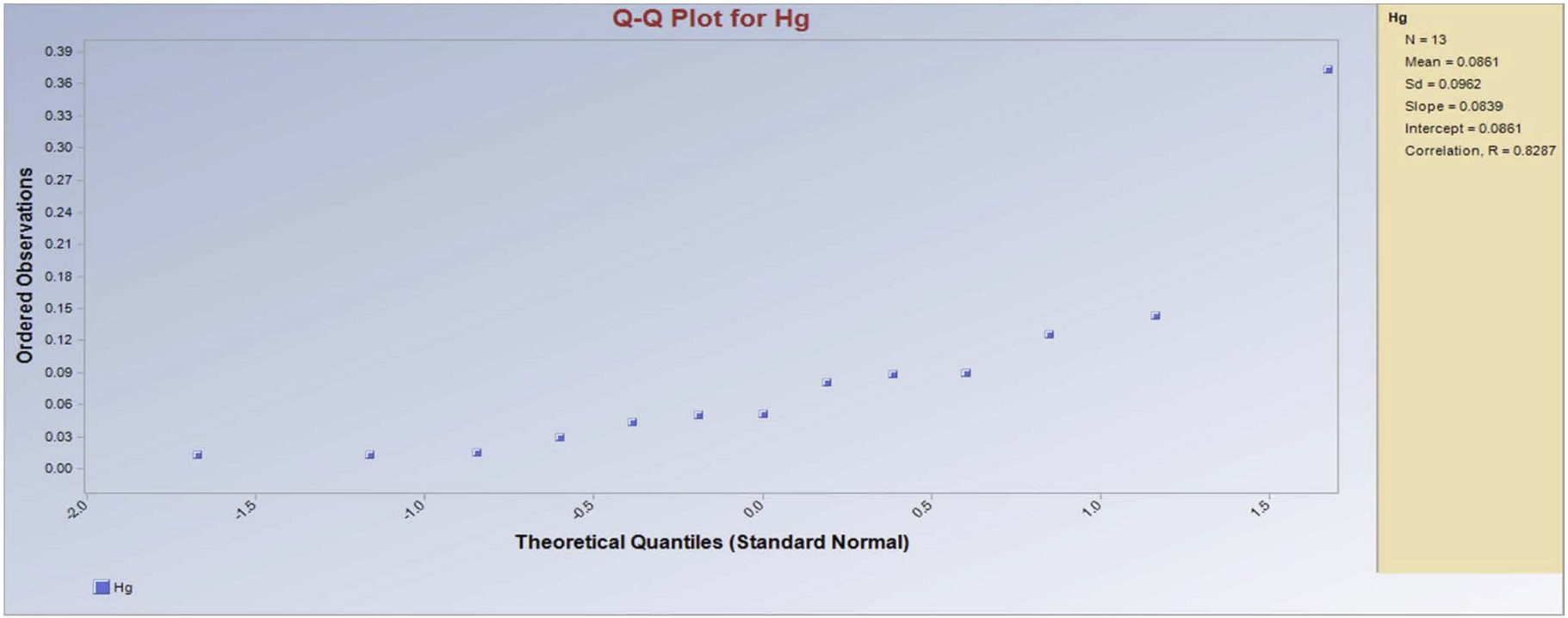

Q-Q Plot for Cu
Ordered Observations
60.00
56.00
52.00
48.00
44.00
40.00
36.00
32.00
28.00
24.00
20.00
16.00
12.00
8.00
4.00
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Cu
Cu
N = 13
Mean = 20.9431
Sd = 14.4165
Slope = 14.3783
Intercept = 20.9431
Correlation, R = 0.9477

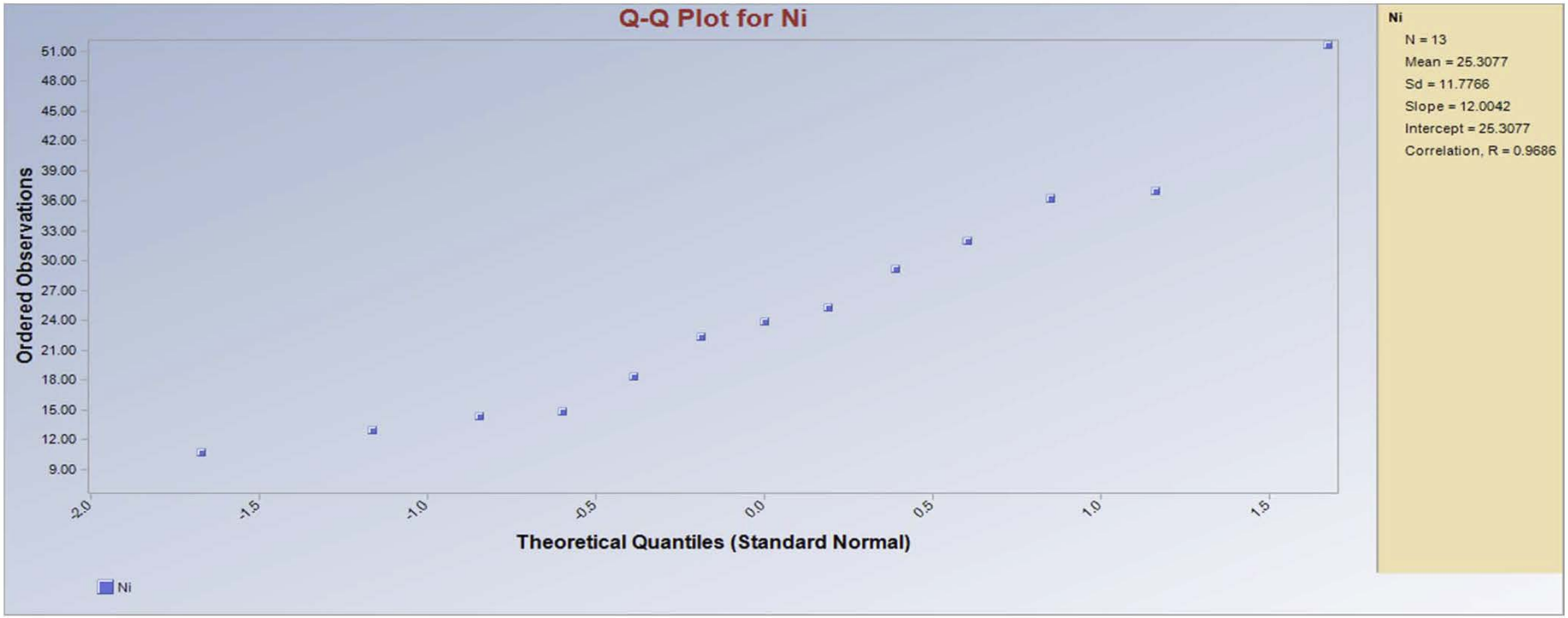

Q-Q Plot for Fe
Ordered Observations
34000.00
32000.00
30000.00
28000.00
26000.00
24000.00
22000.00
20000.00
18000.00
16000.00
14000.00
12000.00
10000.00
8000.00
6000.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Fe
Fe
N = 13
Mean = 20959.2308
Sd = 8048.4848
Slope = 8279.8789
Intercept = 20959.2308
Correlation, R = 0.9775

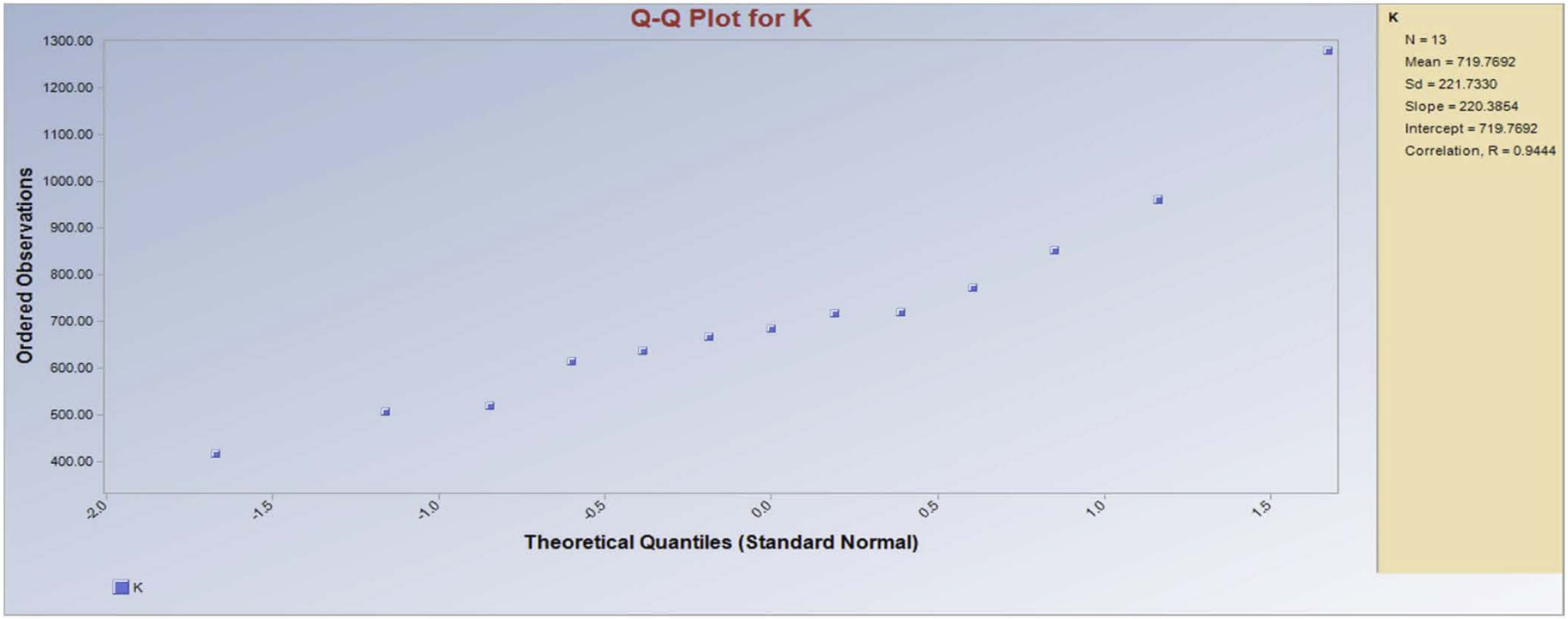

Q-Q Plot for Pb
Ordered Observations
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Pb
Pb
N = 13
Mean = 6.5377
Sd = 3.9611
Slope = 4.0269
Intercept = 6.5377
Correlation, R = 0.9660


Q-Q Plot for Mg
Ordered Observations
6000.00
5700.00
5400.00
5100.00
4800.00
4500.00
4200.00
3900.00
3600.00
3300.00
3000.00
2700.00
2400.00
2100.00
1800.00
1500.00
1200.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Mg
Mg
N = 13
Mean = 3824.6154
Sd = 1230.7763
Slope = 1266.4991
Intercept = 3824.6154
Correlation, R = 0.9778

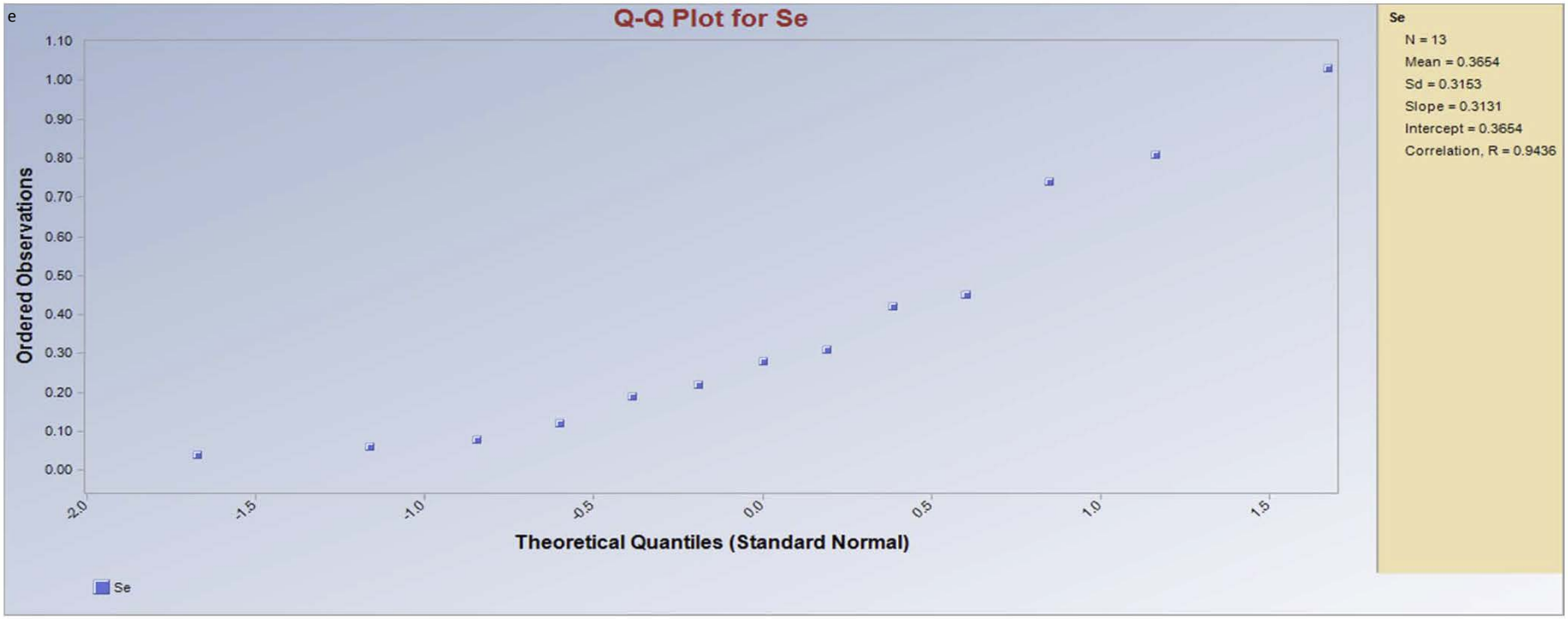

Q-Q Plot for Mn
Ordered Observations
800.00
700.00
600.00
500.00
400.00
300.00
200.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Mn
Mn
N = 13
Mean = 398.1538
Sd = 184.1059
Slope = 182.7659
Intercept = 398.1538
Correlation, R = 0.9433


Q-Q Plot for Hg
Ordered Observations
0.39
0.36
0.33
0.30
0.27
0.24
0.21
0.18
0.15
0.12
0.09
0.06
0.03
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Hg
Hg
N = 13
Mean = 0.0861
Sd = 0.0962
Slope = 0.0839
Intercept = 0.0861
Correlation, R = 0.8287

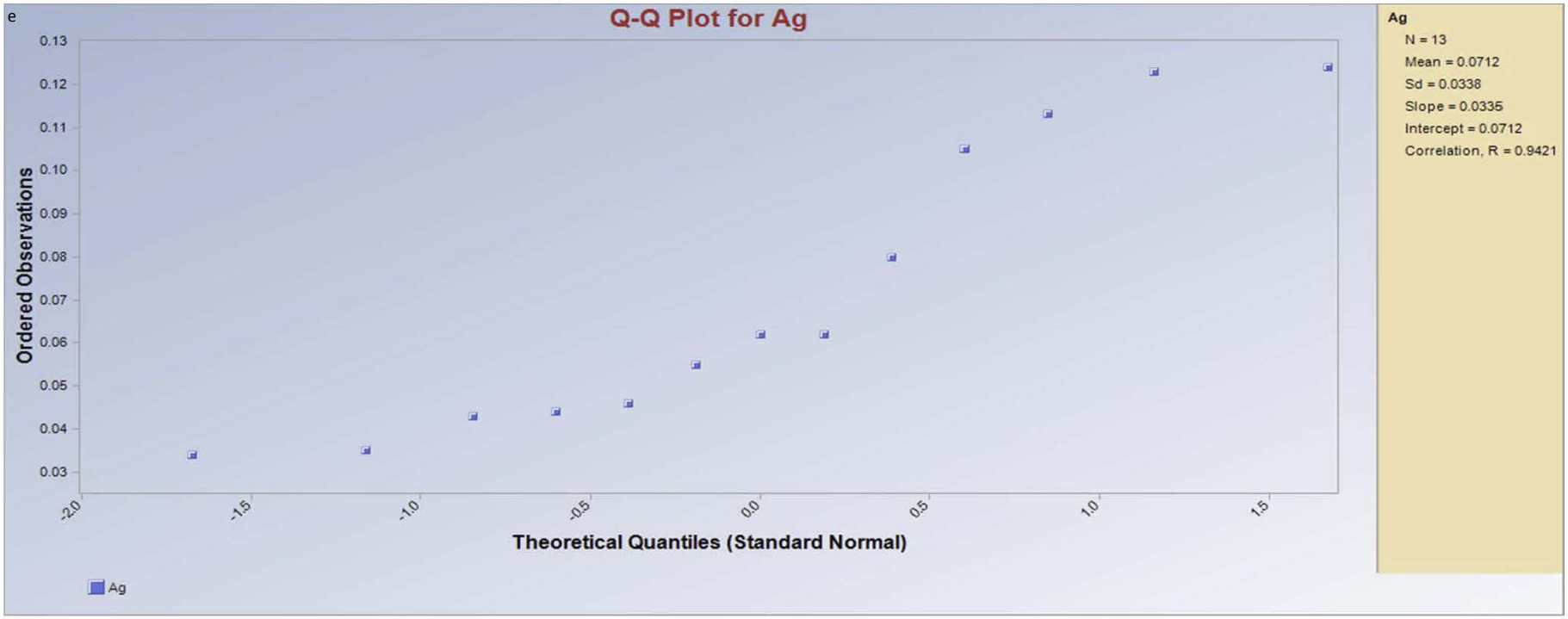

Q-Q Plot for Ni
Ordered Observations
51.00
48.00
45.00
42.00
39.00
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Ni
Ni
N = 13
Mean = 25.3077
Sd = 11.7766
Slope = 12.0042
Intercept = 25.3077
Correlation, R = 0.9686

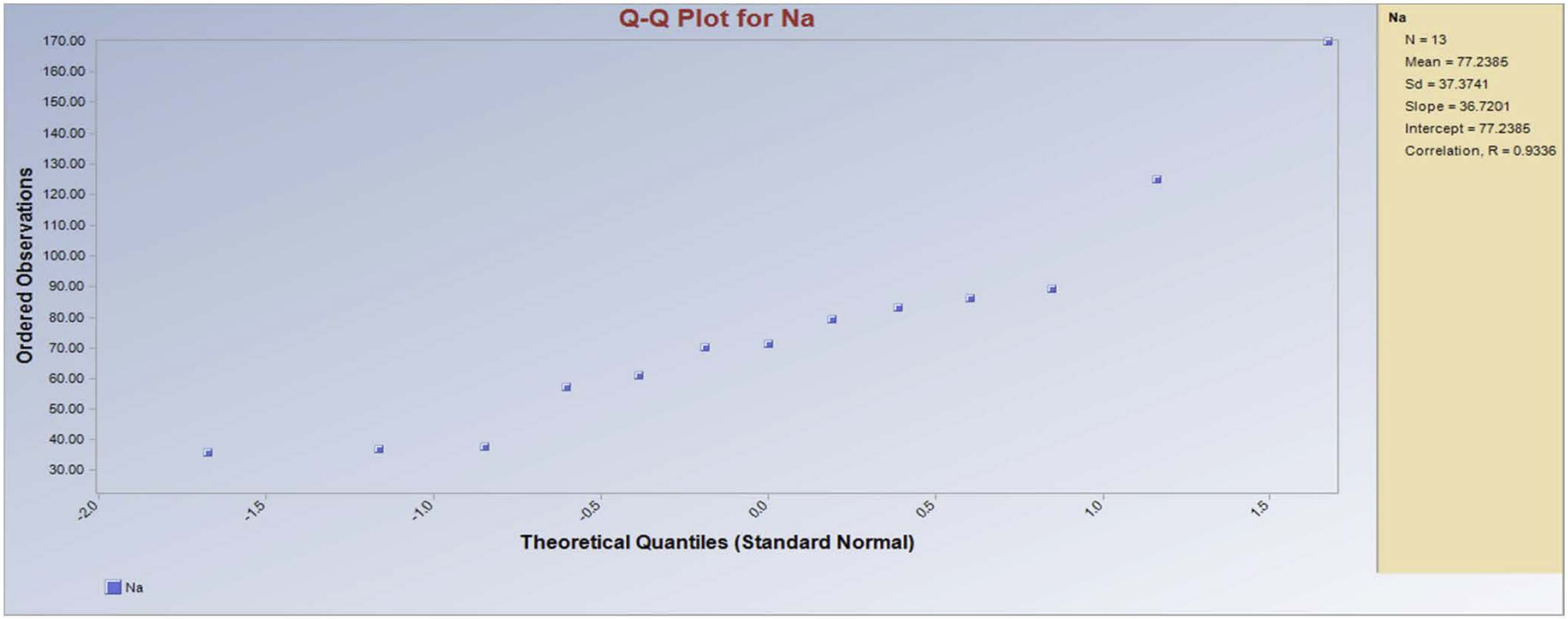

Q-Q Plot for K
Ordered Observations
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
K
K
N = 13
Mean = 719.7692
Sd = 221.7330
Slope = 220.3854
Intercept = 719.7692
Correlation, R = 0.9444

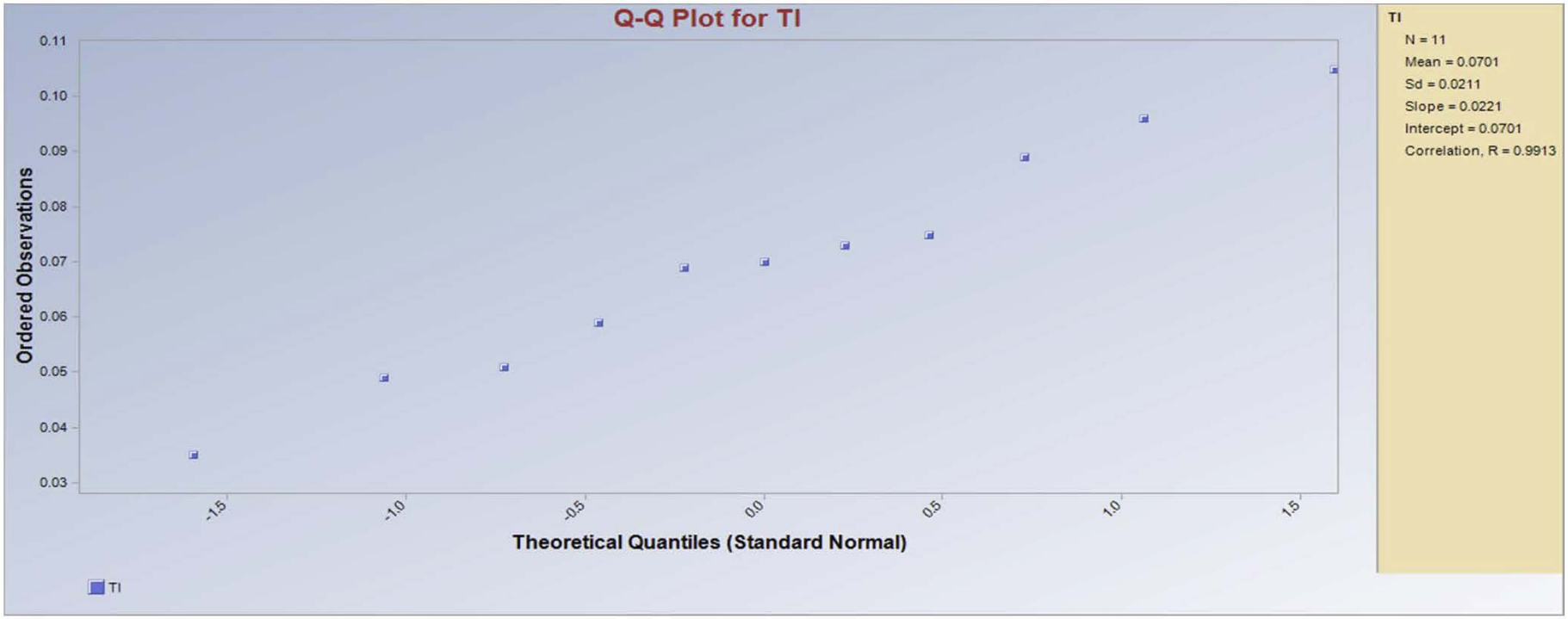
e

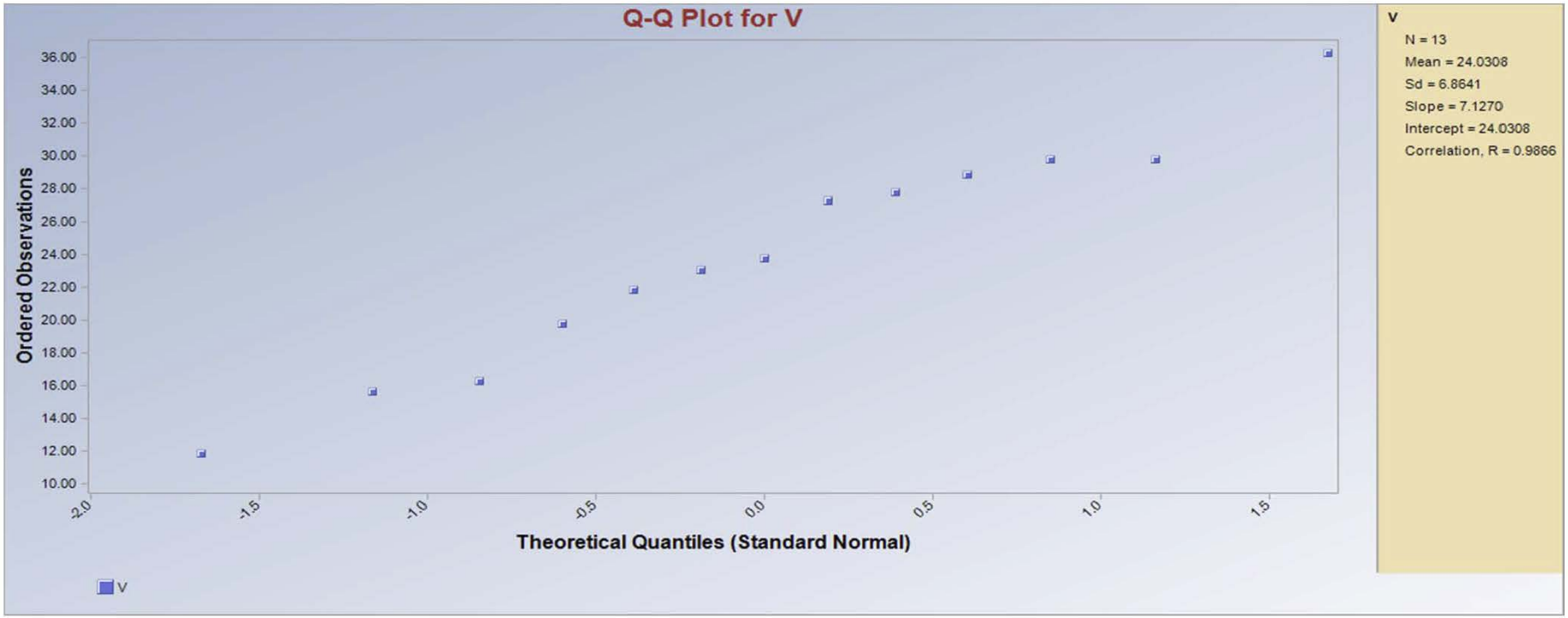

Q-Q Plot for Se
Ordered Observations
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Se
Se
N = 13
Mean = 0.3654
Sd = 0.3153
Slope = 0.3131
Intercept = 0.3654
Correlation, R = 0.9436

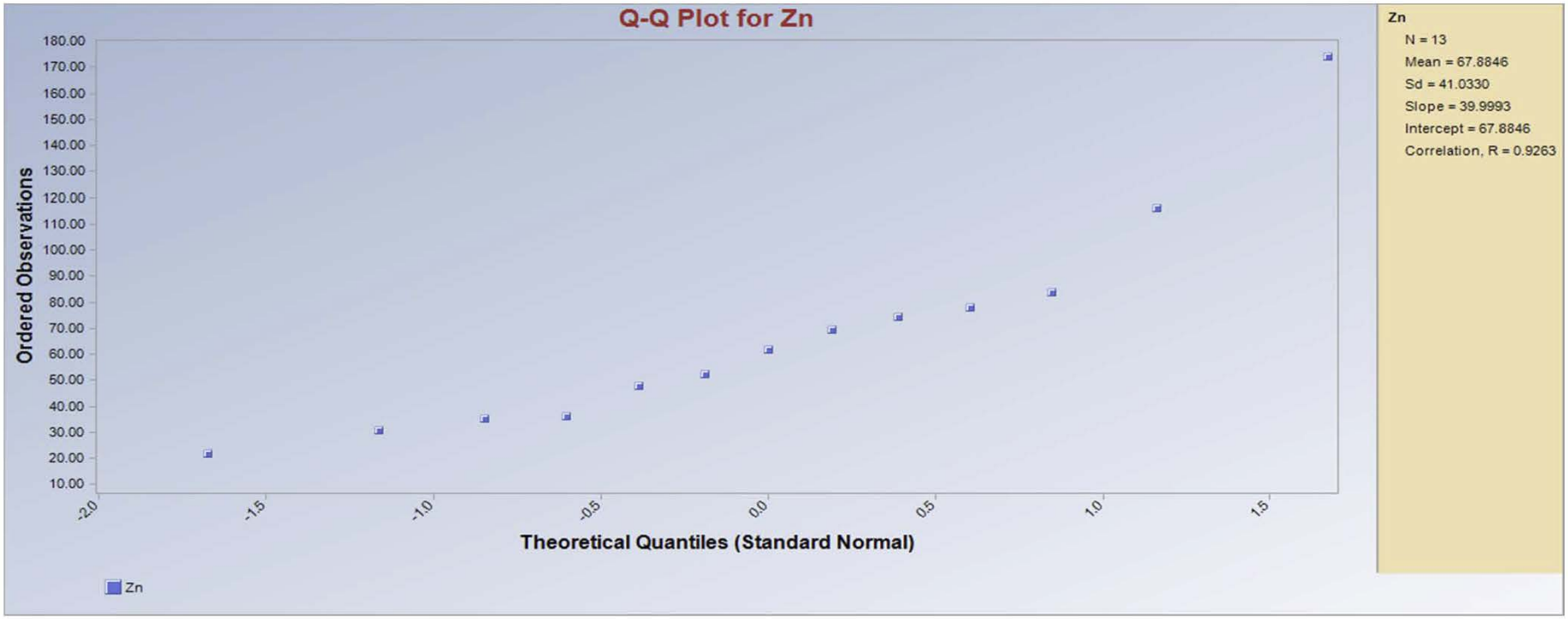
e


Q-Q Plot for Ag
Ordered Observations
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Ag
Ag
N = 13
Mean = 0.0712
Sd = 0.0338
Slope = 0.0335
Intercept = 0.0712
Correlation, R = 0.9421


Q-Q Plot for Na
Ordered Observations
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Na
Na
N = 13
Mean = 77.2385
Sd = 37.3741
Slope = 36.7201
Intercept = 77.2385
Correlation, R = 0.9336


Q-Q Plot for TI
Ordered Observations
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
TI
TI
N = 11
Mean = 0.0701
Sd = 0.0211
Slope = 0.0221
Intercept = 0.0701
Correlation, R = 0.9913


Q-Q Plot for V
Ordered Observations
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
V
V
N = 13
Mean = 24.0308
Sd = 6.8641
Slope = 7.1270
Intercept = 24.0308
Correlation, R = 0.9866


Q-Q Plot for Zn
Ordered Observations
180.00
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Theoretical Quantiles (Standard Normal)
Zn
Zn
N = 13
Mean = 67.8846
Sd = 41.0330
Slope = 39.9993
Intercept = 67.8846
Correlation, R = 0.9263

Outlier Tests for Selected Variables

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for As

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 15 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.622

For 10% significance level, 15 is an outlier.
For 5% significance level, 15 is an outlier.
For 1% significance level, 15 is not an outlier.

2. Data Value 3.67 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.031

For 10% significance level, 3.67 is not an outlier.
For 5% significance level, 3.67 is not an outlier.
For 1% significance level, 3.67 is not an outlier.

Dixon's Outlier Test for Cd

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.82 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.555

For 10% significance level, 0.82 is an outlier.
For 5% significance level, 0.82 is an outlier.
For 1% significance level, 0.82 is not an outlier.

2. Data Value 0.069 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.118

For 10% significance level, 0.069 is not an outlier.
For 5% significance level, 0.069 is not an outlier.
For 1% significance level, 0.069 is not an outlier.

Dixon's Outlier Test for Ca

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 4800 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.565

For 10% significance level, 4800 is an outlier.
For 5% significance level, 4800 is an outlier.
For 1% significance level, 4800 is not an outlier.

2. Data Value 762 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.386

For 10% significance level, 762 is not an outlier.
For 5% significance level, 762 is not an outlier.
For 1% significance level, 762 is not an outlier.

Dixon's Outlier Test for Cu

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 56.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.546

For 10% significance level, 56.2 is an outlier.

For 5% significance level, 56.2 is an outlier.
For 1% significance level, 56.2 is not an outlier.

2. Data Value 4.62 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.095

For 10% significance level, 4.62 is not an outlier.
For 5% significance level, 4.62 is not an outlier.
For 1% significance level, 4.62 is not an outlier.

Dixon's Outlier Test for Hg

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.374 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.687

For 10% significance level, 0.374 is an outlier.
For 5% significance level, 0.374 is an outlier.
For 1% significance level, 0.374 is an outlier.

2. Data Value 0.013 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.015

For 10% significance level, 0.013 is not an outlier.
For 5% significance level, 0.013 is not an outlier.
For 1% significance level, 0.013 is not an outlier.

Dixon's Outlier Test for Ni

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 51.7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.401

For 10% significance level, 51.7 is not an outlier.
For 5% significance level, 51.7 is not an outlier.
For 1% significance level, 51.7 is not an outlier.

2. Data Value 10.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.141

For 10% significance level, 10.7 is not an outlier.
For 5% significance level, 10.7 is not an outlier.
For 1% significance level, 10.7 is not an outlier.

Dixon's Outlier Test for K

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 1280 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.553

For 10% significance level, 1280 is an outlier.
For 5% significance level, 1280 is an outlier.
For 1% significance level, 1280 is not an outlier.

2. Data Value 418 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.190

For 10% significance level, 418 is not an outlier.
For 5% significance level, 418 is not an outlier.
For 1% significance level, 418 is not an outlier.

Dixon's Outlier Test for Na

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 170 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.608

For 10% significance level, 170 is an outlier.
For 5% significance level, 170 is an outlier.
For 1% significance level, 170 is not an outlier.

2. Data Value 35.9 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.022

For 10% significance level, 35.9 is not an outlier.
For 5% significance level, 35.9 is not an outlier.
For 1% significance level, 35.9 is not an outlier.

Dixon's Outlier Test for Tl

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.34 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.838

For 10% significance level, 0.34 is an outlier.
For 5% significance level, 0.34 is an outlier.
For 1% significance level, 0.34 is an outlier.

2. Data Value 0.035 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 0.035 is not an outlier.
For 5% significance level, 0.035 is not an outlier.
For 1% significance level, 0.035 is not an outlier.

Dixon's Outlier Test for Zn

Number of data = 13

10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 174 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.629

For 10% significance level, 174 is an outlier.
For 5% significance level, 174 is an outlier.
For 1% significance level, 174 is an outlier.

2. Data Value 21.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.143

For 10% significance level, 21.8 is not an outlier.
For 5% significance level, 21.8 is not an outlier.
For 1% significance level, 21.8 is not an outlier.

General Background Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Al

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	2160	Minimum	7.678
Maximum	12500	Maximum	9.433
Second Largest	11000	Second Largest	9.306
First Quartile	5945	First Quartile	8.69
Median	8600	Median	9.06
Third Quartile	10500	Third Quartile	9.259
Mean	8111	Mean	8.907
Geometric Mean	7382	SD	0.503
SD	3139		
Coefficient of Variation	0.387		
Skewness	-0.433		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.845

Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	15252	95% UTL with 90% Coverage	23187
95% UPL (t)	14053	95% UPL (t)	19134
90% Percentile (z)	12133	90% Percentile (z)	14066
95% Percentile (z)	13274	95% Percentile (z)	16887
99% Percentile (z)	15413	99% Percentile (z)	23794
Gamma Distribution Test		Data Distribution Test	
k star	4.039	Data appear Normal at 5% Significance Level	
Theta Star	2008		
MLE of Mean	8111		
MLE of Standard Deviation	4036		
nu star	88.86		
A-D Test Statistic	0.53	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	11000
K-S Test Statistic	0.212	95% Percentile	11750
5% K-S Critical Value	0.256	99% Percentile	12350
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	12500
90% Percentile	13520	95% Percentile Bootstrap UTL with 90% Coverage	12500
95% Percentile	15682	95% BCA Bootstrap UTL with 90% Coverage	12500
99% Percentile	20297	95% UPL	12500
		95% Chebyshev UPL	22401
95% WH Approx. Gamma UPL	16336	Upper Threshold Limit Based upon IQR	17333
95% HW Approx. Gamma UPL	16857		
95% WH Approx. Gamma UTL with 90% Coverage	18646		
95% HW Approx. Gamma UTL with 90% Coverage	19456		

Sb

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	0.114	Minimum	-2.172
Maximum	0.473	Maximum	-0.749
Second Largest	0.45	Second Largest	-0.799
First Quartile	0.17	First Quartile	-1.776
Median	0.189	Median	-1.666
Third Quartile	0.234	Third Quartile	-1.455
Mean	0.234	Mean	-1.55
Geometric Mean	0.212	SD	0.445
SD	0.119		
Coefficient of Variation	0.508		
Skewness	1.466		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.505	95% UTL with 90% Coverage	0.584
95% UPL (t)	0.459	95% UPL (t)	0.493
90% Percentile (z)	0.386	90% Percentile (z)	0.375

95% Percentile (z)	0.43	95% Percentile (z)	0.441
99% Percentile (z)	0.511	99% Percentile (z)	0.597

Gamma Distribution Test		Data Distribution Test	
k star	3.908	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0599		
MLE of Mean	0.234		
MLE of Standard Deviation	0.118		
nu star	85.98		

A-D Test Statistic	0.676	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	0.45
K-S Test Statistic	0.241	95% Percentile	0.462
5% K-S Critical Value	0.256	99% Percentile	0.471
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.473
90% Percentile	0.393	95% Percentile Bootstrap UTL with 90% Coverage	0.473
95% Percentile	0.456	95% BCA Bootstrap UTL with 90% Coverage	0.473
99% Percentile	0.593	95% UPL	0.473
		95% Chebyshev UPL	0.775
95% WH Approx. Gamma UPL	0.475	Upper Threshold Limit Based upon IQR	0.329
95% HW Approx. Gamma UPL	0.478		
95% WH Approx. Gamma UTL with 90% Coverage	0.543		
95% HW Approx. Gamma UTL with 90% Coverage	0.551		

As

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	10
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	3.67	Minimum	1.3
Maximum	12.7	Maximum	2.542
Second Largest	7.95	Second Largest	2.073
First Quartile	4.35	First Quartile	1.466
Median	5.6	Median	1.723
Third Quartile	6.19	Third Quartile	1.823
Mean	5.962	Mean	1.718
Geometric Mean	5.574	SD	0.366
SD	2.583		
Coefficient of Variation	0.433		
Skewness	1.977		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.793	Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	11.84	95% UTL with 90% Coverage	12.82
95% UPL (t)	10.85	95% UPL (t)	11.15
90% Percentile (z)	9.272	90% Percentile (z)	8.911
95% Percentile (z)	10.21	95% Percentile (z)	10.18
99% Percentile (z)	11.97	99% Percentile (z)	13.06

Gamma Distribution Test		Data Distribution Test	
k star	5.583	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.068		
MLE of Mean	5.962		
MLE of Standard Deviation	2.523		
nu star	122.8		
A-D Test Statistic	0.484	Nonparametric Statistics	
5% A-D Critical Value	0.73	90% Percentile	7.95
K-S Test Statistic	0.207	95% Percentile	10.33
5% K-S Critical Value	0.256	99% Percentile	12.23
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	12.7
90% Percentile	9.337	95% Percentile Bootstrap UTL with 90% Coverage	12.7
95% Percentile	10.63	95% BCA Bootstrap UTL with 90% Coverage	12.7
99% Percentile	13.33	95% UPL	12.7
		95% Chebyshev UPL	17.72
95% WH Approx. Gamma UPL	10.95	Upper Threshold Limit Based upon IQR	8.95
95% HW Approx. Gamma UPL	10.99		
95% WH Approx. Gamma UTL with 90% Coverage	12.3		
95% HW Approx. Gamma UTL with 90% Coverage	12.41		

Ba

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	55.6	Minimum	4.018
Maximum	146	Maximum	4.984
Second Largest	142	Second Largest	4.956
First Quartile	72.75	First Quartile	4.286
Median	79.5	Median	4.376
Third Quartile	127	Third Quartile	4.838
Mean	96.09	Mean	4.508
Geometric Mean	90.77	SD	0.353
SD	34.17		
Coefficient of Variation	0.356		
Skewness	0.491		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	173.8	95% UTL with 90% Coverage	202.9
95% UPL (t)	160.8	95% UPL (t)	177.2
90% Percentile (z)	139.9	90% Percentile (z)	142.8
95% Percentile (z)	152.3	95% Percentile (z)	162.3
99% Percentile (z)	175.6	99% Percentile (z)	206.6
Gamma Distribution Test		Data Distribution Test	
k star	6.561	Data appear Normal at 5% Significance Level	
Theta Star	14.64		
MLE of Mean	96.09		
MLE of Standard Deviation	37.51		
nu star	144.4		

A-D Test Statistic	0.494	Nonparametric Statistics	
5% A-D Critical Value	0.73	90% Percentile	142
K-S Test Statistic	0.214	95% Percentile	144
5% K-S Critical Value	0.256	99% Percentile	145.6

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	146
90% Percentile	146.2	95% Percentile Bootstrap UTL with 90% Coverage	146
95% Percentile	164.9	95% BCA Bootstrap UTL with 90% Coverage	146
99% Percentile	204.1	95% UPL	146
		95% Chebyshev UPL	251.6
95% WH Approx. Gamma UPL	169.8	Upper Threshold Limit Based upon IQR	208.4
95% HW Approx. Gamma UPL	171.4		
95% WH Approx. Gamma UTL with 90% Coverage	189.4		
95% HW Approx. Gamma UTL with 90% Coverage	192.2		

Be

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	0.13	Minimum	-2.04
Maximum	0.408	Maximum	-0.896
Second Largest	0.383	Second Largest	-0.96
First Quartile	0.177	First Quartile	-1.741
Median	0.265	Median	-1.328
Third Quartile	0.348	Third Quartile	-1.057

Mean	0.268	Mean	-1.388
Geometric Mean	0.25	SD	0.411
SD	0.0996		
Coefficient of Variation	0.372		
Skewness	-0.104		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.495	95% UTL with 90% Coverage	0.635
95% UPL (t)	0.457	95% UPL (t)	0.543
90% Percentile (z)	0.396	90% Percentile (z)	0.422
95% Percentile (z)	0.432	95% Percentile (z)	0.49
99% Percentile (z)	0.5	99% Percentile (z)	0.649
Gamma Distribution Test		Data Distribution Test	
k star	5.255	Data appear Normal at 5% Significance Level	
Theta Star	0.051		
MLE of Mean	0.268		
MLE of Standard Deviation	0.117		
nu star	115.6		
A-D Test Statistic	0.421	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	0.383
K-S Test Statistic	0.166	95% Percentile	0.396
5% K-S Critical Value	0.256	99% Percentile	0.406
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.408
90% Percentile	0.425	95% Percentile Bootstrap UTL with 90% Coverage	0.408
95% Percentile	0.485	95% BCA Bootstrap UTL with 90% Coverage	0.408
99% Percentile	0.612	95% UPL	0.408
		95% Chebyshev UPL	0.722
95% WH Approx. Gamma UPL	0.502	Upper Threshold Limit Based upon IQR	0.604
95% HW Approx. Gamma UPL	0.511		
95% WH Approx. Gamma UTL with 90% Coverage	0.566		
95% HW Approx. Gamma UTL with 90% Coverage	0.58		

Cd

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Tolerance Factor	2.355	Number of Missing Values	4

Raw Statistics		Log-Transformed Statistics	
Minimum	0.069	Minimum	-2.674
Maximum	0.288	Maximum	-1.245
Second Largest	0.268	Second Largest	-1.317
First Quartile	0.122	First Quartile	-2.106
Median	0.163	Median	-1.818
Third Quartile	0.255	Third Quartile	-1.368
Mean	0.179	Mean	-1.817
Geometric Mean	0.163	SD	0.479
SD	0.0781		
Coefficient of Variation	0.436		
Skewness	0.155		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.363	95% UTL with 90% Coverage	0.503
95% UPL (t)	0.329	95% UPL (t)	0.408
90% Percentile (z)	0.279	90% Percentile (z)	0.3
95% Percentile (z)	0.307	95% Percentile (z)	0.358
99% Percentile (z)	0.361	99% Percentile (z)	0.496
Gamma Distribution Test		Data Distribution Test	
k star	3.809	Data appear Normal at 5% Significance Level	
Theta Star	0.047		
MLE of Mean	0.179		
MLE of Standard Deviation	0.0917		
nu star	76.19		
A-D Test Statistic	0.319	Nonparametric Statistics	
5% A-D Critical Value	0.729	90% Percentile	0.27
K-S Test Statistic	0.176	95% Percentile	0.279
5% K-S Critical Value	0.267	99% Percentile	0.286
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	0.288
90% Percentile	0.302	95% Percentile Bootstrap UTL with 90% Coverage	0.288
95% Percentile	0.352	95% BCA Bootstrap UTL with 90% Coverage	0.288
99% Percentile	0.458	95% UPL	0.288
		95% Chebyshev UPL	0.536

95% WH Approx. Gamma UPL	0.368	Upper Threshold Limit Based upon IQR	0.455
95% HW Approx. Gamma UPL	0.376		
95% WH Approx. Gamma UTL with 90% Coverage	0.428		
95% HW Approx. Gamma UTL with 90% Coverage	0.443		

Ca

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	10
Tolerance Factor	2.275	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	762	Minimum	6.636
Maximum	2960	Maximum	7.993
Second Largest	2930	Second Largest	7.983
First Quartile	1655	First Quartile	7.411
Median	2220	Median	7.705
Third Quartile	2800	Third Quartile	7.936
Mean	2140	Mean	7.603
Geometric Mean	2005	SD	0.408
SD	716.5		
Coefficient of Variation	0.335		
Skewness	-0.48		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	3770	95% UTL with 90% Coverage	5075
95% UPL (t)	3497	95% UPL (t)	4342
90% Percentile (z)	3058	90% Percentile (z)	3383
95% Percentile (z)	3319	95% Percentile (z)	3924
99% Percentile (z)	3807	99% Percentile (z)	5182

Gamma Distribution Test		Data Distribution Test	
k star	5.745	Data appear Normal at 5% Significance Level	
Theta Star	372.5		
MLE of Mean	2140		
MLE of Standard Deviation	892.9		
nu star	126.4		

A-D Test Statistic	0.426	Nonparametric Statistics	
5% A-D Critical Value	0.73	90% Percentile	2930
K-S Test Statistic	0.141	95% Percentile	2945
5% K-S Critical Value	0.256	99% Percentile	2957
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	2960
90% Percentile	3334	95% Percentile Bootstrap UTL with 90% Coverage	2960
95% Percentile	3788	95% BCA Bootstrap UTL with 90% Coverage	2930
99% Percentile	4742	95% UPL	2960
		95% Chebyshev UPL	5402
95% WH Approx. Gamma UPL	3912	Upper Threshold Limit Based upon IQR	4518
95% HW Approx. Gamma UPL	3998		
95% WH Approx. Gamma UTL with 90% Coverage	4388		
95% HW Approx. Gamma UTL with 90% Coverage	4521		

Cr

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	10.7	Minimum	2.37
Maximum	22.2	Maximum	3.1
Second Largest	21.4	Second Largest	3.063
First Quartile	12.8	First Quartile	2.547
Median	15.8	Median	2.76
Third Quartile	18.4	Third Quartile	2.908
Mean	15.84	Mean	2.733
Geometric Mean	15.38	SD	0.254
SD	4.023		
Coefficient of Variation	0.254		
Skewness	0.378		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	24.99	95% UTL with 90% Coverage	27.42
95% UPL (t)	23.45	95% UPL (t)	24.89
90% Percentile (z)	20.99	90% Percentile (z)	21.3
95% Percentile (z)	22.45	95% Percentile (z)	23.36
99% Percentile (z)	25.19	99% Percentile (z)	27.78

Gamma Distribution Test		Data Distribution Test	
k star	12.59	Data appear Normal at 5% Significance Level	
Theta Star	1.258		
MLE of Mean	15.84		
MLE of Standard Deviation	4.464		
nu star	276.9		
A-D Test Statistic	0.283	Nonparametric Statistics	
5% A-D Critical Value	0.729	90% Percentile	21.4
K-S Test Statistic	0.144	95% Percentile	21.8
5% K-S Critical Value	0.255	99% Percentile	22.12
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	22.2
90% Percentile	21.76	95% Percentile Bootstrap UTL with 90% Coverage	22.2
95% Percentile	23.82	95% BCA Bootstrap UTL with 90% Coverage	22.2
99% Percentile	28.02	95% UPL	22.2
		95% Chebyshev UPL	34.15
95% WH Approx. Gamma UPL	24.28	Upper Threshold Limit Based upon IQR	26.8
95% HW Approx. Gamma UPL	24.42		
95% WH Approx. Gamma UTL with 90% Coverage	26.37		
95% HW Approx. Gamma UTL with 90% Coverage	26.6		

Co

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	3.83	Minimum	1.343
Maximum	13.5	Maximum	2.603
Second Largest	11.9	Second Largest	2.477
First Quartile	5.315	First Quartile	1.668
Median	7.29	Median	1.987
Third Quartile	10.21	Third Quartile	2.315
Mean	7.873	Mean	1.985
Geometric Mean	7.277	SD	0.419
SD	3.254		
Coefficient of Variation	0.413		
Skewness	0.531		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	15.27	95% UTL with 90% Coverage	18.87
95% UPL (t)	14.03	95% UPL (t)	16.08
90% Percentile (z)	12.04	90% Percentile (z)	12.45
95% Percentile (z)	13.22	95% Percentile (z)	14.49
99% Percentile (z)	15.44	99% Percentile (z)	19.28
Gamma Distribution Test		Data Distribution Test	
k star	4.799	Data appear Normal at 5% Significance Level	
Theta Star	1.64		
MLE of Mean	7.873		
MLE of Standard Deviation	3.594		
nu star	105.6		

A-D Test Statistic	0.241	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	11.9
K-S Test Statistic	0.15	95% Percentile	12.7
5% K-S Critical Value	0.256	99% Percentile	13.34
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	13.5
90% Percentile	12.69	95% Percentile Bootstrap UTL with 90% Coverage	13.5
95% Percentile	14.56	95% BCA Bootstrap UTL with 90% Coverage	13.5
99% Percentile	18.53	95% UPL	13.5
		95% Chebyshev UPL	22.69
95% WH Approx. Gamma UPL	15.1	Upper Threshold Limit Based upon IQR	17.54
95% HW Approx. Gamma UPL	15.3		
95% WH Approx. Gamma UTL with 90% Coverage	17.09		
95% HW Approx. Gamma UTL with 90% Coverage	17.45		

Cu

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	4.62	Minimum	1.53
Maximum	36.9	Maximum	3.608
Second Largest	29.4	Second Largest	3.381
First Quartile	9.045	First Quartile	2.191
Median	16.7	Median	2.815
Third Quartile	24.45	Third Quartile	3.186

Mean	17.34	Mean	2.671
Geometric Mean	14.45	SD	0.658
SD	10.44		
Coefficient of Variation	0.602		
Skewness	0.644		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	41.09	95% UTL with 90% Coverage	64.62
95% UPL (t)	37.1	95% UPL (t)	50.25
90% Percentile (z)	30.72	90% Percentile (z)	33.6
95% Percentile (z)	34.51	95% Percentile (z)	42.68
99% Percentile (z)	41.62	99% Percentile (z)	66.84
Gamma Distribution Test		Data Distribution Test	
k star	2.166	Data appear Normal at 5% Significance Level	
Theta Star	8.006		
MLE of Mean	17.34		
MLE of Standard Deviation	11.78		
nu star	47.65		
A-D Test Statistic	0.201	Nonparametric Statistics	
5% A-D Critical Value	0.734	90% Percentile	29.4
K-S Test Statistic	0.131	95% Percentile	33.15
5% K-S Critical Value	0.257	99% Percentile	36.15
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	36.9
90% Percentile	33.1	95% Percentile Bootstrap UTL with 90% Coverage	36.9
95% Percentile	40.12	95% BCA Bootstrap UTL with 90% Coverage	36.9
99% Percentile	55.6	95% UPL	36.9
		95% Chebyshev UPL	64.86
95% WH Approx. Gamma UPL	42.74	Upper Threshold Limit Based upon IQR	47.56
95% HW Approx. Gamma UPL	44.11		
95% WH Approx. Gamma UTL with 90% Coverage	50.64		
95% HW Approx. Gamma UTL with 90% Coverage	53.06		

Fe

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3
Raw Statistics		Log-Transformed Statistics	
Minimum	8170	Minimum	9.008
Maximum	33600	Maximum	10.42
Second Largest	32300	Second Largest	10.38
First Quartile	14300	First Quartile	9.566
Median	17200	Median	9.753
Third Quartile	21850	Third Quartile	9.992
Mean	19470	Mean	9.803
Geometric Mean	18091	SD	0.407
SD	7813		
Coefficient of Variation	0.401		
Skewness	0.759		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	37244	95% UTL with 90% Coverage	45712
95% UPL (t)	34260	95% UPL (t)	39124
90% Percentile (z)	29482	90% Percentile (z)	30495
95% Percentile (z)	32320	95% Percentile (z)	35361
99% Percentile (z)	37645	99% Percentile (z)	46678
Gamma Distribution Test		Data Distribution Test	
k star	5.129	Data appear Normal at 5% Significance Level	
Theta Star	3796		
MLE of Mean	19470		
MLE of Standard Deviation	8597		
nu star	112.8		
A-D Test Statistic	0.283	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	32300
K-S Test Statistic	0.147	95% Percentile	32950
5% K-S Critical Value	0.256	99% Percentile	33470
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	33600
90% Percentile	30978	95% Percentile Bootstrap UTL with 90% Coverage	33600
95% Percentile	35422	95% BCA Bootstrap UTL with 90% Coverage	33600
99% Percentile	44800	95% UPL	33600
		95% Chebyshev UPL	55038

95% WH Approx. Gamma UPL	36649	Upper Threshold Limit Based upon IQR	33175
95% HW Approx. Gamma UPL	37148		
95% WH Approx. Gamma UTL with 90% Coverage	41341		
95% HW Approx. Gamma UTL with 90% Coverage	42205		

Pb

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	1.82	Minimum	0.599
Maximum	13.5	Maximum	2.603
Second Largest	10.5	Second Largest	2.351
First Quartile	2.88	First Quartile	1.044
Median	4.43	Median	1.488
Third Quartile	8.655	Third Quartile	2.142
Mean	5.972	Mean	1.589
Geometric Mean	4.899	SD	0.669
SD	3.89		
Coefficient of Variation	0.651		
Skewness	0.846		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	14.82	95% UTL with 90% Coverage	22.45
95% UPL (t)	13.34	95% UPL (t)	17.39
90% Percentile (z)	10.96	90% Percentile (z)	11.55
95% Percentile (z)	12.37	95% Percentile (z)	14.73
99% Percentile (z)	15.02	99% Percentile (z)	23.24

Gamma Distribution Test		Data Distribution Test	
k star	2.01	Data appear Normal at 5% Significance Level	
Theta Star	2.971		
MLE of Mean	5.972		
MLE of Standard Deviation	4.212		
nu star	44.22		

A-D Test Statistic	0.302	Nonparametric Statistics	
5% A-D Critical Value	0.735	90% Percentile	10.5
K-S Test Statistic	0.149	95% Percentile	12
5% K-S Critical Value	0.257	99% Percentile	13.2
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	13.5
90% Percentile	11.6	95% Percentile Bootstrap UTL with 90% Coverage	13.5
95% Percentile	14.14	95% BCA Bootstrap UTL with 90% Coverage	13.5
99% Percentile	19.78	95% UPL	13.5
		95% Chebyshev UPL	23.68
95% WH Approx. Gamma UPL	15.11	Upper Threshold Limit Based upon IQR	17.32
95% HW Approx. Gamma UPL	15.53		
95% WH Approx. Gamma UTL with 90% Coverage	17.99		
95% HW Approx. Gamma UTL with 90% Coverage	18.77		

Mg

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	1400	Minimum	7.244
Maximum	5900	Maximum	8.683
Second Largest	5040	Second Largest	8.525
First Quartile	3025	First Quartile	8.013
Median	3460	Median	8.149
Third Quartile	4720	Third Quartile	8.458
Mean	3812	Mean	8.183
Geometric Mean	3580	SD	0.396
SD	1280		
Coefficient of Variation	0.336		
Skewness	-0.181		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Test Statistic	0.899
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	6723	95% UTL with 90% Coverage	8821
95% UPL (t)	6235	95% UPL (t)	7582
90% Percentile (z)	5452	90% Percentile (z)	5950
95% Percentile (z)	5917	95% Percentile (z)	6872
99% Percentile (z)	6789	99% Percentile (z)	9003

Gamma Distribution Test		Data Distribution Test	
k star	5.98	Data appear Normal at 5% Significance Level	
Theta Star	637.4		
MLE of Mean	3812		
MLE of Standard Deviation	1559		
nu star	131.6		
A-D Test Statistic	0.337	Nonparametric Statistics	
5% A-D Critical Value	0.73	90% Percentile	5040
K-S Test Statistic	0.158	95% Percentile	5470
5% K-S Critical Value	0.256	99% Percentile	5814
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	5900
90% Percentile	5896	95% Percentile Bootstrap UTL with 90% Coverage	5900
95% Percentile	6684	95% BCA Bootstrap UTL with 90% Coverage	5900
99% Percentile	8337	95% UPL	5900
		95% Chebyshev UPL	9639
95% WH Approx. Gamma UPL	6895	Upper Threshold Limit Based upon IQR	7263
95% HW Approx. Gamma UPL	7032		
95% WH Approx. Gamma UTL with 90% Coverage	7720		
95% HW Approx. Gamma UTL with 90% Coverage	7933		

Mn

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	197	Minimum	5.283
Maximum	743	Maximum	6.611
Second Largest	740	Second Largest	6.607
First Quartile	253.5	First Quartile	5.535
Median	366	Median	5.903
Third Quartile	500.5	Third Quartile	6.213
Mean	404.1	Mean	5.899
Geometric Mean	364.6	SD	0.471
SD	197.4		
Coefficient of Variation	0.488		
Skewness	0.873		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	853.1	95% UTL with 90% Coverage	1064
95% UPL (t)	777.7	95% UPL (t)	888.6
90% Percentile (z)	657	90% Percentile (z)	666.4
95% Percentile (z)	728.8	95% Percentile (z)	790.6
99% Percentile (z)	863.3	99% Percentile (z)	1090
Gamma Distribution Test		Data Distribution Test	
k star	3.714	Data appear Normal at 5% Significance Level	
Theta Star	108.8		
MLE of Mean	404.1		
MLE of Standard Deviation	209.7		
nu star	81.72		

A-D Test Statistic	0.384	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	740
K-S Test Statistic	0.185	95% Percentile	741.5
5% K-S Critical Value	0.256	99% Percentile	742.7

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	743
90% Percentile	685.2	95% Percentile Bootstrap UTL with 90% Coverage	743
95% Percentile	799	95% BCA Bootstrap UTL with 90% Coverage	743
99% Percentile	1043	95% UPL	743
		95% Chebyshev UPL	1303
95% WH Approx. Gamma UPL	833.7	Upper Threshold Limit Based upon IQR	871
95% HW Approx. Gamma UPL	845		
95% WH Approx. Gamma UTL with 90% Coverage	956.5		
95% HW Approx. Gamma UTL with 90% Coverage	977.9		

Hg

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	0.013	Minimum	-4.343
Maximum	0.143	Maximum	-1.945
Second Largest	0.126	Second Largest	-2.071
First Quartile	0.0225	First Quartile	-3.853
Median	0.05	Median	-2.996
Third Quartile	0.085	Third Quartile	-2.466

Mean	0.0595	Mean	-3.131
Geometric Mean	0.0437	SD	0.876
SD	0.0451		
Coefficient of Variation	0.757		
Skewness	0.787		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.162	95% UTL with 90% Coverage	0.321
95% UPL (t)	0.145	95% UPL (t)	0.23
90% Percentile (z)	0.117	90% Percentile (z)	0.134
95% Percentile (z)	0.134	95% Percentile (z)	0.185
99% Percentile (z)	0.164	99% Percentile (z)	0.336

Gamma Distribution Test		Data Distribution Test
k star	1.343	Data appear Normal at 5% Significance Level
Theta Star	0.0443	
MLE of Mean	0.0595	
MLE of Standard Deviation	0.0514	
nu star	29.55	

A-D Test Statistic	0.32	Nonparametric Statistics	
5% A-D Critical Value	0.74	90% Percentile	0.126
K-S Test Statistic	0.161	95% Percentile	0.135
5% K-S Critical Value	0.259	99% Percentile	0.141

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.143
90% Percentile	0.127	95% Percentile Bootstrap UTL with 90% Coverage	0.143
95% Percentile	0.161	95% BCA Bootstrap UTL with 90% Coverage	0.143
99% Percentile	0.237	95% UPL	0.143
		95% Chebyshev UPL	0.265
95% WH Approx. Gamma UPL	0.176	Upper Threshold Limit Based upon IQR	0.179
95% HW Approx. Gamma UPL	0.185		
95% WH Approx. Gamma UTL with 90% Coverage	0.216		
95% HW Approx. Gamma UTL with 90% Coverage	0.231		

Ni

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	10.7	Minimum	2.37
Maximum	37	Maximum	3.611
Second Largest	36.2	Second Largest	3.589
First Quartile	14.6	First Quartile	2.681
Median	22.4	Median	3.109
Third Quartile	27.25	Third Quartile	3.302
Mean	22.3	Mean	3.027
Geometric Mean	20.64	SD	0.418
SD	9.074		
Coefficient of Variation	0.407		
Skewness	0.471		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	42.94	95% UTL with 90% Coverage	53.38
95% UPL (t)	39.48	95% UPL (t)	45.51
90% Percentile (z)	33.93	90% Percentile (z)	35.25
95% Percentile (z)	37.23	95% Percentile (z)	41.02
99% Percentile (z)	43.41	99% Percentile (z)	54.54
Gamma Distribution Test		Data Distribution Test	
k star	4.867	Data appear Normal at 5% Significance Level	
Theta Star	4.582		
MLE of Mean	22.3		
MLE of Standard Deviation	10.11		
nu star	107.1		
A-D Test Statistic	0.263	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	36.2
K-S Test Statistic	0.167	95% Percentile	36.6
5% K-S Critical Value	0.256	99% Percentile	36.92
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	37
90% Percentile	35.84	95% Percentile Bootstrap UTL with 90% Coverage	37
95% Percentile	41.1	95% BCA Bootstrap UTL with 90% Coverage	37
99% Percentile	52.24	95% UPL	37
		95% Chebyshev UPL	63.61

95% WH Approx. Gamma UPL	42.6	Upper Threshold Limit Based upon IQR	46.23
95% HW Approx. Gamma UPL	43.21		
95% WH Approx. Gamma UTL with 90% Coverage	48.19		
95% HW Approx. Gamma UTL with 90% Coverage	49.24		

K

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	418	Minimum	6.035
Maximum	961	Maximum	6.868
Second Largest	773	Second Largest	6.65
First Quartile	567.5	First Quartile	6.338
Median	668	Median	6.504
Third Quartile	719.5	Third Quartile	6.579
Mean	656.7	Mean	6.464
Geometric Mean	641.8	SD	0.227
SD	146.5		
Coefficient of Variation	0.223		
Skewness	0.419		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Test Statistic	0.971
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	990	95% UTL with 90% Coverage	1075
95% UPL (t)	934.1	95% UPL (t)	985.7
90% Percentile (z)	844.5	90% Percentile (z)	858.1
95% Percentile (z)	897.7	95% Percentile (z)	931.8
99% Percentile (z)	997.6	99% Percentile (z)	1087

Gamma Distribution Test		Data Distribution Test
k star	16.03	Data appear Normal at 5% Significance Level
Theta Star	40.97	
MLE of Mean	656.7	
MLE of Standard Deviation	164	
nu star	352.6	

A-D Test Statistic	0.237	Nonparametric Statistics	
5% A-D Critical Value	0.729	90% Percentile	773
K-S Test Statistic	0.132	95% Percentile	867
5% K-S Critical Value	0.255	99% Percentile	942.2

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution			
90% Percentile	873.8	95% UTL with 90% Coverage	961
95% Percentile	947.8	95% Percentile Bootstrap UTL with 90% Coverage	961
99% Percentile	1097	95% BCA Bootstrap UTL with 90% Coverage	961
		95% UPL	961
		95% Chebyshev UPL	1324
95% WH Approx. Gamma UPL	963.3	Upper Threshold Limit Based upon IQR	947.5
95% HW Approx. Gamma UPL	968.2		
95% WH Approx. Gamma UTL with 90% Coverage	1038		
95% HW Approx. Gamma UTL with 90% Coverage	1046		

Se

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	2

Raw Statistics		Log-Transformed Statistics	
Minimum	0.04	Minimum	-3.219
Maximum	1.03	Maximum	0.0296
Second Largest	0.45	Second Largest	-0.799
First Quartile	0.1	First Quartile	-2.323
Median	0.22	Median	-1.514
Third Quartile	0.365	Third Quartile	-1.019
Mean	0.291	Mean	-1.63
Geometric Mean	0.196	SD	0.967
SD	0.282		
Coefficient of Variation	0.969		
Skewness	2		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.932	95% UTL with 90% Coverage	1.767
95% UPL (t)	0.824	95% UPL (t)	1.221
90% Percentile (z)	0.652	90% Percentile (z)	0.676
95% Percentile (z)	0.754	95% Percentile (z)	0.961
99% Percentile (z)	0.946	99% Percentile (z)	1.857

Gamma Distribution Test		Data Distribution Test	
k star	1.084	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.268		
MLE of Mean	0.291		
MLE of Standard Deviation	0.279		
nu star	23.85		
A-D Test Statistic	0.196	Nonparametric Statistics	
5% A-D Critical Value	0.744	90% Percentile	0.45
K-S Test Statistic	0.112	95% Percentile	0.74
5% K-S Critical Value	0.26	99% Percentile	0.972
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	1.03
90% Percentile	0.657	95% Percentile Bootstrap UTL with 90% Coverage	1.03
95% Percentile	0.847	95% BCA Bootstrap UTL with 90% Coverage	1.03
99% Percentile	1.287	95% UPL	1.03
		95% Chebyshev UPL	1.574
95% WH Approx. Gamma UPL	0.929	Upper Threshold Limit Based upon IQR	0.763
95% HW Approx. Gamma UPL	0.972		
95% WH Approx. Gamma UTL with 90% Coverage	1.157		
95% HW Approx. Gamma UTL with 90% Coverage	1.24		

Ag

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	10
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	0.034	Minimum	-3.381
Maximum	0.124	Maximum	-2.087
Second Largest	0.113	Second Largest	-2.18
First Quartile	0.0435	First Quartile	-3.135
Median	0.062	Median	-2.781
Third Quartile	0.0925	Third Quartile	-2.39
Mean	0.068	Mean	-2.79
Geometric Mean	0.0614	SD	0.47
SD	0.0327		
Coefficient of Variation	0.481		
Skewness	0.713		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.142	95% UTL with 90% Coverage	0.179
95% UPL (t)	0.13	95% UPL (t)	0.15
90% Percentile (z)	0.11	90% Percentile (z)	0.112
95% Percentile (z)	0.122	95% Percentile (z)	0.133
99% Percentile (z)	0.144	99% Percentile (z)	0.183
Gamma Distribution Test		Data Distribution Test	
k star	3.746	Data appear Normal at 5% Significance Level	
Theta Star	0.0182		
MLE of Mean	0.068		
MLE of Standard Deviation	0.0351		
nu star	82.41		

A-D Test Statistic	0.48	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	0.113
K-S Test Statistic	0.204	95% Percentile	0.119
5% K-S Critical Value	0.256	99% Percentile	0.123
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.124
90% Percentile	0.115	95% Percentile Bootstrap UTL with 90% Coverage	0.124
95% Percentile	0.134	95% BCA Bootstrap UTL with 90% Coverage	0.124
99% Percentile	0.175	95% UPL	0.124
		95% Chebyshev UPL	0.217
95% WH Approx. Gamma UPL	0.14	Upper Threshold Limit Based upon IQR	0.166
95% HW Approx. Gamma UPL	0.142		
95% WH Approx. Gamma UTL with 90% Coverage	0.161		
95% HW Approx. Gamma UTL with 90% Coverage	0.164		

Na

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	2

Raw Statistics		Log-Transformed Statistics	
Minimum	35.9	Minimum	3.581
Maximum	125	Maximum	4.828
Second Largest	89.3	Second Largest	4.492
First Quartile	49.4	First Quartile	3.872
Median	71.4	Median	4.268
Third Quartile	84.8	Third Quartile	4.44

Mean	70.62	Mean	4.185
Geometric Mean	65.7	SD	0.41
SD	26.98		
Coefficient of Variation	0.382		
Skewness	0.366		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	132	95% UTL with 90% Coverage	167.1
95% UPL (t)	121.7	95% UPL (t)	142.8
90% Percentile (z)	105.2	90% Percentile (z)	111.1
95% Percentile (z)	115	95% Percentile (z)	129
99% Percentile (z)	133.4	99% Percentile (z)	170.6
Gamma Distribution Test		Data Distribution Test	
k star	5.216	Data appear Normal at 5% Significance Level	
Theta Star	13.54		
MLE of Mean	70.62		
MLE of Standard Deviation	30.92		
nu star	114.7		
A-D Test Statistic	0.502	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	89.3
K-S Test Statistic	0.187	95% Percentile	107.2
5% K-S Critical Value	0.256	99% Percentile	121.4
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	125
90% Percentile	112	95% Percentile Bootstrap UTL with 90% Coverage	125
95% Percentile	127.9	95% BCA Bootstrap UTL with 90% Coverage	125
99% Percentile	161.6	95% UPL	125
		95% Chebyshev UPL	193.4
95% WH Approx. Gamma UPL	132.4	Upper Threshold Limit Based upon IQR	137.9
95% HW Approx. Gamma UPL	134.6		
95% WH Approx. Gamma UTL with 90% Coverage	149.3		
95% HW Approx. Gamma UTL with 90% Coverage	152.8		

Tl

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Tolerance Factor	2.275	Number of Missing Values	3

Raw Statistics		Log-Transformed Statistics	
Minimum	0.035	Minimum	-3.352
Maximum	0.105	Maximum	-2.254
Second Largest	0.096	Second Largest	-2.343
First Quartile	0.055	First Quartile	-2.903
Median	0.07	Median	-2.659
Third Quartile	0.082	Third Quartile	-2.505
Mean	0.0701	Mean	-2.703
Geometric Mean	0.067	SD	0.323
SD	0.0211		
Coefficient of Variation	0.301		
Skewness	0.0772		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.978	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.118	95% UTL with 90% Coverage	0.14
95% UPL (t)	0.11	95% UPL (t)	0.124
90% Percentile (z)	0.0971	90% Percentile (z)	0.101
95% Percentile (z)	0.105	95% Percentile (z)	0.114
99% Percentile (z)	0.119	99% Percentile (z)	0.142
Gamma Distribution Test		Data Distribution Test	
k star	8.282	Data appear Normal at 5% Significance Level	
Theta Star	0.00846		
MLE of Mean	0.0701		
MLE of Standard Deviation	0.0244		
nu star	182.2		
A-D Test Statistic	0.197	Nonparametric Statistics	
5% A-D Critical Value	0.729	90% Percentile	0.096
K-S Test Statistic	0.155	95% Percentile	0.101
5% K-S Critical Value	0.255	99% Percentile	0.104
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	0.105
90% Percentile	0.103	95% Percentile Bootstrap UTL with 90% Coverage	0.105
95% Percentile	0.114	95% BCA Bootstrap UTL with 90% Coverage	0.105
99% Percentile	0.139	95% UPL	0.105
		95% Chebyshev UPL	0.166

95% WH Approx. Gamma UPL	0.117	Upper Threshold Limit Based upon IQR	0.123
95% HW Approx. Gamma UPL	0.119		
95% WH Approx. Gamma UTL with 90% Coverage	0.129		
95% HW Approx. Gamma UTL with 90% Coverage	0.132		

V

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	10
Tolerance Factor	2.275	Number of Missing Values	3
Raw Statistics		Log-Transformed Statistics	
Minimum	11.9	Minimum	2.477
Maximum	29.8	Maximum	3.395
Second Largest	29.8	Second Largest	3.395
First Quartile	18.05	First Quartile	2.888
Median	23.1	Median	3.14
Third Quartile	28.1	Third Quartile	3.335
Mean	22.57	Mean	3.078
Geometric Mean	21.72	SD	0.301
SD	6.142		
Coefficient of Variation	0.272		
Skewness	-0.365		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	36.55	95% UTL with 90% Coverage	43.06
95% UPL (t)	34.2	95% UPL (t)	38.39
90% Percentile (z)	30.44	90% Percentile (z)	31.94
95% Percentile (z)	32.68	95% Percentile (z)	35.63
99% Percentile (z)	36.86	99% Percentile (z)	43.73

Gamma Distribution Test		Data Distribution Test	
k star	9.673	Data appear Normal at 5% Significance Level	
Theta Star	2.334		
MLE of Mean	22.57		
MLE of Standard Deviation	7.258		
nu star	212.8		

A-D Test Statistic	0.364	Nonparametric Statistics	
5% A-D Critical Value	0.729	90% Percentile	29.8
K-S Test Statistic	0.153	95% Percentile	29.8
5% K-S Critical Value	0.255	99% Percentile	29.8
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	29.8
90% Percentile	32.23	95% Percentile Bootstrap UTL with 90% Coverage	29.8
95% Percentile	35.68	95% BCA Bootstrap UTL with 90% Coverage	29.8
99% Percentile	42.78	95% UPL	29.8
		95% Chebyshev UPL	50.54
95% WH Approx. Gamma UPL	36.51	Upper Threshold Limit Based upon IQR	43.18
95% HW Approx. Gamma UPL	36.92		
95% WH Approx. Gamma UTL with 90% Coverage	40.05		
95% HW Approx. Gamma UTL with 90% Coverage	40.68		

Zn

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
Tolerance Factor	2.355	Number of Missing Values	4

Raw Statistics		Log-Transformed Statistics	
Minimum	21.8	Minimum	3.082
Maximum	78	Maximum	4.357
Second Largest	74.3	Second Largest	4.308
First Quartile	35.53	First Quartile	3.57
Median	50.25	Median	3.916
Third Quartile	67.63	Third Quartile	4.213
Mean	50.85	Mean	3.853
Geometric Mean	47.14	SD	0.425
SD	19.63		
Coefficient of Variation	0.386		
Skewness	0.0258		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.943	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	97.07	95% UTL with 90% Coverage	128.2
95% UPL (t)	88.59	95% UPL (t)	106.7
90% Percentile (z)	76	90% Percentile (z)	81.25
95% Percentile (z)	83.14	95% Percentile (z)	94.82
99% Percentile (z)	96.51	99% Percentile (z)	126.7

Gamma Distribution Test		Data Distribution Test	
k star	4.799	Data appear Normal at 5% Significance Level	
Theta Star	10.6		
MLE of Mean	50.85		
MLE of Standard Deviation	23.21		
nu star	95.99		
A-D Test Statistic	0.286	Nonparametric Statistics	
5% A-D Critical Value	0.728	90% Percentile	74.67
K-S Test Statistic	0.159	95% Percentile	76.34
5% K-S Critical Value	0.267	99% Percentile	77.67
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	78
90% Percentile	81.93	95% Percentile Bootstrap UTL with 90% Coverage	78
95% Percentile	94.05	95% BCA Bootstrap UTL with 90% Coverage	78
99% Percentile	119.7	95% UPL	78
		95% Chebyshev UPL	140.6
95% WH Approx. Gamma UPL	97.84	Upper Threshold Limit Based upon IQR	115.8
95% HW Approx. Gamma UPL	99.65		
95% WH Approx. Gamma UTL with 90% Coverage	112.3		
95% HW Approx. Gamma UTL with 90% Coverage	115.4		

Biota ProUCL Data

Blueberry leaves and stems - background (mg/kg-dry weight)
Lowest duplicate kept; no outliers

	Aluminum	D_Aluminum	Antimony	D_Antimony	Arsenic	D_Arsenic	Barium	D_Barium	Beryllium	D_Beryllium	Cadmium	D_Cadmium	Calcium	D_Calcium	Chromium	D_Chromium	Cobalt	D_Cobalt	Copper	D_Copper	Iron	D_Iron	Lead	D_Lead	Magnesium	D_Magnesium
11RD12BL	11.5	1	0.146	1	0.1	1	36.3	1	0.003	0	0.255	1	2430	1	0.2	0	0.017	1	3.93	1	19.6	1	0.056	1	1060	1
11RD14BL	25.4	1	0.164	1	0.13	1	56.4	1	0.003	0	0.195	1	2290	1	0.2	0	0.034	1	3.7	1	37.3	1	0.041	1	867	1
11RD18BL	15	1	0.214	1	0.15	1					0.093	1					0.021	1			31.1	1	0.021	1	1360	1
11RD40BL (Dup)							42.7	1	0.003	0			2820	1	0.2	0			5.08	1						
11UP02BL	56.7	1	0.225	1	0.06	0	34.4	1	0.003	0	0.174	1	2600	1	0.2	0	0.041	1	5.32	1	30.3	1	0.032	1	1030	1
11UP04BL	19.5	1	0.441	1	0.06	0	18.8	1	0.003	0	0.154	1	1660	1	0.2	0	0.003	0	2.74	1	13.5	1	0.022	1	706	1
11UP07BL	42.2	1	0.009	0	0.11	1	49.4	1	0.003	0	0.304	1	2030	1	0.2	0	0.091	1	7.87	1	26.2	1	0.078	1	770	1
11UP08BL	28.9	1	0.009	0	0.09	1	48.1	1	0.003	0	0.192	1	2150	1	0.2	0	0.03	1	5.73	1	26.9	1	0.035	1	1140	1
11UP09BL	51.5	1	0.126	1	0.16	1	48.8	1	0.019	1	0.432	1	3100	1	0.2	0	0.105	1	6.58	1	32.8	1	0.085	1	1060	1

	Manganese	D_Manganese	Mercury	D_Mercury	Nickel	D_Nickel	Potassium	D_Potassium	Selenium	D_Selenium	Silver	D_Silver	Sodium	D_Sodium	Thallium	D_Thallium	Vanadium	D_Vanadium	Zinc	D_Zinc
11RD12BL	462	1	0.016	1	0.51	1	3300	1	0.15	0	0.008	0	11.7	1	0.002	0	0.04	1	48.9	1
11RD14BL	652	1	0.05	1	0.96	1	3390	1	0.03	0	0.008	0	9.5	1	0.002	0	0.05	1	35.8	1
11RD18BL	328	1					5080	1	0.15	0	0.008	0								
11RD40BL (Dup)			0.036	1	0.49	1							17.5	1	0.002	0	0.02	0	38.8	1
11UP02BL	1530	1	0.023	1	1.68	1	3550	1	0.03	0	0.012	1	7.5	1	0.002	0	0.03	1	21.9	1
11UP04BL	960	1	0.025	1	0.51	1	2060	1	0.15	0	0.035	1	5	1	0.002	0	0.03	1	29.6	1
11UP07BL	1120	1	0.03	1	1.58	1	2670	1	0.03	0	0.008	0	7.8	1	0.002	0	0.07	1	44	1
11UP08BL	1250	1	0.044	1	1	1	3900	1	0.03	0	0.008	0	7.1	1	0.002	0	0.04	1	22.4	1
11UP09BL	1020	1	0.034	1	2.01	1	3750	1	0.15	0	0.008	0	15.8	1	0.019	1	0.06	1	39.5	1

General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	11.5	Minimum	2.442
Maximum	56.7	Maximum	4.038
Second Largest	51.5	Second Largest	3.942
First Quartile	18.38	First Quartile	2.905
Median	27.15	Median	3.299
Third Quartile	44.53	Third Quartile	3.792
Mean	31.34	Mean	3.305
Geometric Mean	27.25	SD	0.58
SD	16.94		
Coefficient of Variation	0.541		
Skewness	0.46		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	75.09	95% UTL with 90% Coverage	121.8
95% UPL (t)	65.39	95% UPL (t)	87.41
90% Percentile (z)	53.05	90% Percentile (z)	57.3
95% Percentile (z)	59.21	95% Percentile (z)	70.74
99% Percentile (z)	70.75	99% Percentile (z)	105

Gamma Distribution Test		Data Distribution Test	
k star	2.42	Data appear Normal at 5% Significance Level	
Theta Star	12.95		
MLE of Mean	31.34		
MLE of Standard Deviation	20.15		
nu star	38.72		

A-D Test Statistic	0.241	Nonparametric Statistics	
5% A-D Critical Value	0.719	90% Percentile	53.06
K-S Test Statistic	0.156	95% Percentile	54.88
5% K-S Critical Value	0.296	99% Percentile	56.34

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution			
90% Percentile	58.32	95% UTL with 90% Coverage	56.7
95% Percentile	70.07	95% Percentile Bootstrap UTL with 90% Coverage	56.7
99% Percentile	95.85	95% BCA Bootstrap UTL with 90% Coverage	56.7
		95% UPL	56.7

		95% Chebyshev UPL	109.7
95% WH Approx. Gamma UPL	75.59	Upper Threshold Limit Based upon IQR	83.75
95% HW Approx. Gamma UPL	77.84		
95% WH Approx. Gamma UTL with 90% Coverage	94.92		
95% HW Approx. Gamma UTL with 90% Coverage	99.67		

Antimony

General Statistics			
Number of Valid Data	8	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	2
Tolerance Factor	2.582	Percent Non-Detects	25.00%
Number of Missing Values	1		
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.126	Minimum Detected	-2.071
Maximum Detected	0.441	Maximum Detected	-0.819
Mean of Detected	0.219	Mean of Detected	-1.609
SD of Detected	0.115	SD of Detected	0.446
Minimum Non-Detect	0.009	Minimum Non-Detect	-4.711
Maximum Non-Detect	0.009	Maximum Non-Detect	-4.711

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.791	Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.166	Mean (Log Scale)	-2.558
SD	0.139	SD (Log Scale)	1.796
95% UTL 90% Coverage	0.525	95% UTL 90% Coverage	8.01
95% UPL (t)	0.445	95% UPL (t)	2.864
90% Percentile (z)	0.344	90% Percentile (z)	0.774
95% Percentile (z)	0.395	95% Percentile (z)	1.488
99% Percentile (z)	0.489	99% Percentile (z)	5.06
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.144	Mean in Original Scale	0.181
SD	0.164	SD in Original Scale	0.121
95% UTL with 90% Coverage	0.568	95% UTL with 90% Coverage	0.807
		95% BCA UTL with 90% Coverage	0.441
		95% Bootstrap (%) UTL with 90% Coverage	0.441
95% UPL (t)	0.474	95% UPL (t)	0.556
90% Percentile (z)	0.354	90% Percentile (z)	0.347
95% Percentile (z)	0.414	95% Percentile (z)	0.439
99% Percentile (z)	0.526	99% Percentile (z)	0.683
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.906	Data appear Normal at 5% Significance Level	
Theta Star	0.0755		
nu star	34.87		
A-D Test Statistic	0.445	Nonparametric Statistics	
5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method	

K-S Test Statistic	0.253	Mean	0.196
5% K-S Critical Value	0.333	SD	0.0996
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0386
		95% KM UTL with 90% Coverage	0.453
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.657
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.396
Mean	0.165	90% Percentile (z)	0.324
Median	0.155	95% Percentile (z)	0.36
SD	0.141	99% Percentile (z)	0.428
k star	0.239		
Theta star	0.689	Gamma ROS Limits with Extrapolated Data	
Nu star	3.822	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.024
95% Percentile of Chisquare (2k)	2.344	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.59
		95% WH Approx. Gamma UTL with 90% Coverage	1.595
90% Percentile	0.495	95% HW Approx. Gamma UTL with 90% Coverage	2.829
95% Percentile	0.807		
99% Percentile	1.642		

Note: DL/2 is not a recommended method.

Arsenic

General Statistics

Number of Valid Data	8	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	2
Tolerance Factor	2.582	Percent Non-Detects	25.00%
Number of Missing Values	1		

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.09	Minimum Detected	-2.408
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.123	Mean of Detected	-2.115
SD of Detected	0.028	SD of Detected	0.229
Minimum Non-Detect	0.06	Minimum Non-Detect	-2.813
Maximum Non-Detect	0.06	Maximum Non-Detect	-2.813

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.947
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.1	Mean (Log Scale)	-2.463
SD	0.0493	SD (Log Scale)	0.673
95% UTL 90% Coverage	0.227	95% UTL 90% Coverage	0.484
95% UPL (t)	0.199	95% UPL (t)	0.329
90% Percentile (z)	0.163	90% Percentile (z)	0.202
95% Percentile (z)	0.181	95% Percentile (z)	0.258
99% Percentile (z)	0.215	99% Percentile (z)	0.408
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.101	Mean in Original Scale	0.109
SD	0.0452	SD in Original Scale	0.0354
95% UTL with 90% Coverage	0.218	95% UTL with 90% Coverage	0.249
		95% BCA UTL with 90% Coverage	0.16

		95% Bootstrap (%) UTL with 90% Coverage	0.16
95% UPL (t)	0.192	95% UPL (t)	0.205
90% Percentile (z)	0.159	90% Percentile (z)	0.161
95% Percentile (z)	0.176	95% Percentile (z)	0.182
99% Percentile (z)	0.207	99% Percentile (z)	0.229

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	11.68	Data appear Normal at 5% Significance Level	
Theta Star	0.0106		
nu star	140.2		
A-D Test Statistic	0.261	Nonparametric Statistics	
5% A-D Critical Value	0.697	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.185	Mean	0.115
5% K-S Critical Value	0.332	SD	0.0265
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0102
		95% KM UTL with 90% Coverage	0.183
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.237
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.168
Mean	0.0973	90% Percentile (z)	0.149
Median	0.105	95% Percentile (z)	0.159
SD	0.0545	99% Percentile (z)	0.177
k star	0.833		
Theta star	0.117	Gamma ROS Limits with Extrapolated Data	
Nu star	13.32	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.361
95% Percentile of Chisquare (2k)	5.326	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.432
		95% WH Approx. Gamma UTL with 90% Coverage	0.498
90% Percentile	0.234	95% HW Approx. Gamma UTL with 90% Coverage	0.635
95% Percentile	0.311		
99% Percentile	0.492		

Note: DL/2 is not a recommended method.

Barium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	18.8	Minimum	2.934
Maximum	56.4	Maximum	4.032
Second Largest	49.4	Second Largest	3.9
First Quartile	35.83	First Quartile	3.578
Median	45.4	Median	3.814
Third Quartile	48.95	Third Quartile	3.891
Mean	41.86	Mean	3.689
Geometric Mean	40	SD	0.347
SD	11.8		
Coefficient of Variation	0.282		
Skewness	-1.018		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	72.33	95% UTL with 90% Coverage	97.98
95% UPL (t)	65.57	95% UPL (t)	80.33
90% Percentile (z)	56.98	90% Percentile (z)	62.4
95% Percentile (z)	61.27	95% Percentile (z)	70.78
99% Percentile (z)	69.31	99% Percentile (z)	89.66

Gamma Distribution Test		Data Distribution Test
k star	7.059	Data appear Normal at 5% Significance Level
Theta Star	5.931	
MLE of Mean	41.86	
MLE of Standard Deviation	15.76	
nu star	112.9	

A-D Test Statistic	0.523	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	51.5
K-S Test Statistic	0.217	95% Percentile	53.95
5% K-S Critical Value	0.294	99% Percentile	55.91

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution			
90% Percentile	62.9	95% UTL with 90% Coverage	56.4
95% Percentile	70.69	95% Percentile Bootstrap UTL with 90% Coverage	56.4
99% Percentile	86.92	95% BCA Bootstrap UTL with 90% Coverage	56.4
		95% UPL	56.4
		95% Chebyshev UPL	96.41
95% WH Approx. Gamma UPL	73.17	Upper Threshold Limit Based upon IQR	68.64
95% HW Approx. Gamma UPL	74.64		
95% WH Approx. Gamma UTL with 90% Coverage	84.85		
95% HW Approx. Gamma UTL with 90% Coverage	87.44		

Beryllium

General Statistics

Number of Valid Data	8	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	7

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium was not processed!

Cadmium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	0.093	Minimum	-2.375
Maximum	0.432	Maximum	-0.839
Second Largest	0.304	Second Largest	-1.191
First Quartile	0.169	First Quartile	-1.779
Median	0.194	Median	-1.643
Third Quartile	0.267	Third Quartile	-1.323
Mean	0.225	Mean	-1.585
Geometric Mean	0.205	SD	0.463
SD	0.105		
Coefficient of Variation	0.467		
Skewness	1.083		

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.98
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.496	95% UTL with 90% Coverage	0.677
95% UPL (t)	0.436	95% UPL (t)	0.52
90% Percentile (z)	0.359	90% Percentile (z)	0.371
95% Percentile (z)	0.397	95% Percentile (z)	0.439
99% Percentile (z)	0.469	99% Percentile (z)	0.602

Gamma Distribution Test		Data Distribution Test	
k star	3.569	Data appear Normal at 5% Significance Level	
Theta Star	0.063		
MLE of Mean	0.225		
MLE of Standard Deviation	0.119		
nu star	57.11		
A-D Test Statistic	0.219	Nonparametric Statistics	
5% A-D Critical Value	0.719	90% Percentile	0.342
K-S Test Statistic	0.199	95% Percentile	0.387
5% K-S Critical Value	0.295	99% Percentile	0.423
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	0.432
90% Percentile	0.384	95% Percentile Bootstrap UTL with 90% Coverage	0.432
95% Percentile	0.449	95% BCA Bootstrap UTL with 90% Coverage	0.432
99% Percentile	0.589	95% UPL	0.432
		95% Chebyshev UPL	0.71
95% WH Approx. Gamma UPL	0.475	Upper Threshold Limit Based upon IQR	0.415
95% HW Approx. Gamma UPL	0.484		
95% WH Approx. Gamma UTL with 90% Coverage	0.578		
95% HW Approx. Gamma UTL with 90% Coverage	0.596		

Calcium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	1660	Minimum	7.415
Maximum	3100	Maximum	8.039
Second Largest	2820	Second Largest	7.944
First Quartile	2120	First Quartile	7.659
Median	2360	Median	7.766
Third Quartile	2655	Third Quartile	7.884
Mean	2385	Mean	7.76
Geometric Mean	2346	SD	0.197
SD	457.4		
Coefficient of Variation	0.192		
Skewness	0.0363		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.996	Shapiro Wilk Test Statistic	0.988
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	3566	95% UTL with 90% Coverage	3903
95% UPL (t)	3304	95% UPL (t)	3486
90% Percentile (z)	2971	90% Percentile (z)	3020
95% Percentile (z)	3137	95% Percentile (z)	3244
99% Percentile (z)	3449	99% Percentile (z)	3711
Gamma Distribution Test		Data Distribution Test	
k star	18.96	Data appear Normal at 5% Significance Level	
Theta Star	125.8		
MLE of Mean	2385		
MLE of Standard Deviation	547.8		
nu star	303.3		
A-D Test Statistic	0.122	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	2904
K-S Test Statistic	0.093	95% Percentile	3002
5% K-S Critical Value	0.294	99% Percentile	3080
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	3100
90% Percentile	3108	95% Percentile Bootstrap UTL with 90% Coverage	3100
95% Percentile	3352	95% BCA Bootstrap UTL with 90% Coverage	3100
99% Percentile	3840	95% UPL	3100
		95% Chebyshev UPL	4500
95% WH Approx. Gamma UPL	3411	Upper Threshold Limit Based upon IQR	3458
95% HW Approx. Gamma UPL	3428		
95% WH Approx. Gamma UTL with 90% Coverage	3759		
95% HW Approx. Gamma UTL with 90% Coverage	3791		

Chromium

General Statistics

Number of Valid Data	8	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Chromium was not processed!

Cobalt

General Statistics

Number of Valid Data	8	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	1
Tolerance Factor	2.582	Percent Non-Detects	12.50%
Number of Missing Values	1		

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.017	Minimum Detected	-4.075
Maximum Detected	0.105	Maximum Detected	-2.254
Mean of Detected	0.0484	Mean of Detected	-3.239
SD of Detected	0.035	SD of Detected	0.691
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Test Statistic	0.921
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0426	Mean (Log Scale)	-3.647
SD	0.0364	SD (Log Scale)	1.319
95% UTL 90% Coverage	0.137	95% UTL 90% Coverage	0.786
95% UPL (t)	0.116	95% UPL (t)	0.369
90% Percentile (z)	0.0892	90% Percentile (z)	0.141
95% Percentile (z)	0.102	95% Percentile (z)	0.228
99% Percentile (z)	0.127	99% Percentile (z)	0.561

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0403	Mean in Original Scale	0.0433
SD	0.0377	SD in Original Scale	0.0356
95% UTL with 90% Coverage	0.138	95% UTL with 90% Coverage	0.308
		95% BCA UTL with 90% Coverage	0.105
		95% Bootstrap (%) UTL with 90% Coverage	0.105
95% UPL (t)	0.116	95% UPL (t)	0.186
90% Percentile (z)	0.0886	90% Percentile (z)	0.0979
95% Percentile (z)	0.102	95% Percentile (z)	0.135
99% Percentile (z)	0.128	99% Percentile (z)	0.246

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.537	Data appear Normal at 5% Significance Level	
Theta Star	0.0315		
nu star	21.52		
A-D Test Statistic	0.446	Nonparametric Statistics	
5% A-D Critical Value	0.713	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.232	Mean	0.0445
5% K-S Critical Value	0.314	SD	0.0321
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0122
		95% KM UTL with 90% Coverage	0.127
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.193
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.109
Mean	0.0424	90% Percentile (z)	0.0856
Median	0.032	95% Percentile (z)	0.0972
SD	0.0367	99% Percentile (z)	0.119
k star	0.371		
Theta star	0.114	Gamma ROS Limits with Extrapolated Data	
Nu star	5.932	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.206
95% Percentile of Chisquare (2k)	3.162	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.286
		95% WH Approx. Gamma UTL with 90% Coverage	0.303
90% Percentile	0.121	95% HW Approx. Gamma UTL with 90% Coverage	0.466
95% Percentile	0.181		
99% Percentile	0.331		

Note: DL/2 is not a recommended method.

Copper

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	2.74	Minimum	1.008
Maximum	7.87	Maximum	2.063
Second Largest	6.58	Second Largest	1.884
First Quartile	3.873	First Quartile	1.354
Median	5.2	Median	1.648
Third Quartile	5.943	Third Quartile	1.78
Mean	5.119	Mean	1.584
Geometric Mean	4.876	SD	0.34
SD	1.656		
Coefficient of Variation	0.324		
Skewness	0.259		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	9.395	95% UTL with 90% Coverage	11.73
95% UPL (t)	8.447	95% UPL (t)	9.656
90% Percentile (z)	7.241	90% Percentile (z)	7.539
95% Percentile (z)	7.843	95% Percentile (z)	8.53
99% Percentile (z)	8.972	99% Percentile (z)	10.75

Gamma Distribution Test		Data Distribution Test
k star	6.616	Data appear Normal at 5% Significance Level
Theta Star	0.774	
MLE of Mean	5.119	
MLE of Standard Deviation	1.99	
nu star	105.9	
A-D Test Statistic	0.17	Nonparametric Statistics
5% A-D Critical Value	0.715	90% Percentile 6.967
K-S Test Statistic	0.156	95% Percentile 7.419
5% K-S Critical Value	0.294	99% Percentile 7.78
Data appear Gamma Distributed at 5% Significance Level		
Assuming Gamma Distribution		95% UTL with 90% Coverage 7.87
90% Percentile	7.777	95% Percentile Bootstrap UTL with 90% Coverage 7.87
95% Percentile	8.77	95% BCA Bootstrap UTL with 90% Coverage 7.87
99% Percentile	10.84	95% UPL 7.87
		95% Chebyshev UPL 12.78
95% WH Approx. Gamma UPL	9.091	Upper Threshold Limit Based upon IQR 9.048
95% HW Approx. Gamma UPL	9.211	
95% WH Approx. Gamma UTL with 90% Coverage	10.59	
95% HW Approx. Gamma UTL with 90% Coverage	10.82	

Iron

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	13.5	Minimum	2.603
Maximum	37.3	Maximum	3.619
Second Largest	32.8	Second Largest	3.49
First Quartile	24.55	First Quartile	3.193
Median	28.6	Median	3.352
Third Quartile	31.53	Third Quartile	3.451
Mean	27.21	Mean	3.262
Geometric Mean	26.09	SD	0.327
SD	7.604		
Coefficient of Variation	0.279		
Skewness	-0.75		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.952	Shapiro Wilk Test Statistic	0.884

Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	46.85	95% UTL with 90% Coverage	60.77
95% UPL (t)	42.49	95% UPL (t)	50.38
90% Percentile (z)	36.96	90% Percentile (z)	39.7
95% Percentile (z)	39.72	95% Percentile (z)	44.71
99% Percentile (z)	44.9	99% Percentile (z)	55.89
Gamma Distribution Test		Data Distribution Test	
k star	7.637	Data appear Normal at 5% Significance Level	
Theta Star	3.563		
MLE of Mean	27.21		
MLE of Standard Deviation	9.847		
nu star	122.2		
A-D Test Statistic	0.411	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	34.15
K-S Test Statistic	0.236	95% Percentile	35.73
5% K-S Critical Value	0.294	99% Percentile	36.99
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	37.3
90% Percentile	40.35	95% Percentile Bootstrap UTL with 90% Coverage	37.3
95% Percentile	45.17	95% BCA Bootstrap UTL with 90% Coverage	37.3
99% Percentile	55.18	95% UPL	37.3
		95% Chebyshev UPL	62.37
95% WH Approx. Gamma UPL	46.67	Upper Threshold Limit Based upon IQR	41.99
95% HW Approx. Gamma UPL	47.45		
95% WH Approx. Gamma UTL with 90% Coverage	53.87		
95% HW Approx. Gamma UTL with 90% Coverage	55.27		

Lead

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	0.021	Minimum	-3.863
Maximum	0.085	Maximum	-2.465
Second Largest	0.078	Second Largest	-2.551
First Quartile	0.0295	First Quartile	-3.536
Median	0.038	Median	-3.273
Third Quartile	0.0615	Third Quartile	-2.8
Mean	0.0463	Mean	-3.196
Geometric Mean	0.0409	SD	0.53
SD	0.0245		
Coefficient of Variation	0.529		
Skewness	0.733		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.109	95% UTL with 90% Coverage	0.161
95% UPL (t)	0.0954	95% UPL (t)	0.119
90% Percentile (z)	0.0776	90% Percentile (z)	0.0807
95% Percentile (z)	0.0865	95% Percentile (z)	0.0978
99% Percentile (z)	0.103	99% Percentile (z)	0.14

Gamma Distribution Test		Data Distribution Test
k star	2.74	Data appear Normal at 5% Significance Level
Theta Star	0.0169	
MLE of Mean	0.0463	
MLE of Standard Deviation	0.0279	
nu star	43.85	

A-D Test Statistic	0.316	Nonparametric Statistics	
5% A-D Critical Value	0.719	90% Percentile	0.0801
K-S Test Statistic	0.159	95% Percentile	0.0826
5% K-S Critical Value	0.295	99% Percentile	0.0845

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution			
90% Percentile	0.0837	95% UTL with 90% Coverage	0.085
95% Percentile	0.0996	95% Percentile Bootstrap UTL with 90% Coverage	0.085
99% Percentile	0.134	95% BCA Bootstrap UTL with 90% Coverage	0.085
		95% UPL	0.085
		95% Chebyshev UPL	0.159
95% WH Approx. Gamma UPL	0.107	Upper Threshold Limit Based upon IQR	0.11
95% HW Approx. Gamma UPL	0.109		
95% WH Approx. Gamma UTL with 90% Coverage	0.133		
95% HW Approx. Gamma UTL with 90% Coverage	0.138		

Magnesium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	706	Minimum	6.56
Maximum	1360	Maximum	7.215
Second Largest	1140	Second Largest	7.039
First Quartile	842.8	First Quartile	6.735
Median	1045	Median	6.952
Third Quartile	1080	Third Quartile	6.984
Mean	999.1	Mean	6.887
Geometric Mean	979.3	SD	0.216
SD	211.9		
Coefficient of Variation	0.212		
Skewness	0.215		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	Assuming Lognormal Distribution

95% UTL with 90% Coverage	1546	95% UTL with 90% Coverage	1709
95% UPL (t)	1425	95% UPL (t)	1511
90% Percentile (z)	1271	90% Percentile (z)	1291
95% Percentile (z)	1348	95% Percentile (z)	1396
99% Percentile (z)	1492	99% Percentile (z)	1618

Gamma Distribution Test		Data Distribution Test	
k star	15.75	Data appear Normal at 5% Significance Level	
Theta Star	63.43		
MLE of Mean	999.1		
MLE of Standard Deviation	251.7		
nu star	252		
A-D Test Statistic	0.285	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	1206
K-S Test Statistic	0.212	95% Percentile	1283
5% K-S Critical Value	0.294	99% Percentile	1345
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	1360
90% Percentile	1332	95% Percentile Bootstrap UTL with 90% Coverage	1360
95% Percentile	1446	95% BCA Bootstrap UTL with 90% Coverage	1360
99% Percentile	1676	95% UPL	1360
		95% Chebyshev UPL	1979
95% WH Approx. Gamma UPL	1475	Upper Threshold Limit Based upon IQR	1436
95% HW Approx. Gamma UPL	1483		
95% WH Approx. Gamma UTL with 90% Coverage	1639		
95% HW Approx. Gamma UTL with 90% Coverage	1655		

Manganese

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	328	Minimum	5.793
Maximum	1530	Maximum	7.333
Second Largest	1250	Second Largest	7.131
First Quartile	604.5	First Quartile	6.394
Median	990	Median	6.897
Third Quartile	1153	Third Quartile	7.049
Mean	915.3	Mean	6.711
Geometric Mean	821.4	SD	0.529
SD	407.9		
Coefficient of Variation	0.446		
Skewness	-0.0961		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	1968	95% UTL with 90% Coverage	3218
95% UPL (t)	1735	95% UPL (t)	2377

90% Percentile (z)	1438	90% Percentile (z)	1618
95% Percentile (z)	1586	95% Percentile (z)	1960
99% Percentile (z)	1864	99% Percentile (z)	2811

Gamma Distribution Test		Data Distribution Test	
k star	3.072	Data appear Normal at 5% Significance Level	
Theta Star	297.9		
MLE of Mean	915.3		
MLE of Standard Deviation	522.2		
nu star	49.16		

A-D Test Statistic	0.304	Nonparametric Statistics	
5% A-D Critical Value	0.719	90% Percentile	1334
K-S Test Statistic	0.227	95% Percentile	1432
5% K-S Critical Value	0.295	99% Percentile	1510
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	1530
90% Percentile	1615	95% Percentile Bootstrap UTL with 90% Coverage	1530
95% Percentile	1908	95% BCA Bootstrap UTL with 90% Coverage	1530
99% Percentile	2541	95% UPL	1530
		95% Chebyshev UPL	2801
95% WH Approx. Gamma UPL	2034	Upper Threshold Limit Based upon IQR	1975
95% HW Approx. Gamma UPL	2099		
95% WH Approx. Gamma UTL with 90% Coverage	2502		
95% HW Approx. Gamma UTL with 90% Coverage	2629		

Mercury

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	0.016	Minimum	-4.135
Maximum	0.05	Maximum	-2.996
Second Largest	0.044	Second Largest	-3.124
First Quartile	0.0245	First Quartile	-3.71
Median	0.032	Median	-3.444
Third Quartile	0.038	Third Quartile	-3.274
Mean	0.0323	Mean	-3.491
Geometric Mean	0.0305	SD	0.369
SD	0.0112		
Coefficient of Variation	0.347		
Skewness	0.244		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.983	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.0612	95% UTL with 90% Coverage	0.079
95% UPL (t)	0.0547	95% UPL (t)	0.064
90% Percentile (z)	0.0466	90% Percentile (z)	0.0489
95% Percentile (z)	0.0507	95% Percentile (z)	0.0559

99% Percentile (z)	0.0583	99% Percentile (z)	0.0719

Gamma Distribution Test		Data Distribution Test	
k star	5.693	Data appear Normal at 5% Significance Level	
Theta Star	0.00566		
MLE of Mean	0.0323		
MLE of Standard Deviation	0.0135		
nu star	91.09		
A-D Test Statistic	0.144	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	0.0458
K-S Test Statistic	0.112	95% Percentile	0.0479
5% K-S Critical Value	0.294	99% Percentile	0.0496
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution			
		95% UTL with 90% Coverage	0.05
90% Percentile	0.0503	95% Percentile Bootstrap UTL with 90% Coverage	0.05
95% Percentile	0.0572	95% BCA Bootstrap UTL with 90% Coverage	0.05
99% Percentile	0.0717	95% UPL	0.05
		95% Chebyshev UPL	0.084
95% WH Approx. Gamma UPL	0.0595	Upper Threshold Limit Based upon IQR	0.0583
95% HW Approx. Gamma UPL	0.0605		
95% WH Approx. Gamma UTL with 90% Coverage	0.07		
95% HW Approx. Gamma UTL with 90% Coverage	0.0718		

Nickel

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	7
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	0.49	Minimum	-0.713
Maximum	2.01	Maximum	0.698
Second Largest	1.68	Second Largest	0.519
First Quartile	0.51	First Quartile	-0.673
Median	0.98	Median	-0.0204
Third Quartile	1.605	Third Quartile	0.473
Mean	1.093	Mean	-0.0533
Geometric Mean	0.948	SD	0.581
SD	0.597		
Coefficient of Variation	0.546		
Skewness	0.425		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	2.633	95% UTL with 90% Coverage	4.246
95% UPL (t)	2.292	95% UPL (t)	3.045
90% Percentile (z)	1.857	90% Percentile (z)	1.995
95% Percentile (z)	2.074	95% Percentile (z)	2.464
99% Percentile (z)	2.481	99% Percentile (z)	3.66

Gamma Distribution Test		Data Distribution Test	
k star	2.386	Data appear Normal at 5% Significance Level	
Theta Star	0.458		
MLE of Mean	1.093		
MLE of Standard Deviation	0.707		
nu star	38.18		
A-D Test Statistic	0.509	Nonparametric Statistics	
5% A-D Critical Value	0.719	90% Percentile	1.779
K-S Test Statistic	0.242	95% Percentile	1.895
5% K-S Critical Value	0.296	99% Percentile	1.987
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	2.01
90% Percentile	2.04	95% Percentile Bootstrap UTL with 90% Coverage	2.01
95% Percentile	2.453	95% BCA Bootstrap UTL with 90% Coverage	2.01
99% Percentile	3.361	95% UPL	2.01
		95% Chebyshev UPL	3.851
95% WH Approx. Gamma UPL	2.649	Upper Threshold Limit Based upon IQR	3.248
95% HW Approx. Gamma UPL	2.726		
95% WH Approx. Gamma UTL with 90% Coverage	3.331		
95% HW Approx. Gamma UTL with 90% Coverage	3.495		

Potassium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1
Raw Statistics		Log-Transformed Statistics	
Minimum	2060	Minimum	7.63
Maximum	5080	Maximum	8.533
Second Largest	3900	Second Largest	8.269
First Quartile	3143	First Quartile	8.049
Median	3470	Median	8.152
Third Quartile	3788	Third Quartile	8.239
Mean	3463	Mean	8.12
Geometric Mean	3360	SD	0.267
SD	888.4		
Coefficient of Variation	0.257		
Skewness	0.293		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.961	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	5756	95% UTL with 90% Coverage	6702
95% UPL (t)	5248	95% UPL (t)	5751
90% Percentile (z)	4601	90% Percentile (z)	4733
95% Percentile (z)	4924	95% Percentile (z)	5216
99% Percentile (z)	5529	99% Percentile (z)	6259
Gamma Distribution Test		Data Distribution Test	
k star	10.54	Data appear Normal at 5% Significance Level	

Theta Star	328.4		
MLE of Mean	3463		
MLE of Standard Deviation	1066		
nu star	168.7		
A-D Test Statistic	0.281	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	4254
K-S Test Statistic	0.205	95% Percentile	4667
5% K-S Critical Value	0.294	99% Percentile	4997
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	5080
90% Percentile	4880	95% Percentile Bootstrap UTL with 90% Coverage	5080
95% Percentile	5383	95% BCA Bootstrap UTL with 90% Coverage	5080
99% Percentile	6412	95% UPL	5080
		95% Chebyshev UPL	7570
95% WH Approx. Gamma UPL	5523	Upper Threshold Limit Based upon IQR	4755
95% HW Approx. Gamma UPL	5573		
95% WH Approx. Gamma UTL with 90% Coverage	6261		
95% HW Approx. Gamma UTL with 90% Coverage	6355		

Selenium

General Statistics

Number of Valid Data	8	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Selenium was not processed!

Silver

General Statistics

Number of Valid Data	8	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	6

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful and reliable test statistics and estimates.
No statistics will be produced!

Tolerance Factor	2.582	Percent Non-Detects	75.00%
Number of Missing Values	1		
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.012	Minimum Detected	-4.423
Maximum Detected	0.035	Maximum Detected	-3.352
Mean of Detected	0.0235	Mean of Detected	-3.888
SD of Detected	0.0163	SD of Detected	0.757
Minimum Non-Detect	0.008	Minimum Non-Detect	-4.828
Maximum Non-Detect	0.008	Maximum Non-Detect	-4.828

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00888	Mean (Log Scale)	-5.113
SD	0.0109	SD (Log Scale)	0.809
95% UTL 90% Coverage	0.0371	95% UTL 90% Coverage	0.0486
95% UPL (t)	0.0308	95% UPL (t)	0.0306
90% Percentile (z)	0.0229	90% Percentile (z)	0.017
95% Percentile (z)	0.0268	95% Percentile (z)	0.0228
99% Percentile (z)	0.0343	99% Percentile (z)	0.0395
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 90% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0149
5% K-S Critical Value	N/A	SD	0.00761
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0038
		95% KM UTL with 90% Coverage	0.0345
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.05
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0302
Mean	N/A	90% Percentile (z)	0.0246
Median	N/A	95% Percentile (z)	0.0274
SD	N/A	99% Percentile (z)	0.0326
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 90% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 90% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Sodium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	5	Minimum	1.609
Maximum	17.5	Maximum	2.862
Second Largest	15.8	Second Largest	2.76
First Quartile	7.4	First Quartile	2.001
Median	8.65	Median	2.153
Third Quartile	12.73	Third Quartile	2.535
Mean	10.24	Mean	2.246
Geometric Mean	9.454	SD	0.425
SD	4.425		
Coefficient of Variation	0.432		
Skewness	0.766		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.906	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	21.66	95% UTL with 90% Coverage	28.36
95% UPL (t)	19.13	95% UPL (t)	22.23
90% Percentile (z)	15.91	90% Percentile (z)	16.31
95% Percentile (z)	17.52	95% Percentile (z)	19.03
99% Percentile (z)	20.53	99% Percentile (z)	25.43

Gamma Distribution Test		Data Distribution Test
k star	4.11	Data appear Normal at 5% Significance Level
Theta Star	2.491	
MLE of Mean	10.24	
MLE of Standard Deviation	5.05	
nu star	65.77	

		Nonparametric Statistics	
A-D Test Statistic	0.308		
5% A-D Critical Value	0.718	90% Percentile	16.31
K-S Test Statistic	0.2	95% Percentile	16.91
5% K-S Critical Value	0.295	99% Percentile	17.38
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution			
90% Percentile	17.01	95% UTL with 90% Coverage	17.5
95% Percentile	19.7	95% Percentile Bootstrap UTL with 90% Coverage	17.5
99% Percentile	25.46	95% BCA Bootstrap UTL with 90% Coverage	17.5
		95% UPL	17.5
		95% Chebyshev UPL	30.7
95% WH Approx. Gamma UPL	20.72	Upper Threshold Limit Based upon IQR	20.71
95% HW Approx. Gamma UPL	21.03		
95% WH Approx. Gamma UTL with 90% Coverage	24.93		
95% HW Approx. Gamma UTL with 90% Coverage	25.61		

Thallium

General Statistics

Number of Valid Data	8	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	7

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium was not processed!

Vanadium

General Statistics			
Number of Valid Data	8	Number of Detected Data	7
Number of Distinct Detected Data	5	Number of Non-Detect Data	1
Tolerance Factor	2.582	Percent Non-Detects	12.50%
Number of Missing Values	1		

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.03	Minimum Detected	-3.507
Maximum Detected	0.07	Maximum Detected	-2.659
Mean of Detected	0.0457	Mean of Detected	-3.131
SD of Detected	0.0151	SD of Detected	0.326
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.926
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0413	Mean (Log Scale)	-3.316
SD	0.0189	SD (Log Scale)	0.602
95% UTL 90% Coverage	0.0899	95% UTL 90% Coverage	0.172
95% UPL (t)	0.0791	95% UPL (t)	0.122
90% Percentile (z)	0.0654	90% Percentile (z)	0.0786
95% Percentile (z)	0.0723	95% Percentile (z)	0.0978
99% Percentile (z)	0.0851	99% Percentile (z)	0.147
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0414	Mean in Original Scale	0.0424
SD	0.0175	SD in Original Scale	0.0168
95% UTL with 90% Coverage	0.0866	95% UTL with 90% Coverage	0.116
		95% BCA UTL with 90% Coverage	0.07
		95% Bootstrap (%) UTL with 90% Coverage	0.07
95% UPL (t)	0.0766	95% UPL (t)	0.0913
90% Percentile (z)	0.0639	90% Percentile (z)	0.0673
95% Percentile (z)	0.0702	95% Percentile (z)	0.0784
99% Percentile (z)	0.0821	99% Percentile (z)	0.104
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	6.403	Data appear Normal at 5% Significance Level	
Theta Star	0.00714		
nu star	89.64		
A-D Test Statistic	0.312	Nonparametric Statistics	
5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.202	Mean	0.0438
5% K-S Critical Value	0.312	SD	0.0141

Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00538
		95% KM UTL with 90% Coverage	0.0801
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.109
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0721
Mean	0.04	90% Percentile (z)	0.0618
Median	0.04	95% Percentile (z)	0.0669
SD	0.0214	99% Percentile (z)	0.0765
k star	0.401		
Theta star	0.0998	Gamma ROS Limits with Extrapolated Data	
Nu star	6.411	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.181
95% Percentile of Chisquare (2k)	3.328	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.263
		95% WH Approx. Gamma UTL with 90% Coverage	0.26
90% Percentile	0.113	95% HW Approx. Gamma UTL with 90% Coverage	0.42
95% Percentile	0.166		
99% Percentile	0.3		

Note: DL/2 is not a recommended method.

Zinc

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582	Number of Missing Values	1

Raw Statistics		Log-Transformed Statistics	
Minimum	21.9	Minimum	3.086
Maximum	48.9	Maximum	3.89
Second Largest	44	Second Largest	3.784
First Quartile	27.8	First Quartile	3.318
Median	37.3	Median	3.618
Third Quartile	40.63	Third Quartile	3.703
Mean	35.11	Mean	3.521
Geometric Mean	33.83	SD	0.299
SD	9.776		
Coefficient of Variation	0.278		
Skewness	-0.218		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	60.35	95% UTL with 90% Coverage	73.29
95% UPL (t)	54.76	95% UPL (t)	61.75
90% Percentile (z)	47.64	90% Percentile (z)	49.65
95% Percentile (z)	51.19	95% Percentile (z)	55.36
99% Percentile (z)	57.85	99% Percentile (z)	67.89

Gamma Distribution Test		Data Distribution Test
k star	8.561	Data appear Normal at 5% Significance Level
Theta Star	4.101	
MLE of Mean	35.11	
MLE of Standard Deviation	12	
nu star	137	

A-D Test Statistic	0.361	Nonparametric Statistics

5% A-D Critical Value	0.715	90% Percentile	45.47
K-S Test Statistic	0.189	95% Percentile	47.19
5% K-S Critical Value	0.294	99% Percentile	48.56

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	48.9
90% Percentile	51.1	95% Percentile Bootstrap UTL with 90% Coverage	48.9
95% Percentile	56.89	95% BCA Bootstrap UTL with 90% Coverage	48.9
99% Percentile	68.86	95% UPL	48.9
		95% Chebyshev UPL	80.31
95% WH Approx. Gamma UPL	58.64	Upper Threshold Limit Based upon IQR	59.86
95% HW Approx. Gamma UPL	59.32		
95% WH Approx. Gamma UTL with 90% Coverage	67.25		
95% HW Approx. Gamma UTL with 90% Coverage	68.52		

Blueberry leaves and stems - background (mg/kg-dry weight)

	Aluminum	D_Aluminum	Antimony	D_Antimony	Arsenic	D_Arsenic	Barium	D_Barium	Beryllium	D_Beryllium	Cadmium	D_Cadmium	Calcium	D_Calcium	Chromium	D_Chromium	Cobalt	D_Cobalt	Copper	D_Copper	Iron	D_Iron	Lead	D_Lead	Magnesium	D_Magnesium
11RD11WS	3.8	1	0.205	1	0.11	1	64.5	1	0.003	0	0.005	1	4720	1	0.2	0	0.023	1	2.34	1	18.3	1	0.032	1	681	1
11RD12WS	0.4	0	0.009	0	0.06	0	51.9	1	0.003	0	0.003	0	5320	1	0.2	0	0.003	0	1.54	1	19.3	1	0.019	1	847	1
11RD14WS	0.4	0	0.009	0	0.09	1	46.2	1	0.003	0	0.003	0	6550	1	0.2	0	0.024	1	1.9	1	15.8	1	0.021	1	769	1
11RD18WS	0.4	0	0.104	1	0.06	0	80.4	1	0.003	0	0.003	0	7590	1	0.2	0	0.003	0	1.61	1	25.2	1	0.015	1	596	1
11UP01WS	68.8	1	0.096	1	0.06	1	7.5	1	0.007	1	0.032	1	3210	1	0.2	0	0.048	1	1.31	1	16.6	1	0.044	1	863	1
11UP02WS	53.4	1	1.49	1	0.06	0	11.3	1	0.005	1	0.018	1	4240	1	0.2	0	0.041	1	1.46	1	17.3	1	0.036	1	653	1
11UP07WS	14	1	0.101	1	0.06	0	5.31	1	0.003	0	0.009	1	3310	1	0.2	0	0.094	1	1.75	1	12.8	1	0.022	1	943	1
11UP09WS	9.8	1	0.107	1	0.06	0	9.05	1	0.003	1	0.015	1	3840	1	0.2	0	0.034	1	1.38	1	14.9	1	0.02	1	988	1

	Manganese	D_Manganese	Mercury	D_Mercury	Nickel	D_Nickel	Potassium	D_Potassium	Selenium	D_Selenium	Silver	D_Silver	Sodium	D_Sodium	Thallium	D_Thalllium	Vanadium	D_Vanadium	Zinc	D_Zinc
11RD11WS	58.8	1	0.056	1	0.28	1	5930	1	0.15	0	0.008	0	13.4	1	0.002	1	0.02	1	24.2	1
11RD12WS	162	1	0.027	1	0.29	1	4060	1	0.03	0	0.008	0	7.9	1	0.002	0	0.03	1	54.8	1
11RD14WS	232	1	0.039	1	0.58	1	5310	1	0.15	0	0.008	0	9.8	1	0.002	0	0.04	1	46	1
11RD18WS	135	1	0.036	1	0.03	0	4530	1	0.15	0	0.008	0	6.4	1	0.002	0	0.03	1	23.3	1
11UP01WS	931	1	0.034	1	1.39	1	3800	1	0.15	0	0.008	0	13.5	1	0.015	1	0.04	1	25.1	1
11UP02WS	1590	1	0.032	1	1.02	1	4280	1	0.15	0	0.154	1	7.8	1	0.004	1	0.04	1	50.3	1
11UP07WS	1040	1	0.021	1	1.01	1	5370	1	0.15	0	0.011	1	10.5	1	0.008	1	0.03	1	28.7	1
11UP09WS	1350	1	0.038	1	1.11	1	3990	1	0.15	0	0.008	0	7	1	0.015	1	0.02	1	29.3	1

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Data	8	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	3
Tolerance Factor	2.582	Percent Non-Detects	37.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.8	Minimum Detected	1.335
Maximum Detected	68.8	Maximum Detected	4.231
Mean of Detected	29.96	Mean of Detected	2.893
SD of Detected	29.17	SD of Detected	1.208
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	0.4	Maximum Non-Detect	-0.916

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.934
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	18.8	Mean (Log Scale)	1.205
SD	26.9	SD (Log Scale)	2.503
95% UTL 90% Coverage	88.25	95% UTL 90% Coverage	2136
95% UPL (t)	72.85	95% UPL (t)	509.7
90% Percentile (z)	53.27	90% Percentile (z)	82.43
95% Percentile (z)	63.04	95% Percentile (z)	204.6
99% Percentile (z)	81.37	99% Percentile (z)	1126
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.233	Mean in Original Scale	19.02
SD	35.96	SD in Original Scale	26.73
95% UTL with 90% Coverage	102.1	95% UTL with 90% Coverage	922.7
		95% BCA UTL with 90% Coverage	68.8
		95% Bootstrap (%) UTL with 90% Coverage	68.8
95% UPL (t)	81.5	95% UPL (t)	292
90% Percentile (z)	55.32	90% Percentile (z)	67.58
95% Percentile (z)	68.39	95% Percentile (z)	140.3
99% Percentile (z)	92.9	99% Percentile (z)	552
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.583	Data appear Normal at 5% Significance Level	
Theta Star	51.4		
nu star	5.829		
A-D Test Statistic	0.35	Nonparametric Statistics	

5% A-D Critical Value	0.69	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.249	Mean	20.15
5% K-S Critical Value	0.364	SD	24.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	9.567
		95% KM UTL with 90% Coverage	82.64
Assuming Gamma Distribution		95% KM Chebyshev UPL	132.1
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	68.79
Mean	18.73	90% Percentile (z)	51.17
Median	6.8	95% Percentile (z)	59.96
SD	26.96	99% Percentile (z)	76.46
k star	0.162		
Theta star	115.9	Gamma ROS Limits with Extrapolated Data	
Nu star	2.584	95% Wilson Hilferty (WH) Approx. Gamma UPL	131.5
95% Percentile of Chisquare (2k)	1.751	95% Hawkins Wixley (HW) Approx. Gamma UPL	195.2
		95% WH Approx. Gamma UTL with 90% Coverage	219.9
90% Percentile	56.02	95% HW Approx. Gamma UTL with 90% Coverage	381.3
95% Percentile	101.5		
99% Percentile	231.6		

Note: DL/2 is not a recommended method.

Antimony

General Statistics

Number of Valid Data	8	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	2
Tolerance Factor	2.582	Percent Non-Detects	25.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.096	Minimum Detected	-2.343
Maximum Detected	1.49	Maximum Detected	0.399
Mean of Detected	0.351	Mean of Detected	-1.72
SD of Detected	0.56	SD of Detected	1.076
Minimum Non-Detect	0.009	Minimum Non-Detect	-4.711
Maximum Non-Detect	0.009	Maximum Non-Detect	-4.711

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.547	Shapiro Wilk Test Statistic	0.667
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.264	Mean (Log Scale)	-2.641
SD	0.499	SD (Log Scale)	1.932
95% UTL 90% Coverage	1.554	95% UTL 90% Coverage	10.47
95% UPL (t)	1.268	95% UPL (t)	3.463
90% Percentile (z)	0.904	90% Percentile (z)	0.848
95% Percentile (z)	1.086	95% Percentile (z)	1.712
99% Percentile (z)	1.426	99% Percentile (z)	6.388
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	

Mean	0.164	Mean in Original Scale	0.267
SD	0.57	SD in Original Scale	0.498
95% UTL with 90% Coverage	1.636	95% UTL with 90% Coverage	4.072
		95% BCA UTL with 90% Coverage	1.49
		95% Bootstrap (%) UTL with 90% Coverage	1.49
95% UPL (t)	1.309	95% UPL (t)	1.785
90% Percentile (z)	0.895	90% Percentile (z)	0.625
95% Percentile (z)	1.102	95% Percentile (z)	1.055
99% Percentile (z)	1.49	99% Percentile (z)	2.817

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.548	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.64		
nu star	6.575		
A-D Test Statistic	1.241	Nonparametric Statistics	
5% A-D Critical Value	0.718	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.374	Mean	0.287
5% K-S Critical Value	0.342	SD	0.456
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.177
		95% KM UTL with 90% Coverage	1.464
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.395
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.203
Mean	0.263	90% Percentile (z)	0.871
Median	0.103	95% Percentile (z)	1.037
SD	0.5	99% Percentile (z)	1.348
k star	0.217		
Theta star	1.212	Gamma ROS Limits with Extrapolated Data	
Nu star	3.47	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.593
95% Percentile of Chisquare (2k)	2.187	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.165
		95% WH Approx. Gamma UTL with 90% Coverage	2.581
90% Percentile	0.794	95% HW Approx. Gamma UTL with 90% Coverage	3.981
95% Percentile	1.325		

99% Percentile	2.768

Note: DL/2 is not a recommended method.

Arsenic

General Statistics

Number of Valid Data	8	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	5

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful and reliable test statistics and estimates.
No statistics will be produced!

Tolerance Factor	2.582	Percent Non-Detects	62.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.06	Minimum Detected	-2.813
Maximum Detected	0.11	Maximum Detected	-2.207
Mean of Detected	0.0867	Mean of Detected	-2.476
SD of Detected	0.0252	SD of Detected	0.309
Minimum Non-Detect	0.06	Minimum Non-Detect	-2.813
Maximum Non-Detect	0.06	Maximum Non-Detect	-2.813

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.987	Shapiro Wilk Test Statistic	0.963
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0513	Mean (Log Scale)	-3.12
SD	0.0323	SD (Log Scale)	0.558
95% UTL 90% Coverage	0.135	95% UTL 90% Coverage	0.187
95% UPL (t)	0.116	95% UPL (t)	0.136
90% Percentile (z)	0.0926	90% Percentile (z)	0.0903
95% Percentile (z)	0.104	95% Percentile (z)	0.111
99% Percentile (z)	0.126	99% Percentile (z)	0.162
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.048	Mean in Original Scale	0.0498
SD	0.0381	SD in Original Scale	0.0343
95% UTL with 90% Coverage	0.146	95% UTL with 90% Coverage	0.247
		95% BCA UTL with 90% Coverage	0.11
		95% Bootstrap (%) UTL with 90% Coverage	0.11
95% UPL (t)	0.125	95% UPL (t)	0.165
90% Percentile (z)	0.0968	90% Percentile (z)	0.0992
95% Percentile (z)	0.111	95% Percentile (z)	0.128
99% Percentile (z)	0.137	99% Percentile (z)	0.206

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
95% Percentile of Chisquare (2k)	N/A
90% Percentile	N/A
95% Percentile	N/A
99% Percentile	N/A

Data Distribution Test with Detected Values Only		
Data appear Normal at 5% Significance Level		
Nonparametric Statistics		
Kaplan-Meier (KM) Method		
Mean	0.07	
SD	0.018	
SE of Mean	0.00781	
95% KM UTL with 90% Coverage	0.117	
95% KM Chebyshev UPL	0.153	
95% KM UPL (t)	0.106	
90% Percentile (z)	0.0931	
95% Percentile (z)	0.0997	
99% Percentile (z)	0.112	
Gamma ROS Limits with Extrapolated Data		
95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A	
95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A	
95% WH Approx. Gamma UTL with 90% Coverage	N/A	
95% HW Approx. Gamma UTL with 90% Coverage	N/A	

Note: DL/2 is not a recommended method.

Barium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	5.31	Minimum	1.67
Maximum	80.4	Maximum	4.387
Second Largest	64.5	Second Largest	4.167
First Quartile	8.663	First Quartile	2.156
Median	28.75	Median	3.129
Third Quartile	55.05	Third Quartile	4.004
Mean	34.52	Mean	3.081
Geometric Mean	21.78	SD	1.104
SD	29.79		
Coefficient of Variation	0.863		
Skewness	0.408		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	111.4	95% UTL with 90% Coverage	376.9
95% UPL (t)	94.39	95% UPL (t)	200.3
90% Percentile (z)	72.7	90% Percentile (z)	89.66
95% Percentile (z)	83.53	95% Percentile (z)	133.9
99% Percentile (z)	103.8	99% Percentile (z)	284.2
Gamma Distribution Test		Data Distribution Test	
k star	0.849	Data appear Normal at 5% Significance Level	
Theta Star	40.65		
MLE of Mean	34.52		
MLE of Standard Deviation	37.46		
nu star	13.59		
A-D Test Statistic	0.62	Nonparametric Statistics	
5% A-D Critical Value	0.732	90% Percentile	69.27
K-S Test Statistic	0.264	95% Percentile	74.84
5% K-S Critical Value	0.3	99% Percentile	79.29
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	80.4
90% Percentile	82.73	95% Percentile Bootstrap UTL with 90% Coverage	80.4
95% Percentile	109.6	95% BCA Bootstrap UTL with 90% Coverage	80.4
99% Percentile	172.8	95% UPL	80.4
		95% Chebyshev UPL	172.3
95% WH Approx. Gamma UPL	130	Upper Threshold Limit Based upon IQR	124.6
95% HW Approx. Gamma UPL	140.4		
95% WH Approx. Gamma UTL with 90% Coverage	181.9		
95% HW Approx. Gamma UTL with 90% Coverage	205.7		

Beryllium

General Statistics

Number of Valid Data	8	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	5

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful and reliable test statistics and estimates.
No statistics will be produced!

Tolerance Factor	2.582	Percent Non-Detects	62.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.007	Maximum Detected	-4.962
Mean of Detected	0.005	Mean of Detected	-5.356
SD of Detected	0.002	SD of Detected	0.427
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	0.986
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00281	Mean (Log Scale)	-6.073
SD	0.0021	SD (Log Scale)	0.635
95% UTL 90% Coverage	0.00824	95% UTL 90% Coverage	0.0119
95% UPL (t)	0.00704	95% UPL (t)	0.00826
90% Percentile (z)	0.00551	90% Percentile (z)	0.0052
95% Percentile (z)	0.00627	95% Percentile (z)	0.00656
99% Percentile (z)	0.00771	99% Percentile (z)	0.0101

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00205	Mean in Original Scale	0.00251
SD	0.00293	SD in Original Scale	0.00235
95% UTL with 90% Coverage	0.00961	95% UTL with 90% Coverage	0.0215
		95% BCA UTL with 90% Coverage	0.007
		95% Bootstrap (%) UTL with 90% Coverage	0.007
95% UPL (t)	0.00793	95% UPL (t)	0.0122
90% Percentile (z)	0.0058	90% Percentile (z)	0.00595
95% Percentile (z)	0.00687	95% Percentile (z)	0.00851
99% Percentile (z)	0.00886	99% Percentile (z)	0.0167

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level
Theta Star	N/A	
nu star	N/A	
A-D Test Statistic	N/A	Nonparametric Statistics

5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.00375
5% K-S Critical Value	N/A	SD	0.00139
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.03E-04
		95% KM UTL with 90% Coverage	0.00734
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0102
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00655
Mean	N/A	90% Percentile (z)	0.00553
Median	N/A	95% Percentile (z)	0.00604
SD	N/A	99% Percentile (z)	0.00699
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 90% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 90% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Cadmium

General Statistics			
Number of Valid Data	8	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	3
Tolerance Factor	2.582	Percent Non-Detects	37.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.005	Minimum Detected	-5.298
Maximum Detected	0.032	Maximum Detected	-3.442
Mean of Detected	0.0158	Mean of Detected	-4.334

SD of Detected	0.0104	SD of Detected	0.705
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.988
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0104	Mean (Log Scale)	-5.147
SD	0.0108	SD (Log Scale)	1.242
95% UTL 90% Coverage	0.0383	95% UTL 90% Coverage	0.144
95% UPL (t)	0.0321	95% UPL (t)	0.0706
90% Percentile (z)	0.0243	90% Percentile (z)	0.0286
95% Percentile (z)	0.0282	95% Percentile (z)	0.0449
99% Percentile (z)	0.0355	99% Percentile (z)	0.105

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00738	Mean in Original Scale	0.0106
SD	0.0139	SD in Original Scale	0.0106
95% UTL with 90% Coverage	0.0433	95% UTL with 90% Coverage	0.133
		95% BCA UTL with 90% Coverage	0.032

		95% Bootstrap (%) UTL with 90% Coverage	0.032
95% UPL (t)	0.0354	95% UPL (t)	0.0676
90% Percentile (z)	0.0252	90% Percentile (z)	0.0285
95% Percentile (z)	0.0303	95% Percentile (z)	0.0439
99% Percentile (z)	0.0398	99% Percentile (z)	0.0984

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.272	Data appear Normal at 5% Significance Level	
Theta Star	0.0124		
nu star	12.72		
A-D Test Statistic	0.182	Nonparametric Statistics	
5% A-D Critical Value	0.683	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.146	Mean	0.0118
5% K-S Critical Value	0.36	SD	0.00901
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00356
		95% KM UTL with 90% Coverage	0.035
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0534
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0299
Mean	0.00988	90% Percentile (z)	0.0233
Median	0.007	95% Percentile (z)	0.0266
SD	0.0113	99% Percentile (z)	0.0327
k star	0.222		
Theta star	0.0445	Gamma ROS Limits with Extrapolated Data	
Nu star	3.547	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0684
95% Percentile of Chisquare (2k)	2.222	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0996
		95% WH Approx. Gamma UTL with 90% Coverage	0.112
90% Percentile	0.0298	95% HW Approx. Gamma UTL with 90% Coverage	0.187
95% Percentile	0.0495		

99% Percentile	0.103

Note: DL/2 is not a recommended method.

Calcium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	3210	Minimum	8.074
Maximum	7590	Maximum	8.935
Second Largest	6550	Second Largest	8.787
First Quartile	3708	First Quartile	8.216
Median	4480	Median	8.406
Third Quartile	5628	Third Quartile	8.631
Mean	4848	Mean	8.443
Geometric Mean	4643	SD	0.31
SD	1562		
Coefficient of Variation	0.322		
Skewness	0.819		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	8882	95% UTL with 90% Coverage	10344
95% UPL (t)	7987	95% UPL (t)	8661
90% Percentile (z)	6850	90% Percentile (z)	6910
95% Percentile (z)	7418	95% Percentile (z)	7734
99% Percentile (z)	8482	99% Percentile (z)	9555
Gamma Distribution Test		Data Distribution Test	
k star	7.435	Data appear Normal at 5% Significance Level	
Theta Star	652		
MLE of Mean	4848		
MLE of Standard Deviation	1778		
nu star	119		
A-D Test Statistic	0.256	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	6862
K-S Test Statistic	0.137	95% Percentile	7226
5% K-S Critical Value	0.294	99% Percentile	7517
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	7590
90% Percentile	7219	95% Percentile Bootstrap UTL with 90% Coverage	7590
95% Percentile	8093	95% BCA Bootstrap UTL with 90% Coverage	7590
99% Percentile	9908	95% UPL	7590
		95% Chebyshev UPL	12071
95% WH Approx. Gamma UPL	8363	Upper Threshold Limit Based upon IQR	8508
95% HW Approx. Gamma UPL	8428		

95% WH Approx. Gamma UTL with	90% Coverage	9671
95% HW Approx. Gamma UTL with	90% Coverage	9815

Chromium

General Statistics

Number of Valid Data	8	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Chromium was not processed!

Cobalt

General Statistics

Number of Valid Data	8	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	2
Tolerance Factor	2.582	Percent Non-Detects	25.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.023	Minimum Detected	-3.772
Maximum Detected	0.094	Maximum Detected	-2.364
Mean of Detected	0.044	Mean of Detected	-3.246
SD of Detected	0.0263	SD of Detected	0.52
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.811	Shapiro Wilk Test Statistic	0.921
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0334	Mean (Log Scale)	-4.06
SD	0.0297	SD (Log Scale)	1.57
95% UTL 90% Coverage	0.11	95% UTL 90% Coverage	0.993
95% UPL (t)	0.0931	95% UPL (t)	0.404
90% Percentile (z)	0.0714	90% Percentile (z)	0.129
95% Percentile (z)	0.0822	95% Percentile (z)	0.228
99% Percentile (z)	0.102	99% Percentile (z)	0.665
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0287	Mean in Original Scale	0.0356
SD	0.0347	SD in Original Scale	0.0272
95% UTL with 90% Coverage	0.118	95% UTL with 90% Coverage	0.2
		95% BCA UTL with 90% Coverage	0.094
		95% Bootstrap (%) UTL with 90% Coverage	0.094
95% UPL (t)	0.0985	95% UPL (t)	0.129
90% Percentile (z)	0.0732	90% Percentile (z)	0.0742
95% Percentile (z)	0.0858	95% Percentile (z)	0.0979
99% Percentile (z)	0.109	99% Percentile (z)	0.165

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only		
k star (bias corrected)	2.226	Data appear Normal at 5% Significance Level		
Theta Star	0.0198			
nu star	26.71			
A-D Test Statistic	0.374	Nonparametric Statistics		
5% A-D Critical Value	0.7	Kaplan-Meier (KM) Method		
K-S Test Statistic	0.199	Mean		0.0388
5% K-S Critical Value	0.333	SD		0.0227
Data appear Gamma Distributed at 5% Significance Level		SE of Mean		0.0088
		95% KM UTL with 90% Coverage		0.0974
Assuming Gamma Distribution		95% KM Chebyshev UPL		0.144
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)		0.0844
Mean	0.033	90% Percentile (z)		0.0679
Median	0.029	95% Percentile (z)		0.0761
SD	0.0302	99% Percentile (z)		0.0916
k star	0.259			
Theta star	0.127	Gamma ROS Limits with Extrapolated Data		
Nu star	4.146	95% Wilson Hilferty (WH) Approx. Gamma UPL		0.203
95% Percentile of Chisquare (2k)	2.482	95% Hawkins Wixley (HW) Approx. Gamma UPL		0.306
		95% WH Approx. Gamma UTL with 90% Coverage		0.316
90% Percentile	0.0988	95% HW Approx. Gamma UTL with 90% Coverage		0.541
95% Percentile	0.158			
99% Percentile	0.315			

Note: DL/2 is not a recommended method.

Copper

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	1.31	Minimum	0.27
Maximum	2.34	Maximum	0.85
Second Largest	1.9	Second Largest	0.642
First Quartile	1.44	First Quartile	0.364
Median	1.575	Median	0.454
Third Quartile	1.788	Third Quartile	0.58
Mean	1.661	Mean	0.491
Geometric Mean	1.634	SD	0.189
SD	0.335		
Coefficient of Variation	0.202		
Skewness	1.273		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	2.526	95% UTL with 90% Coverage	2.663
95% UPL (t)	2.335	95% UPL (t)	2.39
90% Percentile (z)	2.091	90% Percentile (z)	2.082
95% Percentile (z)	2.212	95% Percentile (z)	2.231
99% Percentile (z)	2.441	99% Percentile (z)	2.537

Gamma Distribution Test		Data Distribution Test	
k star	19.36	Data appear Normal at 5% Significance Level	
Theta Star	0.0858		
MLE of Mean	1.661		
MLE of Standard Deviation	0.378		
nu star	309.8		

A-D Test Statistic	0.284	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	2.032
K-S Test Statistic	0.17	95% Percentile	2.186
5% K-S Critical Value	0.294	99% Percentile	2.309
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	2.34
90% Percentile	2.16	95% Percentile Bootstrap UTL with 90% Coverage	2.34
95% Percentile	2.327	95% BCA Bootstrap UTL with 90% Coverage	2.34
99% Percentile	2.663	95% UPL	2.34
		95% Chebyshev UPL	3.21
95% WH Approx. Gamma UPL	2.367	Upper Threshold Limit Based upon IQR	2.309
95% HW Approx. Gamma UPL	2.372		
95% WH Approx. Gamma UTL with 90% Coverage	2.607		
95% HW Approx. Gamma UTL with 90% Coverage	2.619		

Iron

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	12.8	Minimum	2.549
Maximum	25.2	Maximum	3.227
Second Largest	19.3	Second Largest	2.96
First Quartile	15.58	First Quartile	2.745
Median	16.95	Median	2.83
Third Quartile	18.55	Third Quartile	2.92
Mean	17.53	Mean	2.846
Geometric Mean	17.21	SD	0.2
SD	3.699		
Coefficient of Variation	0.211		
Skewness	1.237		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	27.07	95% UTL with 90% Coverage	28.83
95% UPL (t)	24.96	95% UPL (t)	25.71
90% Percentile (z)	22.26	90% Percentile (z)	22.23
95% Percentile (z)	23.61	95% Percentile (z)	23.91
99% Percentile (z)	26.13	99% Percentile (z)	27.39

Gamma Distribution Test		Data Distribution Test	
k star	17.52	Data appear Normal at 5% Significance Level	
Theta Star	1		
MLE of Mean	17.53		
MLE of Standard Deviation	4.187		
nu star	280.3		
A-D Test Statistic	0.256	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	21.07
K-S Test Statistic	0.156	95% Percentile	23.14
5% K-S Critical Value	0.294	99% Percentile	24.79
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	25.2
90% Percentile	23.06	95% Percentile Bootstrap UTL with 90% Coverage	25.2
95% Percentile	24.93	95% BCA Bootstrap UTL with 90% Coverage	25.2
99% Percentile	28.71	95% UPL	25.2
		95% Chebyshev UPL	34.62
95% WH Approx. Gamma UPL	25.39	Upper Threshold Limit Based upon IQR	23.01
95% HW Approx. Gamma UPL	25.46		
95% WH Approx. Gamma UTL with 90% Coverage	28.08		
95% HW Approx. Gamma UTL with 90% Coverage	28.25		

Lead

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	0.015	Minimum	-4.2
Maximum	0.044	Maximum	-3.124
Second Largest	0.036	Second Largest	-3.324
First Quartile	0.0198	First Quartile	-3.925
Median	0.0215	Median	-3.84
Third Quartile	0.033	Third Quartile	-3.413
Mean	0.0261	Mean	-3.706
Geometric Mean	0.0246	SD	0.367
SD	0.01		
Coefficient of Variation	0.385		
Skewness	0.883		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.0521	95% UTL with 90% Coverage	0.0635
95% UPL (t)	0.0463	95% UPL (t)	0.0514
90% Percentile (z)	0.039	90% Percentile (z)	0.0394
95% Percentile (z)	0.0427	95% Percentile (z)	0.045
99% Percentile (z)	0.0495	99% Percentile (z)	0.0578

Gamma Distribution Test		Data Distribution Test	
k star	5.33	Data appear Normal at 5% Significance Level	
Theta Star	0.0049		
MLE of Mean	0.0261		
MLE of Standard Deviation	0.0113		
nu star	85.28		

A-D Test Statistic	0.428	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	0.0384
K-S Test Statistic	0.268	95% Percentile	0.0412
5% K-S Critical Value	0.295	99% Percentile	0.0434
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.044
90% Percentile	0.0413	95% Percentile Bootstrap UTL with 90% Coverage	0.044
95% Percentile	0.0471	95% BCA Bootstrap UTL with 90% Coverage	0.044
99% Percentile	0.0593	95% UPL	0.044
		95% Chebyshev UPL	0.0726
95% WH Approx. Gamma UPL	0.0491	Upper Threshold Limit Based upon IQR	0.0529
95% HW Approx. Gamma UPL	0.0496		
95% WH Approx. Gamma UTL with 90% Coverage	0.058		
95% HW Approx. Gamma UTL with 90% Coverage	0.0591		

Magnesium

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	596	Minimum	6.39
Maximum	988	Maximum	6.896
Second Largest	943	Second Largest	6.849
First Quartile	674	First Quartile	6.513
Median	808	Median	6.693
Third Quartile	883	Third Quartile	6.783
Mean	792.5	Mean	6.661
Geometric Mean	781.3	SD	0.182
SD	141.4		
Coefficient of Variation	0.178		
Skewness	-0.0208		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	1157	95% UTL with 90% Coverage	1249
95% UPL (t)	1077	95% UPL (t)	1126
90% Percentile (z)	973.7	90% Percentile (z)	986.3
95% Percentile (z)	1025	95% Percentile (z)	1054
99% Percentile (z)	1121	99% Percentile (z)	1193

Gamma Distribution Test		Data Distribution Test
k star	22.08	Data appear Normal at 5% Significance Level
Theta Star	35.9	
MLE of Mean	792.5	
MLE of Standard Deviation	168.7	
nu star	353.2	

A-D Test Statistic	0.255	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	956.5
K-S Test Statistic	0.175	95% Percentile	972.3
5% K-S Critical Value	0.294	99% Percentile	984.9

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution			
90% Percentile	1015	95% UTL with 90% Coverage	988
95% Percentile	1089	95% Percentile Bootstrap UTL with 90% Coverage	988
99% Percentile	1237	95% BCA Bootstrap UTL with 90% Coverage	988
		95% UPL	988
		95% Chebyshev UPL	1446
95% WH Approx. Gamma UPL	1106	Upper Threshold Limit Based upon IQR	1197
95% HW Approx. Gamma UPL	1111		
95% WH Approx. Gamma UTL with 90% Coverage	1212		
95% HW Approx. Gamma UTL with 90% Coverage	1220		

Manganese

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	58.8	Minimum	4.074
Maximum	1590	Maximum	7.371
Second Largest	1350	Second Largest	7.208
First Quartile	155.3	First Quartile	5.042
Median	581.5	Median	6.141
Third Quartile	1118	Third Quartile	7.012
Mean	687.4	Mean	5.985
Geometric Mean	397.2	SD	1.252
SD	611.9		
Coefficient of Variation	0.89		
Skewness	0.356		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	0.89
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	2267	95% UTL with 90% Coverage	10080
95% UPL (t)	1917	95% UPL (t)	4921
90% Percentile (z)	1472	90% Percentile (z)	1978
95% Percentile (z)	1694	95% Percentile (z)	3117
99% Percentile (z)	2111	99% Percentile (z)	7318

Gamma Distribution Test		Data Distribution Test	
k star	0.738	Data appear Normal at 5% Significance Level	
Theta Star	931.6		
MLE of Mean	687.4		
MLE of Standard Deviation	800.2		
nu star	11.8		

A-D Test Statistic	0.515	Nonparametric Statistics	
5% A-D Critical Value	0.735	90% Percentile	1422
K-S Test Statistic	0.242	95% Percentile	1506
5% K-S Critical Value	0.301	99% Percentile	1573

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	1590
90% Percentile	1704	95% Percentile Bootstrap UTL with 90% Coverage	1590
95% Percentile	2296	95% BCA Bootstrap UTL with 90% Coverage	1590
99% Percentile	3702	95% UPL	1590
		95% Chebyshev UPL	3516
95% WH Approx. Gamma UPL	2773	Upper Threshold Limit Based upon IQR	2561
95% HW Approx. Gamma UPL	3053		
95% WH Approx. Gamma UTL with 90% Coverage	3944		
95% HW Approx. Gamma UTL with 90% Coverage	4577		

Mercury

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		

Raw Statistics		Log-Transformed Statistics	
Minimum	0.021	Minimum	-3.863
Maximum	0.056	Maximum	-2.882
Second Largest	0.039	Second Largest	-3.244
First Quartile	0.0308	First Quartile	-3.484
Median	0.035	Median	-3.353
Third Quartile	0.0383	Third Quartile	-3.264
Mean	0.0354	Mean	-3.377
Geometric Mean	0.0341	SD	0.286
SD	0.0103		
Coefficient of Variation	0.29		
Skewness	0.926		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.0618	95% UTL with 90% Coverage	0.0714
95% UPL (t)	0.056	95% UPL (t)	0.0606
90% Percentile (z)	0.0485	90% Percentile (z)	0.0492
95% Percentile (z)	0.0522	95% Percentile (z)	0.0546
99% Percentile (z)	0.0592	99% Percentile (z)	0.0664

Gamma Distribution Test		Data Distribution Test	
k star	8.941	Data appear Normal at 5% Significance Level	
Theta Star	0.00396		
MLE of Mean	0.0354		
MLE of Standard Deviation	0.0118		
nu star	143.1		
A-D Test Statistic	0.272	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	0.0441
K-S Test Statistic	0.197	95% Percentile	0.0501
5% K-S Critical Value	0.294	99% Percentile	0.0548
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	0.056
90% Percentile	0.0511	95% Percentile Bootstrap UTL with 90% Coverage	0.056
95% Percentile	0.0568	95% BCA Bootstrap UTL with 90% Coverage	0.056
99% Percentile	0.0685	95% UPL	0.056
		95% Chebyshev UPL	0.0828
95% WH Approx. Gamma UPL	0.0585	Upper Threshold Limit Based upon IQR	0.0495
95% HW Approx. Gamma UPL	0.0589		
95% WH Approx. Gamma UTL with 90% Coverage	0.0669		
95% HW Approx. Gamma UTL with 90% Coverage	0.0678		

Nickel

General Statistics

Number of Valid Data	8	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	1
Tolerance Factor	2.582	Percent Non-Detects	12.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.28	Minimum Detected	-1.273
Maximum Detected	1.39	Maximum Detected	0.329
Mean of Detected	0.811	Mean of Detected	-0.37
SD of Detected	0.431	SD of Detected	0.659
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.845
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.712	Mean (Log Scale)	-0.849
SD	0.488	SD (Log Scale)	1.485
95% UTL 90% Coverage	1.973	95% UTL 90% Coverage	19.8
95% UPL (t)	1.693	95% UPL (t)	8.462
90% Percentile (z)	1.338	90% Percentile (z)	2.87
95% Percentile (z)	1.515	95% Percentile (z)	4.923
99% Percentile (z)	1.848	99% Percentile (z)	13.55
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.684	Mean in Original Scale	0.728
SD	0.509	SD in Original Scale	0.463
95% UTL with 90% Coverage	1.998	95% UTL with 90% Coverage	4.732
		95% BCA UTL with 90% Coverage	1.39
		95% Bootstrap (%) UTL with 90% Coverage	1.39
95% UPL (t)	1.707	95% UPL (t)	2.958
90% Percentile (z)	1.336	90% Percentile (z)	1.628
95% Percentile (z)	1.521	95% Percentile (z)	2.193
99% Percentile (z)	1.868	99% Percentile (z)	3.836
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.956	Data appear Normal at 5% Significance Level	
Theta Star	0.415		
nu star	27.38		
A-D Test Statistic	0.54	Nonparametric Statistics	
5% A-D Critical Value	0.712	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.295	Mean	0.745
5% K-S Critical Value	0.314	SD	0.413
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.158
		95% KM UTL with 90% Coverage	1.81
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.653

Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.574
Mean	0.71	90% Percentile (z)	1.274
Median	0.795	95% Percentile (z)	1.424
SD	0.491	99% Percentile (z)	1.705
k star	0.325		
Theta star	2.182	Gamma ROS Limits with Extrapolated Data	
Nu star	5.205	95% Wilson Hilferty (WH) Approx. Gamma UPL	3.459
95% Percentile of Chisquare (2k)	2.899	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.044
		95% WH Approx. Gamma UTL with 90% Coverage	5.072
90% Percentile	2.072	95% HW Approx. Gamma UTL with 90% Coverage	8.246
95% Percentile	3.163		
99% Percentile	5.971		

Note: DL/2 is not a recommended method.

Potassium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		
Raw Statistics		Log-Transformed Statistics	
Minimum	3800	Minimum	8.243
Maximum	5930	Maximum	8.688
Second Largest	5370	Second Largest	8.589
First Quartile	4043	First Quartile	8.305
Median	4405	Median	8.39
Third Quartile	5325	Third Quartile	8.58
Mean	4659	Mean	8.435
Geometric Mean	4604	SD	0.163
SD	779.1		
Coefficient of Variation	0.167		

Skewness	0.599

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	6670	95% UTL with 90% Coverage	7020
95% UPL (t)	6224	95% UPL (t)	6393
90% Percentile (z)	5657	90% Percentile (z)	5676
95% Percentile (z)	5940	95% Percentile (z)	6023
99% Percentile (z)	6471	99% Percentile (z)	6732
Gamma Distribution Test		Data Distribution Test	
k star	26.54	Data appear Normal at 5% Significance Level	
Theta Star	175.6		
MLE of Mean	4659		
MLE of Standard Deviation	904.4		
nu star	424.6		

A-D Test Statistic	0.421	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	5538
K-S Test Statistic	0.196	95% Percentile	5734
5% K-S Critical Value	0.294	99% Percentile	5891

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	5930
90% Percentile	5849	95% Percentile Bootstrap UTL with 90% Coverage	5930
95% Percentile	6239	95% BCA Bootstrap UTL with 90% Coverage	5930
99% Percentile	7017	95% UPL	5930
		95% Chebyshev UPL	8261
95% WH Approx. Gamma UPL	6328	Upper Threshold Limit Based upon IQR	7249
95% HW Approx. Gamma UPL	6343		
95% WH Approx. Gamma UTL with 90% Coverage	6881		
95% HW Approx. Gamma UTL with 90% Coverage	6913		

Selenium

General Statistics

Number of Valid Data	8	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Selenium was not processed!

Silver

General Statistics

Number of Valid Data	8	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	6

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful and reliable test statistics and estimates.
No statistics will be produced!

Tolerance Factor	2.582	Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.011	Minimum Detected	-4.51
Maximum Detected	0.154	Maximum Detected	-1.871
Mean of Detected	0.0825	Mean of Detected	-3.19
SD of Detected	0.101	SD of Detected	1.866
Minimum Non-Detect	0.008	Minimum Non-Detect	-4.828
Maximum Non-Detect	0.008	Maximum Non-Detect	-4.828

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0236	Mean (Log Scale)	-4.939
SD	0.0527	SD (Log Scale)	1.289
95% UTL 90% Coverage	0.16	95% UTL 90% Coverage	0.2
95% UPL (t)	0.13	95% UPL (t)	0.0956
90% Percentile (z)	0.0912	90% Percentile (z)	0.0374
95% Percentile (z)	0.11	95% Percentile (z)	0.0597
99% Percentile (z)	0.146	99% Percentile (z)	0.144
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 90% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0289
5% K-S Critical Value	N/A	SD	0.0473
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0236
		95% KM UTL with 90% Coverage	0.151
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.248
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.124
Mean	N/A	90% Percentile (z)	0.0895
Median	N/A	95% Percentile (z)	0.107
SD	N/A	99% Percentile (z)	0.139
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 90% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 90% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Sodium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		
Raw Statistics		Log-Transformed Statistics	
Minimum	6.4	Minimum	1.856
Maximum	13.5	Maximum	2.603
Second Largest	13.4	Second Largest	2.595

First Quartile	7.6	First Quartile	2.027
Median	8.85	Median	2.175
Third Quartile	11.23	Third Quartile	2.412
Mean	9.538	Mean	2.219
Geometric Mean	9.201	SD	0.285
SD	2.767		
Coefficient of Variation	0.29		
Skewness	0.574		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	16.68	95% UTL with 90% Coverage	19.18
95% UPL (t)	15.1	95% UPL (t)	16.3
90% Percentile (z)	13.08	90% Percentile (z)	13.25
95% Percentile (z)	14.09	95% Percentile (z)	14.69
99% Percentile (z)	15.97	99% Percentile (z)	17.84
Gamma Distribution Test		Data Distribution Test	
k star	8.898	Data appear Normal at 5% Significance Level	
Theta Star	1.072		
MLE of Mean	9.538		

MLE of Standard Deviation	3.197		
nu star	142.4		
A-D Test Statistic	0.38	Nonparametric Statistics	
5% A-D Critical Value	0.715	90% Percentile	13.43
K-S Test Statistic	0.224	95% Percentile	13.47
5% K-S Critical Value	0.294	99% Percentile	13.49
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	13.5
90% Percentile	13.8	95% Percentile Bootstrap UTL with 90% Coverage	13.5
95% Percentile	15.33	95% BCA Bootstrap UTL with 90% Coverage	13.5
99% Percentile	18.5	95% UPL	13.5
		95% Chebyshev UPL	22.33
95% WH Approx. Gamma UPL	15.78	Upper Threshold Limit Based upon IQR	16.66
95% HW Approx. Gamma UPL	15.9		
95% WH Approx. Gamma UTL with 90% Coverage	18.06		
95% HW Approx. Gamma UTL with 90% Coverage	18.31		

Vanadium

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	3
Tolerance Factor	2.582		
Raw Statistics		Log-Transformed Statistics	
Minimum	0.02	Minimum	-3.912
Maximum	0.04	Maximum	-3.219
Second Largest	0.04	Second Largest	-3.219
First Quartile	0.0275	First Quartile	-3.608
Median	0.03	Median	-3.507

Third Quartile	0.04	Third Quartile	-3.219
Mean	0.0313	Mean	-3.5
Geometric Mean	0.0302	SD	0.287
SD	0.00835		
Coefficient of Variation	0.267		
Skewness	-0.277		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.823
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	0.0528	95% UTL with 90% Coverage	0.0634
95% UPL (t)	0.048	95% UPL (t)	0.0538
90% Percentile (z)	0.0419	90% Percentile (z)	0.0436
95% Percentile (z)	0.045	95% Percentile (z)	0.0484
99% Percentile (z)	0.0507	99% Percentile (z)	0.0589
Gamma Distribution Test		Data Distribution Test	
k star	9.295	Data appear Normal at 5% Significance Level	
Theta Star	0.00336		
MLE of Mean	0.0313		

MLE of Standard Deviation	0.0102		
nu star	148.7		
A-D Test Statistic	0.668	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	0.04
K-S Test Statistic	0.233	95% Percentile	0.04
5% K-S Critical Value	0.294	99% Percentile	0.04
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	0.04
90% Percentile	0.0449	95% Percentile Bootstrap UTL with 90% Coverage	N/A
95% Percentile	0.0498	95% BCA Bootstrap UTL with 90% Coverage	N/A
99% Percentile	0.0599	95% UPL	0.04
		95% Chebyshev UPL	0.0698
95% WH Approx. Gamma UPL	0.0512	Upper Threshold Limit Based upon IQR	0.0588
95% HW Approx. Gamma UPL	0.0518		
95% WH Approx. Gamma UTL with 90% Coverage	0.0585		
95% HW Approx. Gamma UTL with 90% Coverage	0.0595		

Zinc

General Statistics			
Total Number of Observations	8	Number of Distinct Observations	8
Tolerance Factor	2.582		
Raw Statistics		Log-Transformed Statistics	
Minimum	23.3	Minimum	3.148
Maximum	54.8	Maximum	4.004
Second Largest	50.3	Second Largest	3.918
First Quartile	24.88	First Quartile	3.214
Median	29	Median	3.367

Third Quartile	47.08	Third Quartile	3.851
Mean	35.21	Mean	3.505
Geometric Mean	33.29	SD	0.353
SD	12.93		
Coefficient of Variation	0.367		
Skewness	0.675		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.821	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	68.6	95% UTL with 90% Coverage	82.75
95% UPL (t)	61.2	95% UPL (t)	67.62
90% Percentile (z)	51.78	90% Percentile (z)	52.31
95% Percentile (z)	56.48	95% Percentile (z)	59.46
99% Percentile (z)	65.29	99% Percentile (z)	75.61
Gamma Distribution Test		Data Distribution Test	
k star	5.757	Data appear Normal at 5% Significance Level	
Theta Star	6.116		
MLE of Mean	35.21		
MLE of Standard Deviation	14.68		
nu star	92.11		

A-D Test Statistic	0.699	Nonparametric Statistics	
5% A-D Critical Value	0.716	90% Percentile	51.65
K-S Test Statistic	0.29	95% Percentile	53.23
5% K-S Critical Value	0.294	99% Percentile	54.49
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	54.8
90% Percentile	54.84	95% Percentile Bootstrap UTL with 90% Coverage	54.8
95% Percentile	62.3	95% BCA Bootstrap UTL with 90% Coverage	54.8
99% Percentile	77.97	95% UPL	54.8
		95% Chebyshev UPL	95
95% WH Approx. Gamma UPL	64.81	Upper Threshold Limit Based upon IQR	80.38
95% HW Approx. Gamma UPL	65.43		
95% WH Approx. Gamma UTL with 90% Coverage	76.18		
95% HW Approx. Gamma UTL with 90% Coverage	77.57		