APPENDIX 7*

STATISTICAL METHODOLOGY

ProUCL 95% UCL Soil

East Mountain Assessment Area

Antimony

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	35

Raw Statistics		Log-transformed Statistics	
Minimum	0.211	Minimum of Log Data	-1.556
Maximum	137	Maximum of Log Data	4.92
Mean	11.36	Mean of log Data	1.493
Median	5.475	SD of log Data	1.454
SD	23.14		
Std. Error of Mean	3.856		
Coefficient of Variation	2.036		
Skewness	4.873		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.441	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.88	95% H-UCL	26.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.42
95% Adjusted-CLT UCL (Chen-1995)	21.05	97.5% Chebyshev (MVUE) UCL	35.48
95% Modified-t UCL (Johnson-1978)	18.4	99% Chebyshev (MVUE) UCL	49.35

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.616	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	18.46		
MLE of Mean	11.36		
MLE of Standard Deviation	14.48		
nu star	44.33		
Approximate Chi Square Value (.05)	30.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	17.71
Adjusted Chi Square Value	29.52	95% Jackknife UCL	17.88
		95% Standard Bootstrap UCL	17.58
Anderson-Darling Test Statistic	0.836	95% Bootstrap-t UCL	30.11
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	41.23
Kolmogorov-Smirnov Test Statistic	0.14	95% Percentile Bootstrap UCL	18.55
Kolmogorov-Smirnov 5% Critical Value	0.154	95% BCA Bootstrap UCL	22.22
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.17
		97.5% Chebyshev(Mean, Sd) UCL	35.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49.73
95% Approximate Gamma UCL	16.76		
95% Adjusted Gamma UCL	17.06		

Potential UCL to Use		Use 95% Approximate Gamma UCL	16.76

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	43	Number of Distinct Observations	43

Raw Statistics		Log-transformed Statistics	
Minimum	4.25	Minimum of Log Data	1.447
Maximum	615	Maximum of Log Data	6.422
Mean	98.47	Mean of log Data	4.131
Median	63.9	SD of log Data	1.026
SD	108.5		
Std. Error of Mean	16.54		
Coefficient of Variation	1.101		
Skewness	2.986		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.709	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.943	Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	126.3	95% H-UCL	153.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	186.5
95% Adjusted-CLT UCL (Chen-1995)	133.7	97.5% Chebyshev (MVUE) UCL	222.4
95% Modified-t UCL (Johnson-1978)	127.5	99% Chebyshev (MVUE) UCL	293
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.159	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	84.95		
MLE of Mean	98.47		
MLE of Standard Deviation	91.46		
nu star	99.69		
Approximate Chi Square Value (.05)	77.66	Nonparametric Statistics	
Adjusted Level of Significance	0.0444	95% CLT UCL	125.7
Adjusted Chi Square Value	76.98	95% Jackknife UCL	126.3
		95% Standard Bootstrap UCL	125.1
Anderson-Darling Test Statistic	0.539	95% Bootstrap-t UCL	139.2
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	172.7
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	126.6
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	133.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	170.6
		97.5% Chebyshev(Mean, Sd) UCL	201.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	263
95% Approximate Gamma UCL	126.4		
95% Adjusted Gamma UCL	127.5		
Potential UCL to Use		Use 95% Approximate Gamma UCL	126.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics			
Number of Valid Observations	43	Number of Distinct Observations	38

Raw Statistics		Log-transformed Statistics	
Minimum	0.0431	Minimum of Log Data	-3.144
Maximum	132	Maximum of Log Data	4.883
Mean	24.43	Mean of log Data	2.505
Median	14.6	SD of log Data	1.492
SD	29.06		
Std. Error of Mean	4.431		
Coefficient of Variation	1.19		
Skewness	2.363		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.882
Shapiro Wilk Critical Value	0.943	Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	31.88	95% H-UCL	73.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.34
95% Adjusted-CLT UCL (Chen-1995)	33.42	97.5% Chebyshev (MVUE) UCL	101.2
95% Modified-t UCL (Johnson-1978)	32.14	99% Chebyshev (MVUE) UCL	140.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.808	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	30.22		
MLE of Mean	24.43		
MLE of Standard Deviation	27.17		
nu star	69.5		
Approximate Chi Square Value (.05)	51.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0444	95% CLT UCL	31.71
Adjusted Chi Square Value	50.77	95% Jackknife UCL	31.88
		95% Standard Bootstrap UCL	31.59
Anderson-Darling Test Statistic	0.597	95% Bootstrap-t UCL	35.53
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	34.23
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	31.81
Kolmogorov-Smirnov 5% Critical Value	0.14	95% BCA Bootstrap UCL	33.97
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	43.74
		97.5% Chebyshev(Mean, Sd) UCL	52.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	68.52
95% Approximate Gamma UCL	33.08		
95% Adjusted Gamma UCL	33.44		

Potential UCL to Use		Use 95% Approximate Gamma UCL	33.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	43	Number of Distinct Observations	41

Raw Statistics		Log-transformed Statistics	
Minimum	2.83	Minimum of Log Data	1.04
Maximum	5460	Maximum of Log Data	8.605
Mean	818.7	Mean of log Data	5.666
Median	393	SD of log Data	1.802
SD	1111		
Std. Error of Mean	169.4		
Coefficient of Variation	1.357		
Skewness	2.485		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.943	Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1104	95% H-UCL	3757
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3563
95% Adjusted-CLT UCL (Chen-1995)	1166	97.5% Chebyshev (MVUE) UCL	4526
95% Modified-t UCL (Johnson-1978)	1114	99% Chebyshev (MVUE) UCL	6416

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.568	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1441		
MLE of Mean	818.7		
MLE of Standard Deviation	1086		
nu star	48.86		
Approximate Chi Square Value (.05)	33.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0444	95% CLT UCL	1097
Adjusted Chi Square Value	33.38	95% Jackknife UCL	1104
		95% Standard Bootstrap UCL	1090
Anderson-Darling Test Statistic	0.242	95% Bootstrap-t UCL	1197
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	1236
Kolmogorov-Smirnov Test Statistic	0.0931	95% Percentile Bootstrap UCL	1110
Kolmogorov-Smirnov 5% Critical Value	0.142	95% BCA Bootstrap UCL	1186
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1557
		97.5% Chebyshev(Mean, Sd) UCL	1876
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2504
95% Approximate Gamma UCL	1183		
95% Adjusted Gamma UCL	1198		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1183

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

Number of Valid Observations	43	Number of Distinct Observations	43

Raw Statistics		Log-transformed Statistics	
Minimum	2.51	Minimum of Log Data	0.92
Maximum	5570	Maximum of Log Data	8.625
Mean	736.5	Mean of log Data	5.66
Median	400	SD of log Data	1.723
SD	981.2		
Std. Error of Mean	149.6		
Coefficient of Variation	1.332		
Skewness	3.15		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.694	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.943	Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	988.2	95% H-UCL	3021
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3002
95% Adjusted-CLT UCL (Chen-1995)	1059	97.5% Chebyshev (MVUE) UCL	3794
95% Modified-t UCL (Johnson-1978)	1000	99% Chebyshev (MVUE) UCL	5351

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.619	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1191		
MLE of Mean	736.5		
MLE of Standard Deviation	936.4		
nu star	53.21		
Approximate Chi Square Value (.05)	37.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0444	95% CLT UCL	982.7
Adjusted Chi Square Value	36.99	95% Jackknife UCL	988.2
		95% Standard Bootstrap UCL	978
Anderson-Darling Test Statistic	0.193	95% Bootstrap-t UCL	1123
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	2013
Kolmogorov-Smirnov Test Statistic	0.0624	95% Percentile Bootstrap UCL	990.2
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	1079
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1389
		97.5% Chebyshev(Mean, Sd) UCL	1671
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2225
95% Approximate Gamma UCL	1046		
95% Adjusted Gamma UCL	1059		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1046

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.0141	Minimum of Log Data	-4.262
Maximum	1.82	Maximum of Log Data	0.599
Mean	0.373	Mean of log Data	-1.72
Median	0.144	SD of log Data	1.317
SD	0.445		
Std. Error of Mean	0.0741		
Coefficient of Variation	1.193		
Skewness	1.634		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.768	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.498	95% H-UCL	0.789
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.895
95% Adjusted-CLT UCL (Chen-1995)	0.516	97.5% Chebyshev (MVUE) UCL	1.105
95% Modified-t UCL (Johnson-1978)	0.502	99% Chebyshev (MVUE) UCL	1.518

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.759	Data appear Lognormal at 5% Significance Level	
Theta Star	0.491		
MLE of Mean	0.373		
MLE of Standard Deviation	0.428		
nu star	54.68		
Approximate Chi Square Value (.05)	38.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.495
Adjusted Chi Square Value	38.08	95% Jackknife UCL	0.498
		95% Standard Bootstrap UCL	0.494
Anderson-Darling Test Statistic	0.804	95% Bootstrap-t UCL	0.537
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	0.526
Kolmogorov-Smirnov Test Statistic	0.161	95% Percentile Bootstrap UCL	0.497
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.509
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.696
		97.5% Chebyshev(Mean, Sd) UCL	0.836
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.11
95% Approximate Gamma UCL	0.527		
95% Adjusted Gamma UCL	0.536		

Potential UCL to Use		Use 95% H-UCL	0.789

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.156	Minimum of Log Data	-1.858
Maximum	16.3	Maximum of Log Data	2.791
Mean	2.178	Mean of log Data	0.215
Median	1.43	SD of log Data	1.106
SD	2.884		
Std. Error of Mean	0.481		
Coefficient of Variation	1.324		
Skewness	3.682		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.99	95% H-UCL	3.653
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.353
95% Adjusted-CLT UCL (Chen-1995)	3.284	97.5% Chebyshev (MVUE) UCL	5.273
95% Modified-t UCL (Johnson-1978)	3.04	99% Chebyshev (MVUE) UCL	7.08

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.955	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.281		
MLE of Mean	2.178		
MLE of Standard Deviation	2.229		
nu star	68.75		
Approximate Chi Square Value (.05)	50.67	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	2.969
Adjusted Chi Square Value	49.96	95% Jackknife UCL	2.99
		95% Standard Bootstrap UCL	2.961
Anderson-Darling Test Statistic	0.422	95% Bootstrap-t UCL	3.706
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	6.669
Kolmogorov-Smirnov Test Statistic	0.0899	95% Percentile Bootstrap UCL	3.047
Kolmogorov-Smirnov 5% Critical Value	0.151	95% BCA Bootstrap UCL	3.328
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.274
		97.5% Chebyshev(Mean, Sd) UCL	5.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.961
95% Approximate Gamma UCL	2.956		
95% Adjusted Gamma UCL	2.997		

Potential UCL to Use		Use 95% Approximate Gamma UCL	2.956

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.0867	Minimum of Log Data	-2.445
Maximum	44.5	Maximum of Log Data	3.795
Mean	4.448	Mean of log Data	0.465
Median	2.065	SD of log Data	1.592
SD	7.88		
Std. Error of Mean	1.313		
Coefficient of Variation	1.772		
Skewness	4.056		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.542	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.667	95% H-UCL	13.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.2
95% Adjusted-CLT UCL (Chen-1995)	7.557	97.5% Chebyshev (MVUE) UCL	16.64
95% Modified-t UCL (Johnson-1978)	6.815	99% Chebyshev (MVUE) UCL	23.39

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.569	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.813		
MLE of Mean	4.448		
MLE of Standard Deviation	5.895		
nu star	40.99		
Approximate Chi Square Value (.05)	27.32	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	6.609
Adjusted Chi Square Value	26.81	95% Jackknife UCL	6.667
		95% Standard Bootstrap UCL	6.571
Anderson-Darling Test Statistic	0.6	95% Bootstrap-t UCL	8.954
Anderson-Darling 5% Critical Value	0.803	95% Hall's Bootstrap UCL	14.94
Kolmogorov-Smirnov Test Statistic	0.141	95% Percentile Bootstrap UCL	6.596
Kolmogorov-Smirnov 5% Critical Value	0.154	95% BCA Bootstrap UCL	8.071
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.17
		97.5% Chebyshev(Mean, Sd) UCL	12.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.52
95% Approximate Gamma UCL	6.674		
95% Adjusted Gamma UCL	6.801		

Potential UCL to Use		Use 95% Approximate Gamma UCL	6.674

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Zinc

General Statistics			
Number of Valid Observations	43	Number of Distinct Observations	43
Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	3270	Maximum of Log Data	8.093
Mean	541	Mean of log Data	5.523
Median	312	SD of log Data	1.384
SD	689.4		
Std. Error of Mean	105.1		
Coefficient of Variation	1.274		
Skewness	2.222		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical Value	0.943	Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	717.9	95% H-UCL	1192
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1363
95% Adjusted-CLT UCL (Chen-1995)	752	97.5% Chebyshev (MVUE) UCL	1681
95% Modified-t UCL (Johnson-1978)	723.8	99% Chebyshev (MVUE) UCL	2307
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.736	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	735.5		
MLE of Mean	541		
MLE of Standard Deviation	630.8		
nu star	63.26		
Approximate Chi Square Value (.05)	45.96	Nonparametric Statistics	
Adjusted Level of Significance	0.0444	95% CLT UCL	714
Adjusted Chi Square Value	45.45	95% Jackknife UCL	717.9
		95% Standard Bootstrap UCL	710.8
Anderson-Darling Test Statistic	0.501	95% Bootstrap-t UCL	774.2
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	781.8
Kolmogorov-Smirnov Test Statistic	0.115	95% Percentile Bootstrap UCL	709.7
Kolmogorov-Smirnov 5% Critical Value	0.14	95% BCA Bootstrap UCL	783.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	999.3
		97.5% Chebyshev(Mean, Sd) UCL	1198
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1587
95% Approximate Gamma UCL	744.6		
95% Adjusted Gamma UCL	753		
Potential UCL to Use		Use 95% Approximate Gamma UCL	744.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	45	Number of Distinct Observations	42
Raw Statistics		Log-transformed Statistics	
Minimum	0.4	Minimum of Log Data	-0.916
Maximum	130	Maximum of Log Data	4.868
Mean	18.75	Mean of log Data	1.893
Median	4.66	SD of log Data	1.341
SD	32.13		
Std. Error of Mean	4.79		
Coefficient of Variation	1.714		
Skewness	2.088		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.563	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26.79	95% H-UCL	28.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.17
95% Adjusted-CLT UCL (Chen-1995)	28.22	97.5% Chebyshev (MVUE) UCL	40.71
95% Modified-t UCL (Johnson-1978)	27.04	99% Chebyshev (MVUE) UCL	55.52
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.571	Data do not follow a Discernable Distribution (0.05)	
Theta Star	32.84		
MLE of Mean	18.75		
MLE of Standard Deviation	24.81		
nu star	51.38		
Approximate Chi Square Value (.05)	35.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0447	95% CLT UCL	26.62
Adjusted Chi Square Value	35.49	95% Jackknife UCL	26.79
		95% Standard Bootstrap UCL	26.61
Anderson-Darling Test Statistic	4.797	95% Bootstrap-t UCL	28.89
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	27.34
Kolmogorov-Smirnov Test Statistic	0.297	95% Percentile Bootstrap UCL	26.98
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	29.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.62
		97.5% Chebyshev(Mean, Sd) UCL	48.66
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	66.41
95% Approximate Gamma UCL	26.82		
95% Adjusted Gamma UCL	27.14		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	39.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

ProUCL 95% UCL Soil

South Arroyo Open Space

Antimony

General Statistics			
Number of Valid Observations	159	Number of Distinct Observations	129
Number of Missing Values	23		

Raw Statistics		Log-transformed Statistics	
Minimum	0.198	Minimum of Log Data	-1.619
Maximum	2.22	Maximum of Log Data	0.798
Mean	0.888	Mean of log Data	-0.283
Median	0.741	SD of log Data	0.588
SD	0.497		
Std. Error of Mean	0.0394		
Coefficient of Variation	0.56		
Skewness	0.713		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.15	Lilliefors Test Statistic	0.109
Lilliefors Critical Value	0.0703	Lilliefors Critical Value	0.0703
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.953	95% H-UCL	0.979
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.091
95% Adjusted-CLT UCL (Chen-1995)	0.955	97.5% Chebyshev (MVUE) UCL	1.176
95% Modified-t UCL (Johnson-1978)	0.953	99% Chebyshev (MVUE) UCL	1.343
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.161	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.281		
MLE of Mean	0.888		
MLE of Standard Deviation	0.499		
nu star	1005		
Approximate Chi Square Value (.05)	932.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0485	95% CLT UCL	0.952
Adjusted Chi Square Value	932.1	95% Jackknife UCL	0.953
		95% Standard Bootstrap UCL	0.949
Anderson-Darling Test Statistic	2.037	95% Bootstrap-t UCL	0.954
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	0.955
Kolmogorov-Smirnov Test Statistic	0.128	95% Percentile Bootstrap UCL	0.953
Kolmogorov-Smirnov 5% Critical Value	0.0747	95% BCA Bootstrap UCL	0.955
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.059
		97.5% Chebyshev(Mean, Sd) UCL	1.134
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.28
95% Approximate Gamma UCL	0.957		
95% Adjusted Gamma UCL	0.957		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.059

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	156

Raw Statistics		Log-transformed Statistics	
Minimum	2.48	Minimum of Log Data	0.908
Maximum	82.6	Maximum of Log Data	4.414
Mean	19.58	Mean of log Data	2.735
Median	15.65	SD of log Data	0.693
SD	14.76		
Std. Error of Mean	1.094		
Coefficient of Variation	0.754		
Skewness	1.823		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.15	Lilliefors Test Statistic	0.038
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21.39	95% H-UCL	21.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.42
95% Adjusted-CLT UCL (Chen-1995)	21.54	97.5% Chebyshev (MVUE) UCL	26.52
95% Modified-t UCL (Johnson-1978)	21.42	99% Chebyshev (MVUE) UCL	30.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.204	Data appear Lognormal at 5% Significance Level	
Theta Star	8.885		
MLE of Mean	19.58		
MLE of Standard Deviation	13.19		
nu star	802.3		
Approximate Chi Square Value (.05)	737.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	21.38
Adjusted Chi Square Value	737.1	95% Jackknife UCL	21.39
		95% Standard Bootstrap UCL	21.39
Anderson-Darling Test Statistic	1.521	95% Bootstrap-t UCL	21.6
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	21.67
Kolmogorov-Smirnov Test Statistic	0.0692	95% Percentile Bootstrap UCL	21.4
Kolmogorov-Smirnov 5% Critical Value	0.0691	95% BCA Bootstrap UCL	21.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.35
		97.5% Chebyshev(Mean, Sd) UCL	26.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.47
95% Approximate Gamma UCL	21.3		
95% Adjusted Gamma UCL	21.32		

Potential UCL to Use		Use 95% H-UCL	21.65

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	147

Raw Statistics		Log-transformed Statistics	
Minimum	24.7	Minimum of Log Data	3.207
Maximum	530	Maximum of Log Data	6.273
Mean	123.4	Mean of log Data	4.695
Median	108	SD of log Data	0.47
SD	71.87		
Std. Error of Mean	5.327		
Coefficient of Variation	0.583		
Skewness	2.642		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.183	Lilliefors Test Statistic	0.0747
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	132.2	95% H-UCL	130.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	141.5
95% Adjusted-CLT UCL (Chen-1995)	133.3	97.5% Chebyshev (MVUE) UCL	150
95% Modified-t UCL (Johnson-1978)	132.4	99% Chebyshev (MVUE) UCL	166.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.253	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.01		
MLE of Mean	123.4		
MLE of Standard Deviation	59.83		
nu star	1548		
Approximate Chi Square Value (.05)	1458	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	132.1
Adjusted Chi Square Value	1457	95% Jackknife UCL	132.2
		95% Standard Bootstrap UCL	132.1
Anderson-Darling Test Statistic	2.915	95% Bootstrap-t UCL	133.2
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	133.8
Kolmogorov-Smirnov Test Statistic	0.111	95% Percentile Bootstrap UCL	132.5
Kolmogorov-Smirnov 5% Critical Value	0.0685	95% BCA Bootstrap UCL	133.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	146.6
		97.5% Chebyshev(Mean, Sd) UCL	156.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	176.4
95% Approximate Gamma UCL	131		
95% Adjusted Gamma UCL	131.1		

Potential UCL to Use		
	Use 95% Student's-t UCL	132.2
	or 95% Modified-t UCL	132.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	168

Raw Statistics		Log-transformed Statistics	
Minimum	0.101	Minimum of Log Data	-2.293
Maximum	27.2	Maximum of Log Data	3.303
Mean	4.534	Mean of log Data	0.934
Median	2.935	SD of log Data	1.165
SD	5.028		
Std. Error of Mean	0.373		
Coefficient of Variation	1.109		
Skewness	2.151		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.189	Lilliefors Test Statistic	0.0621
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.151	95% H-UCL	6.129
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.374
95% Adjusted-CLT UCL (Chen-1995)	5.211	97.5% Chebyshev (MVUE) UCL	8.409
95% Modified-t UCL (Johnson-1978)	5.16	99% Chebyshev (MVUE) UCL	10.44

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.986	Data appear Lognormal at 5% Significance Level	
Theta Star	4.597		
MLE of Mean	4.534		
MLE of Standard Deviation	4.566		
nu star	359		
Approximate Chi Square Value (.05)	316.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	5.147
Adjusted Chi Square Value	315.8	95% Jackknife UCL	5.151
		95% Standard Bootstrap UCL	5.141
Anderson-Darling Test Statistic	1.057	95% Bootstrap-t UCL	5.22
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	5.247
Kolmogorov-Smirnov Test Statistic	0.0706	95% Percentile Bootstrap UCL	5.177
Kolmogorov-Smirnov 5% Critical Value	0.0703	95% BCA Bootstrap UCL	5.191
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.159
		97.5% Chebyshev(Mean, Sd) UCL	6.862
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.243
95% Approximate Gamma UCL	5.15		
95% Adjusted Gamma UCL	5.155		

Potential UCL to Use		Use 95% H-UCL	6.129

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	165

Raw Statistics		Log-transformed Statistics	
Minimum	0.736	Minimum of Log Data	-0.307
Maximum	41.1	Maximum of Log Data	3.716
Mean	6.345	Mean of log Data	1.667
Median	5.655	SD of log Data	0.626
SD	4.344		
Std. Error of Mean	0.322		
Coefficient of Variation	0.685		
Skewness	3.63		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.14	Lilliefors Test Statistic	0.0734
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.877	95% H-UCL	7.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.848
95% Adjusted-CLT UCL (Chen-1995)	6.967	97.5% Chebyshev (MVUE) UCL	8.46
95% Modified-t UCL (Johnson-1978)	6.892	99% Chebyshev (MVUE) UCL	9.664

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.873	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2.208		
MLE of Mean	6.345		
MLE of Standard Deviation	3.743		
nu star	1046		
Approximate Chi Square Value (.05)	971.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	6.874
Adjusted Chi Square Value	971.2	95% Jackknife UCL	6.877
		95% Standard Bootstrap UCL	6.888
Anderson-Darling Test Statistic	1.15	95% Bootstrap-t UCL	6.999
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	7.089
Kolmogorov-Smirnov Test Statistic	0.0578	95% Percentile Bootstrap UCL	6.928
Kolmogorov-Smirnov 5% Critical Value	0.0688	95% BCA Bootstrap UCL	7.013
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.748
		97.5% Chebyshev(Mean, Sd) UCL	8.355
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.548
95% Approximate Gamma UCL	6.828		
95% Adjusted Gamma UCL	6.832		

Potential UCL to Use		Use 95% Approximate Gamma UCL	6.828

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	157

Raw Statistics		Log-transformed Statistics	
Minimum	0.489	Minimum of Log Data	-0.715
Maximum	14.2	Maximum of Log Data	2.653
Mean	4.621	Mean of log Data	1.425
Median	4.455	SD of log Data	0.492
SD	2.077		
Std. Error of Mean	0.154		
Coefficient of Variation	0.45		
Skewness	1.282		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0807	Lilliefors Test Statistic	0.0953
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.876	95% H-UCL	5.013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.475
95% Adjusted-CLT UCL (Chen-1995)	4.89	97.5% Chebyshev (MVUE) UCL	5.816
95% Modified-t UCL (Johnson-1978)	4.878	99% Chebyshev (MVUE) UCL	6.485

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.798	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.963		
MLE of Mean	4.621		
MLE of Standard Deviation	2.11		
nu star	1746		
Approximate Chi Square Value (.05)	1650	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	4.875
Adjusted Chi Square Value	1650	95% Jackknife UCL	4.876
		95% Standard Bootstrap UCL	4.875
Anderson-Darling Test Statistic	0.987	95% Bootstrap-t UCL	4.898
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	4.91
Kolmogorov-Smirnov Test Statistic	0.066	95% Percentile Bootstrap UCL	4.877
Kolmogorov-Smirnov 5% Critical Value	0.0685	95% BCA Bootstrap UCL	4.892
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.293
		97.5% Chebyshev(Mean, Sd) UCL	5.583
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.154
95% Approximate Gamma UCL	4.89		
95% Adjusted Gamma UCL	4.893		

Potential UCL to Use		Use 95% Approximate Gamma UCL	4.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	165

Raw Statistics		Log-transformed Statistics	
Minimum	5.78	Minimum of Log Data	1.754
Maximum	832	Maximum of Log Data	6.724
Mean	134.6	Mean of log Data	4.382
Median	95.55	SD of log Data	1.104
SD	140.4		
Std. Error of Mean	10.41		
Coefficient of Variation	1.043		
Skewness	2.163		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.179	Lilliefors Test Statistic	0.0735
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	151.8	95% H-UCL	177.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	211.6
95% Adjusted-CLT UCL (Chen-1995)	153.5	97.5% Chebyshev (MVUE) UCL	239.8
95% Modified-t UCL (Johnson-1978)	152.1	99% Chebyshev (MVUE) UCL	295.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.083	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	124.3		
MLE of Mean	134.6		
MLE of Standard Deviation	129.3		
nu star	394.3		
Approximate Chi Square Value (.05)	349.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	151.8
Adjusted Chi Square Value	349	95% Jackknife UCL	151.8
		95% Standard Bootstrap UCL	152.2
Anderson-Darling Test Statistic	0.599	95% Bootstrap-t UCL	154.3
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	153.8
Kolmogorov-Smirnov Test Statistic	0.0531	95% Percentile Bootstrap UCL	152.5
Kolmogorov-Smirnov 5% Critical Value	0.0701	95% BCA Bootstrap UCL	154.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	180
		97.5% Chebyshev(Mean, Sd) UCL	199.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	238.2
95% Approximate Gamma UCL	152		
95% Adjusted Gamma UCL	152.1		

Potential UCL to Use		Use 95% Approximate Gamma UCL	152

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	151

Raw Statistics		Log-transformed Statistics	
Minimum	396	Minimum of Log Data	5.981
Maximum	33200	Maximum of Log Data	10.41
Mean	10715	Mean of log Data	9.057
Median	9965	SD of log Data	0.792
SD	6132		
Std. Error of Mean	454.6		
Coefficient of Variation	0.572		
Skewness	0.759		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.11	Lilliefors Test Statistic	0.116
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11466	95% H-UCL	13196
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15109
95% Adjusted-CLT UCL (Chen-1995)	11490	97.5% Chebyshev (MVUE) UCL	16583
95% Modified-t UCL (Johnson-1978)	11471	99% Chebyshev (MVUE) UCL	19478
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.361	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4538		
MLE of Mean	10715		
MLE of Standard Deviation	6973		
nu star	859.5		
Approximate Chi Square Value (.05)	792.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	11463
Adjusted Chi Square Value	792	95% Jackknife UCL	11466
		95% Standard Bootstrap UCL	11465
Anderson-Darling Test Statistic	2.27	95% Bootstrap-t UCL	11505
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	11508
Kolmogorov-Smirnov Test Statistic	0.1	95% Percentile Bootstrap UCL	11487
Kolmogorov-Smirnov 5% Critical Value	0.069	95% BCA Bootstrap UCL	11464
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12696
		97.5% Chebyshev(Mean, Sd) UCL	13554
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15238
95% Approximate Gamma UCL	11621		
95% Adjusted Gamma UCL	11629		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12696

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	165

Raw Statistics		Log-transformed Statistics	
Minimum	4.95	Minimum of Log Data	1.599
Maximum	763	Maximum of Log Data	6.637
Mean	131.7	Mean of log Data	4.316
Median	83.7	SD of log Data	1.15
SD	140.5		
Std. Error of Mean	10.41		
Coefficient of Variation	1.066		
Skewness	1.939		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.183	Lilliefors Test Statistic	0.0725
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	148.9	95% H-UCL	176.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	212.2
95% Adjusted-CLT UCL (Chen-1995)	150.5	97.5% Chebyshev (MVUE) UCL	241.6
95% Modified-t UCL (Johnson-1978)	149.2	99% Chebyshev (MVUE) UCL	299.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.006	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	131		
MLE of Mean	131.7		
MLE of Standard Deviation	131.3		
nu star	366.1		
Approximate Chi Square Value (.05)	322.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	148.9
Adjusted Chi Square Value	322.5	95% Jackknife UCL	148.9
		95% Standard Bootstrap UCL	148.8
Anderson-Darling Test Statistic	0.884	95% Bootstrap-t UCL	151.6
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	151.2
Kolmogorov-Smirnov Test Statistic	0.0598	95% Percentile Bootstrap UCL	149.3
Kolmogorov-Smirnov 5% Critical Value	0.0703	95% BCA Bootstrap UCL	150.1
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	177.1
		97.5% Chebyshev(Mean, Sd) UCL	196.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	235.3
95% Approximate Gamma UCL	149.4		
95% Adjusted Gamma UCL	149.6		

Potential UCL to Use		Use 95% Approximate Gamma UCL	149.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	161

Raw Statistics		Log-transformed Statistics	
Minimum	0.00897	Minimum of Log Data	-4.714
Maximum	1.05	Maximum of Log Data	0.0488
Mean	0.104	Mean of log Data	-2.761
Median	0.071	SD of log Data	1.051
SD	0.115		
Std. Error of Mean	0.00849		
Coefficient of Variation	1.105		
Skewness	3.79		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.204	Lilliefors Test Statistic	0.0654
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.118	95% H-UCL	0.131
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.155
95% Adjusted-CLT UCL (Chen-1995)	0.12	97.5% Chebyshev (MVUE) UCL	0.175
95% Modified-t UCL (Johnson-1978)	0.118	99% Chebyshev (MVUE) UCL	0.214

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.136	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0912		
MLE of Mean	0.104		
MLE of Standard Deviation	0.0972		
nu star	413.4		
Approximate Chi Square Value (.05)	367.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	0.118
Adjusted Chi Square Value	366.9	95% Jackknife UCL	0.118
		95% Standard Bootstrap UCL	0.118
Anderson-Darling Test Statistic	0.922	95% Bootstrap-t UCL	0.121
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL	0.123
Kolmogorov-Smirnov Test Statistic	0.0622	95% Percentile Bootstrap UCL	0.118
Kolmogorov-Smirnov 5% Critical Value	0.0701	95% BCA Bootstrap UCL	0.121
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.141
		97.5% Chebyshev(Mean, Sd) UCL	0.157
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.188
95% Approximate Gamma UCL	0.117		
95% Adjusted Gamma UCL	0.117		

Potential UCL to Use		Use 95% Approximate Gamma UCL	0.117

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Molybdenium

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	160

Raw Statistics		Log-transformed Statistics	
Minimum	0.307	Minimum of Log Data	-1.181
Maximum	21.8	Maximum of Log Data	3.082
Mean	2.847	Mean of log Data	0.597
Median	1.645	SD of log Data	0.924
SD	3.345		
Std. Error of Mean	0.248		
Coefficient of Variation	1.175		
Skewness	3.168		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.224	Lilliefors Test Statistic	0.0607
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.257	95% H-UCL	3.218
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.755
95% Adjusted-CLT UCL (Chen-1995)	3.317	97.5% Chebyshev (MVUE) UCL	4.179
95% Modified-t UCL (Johnson-1978)	3.266	99% Chebyshev (MVUE) UCL	5.012

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.238	Data appear Lognormal at 5% Significance Level	
Theta Star	2.3		
MLE of Mean	2.847		
MLE of Standard Deviation	2.559		
nu star	450.5		
Approximate Chi Square Value (.05)	402.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	3.255
Adjusted Chi Square Value	401.9	95% Jackknife UCL	3.257
		95% Standard Bootstrap UCL	3.265
Anderson-Darling Test Statistic	3.198	95% Bootstrap-t UCL	3.361
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	3.348
Kolmogorov-Smirnov Test Statistic	0.106	95% Percentile Bootstrap UCL	3.282
Kolmogorov-Smirnov 5% Critical Value	0.0699	95% BCA Bootstrap UCL	3.301
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.928
		97.5% Chebyshev(Mean, Sd) UCL	4.395
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.314
95% Approximate Gamma UCL	3.188		
95% Adjusted Gamma UCL	3.191		

Potential UCL to Use		Use 95% H-UCL	3.218

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	164

Raw Statistics		Log-transformed Statistics	
Minimum	0.783	Minimum of Log Data	-0.245
Maximum	37.4	Maximum of Log Data	3.622
Mean	6.046	Mean of log Data	1.645
Median	5.455	SD of log Data	0.545
SD	4.427		
Std. Error of Mean	0.328		
Coefficient of Variation	0.732		
Skewness	4.563		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.227	Lilliefors Test Statistic	0.109
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.589	95% H-UCL	6.474
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.133
95% Adjusted-CLT UCL (Chen-1995)	6.704	97.5% Chebyshev (MVUE) UCL	7.621
95% Modified-t UCL (Johnson-1978)	6.607	99% Chebyshev (MVUE) UCL	8.58

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.343	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.808		
MLE of Mean	6.046		
MLE of Standard Deviation	3.307		
nu star	1217		
Approximate Chi Square Value (.05)	1137	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	6.586
Adjusted Chi Square Value	1136	95% Jackknife UCL	6.589
		95% Standard Bootstrap UCL	6.595
Anderson-Darling Test Statistic	5.109	95% Bootstrap-t UCL	6.837
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	6.895
Kolmogorov-Smirnov Test Statistic	0.138	95% Percentile Bootstrap UCL	6.648
Kolmogorov-Smirnov 5% Critical Value	0.0687	95% BCA Bootstrap UCL	6.73
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.476
		97.5% Chebyshev(Mean, Sd) UCL	8.095
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.311
95% Approximate Gamma UCL	6.471		
95% Adjusted Gamma UCL	6.475		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	7.476

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	154

Raw Statistics		Log-transformed Statistics	
Minimum	0.144	Minimum of Log Data	-1.938
Maximum	23	Maximum of Log Data	3.135
Mean	2.007	Mean of log Data	0.0989
Median	1.16	SD of log Data	1.009
SD	3.345		
Std. Error of Mean	0.248		
Coefficient of Variation	1.666		
Skewness	4.193		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.306	Lilliefors Test Statistic	0.0775
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.417	95% H-UCL	2.163
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.554
95% Adjusted-CLT UCL (Chen-1995)	2.497	97.5% Chebyshev (MVUE) UCL	2.867
95% Modified-t UCL (Johnson-1978)	2.43	99% Chebyshev (MVUE) UCL	3.483
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.957	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.098		
MLE of Mean	2.007		
MLE of Standard Deviation	2.052		
nu star	348.2		
Approximate Chi Square Value (.05)	306	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	2.415
Adjusted Chi Square Value	305.7	95% Jackknife UCL	2.417
		95% Standard Bootstrap UCL	2.416
Anderson-Darling Test Statistic	7.486	95% Bootstrap-t UCL	2.557
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	2.501
Kolmogorov-Smirnov Test Statistic	0.168	95% Percentile Bootstrap UCL	2.461
Kolmogorov-Smirnov 5% Critical Value	0.0704	95% BCA Bootstrap UCL	2.489
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.088
		97.5% Chebyshev(Mean, Sd) UCL	3.556
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.474
95% Approximate Gamma UCL	2.284		
95% Adjusted Gamma UCL	2.287		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.088

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	182	Number of Distinct Observations	148

Raw Statistics		Log-transformed Statistics	
Minimum	0.0816	Minimum of Log Data	-2.506
Maximum	3.14	Maximum of Log Data	1.144
Mean	0.464	Mean of log Data	-1.311
Median	0.194	SD of log Data	1.01
SD	0.543		
Std. Error of Mean	0.0402		
Coefficient of Variation	1.168		
Skewness	2.171		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.24	Lilliefors Test Statistic	0.181
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.531	95% H-UCL	0.529
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.625
95% Adjusted-CLT UCL (Chen-1995)	0.537	97.5% Chebyshev (MVUE) UCL	0.701
95% Modified-t UCL (Johnson-1978)	0.532	99% Chebyshev (MVUE) UCL	0.852

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.042	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.446		
MLE of Mean	0.464		
MLE of Standard Deviation	0.455		
nu star	379.2		
Approximate Chi Square Value (.05)	335.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	0.53
Adjusted Chi Square Value	334.8	95% Jackknife UCL	0.531
		95% Standard Bootstrap UCL	0.53
Anderson-Darling Test Statistic	10.06	95% Bootstrap-t UCL	0.543
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.537
Kolmogorov-Smirnov Test Statistic	0.185	95% Percentile Bootstrap UCL	0.534
Kolmogorov-Smirnov 5% Critical Value	0.0702	95% BCA Bootstrap UCL	0.532
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.64
		97.5% Chebyshev(Mean, Sd) UCL	0.715
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.864
95% Approximate Gamma UCL	0.525		
95% Adjusted Gamma UCL	0.526		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.64

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Zinc

General Statistics			
Number of Valid Observations	182	Number of Distinct Observations	157

Raw Statistics		Log-transformed Statistics	
Minimum	8.16	Minimum of Log Data	2.099
Maximum	617	Maximum of Log Data	6.425
Mean	138.3	Mean of log Data	4.611
Median	110	SD of log Data	0.832
SD	113		
Std. Error of Mean	8.375		
Coefficient of Variation	0.817		
Skewness	1.561		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.146	Lilliefors Test Statistic	0.0515
Lilliefors Critical Value	0.0657	Lilliefors Critical Value	0.0657
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	152.1	95% H-UCL	161.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	185.8
95% Adjusted-CLT UCL (Chen-1995)	153.1	97.5% Chebyshev (MVUE) UCL	204.8
95% Modified-t UCL (Johnson-1978)	152.3	99% Chebyshev (MVUE) UCL	242.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.693	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	81.67		
MLE of Mean	138.3		
MLE of Standard Deviation	106.3		
nu star	616.4		
Approximate Chi Square Value (.05)	559.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0487	95% CLT UCL	152.1
Adjusted Chi Square Value	559.4	95% Jackknife UCL	152.1
		95% Standard Bootstrap UCL	152.1
Anderson-Darling Test Statistic	0.794	95% Bootstrap-t UCL	153.3
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	153.2
Kolmogorov-Smirnov Test Statistic	0.0633	95% Percentile Bootstrap UCL	151.9
Kolmogorov-Smirnov 5% Critical Value	0.0694	95% BCA Bootstrap UCL	153.4
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	174.8
		97.5% Chebyshev(Mean, Sd) UCL	190.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	221.6
95% Approximate Gamma UCL	152.3		
95% Adjusted Gamma UCL	152.4		
Potential UCL to Use		Use 95% Approximate Gamma UCL	152.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.